Stellram®
Cutting Tool Systems



TURNING

Stellram® Cutting Tool Products



stellram.com

Turning

Machining Solutions for Mission Critical Metallics®

Increase productivity and reduce tooling costs in today's most challenging applications with machining solutions from Stellram Cutting Tool Systems.

Stellram is a leading producer of specialty metals including titanium and titanium alloys, nickel-based alloys and superalloys, stainless steel and specialty alloys, powder metals and tungsten and tungsten alloys as well as a manufacturer of precision components and fabrications.

Stellram, an operating unit within the Allegheny Technologies Incorporated (ATI) group of companies, is a metalcutting and metal finishing technology leader. Featured products include Stellram® Cutting Tool Systems, Garryson® Abrasives, Burrs and Routers and Landis® Threading Systems.

Stellram draws on the advanced R&D capabilities throughout ATI enabling us to provide "Best in Class" machining solutions for the aerospace, defense, power generation, oil and gas, medical, transportation and construction and mining industries.

We, as Stellram employees, are responsible for achieving customer satisfaction by continually improving processes, products, deliveries and services to ensure they meet or exceed customer requirements. We strive for zero defects in everything we do while promoting a safe work environment for all employees at work and at home.



All Stellram's products are supported by a confident and technical sales team backed by an extensive customer care policy.



Stellram®
Cutting Tool Systems

Turning Solutions

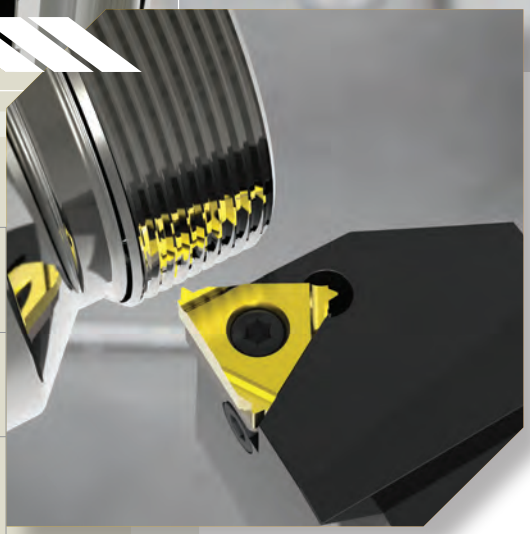
This product catalog highlights a broad range of tooling solutions ideal for turning, boring, threading, grooving and cutoff applications and features:

- A complete range of PVD and CVD “First Choice” grades that includes the advanced NL range of coatings, fine-tuned to specific materials and applications for optimum results.
- Geometries that also offer a “First Choice” range from finishing to roughing to meet the increasing demands of higher feed rates for greater chip control.
- Comprehensive threading programs available in a wide range of standard and customer licensed thread forms.
- A full line of toolholders and boring bars to support and compliment our elite grade and geometry programs.
- Application and customer service support from our technical sales engineers ready to address your on-site needs and backed by an experienced customer service team.

Rely on Stellram to achieve “Best in Class” machining solutions for your high performance applications.

Please contact us for additional information on any of the products illustrated in this catalog or any other part of Stellram’s comprehensive tooling program.





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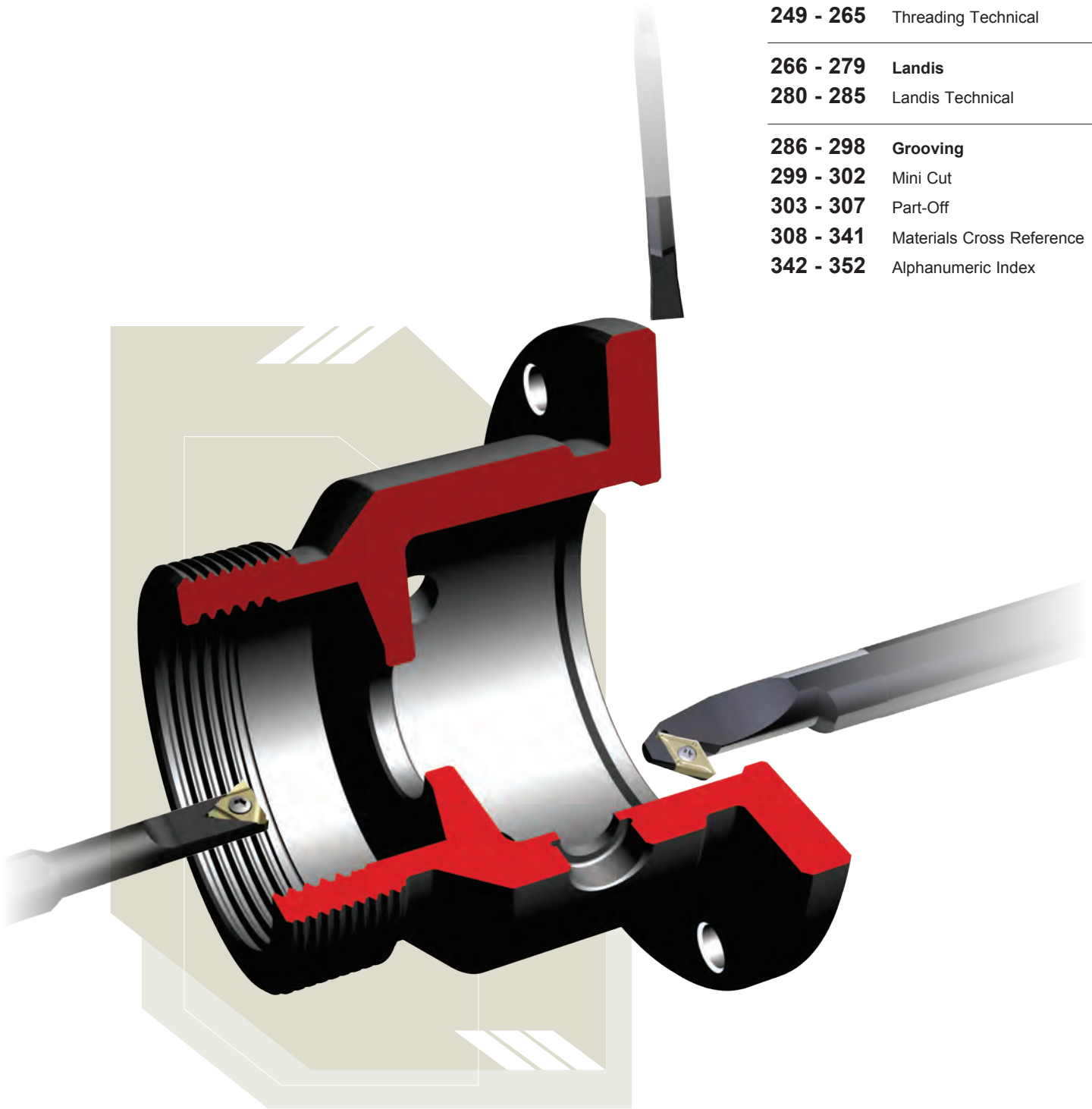
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Tool Selection

The following Material Guide pages enable you to select the appropriate geometry and grade along with a suggested start point for speeds and feeds. Simply select the material to be machined and type of machining operation.

1st Choice

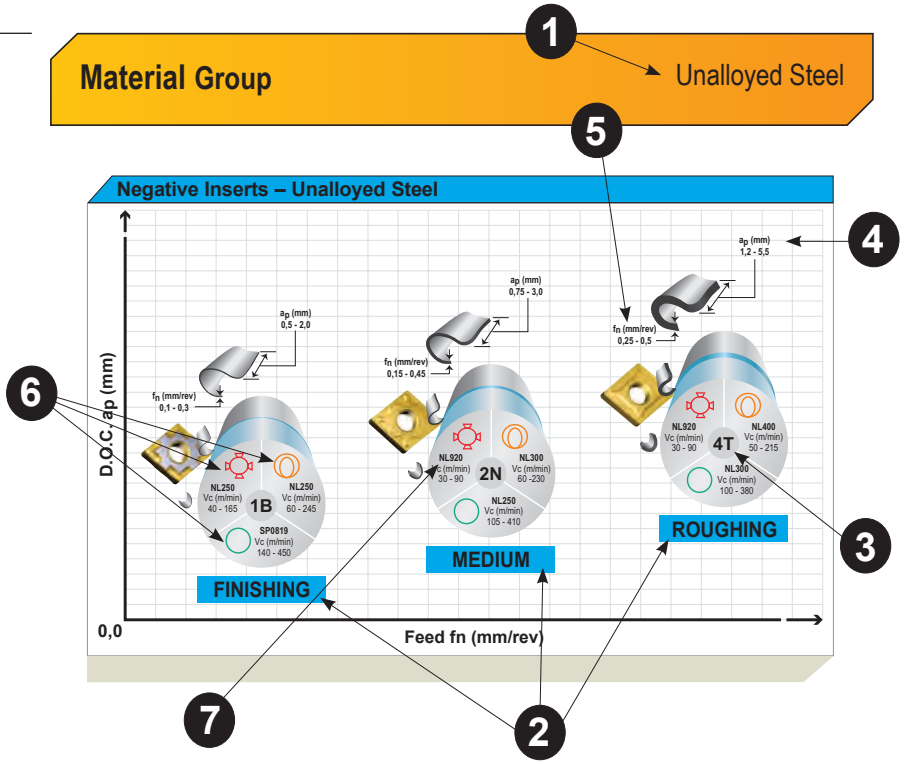
1. **Select your material.**
2. **Select your machining operation from finishing to roughing.**
3. **Recommended geometry for the operation.**
4. **Maximum and minimum depth of cut for this geometry.**
5. **Maximum and minimum feed for this geometry.**
6. **Choose the machining condition as below:**

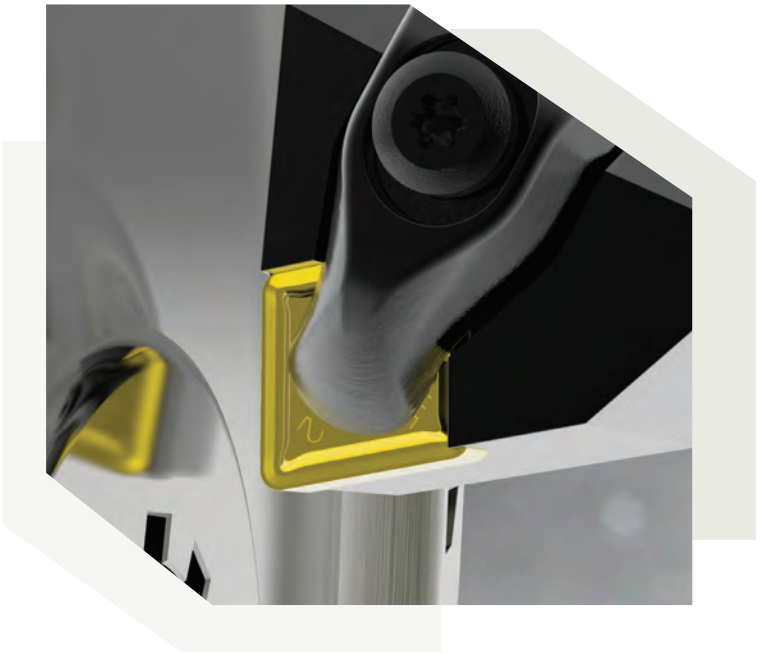
   Interrupted cut

   Varying depth of cut

   Good condition

7. **Recommended grade and cutting speeds for this condition.**





Machining Materials Guide



Unalloyed Steels — P

Alloyed Steels — P

Stainless Steels — M

PH Stainless — M

Cast Irons — K

Aluminum & Alloys — N

High Temperature Alloys — S

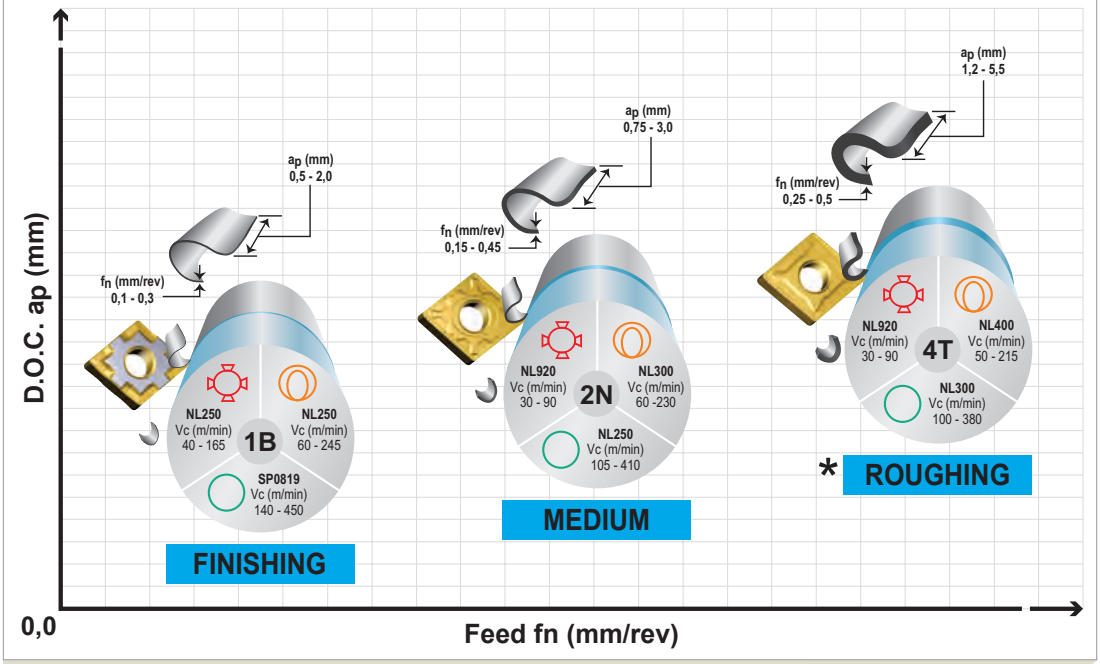
Hard Materials (52-56 HRC) — H

Material Guide – Key to Recommended Inserts

Material Designation

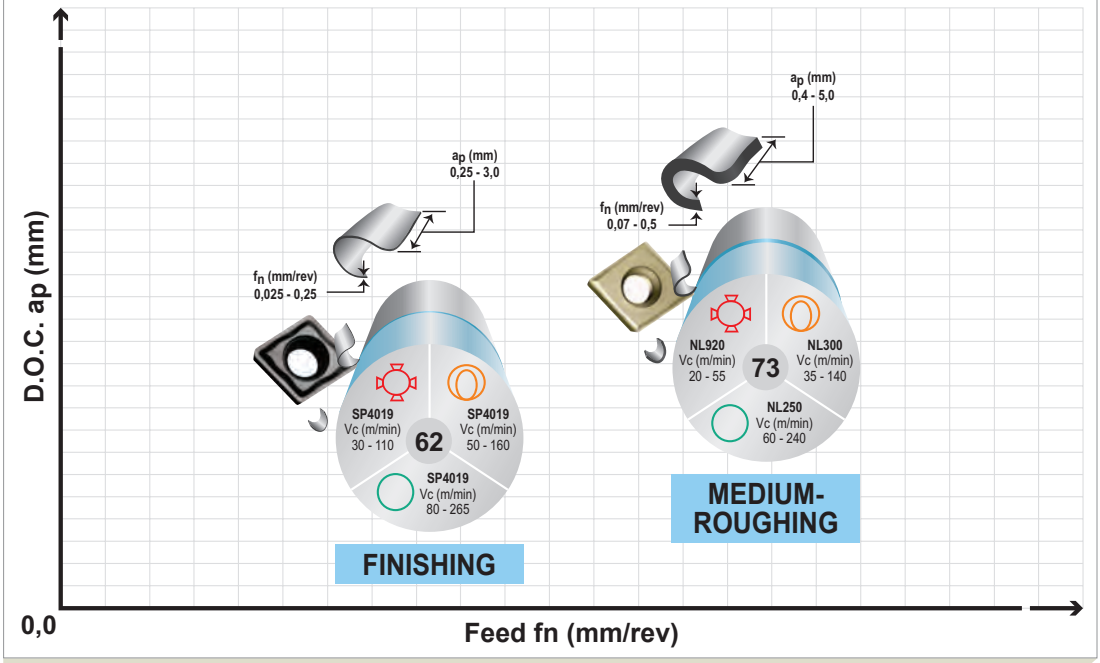
P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Negative Inserts – Unalloyed Steel — Metric



*Note: For Heavy Roughing applications see 5R geometry, page 19.

Positive Inserts – Unalloyed Steel — Metric

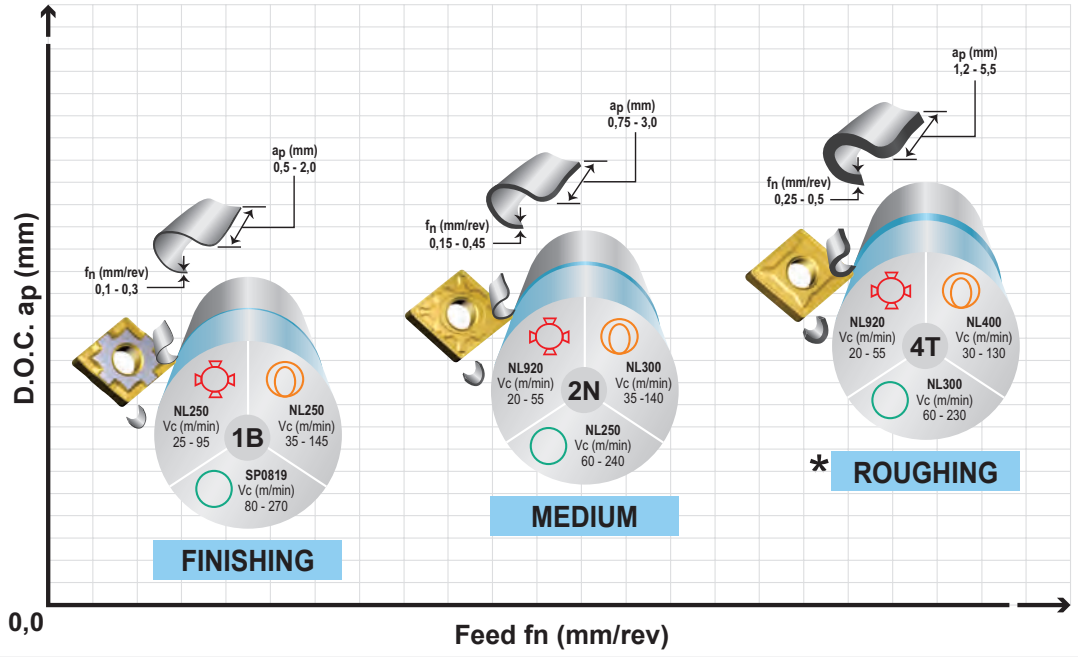


Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

Negative Inserts – Alloyed Steel

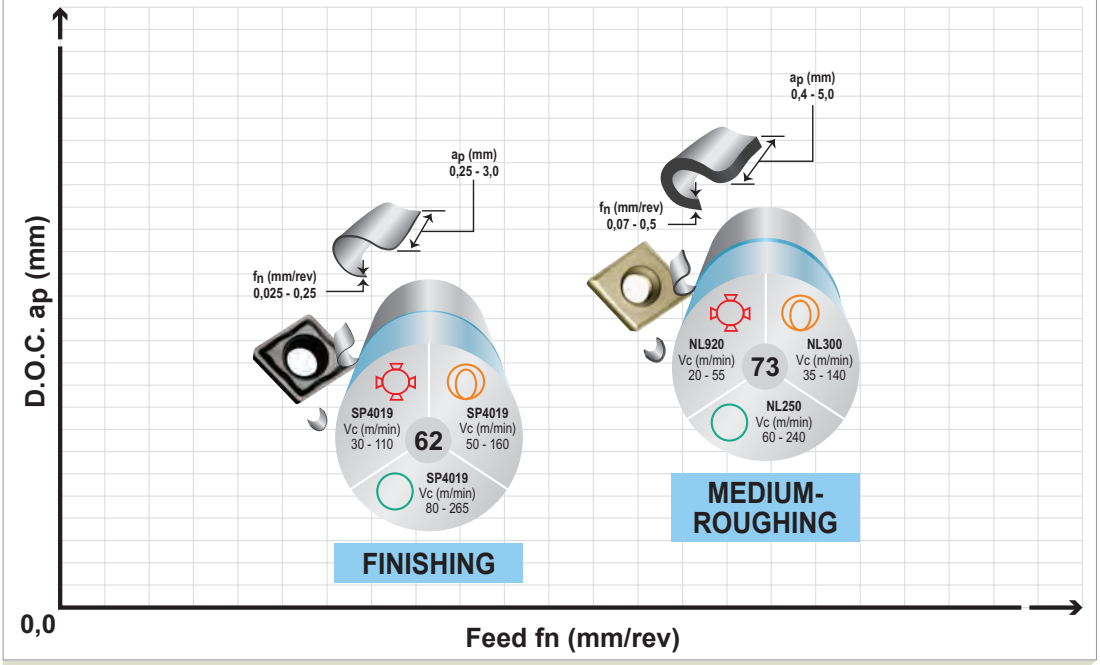
Metric



*Note: For Heavy Roughing applications see 5R geometry, page 19.

Positive Inserts – Alloyed Steel

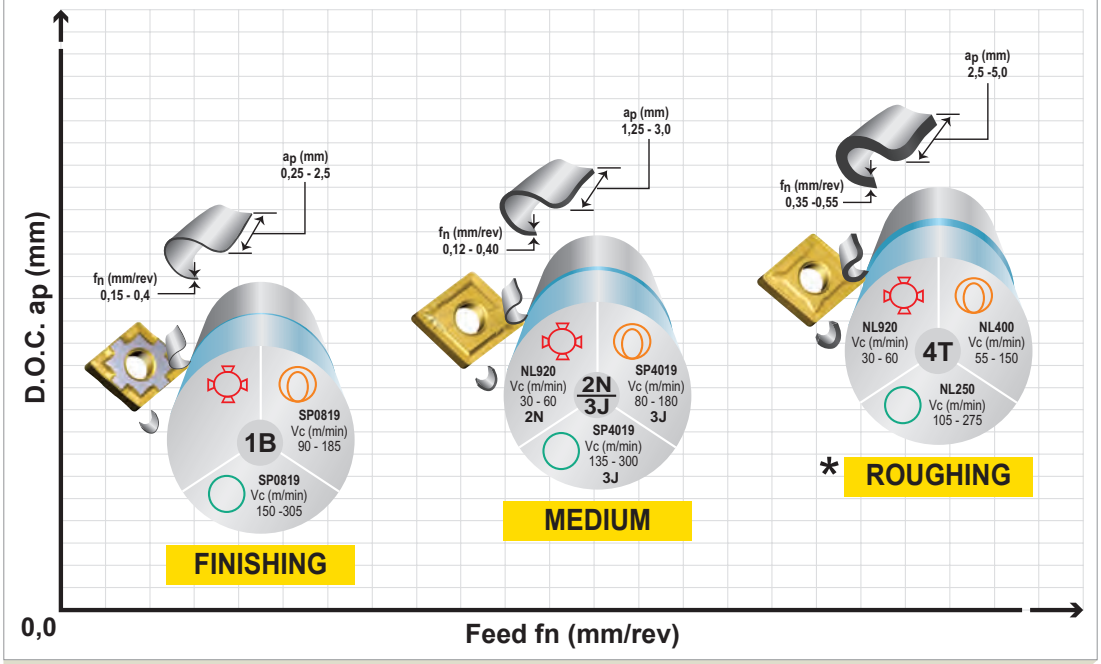
Metric



Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

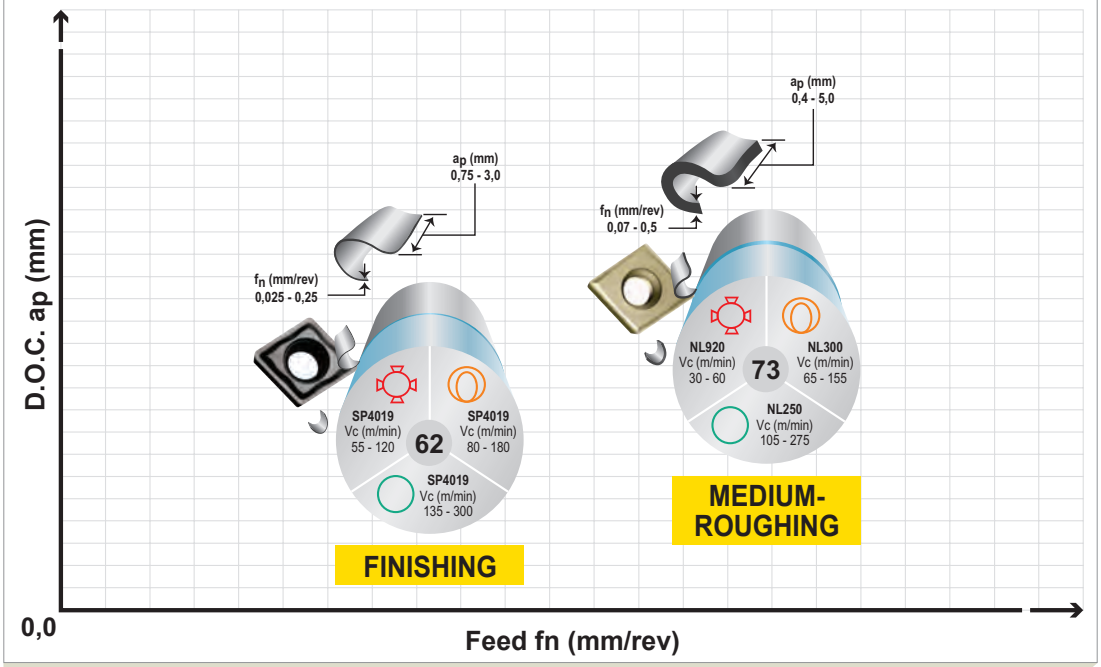
Key	Interrupted cut	Varying depth of cut	Good condition

Negative Inserts – Stainless Steel — Metric



*Note: For Heavy Roughing applications see 5R geometry, page 19.

Positive Inserts – Stainless Steel — Metric

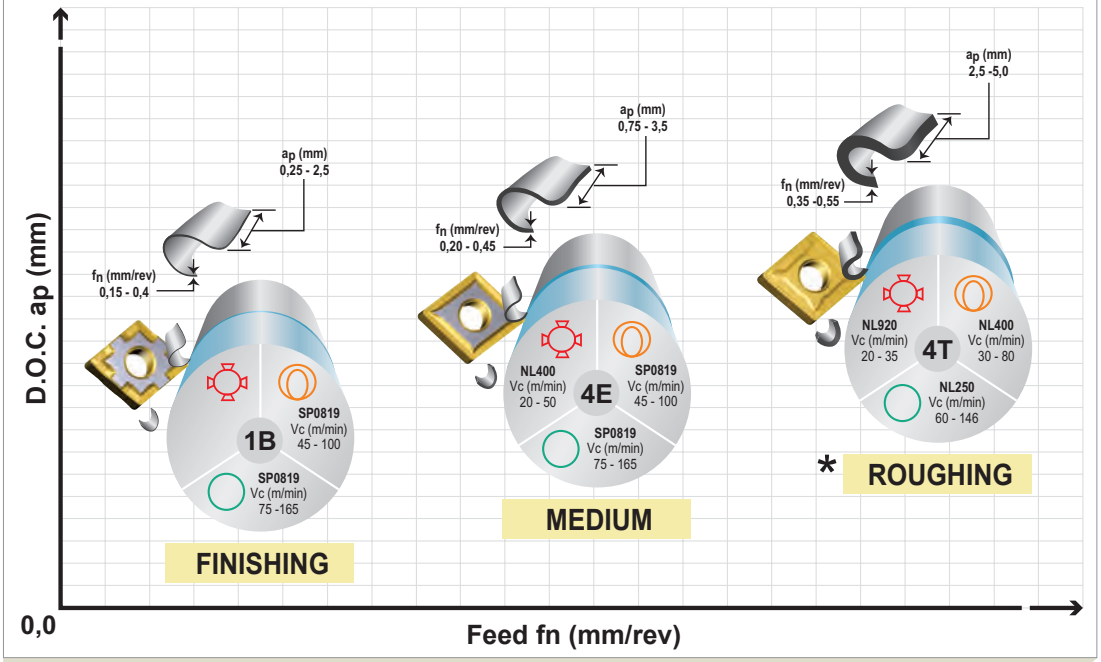


Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

Negative Inserts – Stainless Steel PH

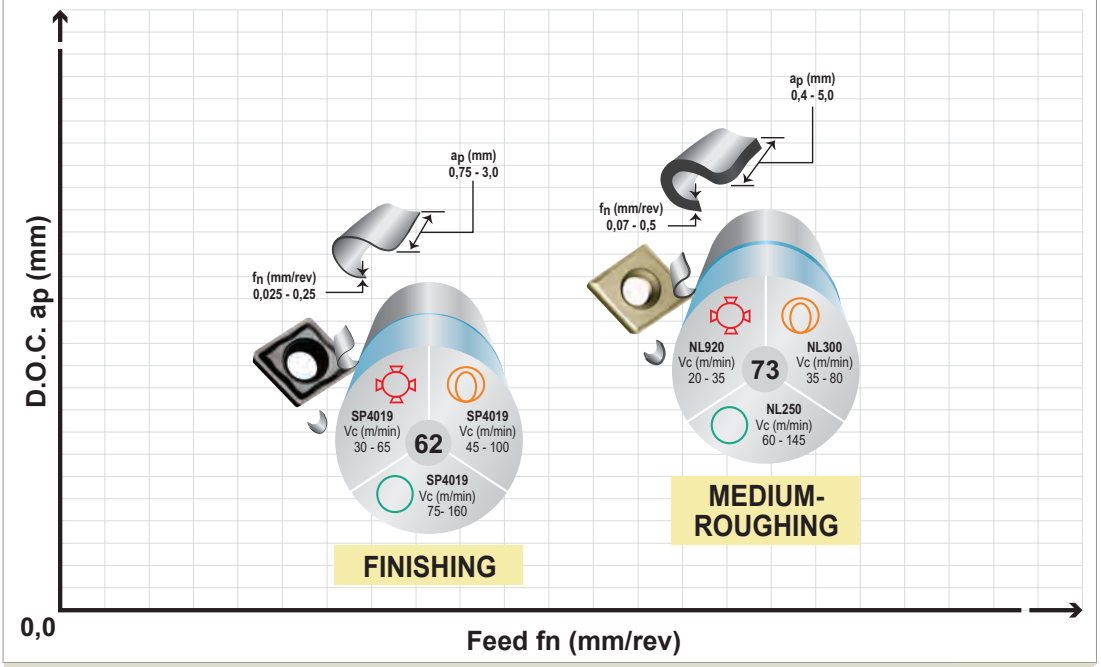
Metric



*Note: For Heavy Roughing applications see 5R geometry, page 19.

Positive Inserts – Stainless Steel PH

Metric

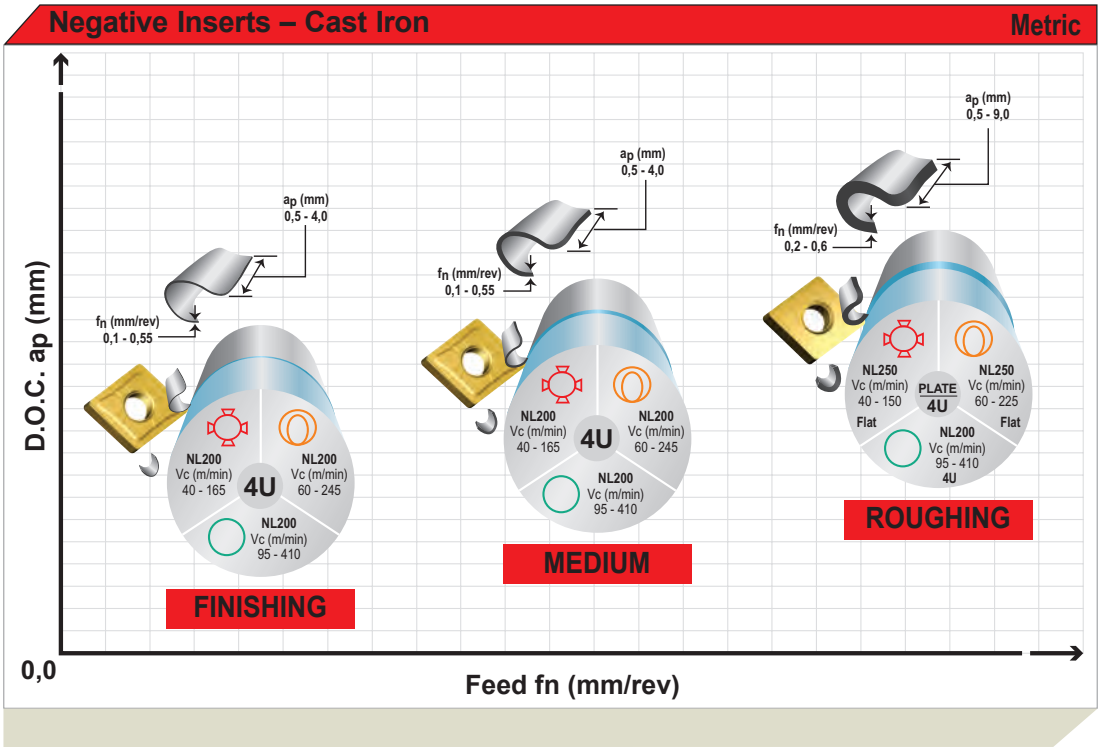


Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

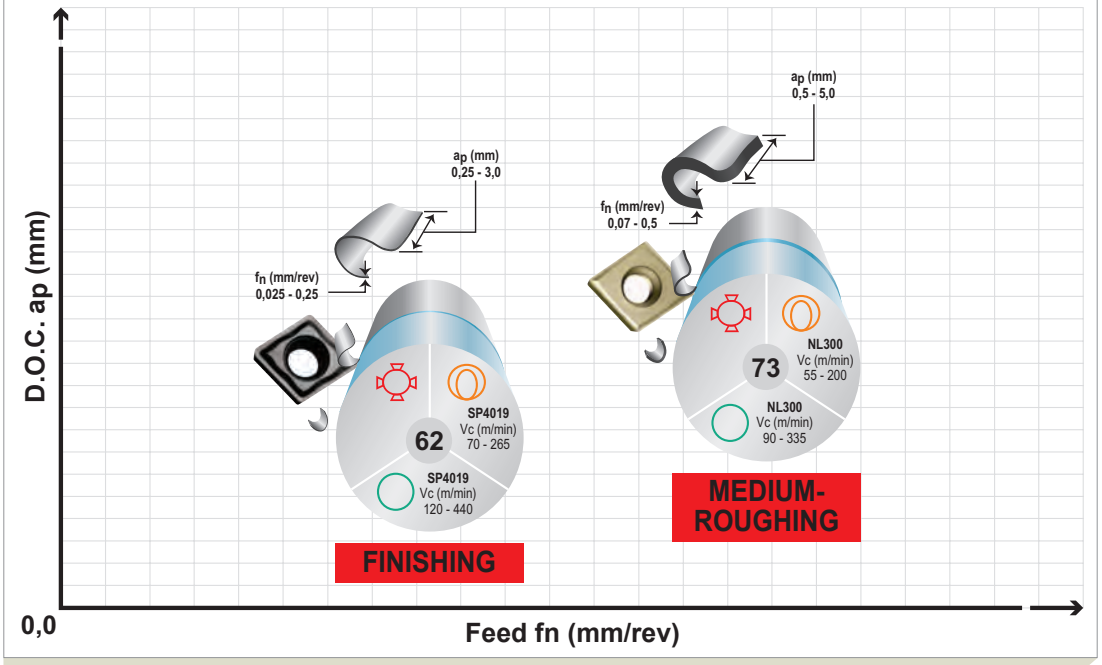
Negative Inserts – Cast Iron

Metric



Positive Inserts – Cast Iron

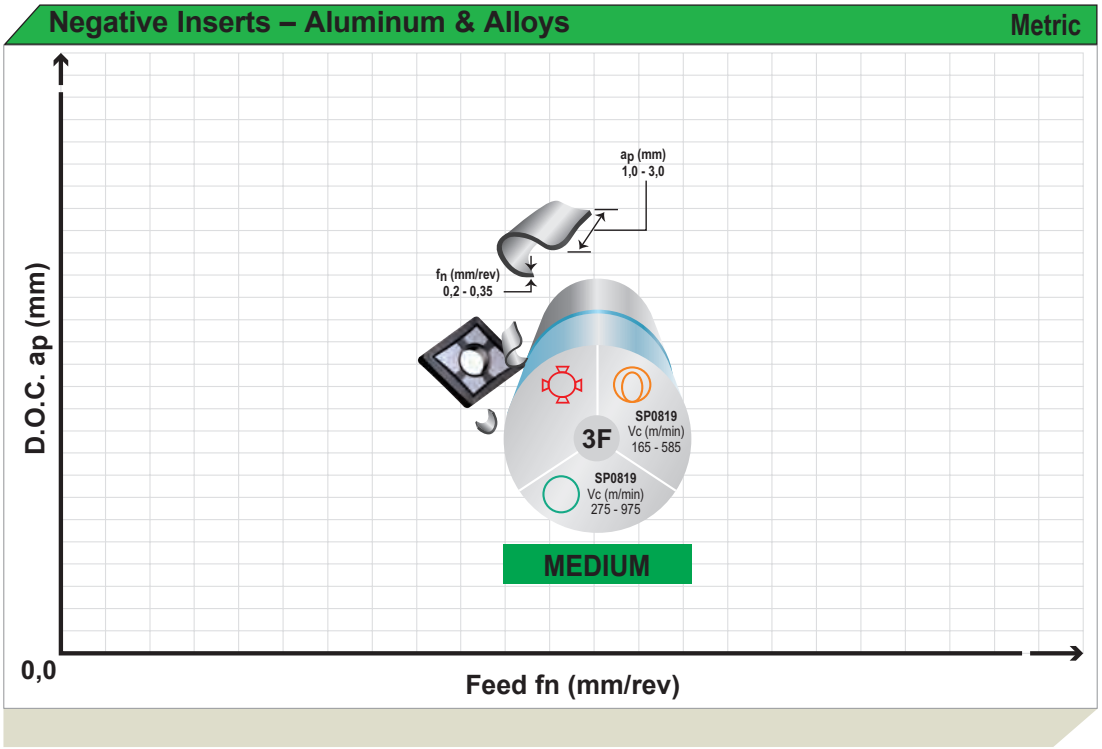
Metric



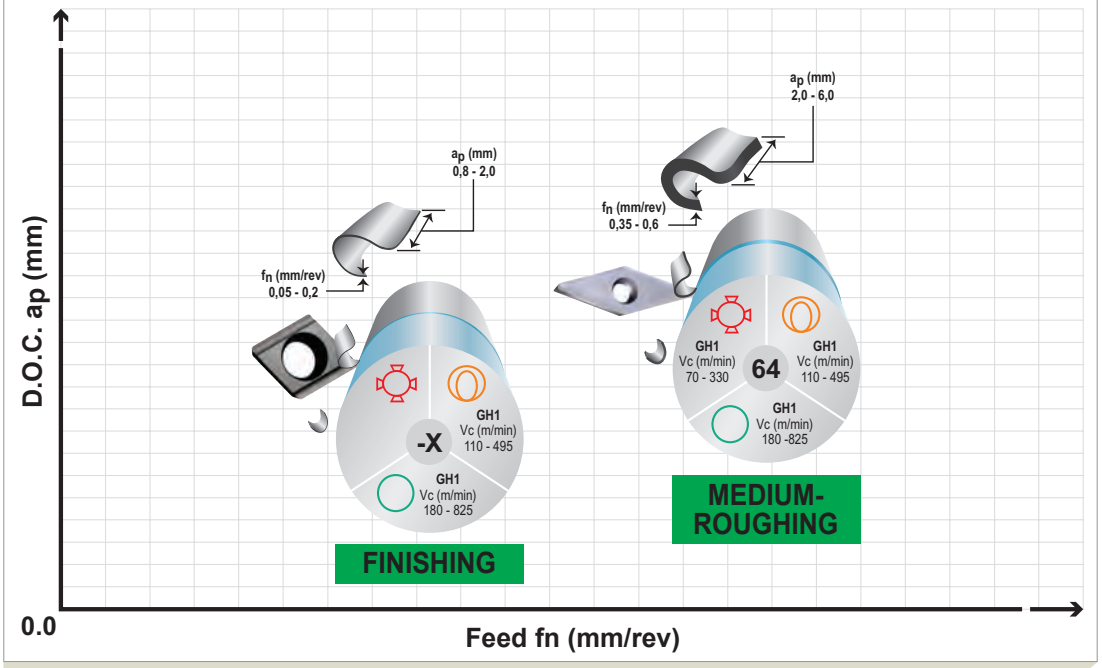
Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

Negative Inserts – Aluminum & Alloys — Metric



Positive Inserts – Aluminum & Alloys — Metric

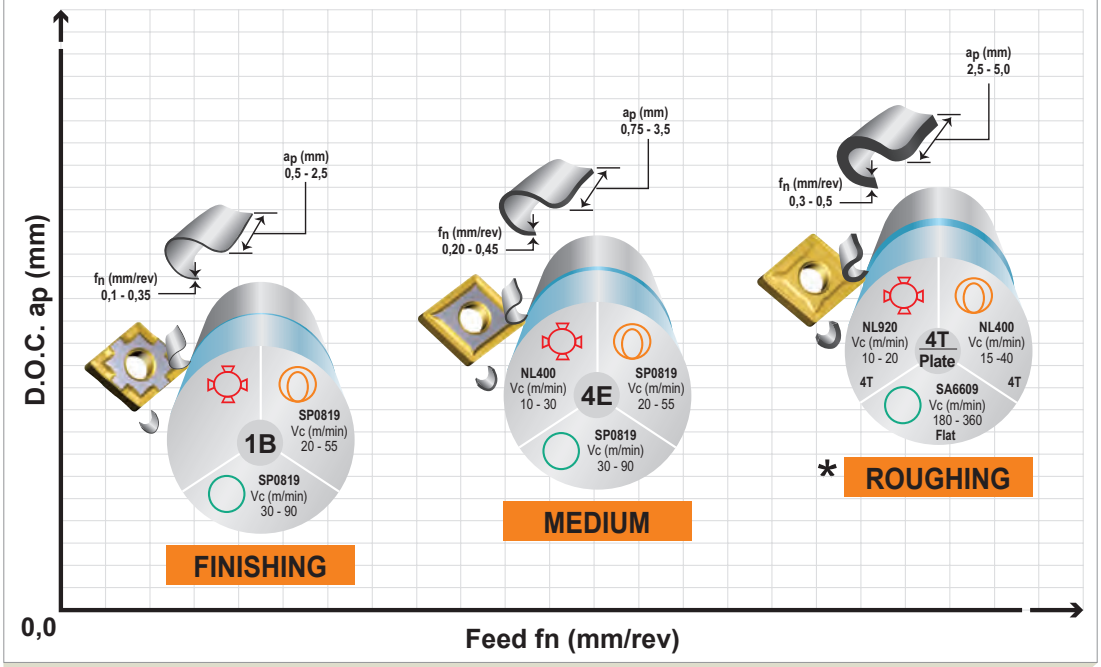


Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

Negative Inserts – High Temperature Alloys

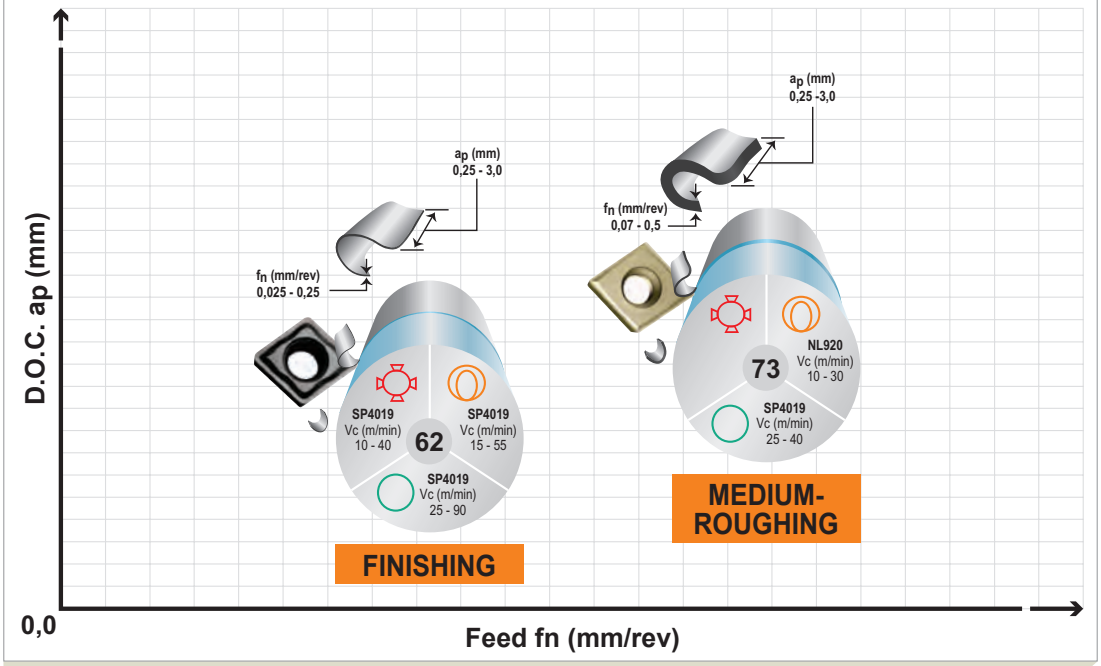
Metric



*Note: For Heavy Roughing applications see 5R geometry, page 19.

Positive Inserts – High Temperature Alloys

Metric

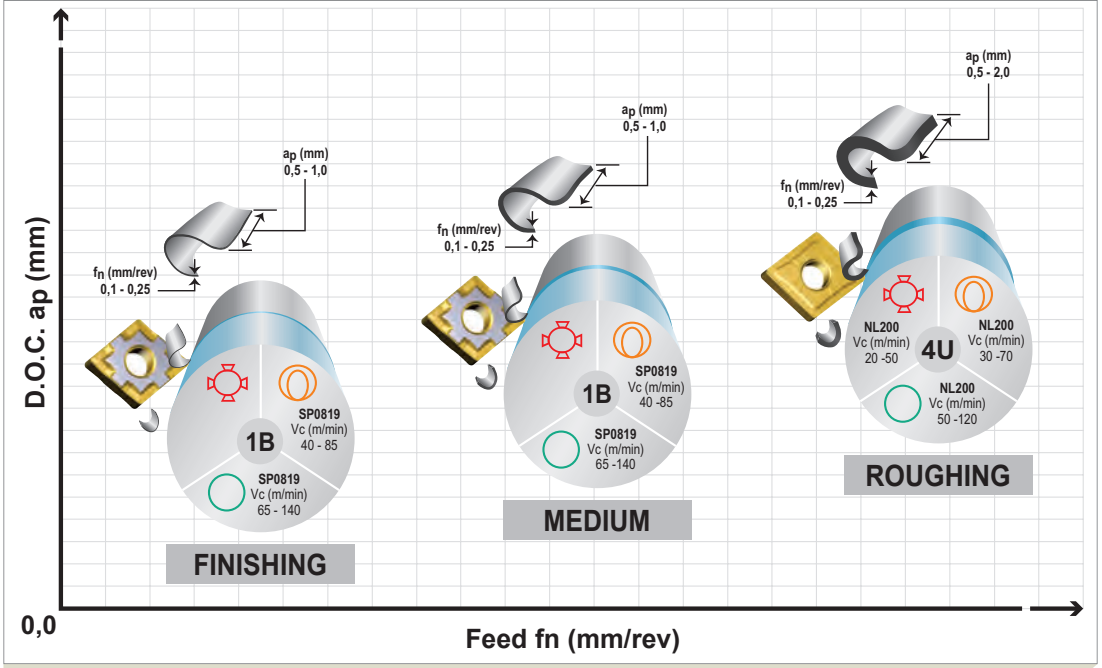


Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

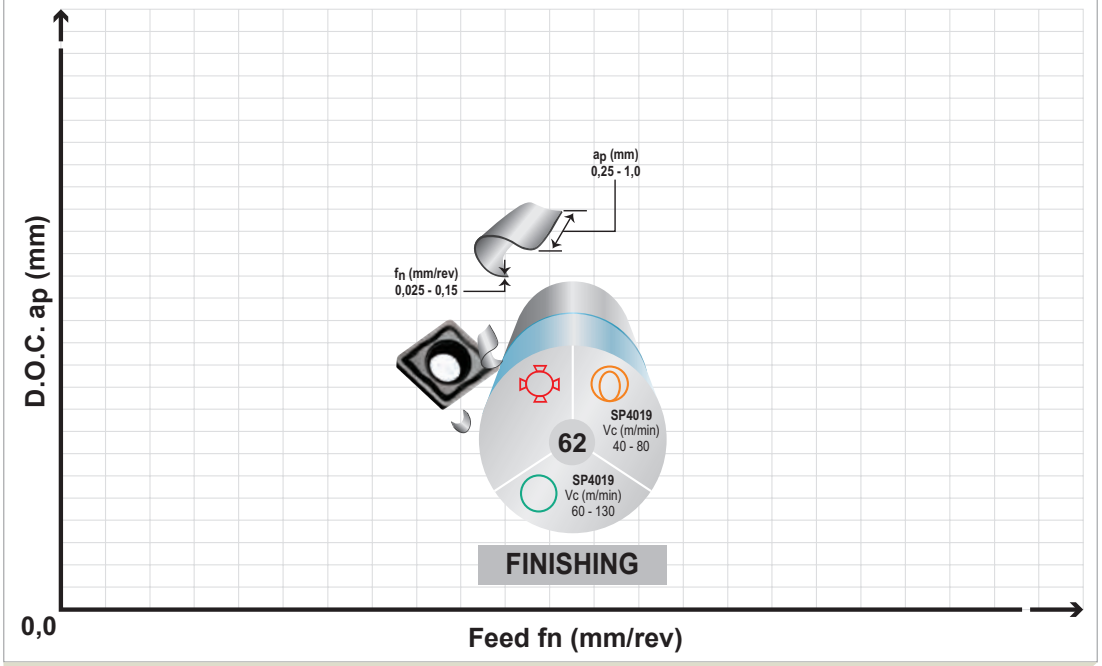
Negative Inserts – Hard Materials

Metric



Positive Inserts – Hard Materials

Metric



Please note the above recommended cutting speeds, geometries and grades are for guidance only.
For more detailed information, see pages 14 - 25 (geometry technical information & grade technical information).

Key	Interrupted cut	Varying depth of cut	Good condition

Geometry User Guide

1st Choice

Diamond will indicate the recommended insert for each material. Stellram's Material Guide enables you to find the right insert for your machining requirements.

1. **Application information**
2. **Material Guide information – diamond indicates the recommended materials related to the geometry.**
3. **Detailed outline of geometry profile.**
4. **Identifies depth of cut (D.O.C) and feed rate range applicable to the geometry.**
5. **Cutting condition applicable to geometry.**

2N Inserts

2N Geometry Technical Information

Light to Medium Roughing:
Positive rake angle provides a positive cutting action reducing cutting pressure, this makes 2N a good first choice geometry for a wide range of applications and materials.
Available in Grades: NL250, NL300 & NL920

Materials Application

SP0819					
P	M	K	N	S	H
◆	◆				

NL250					
P	M	K	N	S	H
◆	◆				

NL250					
P	M	K	N	S	H
◆	◆				

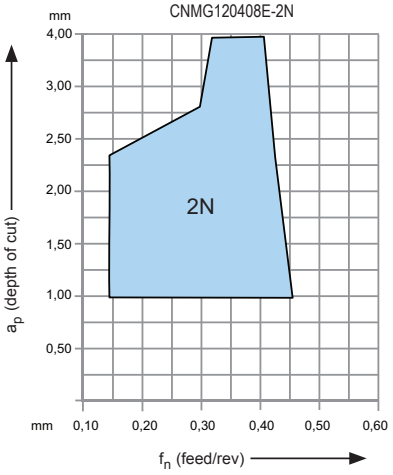
Cutting Condition

✔	✔	✔

Profile



Alloyed Steel: 900 - 1200 N/mm² HBN 260 - 340



Negative Insert Geometries

1B Inserts

1B Geometry Technical Information

Finishing:
The 1B Geometry is ideal for the finish machining of Steels, Stainless Steels, and High Temperature Alloys. The precisely controlled cutting edge and nose profile removes material cleanly and efficiently, leaving a superior surface finish. **Available in Grades: SP0819 & NL250**

Materials Application

SP0819

P	M	K	N	S	H
◆	◆			◆	◆

NL250

P	M	K	N	S	H
◆	◆			◆	

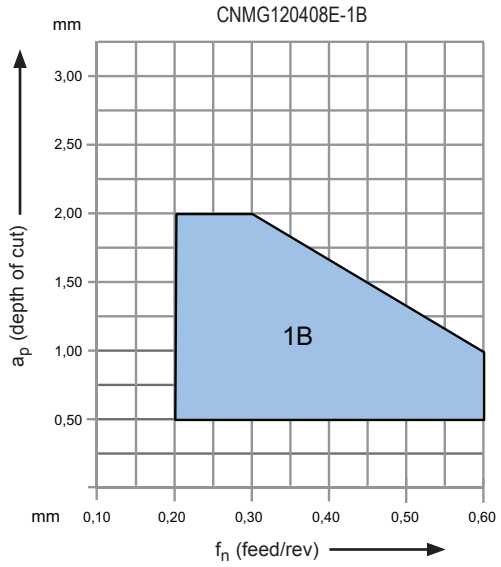
Cutting Condition

✔	✔	✘

Profile



Alloyed Steel: 4140 (41CrMo4)



2N Inserts

2N Geometry Technical Information

Light to Medium Roughing:
The 2N Geometry's positive rake angle, provides a positive cutting action with reduced cutting pressure, making it an excellent first choice for a wide range of applications and materials.
Available in Grades: NL250, NL300 & NL920

Materials Application

NL250

P	M	K	N	S	H
◆	◆				

NL300

P	M	K	N	S	H
◆	◆				

NL920

P	M	K	N	S	H
◆	◆				

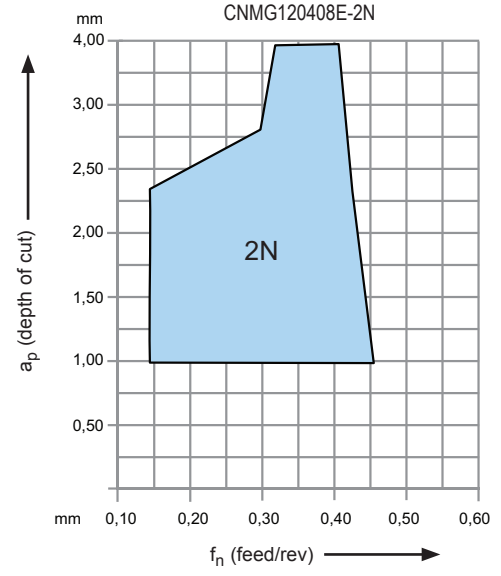
Cutting Condition

✔	✔	✔

Profile



Alloyed Steel: 900 - 1200 N/mm² HBN 260 - 340



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

3F Geometry Technical Information

Finishing to Light Roughing:
The 3F Geometry has a precision ground periphery to ensure a precise cutting edge profile, with accurate indexability. The micro edge conditioning reduces the cutting pressure, built-up edge and improves the surface finish in difficult to machine materials. **Available in Grade: SP0819**

Materials Application

SP0819

P	M	K	N	S	H
	◆		◆	◆	

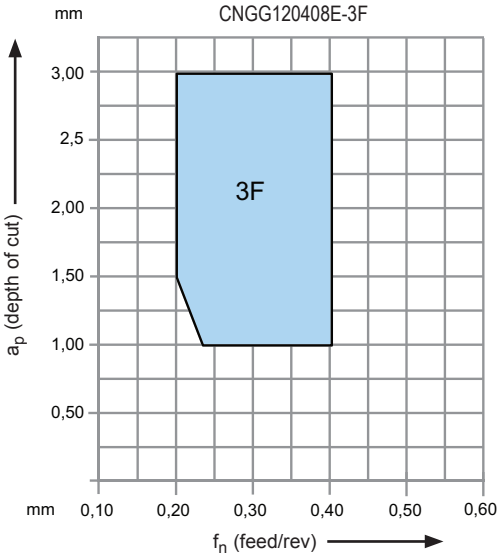
Cutting Condition

✔	✔	✘

Profile



Stainless Steel: ATI 316™



3J Inserts

3J Geometry Technical Information

Medium to Light Roughing:
The 3J Geometry has a smooth cutting action which reduces cutting forces, improves surface finishes and increases the tool life, making it ideal for the machining of Stainless Steels. **Available in Grade: SP4019**

Materials Application

SP4019

P	M	K	N	S	H
	◆			◆	

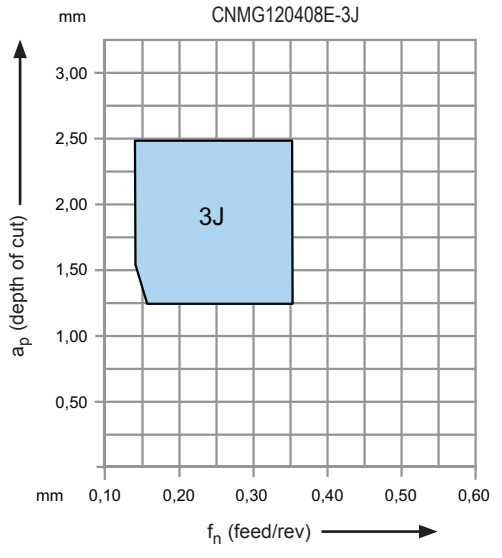
Cutting Condition

✔	✔	Light

Profile



Stainless Steel: ATI 316™



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

4E Geometry Technical Information

Semi-Finishing to Light Roughing:
The 4E Geometry was designed specifically for the machining of High Nickel, High Cobalt, and Titanium based alloys. It's reinforced chip-breaker and precision edge condition enhances the performance of this geometry. **Available in Grades: SP0819 & NL400**

Materials Application

SP0819

P	M	K	N	S	H
	◆			◆	

NL400

P	M	K	N	S	H
	◆			◆	

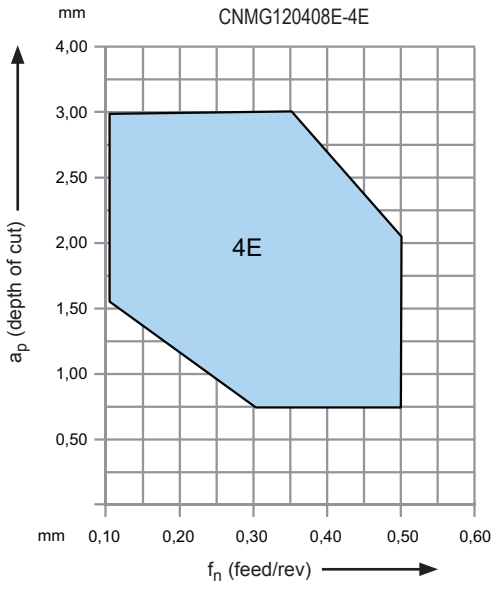
Cutting Condition

✔	✔	Light

Profile



Titanium Alloy: ATI 6-4™



4T Geometry Technical Information

General Purpose Roughing:
The 4T Geometry is the first choice for general purpose machining of all Steels, Stainless Steels and Cast Irons.
Available in Grades: NL250, NL300, NL400 & NL920

Materials Application

NL250

P	M	K	N	S	H
◆	◆	◆			

NL300

P	M	K	N	S	H
◆	◆	◆			

NL400

P	M	K	N	S	H
◆	◆				

NL920

P	M	K	N	S	H
◆	◆	◆			

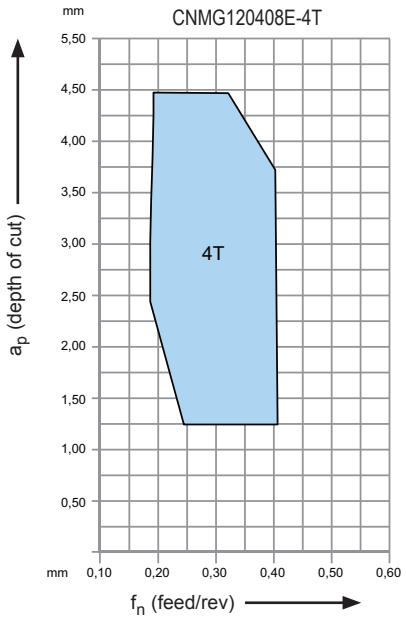
Cutting Condition

✔	✔	✔

Profile



Alloyed Steel: 800 - 1200 N/mm² HBN 230 - 340



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

4U Geometry Technical Information

Medium to Roughing:
The 4U Geometry was designed specifically for roughing applications in Grey, Ductile and Malleable Irons. The geometry design produces low cutting pressure with excellent chip control, enhancing the tool life.
Available in Grade: NL200

Materials Application

NL200

P	M	K	N	S	H
◆		◆			◆

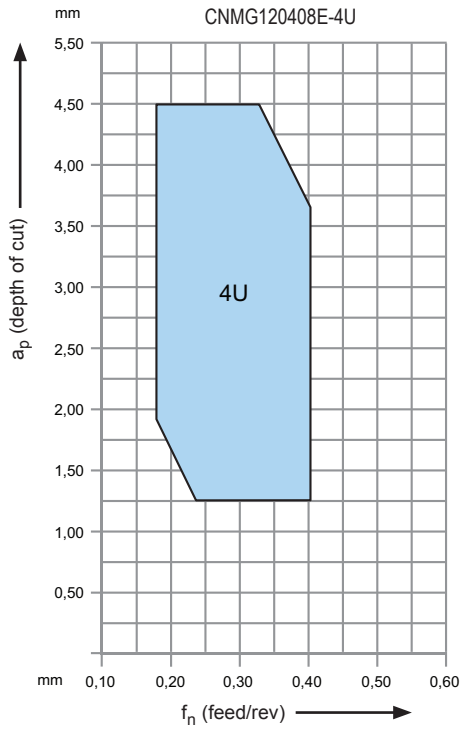
Cutting Condition

✔	✔	Light

Profile



Ductile Iron: HBN 170



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

5R Geometry Technical Information

Single Sided Heavy Roughing:
The 5R Geometry was designed specifically for the heavy, rough machining of Steels, Stainless Steels, High Nickel, High Cobalt and Titanium based alloys. It is the first choice when stability, high feed rates and strong edge conditions are required.
Available in Grades: NL300, NL400 & NL920

Materials Application

NL300

P	M	K	N	S	H
◆	◆				

NL400

P	M	K	N	S	H
◆	◆			◆	

NL920

P	M	K	N	S	H
◆	◆			◆	

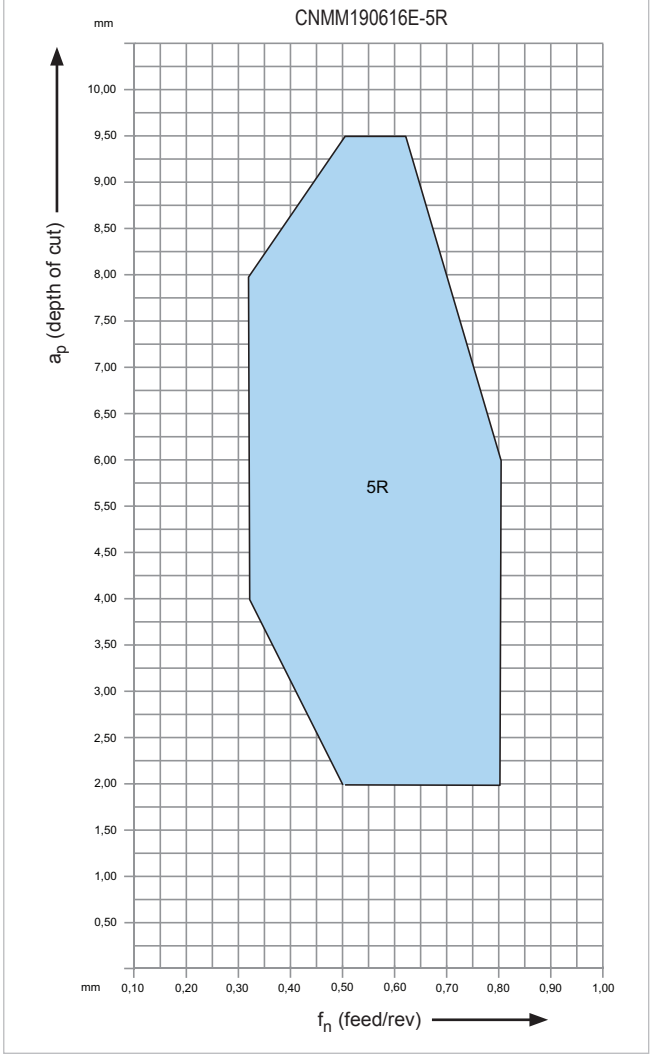
Cutting Condition



Profile



Stainless Steel: ATI 316™



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Positive Insert Geometries

-15 Inserts

-15 Geometry Technical Information

Medium to Finishing:
The -15 Geometry is ideally suited to applications which require light depths of cut and feeds, and where vibration could be an issue. This geometry is ground and has a sharp edge condition.
Available in Grades: SP4019 & GH1

Materials Application

SP4019

P	M	K	N	S	H
◆	◆			◆	

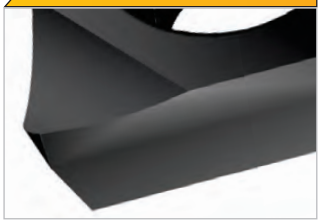
GH1

P	M	K	N	S	H
			◆		

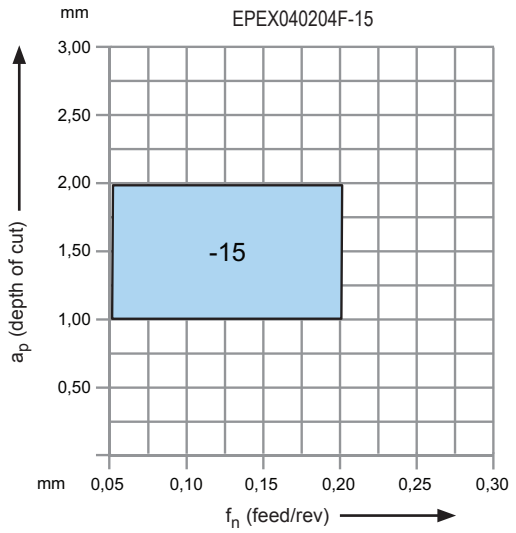
Cutting Condition



Profile



Aluminium: <16% Si HBN 116



-61 Inserts

-61 Geometry Technical Information

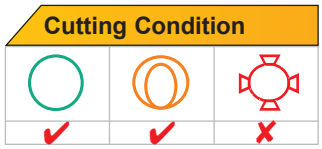
Finishing:
The -61 Geometry has 6 cutting edges and is one of the most economical inserts for small part machining. The chip-breaker provides good chip control and surface finish.
Available in Grade: SP4019

Materials Application

SP4019

P	M	K	N	S	H
◆	◆	◆			

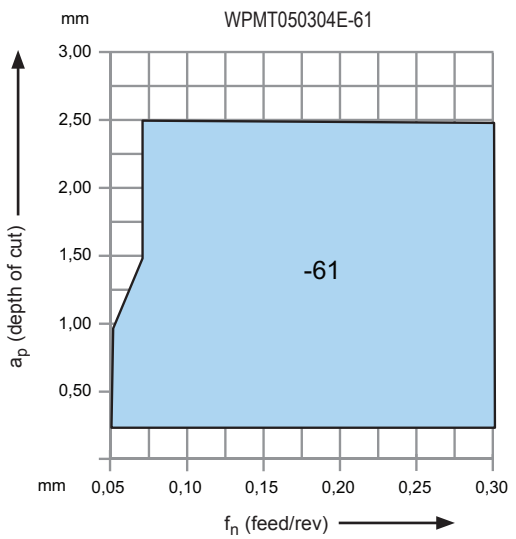
Cutting Condition



Profile



Unalloyed Steel: 750 - 950 N/mm² HBN 220 - 270



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Positive Insert Geometries

-62 Inserts

-62 Geometry Technical Information

Finishing:
The -62 Geometry is one of the most versatile geometries for the machining of Steels, Stainless Steels, High Nickel, High Cobalt and Titanium based alloys. This positive geometry was designed for a wide variety of finishing applications.
Available in Grade: SP4019

Materials Application

SP4019

P	M	K	N	S	H
◆	◆	◆		◆	◆

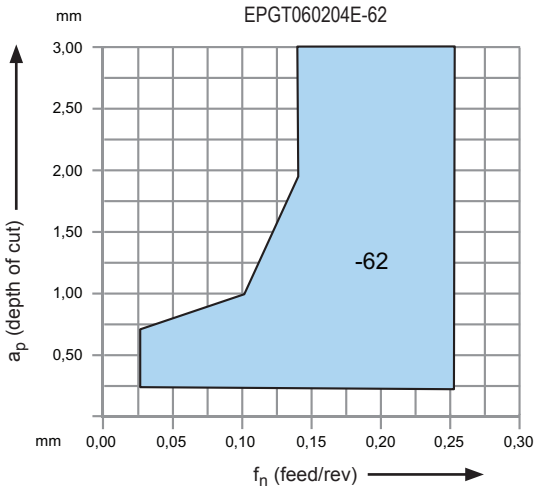
Cutting Condition

✔	✔	✘

Profile



Unalloyed Steel: 750 - 950 N/mm² HBN 220 - 270



-64 Inserts

-64 Geometry Technical Information

Medium to Roughing:
The -64 Geometry is a very positive geometry, with polished top rake and ground periphery. Specifically designed for the machining of Aluminum, Plastics and Soft Alloys.
Available in Grade: GH1

Materials Application

GH1

P	M	K	N	S	H
			◆		

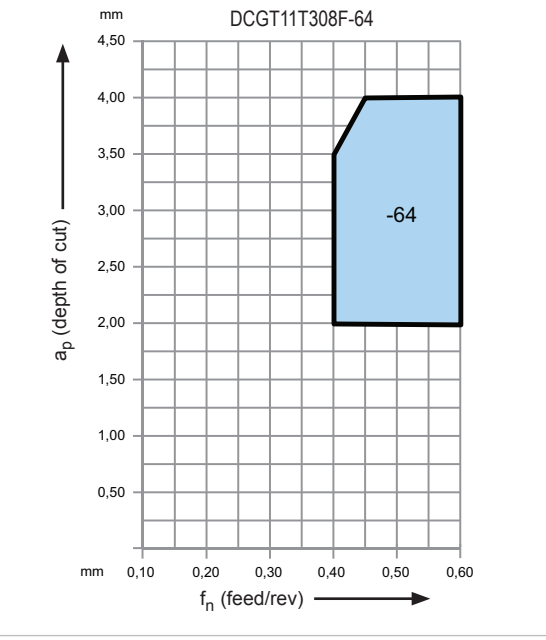
Cutting Condition

✔	✔	✘

Profile



Aluminium: <16% Si HBN 116



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Positive Insert Geometries

-66 Inserts

-66 Geometry Technical Information

Medium to Finishing:
The -66 Geometry has a precision ground periphery and pressed in chip-breaker, with a sharp edge condition, ideally suited for fine chip control when machining medical and small precision components.
Available in Grade: GH1

Materials Application

GH1

P	M	K	N	S	H
	◆		◆		

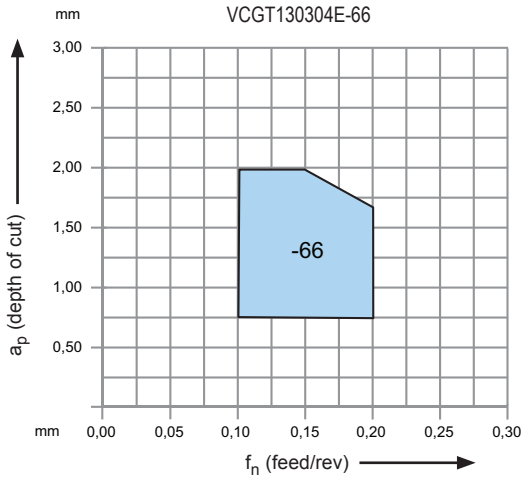
Cutting Condition

✔	✔	✘

Profile



Stainless Steel: 450 - 700 N/mm² HBN 120 - 180



-73 Inserts

-73 Geometry Technical Information

Medium to Roughing:
The -73 Geometry is an as pressed geometry, covering a wide range of applications and materials, making it the ideal first choice for most medium to roughing, machining applications.
Available in Grades: SP4019, NL300 & NL920

Materials Application

SP4019

P	M	K	N	S	H
◆	◆			◆	

NL300

P	M	K	N	S	H
◆	◆				

NL920

P	M	K	N	S	H
◆	◆			◆	

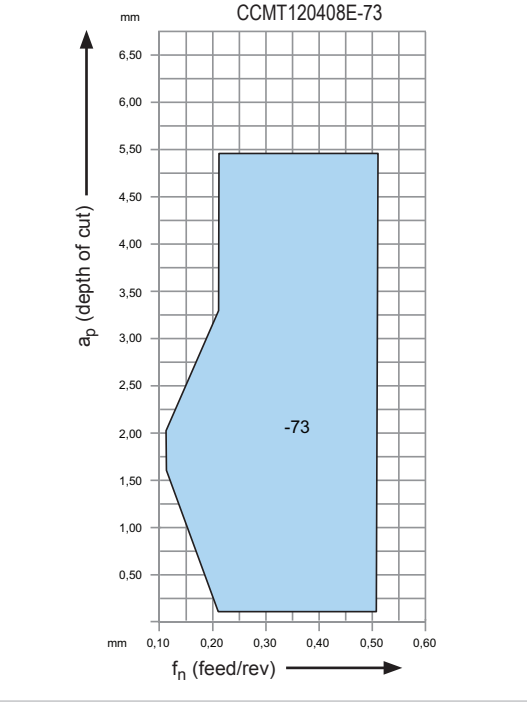
Cutting Condition

✔	✔	✔

Profile



Alloyed Steel: 900 - 1200 N/mm² HBN 260 - 340



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

-M Geometry Technical Information

Medium to Finishing:
The -M Geometry has a small, well defined chip-breaker for a soft cutting action, resulting in very little stress being produced, when machining small diameter components.
Available in Grades: SP4019 & GH1

Materials Application

SP4019

P	M	K	N	S	H
◆	◆			◆	

GH1

P	M	K	N	S	H
	◆			◆	

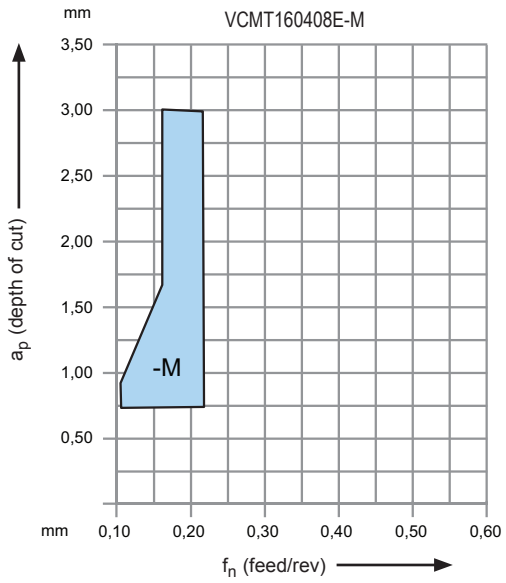
Cutting Condition



Profile



Unalloyed Steel: 750 - 950 N/mm² HBN 220 - 270



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

-T Geometry Technical Information

Medium to Roughing:
The -T Geometry is a utility geometry giving a stable cutting action in a wide vareity of demanding applications.
Available in Grades: SP4019, NL250, NL300, NL400 & NL920

Materials Application

SP4019					
P	M	K	N	S	H
◆	◆			◆	

NL250					
P	M	K	N	S	H
◆	◆				

NL300					
P	M	K	N	S	H
◆	◆				

NL400					
P	M	K	N	S	H
◆	◆			◆	

NL920					
P	M	K	N	S	H
◆	◆			◆	

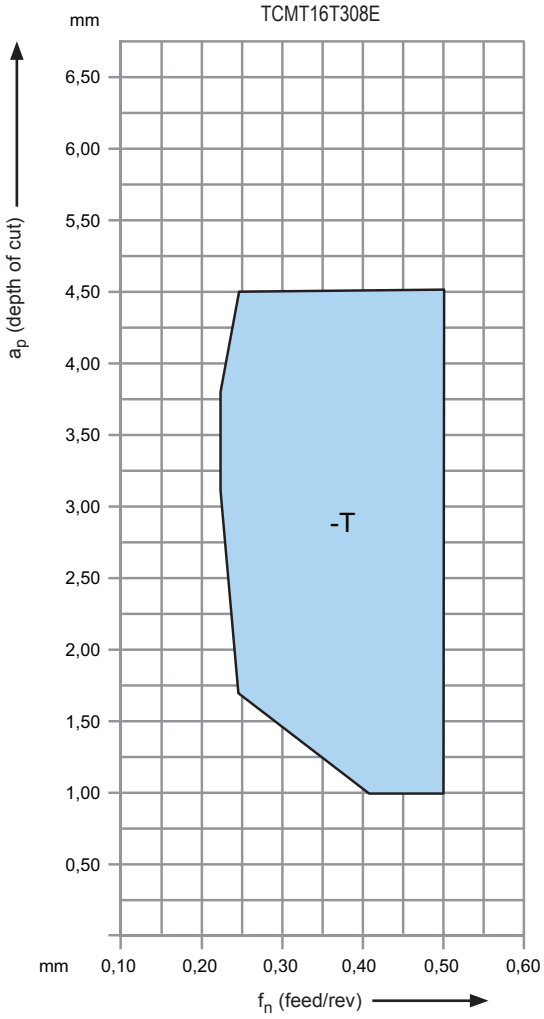
Cutting Condition



Profile



Unalloyed Steel: 750 - 950 N/mm² HBN 220 - 270



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

-X Geometry Technical Information

Medium to Roughing:
The -X Geometry has a precision ground parallel chip groove, available with a fully ground periphery or as pressed, both with a sharp edge condition. Ideal for the machining of components which have vibration sensitive applications.
Available in Grades: SP4019 & GH1

Materials Application

SP4019

P	M	K	N	S	H
◆				◆	

GH1

P	M	K	N	S	H
			◆		

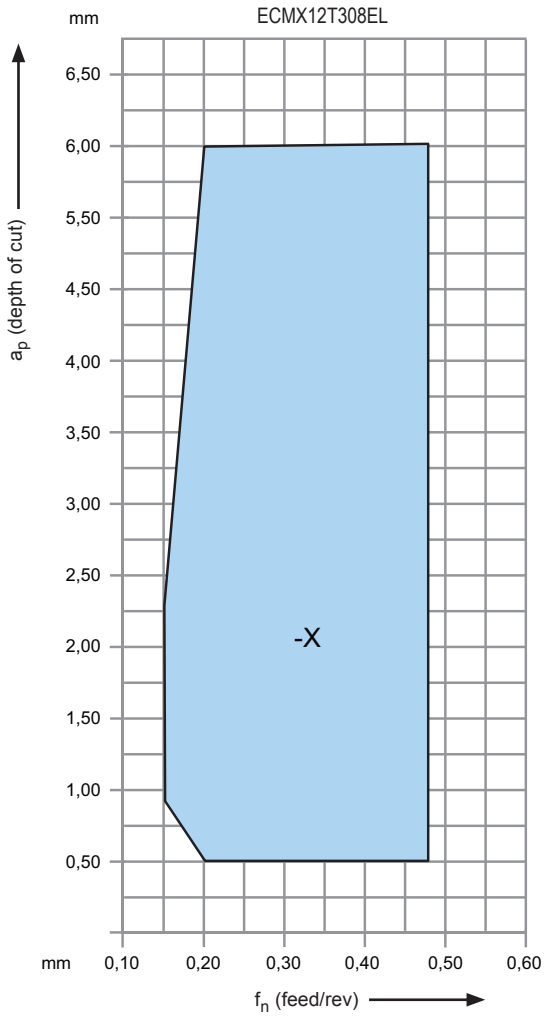
Cutting Condition

✔	✔	✘

Profile



Aluminium: <16% Si HBN 116



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Grade Selection

Stellram's range of carbide and ceramic grades offer solutions to suit all material groups.

Cutting Material Groups

Uncoated Grade



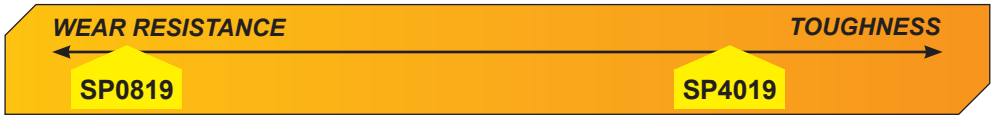
Stellram's uncoated GH1 grade is a micro-gain carbide offering excellent wear resistance at high cutting speeds, in various materials and applications.

NL = CVD Coated Grades



The **NL** range of CVD coated grades with enhanced surface layering have been specifically developed and engineered to machine at elevated cutting conditions, in a broad range of materials.

SP = PVD Coated Grades



These PVD coated grades can be applied to varying applications and materials, but primarily designed to machine stainless steels, and high temperature alloys.

SA = Ceramic Grade



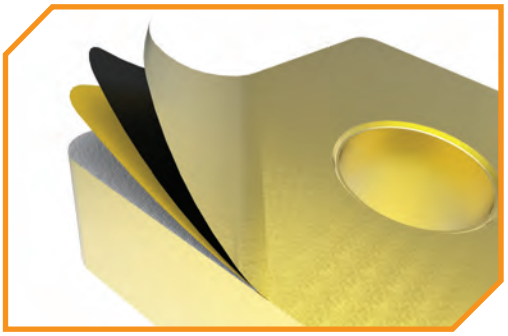
SA6609 is an advanced silicon-carbide whisker reinforced ceramic grade, which makes it very resistant to edge facture and notch wear, especially when machining high nickel, and high cobalt based alloys.

NL200

Coating Type: CVD

First choice to machine Cast Iron, this grade has a very good resistance to wear and deformation, suitable for medium and finishing applications on gray and malleable cast irons.

Available in the following geometries:
Medium – Roughing: 4U



NL200	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P			●	●	●							●	●	60	415
M															
K		●	●	●								●	●	95	410
N															
S															
H		●	●									●		45	125

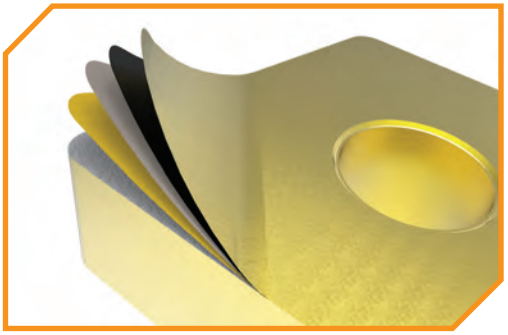
Recommended ● Acceptable ◉

NL250

Coating Type: CVD

Wear resistant grade for semi-finishing and finishing applications. Suitable for stable conditions with limited interrupted machining.

Available in the following geometries:
Finishing: 1B
Light-Medium Roughing: 2N
Roughing: 4T
Flat Top: Roughing



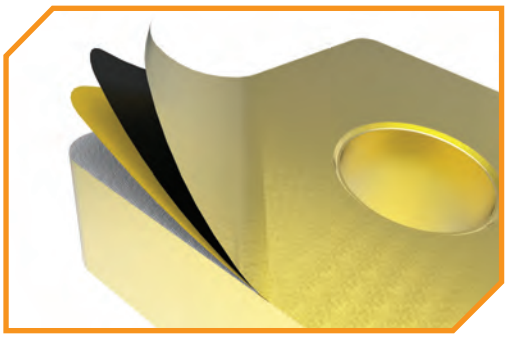
NL250	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P			●	●	●	●						●	●	60	405
M		●	●	●	●							●		60	275
K		●	●	●	●							●	●	95	375
N															
S		●	●	●								●		20	80
H															

Recommended ● Acceptable ◉

NL300

Coating Type: CVD

A tough but wear resistant grade for medium and rough machining with light scale but, no interruption. General purpose for Steels and Cast Iron materials.



Available in the following geometries:
Medium roughing: -73
Light-Medium Roughing: 2N
Roughing: 4T
Single Sided Heavy Roughing: 5R
Medium – Roughing:-T

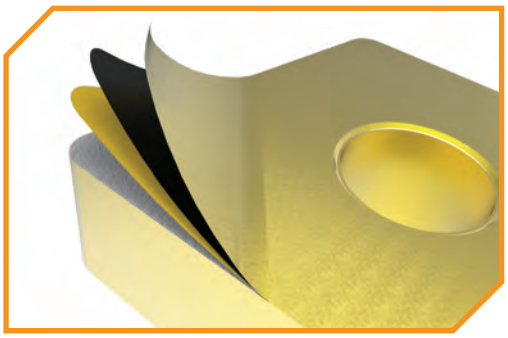
NL300	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P			■	■	■	■	■					●	●	60	380
M				■	■	■						●		60	255
K			■	■	■	■						●	●	90	335
N															
S															
H															

Recommended ● Acceptable ◉

NL400

Coating Type: CVD

A very tough grade for medium and rough machining, primarily on Stainless Steel and Exotic Alloys. Good resistance to thermal diffusion, and accepts light interruption.



Available in the following geometries:
Light Roughing – Semi-Finishing: 4E
Roughing: 4T
Single Sided Heavy Roughing: 5R

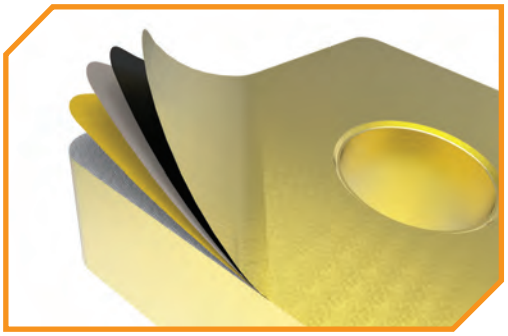
NL400	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P					■	■	■	■				●	●	50	360
M			■	■	■	■	■					●		50	245
K															
N															
S			■	■	■	■						●		15	70
H															

Recommended ● Acceptable ◉

NL920

Coating Type: CVD

A fine grain but tough grade, with a high degree of edge security on Steels and Stainless Steels. Performs well on rough and heavy machining applications, including interrupted applications.



Available in the following geometries:
Light-Medium: 2N
Roughing: 4T
Sing Sided Heavy Roughing: 5R
Medium –Roughing: -73
Medium –Roughing: -T

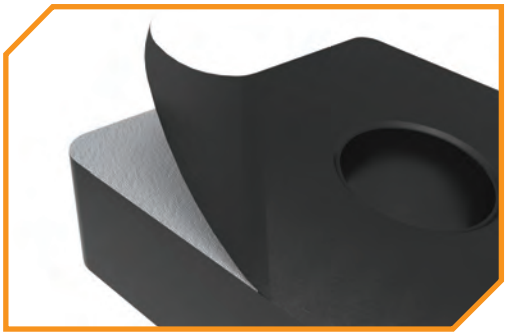
NL920	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P							■	■	■	■		●	●	45	225
M							■	■	■			●		40	155
K							■	■	■			●	●	70	225
N															
S					■	■	■					●		15	45
H															

Recommended ● Acceptable ◉

SP0819

Coating Type: PVD

A very wear resistant micro grain substrate with a new generation of TiAlN coating. First choice to machine difficult to machine materials, including PH Stainless Steel. Requires higher cutting speeds in finishing and medium operations, with stable conditions and clean material.



Available in the following geometries:
Finishing: 1B
Finishing-Light Roughing: 3F
Semi Finishing – Light Roughing: 4E

SP0819	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P	■	■										●	●	80	450
M		■	■									●		75	315
K															
N	■	■										●	●	275	975
S	■	■										●		25	90
H	■	■										●		65	140

Recommended ● Acceptable ◉

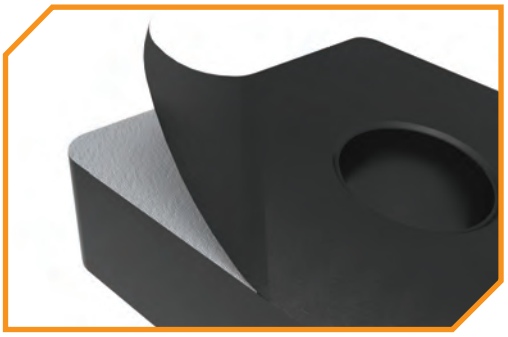
SP4019

Coating Type: PVD

A tough micro-grain substrate with new generation TiAlN coating, renders this PVD grade extremely hard for unmatched performance in all materials.

Available in the following geometries:

Finishing: -62 (positive)
Finishing – Light Roughing: 3J
Medium -Roughing: -73 (positive)
Medium – Finishing: -15
Medium – Roughing: -X
Finishing: -61
Medium- Roughing: -T



SP4019	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P			●	●	●	●						●	●	80	440
M		●	●	●	●							●		75	300
K				●	●	●						●	●	120	440
N			●	●	●							●	●	365	975
S		●	●									●		25	90
H												●		60	130

Recommended ● Acceptable ⦿

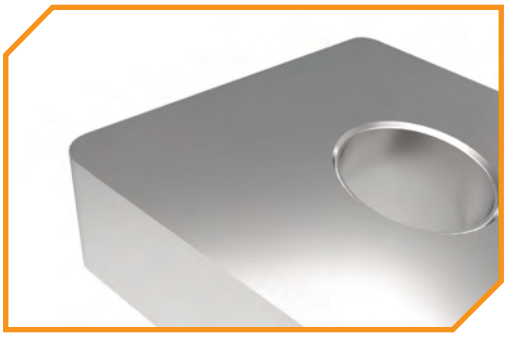
GH1

Coating Type: Uncoated

A very wear resistant uncoated micrograin for Cast Irons, Hardened Steel to 58 HRC and non ferrous alloys. Produces a low cutting pressure at high speed due to sharp cutting edge definition.

Available in the following positive geometries:

Medium – Roughing: X
Medium – Finishing: -64
Medium – Finishing: -66
Medium – Finishing: M



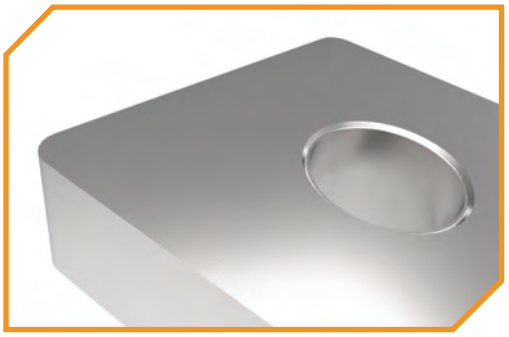
GH1	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P															
M															
K		●	●	●	●	●	●					●	●	70	225
N	●	●	●									●	●	185	825
S															
H															

Recommended ● Acceptable ⦿

SA6609

Coating Type: Uncoated
A whisker ceramic grade for roughing and medium machining applications, on High Temperature Alloys. Excellent wear resistance with elevated cutting surface speeds.

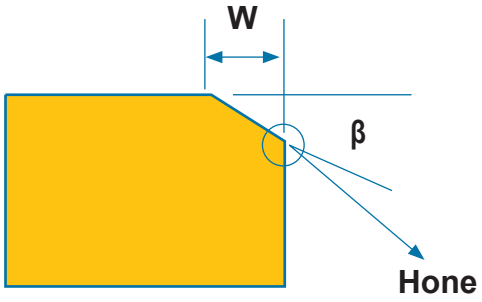
Available in two edge preparation:
Finishing to medium: E010
Medium to roughing: E030



SA6609	Application Range											MAX	DRY	Cutting speed m/min	
	01	05	10	15	20	25	30	35	40	45	50			Vc min	Vc max
P															
M															
K															
N															
S			■	■	■							●		180	450
H															

Recommended ● Acceptable ⦿

Edge Condition	W	β	Hone
	mm	mm	mm
E010	0.05	20°	0
E030	0.15	20°	0



Negative Turning: Geometry, Grade and Material Selection

Geometry	Grade																					
	SP0819						SP4019						NL200						NL250					
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
1B	◆◆	◆◆			◆	◆													◆◆	◆◆			◆	
2N																			◆◆	◆◆				
3F		◆◆		◆	◆																			
3J								◆◆			◆													
4E		◆◆			◆																			
4T																			◆◆	◆◆	◆			
4U													◆◆		◆			◆						
Flat-Top																					◆			
5R																								

Negative Turning: Geometry, Grade and Material Selection

Geometry	Grade																	
	NL300						NL400						NL920					
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
1B																		
2N	◆◆	◆◆											◆◆	◆◆				
3F																		
3J																		
4E								◆◆			◆							
4T	◆◆	◆◆	◆				◆◆	◆◆					◆◆	◆◆	◆			
4U																		
Flat-Top																		
5R	◆◆	◆◆					◆◆	◆◆			◆		◆◆	◆◆			◆	

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Positive Turning: Geometry, Grade and Material Selection

Geometry	Grade																	
	SP4019						NL250						NL300					
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
15	◆◆	◆◆			◆													
X	◆◆				◆													
61	◆◆	◆◆	◆															
62	◆◆	◆◆	◆		◆	◆												
64																		
66																		
73	◆◆	◆◆			◆								◆◆	◆◆				
M	◆◆	◆◆			◆													
T	◆◆	◆◆			◆		◆◆	◆◆					◆◆	◆◆				

Positive Turning: Geometry, Grade and Material Selection

Geometry	Grade																	
	NL400						NL920						GH1					
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
15																◆		
X																◆		
61																		
62																		
64																◆		
66														◆◆		◆		
73							◆◆	◆◆			◆							
M														◆◆			◆	
T	◆◆	◆◆			◆		◆◆	◆◆			◆							

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Cutting Speed (Vc) m/min

Cutting Speed (v_c) m/min

ISO	Materials	Rm and Hardness	CVD Coated				
			NL200	NL250	NL300	NL400	NL920
			min. - max.	min. - max.	min. - max.	min. - max.	min. - max.
P	Unalloyed Steel	<600 N/mm² <180 HBN	167 - 415	162 - 406	158 - 381	135 - 361	117 - 226
		<950 N/mm² <280 HBN	108 - 269	105 - 263	102 - 244	88 - 234	76 - 146
	Alloyed Steel	700-950 N/mm² 200-280 HBN	99 - 247	97 - 241	94 - 229	80 - 215	70 - 134
		950-1200 N/mm² 280-355 HBN	90 - 224	88 - 220	85 - 201	73 - 195	63 - 122
		1200-1400 N/mm² 355-415 HBN	62 - 153	60 - 150	58 - 134	50 - 133	43 - 83
M	Stainless Steel	Austenitic + Ferritic 300 series		110 - 274	110 - 255	91 - 244	79 - 152
		Martensitic 400 series		105 - 263	105 - 245	88 - 234	76 - 146
	PH Stainless	Refractory P.H.		59 - 146	60 - 135	49 - 130	42 - 81
K	Cast Iron	Grey GG-Ft	165 - 411	161 - 373	157- 335		116 - 224
		Spheroidal-Ductile GGG-FGS	143 -355	139 - 322	135 - 290		100 - 193
		Malleable GTS - MN/MP	96 - 239	94 - 217	91 - 195		68 - 130
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB					
		Aluminium + Silicon > 16% 92 HB					
S	High Temperature Alloys	Iron Based		23 - 59		20 - 52	17 - 33
		Cobalt Based		19 - 48		16 - 42	14 - 26
		Nickel Based		20 - 51		17 - 46	15 - 28
		Titanium Based		32 - 80		27 - 72	23 - 45
H	Hard Materials	Hard Steel >1400 N/mm² >415 HBN	45 - 125				
		Chilled Cast Iron >1400 N/mm² >400 HBN	50 - 120				

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Cutting Speed (Vc) m/min

Cutting Speed (v_c) m/min

ISO	Materials	Rm and Hardness	PVD				Uncoated	Ceramic
			SP0819	SP4019	SP4030 (Grooving)	SP4066 (Threading)	GH1 Micrograin	SA6609
P	Unalloyed Steel	<600 N/mm² <180 HBN	212 - 451	208 - 442	135 - 271	230 - 485		
		<950 N/mm² <280 HBN	138 - 293	135 -287	88 - 176	150 -315		
	Alloyed Steel	700-950 N/mm² 200-280 HBN	126 - 268	123 - 263	80 - 161	135 - 290		
		950-1200 N/mm² 280-355 HBN	115 - 244	112 - 239	73 - 146	125 - 265		
		1200-1400 N/mm² 355-415 HBN	78 - 167	77 - 163	50 - 100	85 - 180		
M	Stainless Steel	Austenitic + Ferritic 300 series	143 - 305	140 - 299	107 - 229	154 -329	80 - 150	
		Martensitic 400 series	149 - 317	135 - 287	102 - 220	160 - 342	80 - 160	
	PH Stainless	Refractory P.H.	76 - 163	75 - 159	57 - 122	82 - 175	40 - 80	
K	Cast Iron	Grey GG-Ft		206 - 438	134 - 268	226 - 482	116 - 224	
		Spheroidal-Ductile GGG-FGS		178 - 378	116 - 232	195 - 416	100 - 193	
		Malleable GTS - MN/MP		120 - 255	78 - 156	132 - 280	60 - 130	
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB	396 - 976	365 - 975	366 - 915		335 - 823	
		Aluminium + Silicon > 16% 92 HB	274 - 671		244 - 610		183 - 549	
S	High Temperature Alloys	Iron Based	31 - 65	30 - 64	20 - 39	33 - 70	15 - 35	180 - 450
		Cobalt Based	25 - 53	24 - 52	16 - 32	27 - 57	15 - 25	180 - 400
		Nickel Based	27 - 57	26 - 56	17 - 34	29 - 61	15 - 30	180 - 360
		Titanium Based	42 - 89	41- 88	27 - 54	45 - 96	25 - 45	
H	Hard Materials	Hard Steel >1400 N/mm² >415 HBN	70 - 140	62 - 131				
		Chilled Cast Iron >1400 N/mm² >400 HBN	65 - 135	60 - 127				

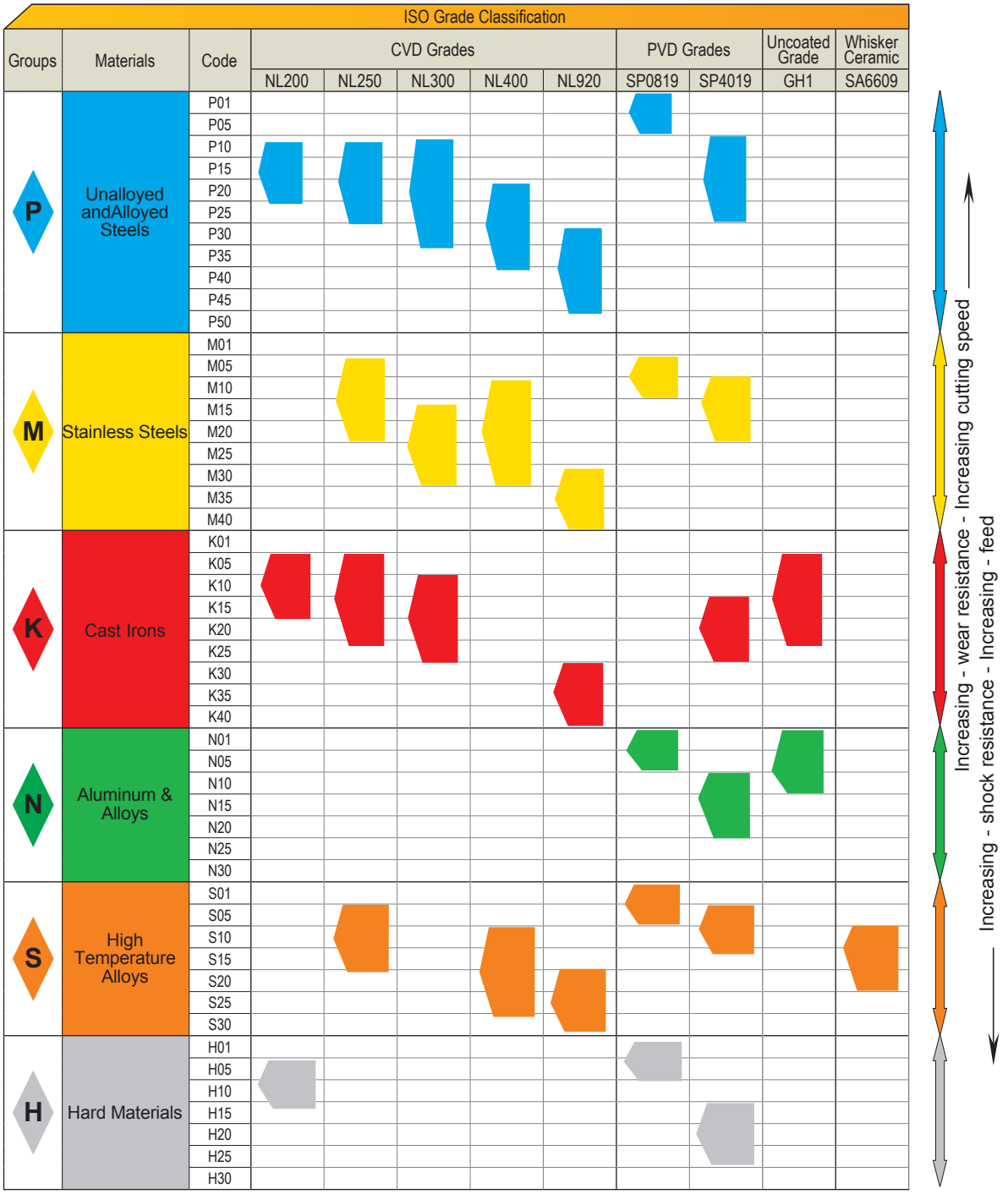
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

ISO Turning Grade — Classification Chart

Optimum Grade Performance



Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

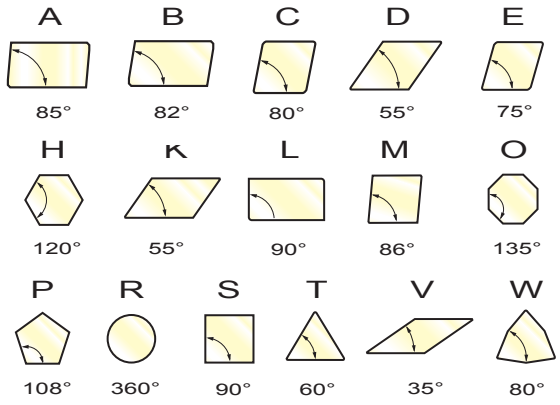
Turning Inserts



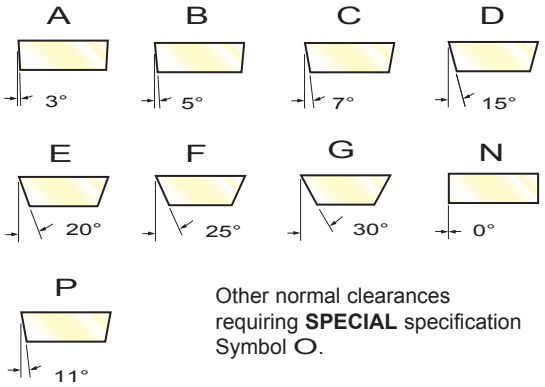
ISO Insert Designation

S	N	M	G
1	2	3	4

1 Shape

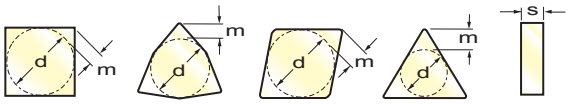


2 Clearance



Other normal clearances requiring **SPECIAL** specification Symbol O.

3 Tolerance



Class		d	m	s
A	mm	±0,025	±0,005	±0,025
C	mm	±0,025	±0,013	±0,025
E	mm	±0,025	±0,025	±0,025
F	mm	±0,013	±0,005	±0,025
G	mm	±0,025	±0,025	±0,13
H	mm	±0,013	±0,013	±0,025
J	mm	*	±0,005	±0,025
K	mm	*	±0,013	±0,025
L	mm	*	±0,025	±0,025
M	mm	*	*	±0,127
U	mm	*	*	±0,127
N	mm	*	*	±0,025

* See tables below.

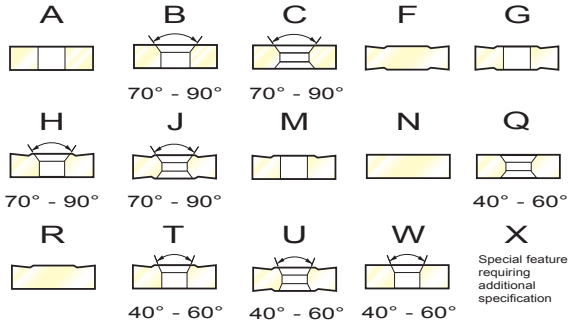
Valid for shapes:
C, E, H, M, O, P, S, T, R, W

IC	d		m	
	J, K, L, M, N	U	M, N	U
4,76	±0,05	±0,08	±0,08	±0,13
5,56	±0,05	±0,08	±0,08	±0,13
6	±0,05	±0,08	±0,08	±0,13
6,35	±0,05	±0,08	±0,08	±0,13
7,94	±0,05	±0,08	±0,08	±0,13
8	±0,05	±0,08	±0,08	±0,13
9,525	±0,05	±0,08	±0,08	±0,13
10	±0,05	±0,08	±0,08	±0,13
12	±0,08	±0,13	±0,13	±0,2
12,7	±0,08	±0,13	±0,13	±0,2
15,875	±0,1	±0,18	±0,15	±0,27
16	±0,1	±0,18	±0,15	±0,27
19,05	±0,1	±0,18	±0,15	±0,27
20	±0,1	±0,18	±0,15	±0,27
25	±0,13	±0,25	±0,18	±0,38
25,4	±0,13	±0,25	±0,18	±0,38
31,75	±0,15	±0,25	±0,2	±0,38
32	±0,15	±0,25	±0,2	±0,38

Valid for shape D only (**M** & **N** Tolerance)

IC	d	m
5,56	±0,05	±0,11
6,35	±0,05	±0,11
7,94	±0,05	±0,11
9,525	±0,05	±0,11
12,7	±0,08	±0,15
15,875	±0,10	±0,18
19,05	±0,10	±0,18

4 Type

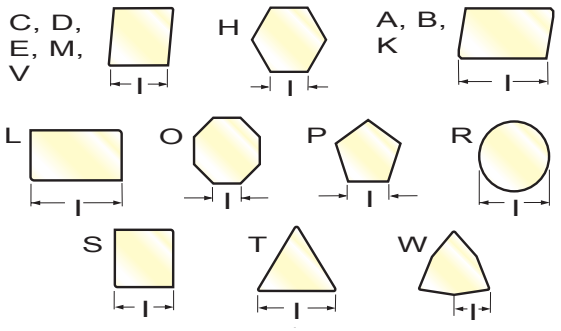


ISO Insert Designation

12	04	08	E
5	6	7	8

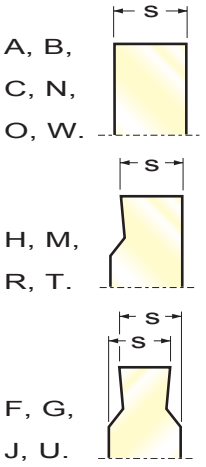
5 Size

Integers to be preceded by a **0** (zero).
Disregard any decimals. e.g. 9.525 = **09**



6 Thickness

Integers to be preceded by a 0 (zero) or the letter T.
Disregard any decimals.



Examples:

01	= 1,588
T1	= 1,984
02	= 2,381
03	= 3,175
T3	= 3,969
04	= 4,763
05	= 5,556
06	= 6,350
07	= 7,938
09	= 9,525
11	= 11,113
12	= 12,700
14	= 14,288
15	= 15,875

7 Corner

Inserts with wiper edges

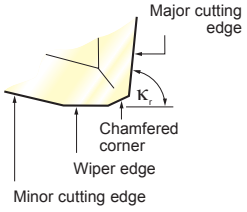
Cutting edge Angle (κ_r) 1st letter:			Wiper edge normal Clearance 2nd letter: (α_n)		
A	=	45°	**A**	=	3°
D	=	60°	**B**	=	5°
E	=	75°	**C**	=	7°
F	=	85°	**D**	=	15°
G	=	87°	**E**	=	20°
P	=	90°	**F**	=	25°
Z	=	ANY OTHER	**G**	=	30°
			N	=	0°
			P	=	11°
			Z	=	ANY OTHER

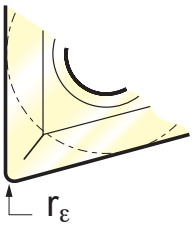
7 Corner *continued*

Inserts with rounded corners. The corner radius is indicated in 0.1mm. Integers to be preceded by a 0 (zero). If the corner is not rounded, use the symbol of designation 00 (zero zero).

Examples:

00	= SHARP CORNER	**24**	= 2,4
01	= 0,1	**28**	= 2,8
02	= 0,2	**32**	= 3,2
04	= 0,4	**40**	= 4,0
08	= 0,8	**48**	= 4,8
12	= 1,2	**56**	= 5,6
16	= 1,6	**64**	= 6,4
20	= 2,0	**X**	= ANY OTHER





8 Edge Condition

	Symbol
Sharp	**F**
Honed (Rounded)	**E**
Chamfered (Negative Land)	**T**
Chamfered + Honed	**S**

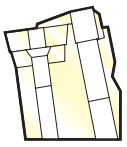
External Toolholders

ISO Designation (ISO 5608)

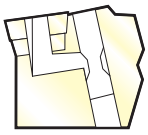
P	D	J	N	R
1	2	3	4	5

1 Assembly

M Clamp Lock



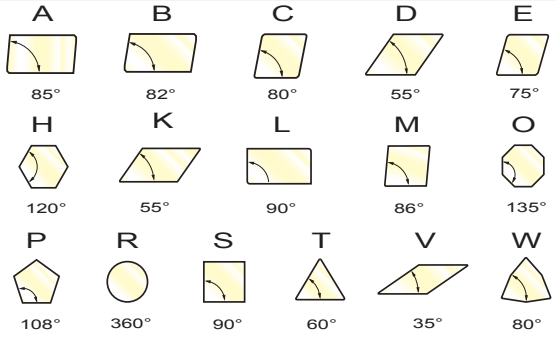
P Lever Lock



S Posicut®

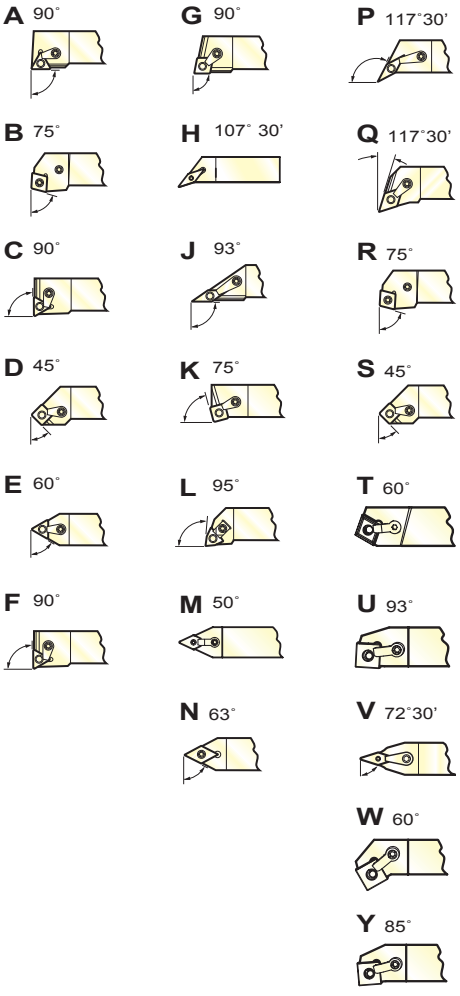


2 Insert Shape

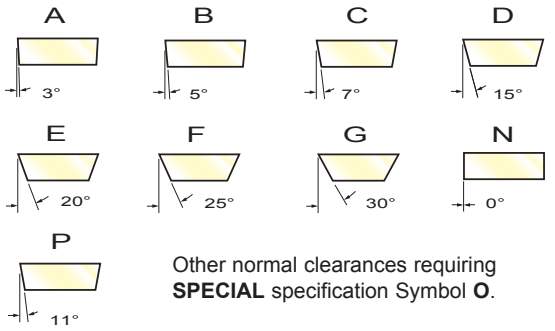


3 Tool Style

METRIC



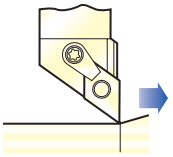
4 Clearance



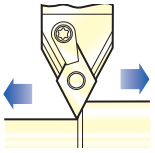
Other normal clearances requiring **SPECIAL** specification Symbol **O**.

5 Hand

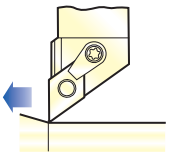
R Right Hand



N Neutral



L Left Hand



External Toolholders

ISO Designation (ISO 5608)

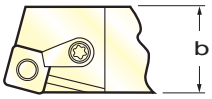
20	20	K	12	-	-
6	7	8	9	10	11

6 Tool Height



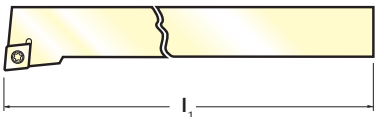
06	= 6
08	= 8
10	= 10
12	= 12
14	= 14
16	= 16
20	= 20
25	= 25
32	= 32
40	= 40
50	= 50

7 Tool Width



06	= 6
08	= 8
10	= 10
12	= 12
14	= 14
16	= 16
20	= 20
25	= 25
32	= 32
40	= 40
50	= 50

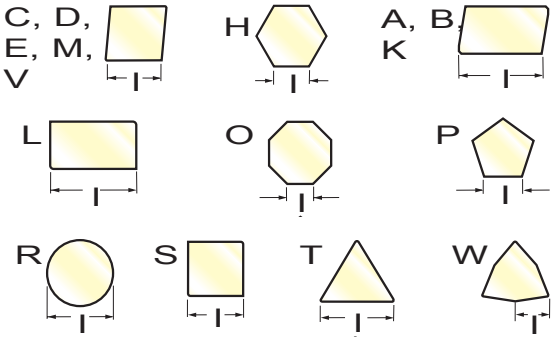
8 Tool Length



A	= 32
B	= 40
C	= 50
D	= 60
E	= 70
F	= 80
G	= 90
H	= 100
J	= 110
K	= 125
L	= 140
M	= 150
N	= 160
P	= 170
Q	= 180
R	= 200
S	= 250
T	= 300
U	= 350
V	= 400
W	= 450
Y	= 500
X	= SPECIAL

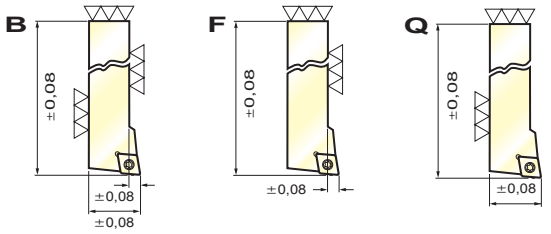
9 Insert Size

Integers to be preceded by a **0** (zero).
Disregard any decimals. e.g. 9,525 = **09**



10 Optional

Qualified tools.



11 Optional

Supplementary optional symbol (numbers or letters) added by the manufacturer.

Must be separated from the standardised designation by a dash (-).

Internal Boring Bars

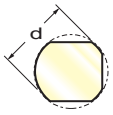
Clamp Lock Designation

A	25	R	-	P	C
1	2	3		4	5

1 Bar Type

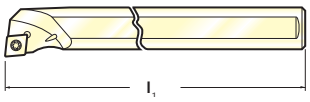
A	Steel shank and coolant hole.
B	Steel shank and anti-vibration device.
C	Cemented carbide shank with steel head.
D	Steel shank, anti-vibration device and coolant hole.
E	Cemented carbide shank with steel head and coolant hole.
F	Cemented carbide shank with steel head and anti-vibration device.
G	Cemented carbide shank with steel head, coolant hole and anti-vibration device.
H	Heavy metal shank.
J	Heavy metal shank and coolant hole.
S	Steel shank.

2 Bar Ø



METRIC	
06	= 6
08	= 8
10	= 10
12	= 12
16	= 16
20	= 20
25	= 25
32	= 32
40	= 40
50	= 50

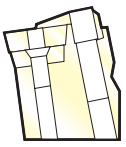
3 Bar Length



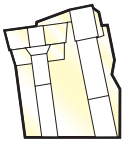
METRIC	
F	= 80
H	= 100
K	= 125
M	= 150
P	= 170
Q	= 180
R	= 200
S	= 250
T	= 300
U	= 350
V	= 400
W	= 450
Y	= 500
X	= SPECIAL

4 Assembly

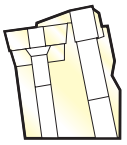
M Clamp Lock



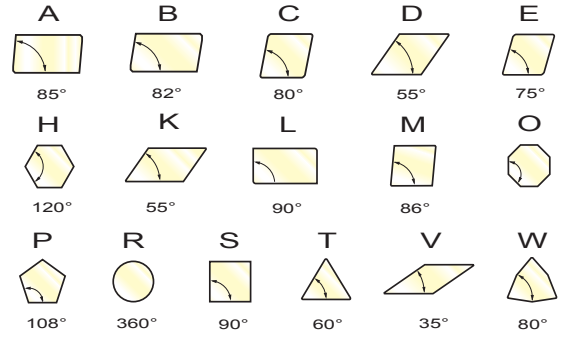
P Lever Lock



S Posicut®

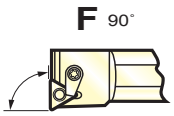


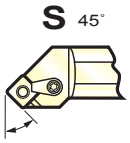
5 Insert Shape

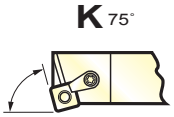


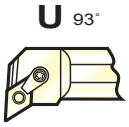
L	N	R	12	-
6	7	8	9	10

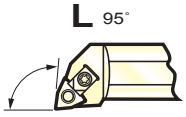
6 Tool Style

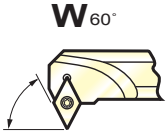


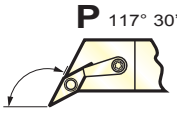


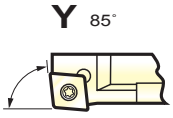


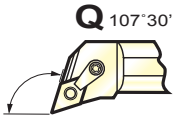




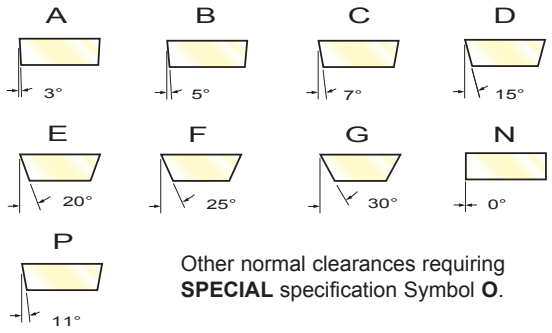








7 Clearance



Other normal clearances requiring **SPECIAL** specification Symbol **O**.

8 Hand

R Right Hand

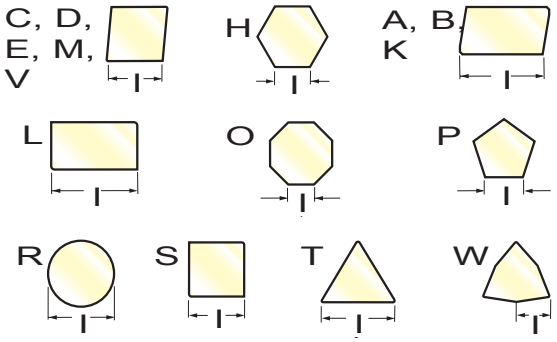


L Left Hand



9 Insert Size

Integers to be preceded by a **0** (zero).
Disregard any decimals. e.g. 9,525 = **09**

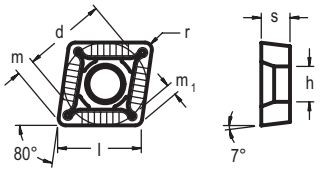


10 Optional

Supplementary optional symbol (numbers or letters) added by the manufacturer.

Must be separated from the standardised designation by a dash (-).

CCGT
-62 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
031243	**CCGT060200E-62**	SP4019	6,35	6,45	2,38	0,00	2,80		Finishing
030568	**CCGT060201E-62**	SP4019	6,35	6,45	2,38	0,10	2,80		Finishing
030569	**CCGT060202E-62**	SP4019	6,35	6,45	2,38	0,20	2,80		Finishing
030570	**CCGT060204E-62**	SP4019	6,35	6,45	2,38	0,40	2,80		Finishing
030571	**CCGT09T300E-62**	SP4019	9,52	9,57	3,97	0,00	4,40		Finishing
030572	**CCGT09T301E-62**	SP4019	9,52	9,57	3,97	0,10	4,40		Finishing
030573	**CCGT09T302E-62**	SP4019	9,52	9,57	3,97	0,20	4,40		Finishing
030574	**CCGT09T304E-62**	SP4019	9,52	9,57	3,97	0,40	4,40		Finishing
030575	**CCGT09T308E-62**	SP4019	9,52	9,57	3,97	0,80	4,40		Finishing

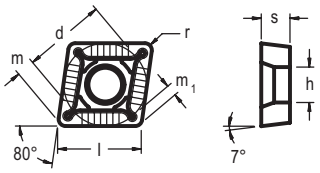
For Toolholders External: see page 46 | Internal: see page 47

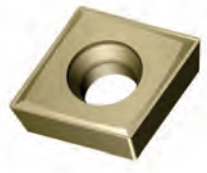
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CCMT
-73 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032365	CCMT060202E-73	SP4019	6,35	6,45	2,38	0,20	2,80		Medium
032366	CCMT060204E-73	SP4019	6,35	6,45	2,38	0,40	2,80		Medium
032367	CCMT060204E-73	NL300	6,35	6,45	2,38	0,40	2,80		Medium
032368	CCMT060208E-73	SP4019	6,35	6,45	2,38	0,80	2,80		Medium
032369	CCMT060208E-73	NL300	6,35	6,45	2,38	0,80	2,80		Medium
032370	CCMT09T304E-73	SP4019	9,52	9,57	3,97	0,40	4,40		Medium
032371	CCMT09T304E-73	NL300	9,52	9,57	3,97	0,40	4,40		Medium
032372	CCMT09T304E-73	NL920	9,52	9,57	3,97	0,40	4,40		Medium
032373	CCMT09T308E-73	SP4019	9,52	9,57	3,97	0,80	4,40		Medium
032374	CCMT09T308E-73	NL300	9,52	9,57	3,97	0,80	4,40		Medium
032375	CCMT09T308E-73	NL920	9,52	9,57	3,97	0,80	4,40		Medium
032376	CCMT120404E-73	SP4019	12,70	12,90	2,38	0,40	5,16		Medium
032377	CCMT120404E-73	NL300	12,70	12,90	2,38	0,40	5,16		Medium
032378	CCMT120404E-73	NL920	12,70	12,90	2,38	0,40	5,16		Medium
032379	CCMT120408E-73	SP4019	12,70	12,90	4,76	0,80	5,16		Medium
032380	CCMT120408E-73	NL300	12,70	12,90	4,76	0,80	5,16		Medium
032381	CCMT120408E-73	NL920	12,70	12,90	4,76	0,80	5,16		Medium
032382	CCMT120412E-73	SP4019	12,70	12,90	4,76	1,20	5,16		Medium
032383	CCMT120412E-73	NL300	12,70	12,90	4,76	1,20	5,16		Medium
032384	CCMT120412E-73	NL920	12,70	12,90	4,76	1,20	5,16		Medium

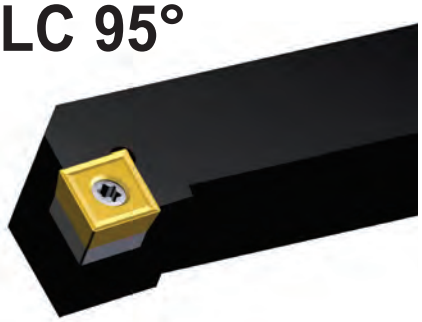
For Toolholders External: see page 46 | Internal: see page 47

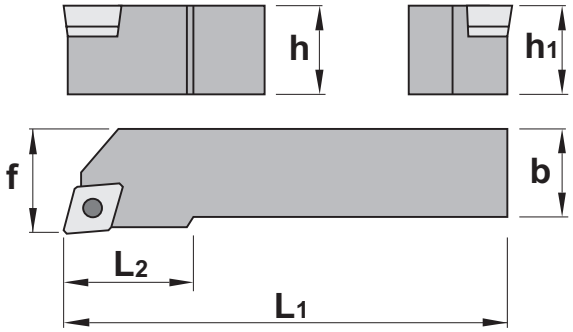
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SCLC 95°





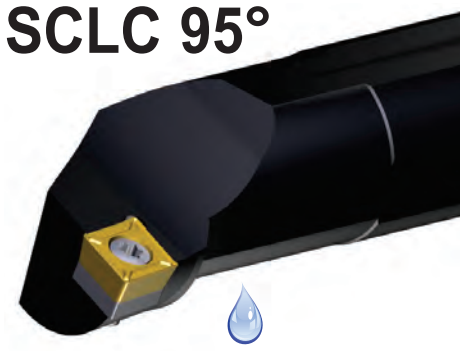
SCLC LH & RH External Square Shank Toolholders								
EDP	ISO Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028507	**SCLCL 1010 E06**	LH	CC_0602	10	10	12	70	10
028513	**SCLCR 1010 E06**	RH	CC_0602	10	10	12	70	10
028508	**SCLCL 1212 F09**	LH	CC_09T3	12	12	16	80	16
028509	**SCLCL 1616 H09**	LH	CC_09T3	16	16	20	100	18
028510	**SCLCL 2020 K09**	LH	CC_09T3	20	20	25	125	22
028514	**SCLCR 1212 F09**	RH	CC_09T3	12	12	16	80	16
028515	**SCLCR 1616 H09**	RH	CC_09T3	16	16	20	100	18
028516	**SCLCR 2020 K09**	RH	CC_09T3	20	20	25	125	22
028512	**SCLCL 2525 M12**	LH	CC_1204	25	25	32	150	25
028518	**SCLCR 2525 M12**	RH	CC_1204	25	25	32	150	25

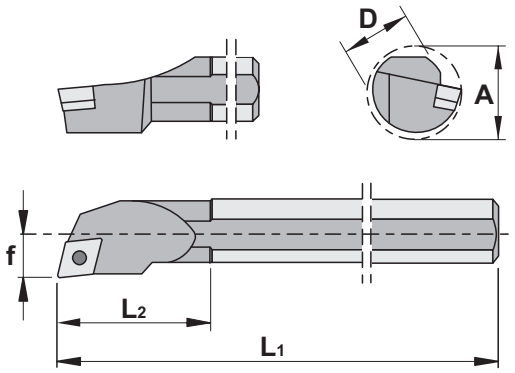


S Style External Toolholder
for Positive Inserts:
CC_06, CC_09, and CC_12
Application: Face and Turn O/D
Approach 95°
Axial 0°
Radial 0°
Profiling Clearance Angle β = 0°
RH Holder Shown

SCLCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SCLCL/R 1010 E06	015061	F2507T	018488	T7	-	-	-	-
SCLCL/R 1212 F09	015262	D4010T	015240	T15	-	-	-	-
SCLCL/R 1616 H09								
SCLCL/R 2020 K09								
SCLCL/R 2525 M12	034500	1540	034577	K5517	028571	SA3614	028739	SAS1760

A.. SCLC 95°





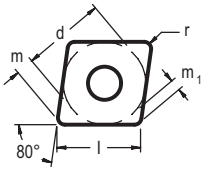
A.. SCLC LH & RH Internal Boring Bars									
EDP	**ISO Description**	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L1	L2	Through Coolant
033481	**A08F SCLCL 06**	LH	CC_0602	11	8	5	80	20	
033903	**A10H SCLCL 06**	LH	CC_0602	13	10	7	100	21	
018349	**A12K SCLCL 06**	LH	CC_0602	16	12	9	125	23	
033482	**A08F SCLCR 06**	RH	CC_0602	11	8	5	80	20	
033483	**A10H SCLCR 06**	RH	CC_0602	13	10	7	100	21	
018350	**A12K SCLCR 06**	RH	CC_0602	16	12	9	125	23	
018351	**A16M SCLCL 09**	LH	CC_09T3	20	16	11	150	31	
018353	**A20Q SCLCL 09**	LH	CC_09T3	24	20	13	180	36	
018355	**A25R SCLCL 09**	LH	CC_09T3	31	25	17	200	42	
018352	**A16M SCLCR 09**	RH	CC_09T3	20	16	11	150	31	
018354	**A20Q SCLCR 09**	RH	CC_09T3	24	20	13	180	36	
018356	**A25R SCLCR 09**	RH	CC_09T3	31	25	17	200	42	
033904	**A32S SCLCL 12**	LH	CC_1204	39	32	22	250	45	
033905	**A32S SCLCR 12**	RH	CC_1204	39	32	22	250	45	



S Style Internal Boring Bar
for Positive Inserts:
CC_06, CC_09, and CC_1204
Application: I/D Boring
Approach 95°
Axial 0°
Radial -6°
Profiling Clearance Angle β = 0°
RH Bar shown

A.. SCLCL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
A08F SCLCL/R 06	*034498*	1425	*018488*	T7	-	-	-	-
A10H SCLCL/R 06								
A12K SCLCL/R 06								
A16M SCLCL/R 09	*034499*	1440	*015240*	T15	-	-	-	-
A20Q SCLCL/R 09								
A25R SCLCL/R 09								
A32S SCLCL/R 12	*034500*	1540	*034577*	K5517	*028571*	SA3614	*028739*	SAS1760

CNGG
3F Geometry

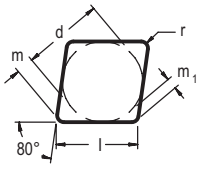


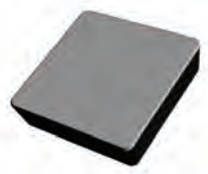


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
031580	**CNGG120401F-3F**	SP0819	12,70	12,90	4,76	0,10	5,16		Medium
031543	**CNGG120402F-3F**	SP0819	12,70	12,90	4,76	0,20	5,16		Medium
031544	**CNGG120404F-3F**	SP0819	12,70	12,90	4,76	0,40	5,16		Medium
031545	**CNGG120408F-3F**	SP0819	12,70	12,90	4,76	0,80	5,16		Medium
031546	**CNGG120412F-3F**	SP0819	12,70	12,90	4,76	0,80	5,16		Medium

For Toolholders External: see pages 61 - 65 | Internal: see pages 66

CNGN
Ceramics





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032314	**CNGN120404 E010**	SA6609	12,70	12,90	4,76	0,40	5,16		Roughing
032315	**CNGN120408 E010**	SA6609	12,70	12,90	4,76	0,80	5,16		Roughing
032316	**CNGN120408 E030**	SA6609	12,70	12,90	4,76	0,80	5,16		Roughing
032317	**CNGN120412 E010**	SA6609	12,70	12,90	4,76	1,20	5,16		Roughing
032318	**CNGN120412 E030**	SA6609	12,70	12,90	4,76	1,20	5,16		Roughing
032319	**CNGN120416 E030**	SA6609	12,70	12,90	4,76	1,60	5,16		Roughing
032320	**CNGN120708 E010**	SA6609	12,70	12,90	7,94	0,80	5,16		Roughing
032321	**CNGN120712 E010**	SA6609	12,70	12,90	7,94	1,20	5,16		Roughing
032322	**CNGN120716 E030**	SA6609	12,70	12,90	7,94	1,60	5,16		Roughing
032323	**CNGN160612 E010**	SA6609	15,88	16,10	6,35	1,20	6,35		Roughing

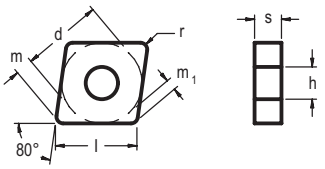
Note: For edge condition refer to Grade page 31

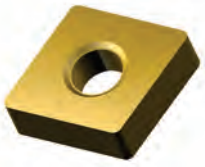
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMA
Flat Top





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032385	**CNMA120404E**	NL250	12,70	12,90	4,76	0,40	5,16	♦	Heavy Roughing
032386	**CNMA120408E**	NL250	12,70	12,90	4,76	0,80	5,16	♦	Heavy Roughing
032387	**CNMA120412E**	NL250	12,70	12,90	4,76	1,20	5,16	♦	Heavy Roughing
032388	**CNMA120416E**	NL250	12,70	12,90	4,76	1,60	5,16	♦	Heavy Roughing
032389	**CNMA160612E**	NL250	15,88	16,10	6,35	1,20	6,35	♦	Heavy Roughing
032390	**CNMA160616E**	NL250	15,88	16,10	6,35	1,60	6,35	♦	Heavy Roughing
032391	**CNMA160632E**	NL250	15,88	16,10	6,35	3,20	6,35	♦	Heavy Roughing
032392	**CNMA190612E**	NL250	19,05	19,40	6,35	1,20	7,92	♦	Heavy Roughing
032393	**CNMA190616E**	NL250	19,05	19,40	6,35	1,60	7,92	♦	Heavy Roughing
032394	**CNMA190632E**	NL250	19,05	19,40	6,35	3,20	7,92	♦	Heavy Roughing

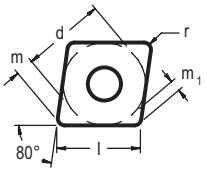
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
1B Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032395	**CNMG120404E-1B**	NL250	12,70	12,90	4,76	0,40	5,16		Finishing
030864	**CNMG120404E-1B**	SP0819	12,70	12,90	4,76	0,40	5,16		Finishing
030865	**CNMG120408E-1B**	SP0819	12,70	12,90	4,76	0,80	5,16		Finishing
032396	**CNMG120408E-1B**	NL250	12,70	12,90	4,76	0,80	5,16		Finishing
032397	**CNMG120412E-1B**	NL250	12,70	12,90	4,76	1,20	5,16		Finishing
030866	**CNMG120412E-1B**	SP0819	12,70	12,90	4,76	1,20	5,16		Finishing

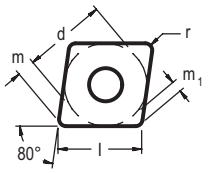
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

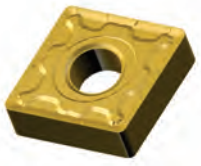
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
2N Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032398	**CNMG120404E-2N**	NL250	12,70	12,90	4,76	0,40	5,16		Medium
032399	**CNMG120404E-2N**	NL300	12,70	12,90	4,76	0,40	5,16		Medium
032400	**CNMG120404E-2N**	NL920	12,70	12,90	4,76	0,40	5,16		Medium
032401	**CNMG120408E-2N**	NL250	12,70	12,90	4,76	0,80	5,16		Medium
032402	**CNMG120408E-2N**	NL300	12,70	12,90	4,76	0,80	5,16		Medium
032403	**CNMG120408E-2N**	NL920	12,70	12,90	4,76	0,80	5,16		Medium
032404	**CNMG120412E-2N**	NL250	12,70	12,90	4,76	1,20	5,16		Medium
032405	**CNMG120412E-2N**	NL300	12,70	12,90	4,76	1,20	5,16		Medium
032406	**CNMG120412E-2N**	NL920	12,70	12,90	4,76	1,20	5,16		Medium
032407	**CNMG120416E-2N**	NL250	12,70	12,90	4,76	1,60	5,16		Medium
032408	**CNMG120416E-2N**	NL300	12,70	12,90	4,76	1,60	5,16		Medium
032409	**CNMG120416E-2N**	NL920	12,70	12,90	4,76	1,60	5,16		Medium

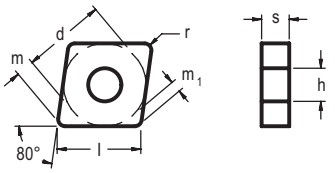
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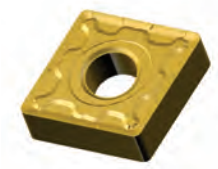
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
2N Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032410	**CNMG160608E-2N**	NL250	15,88	16,10	6,35	0,80	6,35		Medium
032411	**CNMG160608E-2N**	NL300	15,88	16,10	6,35	0,80	6,35		Medium
032412	**CNMG160608E-2N**	NL920	15,88	16,10	6,35	0,80	6,35		Medium
032413	**CNMG160612E-2N**	NL250	15,88	16,10	6,35	1,20	6,35		Medium
032414	**CNMG160612E-2N**	NL300	15,88	16,10	6,35	1,20	6,35		Medium
032415	**CNMG160612E-2N**	NL920	15,88	16,10	6,35	1,20	6,35		Medium
032416	**CNMG160616E-2N**	NL250	15,88	16,10	6,35	1,60	6,35		Medium
032417	**CNMG160616E-2N**	NL300	15,88	16,10	6,35	1,60	6,35		Medium
032418	**CNMG160616E-2N**	NL920	15,88	16,10	6,35	1,60	6,35		Medium
032419	**CNMG190612E-2N**	NL300	19,05	19,40	6,35	1,20	7,92		Medium
032420	**CNMG190612E-2N**	NL920	19,05	19,40	6,35	1,20	7,92		Medium
032421	**CNMG190616E-2N**	NL300	19,05	19,40	6,35	1,60	7,92		Medium
032422	**CNMG190616E-2N**	NL920	19,05	19,40	6,35	1,60	7,92		Medium

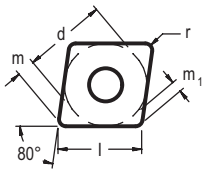
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

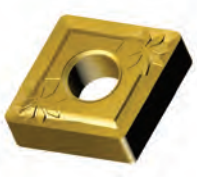
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
3J Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032423	**CNMG120404E-3J**	SP4019	12,70	12,90	4,76	0,40	5,16		Medium
032424	**CNMG120408E-3J**	SP4019	12,70	12,90	4,76	0,80	5,16		Medium
032425	**CNMG120412E-3J**	SP4019	12,70	12,90	4,76	1,20	5,16		Medium
032426	**CNMG120416E-3J**	SP4019	12,70	12,90	4,76	1,60	5,16		Medium
032427	**CNMG160612E-3J**	SP4019	15,88	16,10	6,35	1,20	6,35		Medium
032428	**CNMG160616E-3J**	SP4019	15,88	16,10	6,35	1,60	6,35		Medium
032429	**CNMG190612E-3J**	SP4019	19,05	19,40	6,35	1,20	7,92		Medium
032430	**CNMG190616E-3J**	SP4019	19,05	19,40	6,35	1,60	7,92		Medium

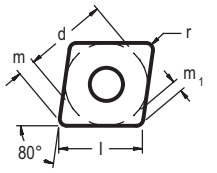
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

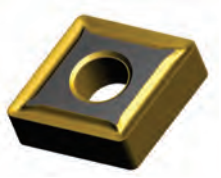
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
4E Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030506	**CNMG120404E-4E**	SP0819	12,70	12,90	4,76	0,40	5,16		Medium-Roughing
032431	**CNMG120404E-4E**	NL400	12,70	12,90	4,76	0,40	5,16		Medium-Roughing
030507	**CNMG120408E-4E**	SP0819	12,70	12,90	4,76	0,80	5,16		Medium-Roughing
032432	**CNMG120408E-4E**	NL400	12,70	12,90	4,76	0,80	5,16		Medium-Roughing
030507	**CNMG120408E-4E**	SP0819	12,70	12,90	4,76	0,80	5,16		Medium-Roughing
032433	**CNMG120412E-4E**	NL400	12,70	12,90	4,76	1,20	5,16		Medium-Roughing
030508	**CNMG120412E-4E**	SP0819	12,70	12,90	4,76	1,20	5,16		Medium-Roughing
032434	**CNMG160608E-4E**	NL400	15,88	16,10	6,35	0,80	6,35		Medium-Roughing
030509	**CNMG160608E-4E**	SP0819	15,88	16,10	6,35	0,80	6,35		Medium-Roughing
030510	**CNMG160612E-4E**	SP0819	15,88	16,10	6,35	1,20	6,35		Medium-Roughing
032435	**CNMG160612E-4E**	NL400	15,88	16,10	6,35	1,20	6,35		Medium-Roughing
032436	**CNMG160616E-4E**	NL400	15,88	16,10	6,35	1,60	6,35		Medium-Roughing
030511	**CNMG160616E-4E**	SP0819	15,88	16,10	6,35	1,60	6,35		Medium-Roughing

For Toolholders External: see pages 61 - 65 | Internal: see pages 66

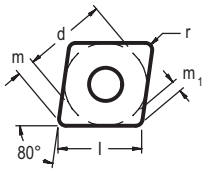
CNMG1906 See page 55

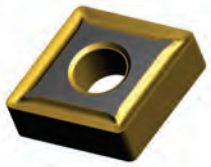
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
4E Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032437	**CNMG190608E-4E**	NL400	19,05	19,40	6,35	0,80	7,92		Medium-Roughing
030512	**CNMG190608E-4E**	SP0819	19,05	19,40	6,35	0,80	7,92		Medium-Roughing
030513	**CNMG190612E-4E**	SP0819	19,05	19,40	6,35	1,20	7,92		Medium-Roughing
032438	**CNMG190612E-4E**	NL400	19,05	19,40	6,35	1,20	7,92		Medium-Roughing
032439	**CNMG190616E-4E**	NL400	19,05	19,40	6,35	1,60	7,92		Medium-Roughing
030514	**CNMG190616E-4E**	SP0819	19,05	19,40	6,35	1,60	7,92		Medium-Roughing
032440	**CNMG190624E-4E**	NL400	19,05	19,40	6,35	2,40	7,92		Medium-Roughing
030515	**CNMG190624E-4E**	SP0819	19,05	19,40	6,35	2,40	7,92		Medium-Roughing

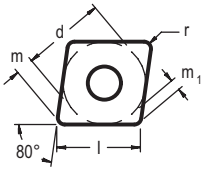
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

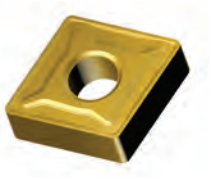
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032442	**CNMG120404E-4T**	NL250	12,70	12,90	4,76	0,40	5,16		Roughing
032443	**CNMG120404E-4T**	NL300	12,70	12,90	4,76	0,40	5,16		Roughing
032444	**CNMG120404E-4T**	NL400	12,70	12,90	4,76	0,40	5,16		Roughing
032445	**CNMG120404E-4T**	NL920	12,70	12,90	4,76	0,40	5,16		Roughing
032446	**CNMG120408E-4T**	NL250	12,70	12,90	4,76	0,80	5,16		Roughing
032447	**CNMG120408E-4T**	NL300	12,70	12,90	4,76	0,80	5,16		Roughing
032448	**CNMG120408E-4T**	NL400	12,70	12,90	4,76	0,80	5,16		Roughing
032449	**CNMG120408E-4T**	NL920	12,70	12,90	4,76	0,80	5,16		Roughing
032450	**CNMG120412E-4T**	NL250	12,70	12,90	4,76	1,20	5,16		Roughing
032451	**CNMG120412E-4T**	NL300	12,70	12,90	4,76	1,20	5,16		Roughing
032452	**CNMG120412E-4T**	NL400	12,70	12,90	4,76	1,20	5,16		Roughing
032453	**CNMG120412E-4T**	NL920	12,70	12,90	4,76	1,20	5,16		Roughing
032454	**CNMG120416E-4T**	NL250	12,70	12,90	4,76	1,60	5,16		Roughing
032455	**CNMG120416E-4T**	NL300	12,70	12,90	4,76	1,60	5,16		Roughing
032456	**CNMG120416E-4T**	NL400	12,70	12,90	4,76	1,60	5,16		Roughing
032457	**CNMG120416E-4T**	NL920	12,70	12,90	4,76	1,60	5,16		Roughing

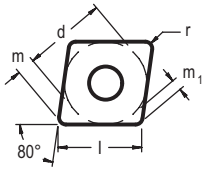
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

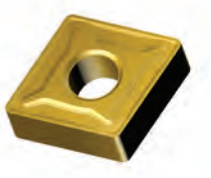
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032458	**CNMG160608E-4T**	NL250	15,88	16,10	6,35	0,80	6,35		Roughing
032459	**CNMG160608E-4T**	NL300	15,88	16,10	6,35	0,80	6,35		Roughing
032460	**CNMG160608E-4T**	NL400	15,88	16,10	6,35	0,80	6,35		Roughing
032461	**CNMG160608E-4T**	NL920	15,88	16,10	6,35	0,80	6,35		Roughing
032462	**CNMG160612E-4T**	NL250	15,88	16,10	6,35	1,20	6,35		Roughing
032463	**CNMG160612E-4T**	NL300	15,88	16,10	6,35	1,20	6,35		Roughing
032464	**CNMG160612E-4T**	NL400	15,88	16,10	6,35	1,20	6,35		Roughing
032465	**CNMG160612E-4T**	NL920	15,88	16,10	6,35	1,20	6,35		Roughing
032466	**CNMG160616E-4T**	NL250	15,88	16,10	6,35	1,60	6,35		Roughing
032467	**CNMG160616E-4T**	NL300	15,88	16,10	6,35	1,60	6,35		Roughing
032468	**CNMG160616E-4T**	NL400	15,88	16,10	6,35	1,60	6,35		Roughing
032469	**CNMG160616E-4T**	NL920	15,88	16,10	6,35	1,60	6,35		Roughing

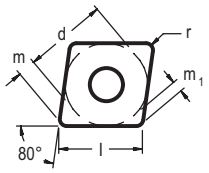
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

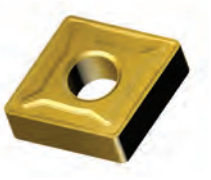
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032470	**CNMG190608E-4T**	NL250	19,05	19,40	6,35	0,80	7,92		Roughing
032471	**CNMG190608E-4T**	NL300	19,05	19,40	6,35	0,80	7,92		Roughing
032472	**CNMG190608E-4T**	NL400	19,05	19,40	6,35	0,80	7,92		Roughing
032473	**CNMG190608E-4T**	NL920	19,05	19,40	6,35	0,80	7,92		Roughing
032474	**CNMG190612E-4T**	NL250	19,05	19,40	6,35	1,20	7,92		Roughing
032475	**CNMG190612E-4T**	NL300	19,05	19,40	6,35	1,20	7,92		Roughing
032476	**CNMG190612E-4T**	NL400	19,05	19,40	6,35	1,20	7,92		Roughing
032477	**CNMG190612E-4T**	NL920	19,05	19,40	6,35	1,20	7,92		Roughing
032478	**CNMG190616E-4T**	NL250	19,05	19,40	6,35	1,60	7,92		Roughing
032479	**CNMG190616E-4T**	NL300	19,05	19,40	6,35	1,60	7,92		Roughing
032480	**CNMG190616E-4T**	NL400	19,05	19,40	6,35	1,60	7,92		Roughing
032481	**CNMG190616E-4T**	NL920	19,05	19,40	6,35	1,60	7,92		Roughing
032482	**CNMG250924E-4T**	NL300	25,40	25,79	9,53	2,40	9,12		Roughing
032483	**CNMG250924E-4T**	NL400	25,40	25,79	9,53	2,40	9,12		Roughing
032484	**CNMG250924E-4T**	NL920	25,40	25,79	9,53	2,40	9,12		Roughing

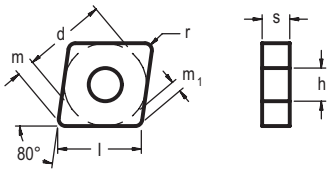
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

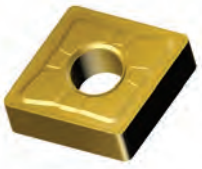
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMG
4U Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032485	**CNMG120404E-4U**	NL200	12,70	12,90	4,76	0,40	5,16		Roughing
032486	**CNMG120408E-4U**	NL200	12,70	12,90	4,76	0,80	5,16		Roughing
032487	**CNMG120412E-4U**	NL200	12,70	12,90	4,76	1,20	5,16		Roughing
032488	**CNMG120416E-4U**	NL200	12,70	12,90	4,76	1,60	5,16		Roughing
032489	**CNMG160608E-4U**	NL200	15,88	16,10	6,35	0,80	6,35		Roughing
032490	**CNMG160612E-4U**	NL200	15,88	16,10	6,35	1,20	6,35		Roughing
032491	**CNMG160616E-4U**	NL200	15,88	16,10	6,35	1,60	6,35		Roughing
032492	**CNMG190612E-4U**	NL200	19,05	19,40	6,35	1,20	7,92		Roughing
032493	**CNMG190616E-4U**	NL200	19,05	19,40	6,35	1,60	7,92		Roughing
032494	**CNMG190624E-4U**	NL200	19,05	19,40	6,35	2,40	7,92		Roughing

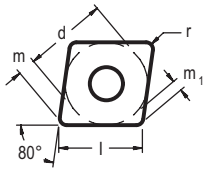
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

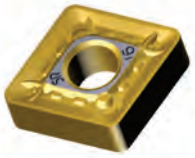
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

CNMM
5R Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031684	**CNMM160612E-5R**	NL300	15,88	16,10	6,35	1,20	6,35		Heavy Roughing
031668	**CNMM160612E-5R**	NL400	15,88	16,10	6,35	1,20	6,35		Heavy Roughing
031685	**CNMM160616E-5R**	NL300	15,88	16,10	6,35	1,60	6,35		Heavy Roughing
031669	**CNMM160616E-5R**	NL400	15,88	16,10	6,35	1,60	6,35		Heavy Roughing
031686	**CNMM160624E-5R**	NL300	15,88	16,10	6,35	2,40	6,35		Heavy Roughing
031670	**CNMM160624E-5R**	NL400	15,88	16,10	6,35	2,40	6,35		Heavy Roughing
031687	**CNMM190612E-5R**	NL300	19,05	19,40	6,35	1,20	7,92		Heavy Roughing
031671	**CNMM190612E-5R**	NL400	19,05	19,40	6,35	1,20	7,92		Heavy Roughing
031688	**CNMM190616E-5R**	NL300	19,05	19,40	6,35	1,60	7,92		Heavy Roughing
031672	**CNMM190616E-5R**	NL400	19,05	19,40	6,35	1,60	7,92		Heavy Roughing
031689	**CNMM190624E-5R**	NL300	19,05	19,40	6,35	2,40	7,92		Heavy Roughing
031673	**CNMM190624E-5R**	NL400	19,05	19,40	6,35	2,40	7,92		Heavy Roughing
031683	**CNMM250924E-5R**	NL300	25,40	25,78	9,53	2,40	9,12		Heavy Roughing
031682	**CNMM250924E-5R**	NL920	25,40	25,78	9,53	2,40	9,12		Heavy Roughing

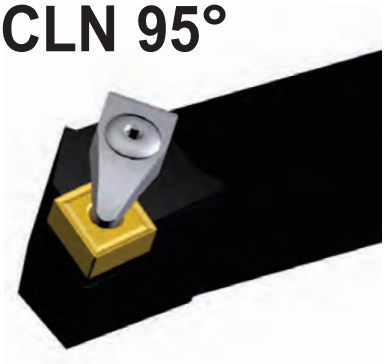
For Toolholders External: see pages 61 - 65 | Internal: see pages 66

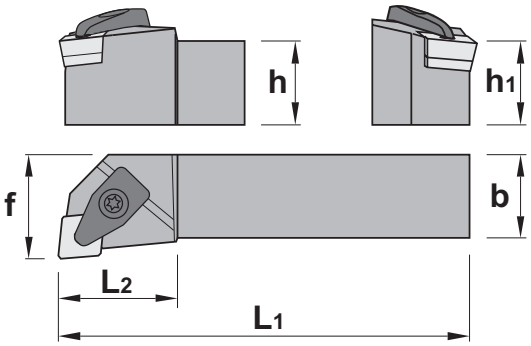
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DCLN 95°





DCLN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033245	DCLNL 2020 K12	LH	CN_1204	20	20	25	125	34
033246	DCLNL 2525 M12	LH	CN_1204	25	25	32	150	34
033247	DCLNL 3232 P12	LH	CN_1204	32	32	40	170	34
033248	DCLNR 2020 K12	RH	CN_1204	20	20	25	125	34
033249	DCLNR 2525 M12	RH	CN_1204	25	25	32	150	34
033250	DCLNR 3232 P12	RH	CN_1204	32	32	40	170	34
033251	DCLNL 2525 M16	LH	CN_1606	25	25	32	150	36
033252	DCLNL 3232 P16	LH	CN_1606	32	32	40	170	40
033253	DCLNR 2525 M16	RH	CN_1606	25	25	32	150	36
033254	DCLNR 3232 P16	RH	CN_1606	32	32	40	170	40
033255	DCLNL 3232 P19	LH	CN_1906	32	32	40	170	42
033256	DCLNL 4040 S19	LH	CN_1906	40	40	50	250	42
033257	DCLNR 3232 P19	RH	CN_1906	32	32	40	170	42
033258	DCLNR 4040 S19	RH	CN_1906	40	40	50	250	42

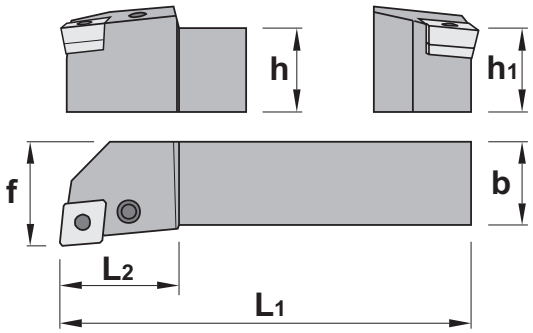


D style External Toolholder
for Negative Inserts:
CN_1204, CN_1606 & CN_1906
Application: Face and Turn O/D
Approach 95°
Axial -6°
Radial -6°
Profiling Clearance Angle β = 0°
RH Holder Shown

DCLNL/R Spare Parts											
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Spring EDP		Anvil EDP		Anvil Screw EDP		Clamp & Anvil Screw Key	
DCLNL/R 2020 K12	033710	1696	033707	DC2712	033719	4295	033712	ICSN442	033716	1766	018287	KH5004
DCLNL/R 2525 M12												
DCLNL/R 3232 P12												
DCLNL/R 2525 M16			034495	DC2716			001685	ICSN533	034509	1768		
DCLNL/R 3232 P16												
DCLNL/R 3232 P19			033708	DC2719			001686	ICSN633	033717	1770		
DCLNL/R 4040 S19												

PCLN 95°





PCLN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033273	*PCLNL 4040 S25	LH	CN_2509	40	40	50	250	45
033274	*PCLNL 5050 T25	LH	CN_2509	50	50	60	300	50
033275	*PCLNR 4040 S25	RH	CN_2509	40	40	50	250	45
033276	*PCLNR 5050 T25	RH	CN_2509	50	50	60	300	50

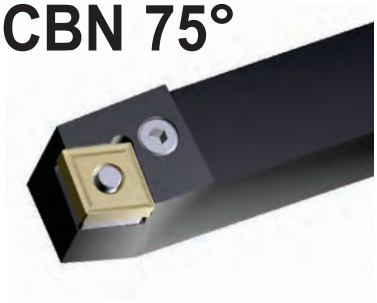
* Non Stock Items, subject to extended delivery time

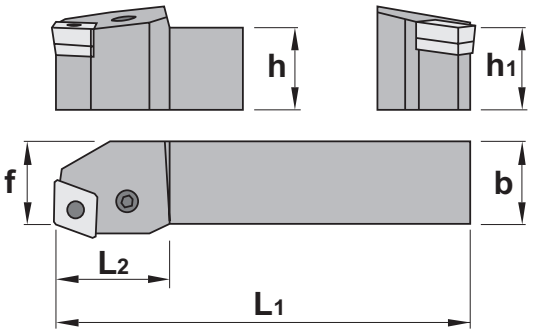


P Style External Toolholder
for Negative Inserts: CN_2509
Application: Face and Turn O/D
Approach 95°
Axial -6°
Radial -6°
Profiling Clearance Angle β = 0°
RH Holder Shown

PCLNL/R Spare Parts												
Item Description	Lever EDP		Lever Screw EDP		Anvil EDP		Anvil Clip EDP		Clip Punch EDP		Key EDP	
PCLNL/R 4040 S25	028408	PL8025	028409	PLS1612	034483	PA3625	028418	PC4125	034506	PCP0025	018285	KH5005
PCLNL/R 5050 T25												

PCBN 75°





PCBN LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
017118	**PCBNL 2020 K12**	LH	CN_1204	20	20	17	125	28
017120	**PCBNL 2525 M12**	LH	CN_1204	25	25	22	150	28
017119	**PCBNR 2020 K12**	RH	CN_1204	20	20	17	125	28
017121	**PCBNR 2525 M12**	RH	CN_1204	25	25	22	150	28
028373	**PCBNL 3232 P16**	LH	CN_1606	32	32	27	170	34
017127	**PCBNR 3232 P16**	RH	CN_1606	32	32	27	170	34

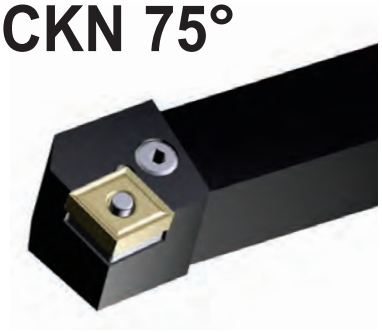


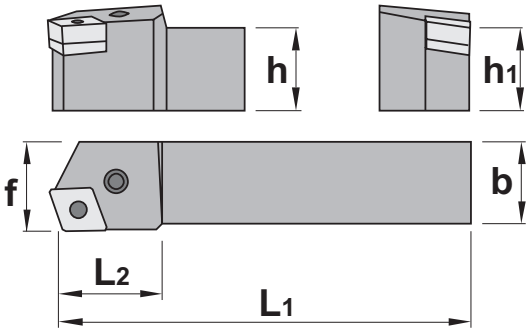
P Style External Toolholder
for Negative Inserts:
CN_1204 & CN_1606
Application: Turn O/D
Approach 75°
Axial -7,25°
Radial -4,25°
RH Holder Shown

PCBNL/R Spare Parts

Item Description	Lever EDP		Lever Screw EDP		Anvil EDP		Anvil Clip EDP		Clip Punch EDP		Key EDP	
PCBNL/R 2020 K12	017443	PL8012	017448	PLS1608	017456	PA3612	017453	PC4112	028054	PCP0012	018286	KH5003
PCBNL/R 2525 M12												
PCBNL/R 3232 P16	017445	PL8016	017450	PLS1618	017457	PA3636	028051	PC4115	034505	PCP0015		

PCKN 75°





PCKN LH & RH External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
017130	**PCKNL 2020 K 12**	LH	CN_1204	20	20	25	125	28
017132	**PCKNL 2525 M 12**	LH	CN_1204	25	25	32	150	28
033280	**PCKNL 3225 P 12**	LH	CN_1204	32	25	32	170	28
017131	**PCKNR 2020 K 12**	RH	CN_1204	20	20	25	125	28
017133	**PCKNR 2525 M 12**	RH	CN_1204	25	25	32	150	28
033281	**PCKNR 3225 P 12**	RH	CN_1204	32	25	32	170	28

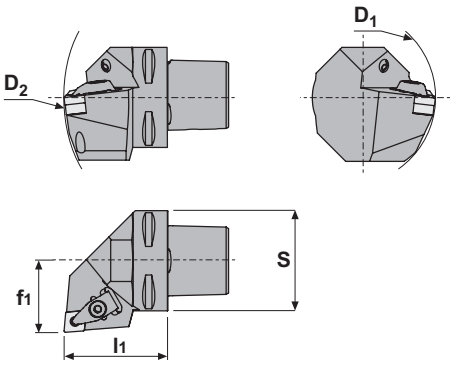


P Style External Toolholder
for Negative Inserts: CN_1204
Application: Facing
Approach 75°
Axial -6,5°
Radial -5,5°
RH Holder Shown

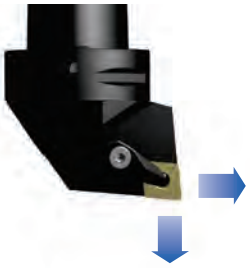
PCKNL/R Spare Parts											
Item Description	*Lever EDP*		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
PCKNL/R 2020 K12	*017443*	PL8012	*017448*	PLS1608	*017456*	PA3612	*017453*	PC4112	*028054*	PCP0012	*018286*	KH5003
PCKNL/R 2525 M12												
PCKNL/R 3225 P12												

DCLN 95°





DCLN LH & RH External PSC Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				S	D1	D2	f1	l1
033691	C5-50-DCLNL35060-12	LH	CN_1204	50	110	165	35	60
033692	C5-50-DCLNR35060-12	RH	CN_1204	50	110	165	35	60
033693	C6-63-DCLNL45065-12	LH	CN_1204	63	110	190	45	65
033694	C6-63-DCLNR45065-12	RH	CN_1204	63	110	190	45	65
033695	C8-80-DCLNL55080-19	LH	CN_1906	80	125	250	55	80
033696	C8-80-DCLNR55080-19	RH	CN_1906	80	125	250	55	80

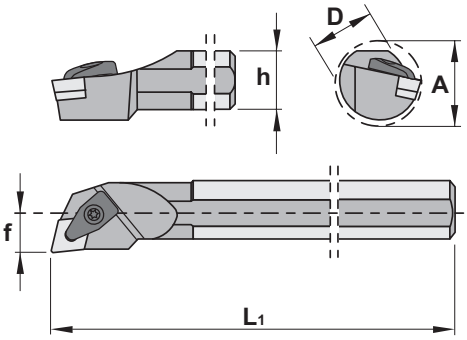


D Style External Toolholder
for Negative Inserts:
CN_1204 & CN_1906
Application: External Face, Turn O/D
Approch 95°
Axial -5°
Radial -6°
Profilling Clearance Angle β = 0°
RH Holder Shown

DCLNL/R Spare Parts												
Item Description	Clamp EDP		Clamp Screw EDP		Anvil EDP		Anvil Screw EDP		Clamp Spring EDP		Screw Key EDP	
C5-50-DCLNL/R 35060-12	033707	2712	033710	1696	033712	ICSN442	033716	1766	033719	4295	018287	KH5004
C6-63-DCLNL/R 45065-12												
C8-80-DCLNL/R 55080-19	033708	2719	033710	1696	001686	ICSN633	033717	1770				

S..DCLN 95°





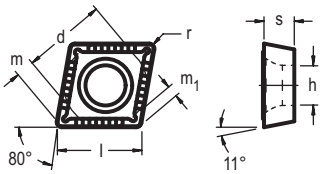
S..DCLN LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	h	Through Coolant
033286	**S25T DCLNL 12**	LH	CN_1204	31	25	17	300	23	
033287	**S32U DCLNL 12**	LH	CN_1204	39	32	22	350	30	
033288	**S40V DCLNL 12**	LH	CN_1204	48	40	27	400	37	
033289	**S25T DCLNR 12**	RH	CN_1204	31	25	17	300	23	
033290	**S32U DCLNR 12**	RH	CN_1204	39	32	22	350	30	
033291	**S40V DCLNR 12**	RH	CN_1204	48	40	27	400	37	
033292	***S40V DCLNL 16**	LH	CN_1606	48	40	27	400	37	
033293	***S50W DCLNL 16**	LH	CN_1606	61	50	35	450	47	
033294	***S40V DCLNR 16**	RH	CN_1606	48	40	27	400	37	
033295	***S50W DCLNR 16**	RH	CN_1606	61	50	35	450	47	

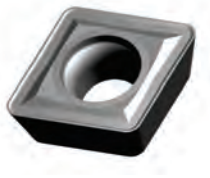


D Style Internal Boring Bar
for Negative Inserts:
CN_1204 & CN_1606
Application:- I/D Face and Bore
Axial Approach 95°
Axial -5°
Radial -13,5°
Profiling Clearance Angle β = 0°
RH Bar Shown

S..DCLNL/R Spare Parts											
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Spring EDP		Anvil EDP		Anvil Screw EDP		Clamp & Anvil Screw Key	
S25T DCLNL/R 12	*033710*	1696	*033707*	DC2712	*033719*	4295	*017456*	3612	*029095*	1765	*018287*	KH5004
S32U DCLNL/R 12							*029079*	ICCN432	*034508*	1161		
S40V DCLNL/R 12									*034507*	1160		
***S40V DCLNL/R 16**			*034495*	DC2716			*001685*	ICSN-533	*034509*	1768		
***S50W DCLNL/R 16**												

CPMT
-73 Geometry





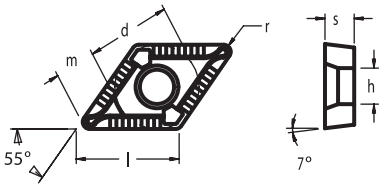
EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032496	**CPMT060204E-73**	SP4019	6,35	6,45	2,38	0,40	2,80		Medium
032497	**CPMT080302E-73**	SP4019	9,52	7,94	3,18	0,20	3,05		Medium
032498	**CPMT080304E -73**	SP4019	9,52	7,94	3,18	0,40	3,05		Medium
032499	**CPMT080308E-73**	SP4019	9,52	7,94	3,18	0,80	3,05		Medium

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DCGT & DCGX
-62 Geometry

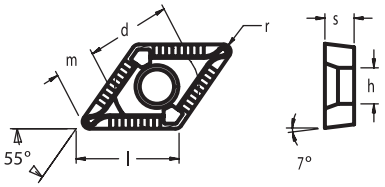




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
031401	DCGX0702005E-62	SP4019	6,35	7,70	2,38	0,05	2,79		Finishing
030577	DCGT070201E-62	SP4019	6,35	7,70	2,38	0,10	2,79		Finishing
030578	DCGT070202E-62	SP4019	6,35	7,70	2,38	0,20	2,79		Finishing
030579	DCGT070204E-62	SP4019	6,35	7,70	2,38	0,40	2,79		Finishing
031402	DCGX11T3005E-62	SP4019	9,52	11,60	3,97	0,05	4,39		Finishing
030581	DCGT11T301E-62	SP4019	9,52	11,60	3,97	0,10	4,39		Finishing
030582	DCGT11T302E-62	SP4019	9,52	11,60	3,97	0,20	4,39		Finishing
030583	DCGT11T304E-62	SP4019	9,52	11,60	3,97	0,40	4,39		Finishing
030584	DCGT11T308E-62	SP4019	9,52	11,60	3,97	0,80	4,39		Finishing

For Toolholders External: see pages 70 - 72 | Internal: see pages 73 - 75

DCGT
-64 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
034465	DCGT11T302F-64	GH1	9,52	11,60	3,97	0,20	4,39		Finishing
014068	DCGT11T304F-64	GH1	9,52	11,60	3,97	0,40	4,39		Finishing
014069	DCGT11T308F-64	GH1	9,52	11,60	3,97	0,80	4,39		Finishing

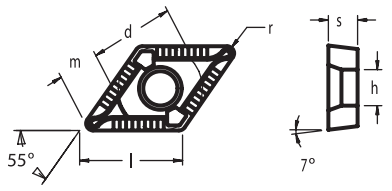
For Toolholders External: see pages 70 - 72 | Internal: see pages 73 - 75

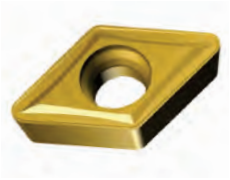
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DCMT
-73 Geometry

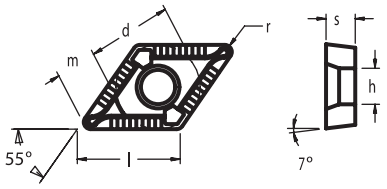




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032501	DCMT070202E-73	SP4019	6,35	7,70	2,38	0,20	2,79		Medium
032502	DCMT070202E-73	NL300	6,35	7,70	2,38	0,20	2,79		Medium
032503	DCMT070204E-73	SP4019	6,35	7,70	2,38	0,40	2,79		Medium
032504	DCMT070204E-73	NL300	6,35	7,70	2,38	0,40	2,79		Medium
032285	DCMT11T304E-73	SP4019	9,52	11,60	3,97	0,40	4,39		Medium
032505	DCMT11T304E-73	NL300	9,52	11,60	3,97	0,40	4,39		Medium
032506	DCMT11T304E-73	NL920	9,52	11,60	3,97	0,40	4,39		Medium
032297	DCMT11T308E-73	SP4019	9,52	11,60	3,97	0,80	4,39		Medium
032507	DCMT11T308E-73	NL300	9,52	11,60	3,97	0,80	4,39		Medium
032508	DCMT11T308E-73	NL920	9,52	11,60	3,97	0,80	4,39		Medium

For Toolholders External: see pages 70 - 72 | Internal: see pages 73 - 75

DCMT
M Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032509	DCMT150404E-M	SP4019	12,70	15,50	4,76	0,40	5,16		Medium
032510	DCMT150404E-M	NL300	12,70	15,50	4,76	0,40	5,16		Medium
032511	DCMT150408E-M	SP4019	12,70	15,50	4,76	0,80	5,16		Medium
032512	DCMT150408E-M	NL300	12,70	15,50	4,76	0,80	5,16		Medium
032513	DCMT150408E-M	NL920	12,70	15,50	4,76	0,80	5,16		Medium

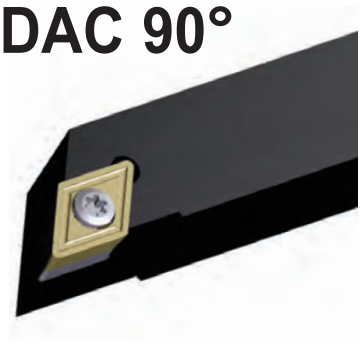
For Toolholders External: see pages 70 - 72 | Internal: see pages 73 - 75

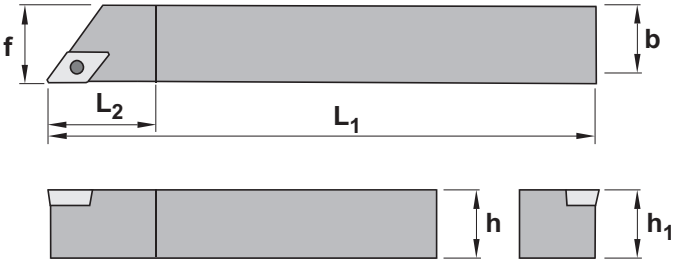
Material Guide – Key to Recommended Inserts

Material Designation

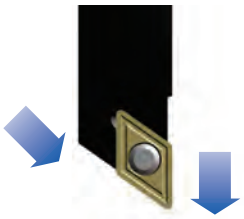
P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SDAC 90°





SDAC LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
025072	**SDACL 1010 M07**	LH	DC_0702	10	10	10	150	15
033486	**SDACL 1212 M07**	LH	DC_0702	12	12	12	150	15
025071	**SDACR 1010 M07**	RH	DC_0702	10	10	10	150	15
033487	**SDACR 1212 M07**	RH	DC_0702	12	12	12	150	15
025074	**SDACL 1212 M11**	LH	DC_11T3	12	12	12	150	19
025076	**SDACL 1616 M11**	LH	DC_11T3	16	16	16	150	19
025078	**SDACL 2020 K11**	LH	DC_11T3	20	20	20	125	20
025073	**SDACR 1212 M11**	RH	DC_11T3	12	12	12	150	19
025075	**SDACR 1616 M11**	RH	DC_11T3	16	16	16	150	19
025077	**SDACR 2020 K11**	RH	DC_11T3	20	20	20	125	20

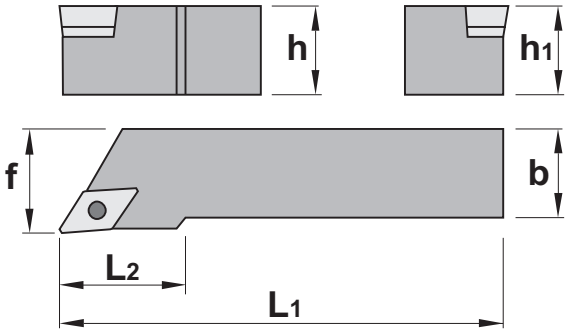


S Style External Toolholder
for Positive Inserts:
DC_0702 and DC_11T3
Application: O/D Profiling
Approach 90°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 32°
RH Holder Shown

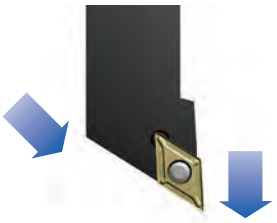
SDACL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SDACL/R 1010 M07	015061	F25007T	018488	T7	-	-	-	-
SDACL/R 1212 M07								
SDACL/R 1212 M11	015262	D4010T	015240	T15	-	-	-	-
SDACL/R 1616 M11								
SDACL/R 2020 K11								

SDJC 93°





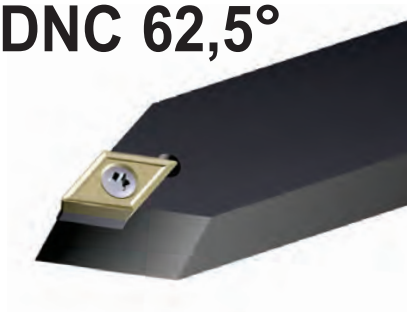
SDJC LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028462	**SDJCL 1010 E07**	LH	DC_0702	10	10	12	70	14
018001	**SDJCL 1212 F07**	LH	DC_0702	12	12	16	80	16
028469	**SDJCR 1010 E07**	RH	DC_0702	10	10	12	70	14
018010	**SDJCR 1212 F07**	RH	DC_0702	12	12	16	80	16
018002	**SDJCL 1212 F11**	LH	DC_11T3	12	12	16	80	20
028464	**SDJCL 1616 H11**	LH	DC_11T3	16	16	20	100	18
028465	**SDJCL 2020 K11**	LH	DC_11T3	20	20	25	125	22
028466	**SDJCL 2525 M11**	LH	DC_11T3	25	25	32	150	28
018011	**SDJCR 1212 F11**	RH	DC_11T3	12	12	16	80	20
028470	**SDJCR 1616 H11**	RH	DC_11T3	16	16	20	100	18
028471	**SDJCR 2020 K11**	RH	DC_11T3	20	20	25	125	22
028472	**SDJCR 2525 M11**	RH	DC_11T3	25	25	32	150	28

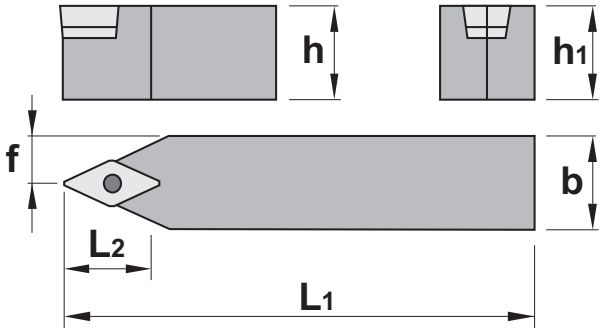


S Style External Toolholder
for Positive Inserts:
DC_0702 and DC_11T3
Application: Facing and O/D Profiling
Approach 93°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 29°
RH Holder Shown

SDJCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SDJCL/R 1010 E07	*015061*	F2507T	*018488*	T7	-	-	-	-
SDJCL/R 1212 F07								
SDJCL/R 1212 F11	*015262*	D4010T	*015240*	T15	-	-	-	-
SDJCL/R 1616 H11	*034497*	1335	*028475*	K5516	*028477*	SA3714	*028478*	SAS1750
SDJCL/R 2020 K11								
SDJCL/R 2525 M11								

SDNC 62,5°





SDNC Neutral External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028519	**SDNC N 1010 E07**	Neutral	DC_0702	10	10	5	70	16
028520	**SDNC N 1212 F07**	Neutral	DC_0702	12	12	6	80	16
028522	**SDNC N 1616 H11**	Neutral	DC_11T3	16	16	8	100	22
028523	**SDNC N 2020 K11**	Neutral	DC_11T3	20	20	10	125	22
028524	**SDNC N 2525 M11**	Neutral	DC_11T3	25	25	12,5	150	22

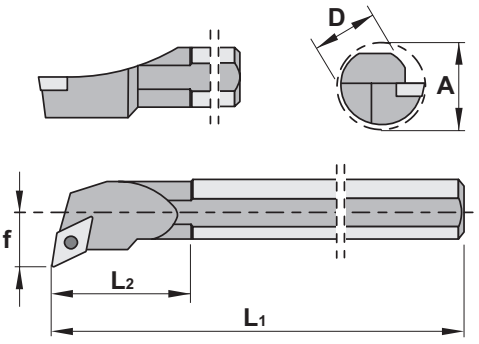


S Style External Toolholder
for Positive Inserts:
DC_0702, and DC_11T3
Application: Plunge and O/D Profiling
Approach 62,5°
Axial 0°
Radial 0°
Profilling Clerance Angle β = 59,5°
Neutral Holder Shown

SDNC Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SDNC N 1010 E07	015061	F2507T	018488	T7	-	-	-	-
SDNC N 1212 F07								
SDNC N 1010 E07	034497	1335	028475	K5516	028477	SA3714	028739	SAS1750
SDNC N 1212 F07								
SDJCL/R 2525 M11								

A.. SDUC 93°





A.. SDUC LH & RH Internal Boring Bars										
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)						
				Min Bore Ø A	ØD	f	L1	L2	Through Coolant	
018357	**A12K SDUCL 07**	LH	DC_0702	16	12	9	125	23		
018359	**A16M SDUCL 07**	LH	DC_0702	20	16	11	150	31		
018358	**A12K SDUCR 07**	RH	DC_0702	16	12	9	125	23		
018360	**A16M SDUCR 07**	RH	DC_0702	20	16	11	150	31		
018361	**A20Q SDUCL 11**	LH	DC_11T3	24	20	13	180	36		
017990	**A25R SDUCL 11**	LH	DC_11T3	31	25	17	200	42		
018363	**A32S SDUCL 11**	LH	DC_11T3	39	32	22	250	45		
018362	**A20Q SDUCR 11**	RH	DC_11T3	24	20	13	180	36		
017991	**A25R SDUCR 11**	RH	DC_11T3	31	25	17	200	42		
018364	**A32S SDUCR 11**	RH	DC_11T3	39	32	22	250	45		

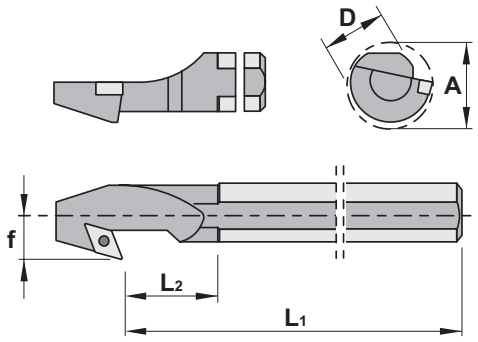


S Style Boring Bar
for Positive Inserts:
DC_0702, and DC_11T3
Application: I/D Profiling
Aproach 93°
Axial 0°
Radial -6°
Profilling Claerance Angle β = 29°
RH Bar Shown

A.. SDUCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
A12K SDUCL/R 07	*015061*	F2507T	*018488*	T7	-	-	-	-
A16M SDUCL/R 07								
A20Q SDUCL/R 11	*015262*	D4010T	*018488*	T7	-	-	-	-
A25R SDUCL/R 11								
A32S SDUCL/R 11	*034497*	1335	*028475*	K5516	*028477*	SA3714	*028478*	SAS1750

A.. SDUC 93°-EX





A.. SDUC -EX LH & RH Internal Boring Bars									
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	L_2	Through Coolant
034596	**A12K SDUCL 07-EX**	LH	DC_0702	16	12	9	125	32	
034597	**A16M SDUCL 07-EX**	LH	DC_0702	20	16	11	150	40	
034598	**A12K SDUCR 07-EX**	RH	DC_0702	16	12	9	125	32	
034599	**A16M SDUCR 07-EX**	RH	DC_0702	20	16	11	150	40	
034600	**A20Q SDUCL 11-EX**	LH	DC_11T3	24	20	13	180	45	
034601	**A25R SDUCL 11-EX**	LH	DC_11T3	31	25	17	200	50	
034602	**A20Q SDUCR 11-EX**	RH	DC_11T3	24	20	13	180	45	
034603	**A25R SDUCR 11-EX**	RH	DC_11T3	31	25	17	200	50	

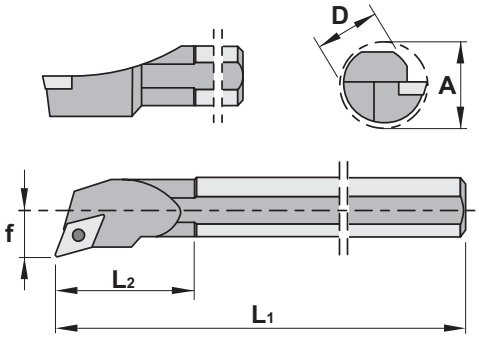


S Style Boring Bar
for Positive Inserts:
DC_0702, and DC_11T3
Application: Back Boring and Profiling
Approach 93°
Axial 0°
Radial -6°
Profilling Clearance Angle β = 29°
RH Bar Shown

A.. SDUCL/R -EX Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
A12K SDUCL/R 07	*015061*	F2507T	*018488*	T7	-	-	-	-
A16M SDUCL/R 07								
A20Q SDUCL/R 11	*034499*	1440	*015240*	T15	-	-	-	-
A25R SDUCL/R 11	*015262*	D4010T						

A.. SDQC 107,5°





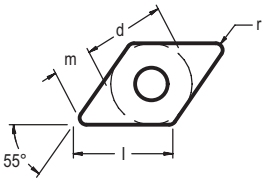
A.. SDQC LH & RH Internal Boring Bars									
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	L_2	Through Coolant
033507	**A12K SDQCL 07**	LH	DC_0702	16	12	9	125	23	💧
033508	**A16M SDQCL 07**	LH	DC_0702	20	16	11	150	31	💧
033509	**A12K SDQCR 07**	RH	DC_0702	16	12	9	125	23	💧
033510	**A16M SDQCR 07**	RH	DC_0702	20	16	11	150	31	💧
033511	**A20Q SDQCL 11**	LH	DC_11T3	24	20	13	180	36	💧
033512	**A25R SDQCL 11**	LH	DC_11T3	31	25	17	200	42	💧
033513	**A20Q SDQCR 11**	RH	DC_11T3	24	20	13	180	36	💧
033514	**A25R SDQCR 11**	RH	DC_11T3	31	25	17	200	42	💧

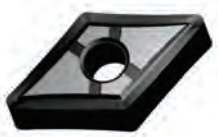


S Style Boring Bar
for Positive Inserts:
DC_0702, and DC_11T3
Application: Face and I/D Profiling
Approach 107,5°
Axial: 0°
Radial -6°
Profilling Clearance Angle β = 14,5°
RH Bar Shown

A.. SDQCL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
A12K SDQCL/R 07 **A16M SDQCL/R 07**	*015061*	F2507T	*018488*	T7	-	-	-	-
A20Q SDQCL/R 11 **A25R SDQCL/R 11**	*015262*	D4010T	*015240*	T15	-	-	-	-

DNGG
3F Geometry

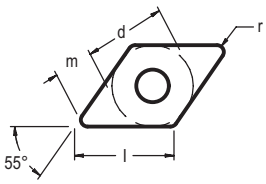




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031561	DNGG150402F-3F	SP0819	12,70	15,50	4,76	0,20	5,16		Medium
031562	DNGG150404F-3F	SP0819	12,70	15,50	4,76	0,40	5,16		Medium
031563	DNGG150408F-3F	SP0819	12,70	15,50	4,76	0,80	5,16		Medium
031564	DNGG150412F-3F	SP0819	12,70	15,50	4,76	1,20	5,16		Medium
031547	DNGG150602F-3F	SP0819	12,70	15,50	6,35	0,20	5,16		Medium
031548	DNGG150604F-3F	SP0819	12,70	15,50	6,35	0,40	5,16		Medium
031565	DNGG150608F-3F	SP0819	12,70	15,50	6,35	0,80	5,16		Medium
031566	DNGG150612F-3F	SP0819	12,70	15,50	6,35	1,20	5,16		Medium

For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

DNMA
Flat Top





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032514	DNMA150408E	NL250	12,70	15,50	4,76	0,80	5,16		Heavy-Roughing
034471	DNMA150412E	NL250	12,70	15,50	4,76	1,20	5,16		Heavy-Roughing
032515	DNMA150608E	NL250	12,70	15,50	6,35	0,80	5,16		Heavy-Roughing
032516	DNMA150612E	NL250	12,70	15,50	6,35	1,20	5,16		Heavy-Roughing

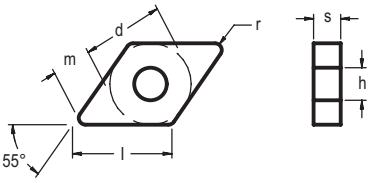
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
1B Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032517	DNMG110404E-1B	NL250	9,52	11,00	4,76	0,40	4,39		Finishing
030869	DNMG110404E-1B	SP0819	9,52	11,00	4,76	0,40	4,39		Finishing
032518	DNMG110408E-1B	NL250	9,52	11,00	4,76	0,80	4,39		Finishing
030870	DNMG110408E-1B	SP0819	9,52	11,00	4,76	0,80	4,39		Finishing
032519	DNMG150404E-1B	NL250	12,70	15,50	4,76	0,40	5,16		Finishing
030872	DNMG150404E-1B	SP0819	12,70	15,50	4,76	0,40	5,16		Finishing
032520	DNMG150408E-1B	NL250	12,70	15,50	4,76	0,80	5,16		Finishing
030873	DNMG150408E-1B	SP0819	12,70	15,50	4,76	0,80	5,16		Finishing
030874	DNMG150412E-1B	SP0819	12,70	15,50	4,76	1,20	5,16		Finishing
032521	DNMG150412E-1B	NL250	12,70	15,50	4,76	1,20	5,16		Finishing
030875	DNMG150604E-1B	SP0819	12,70	15,50	6,35	0,40	5,16		Finishing
032522	DNMG150604E-1B	NL250	12,70	15,50	6,35	0,40	5,16		Finishing
032523	DNMG150608E-1B	NL250	12,70	15,50	6,35	0,80	5,16		Finishing
030876	DNMG150608E-1B	SP0819	12,70	15,50	6,35	0,80	5,16		Finishing
030877	DNMG150612E-1B	SP0819	12,70	15,50	6,35	1,20	5,16		Finishing
032524	DNMG150612E-1B	NL250	12,70	15,50	6,35	1,20	5,16		Finishing

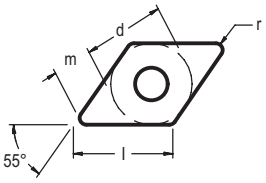
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

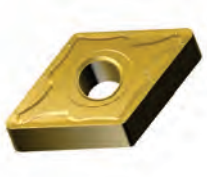
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
2N Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032525	**DNMG110404E-2N**	NL250	9,52	11,00	4,76	0,40	4,39		Medium
032526	**DNMG110404E-2N**	NL300	9,52	11,00	4,76	0,40	4,39		Medium
032527	**DNMG110404E-2N**	NL920	9,52	11,00	4,76	0,40	4,39		Medium
032528	**DNMG110408E-2N**	NL250	9,52	11,00	4,76	0,80	4,39		Medium
032529	**DNMG110408E-2N**	NL300	9,52	11,00	4,76	0,80	4,39		Medium
032530	**DNMG110408E-2N**	NL920	9,52	11,00	4,76	0,80	4,39		Medium

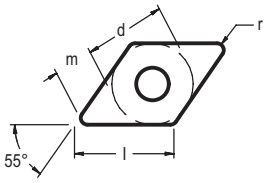
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

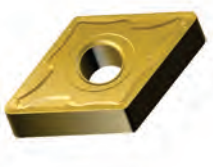
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
2N Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032531	DNMG150404E-2N	NL250	12,70	15,50	4,76	0,40	5,16		Medium
032532	DNMG150404E-2N	NL300	12,70	15,50	4,76	0,40	5,16		Medium
032533	DNMG150404E-2N	NL920	12,70	15,50	4,76	0,40	5,16		Medium
032534	DNMG150408E-2N	NL250	12,70	15,50	4,76	0,80	5,16		Medium
032535	DNMG150408E-2N	NL300	12,70	15,50	4,76	0,80	5,16		Medium
032536	DNMG150408E-2N	NL920	12,70	15,50	4,76	0,80	5,16		Medium
032537	DNMG150412E-2N	NL250	12,70	15,50	4,76	1,20	5,16		Medium
034472	DNMG150412E-2N	NL300	12,70	15,50	4,76	1,20	5,16		Medium
032539	DNMG150604E-2N	NL250	12,70	15,50	6,35	0,40	5,16		Medium
032540	DNMG150604E-2N	NL300	12,70	15,50	6,35	0,40	5,16		Medium
032541	DNMG150604E-2N	NL920	12,70	15,50	6,35	0,40	5,16		Medium
032542	DNMG150608E-2N	NL250	12,70	15,50	6,35	0,80	5,16		Medium
032543	DNMG150608E-2N	NL300	12,70	15,50	6,35	0,80	5,16		Medium
032544	DNMG150608E-2N	NL920	12,70	15,50	6,35	0,80	5,16		Medium
032545	DNMG150612E-2N	NL250	12,70	15,50	6,35	1,20	5,16		Medium
032546	DNMG150612E-2N	NL300	12,70	15,50	6,35	1,20	5,16		Medium
032547	DNMG150612E-2N	NL920	12,70	15,50	6,35	1,20	5,16		Medium

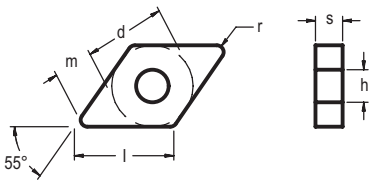
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

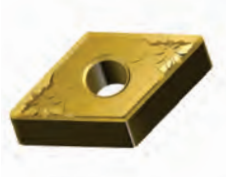
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
3J Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032548	**DNMG110404E-3J**	SP4019	9,52	11,00	4,76	0,40	4,39		Medium
032549	**DNMG110408E-3J**	SP4019	9,52	11,00	4,76	0,80	4,39		Medium
032550	**DNMG150404E-3J**	SP4019	12,70	15,50	4,76	0,40	5,16		Medium
032551	**DNMG150408E-3J**	SP4019	12,70	15,50	4,76	0,80	5,16		Medium
032552	**DNMG150412E-3J**	SP4019	12,70	15,50	4,76	1,20	5,16		Medium
032553	**DNMG150604E-3J**	SP4019	12,70	15,50	6,35	0,40	5,16		Medium
032554	**DNMG150608E-3J**	SP4019	12,70	15,50	6,35	0,80	5,16		Medium
032555	**DNMG150612E-3J**	SP4019	12,70	15,50	6,35	1,20	5,16		Medium

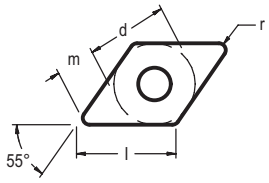
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
4E Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030516	**DNMG150404E-4E**	SP0819	12,70	15,50	4,76	0,40	5,16		Medium-Roughing
030517	**DNMG150408E-4E**	SP0819	12,70	15,50	4,76	0,80	5,16		Medium-Roughing
032556	**DNMG150408E-4E**	NL400	12,70	15,50	4,76	0,80	5,16		Medium-Roughing
030518	**DNMG150412E-4E**	SP0819	12,70	15,50	4,76	1,20	5,16		Medium-Roughing
032557	**DNMG150412E-4E**	NL400	12,70	15,50	4,76	1,20	5,16		Medium-Roughing
030524	**DNMG150604E-4E**	SP0819	12,70	15,50	6,35	0,40	5,16		Medium-Roughing
030525	**DNMG150608E-4E**	SP0819	12,70	15,50	6,35	0,80	5,16		Medium-Roughing
032558	**DNMG150608E-4E**	NL400	12,70	15,50	6,35	0,80	5,16		Medium-Roughing
030526	**DNMG150612E-4E**	SP0819	12,70	15,50	6,35	1,20	5,16		Medium-Roughing
032559	**DNMG150612E-4E**	NL400	12,70	15,50	6,35	1,20	5,16		Medium-Roughing

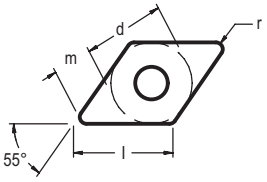
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

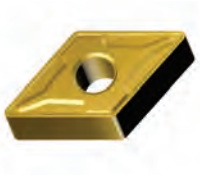
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032560	**DNMG150404E-4T**	NL250	12,70	15,50	4,76	0,40	5,16		Roughing
032561	**DNMG150404E-4T**	NL300	12,70	15,50	4,76	0,40	5,16		Roughing
032562	**DNMG150404E-4T**	NL400	12,70	15,50	4,76	0,40	5,16		Roughing
032563	**DNMG150404E-4T**	NL920	12,70	15,50	4,76	0,40	5,16		Roughing
032564	**DNMG150408E-4T**	NL250	12,70	15,50	4,76	0,80	5,16		Roughing
032565	**DNMG150408E-4T**	NL300	12,70	15,50	4,76	0,80	5,16		Roughing
032566	**DNMG150408E-4T**	NL400	12,70	15,50	4,76	0,80	5,16		Roughing
032567	**DNMG150408E-4T**	NL920	12,70	15,50	4,76	0,80	5,16		Roughing
032568	**DNMG150412E-4T**	NL250	12,70	15,50	4,76	1,20	5,16		Roughing
032569	**DNMG150412E-4T**	NL300	12,70	15,50	4,76	1,20	5,16		Roughing
032570	**DNMG150412E-4T**	NL400	12,70	15,50	4,76	1,20	5,16		Roughing
032571	**DNMG150412E-4T**	NL920	12,70	15,50	4,76	1,20	5,16		Roughing
032572	**DNMG150604E-4T**	NL250	12,70	15,50	6,35	0,40	5,16		Roughing
032573	**DNMG150604E-4T**	NL300	12,70	15,50	6,35	0,40	5,16		Roughing
032574	**DNMG150604E-4T**	NL400	12,70	15,50	6,35	0,40	5,16		Roughing
032575	**DNMG150604E-4T**	NL920	12,70	15,50	6,35	0,40	5,16		Roughing
032576	**DNMG150608E-4T**	NL250	12,70	15,50	6,35	0,80	5,16		Roughing
032577	**DNMG150608E-4T**	NL300	12,70	15,50	6,35	0,80	5,16		Roughing
032578	**DNMG150608E-4T**	NL400	12,70	15,50	6,35	0,80	5,16		Roughing
032579	**DNMG150608E-4T**	NL920	12,70	15,50	6,35	0,80	5,16		Roughing

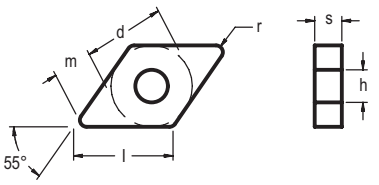
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032580	**DNMG150612E-4T**	NL250	12,70	15,50	6,35	1,20	5,16		Roughing
032581	**DNMG150612E-4T**	NL300	12,70	15,50	6,35	1,20	5,16		Roughing
032582	**DNMG150612E-4T**	NL400	12,70	15,50	6,35	1,20	5,16		Roughing
032583	**DNMG150612E-4T**	NL920	12,70	15,50	6,35	1,20	5,16		Roughing
032584	**DNMG190608E-4T**	NL250	15,88	19,40	6,35	0,80	6,35		Roughing
032585	**DNMG190608E-4T**	NL300	15,88	19,40	6,35	0,80	6,35		Roughing
032586	**DNMG190608E-4T**	NL400	15,88	19,40	6,35	0,80	6,35		Roughing
032587	**DNMG190608E-4T**	NL920	15,88	19,40	6,35	0,80	6,35		Roughing
032588	**DNMG190612E-4T**	NL250	15,88	19,40	6,35	1,20	6,35		Roughing
032589	**DNMG190612E-4T**	NL300	15,88	19,40	6,35	1,20	6,35		Roughing
032590	**DNMG190612E-4T**	NL400	15,88	19,40	6,35	1,20	6,35		Roughing
032591	**DNMG190612E-4T**	NL920	15,88	19,40	6,35	1,20	6,35		Roughing

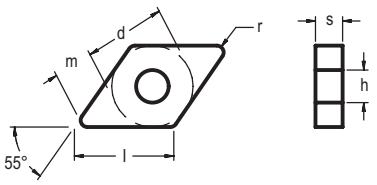
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

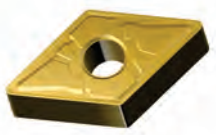
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DNMG
4U Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032592	**DNMG150408E-4U**	NL200	12,70	15,50	4,76	0,80	5,16		Roughing
032593	**DNMG150412E-4U**	NL200	12,70	15,50	4,76	1,20	5,16		Roughing
032594	**DNMG150608E-4U**	NL200	12,70	15,50	6,35	0,80	5,16		Roughing
032595	**DNMG150612E-4U**	NL200	12,70	15,50	6,35	1,20	5,16		Roughing

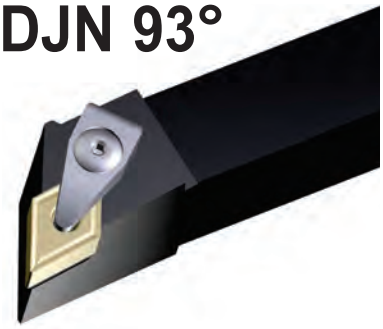
For Toolholders External: see pages 85 - 87 | Internal: see pages 88 - 89

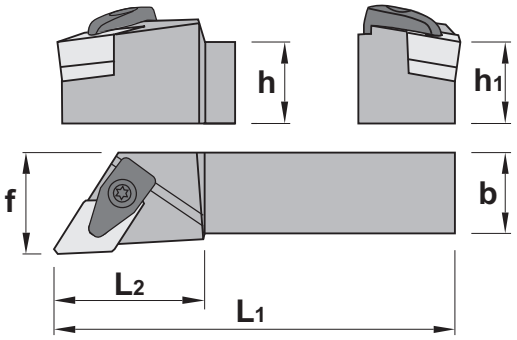
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DDJN 93°





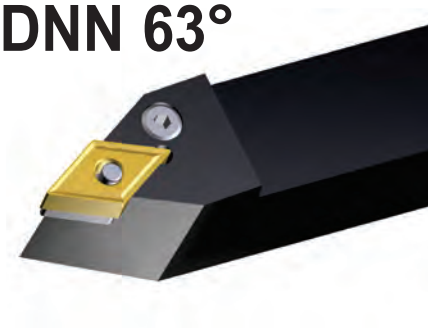
DDJN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033306	**DDJNL 2020 K 11**	LH	DN_1104	20	20	25	125	34
033307	**DDJNL 2525 M11**	LH	DN_1104	25	25	32	150	34
033308	**DDJNR 2020 K11**	RH	DN_1104	20	20	25	125	34
033309	**DDJNR 2525 M11**	RH	DN_1104	25	25	32	150	34
033310	**DDJNL 2020 K 15**	LH	DN_1506	20	20	25	125	38
033311	**DDJNL 2525 M15**	LH	DN_1506	25	25	32	150	38
033312	**DDJNL 3232 P15**	LH	DN_1506	32	32	40	170	38
033313	**DDJNR 2020 K15**	RH	DN_1506	20	20	25	125	38
033314	**DDJNR 2525 M15**	RH	DN_1506	25	25	32	150	38
033315	**DDJNR 3232 P15**	RH	DN_1506	32	32	40	170	38

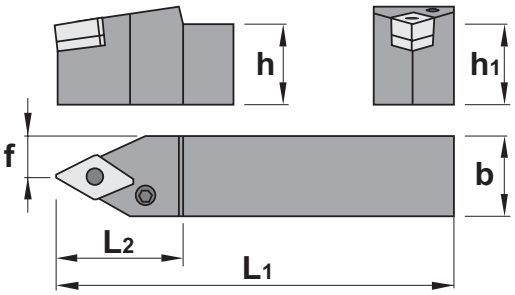


D Style External Toolholder
for Negative Inserts:
DN_1104 & DN_1506
Application: Turn and Profile
Axial Approach 93°
Axial -6,25
Radial -6,75
Profiling Clearance Angle β = 29°
RH Holder Shown

DDJNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Spring EDP		Anvil EDP		Anvil Screw EDP		Clamp & Anvil Screw Key	
DDJNL/R 2020 K11	033711	1695	033709	DC2708	033720	4294	034496	IDSN322	033718	1764	018286	KH5003
DDJNL/R 2525 M11												
DDJNL/R 2020 K15	033710	1696	033707	DC2712	033719	4295	001689	IDSN433	033716	1766	018287	KH5004
DDJNL/R 2525 M15												
DDJNL/R 3232 P15												

PDNN 63°





PDNN External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
017140	**PDNN N 2020 K15**	Neutral	DN_1506	20	20	10	125	34
017142	**PDNN N 2525 M15**	Neutral	DN_1506	25	25	12,5	150	34
017144	**PDNN N 3232 P15**	Neutral	DN_1506	32	32	16	170	34

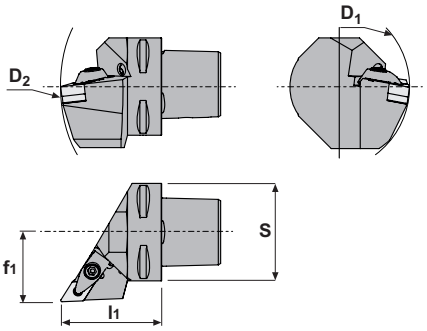


P Style External Toolholder
for Negative Inserts: DN_1506
Application: External Plunge, Turn & Profile
Axial Approach 63°
Axial -8°
Radial -2,5°
Profiling Clearance Angle β = 59.5°
Neutral Holder Shown

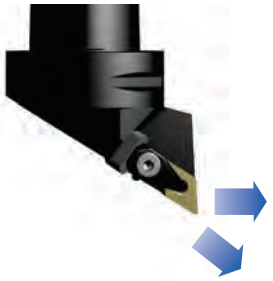
PDNN Spare Parts												
Item Description	*Lever EDP*		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
PDNN N 2020 K15 **PDNN N 2525 M15** **PDNN N 3232 P15**	*017444*	PL8415	*017499*	PLS1638	*017459*	PA3715	*017453*	PC4112	*028054*	PCP0012	*018286*	KH5003

DDJN 93°





DDJN LH & RH External PSC Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				S	D1	D2	f1	l1
033697	C5-50-DDJNL35060-15	LH	DN_1506	50	110	165	35	60
033698	C5-50-DDJNR35060-15	RH	DN_1506	50	110	165	35	60
033699	C6-63-DDJNL45065-15	LH	DN_1506	63	110	190	45	65
033700	C6-63-DDJNR45065-15	RH	DN_1506	63	110	190	45	65

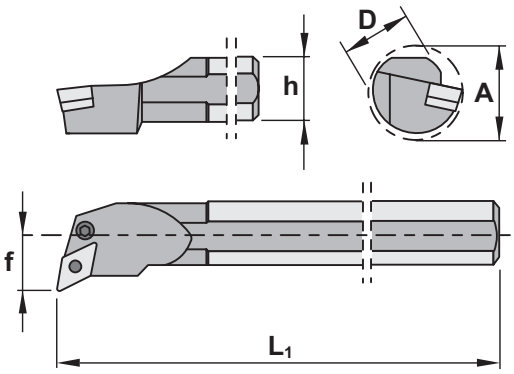


D Style External Toolholder
for Negative Inserts:
DN_1506
Application: External Profile Turn O/D
Approach 93
Axial -6°
Radial -7°
Profilling Clearance Angle β= 27°
RH Holder Shown

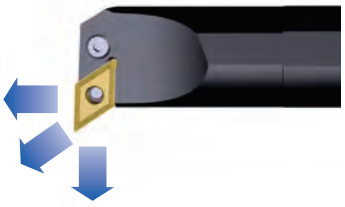
DDJNL/R Spare Parts												
Item Description	Clamp EDP		Clamp Screw EDP		Anvil EDP		Anvil Screw EDP		Clamp Spring EDP		Screw Key EDP	
C5-50-DDJNL/R 35060-15 C6-63-DDJNL/R 45065-15	033707	2712	033710	1696	033713	IDSN432	033716	1766	033719	4295	018287	KH5004

A..PDUN 93°





A..PDUN LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	h	Through Coolant
033334	**A25R PDUNL 11**	LH	DN_1104	31	25	17	200	23	
033335	**A25R PDUNR 11**	RH	DN_1104	31	25	17	200	23	
033336	**A32S PDUNL 15**	LH	DN_1506	39	32	22	250	30	
033337	**A40T PDUNL 15**	LH	DN_1506	48	40	27	300	37	
033338	**A32S PDUNR 15**	RH	DN_1506	39	32	22	250	30	
033339	**A40T PDUNR 15**	RH	DN_1506	48	40	27	300	37	

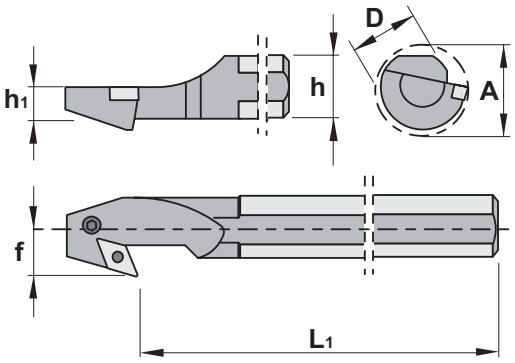


P Style Boring Bar
for Negative Inserts:
DN_1104 & DN_1506
Application: Bore and profile
Axial Approach 93°
Axial -6°
Radial -14°
Profiling Clearance Angle β= 29°
RH Bar Shown

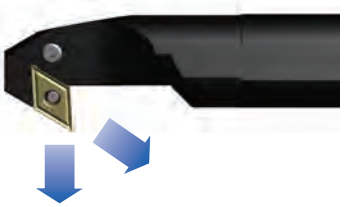
A..PDUNL/R Spare Parts												
Item Description	*Lever EDP*		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
A25R PDUNL/R 11	*017442*	PL8009	*017447*	PLS1606	*028375*	PA3711	*000000*	PC4109	*028053*	PCP0009	*018285*	KH5025
A32S PDUNL/R 15	*017444*	PL8415	*022625*	PLS1648	*017459*	PA3715	*017453*	PC4112	*028054*	PCP0012	*018286*	KH5003
A40T PDUNL/R 15												

S..PDUN 93°-EX





S..PDUN LH & RH Internal Boring Bars											
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)							
				Min Bore Ø A	ØD	f	L_1	h	h_1	Through Coolant	
033346	**S32U PDUNL 15-EX**	LH	DN_1506	39	32	22	350	30	15		
033347	**S40V PDUNL 15-EX**	LH	DN_1506	48	40	27	400	37	18,5		
033348	**S32U PDUNR 15-EX**	RH	DN_1506	39	32	22	350	30	15		
033349	**S40V PDUNR 15-EX**	RH	DN_1506	48	40	27	400	37	18,5		



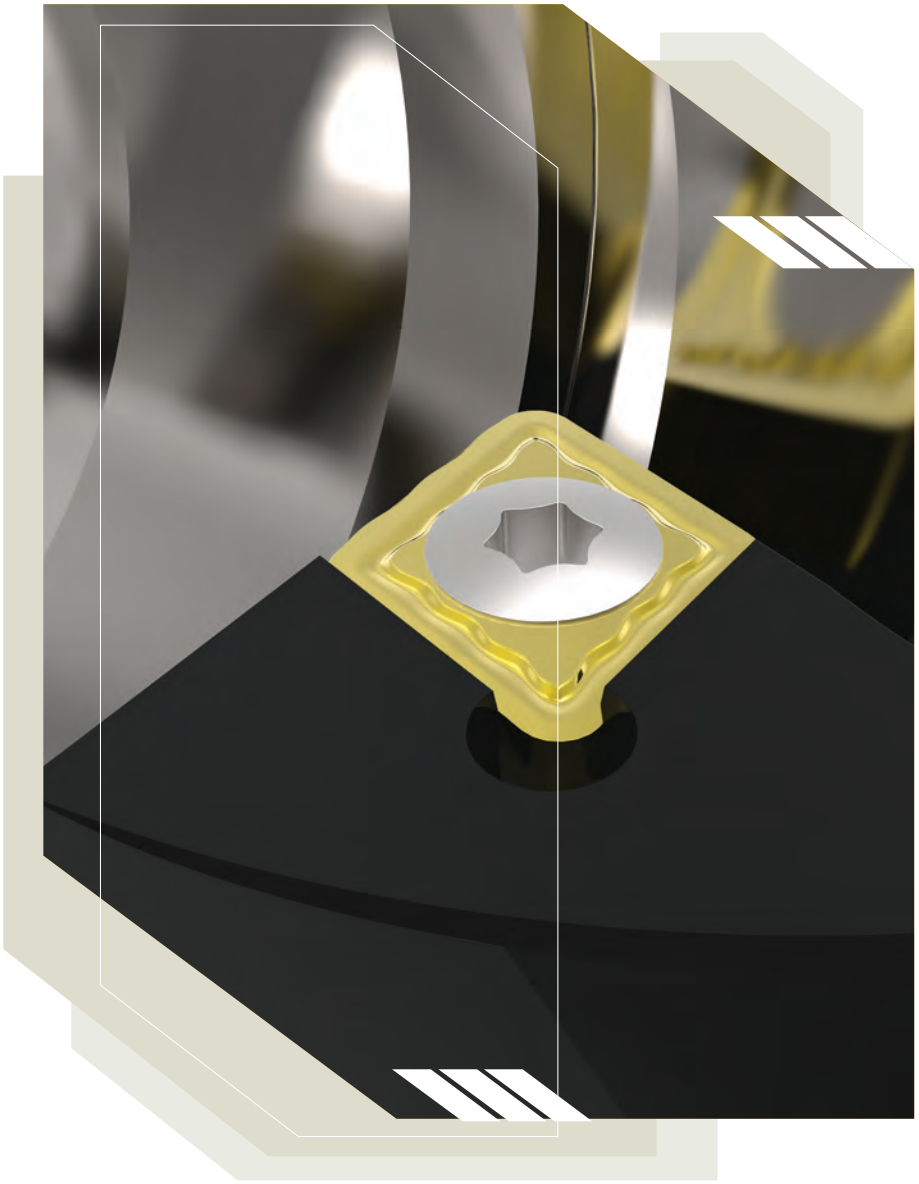
P Style Internal Boring Bar
Negative Inserts: DN_1506
Application: Internal Back Boring & Profiling
Axial Approach 93°
Profiling Clearance Angle β = 29°
RH Bar Shown

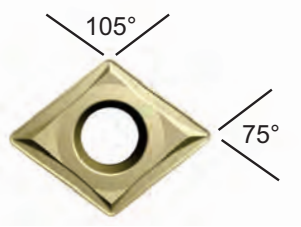
S..PDUNL/R -EX Spare Parts												
Item Description	*Lever EDP*		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
S32U PDUNL/R 15-EX	*017444*	PL8415	*022625*	PLS1648	-	-	-	-	-	-	*018286*	KH5003
S40V PDUNL/R 15-EX			*017499*	PLS1638	*017459*	PA3715	*017453*	PC4112	*028054*	PCP0012		

Stellram's Posicut® range of positive inserts and holders, along with the Poismatic® range for small part machining for medical and watchmaker components.

The "E" Style Program, developed exclusively by Stellram:

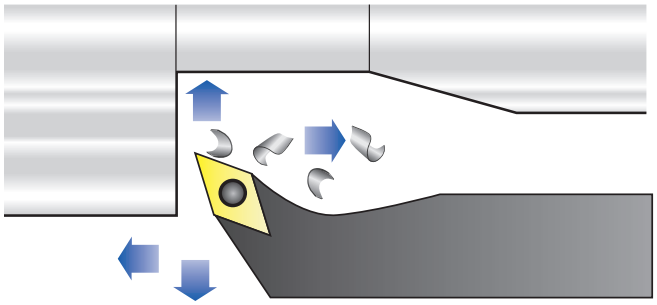
With the 75° inclusive cutting angle this gives the "E" inserts an advantage over the "C" style inserts, allowing for greater radial clearance between the work piece and insert for profiling and chip evacuation. Also improves insert location with a more secure pocket design whilst not compromising insert edge strength.



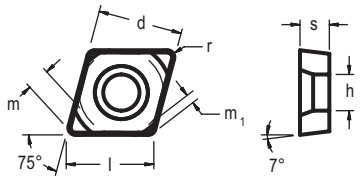


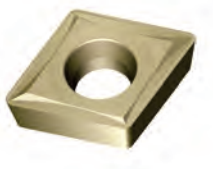
Stellram Posicut™
The worlds first, for screw-on inserts

E" Style Inserts in combination with the Stellram Boring Bar's give greater radial clearance, and with the improved design of Insert and Boring Bar, allows for greater profiling capability and chip evacuation.



ECMT
-73 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
034429	**ECMT09T304E-73**	NL300	9,52	9,85	3,97	0,40	4,40		Medium
034456	**ECMT09T308E-73**	NL300	9,52	9,85	3,97	0,80	4,40		Medium
032295	**ECMT12T304E-73**	SP4019	12,00	12,40	3,97	0,40	5,40		Medium
032598	**ECMT12T304E-73**	NL300	12,00	12,40	3,97	0,40	5,40		Medium
032599	**ECMT12T304E-73**	NL920	12,00	12,40	3,97	0,40	5,40		Medium
032296	**ECMT12T308E-73**	SP4019	12,00	12,40	3,97	0,80	5,40		Medium
032600	**ECMT12T308E-73**	NL300	12,00	12,40	3,97	0,80	5,40		Medium
032601	**ECMT12T308E-73**	NL920	12,00	12,40	3,97	0,80	5,40		Medium
032602	**ECMT12T312E-73**	NL300	12,00	12,40	3,97	1,20	5,40		Medium
032603	**ECMT12T312E-73**	NL920	12,00	12,40	3,97	1,20	5,40		Medium
032604	**ECMT16M608E-73**	NL300	15,88	16,40	6,00	0,80	6,40		Medium
032605	**ECMT16M608E-73**	NL920	15,88	16,40	6,00	0,80	6,40		Medium
032606	**ECMT16M612E-73**	NL300	15,88	16,40	6,00	1,20	6,40		Medium
032607	**ECMT16M612E-73**	NL920	15,88	16,40	6,00	1,20	6,40		Medium

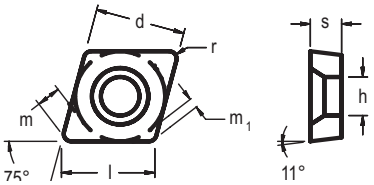
For Toolholders External: see pages 97 - 102 | Internal: see pages 103 - 105

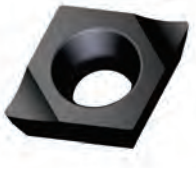
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

EPEX
-15 Geometry

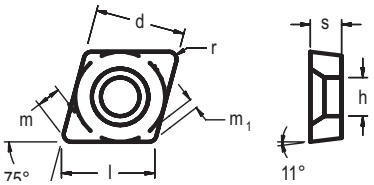




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
022212	**EPEX040202F-15**	GH1	4,76	4,93	2,38	0,20	2,30		Finishing
032608	**EPEX040202F-15**	SP4019	4,76	4,93	2,38	0,20	2,30		Finishing
032609	**EPEX060202F-15**	GH1	6,35	6,54	2,38	0,20	2,80		Finishing
032610	**EPEX060202F-15**	SP4019	6,35	6,54	2,38	0,20	2,80		Finishing

For Toolholders External: see pages 97 - 102 | Internal: see pages 103 - 105

EPEX





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032611	**EPEX060202FL**	SP4019	6,35	6,54	2,38	0,20	2,80		Medium
032612	**EPEX060202FR**	SP4019	6,35	6,54	2,38	0,20	2,80		Medium
017378	**EPEX060202FL**	GH1	6,35	6,54	2,38	0,20	2,80		Medium
018118	**EPEX060202FR**	GH1	6,35	6,54	2,38	0,20	2,80		Medium
032613	**EPEX060204FL**	SP4019	6,35	6,54	2,38	0,40	2,80		Medium
034460	**EPEX060204FR**	SP4019	6,35	6,54	2,38	0,40	2,80		Medium
017280	**EPEX060204FL**	GH1	6,35	6,54	2,38	0,40	2,80		Medium
017387	**EPEX060204FR**	GH1	6,35	6,54	2,38	0,40	2,80		Medium

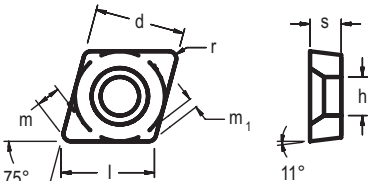
For Toolholders External: see pages 97 - 102 | Internal: see pages 103 - 105

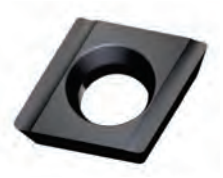
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

EPEX





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
034592	**EPEX08M3005FL**	SP4019	8.00	8.20	3.00	0.05	4.20		Medium
034593	**EPEX08M3005FR**	SP4019	8.00	8.20	3.00	0.05	4.20		Medium
034594	**EPEX08M3005FL**	GH1	8.00	8.20	3.00	0.05	4.20		Medium
034595	**EPEX08M3005FR**	GH1	8.00	8.20	3.00	0.05	4.20		Medium
032310	**EPEX08M301FL**	SP4019	8.00	8.20	3.00	0.10	4.20		Medium
032618	**EPEX08M301FR**	SP4019	8.00	8.20	3.00	0.10	4.20		Medium
032619	**EPEX08M301FL**	GH1	8.00	8.20	3.00	0.10	4.20		Medium
032620	**EPEX08M301FR**	GH1	8.00	8.20	3.00	0.10	4.20		Medium
032306	**EPEX08M302FL**	SP4019	8.00	8.20	3.00	0.20	4.20		Medium
032304	**EPEX08M302FR**	SP4019	8.00	8.20	3.00	0.20	4.20		Medium
017853	**EPEX08M302FL**	GH1	8.00	8.20	3.00	0.20	4.20		Medium
017854	**EPEX08M302FR**	GH1	8.00	8.20	3.00	0.20	4.20		Medium
032312	**EPEX08M304FL**	SP4019	8.00	8.20	3.00	0.40	4.20		Medium
032311	**EPEX08M304FR**	SP4019	8.00	8.20	3.00	0.40	4.20		Medium

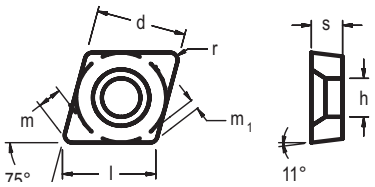
For Toolholders External: see pages 129 - 135 | Internal: see pages 136 - 139

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

EPGT
-62 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
031612	**EPGT040201E-62**	SP4019	4,76	4,93	2,38	0,10	2,30		Finishing
030585	**EPGT040202E-62**	SP4019	4,76	4,93	2,38	0,20	2,30		Finishing
030586	**EPGT040204E-62**	SP4019	4,76	4,93	2,38	0,40	2,30		Finishing
030587	**EPGT060202E-62**	SP4019	6,35	6,54	2,38	0,20	2,80		Finishing
030588	**EPGT060204E-62**	SP4019	6,35	6,54	2,38	0,40	2,80		Finishing
030590	**EPGT08M301E-62**	SP4019	8,00	8,20	3,00	0,10	4,20		Finishing
030591	**EPGT08M302E-62**	SP4019	8,00	8,20	3,00	0,20	4,20		Finishing
030592	**EPGT08M304E-62**	SP4019	8,00	8,20	3,00	0,40	4,20		Finishing
030593	**EPGT08M308E-62**	SP4019	8,00	8,20	3,00	0,80	4,20		Finishing
031403	**EPGX08M3005E-62**	SP4019	8,00	8,20	3,00	0,05	4,20		Finishing

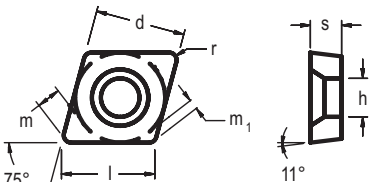
For Toolholders External: see pages 97 - 102 | Internal: see pages 103 - 105

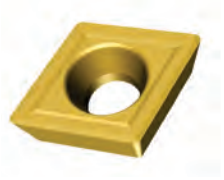
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

EPMT





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032299	**EPMT060202E**	SP4019	6,35	6,54	2,38	0,20	2,80		Medium
032622	**EPMT060202E**	NL300	6,35	6,54	2,38	0,20	2,80		Medium
018135	**EPMT060204E**	GH1	6,35	6,54	2,38	0,40	2,80		Medium
032274	**EPMT060204E**	SP4019	6,35	6,54	2,38	0,40	2,80		Medium
032623	**EPMT060204E**	NL300	6,35	6,54	2,38	0,40	2,80		Medium
034464	**EPMT060204E**	NL920	6,35	6,54	2,38	0,40	2,80		Medium
018142	**EPMT08M302E**	GH1	8,00	8,20	3,00	0,20	4,20		Medium
032286	**EPMT08M302E**	SP4019	8,00	8,20	3,00	0,20	4,20		Medium
032624	**EPMT08M302E**	NL300	8,00	8,20	3,00	0,20	4,20		Medium
017335	**EPMT08M304E**	GH1	8,00	8,20	3,00	0,40	4,20		Medium
032275	**EPMT08M304E**	SP4019	8,00	8,20	3,00	0,40	4,20		Medium
032625	**EPMT08M304E**	NL300	8,00	8,20	3,00	0,40	4,20		Medium
034589	**EPMT08M304E**	NL920	8,00	8,20	3,00	0,40	4,20		Medium
018156	**EPMT08M308E**	GH1	8,00	8,20	3,00	0,80	4,20		Medium
032290	**EPMT08M308E**	SP4019	8,00	8,20	3,00	0,80	4,20		Medium
032626	**EPMT08M308E**	NL300	8,00	8,20	3,00	0,80	4,20		Medium
034590	**EPMT08M308E**	NL920	8,00	8,20	3,00	0,80	4,20		Medium

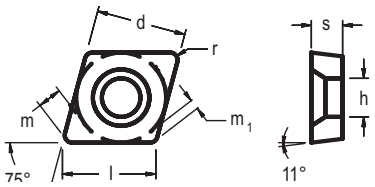
For Toolholders External: see pages 97 - 102 | Internal: see pages 103 - 105

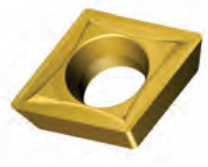
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

EPMT
-73 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032279	**EPMT08M302E-73**	SP4019	8,00	8,20	3,00	0,20	4,20		Medium
032627	**EPMT08M302E-73**	NL300	8,00	8,20	3,00	0,20	4,20		Medium
031245	**EPMT08M304E-73**	SP4019	8,00	8,20	3,00	0,40	4,20		Medium
032628	**EPMT08M304E-73**	NL300	8,00	8,20	3,00	0,40	4,20		Medium
032629	**EPMT08M304E-73**	NL920	8,00	8,20	3,00	0,40	4,20		Medium
032287	**EPMT08M308E-73**	SP4019	8,00	8,20	3,00	0,80	4,20		Medium
032630	**EPMT08M308E-73**	NL300	8,00	8,20	3,00	0,80	4,20		Medium
032631	**EPMT08M308E-73**	NL920	8,00	8,20	3,00	0,80	4,20		Medium

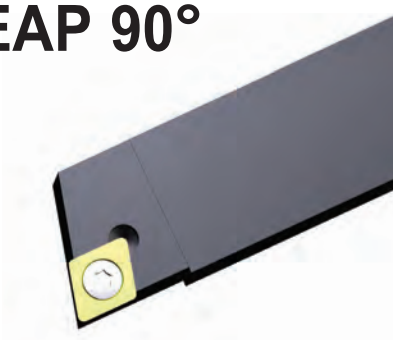
For Toolholders External: see pages 97 - 102 | Internal: see pages 103 - 105

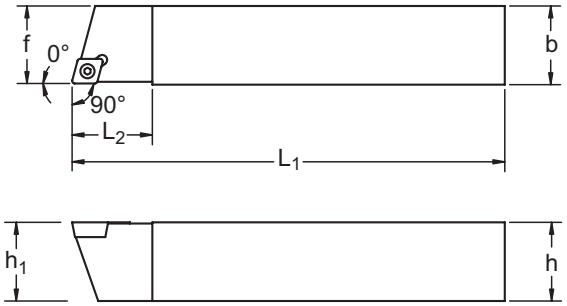
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SEAP 90°

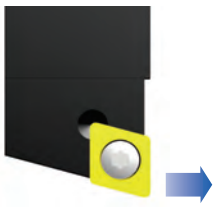




Inserts - EPGT08M3 & EPMT08M3

SEAP LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
018024	**SEAPL 1010 M08**	LH	EP_08M3	10	10	10	150	16
018025	**SEAPL 1212 M08**	LH	EP_08M3	12	12	12	150	16
025044	**SEAPL 1616 M08**	LH	EP_08M3	16	16	16	150	16
025046	**SEAPL 2020 K08**	LH	EP_08M3	20	20	20	125	16
018027	**SEAPR 1010 M08**	RH	EP_08M3	10	10	10	150	16
018028	**SEAPR 1212 M08**	RH	EP_08M3	12	12	12	150	16
025043	**SEAPR 1616 M08**	RH	EP_08M3	16	16	16	150	16
025045	**SEAPR 2020 K08**	RH	EP_08M3	20	20	20	125	16

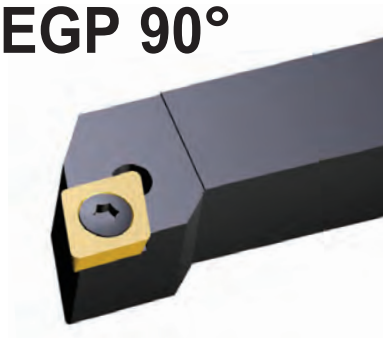


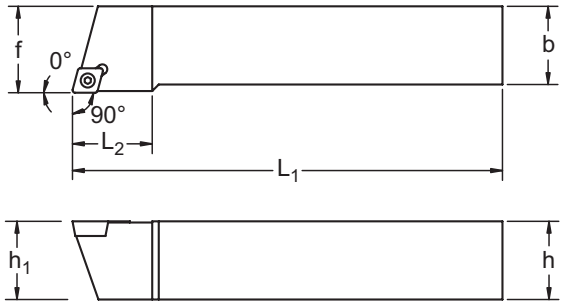
S Style External Toolholder
for Positive Inserts: EP_08M3
Application: Face, Turning and Profile
Approach 90°
Axial: 0°
Radial 0°
Profilling Clearance Angle β = 12°
RH Holder Shown

SEAPL/R Spare Parts

Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SEAPL/R 1010 E06	*017032*	A3006T	*013214*	T9	-	-	-	-
SEAPL/R 1212 F09								
SEAPL/R 1616 H09								
SEAPL/R 2020 K09								

SEGP 90°





Inserts - EPGT08M3 & EPMT08M3

SEGP LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
018087	**SEGPL 0808 F08**	LH	EP_08M3	8	8	11	80	14
017987	**SEGPL 1010 F08**	LH	EP_08M3	10	10	12	80	14
018077	**SEGPL 1212 F08**	LH	EP_08M3	12	12	16	80	16
018078	**SEGPR 0808 F08**	RH	EP_08M3	8	8	11	80	14
018079	**SEGPR 1010 F08**	RH	EP_08M3	10	10	12	80	14
018080	**SEGPR 1212 F08**	RH	EP_08M3	12	12	16	80	16

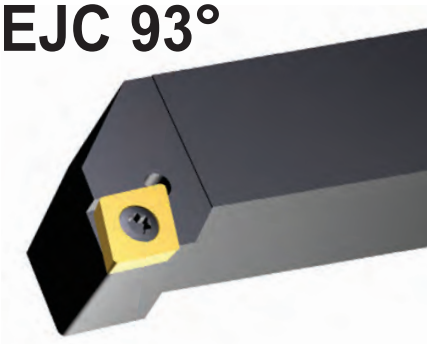


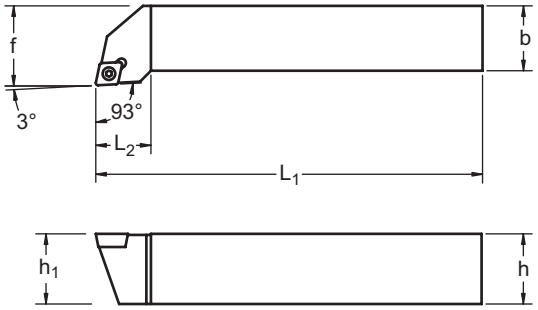
S Style External Toolholder
for Positive Inserts: EP_08M3
Application: Face, Turning and Profile
Approach 90°
Axial: 0°
Radial 0°
Profilling Clearance Angle β = 12°
RH Holder Shown

SEGPL/R Spare Parts

Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SEGPL/R 0808 F08	*017032*	A3006T	*013214*	T9	-	-	-	-
SEGPL/R 1010 F08								
SEGPL/R 1212 F08								

SEJC 93°

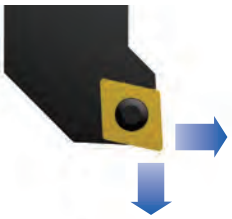




Inserts - EPMT16M6

SEJC LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
028581	**SEJCL 2525 M16**	LH	EC_16M6	25	25	32	150	28
028582	**SEJCR 2525 M16**	RH	EC_16M6	25	25	32	150	28

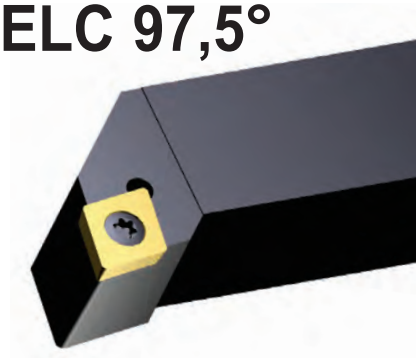


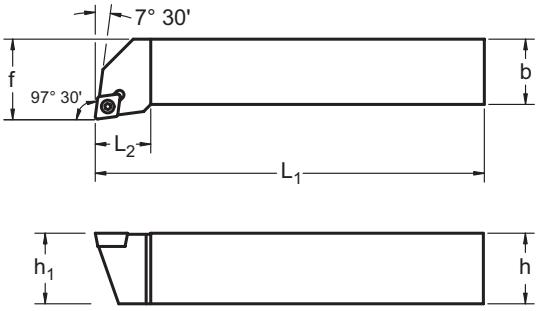
S Style External Toolholder
for Positive Inserts: EC_16M6
Application: Face, Turning and Profile
Approach 93°
Axial: 0°
Radial 0°
Profilling Clearance Angle β = 9°
RH Holder Shown

SEJCL/R Spare Parts (mm)

Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SEJCL/R 2525 M16	*023081*	A5025T	*015241*	T20	-	-	-	-

SELC 97,5°

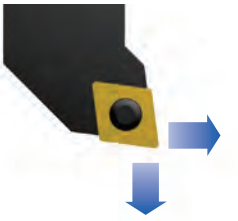




Inserts - ECMT12T3

SELC LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
018082	**SELCL 2020 K12**	LH	EC_12T3	20	20	25	125	22
018083	**SELCL 2525 M12**	LH	EC_12T3	25	25	32	150	28
018085	**SELCR 2020 K12**	RH	EC_12T3	20	20	25	125	22
018086	**SELCR 2525 M12**	RH	EC_12T3	25	25	32	150	28

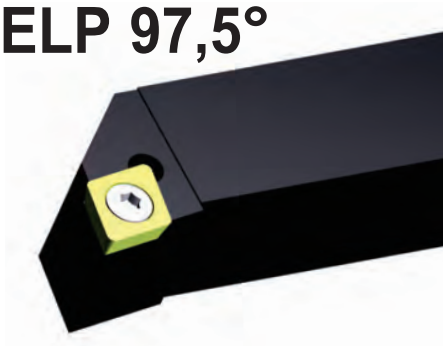


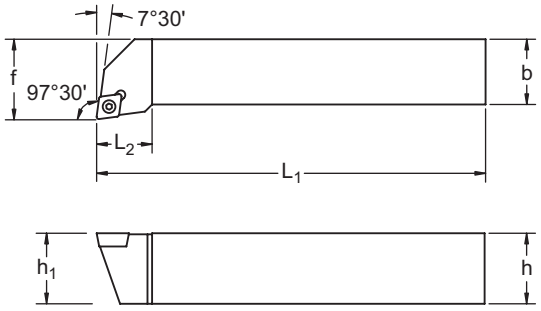
S Style External Toolholder
for Positive Inserts: EC_12T3
Application: Face, Turning and Profile
Approach 97,5°
Axial: 0°
Radial 0°
Profilling Clearance Angle β = 4,5°
RH Holder Shown

SELCL/R Spare Parts

Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SELCL/R 2020 K12	*034500*	1540	*034577*	K5517	*029091*	SA3712	*029095*	1765
SELCL/R 2525 M12								

SELP 97,5°

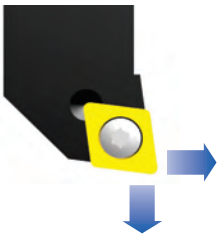




Inserts - EPGT08M3 & EPMT08M3

SELP LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
018089	**SELPL 1010 F08**	LH	EP_08M3	10	10	12	80	14
018090	**SELPL 1212 F08**	LH	EP_08M3	12	12	16	80	16
018091	**SELPL 1616 H08**	LH	EP_08M3	16	16	20	100	18
018092	**SELPL 2020 K08**	LH	EP_08M3	20	20	25	125	22
018093	**SELPL 2525 M08**	LH	EP_08M3	25	25	32	150	28
018094	**SELPR 1010 F08**	RH	EP_08M3	10	10	12	80	14
018095	**SELPR 1212 F08**	RH	EP_08M3	12	12	16	80	16
018096	**SELPR 1616 H08**	RH	EP_08M3	16	16	20	100	18
018097	**SELPR 2020 K08**	RH	EP_08M3	20	20	25	125	22
018098	**SELPR 2525 M08**	RH	EP_08M3	25	25	32	150	28

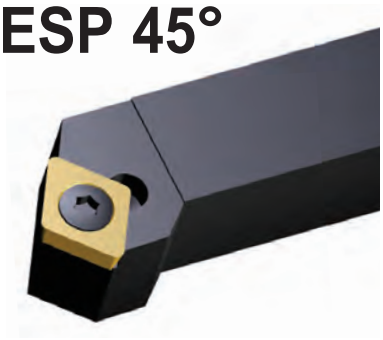


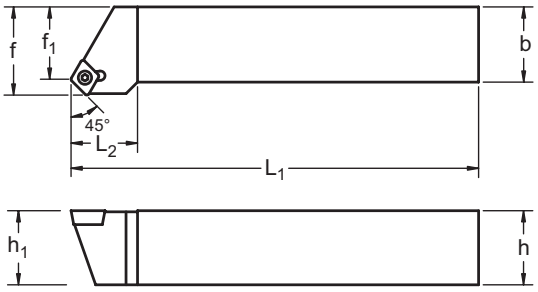
S Style External Toolholder
for Positive Inserts: EP_08M3
Application: Face, Turning and Profile
Approach 97,5°
Axial: 0°
Radial 0°
Profilling Clearance Angle β = 4,5°
RH Holder Shown

SELPL/R Spare Parts

Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SELPL/R 1010 F08	*017032*	A3006T	*013214*	T9	-	-	-	-
SELPL/R 1212 F08								
SELPL/R 1616 H08								
SELPL/R 2020 K08								
SELPL/R 2525 M08								

SESP 45°

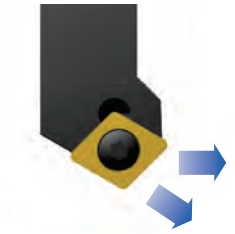




Inserts - EPGT08M3 & EPMT8M3

SESP LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
018099	**SESPL 1010 F08**	LH	EP_08M3	10	10	13,6	80	14
018100	**SESPL 1212 F08**	LH	EP_08M3	12	12	16	80	16
018101	**SESPR 1010 F08**	RH	EP_08M3	10	10	13,6	80	14
018102	**SESPR 1212 F08**	RH	EP_08M3	12	12	16	80	16



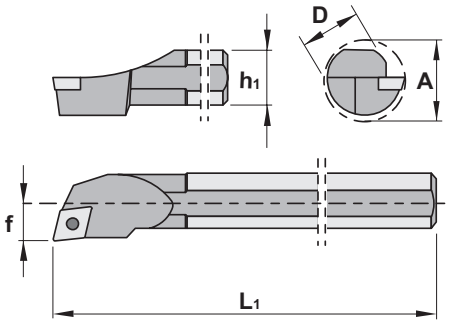
S Style External Toolholder
Positive Inserts: EP_08M3
Application: Turning and Profile
Approach 45°
Axial: 0°
Radial 0°
Profilling Clearance Angle β = 34°
RH Holder Shown

SESPL/R Spare Parts

Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SESPL/R 1010 F08	*017032*	A3006T	*013214*	T9	-	-	-	-
SESPL/R 1212 F08								

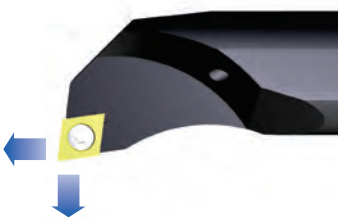
A.. SELP 97,5°





Inserts - EPEX0402, EPGT0402, EPEX0602, EPGT0602,
EPMT0602, EPEX08M3, EPGT08M3 and EPMT8M3

A.. SELP LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	h_1	Through Coolant
018408	S06F SELPL 04	LH	EP_0402	8	6	4	80	4,2	
018397	A08H SELPL 04	LH	EP_0402	11	8	6	100	4	
018322	S06F SELPR 04	RH	EP_0402	8	6	4	80	4,2	
018315	A08H SELPR 04	RH	EP_0402	11	8	6	100	4	
018398	A08H SELPL 06	LH	EP_0602	11	8	6	100	4	
018399	A10K SELPL 06	LH	EP_0602	13	10	7	125	5	
018316	A08H SELPR 06	RH	EP_0602	11	8	6	100	4	
018401	A10K SELPR 06	RH	EP_0602	13	10	7	125	5	
018400	A10K SELPL 08	LH	EP_08M3	13	10	7	125	5	
018318	A12K SELPL 08	LH	EP_08M3	16	12	9	125	6	
018320	A16M SELPL 08	LH	EP_08M3	20	16	11	150	8	
018402	A20Q SELPL 08	LH	EP_08M3	24	20	13	180	10	
018404	A25R SELPL 08	LH	EP_08M3	31	25	17	200	12,5	
018317	A10K SELPR 08	RH	EP_08M3	13	10	7	125	5	
018319	A12K SELPR 08	RH	EP_08M3	16	12	9	125	6	
018321	A16M SELPR 08	RH	EP_08M3	20	16	11	150	8	
018403	A20Q SELPR 08	RH	EP_08M3	24	20	13	180	10	
018405	A25R SELPR 08	RH	EP_08M3	31	25	17	200	12,5	

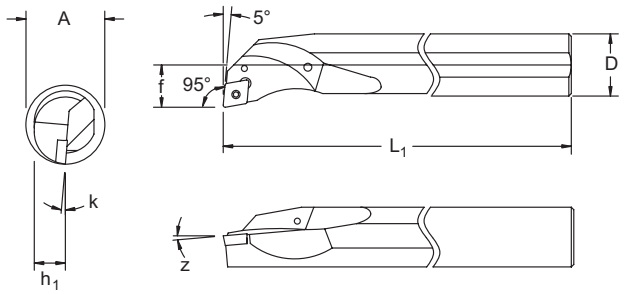


S Style Boring Bar
for Positive Inserts:
EP_0402, EP_0602, and EP_08M3
Application: Facing and I/D part profiling
Approach 97,5°
Axial 5°
Radial 3° - 5°
Profilling Clearance Angle β = 0°
RH Bar Shown

A.. SELPL/R Spare Part								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
S06F SELPL/R 04 A08H SELPL/R 04	015059	F2004T	018487	T6	-	-	-	-
A/D08H SELPL/R 06 A10K SELPL/R 06	015059	F2505T	018488	T7	-	-	-	-
A/D10K SELPL/R 08 A/D12K SELPL/R 08 A/D16M SELPL/R 08 A/D20Q SELPL/R 08 A/D25R SELPL/R 08	017032	A3006T	013214	T9	-	-	-	-

D.. SELP 97,5°
Anti-Vibration Bars





D.. SELP LH & RH Internal Boring Bars									
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	h_1	Through Coolant
023135	**D08H SELPR 06**	RH	EP_0602	11	8	6	100	4	
023137	**D10K SELPR 08**	RH	EP_08M3	13	10	7	125	5	
023139	**D12K SELPR 08**	RH	EP_08M3	16	12	9	125	6	
023141	**D16M SELPR 08**	RH	EP_08M3	20	16	11	150	8	
023143	**D20Q SELPR 08**	RH	EP_08M3	24	20	13	180	10	

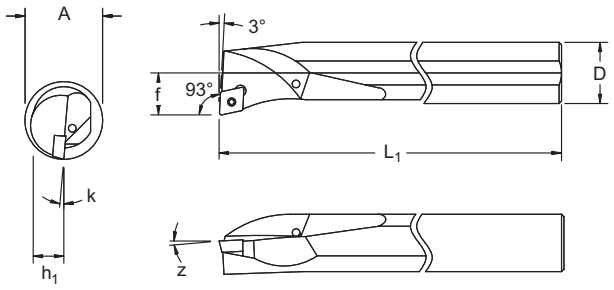


S Style Boring Bar
for Positive Inserts:
EP_0402, EP_0602, and EP_08M3
Application: Facing and I/D part profiling
Approach 97,5°
Axial 5°
Radial 3° - 5°
Profilling Clearance Angle β = 0°
RH Bar Shown

A.. SELPL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
S06F SELPL/R 04	*015059*	F2004T	*018487*	T6	-	-	-	-
A08H SELPL/R 04								
A/D08H SELPL/R 06	*015059*	F2505T	*018488*	T7	-	-	-	-
A10K SELPL/R 06								
A/D10K SELPL/R 08	*017032*	A3006T	*013214*	T9	-	-	-	-
A/D12K SELPL/R 08								
A/D16M SELPL/R 08								
A/D20Q SELPL/R 08								
A/D25R SELPL/R 08								

A.. SEUP 93°





Inserts - EPEX0402, EPGT0402, EPEX0602, EPGT0602,
EPMT0602, EPEX08M3, EPGT08M3 and EPMT8M3

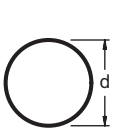
A.. SEUP LH & RH Internal Boring Bars										
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)						
				Min Bore Ø A	ØD	f	L_1	h_1	Through Coolant	
018324	**S06F SEUPL 04**	LH	EP_0402	8	6	4	80	4,2		
018325	**S06F SEUPR 04**	RH	EP_0402	8	6	4	80	4,2		
018409	**A08H SEUPL 06**	LH	EP_0602	11	8	6	100	4		
018410	**A08H SEUPR 06**	RH	EP_0602	11	8	6	100	4		
018412	**A10K SEUPL 08**	LH	EP_08M3	13	10	7	125	5		
018415	**A12K SEUPL 08**	LH	EP_08M3	16	12	9	125	6		
018414	**A10K SEUPR 08**	RH	EP_08M3	13	10	7	125	5		
018323	**A12K SEUPR 08**	RH	EP_08M3	16	12	9	125	6		



S Style Boring Bar
for Positive Inserts:
EP_0402, EP_0602, and EP_08M3
Application: Facing and I/D part profiling
Approach 93°
Axial 0° - 3°
Radial 5° - 10°
Profilling Clearance Angle β = 9°
RH Bar Shown

A.. SEUPL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
S06F SEUPL/R 04	*015059*	F2004T	*018487*	T6	-	-	-	-
A08H SEUPL/R 06	*015059*	F2505T	*018488*	T7	-	-	-	-
A10K SEUPL/R 08	*017032*	A3006T	*013214*	T9	-	-	-	-
A12K SEUPL/R 08								

RCGX
Ceramics







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032338	**RCGX060400 E010**	SA6609	6,35	-	4,76	0,00	-	♦	Roughing
032339	**RCGX090700 E010**	SA6609	9,52	-	7,94	0,00	-	♦	Roughing
032340	**RCGX120700 E010**	SA6609	12,70	-	7,94	0,00	-	♦	Roughing

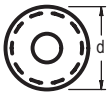
Note: For edge condition refer to Grade page 31

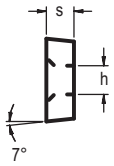
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

RCMT
2N Geometry



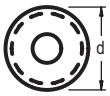


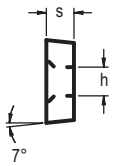


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032632	**RCMT190600E-2N**	NL920	19,05	-	6,35	-	6,50		Medium

For Toolholders External: see pages 109 - 110

RCMT







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032633	**RCMT0602M0E**	NL250	6,00	-	2,38	-	2,79		Medium
032634	**RCMT0602M0E**	NL920	6,00	-	2,38	-	2,79		Medium
032635	**RCMT10T3M0E**	NL250	10,00	-	3,97	-	4,39		Medium
032636	**RCMT10T3M0E**	NL400	10,00	-	3,97	-	4,39		Medium
032637	**RCMT10T3M0E**	NL920	10,00	-	3,97	-	4,39		Medium
032638	**RCMT1204M0E**	NL250	12,00	-	4,76	-	5,50		Medium
032639	**RCMT1204M0E**	NL400	12,00	-	4,76	-	5,50		Medium
032640	**RCMT1204M0E**	NL920	12,00	-	4,76	-	5,50		Medium
032641	**RCMT1606M0E**	NL300	15,88	-	6,35	-	5,51		Roughing
032642	**RCMT1606M0E**	NL400	15,88	-	6,35	-	5,51		Roughing
032643	**RCMT1606M0E**	NL920	15,88	-	6,35	-	5,51		Roughing

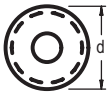
For Toolholders External: see pages 109 - 110

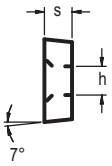
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | High Temp. Alloys | H Hard Materials

RCMT







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032644	**RCMT2006M0E**	NL300	20,00	-	6,35	-	6,50		Roughing
032645	**RCMT2006M0E**	NL400	20,00	-	6,35	-	6,50		Roughing
032646	**RCMT2006M0E**	NL920	20,00	-	6,35	-	6,50		Roughing
032647	**RCMT2507M0S**	NL300	25,00	-	7,94	-	7,11		Roughing
032648	**RCMT2507M0S**	NL400	25,00	-	7,94	-	7,11		Roughing
032649	**RCMT2507M0S**	NL920	25,00	-	7,94	-	7,11		Roughing
032650	**RCMT3209M0S**	NL400	32,00	-	9,53	-	9,52		Roughing
032924	**RCMT3209M0S**	NL300	32,00	-	9,53	-	9,52		Roughing

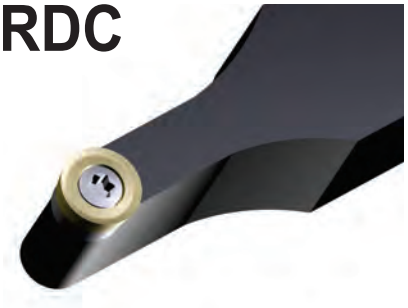
For Toolholders External: see pages 109 - 110

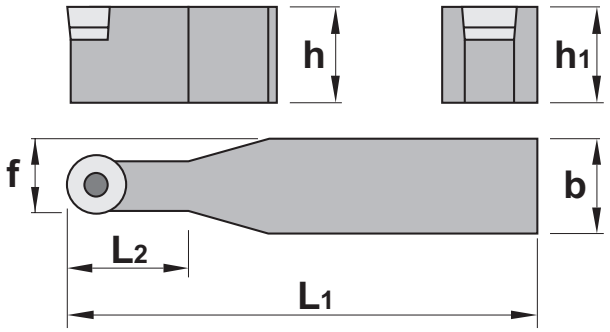
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SRDC





Inserts - RCMT0602, 10T3, and 1204

SRDC Neutral External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
018106	**SRDC N 1616 H06**	Neutral	RCMT_0602	16	16	11	100	20
018107	**SRDC N 2020 K06**	Neutral	RCMT_0602	20	20	13	125	20
018108	**SRDC N 2020 K10**	Neutral	RCMT_10T3	20	20	15	125	22
028594	**SRDC N 2525 M10**	Neutral	RCMT_10T3	25	25	17,5	150	22
033523	**SRDC N 2020 K12**	Neutral	RCMT_1204	20	20	16	125	22
018088	**SRDC N 2525 M12**	Neutral	RCMT_1204	25	25	18,5	150	28

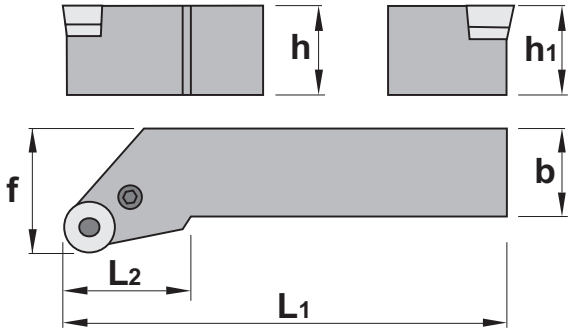


S Style External Toolholder
for Positive Inserts:
RCMT06, 10, and 12
Application: Turning, Plunge and Profile
Approach Angle 0°
Axial 0°
Radial 0°
Neutral Holder Shown

SRDC N Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SRDC N 1616 H06	015061	F2507T	018488	T7	-	-	-	-
SRDC N 2020 K06								
SRDC N 2020 K10	034497	1335	028475	K5516	034501	SA3811	028478	SAS1750
SRDC N 2525 M10								
SRDC N 2020 K12					034502	SA3814		
SRDC N 2525 M12								

PRSC





Inserts - RCMT10T3, 1204, 1606, 2006, & 2507

PRSC LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033527	**PRSCL 2020 K10**	LH	RCMT_10T3	20	20	25	125	28
033528	**PRSCL 2525 M10**	LH	RCMT_10T3	25	25	32	150	28
033529	**PRSCR 2020 K10**	RH	RCMT_10T3	20	20	25	125	28
033530	**PRSCR 2525 M10**	RH	RCMT_10T3	25	25	32	150	28
033531	**PRSCL 2020 K12**	LH	RCMT_1204	20	20	25	125	28
033532	**PRSCL 2525 M12**	LH	RCMT_1204	25	25	32	150	28
033533	**PRSCR 2020 K12**	RH	RCMT_1204	20	20	25	125	28
033534	**PRSCR 2525 M12**	RH	RCMT_1204	25	25	32	150	28
033535	**PRSCL 2525 M16**	LH	RCMT_1606	25	25	32	150	34
033536	**PRSCL 3225 P16**	LH	RCMT_1606	32	25	32	170	34
033537	**PRSCR 2525 M16**	RH	RCMT_1606	25	25	32	150	34
033538	**PRSCR 3225 P16**	RH	RCMT_1606	32	25	32	170	34
033539	**PRSCL 3232 P20**	LH	RCMT_2006	32	32	40	170	42
033540	**PRSCR 3232 P20**	RH	RCMT_2006	32	32	40	170	42
033541	***PRSCL 4040 S25**	LH	RCMT_2507	40	40	50	250	48
033542	***PRSCR 4040 S25**	RH	RCMT_2507	40	40	50	250	48

* Non Stock Items, subject to extended delivery time



P Style External Toolholder
for Positive Inserts:
RCMT10, 12, 16, 20 and 25
Application: Turning, Plunge and Profile
Approach Angle 0°
Axial 0°
Radial 0°
RH Holder Shown

PRSCL/R Spare Parts												
Item Description	*Lever EDP*		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
PRSCL/R 2020 K10	*034475*	PL8110	*034480*	PLS1705	*034484*	PA3810	*028417*	PC4110	*028053*	PCP0009	*028578*	KH5002
PRSCL/R 2525 M10												
PRSCL/R 2020 K12	*034476*	PL8112	*017447*	PLS1606	*034485*	PA3812					*018285*	KH5025
PRSCL/R 2525 M12												
PRSCL/R 2525 M16	*034477*	PL8116	*034481*	PLS1706	*034486*	PA3816	*034504*	PC4116	*028054*	PCP0012		
PRSCL/R 3232 P16												
PRSCL/R 3232 P20	*034478*	PL8120	*028458*	PLS1708	*034487*	PA3820	*028051*	PC4115	*034505*	PCP0015	*018286*	KH5003
***PRSCL/R 4040 S25**	*034479*	PL8125	*034482*	PLS1710	*034488*	PA3825	*017455*	PC4119	*028056*	PCP0019	*018287*	KH5004

RNGN
Ceramics





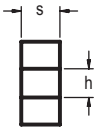


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032324	**RNGN090300 E010**	SA6609	9,52	-	3,18	-	-	♦	Roughing
032325	**RNGN090400 E010**	SA6609	9,52	-	4,76	-	-	♦	Roughing
032326	**RNGN120400 E010**	SA6609	12,70	-	4,76	-	-	♦	Roughing
032327	**RNGN120700 E010**	SA6609	12,70	-	7,94	-	-	♦	Roughing
032328	**RNGN120700 E030**	SA6609	12,70	-	7,94	-	-	♦	Roughing
032329	**RNGN150700 E010**	SA6609	15,88	-	7,94	-	-	♦	Roughing
032330	**RNGN190700 E010**	SA6609	19,05	-	7,94	-	-	♦	Roughing

Note: For edge condition refer to Grade page 31

RNMG
4T Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032651	**RNMG250900E-4T**	NL300	25,00	-	9,53	0,80	5,16	♦♦♦♦♦	Roughing
032652	**RNMG250900E-4T**	NL920	25,00	-	9,53	0,80	5,16	♦♦♦♦♦	Roughing

For Toolholders External: see page 113

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

RPGN
Ceramics







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032336	**RPGN090300 E010**	SA6609	9,52	-	3,18	-	-	♦	Roughing
032337	**RPGN120400 E010**	SA6609	12,70	-	4,76	-	-	♦	Roughing

Note: For edge condition refer to Grade page 31

RPGX
Ceramics







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032341	**RPGX060400 E010**	SA6609	6,35	-	4,76	-	-	♦	Roughing
032342	**RPGX090700 E010**	SA6609	9,52	-	7,94	-	-	♦	Roughing
032343	**RPGX120700 E010**	SA6609	12,70	-	7,94	-	-	♦	Roughing

Note: For edge condition refer to Grade page 31

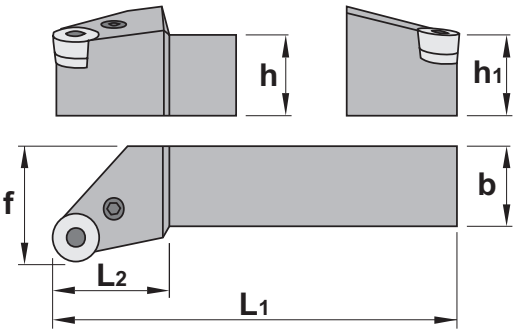
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

PRSN





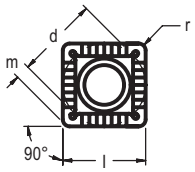
PRSN LH & RH External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028392	**PRSNL 4040 S25**	LH	RN_2509	40	40	50	250	45
028396	**PRSNR 4040 S25**	RH	RN_2509	40	40	50	250	45



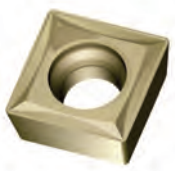
P Style External Toolholder
for Negative Inserts: RN_2509
Application: Turn, Face Plunge and Profile
Axial Approach 0°
Axial -6°
Radial -6°
Profiling Clearance Angle β = 42°
RH Holder Shown

PRSNL/R Spare Parts												
Item Description	Lever EDP		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
PRSNL/R 4040 S25	*028408*	PL8025	*028409*	PLS1612	*034489*	PA3925	*028418*	PC4125	*034506*	PCP0025	*018288*	KH5005

SCMT
-73 Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032653	**SCMT09T304E-73**	SP4019	9,53	9,53	3,97	0,40	4,40		Medium
032654	**SCMT09T304E-73**	NL300	9,53	9,53	3,97	0,40	4,40		Medium
032655	**SCMT09T304E-73**	NL920	9,53	9,53	3,97	0,40	4,40		Medium
030484	**SCMT09T308E-73**	SP4019	9,53	9,53	3,97	0,80	4,40		Medium
032656	**SCMT09T308E-73**	NL300	9,53	9,53	3,97	0,80	4,40		Medium
032657	**SCMT09T308E-73**	NL920	9,53	9,53	3,97	0,80	4,40		Medium
032658	**SCMT12M504E-73**	SP4019	12,70	12,70	5,00	0,40	5,50		Medium
032659	**SCMT12M504E-73**	NL300	12,70	12,70	5,00	0,40	5,50		Medium
032660	**SCMT12M504E-73**	NL920	12,70	12,70	5,00	0,40	5,50		Medium
032661	**SCMT12M508E-73**	SP4019	12,70	12,70	5,00	0,80	5,50		Medium
032662	**SCMT12M508E-73**	NL300	12,70	12,70	5,00	0,80	5,50		Medium
032663	**SCMT12M508E-73**	NL920	12,70	12,70	5,00	0,80	5,50		Medium

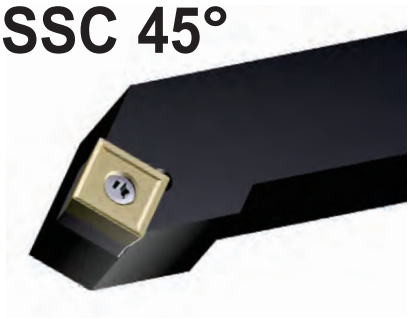
For Toolholders External: see page 115 | Internal: see page 116

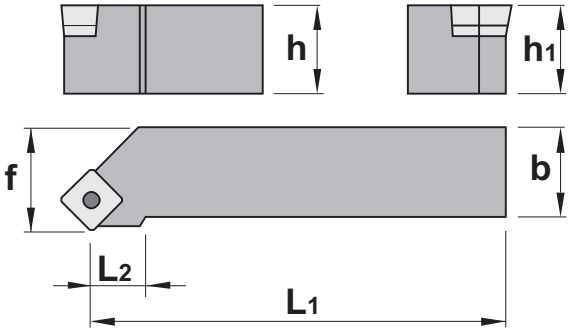
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SSSC 45°





Inserts - SCMT09T3 & 12M5

SSSC LH & RH External Square Shank Toolholders

EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028605	**SSSCL 1212 F09**	LH	SCMT09T3	12	12	16	80	20
028606	**SSSCL 1616 H09**	LH	SCMT09T3	16	16	20	100	22
028609	**SSSCR 1212 F09**	RH	SCMT09T3	12	12	16	80	20
028610	**SSSCR 1616 H09**	RH	SCMT09T3	16	16	20	100	22
028607	**SSSCL 2020 K12**	LH	SCMT12M5	20	20	25	125	25
028608	**SSSCL 2525 M12**	LH	SCMT12M5	25	25	32	150	28
028611	**SSSCR 2020 K12**	RH	SCMT12M5	20	20	25	125	25
028612	**SSSCR 2525 M12**	RH	SCMT12M5	25	25	32	150	28



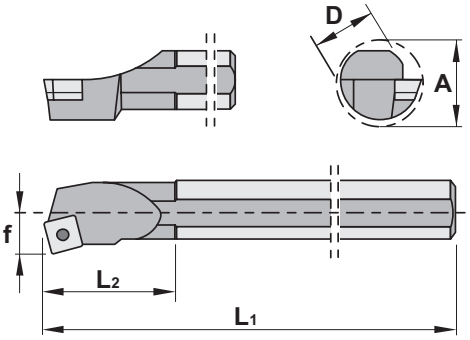
S Style External Toolholder
for Positive Inserts
SCMT09T3 & SCMT12M5
Application: Turning, Plunge and Profile
Approach Angle 45°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 42°
RH Holder Shown

SSSCL/R Spare Parts

Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SSSCL/R 1212 F09 **SSSCL/R 1616 H09**	*015262*	D4010T	*015240*	T15	-	-	-	-
SSSCL/R 2020 K12 **SSSCL/R 2525 M12**	*034500*	1540	*034577*	K5517	*028738*	SA3514	*028739*	SAS1760

SSKC 75°





S.. SSKC LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L1	L2	Through Coolant
033549	**S16R SSKCL 09**	LH	SC_09T3	20	16	11	200	31	⊘
033550	**S20S SSKCL 09**	LH	SC_09T3	24	20	13	250	36	⊘
033551	**S25T SSKCL 09**	LH	SC_09T3	31	25	17	300	42	⊘
033552	**S16R SSKCR 09**	RH	SC_09T3	20	16	11	200	31	⊘
033553	**S20S SSKCR 09**	RH	SC_09T3	24	20	13	250	36	⊘
033554	**S25T SSKCR 09**	RH	SC_09T3	31	25	17	300	42	⊘
033555	**S32U SSKCL 12**	LH	SC_12M5	39	32	22	350	45	⊘
033556	***S40V SSKCL 12**	LH	SC_12M5	48	40	27	400	50	⊘
033557	***S50W SSKCL 12**	LH	SC_12M5	61	50	35	450	50	⊘
033558	**S32U SSKCR 12**	RH	SC_12M5	39	32	22	350	45	⊘
033559	***S40V SSKCR 12**	RH	SC_12M5	48	40	27	400	50	⊘
033560	***S50W SSKCR 12**	RH	SC_12M5	61	50	35	450	50	⊘

* Note these items are on an extended delivery time

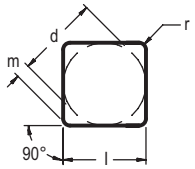


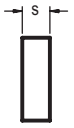
S Style Internal Boring Bar
for Positive Inserts:
SCMT09T3 & SCMT12M5
Application: I/D Boring
Axial Approach: 75°
Axial 0°
Radial -8°
Profilling Clearance Angle β = 12°
RH Bar Shown

S.. SSKCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
S16R SSKCL/R 09	034499	1440	015240	T15	-	-	-	-
S20S SSKCL/R 09	015262	D4010T						
S25T SSKCL/R 09								
S32U SSKCL/R 12	034500	1540	034577	K5517	028738	SA3514	028739	SAS1760
***S40V SSKCL/R 12**								
***S50W SSKCL/R 12**								

* Note these items are on an extended delivery time

SNGN
Ceramics







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032331	**SNGN120408 E010**	SA6609	12,70	12,70	4,76	0,80	-	♦	Roughing
032332	**SNGN120412 E010**	SA6609	12,70	12,70	4,76	1,20	-	♦	Roughing
032333	**SNGN120708 E010**	SA6609	12,70	12,70	7,94	0,80	-	♦	Roughing
032334	**SNGN120712 E010**	SA6609	12,70	12,70	7,94	1,20	-	♦	Roughing
032335	**SNGN190616 E010**	SA6609	19,05	19,05	6,35	1,60	-	♦	Roughing

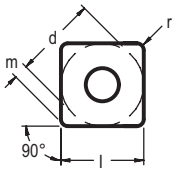
Note: For edge condition refer to Grade page 31

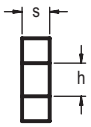
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMA
Flat Top



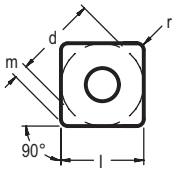


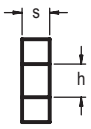


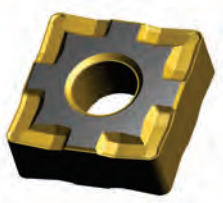
EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032664	**SNMA120408E**	NL250	12,70	12,70	4,76	0,80	5,16	♦	Heavy Roughing
032665	**SNMA120412E**	NL250	12,70	12,70	4,76	1,20	5,16	♦	Heavy Roughing
032666	**SNMA120416E**	NL250	12,70	12,70	4,76	1,60	5,16	♦	Heavy Roughing
032667	**SNMA150612E**	NL250	15,88	15,88	6,35	1,20	6,35	♦	Heavy Roughing
032668	**SNMA190616E**	NL250	19,05	19,05	6,35	1,60	7,94	♦	Heavy Roughing
032669	**SNMA190632E**	NL250	19,05	19,05	6,35	3,20	7,94	♦	Heavy Roughing

For Toolholders External: see pages 126 - 129 | Internal: see page 130

SNMG
1B Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030878	**SNMG120408E-1B**	SP0819	12,70	12,70	4,76	0,80	5,16	♦♦♦♦♦♦	Finishing
032670	**SNMG120408E-1B**	NL250	12,70	12,70	4,76	0,80	5,16	♦♦♦♦♦	Finishing

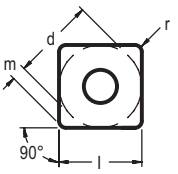
For Toolholders External: see pages 126 - 129 | Internal: see page 130

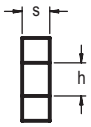
Material Guide – Key to Recommended Inserts

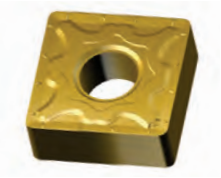
Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMG
2N Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032671	SNMG120408E-2N	NL250	12,70	12,70	4,76	0,80	5,16		Medium
032672	SNMG120408E-2N	NL300	12,70	12,70	4,76	0,80	5,16		Medium
032673	SNMG120408E-2N	NL920	12,70	12,70	4,76	0,80	5,16		Medium
032674	SNMG120412E-2N	NL250	12,70	12,70	4,76	1,20	5,16		Medium
032675	SNMG120412E-2N	NL300	12,70	12,70	4,76	1,20	5,16		Medium
032676	SNMG120412E-2N	NL920	12,70	12,70	4,76	1,20	5,16		Medium
032677	SNMG120416E-2N	NL250	12,70	12,70	4,76	1,60	5,16		Medium
032678	SNMG120416E-2N	NL300	12,70	12,70	4,76	1,60	5,16		Medium
032679	SNMG120416E-2N	NL920	12,70	12,70	4,76	1,60	5,16		Medium
032680	SNMG150608E-2N	NL250	15,88	15,88	6,35	0,80	6,35		Medium
032681	SNMG150608E-2N	NL300	15,88	15,88	6,35	0,80	6,35		Medium
032682	SNMG150608E-2N	NL920	15,88	15,88	6,35	0,80	6,35		Medium
032683	SNMG150612E-2N	NL250	15,88	15,88	6,35	1,20	6,35		Medium
032684	SNMG150612E-2N	NL300	15,88	15,88	6,35	1,20	6,35		Medium
032685	SNMG150612E-2N	NL920	15,88	15,88	6,35	1,20	6,35		Medium
032686	SNMG150616E-2N	NL250	15,88	15,88	6,35	1,60	6,35		Medium
032687	SNMG150616E-2N	NL300	15,88	15,88	6,35	1,60	6,35		Medium
032688	SNMG190612E-2N	NL920	19,05	19,05	6,35	1,20	7,94		Medium
032689	SNMG190616E-2N	NL300	19,05	19,05	6,35	1,60	7,94		Medium
032690	SNMG190616E-2N	NL920	19,05	19,05	6,35	1,60	7,94		Medium

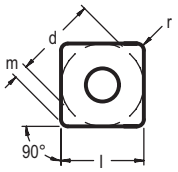
For Toolholders External: see pages 126 - 129 | Internal: see page 130

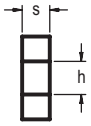
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMG
3J Geometry



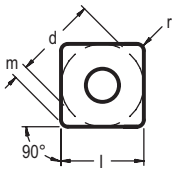


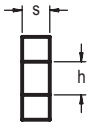


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032691	**SNMG120408E-3J**	SP4019	12,70	12,70	4,76	0,80	5,16		Medium
032692	**SNMG120412E-3J**	SP4019	12,70	12,70	4,76	1,20	5,16		Medium
032693	**SNMG120416E-3J**	SP4019	12,70	12,70	4,76	1,60	5,16		Medium

For Toolholders External: see pages 126 - 129 | Internal: see page 130

SNMG
4E Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031578	**SNMG120408E-4E**	SP0819	12,70	12,70	4,76	0,80	5,16		Roughing
032694	**SNMG120408E-4E**	NL400	12,70	12,70	4,76	0,80	5,16		Roughing
031658	**SNMG120412E-4E**	SP0819	12,70	12,70	4,76	1,20	5,16		Roughing
032695	**SNMG120412E-4E**	NL400	12,70	12,70	4,76	1,20	5,16		Roughing
031696	**SNMG120416E-4E**	SP0819	12,70	12,70	4,76	1,60	5,16		Roughing
032696	**SNMG120416E-4E**	NL400	12,70	12,70	4,76	1,60	5,16		Roughing

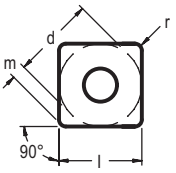
For Toolholders External: see pages 126 - 129 | Internal: see page 130

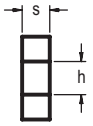
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMG
4E Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030527	**SNMG150608E-4E**	SP0819	15,88	15,88	6,35	0,80	6,35		Medium-Roughing
032697	**SNMG150608E-4E**	NL400	15,88	15,88	6,35	0,80	6,35		Medium-Roughing
030528	**SNMG150612E-4E**	SP0819	15,88	15,88	6,35	1,20	6,35		Medium-Roughing
032698	**SNMG150612E-4E**	NL400	15,88	15,88	6,35	1,20	6,35		Medium-Roughing
030529	**SNMG150616E-4E**	SP0819	15,88	15,88	6,35	1,60	6,35		Medium-Roughing
032699	**SNMG150616E-4E**	NL400	15,88	15,88	6,35	1,60	6,35		Medium-Roughing
030530	**SNMG190608E-4E**	SP0819	19,05	19,05	6,35	0,80	7,94		Medium-Roughing
032700	**SNMG190608E-4E**	NL400	19,05	19,05	6,35	0,80	7,94		Medium-Roughing
030531	**SNMG190612E-4E**	SP0819	19,05	19,05	6,35	1,20	7,94		Medium-Roughing
032701	**SNMG190612E-4E**	NL400	19,05	19,05	6,35	1,20	7,94		Medium-Roughing
032362	**SNMG190616E-4E**	NL400	19,05	19,05	6,35	1,60	7,94		Medium-Roughing
030532	**SNMG190616E-4E**	SP0819	19,05	19,05	6,35	1,60	7,94		Medium-Roughing
030533	**SNMG190624E-4E**	SP0819	19,05	19,05	6,35	2,40	7,94		Medium-Roughing
032703	**SNMG190624E-4E**	NL400	19,05	19,05	6,35	2,40	7,94		Medium-Roughing

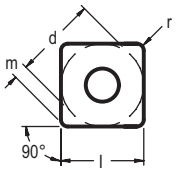
For Toolholders External: see pages 126 - 129 | Internal: see page 130

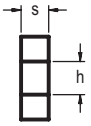
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMG
4T Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032704	**SNMG120404E-4T**	NL250	12,70	12,70	4,76	0,40	5,16		Roughing
032705	**SNMG120404E-4T**	NL300	12,70	12,70	4,76	0,40	5,16		Roughing
032706	**SNMG120404E-4T**	NL400	12,70	12,70	4,76	0,40	5,16		Roughing
032707	**SNMG120404E-4T**	NL920	12,70	12,70	4,76	0,40	5,16		Roughing
032708	**SNMG120408E-4T**	NL250	12,70	12,70	4,76	0,80	5,16		Roughing
032709	**SNMG120408E-4T**	NL300	12,70	12,70	4,76	0,80	5,16		Roughing
032710	**SNMG120408E-4T**	NL400	12,70	12,70	4,76	0,80	5,16		Roughing
032711	**SNMG120408E-4T**	NL920	12,70	12,70	4,76	0,80	5,16		Roughing
032712	**SNMG120412E-4T**	NL250	12,70	12,70	4,76	1,20	5,16		Roughing
032713	**SNMG120412E-4T**	NL300	12,70	12,70	4,76	1,20	5,16		Roughing
032714	**SNMG120412E-4T**	NL400	12,70	12,70	4,76	1,20	5,16		Roughing
032715	**SNMG120412E-4T**	NL920	12,70	12,70	4,76	1,20	5,16		Roughing
032716	**SNMG120416E-4T**	NL250	12,70	12,70	4,76	1,60	5,16		Roughing
032717	**SNMG120416E-4T**	NL300	12,70	12,70	4,76	1,60	5,16		Roughing
032718	**SNMG120416E-4T**	NL400	12,70	12,70	4,76	1,60	5,16		Roughing
032719	**SNMG120416E-4T**	NL920	12,70	12,70	4,76	1,60	5,16		Roughing

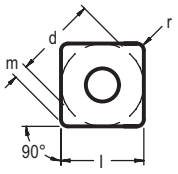
For Toolholders External: see pages 126 - 129 | Internal: see page 130

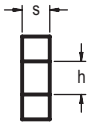
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMG
4T Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032720	**SNMG150608E-4T**	NL250	15,88	15,88	6,35	0,80	6,35		Roughing
032721	**SNMG150608E-4T**	NL300	15,88	15,88	6,35	0,80	6,35		Roughing
032722	**SNMG150608E-4T**	NL400	15,88	15,88	6,35	0,80	6,35		Roughing
032723	**SNMG150608E-4T**	NL920	15,88	15,88	6,35	0,80	6,35		Roughing
032724	**SNMG150612E-4T**	NL250	15,88	15,88	6,35	1,20	6,35		Roughing
032725	**SNMG150612E-4T**	NL300	15,88	15,88	6,35	1,20	6,35		Roughing
032726	**SNMG150612E-4T**	NL400	15,88	15,88	6,35	1,20	6,35		Roughing
032727	**SNMG150612E-4T**	NL920	15,88	15,88	6,35	1,20	6,35		Roughing
032728	**SNMG150616E-4T**	NL250	15,88	15,88	6,35	1,60	6,35		Roughing
032729	**SNMG150616E-4T**	NL300	15,88	15,88	6,35	1,60	6,35		Roughing
032730	**SNMG150616E-4T**	NL400	15,88	15,88	6,35	1,60	6,35		Roughing
032731	**SNMG150616E-4T**	NL920	15,88	15,88	6,35	1,60	6,35		Roughing

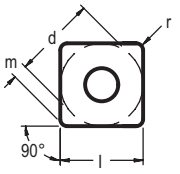
For Toolholders External: see pages 126 - 129 | Internal: see page 130

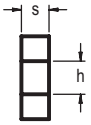
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMG
4T Geometry



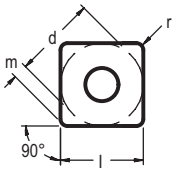


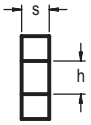


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032732	**SNMG190612E-4T**	NL250	19,05	19,05	6,35	1,20	7,94		Roughing
032733	**SNMG190612E-4T**	NL300	19,05	19,05	6,35	1,20	7,94		Roughing
032734	**SNMG190612E-4T**	NL400	19,05	19,05	6,35	1,20	7,94		Roughing
032735	**SNMG190612E-4T**	NL920	19,05	19,05	6,35	1,20	7,94		Roughing
032736	**SNMG190616E-4T**	NL250	19,05	19,05	6,35	1,60	7,94		Roughing
032737	**SNMG190616E-4T**	NL300	19,05	19,05	6,35	1,60	7,94		Roughing
032738	**SNMG190616E-4T**	NL400	19,05	19,05	6,35	1,60	7,94		Roughing
032739	**SNMG190616E-4T**	NL920	19,05	19,05	6,35	1,60	7,94		Roughing
032740	**SNMG250924E-4T**	NL300	25,40	25,40	9,53	2,40	9,12		Roughing
032741	**SNMG250924E-4T**	NL400	25,40	25,40	9,53	2,40	9,12		Roughing
032742	**SNMG250924E-4T**	NL920	25,40	25,40	9,53	2,40	9,12		Roughing

For Toolholders External: see pages 126 - 129 | Internal: see page 130

SNMG
4U Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032743	**SNMG120408E-4U**	NL200	12,70	12,70	4,76	0,80	5,16		Roughing
032744	**SNMG120412E-4U**	NL200	12,70	12,70	4,76	1,20	5,16		Roughing

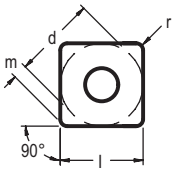
For Toolholders External: see pages 126 - 129 | Internal: see page 130

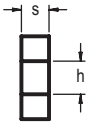
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SNMM
5R Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031690	**SNMM150612E 5R**	NL300	15,88	15,88	6,35	1,20	6,35		Heavy Roughing
031674	**SNMM150612E-5R**	NL400	15,88	15,88	6,35	1,20	6,35		Heavy Roughing
031691	**SNMM150616E-5R**	NL300	15,88	15,88	6,35	1,60	6,35		Heavy Roughing
031675	**SNMM150616E 5R**	NL400	15,88	15,88	6,35	1,60	6,35		Heavy Roughing
031692	**SNMM150624E-5R**	NL300	15,88	15,88	6,35	2,40	6,35		Heavy Roughing
031676	**SNMM150624E-5R**	NL400	15,88	15,88	6,35	2,40	6,35		Heavy Roughing
031693	**SNMM190612E-5R**	NL300	19,05	19,05	6,35	1,20	7,94		Heavy Roughing
031677	**SNMM190612E-5R**	NL400	19,05	19,05	6,35	1,20	7,94		Heavy Roughing
031694	**SNMM190616E-5R**	NL300	19,05	19,05	6,35	1,60	7,94		Heavy Roughing
031678	**SNMM190616E-5R**	NL400	19,05	19,05	6,35	1,60	7,94		Heavy Roughing
031695	**SNMM190624E-5R**	NL300	19,05	19,05	6,35	2,40	7,94		Heavy Roughing
031679	**SNMM190624E-5R**	NL400	19,05	19,05	6,35	2,40	7,94		Heavy Roughing
031681	**SNMM250924E-5R**	NL300	25,40	25,40	9,53	2,40	9,12		Heavy Roughing
032750	**SNMM250924E-5R**	NL400	25,40	25,40	9,53	2,40	9,12		Heavy Roughing
031680	**SNMM250924E-5R**	NL920	25,40	25,40	9,53	2,40	9,12		Heavy Roughing

For Toolholders External: see pages 126 - 129 | Internal: see page 130

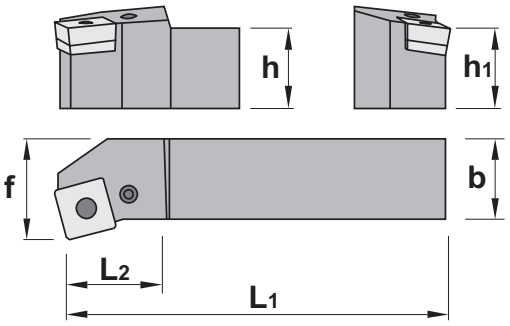
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

PSKN 75°





PSKN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
017165	**PSKNL 2020 K 12**	LH	SN_1204	20	20	25	125	28
017167	**PSKNL 2525 M12**	LH	SN_1204	25	25	32	150	28
017169	**PSKNL 3225 P12**	LH	SN_1204	32	25	32	170	34
017166	**PSKNR 2020 K 12**	RH	SN_1204	20	20	25	125	28
017168	**PSKNR 2525 M12**	RH	SN_1204	25	25	32	150	28
017170	**PSKNR 3225 P12**	RH	SN_1204	32	25	32	170	34
024735	**PSKNL 2525 M15**	LH	SN_1506	25	25	32	150	34
028429	**PSKNL 3232 P15**	LH	SN_1506	32	32	40	170	42
024739	**PSKNR 2525 M15**	RH	SN_1506	25	25	32	150	34
023289	**PSKNR 3232 P15**	RH	SN_1506	32	32	40	170	42
024738	***PSKNL 4040 S19**	LH	SN_1906	40	40	50	250	45
024741	***PSKNR 4040 S19**	RH	SN_1906	40	40	50	250	45
033352	***PSKNL 5050 T25**	LH	SN_2509	50	50	60	300	45
033353	***PSKNR 5050 T25**	RH	SN_2509	50	50	60	300	45

* Non Stock Items, subject to extended delivery time

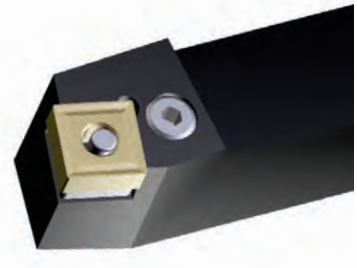


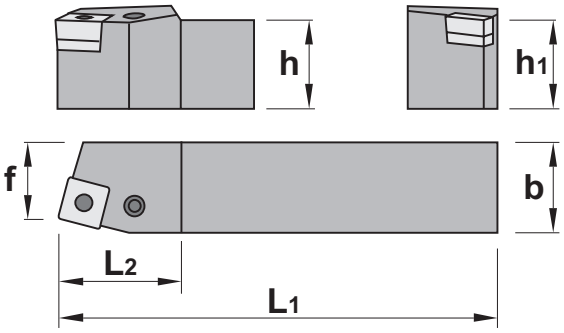
P Style External Toolholder
for Negative Inserts:
SN_1204, SN_1506, SN_1906 & SN_2507
Application: Facing
Axial Approach 75°
Axial -4,25°
Radial -7,25°
Profiling Clearance Angle β = 0°
RH Holder Shown

PSKNL/R Spare Parts												
Item Description	Lever EDP		Lever Screw EDP		Anvil EDP		Anvil Clip EDP		Clip Punch EDP		Key EDP	
PSKNL/R 2020 K 12	017443	8012	017448	1608	017460	PA3512	017453	PC4112	028054	PCP0012	018286	KH5003
PSKNL/R 2525 M12												
PSKNL/R 3225 P12												
PSKNL/R 2525 M15	017445	8016	017450	1618	017461	PA3515	028051	PC4115	034505	PCP0015		
PSKNL/R 3232 P15												
***PSKNL/R 4040 S19**	017446	8019	017451	1610	017462	PA3519	017455	PC4119	028056	PCP0019	018287	KH5004
***PSKNL/R 5050 T25**	028408	8025	028409	1612	028416	PA3525	028418	PC4125	034506	PCP0025	018288	KH5005

* Non Stock Items, subject to extended delivery time

PSBN 75°





PSBN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
017152	**PSBNL 2020 K 12**	LH	SN_1204	20	20	17	125	28
017154	**PSBNL 2525 M12**	LH	SN_1204	25	25	22	150	28
028399	**PSBNL 3225 P12**	LH	SN_1204	32	25	22	170	28
017153	**PSBNR 2020 K 12**	RH	SN_1204	20	20	17	125	28
017155	**PSBNR 2525 M12**	RH	SN_1204	25	25	22	150	28
028405	**PSBNR 3225 P12**	RH	SN_1204	32	25	22	170	28
028400	**PSBNL 2525 M15**	LH	SN_1506	25	25	22	150	34
028401	**PSBNL 3232 P15**	LH	SN_1506	32	32	27	170	34
017159	**PSBNR 2525 M15**	RH	SN_1506	25	25	22	150	34
028406	**PSBNR 3232 P15**	RH	SN_1506	32	32	27	170	34
018466	***PSBNL 4040 S19**	LH	SN_1906	40	40	35	250	48
018467	***PSBNR 4040 S19**	RH	SN_1906	40	40	35	250	48
033356	***PSBNL 5050 T25**	LH	SN_2509	50	50	43	300	50
033357	***PSBNR 5050 T25**	RH	SN_2509	50	50	43	300	50

* Non Stock Items, subject to extended delivery time

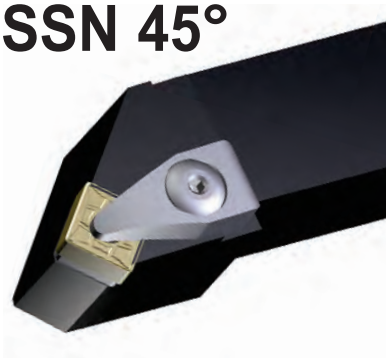


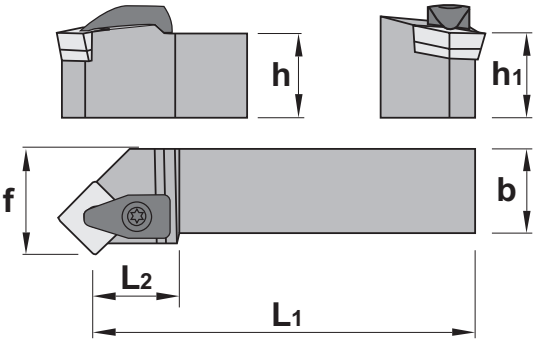
P Style External Toolholder
for Negative Inserts:
SN_1204, SN_1506, SN_1906 & SN_2507
Application: Turn O/D
Axial Approach 75°
Axial -7,25°
Radial -4,25°
Profiling Clearance Angle β = 12°
RH Holder Shown

PSBNL/R Spare Parts												
Item Description	Lever EDP		Lever Screw EDP		Anvil EDP		Anvil Clip EDP		Clip Punch EDP		Key EDP	
PSBNL/R 2020 K 12	017443	PL8012	017448	PLS1608	017460	PA3512	017453	PC4112	028054	PCP0012	018286	KH5003
PSBNL/R 2525 M12												
PSBNL/R 3225 P12												
PSBNL/R 2525 M15	017445	PL8016	017450	PLS1618	017461	PA3515	028051	PC4115	034505	PCP0015		
PSBNL/R 3232 P15												
PSBNL/R 4040 S19	017446	PL8019	017451	PLS1610	017462	PA3519	017455	PC4119	028056	PCP0019	018287	KH5004
***PSBNL/R 5050 T25**	028408	PL8025	028409	PLS1612	028416	PA3525	028418	PC4125	034506	PCP0025	018288	KH5005

* Non Stock Items, subject to extended delivery time

DSSN 45°





DSSN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033358	**DSSNL 2020 K12**	LH	SN_1204	20	20	25	125	37
033359	**DSSNL 2525 M12**	LH	SN_1204	25	25	32	150	37
033360	**DSSNL 3225 P12**	LH	SN_1204	32	25	32	170	37
033361	**DSSNR 2020 K12**	RH	SN_1204	20	20	25	125	37
033362	**DSSNR 2525 M12**	RH	SN_1204	25	25	32	150	37
033363	**DSSNR 3225 P12**	RH	SN_1204	32	25	32	170	37
033364	**DSSNL 2525 M15**	LH	SN_1506	25	25	32	150	36
033365	**DSSNL 3232 P15**	LH	SN_1506	32	32	40	170	40
033366	**DSSNR 2525 M15**	RH	SN_1506	25	25	32	150	36
033367	**DSSNR 3232 P15**	RH	SN_1506	32	32	40	170	40
033368	**DSSNL 3232 P19**	LH	SN_1906	32	32	40	170	45
033369	***DSSNL 4040 S19**	LH	SN_1906	40	40	50	250	45
033370	**DSSNR 3232 P19**	RH	SN_1906	32	32	40	170	45
033371	***DSSNR 4040 S19**	RH	SN_1906	40	40	50	250	45

* Non Stock Items, subject to extended delivery time

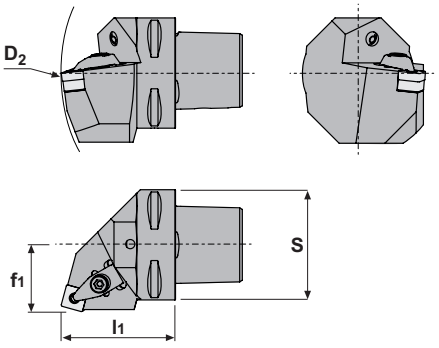


D Style External Toolholder
for Negative Inserts:
SN_1204, SN_1506 & SN_1906
Application: Turn O/D & Plunge Profile
Axial Approach 45°
Axial -5,75°
Radial -5,75°
Profiling Clearance Angle β = 42°
RH Holder Shown

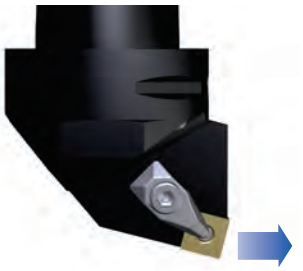
DSSNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Spring EDP		Anvil EDP		Anvil Screw EDP		Clamp & Anvil Screw Key	
DSSNL/R 2020 K12	033710	1696	033707	DC2712	033719	4295	001704	ISSN433	033716	1766	018287	KH5004
DSSNL/R 2525 M12												
DSSNL/R 3225 P12												
DSSNL/R 2525 M15			034495	DC2716			001707	ISSN533	034509	1768		
DSSNL/R 3232 P15												
DSSNL/R 3232 P19			033708	DC2719			001709	ISSN633	033717	1770		
DSSNL/R 4040 S19												

DSRN 75°





DSRN LH & RH External PSC Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				S	D1	D2	f1	l1
033705	**C6-63-DSRNL35065-12**	LH	SN_1204	63	-	190	35	65
033706	**C6-63-DSRNR35065-12**	RH	SN_1204	63	-	190	35	65

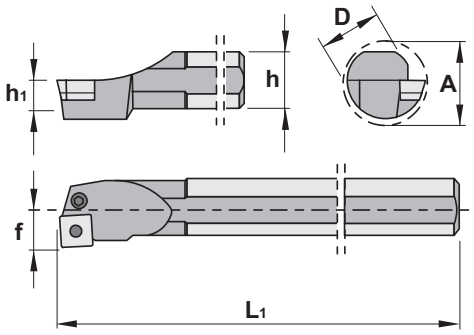


D Style External Toolholder
for Negative Inserts: SN_1204
Application: External Face and Turn O/D
Approach Angle 75°
Axial -6°
Radial -6°
Profilling Clearance Angle β= 12°
RH Holder Shown

C.. DSRNL/R Spare Parts												
Item Description	*Clamp EDP*		*Clamp Screw EDP*		*Anvil EDP*		*Anvil Screw EDP*		*Clamp Spring EDP*		*Screw Key EDP*	
C6-63-DSRNL/R 35065-12	*033707*	2712	*033710*	1696	*033715*	ISSN442	*033716*	1766	*033719*	4295	*018287*	KH5004

A..PSKN 75°





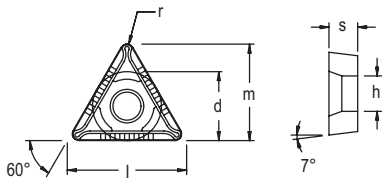
A..PSKN LH & RH Internal Boring Bars										
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)						
				Min Bore Ø A	ØD	f	L1	h	h1	Through Coolant
028724	**A25R PSKNL 12**	LH	SN_1204	31	25	17	200	23	11,5	
028725	**A32S PSKNL 12**	LH	SN_1204	39	32	22	250	30	15,0	
028726	**A40T PSKNL 12**	LH	SN_1204	48	40	27	300	37	18,5	
028727	**A25R PSKNR 12**	RH	SN_1204	31	25	17	200	23	11,5	
028728	**A32S PSKNR 12**	RH	SN_1204	39	32	22	250	30	15,0	
028729	**A40T PSKNR 12**	RH	SN_1204	48	40	27	300	37	18,5	



P Style Internal Boring Bar
for Negative Inserts: SN_1204
Application: Boring
Axial Approach 75°
Axial -3°
Radial -11°
Profiling Clearance Angle β = 12°
RH Bar Shown

A..PSKNL/R Spare Parts												
Item Description	Lever EDP		Lever Screw EDP		Anvil EDP		Anvil Clip EDP		Clip Punch EDP		Key EDP	
A25R PSKNL/R 12	*028742*	PL8212	*028743*	PLS1626	-	-	-	-	-	-	*018285*	KH5025
A32S PSKNIL/R 12	*028047*	PL8312	*022625*	PLS1648	*017460*	PA3512	*017453*	PC4112	*028054*	PCP0012	*018286*	KH5003
A40T PSKNL/R 12	*017443*	PL8012	*017448*	PLA1608								

TCMT
-73 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032751	**TCMT110202E-73**	SP4019	6,35	11,00	2,38	0,20	2,80		Medium
032752	**TCMT110202E-73**	NL300	6,35	11,00	2,38	0,20	2,80		Medium
032753	**TCMT110204E-73**	SP4019	6,35	11,00	2,38	0,40	2,80		Medium
032754	**TCMT110204E-73**	NL300	6,35	11,00	2,38	0,40	2,80		Medium
032755	**TCMT110204E-73**	NL920	6,35	11,00	2,38	0,40	2,80		Medium
032302	**TCMT16T304E-73**	SP4019	9,53	16,50	3,97	0,40	4,40		Medium
032756	**TCMT16T304E-73**	NL300	9,53	16,50	3,97	0,40	4,40		Medium
032757	**TCMT16T304E-73**	NL920	9,53	16,50	3,97	0,40	4,40		Medium
032294	**TCMT16T308E-73**	SP4019	9,53	16,50	3,97	0,80	4,40		Medium
032758	**TCMT16T308E-73**	NL300	9,53	16,50	3,97	0,80	4,40		Medium
032759	**TCMT16T308E-73**	NL920	9,53	16,50	3,97	0,80	4,40		Medium
032760	**TCMT22M508E-73**	NL920	12,70	22,00	5,00	0,80	5,50		Medium

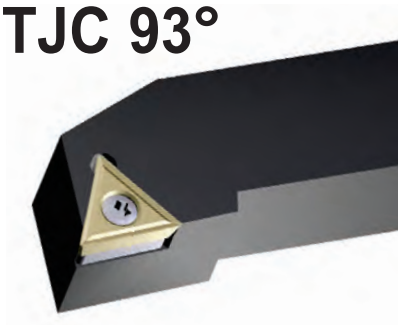
For Toolholders External: see page 132 | Internal: see page 133

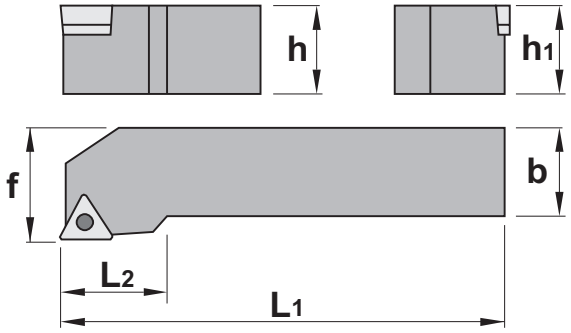
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

STJC 93°





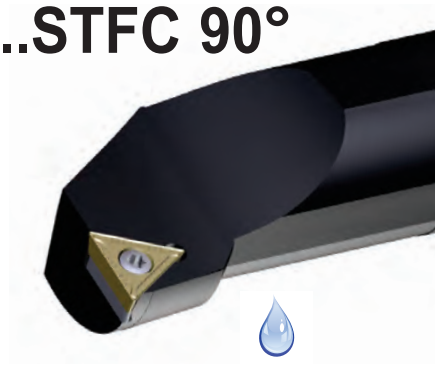
STJC LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028625	**STJCL 1212 F11**	LH	TCMT1102	12	12	16	80	16
028626	**STJCL 1616 H11**	LH	TCMT1102	16	16	20	100	18
028630	**STJCR 1212 F11**	RH	TCMT1102	12	12	16	80	16
028631	**STJCR 1616 H11**	RH	TCMT1102	16	16	20	100	18
028627	**STJCL 1616 H16**	LH	TCMT16T3	16	16	20	100	18
028628	**STJCL 2020 K16**	LH	TCMT16T3	20	20	25	125	22
028629	**STJCL 2525 M16**	LH	TCMT16T3	25	25	32	150	28
028632	**STJCR 1616 H16**	RH	TCMT16T3	16	16	20	100	18
028633	**STJCR 2020 K16**	RH	TCMT16T3	20	20	25	125	22
028634	**STJCR 2525 M16**	RH	TCMT16T3	25	25	32	150	28

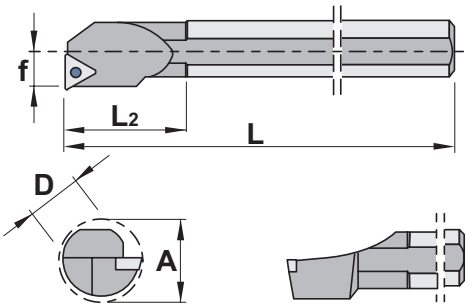


S Style External Toolholder
for Positive Inserts:
TCMT1102 and TCMT16T3
Application: O/D Turning
Approach Angle 93°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 0°
RH Holder Shown

STJCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
STJCL/R 1212 F11	015061	F2507T	018488	T7	-	-	-	-
STJCL/R 1616 H11								
STJCL/R 1616 H16	034497	1335	028475	K5516	028580	SA3414	028478	SA1750
STJCL/R 2020 K16								
STJCL/R 2525 M16								

A..STFC 90°





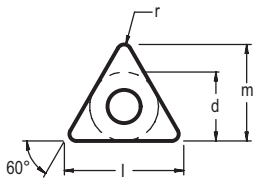
A.. STFC LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	L_2	Through Coolant
033573	**A12K STFCL 11**	LH	TCMT1102	16	12	9	125	23	
033574	**A16M STFCL 11**	LH	TCMT1102	20	16	11	150	31	
033577	**A20Q STFCL 11**	LH	TCMT1102	24	20	13	180	36	
033575	**A12K STFCR 11**	RH	TCMT1102	16	12	9	125	23	
033576	**A16M STFCR 11**	RH	TCMT1102	20	16	11	150	31	
033580	**A20Q STFCR 11**	RH	TCMT16T3	24	20	13	180	36	
033578	**A25R STFCL 16**	LH	TCMT16T3	31	25	17	200	42	
033579	**A32S STFCL 16**	LH	TCMT16T3	39	32	22	250	45	
033581	**A25R STFCR 16**	RH	TCMT16T3	31	25	17	200	42	
033582	**A32S STFCR 16**	RH	TCMT16T3	39	32	22	250	45	

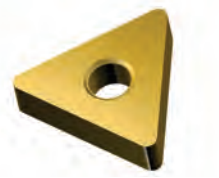


S Style Internal Boring Bar
for Positive Inserts:
TCMT1102 and TCMT16T3
Application: I/D Boring
Axial Approach: 90°
Axial 0°
Radial -6°
Profilling Clearance Angle β = 0°
RH Bar Shown

A.. STFCL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
A12K STFCL/R 11 **A16M STFCL/R 11** **A20Q STFCL/R 11**	*015061*	F2507T	*018488*	T7	-	-	-	-
A25R STFCL/R 16	*015262*	D4010T	*015240*	T15	-	-	-	-
A32S STFCL/R 16	*034497*	1335	*028475*	K5516	*028580*	SA3414	*028478*	SAS1750

TNMA
Flat Top

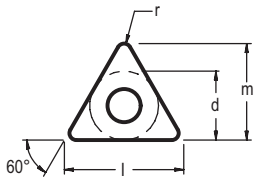




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032761	**TNMA160408E**	NL250	9,53	16,50	4,76	0,80	3,81	◆	Heavy Roughing
032762	**TNMA160412E**	NL250	9,53	16,50	4,76	1,20	3,81	◆	Heavy Roughing
032763	**TNMA220408E**	NL250	12,70	22,00	4,76	0,80	5,16	◆	Heavy Roughing
032764	**TNMA220412E**	NL250	12,70	22,00	4,76	1,20	5,16	◆	Heavy Roughing
032765	**TNMA220416E**	NL250	12,70	22,00	4,76	1,60	5,16	◆	Heavy Roughing
032766	**TNMA270616E**	NL250	15,88	27,50	6,35	1,60	6,35	◆	Heavy Roughing

For Toolholders External: see pages 141 - 142 | Internal: see page 143

TNMG
1B Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032767	**TNMG160404E-1B**	NL250	9,53	16,50	4,76	0,40	3,81	◆◆◆◆◆	Finishing
030879	**TNMG160404E-1B**	SP0819	9,53	16,50	4,76	0,40	3,81	◆◆◆◆◆◆	Finishing
032768	**TNMG160408E-1B**	NL250	9,53	16,50	4,76	0,80	3,81	◆◆◆◆◆	Finishing
030880	**TNMG160408E-1B**	SP0819	9,53	16,50	4,76	0,80	3,81	◆◆◆◆◆◆	Finishing
032769	**TNMG160412E-1B**	SP0819	9,53	16,50	4,76	1,20	3,81	◆◆◆◆◆◆	Finishing
032770	**TNMG160412E-1B**	NL250	9,53	16,50	4,76	1,20	3,81	◆◆◆◆◆	Finishing

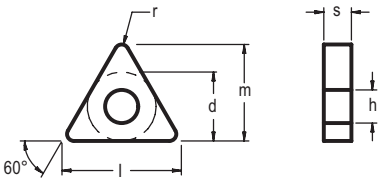
For Toolholders External: see pages 141 - 142 | Internal: see page 143

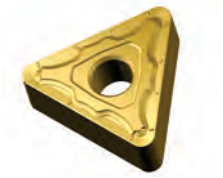
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

TNMG
2N Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032771	TNMG160404E-2N	NL250	9,53	16,50	4,76	0,40	3,81		Semi-Medium
032772	TNMG160404E-2N	NL300	9,53	16,50	4,76	0,40	3,81		Semi-Medium
032773	TNMG160404E-2N	NL920	9,53	16,50	4,76	0,40	3,81		Semi-Medium
032774	TNMG160408E-2N	NL250	9,53	16,50	4,76	0,80	3,81		Semi-Medium
032775	TNMG160408E-2N	NL300	9,53	16,50	4,76	0,80	3,81		Semi-Medium
032776	TNMG160408E-2N	NL920	9,53	16,50	4,76	0,80	3,81		Semi-Medium
032777	TNMG160412E-2N	NL250	9,53	16,50	4,76	1,20	3,81		Semi-Medium
032778	TNMG160412E-2N	NL300	9,53	16,50	4,76	1,20	3,81		Semi-Medium
032779	TNMG160412E-2N	NL920	9,53	16,50	4,76	1,20	3,81		Semi-Medium
032780	TNMG220404E-2N	NL250	12,70	22,00	4,76	0,40	5,16		Semi-Medium
032781	TNMG220404E-2N	NL300	12,70	22,00	4,76	0,40	5,16		Semi-Medium
032782	TNMG220404E-2N	NL920	12,70	22,00	4,76	0,40	5,16		Semi-Medium
032783	TNMG220408E-2N	NL250	12,70	22,00	4,76	0,80	5,16		Semi-Medium
032784	TNMG220408E-2N	NL300	12,70	22,00	4,76	0,80	5,16		Semi-Medium
032785	TNMG220408E-2N	NL920	12,70	22,00	4,76	0,80	5,16		Semi-Medium
032786	TNMG220412E-2N	NL250	12,70	22,00	4,76	1,20	5,16		Semi-Medium
032787	TNMG220412E-2N	NL300	12,70	22,00	4,76	1,20	5,16		Semi-Medium
032788	TNMG220412E-2N	NL920	12,70	22,00	4,76	1,20	5,16		Semi-Medium
032789	TNMG270616E-2N	NL920	15,88	27,50	6,35	1,60	6,35		Semi-Medium

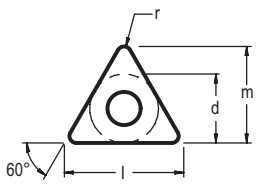
For Toolholders External: see pages 141 - 142 | Internal: see page 143

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

TNMG
3J Geometry

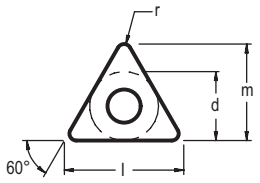


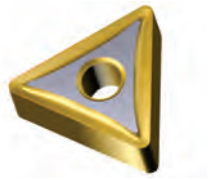


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032790	TNMG160404E-3J	SP4019	9,53	16,50	4,76	0,40	3,81		Medium
032791	TNMG160408E-3J	SP4019	9,53	16,50	4,76	0,80	3,81		Medium
032792	TNMG160412E-3J	SP4019	9,53	16,50	4,76	1,20	3,81		Medium
032793	TNMG220408E-3J	SP4019	12,70	22,00	4,76	0,80	5,16		Medium
032794	TNMG220412E-3J	SP4019	12,70	22,00	4,76	1,20	5,16		Medium
032795	TNMG220416E-3J	SP4019	12,70	22,00	4,76	1,60	5,16		Medium

For Toolholders External: see pages 141 - 142 | Internal: see page 143

TNMG
4E Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
030534	TNMG160404E-4E	SP0819	9,53	16,50	4,76	0,40	3,81		Medium-Roughing
032926	TNMG160404E-4E	NL400	9,53	16,50	4,76	0,40	3,81		Medium-Roughing
030535	TNMG160408E-4E	SP0819	9,53	16,50	4,76	0,80	3,81		Medium-Roughing
032927	TNMG160408E-4E	NL400	9,53	16,50	4,76	0,80	3,81		Medium-Roughing
030536	TNMG160412E-4E	SP0819	9,53	16,50	4,76	1,20	3,81		Medium-Roughing
032928	TNMG160412E-4E	NL400	9,53	16,50	4,76	1,20	3,81		Medium-Roughing

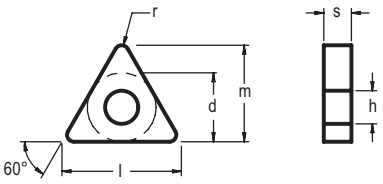
For Toolholders External: see pages 141 - 142 | Internal: see page 143

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

TNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032796	TNMG160304E-4T	NL300	9,53	16,50	3,18	0,40	3,81		Roughing
032797	TNMG160304E-4T	NL400	9,53	16,50	3,18	0,40	3,81		Roughing
032798	TNMG160304E-4T	NL920	9,53	16,50	3,18	0,40	3,81		Roughing
032799	TNMG160308E-4T	NL300	9,53	16,50	3,18	0,80	3,81		Roughing
032800	TNMG160308E-4T	NL400	9,53	16,50	3,18	0,80	3,81		Roughing
032801	TNMG160308E-4T	NL920	9,53	16,50	3,18	0,80	3,81		Roughing
032802	TNMG160404E-4T	NL250	9,53	16,50	4,76	0,40	3,81		Roughing
032803	TNMG160404E-4T	NL300	9,53	16,50	4,76	0,40	3,81		Roughing
032804	TNMG160404E-4T	NL400	9,53	16,50	4,76	0,40	3,81		Roughing
032805	TNMG160404E-4T	NL920	9,53	16,50	4,76	0,40	3,81		Roughing
032806	TNMG160408E-4T	NL250	9,53	16,50	4,76	0,80	3,81		Roughing
032807	TNMG160408E-4T	NL300	9,53	16,50	4,76	0,80	3,81		Roughing
032808	TNMG160408E-4T	NL400	9,53	16,50	4,76	0,80	3,81		Roughing
032809	TNMG160408E-4T	NL920	9,53	16,50	4,76	0,80	3,81		Roughing
032810	TNMG160412E-4T	NL250	9,53	16,50	4,76	1,20	3,81		Roughing
032811	TNMG160412E-4T	NL300	9,53	16,50	4,76	1,20	3,81		Roughing
032812	TNMG160412E-4T	NL400	9,53	16,50	4,76	1,20	3,81		Roughing
032813	TNMG160412E-4T	NL920	9,53	16,50	4,76	1,20	3,81		Roughing

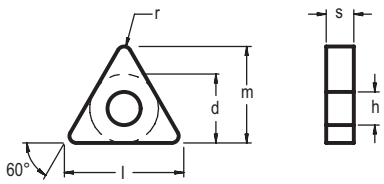
For Toolholders External: see pages 141 - 142 | Internal: see page 143

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

TNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032814	TNMG220404E-4T	NL250	12,70	22,00	4,76	0,40	5,16		Roughing
032815	TNMG220404E-4T	NL300	12,70	22,00	4,76	0,40	5,16		Roughing
032816	TNMG220404E-4T	NL400	12,70	22,00	4,76	0,40	5,16		Roughing
032817	TNMG220404E-4T	NL920	12,70	22,00	4,76	0,40	5,16		Roughing
032818	TNMG220408E-4T	NL250	12,70	22,00	4,76	0,80	5,16		Roughing
032819	TNMG220408E-4T	NL300	12,70	22,00	4,76	0,80	5,16		Roughing
032820	TNMG220408E-4T	NL400	12,70	22,00	4,76	0,80	5,16		Roughing
032821	TNMG220408E-4T	NL920	12,70	22,00	4,76	0,80	5,16		Roughing
032822	TNMG220412E-4T	NL250	12,70	22,00	4,76	1,20	5,16		Roughing
032823	TNMG220412E-4T	NL300	12,70	22,00	4,76	1,20	5,16		Roughing
032824	TNMG220412E-4T	NL400	12,70	22,00	4,76	1,20	5,16		Roughing
032825	TNMG220412E-4T	NL920	12,70	22,00	4,76	1,20	5,16		Roughing
032826	TNMG220416E-4T	NL250	12,70	22,00	4,76	1,60	5,16		Roughing
032827	TNMG220416E-4T	NL300	12,70	22,00	4,76	1,60	5,16		Roughing
032828	TNMG220416E-4T	NL400	12,70	22,00	4,76	1,60	5,16		Roughing
032829	TNMG220416E-4T	NL920	12,70	22,00	4,76	1,60	5,16		Roughing
032830	TNMG220432E-4T	NL300	12,70	22,00	4,76	3,20	5,16		Roughing

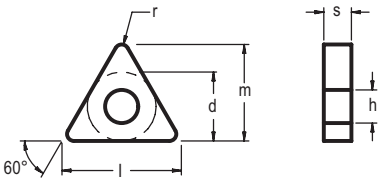
For Toolholders External: see pages 141 - 142 | Internal: see page 143

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

TNMG
4T Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032831	TNMG270608E-4T	NL250	15,88	27,50	6,35	0,80	6,35		Roughing
032832	TNMG270608E-4T	NL300	15,88	27,50	6,35	0,80	6,35		Roughing
032833	TNMG270608E-4T	NL400	15,88	27,50	6,35	0,80	6,35		Roughing
032834	TNMG270608E-4T	NL920	15,88	27,50	6,35	0,80	6,35		Roughing
032835	TNMG270612E-4T	NL250	15,88	27,50	6,35	1,20	6,35		Roughing
032836	TNMG270612E-4T	NL300	15,88	27,50	6,35	1,20	6,35		Roughing
032837	TNMG270612E-4T	NL400	15,88	27,50	6,35	1,20	6,35		Roughing
032838	TNMG270612E-4T	NL920	15,88	27,50	6,35	1,20	6,35		Roughing
032839	TNMG270616E-4T	NL250	15,88	27,50	6,35	1,60	6,35		Roughing
032840	TNMG270616E-4T	NL300	15,88	27,50	6,35	1,60	6,35		Roughing
032841	TNMG270616E-4T	NL400	15,88	27,50	6,35	1,60	6,35		Roughing
032842	TNMG270616E-4T	NL920	15,88	27,50	6,35	1,60	6,35		Roughing
032843	TNMG270632E-4T	NL300	15,88	27,50	6,35	3,20	6,35		Roughing
032844	TNMG330924E-4T	NL300	19,05	33,50	9,53	2,40	7,92		Roughing
032845	TNMG330924E-4T	NL400	19,05	33,50	9,53	2,40	7,92		Roughing
032846	TNMG330924E-4T	NL920	19,05	33,50	9,53	2,40	7,92		Roughing

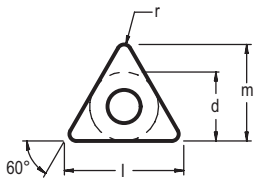
For Toolholders External: see pages 141 - 142 | Internal: see page 143

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

TNMG
4U Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032847	**TNMG160408E-4U**	NL200	9,53	16,50	4,76	0,80	3,81		Roughing
032848	**TNMG160412E-4U**	NL200	9,53	16,50	4,76	1,20	3,81		Roughing
032849	**TNMG220408E-4U**	NL200	12,70	22,00	4,76	0,80	5,16		Roughing
032850	**TNMG220412E-4U**	NL200	12,70	22,00	4,76	1,20	5,16		Roughing
032851	**TNMG220416E-4U**	NL200	12,70	22,00	4,76	1,60	5,16		Roughing

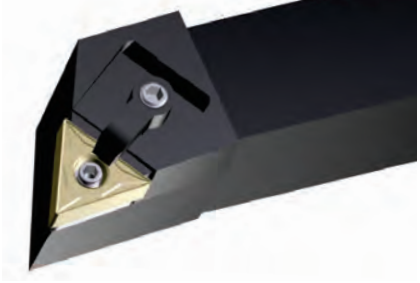
For Toolholders External: see pages 141 - 142 | Internal: see page 143

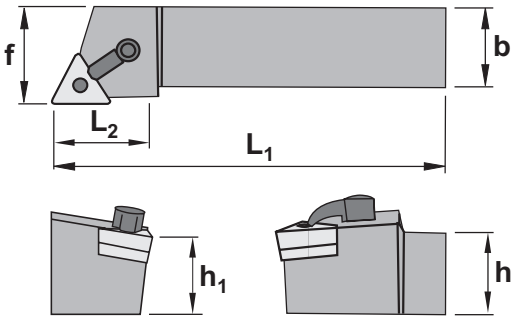
Material Guide – Key to Recommended Inserts

Material Designation

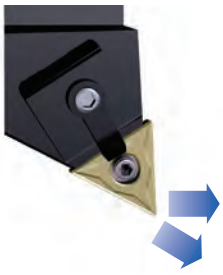
P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

MTJN 93°





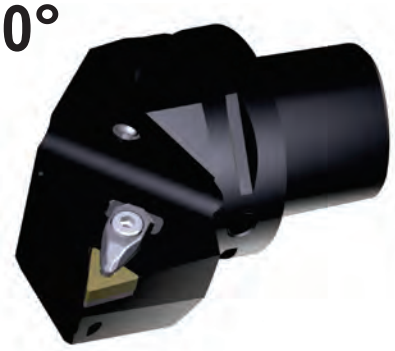
MTJN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028557	MTJNL 2020 K 16-S	LH	TN_1604	20	20	25	125	28
028558	MTJNL 2525 M16-S	LH	TN_1604	25	25	32	150	28
028563	MTJNR 2020 K16-S	RH	TN_1604	20	20	25	125	28
028564	MTJNR 2525 M16-S	RH	TN_1604	25	25	32	150	28
028560	MTJNL 2525 M22 -S	LH	TN_2204	25	25	32	150	34
028562	MTJNL 3232 P22-S	LH	TN_2204	32	32	40	170	34
028566	MTJNR 2525 M22-S	RH	TN_2204	25	25	32	150	34
028568	MTJNR 3232 P22 -S	RH	TN_2204	32	32	40	170	34

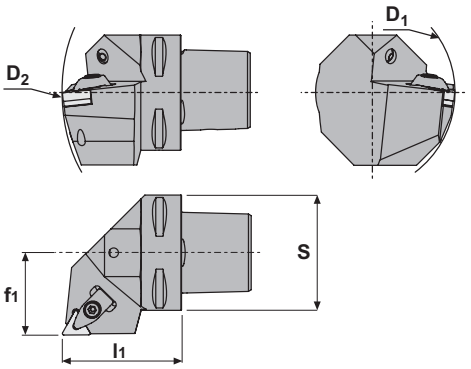


M Style External Toolholder
Negative Inserts: TN_1604, & TN_2204
Application:- Turn O/D
Axial Approach 93°
Axial -6°
Radial -6°
Profiling Clearance Angle β = 24°
RH Holder Shown

MTJNL/R Spare Parts											
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Key EDP		Lock Pin EDP		Lock Pin Key EDP		Anvil EDP	
MTJNL/R 2020 K16-S	028575	1086	034490	CL2613	018286	KH5003	034511	1665	028578	KH5002	001714	ITSN323
MTJNL/R 2525 M16-S												
MTJNL/R 2525 M22-S									018285	KH5025	001689	ITSN433
MTJNL/R 3232 P22-S												

DTGN 90°





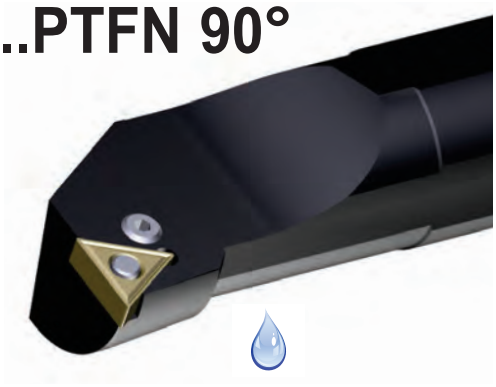
DTGN LH & RH External PSC Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				S	D1	D2	f1	l1
033701	**C5-50-DTGNL35060-16**	LH	TN_1604	50	110	165	35	60
033702	**C5-50-DTGNR35060-16**	RH	TN_1604	50	110	165	35	60
033703	**C6-63-DTGNL45065-16**	LH	TN_1604	63	110	190	45	65
033704	**C6-63-DTGNR45065-16**	RH	TN_1604	63	110	190	45	65

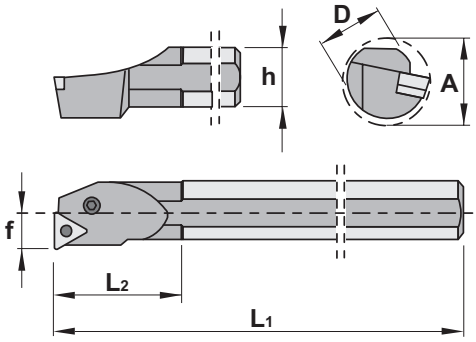


D Style External Toolholder
for Negative Inserts:
TN_1604
Application: External Turn O/D
Approach 90°
Axial -6°
Radial -6°
Profilling Clearence Angle β = 0°
RH Holder Shown

C, DTGNL/R Spare Parts												
Item Description	*Clamp EDP*		*Clamp Screw EDP*		*Anvil EDP*		*Anvil Screw EDP*		*Clamp Spring EDP*		*Screw Key EDP*	
C5-50-DTGNL/R 35060-16	*033709*	2708	*033711*	1695	*033714*	ITSN342	*033718*	1764	*033720*	4294	*018286*	KH5003
C6-63-DTGNL/R 45065-16												

A..PTFN 90°





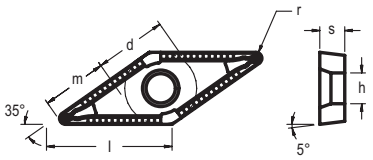
A..PTFN LH & RH Internal Boring Bars										
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)						
				Min Bore Ø A	ØD	f	L_1	L_2	h	Through Coolant
028710	**A25R PTFNL 16**	LH	TN_1604	31	25	17	200	42	23	
028711	**A32S PTFNL 16**	LH	TN_1604	39	32	22	250	45	30	
028713	**A25R PTFNR 16**	RH	TN_1604	31	25	17	200	42	23	
028714	**A32S PTFNR 16**	RH	TN_1604	39	32	22	250	45	30	
028712	**A40T PTFNL 22**	LH	TN_2204	48	40	27	300	50	37	
028715	**A40T PTFNR 22**	RH	TN_2204	48	40	27	300	50	37	



P Style Internal Boring Bar
for Negative Inserts:
TN_1604 & TN_2204
Application: I/D Boring
Axial Approach =90°
Axial -6°
Radial -11°
Profiling Clearance Angle β = 0°
RH Bar Shown

A..PTFNL/R Spare Parts												
Item Description	*Lever EDP*		*Lever Screw EDP*		*Anvil EDP*		*Anvil Clip EDP*		*Clip Punch EDP*		*Key EDP*	
A25R PTFNL/R 16	*022652*	PL8216	*028741*	PLS1605	-	-	-	-	-	-	*028578*	KH5002
A32S PTFNL/R 16	*017442*	PL8009	*017447*	PLS1606	*017463*	PA3416	*034503*	PC4109	*028053*	PCP0009	*018285*	KH5025
A40T PTFNL/R 22	*017443*	PL8012	*017448*	PLS1608	*017464*	PA3422	*017453*	PC4112	*028054*	PCP0012	*018286*	KH5003

VBGT
-62 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031665	**VBGT160402E-62**	SP4019	9,53	16,60	6,35	0,20	4,40		Finishing
031666	**VBGT160404E-62**	SP4019	9,53	16,60	6,35	0,40	4,40		Finishing
031667	**VBGT160408E-62**	SP4019	9,53	16,60	6,35	0,80	4,40		Finishing

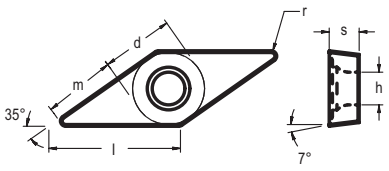
For Toolholders External: see pages 148 - 153 | Internal: see pages 154 - 156

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

VCGT
M Geometry

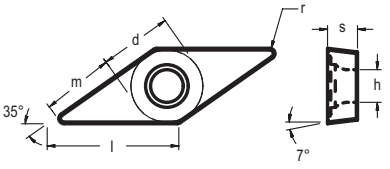




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032852	VCGT130301F-M	GH1	7,94	13,80	3,97	0,10	3,40		Medium
034463	VCGT130301E-M	SP4019	7,94	13,80	3,97	0,10	3,40		Medium
032854	VCGT130302F-M	GH1	7,94	13,80	3,97	0,20	3,40		Medium
034461	VCGT130302E-M	SP4019	7,94	13,80	3,97	0,20	3,40		Medium
032856	VCGT130304F-M	GH1	7,94	13,80	3,97	0,40	3,40		Medium
034462	VCGT130304E-M	SP4019	7,94	13,80	3,97	0,40	3,40		Medium

For Toolholders External: see pages 148, 151 - 153 | Internal: see pages 155 - 156

VCGT & VCGX
-62 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
031608	VCGX1103005E-62	SP4019	6,35	10,07	3,18	0,05	2,80		Finishing
031609	VCGT110301E-62	SP4019	6,35	10,07	3,18	0,10	2,80		Finishing
031610	VCGT110302E-62	SP4019	6,35	10,07	3,18	0,20	2,80		Finishing
031611	VCGT110304E-62	SP4019	6,35	10,07	3,18	0,40	2,80		Finishing
030594	VCGT130301E-62	SP4019	7,94	13,80	3,18	0,10	3,40		Finishing
030595	VCGT130302E-62	SP4019	7,94	13,80	3,18	0,20	3,40		Finishing
030596	VCGT130304E-62	SP4019	7,94	13,80	3,18	0,40	3,40		Finishing

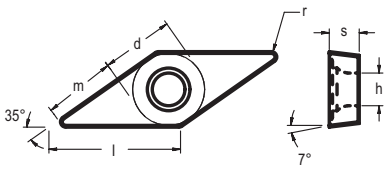
For Toolholders External: see pages 148, 151 - 153 | Internal: see pages 155 - 156

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

VCGT
-64 Geometry

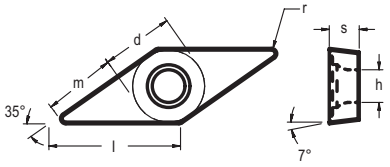




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
014071	**VCGT160408F-64**	GH1	9,53	16,60	4,76	0,80	4,40	♦	Finishing

For Toolholders External: see pages 148, 151 - 153 | Internal: see pages 155 - 156

VCGT
-66 Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
027453	**VCGT130302F-66**	GH1	7,94	13,80	3,18	0,20	3,40	♦♦♦	Finishing
027454	**VCGT130304F-66**	GH1	7,94	13,80	3,18	0,40	3,40	♦♦♦	Finishing
027455	**VCGT130308F-66**	GH1	7,94	13,80	3,18	0,80	3,40	♦♦♦	Finishing

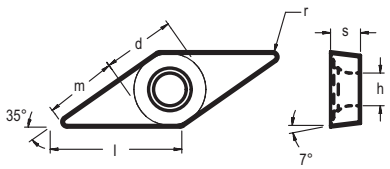
For Toolholders External: see pages 148, 151 - 153 | Internal: see pages 155 - 156

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

VCMT
M Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032858	VCMT160404E-M	GH1	9,53	16,60	4,76	0,40	4,40		Medium
032276	VCMT160404E-M	SP4019	9,53	16,60	4,76	0,40	4,40		Medium
032859	VCMT160408E-M	GH1	9,53	16,60	4,76	0,80	4,40		Medium
032282	VCMT160408E-M	SP4019	9,53	16,60	4,76	0,80	4,40		Medium

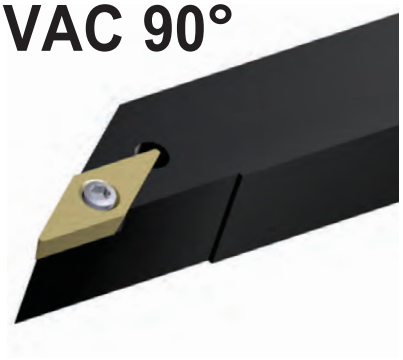
For Toolholders External: see pages 148, 151 - 153 | Internal: see pages 155 - 156

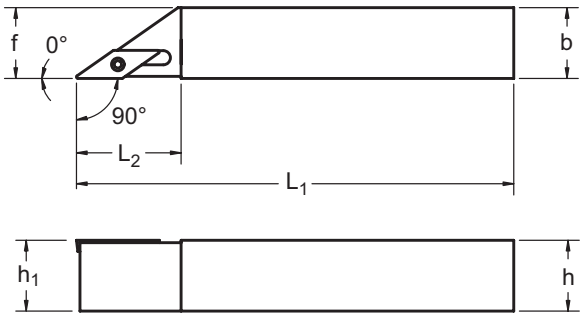
Material Guide – Key to Recommended Inserts

Material Designation

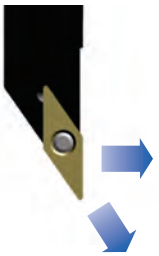
P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SVAC 90°





SVAC LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033593	**SVACL 1010 M11**	LH	VC_1103	10	10	10	150	-
033594	**SVACL 1212 M11**	LH	VC_1103	12	12	12	150	-
033595	**SVACL 1616 M11**	LH	VC_1103	16	16	16	150	-
033596	**SVACR 1010 M11**	RH	VC_1103	10	10	10	150	-
033597	**SVACR 1212 M11**	RH	VC_1103	12	12	12	150	-
033598	**SVACR 1616 M11**	RH	VC_1103	16	16	16	150	-
025092	**SVACL 1010 M13**	LH	VC_1303	10	10	10	150	30
025094	**SVACL 1212 M13**	LH	VC_1303	12	12	12	150	30
025096	**SVACL 1616 M13**	LH	VC_1303	16	16	16	150	30
025098	**SVACL 2020 K13**	LH	VC_1303	20	20	20	125	30
025091	**SVACR 1010 M13**	RH	VC_1303	10	10	10	150	30
025093	**SVACR 1212 M13**	RH	VC_1303	12	12	12	150	30
025095	**SVACR 1616 M13**	RH	VC_1303	16	16	16	150	30
025097	**SVACR 2020 K13**	RH	VC_1303	20	20	20	125	30

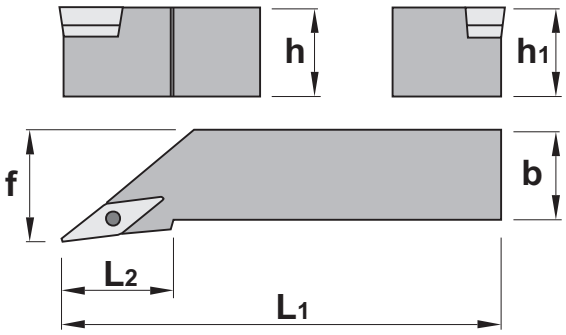


S Style External Toolholder
Positive Inserts VC_1103, and VC_1303
Application: O/D Profiling
Approach 90°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 52°
RH Holder Shown

SVACL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SVACL/R 1010 M11	*15061*	F2507T	*18488*	T7	-	-	-	-
SVACL/R 1212 M11								
SVACL/R 1616 M11								
SVACL/R 1010 M13	*15063*	F3008T	*013214*	T9	-	-	-	-
SVACL/R 1212 M13								
SVACL/R 1616 M13								
SVACL/R 2020 K13								

SVJB 93°





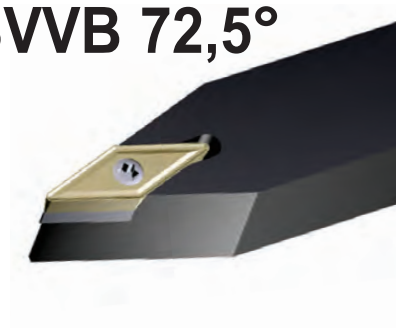
SVJB LH & RH External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
028641	**SVJBL 2020 K16**	LH	VB_1604	20	20	25	125	34
028642	**SVJBL 2525 M16**	LH	VB_1604	25	25	32	150	34
028644	**SVJBR 2020 K16**	RH	VB_1604	20	20	25	125	34
028645	**SVJBR 2525 M16**	RH	VB_1604	25	25	32	150	34

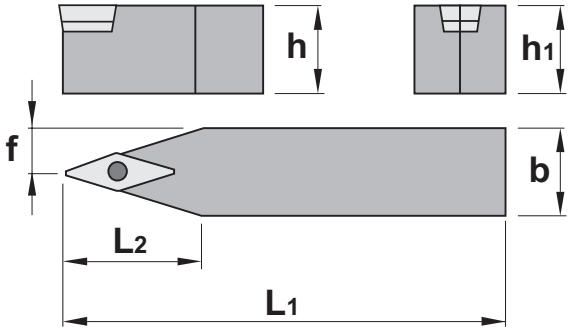


S Style External Toolholder
for Positive Inserts: VB_1604
Application: O/D Profiling
Approach 93°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 49°
RH Holder Shown

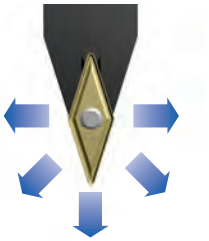
SVJBL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SVJBL/R 2020 K16 **SVJBL/R 2525 M16**	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750

SVVB 72,5°





SVVB Neutral External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033599	**SVVBN 2020 K16**	Neutral	VB_1604	20	20	10	125	-
033600	**SVVBN 2525 M16**	Neutral	VB_1604	25	25	12,5	150	-

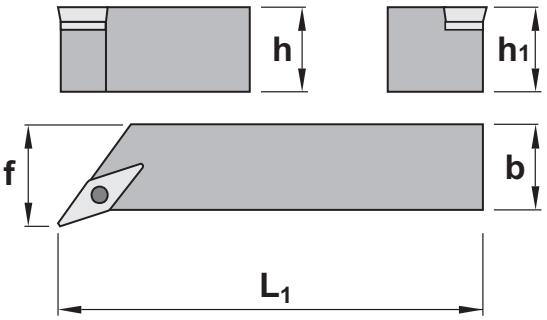


S Style External Toolholder
for Positive Inserts: VB_1604
Application: O/D Profiling
Approach 72,5°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 69,5°
Neutral Holder Shown

SVVBL N Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SVVBN 2020 K16 **SVVBN 2525 M16**	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750

SVHC 107,5°





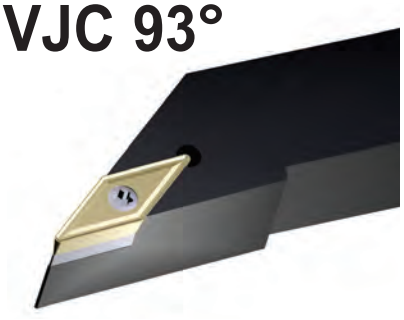
SVHC LH & RH External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				h = h_1	b	f	L_1	L_2
028635	**SVHCL 2020 K16**	LH	VC_1604	20	20	25	125	-
028636	**SVHCL 2525 M16**	LH	VC_1604	25	25	32	150	-
033607	**SVHCL 3225 P16**	LH	VC_1604	32	25	32	170	-
028638	**SVHCR 2020 K16**	RH	VC_1604	20	20	25	125	-
028639	**SVHCR 2525 M16**	RH	VC_1604	25	25	32	150	-
033608	**SVHCR 3225 P16**	RH	VC_1604	32	25	32	170	-

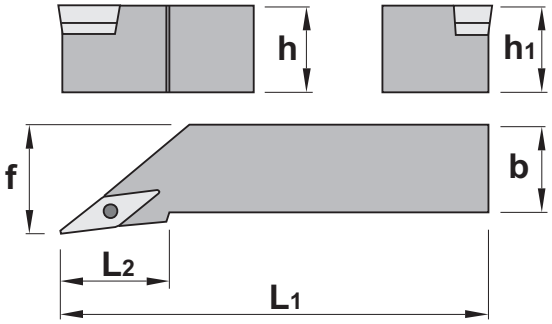


S Style External Toolholder
for Positive Inserts: VC_1604
Application: O/D and Face Profiling
Approach 107,5°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 44,5°
RH Holder Shown

SVHCL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SVHCL/R 2020 K16 **SVHCL/R 2525 M16** **SVHCL/R 3232 P16**	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750

SVJC 93°





SVJC LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033615	**SVJCL 1010 M11**	LH	VC_1103	10	10	10	150	-
033616	**SVJCL 1212 M11**	LH	VC_1103	12	12	12	150	-
033617	**SVJCL 1616 M11**	LH	VC_1103	16	16	16	150	-
033618	**SVJCL 2020 K11**	LH	VC_1103	20	20	25	125	25
033619	**SVJCR 1010 M11**	RH	VC_1103	10	10	10	150	-
033620	**SVJCR 1212 M11**	RH	VC_1103	12	12	12	150	-
033621	**SVJCR 1616 M11**	RH	VC_1103	16	16	16	150	-
033622	**SVJCR 2020 K11**	RH	VC_1103	20	20	25	125	25
018330	**SVJCL 1212 F13**	LH	VC_1303	12	12	16	80	26
018331	**SVJCL 1616 H13**	LH	VC_1303	16	16	20	100	30
018333	**SVJCL 2020 K13**	LH	VC_1303	20	20	25	125	30
018337	**SVJCR 1212 F13**	RH	VC_1303	12	12	16	80	26
018338	**SVJCR 1616 H13**	RH	VC_1303	16	16	20	100	30
018340	**SVJCR 2020 K13**	RH	VC_1303	20	20	25	125	30
028648	**SVJCL 2020 K16**	LH	VC_1604	20	20	25	125	34
028649	**SVJCL 2525 M16**	LH	VC_1604	25	25	32	150	34
028651	**SVJCR 2020 K16**	RH	VC_1604	20	20	25	125	34
028652	**SVJCR 2525 M16**	RH	VC_1604	25	25	32	150	34

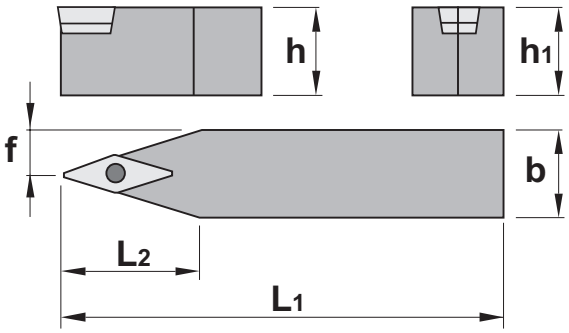


S Style External Toolholder
for Positive Inserts:
VC_1103, VC_1303, and VC_1604
Application: O/D Profiling
Approach 93°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 49°
RH Holder Shown

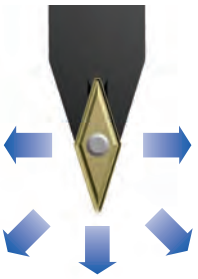
SVJCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
SVJCL/R 1010 M11 **SVJCL/R 1212 M11** **SVJCL/R 1616 M11** **SVJCL/R 2020 K11**	*015061*	F2507T	*18488*	T7	-	-	-	-
SVJCL/R 1212 F13 **SVJCL/R 1616 H13** **SVJCL/R 2020 K13**	*015063*	F3008T	*013214*	T9	-	-	-	-
SVJCL/R 2020 K16 **SVJCL/R 2525 M16**	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750

SVVC 72,5°





SVVC Neutral External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033639	**SVVCN 1212 M11**	Neutral	VC_1103	12	12	6	150	-
033640	**SVVCN 1616 M11**	Neutral	VC_1103	16	16	8	150	-
033641	**SVVCN 2020 K11**	Neutral	VC_1103	20	20	10	125	-
018344	**SVVCN 1212 F13**	Neutral	VC_1303	12	12	6	150	28
018345	**SVVCN 1616 H13**	Neutral	VC_1303	16	16	8	150	28
018346	**SVVCN 2020 K13**	Neutral	VC_1303	20	20	10	125	28
028653	**SVVCN 2020 K16**	Neutral	VC_1604	20	20	10	125	-
028654	**SVVCN 2525 M16**	Neutral	VC_1604	25	25	12,5	150	-

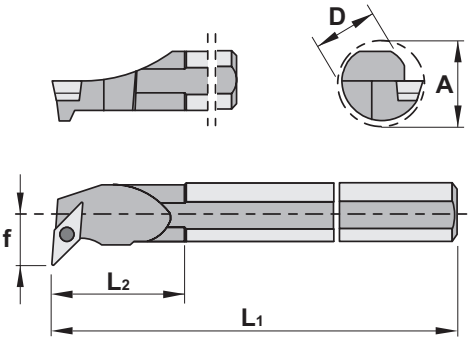


S Style External Toolholder
for Positive Inserts:
VC_1103, VC_1303 and VC_1604
Application: O/D Profiling
Approach 72,5°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 69,5°
Neutral Holder Shown

SVVC N Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SVVCN 1212 M11	*015061*	F2507T	*018488*	T7	-	-	-	-
SVVCN 1616 M11								
SVVCN 2020 K11								
SVVCN 1212 F13	*015063*	F3008T	*013214*	T9	-	-	-	-
SVVCN 1616 H13								
SVVCN 2020 K13								
SVVCN 2020 K16	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750
SVVCN 2525 M16								

SVUB 93°





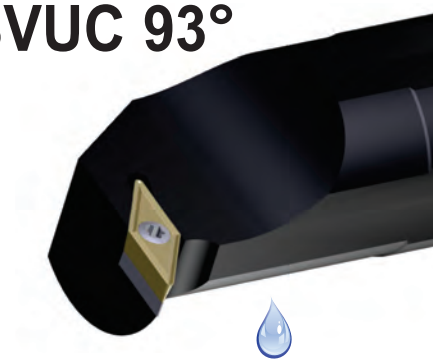
S.. SVUB LH & RH Internal Boring Bars									
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	L_2	Through Coolant
033642	**S25R SVUBL 16**	LH	VB_1604	31	25	17	300	42	
033643	**S32S SVUBL 16**	LH	VB_1604	39	32	22	350	45	
033644	**S25R SVUBR 16**	RH	VB_1604	31	25	17	300	42	
033645	**S32S SVUBR 16**	RH	VB_1604	39	32	22	350	45	

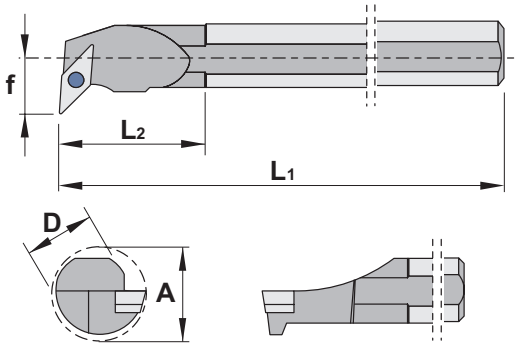


S Style Boring Bar
for Positive Inserts: VB_1604
Application: I/D Profiling
Aproach 93°
Axial 0°
Radial -6°
Profilling Clearance Angle β = 49°
RH Bar Shown

S.. SVUBL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
S25R SVUBL/R 16	*015262*	D4010T	*015240*	T15	-	-	-	-
S32S SVUBL/R 16	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750

SVUC 93°





A.. SVUC LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L1	L2	Through Coolant
033650	**A16M SVUCL 11**	LH	VC_1103	20	16	11	150	31	
033651	**A20Q SVUCL 11**	LH	VC_1103	25	20	13	180	36	
033652	**A16M SVUCR 11**	RH	VC_1103	20	16	11	150	31	
033653	**A20Q SVUCR 11**	RH	VC_1103	25	20	13	180	36	
018443	**A20Q SVUCL 13**	LH	VC_1303	24	20	13	180	-	
018445	**A25S SVUCL 13**	LH	VC_1303	31	25	17	259	-	
018444	**A20Q SVUCR 13**	RH	VC_1303	24	20	13	180	-	
018446	**A25S SVUCR 13**	RH	VC_1303	31	25	17	259	-	
033654	**A25R SVUCL 16**	LH	VC_1604	31	25	17	200	42	
033655	**A32S SVUCL 16**	LH	VC_1604	39	32	22	250	45	
033656	**A25R SVUCR 16**	RH	VC_1604	31	25	17	200	42	
033657	**A32S SVUCR 16**	RH	VC_1604	39	32	22	250	45	

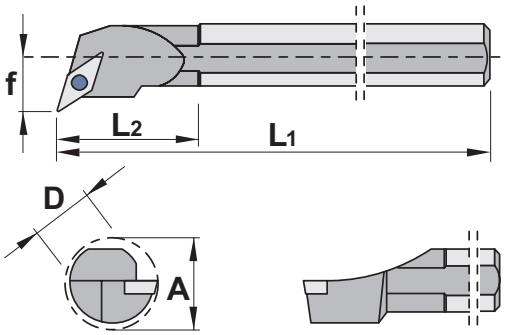


S Style Boring Bar
for Positive Inserts:
VC_1103, VC_1303, and VC_1604
Application: I/D Profiling
Aproach 93°
Axial 0°
Radial -6°
Profilling Clearance Angle β = 49°
RH Bar Shown

A.. SVUCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
A16M SVUCL/R 11	*015061*	F2507T	*018488*	T7	-	-	-	-
A20Q SVUCL/R 11								
A20Q SVUCL/R 13	*015063*	F3008T	*013214*	T9	-	-	-	-
A25S SVUCL/R 13								
A25R SVUCL/R 16	034497	1335	*028475*	K5516	*028740*	SA3718	*028478*	SAS1750
A32S SVUCL/R 16								

SVQC 107,5°





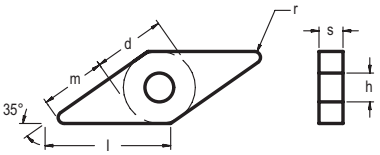
S.. SVQC LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	L_2	Through Coolant
033668	**S16R SVQCL 11**	LH	VC_1103	20	16	11	200	31	
033669	**S20S SVQCL 11**	LH	VC_1103	24	20	13	250	36	
033670	**S16R SVQCR 11**	RH	VC_1103	20	16	11	200	31	
033671	**S20S SVQCR 11**	RH	VC_1103	24	20	13	250	36	
033672	**S16R SVQCL 13**	LH	VC_1303	20	16	11	200	31	
033673	**S20S SVQCL 13**	LH	VC_1303	24	20	13	250	36	
033674	**S16R SVQCR 13**	RH	VC_1303	20	16	11	200	31	
033675	**S20S SVQCR 13**	RH	VC_1303	24	20	13	250	36	
033676	**S25T SVQCL 16**	LH	VC_1604	31	25	17	300	42	
033677	**S25T SVQCR 16**	RH	VC_1604	31	25	17	300	42	



S Style Boring Bar
for Positive Inserts:
VC_1103, VC_1303 and VC_1604
Application: I/D Profiling
Aproach 107,5°
Axial 0°
Radial -6°
Profilling Clearance Angle β = 34,5°
RH Bar Shown

S.. SVQCL/R Spare Parts								
Item Description	Insert Screw EDP		Insert Key EDP		Anvil EDP		Anvil Screw EDP	
S16R SVQCL/R 11	015061	F2507T	018488	T7	-	-	-	-
S20S SVQCL/R 11								
S16R SVQCL/R 13	015063	F3008T	013214	T9	-	-	-	-
S20S SVQCL/R 13								
S25T SVQCL/R 16	034497	1335	028475	K5516	028740	SA3718	028478	SAS1750

VNGG
3F Geometry

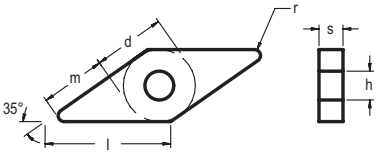




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031549	**VNGG160402F-3F**	SP0819	9,53	16,60	4,76	0,20	3,81		Medium
031550	**VNGG160404F-3F**	SP0819	9,53	16,60	4,76	0,40	3,81		Medium
031551	**VNGG160408F-3F**	SP0819	9,53	16,60	4,76	0,80	3,81		Medium

For Toolholders External: see pages 160 - 162 | Internal: see page 163

VNMG
1B Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030882	**VNMG160404E-1B**	SP0819	9,53	16,60	4,76	0,40	3,81		Finishing
032860	**VNMG160404E-1B**	NL250	9,53	16,60	4,76	0,40	3,81		Finishing
032861	**VNMG160408E-1B**	NL250	9,53	16,60	4,76	0,80	3,81		Finishing
030883	**VNMG160408E-1B**	SP0819	9,53	16,60	4,76	0,80	3,81		Finishing

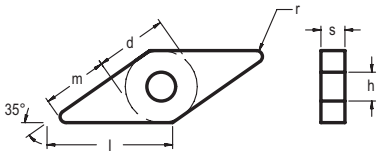
For Toolholders External: see pages 160 - 162 | Internal: see page 163

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

VNMG
2N Geometry

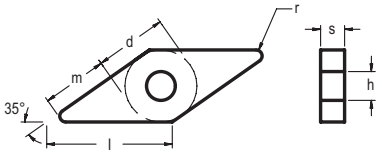




EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032864	VNMG160404E-2N	NL250	9,53	16,60	4,76	0,40	3,81		Medium
032865	VNMG160404E-2N	NL300	9,53	16,60	4,76	0,40	3,81		Medium
032866	VNMG160404E-2N	NL920	9,53	16,60	4,76	0,40	3,81		Medium
032867	VNMG160408E-2N	NL250	9,53	16,60	4,76	0,80	3,81		Medium
032868	VNMG160408E-2N	NL300	9,53	16,60	4,76	0,80	3,81		Medium
032869	VNMG160408E-2N	NL920	9,53	16,60	4,76	0,80	3,81		Medium

For Toolholders External: see pages 160 - 162 | Internal: see page 163

VNMG
3J Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032873	VNMG160404E-3J	SP4019	9,53	16,60	4,76	0,40	3,81		Medium
032874	VNMG160408E-3J	SP4019	9,53	16,60	4,76	0,80	3,81		Medium

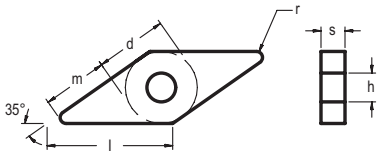
For Toolholders External: see pages 160 - 162 | Internal: see page 163

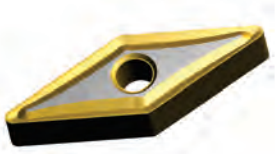
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

VNGG
4E Geometry

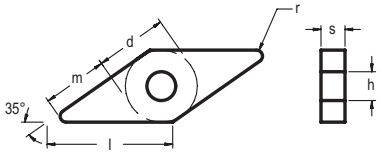


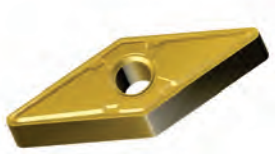


EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
030537	**VNMG160404E-4E**	SP0819	9,53	16,60	4,76	0,40	3,81		Medium-Roughing
030538	**VNMG160408E-4E**	SP0819	9,53	16,60	4,76	0,80	3,81		Medium-Roughing

For Toolholders External: see pages 160 - 162 | Internal: see page 163

VNMG
4U Geometry





EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	rε	h		
032875	**VNMG160404E-4U**	NL200	9,53	16,60	4,76	0,40	3,81		Roughing
032876	**VNMG160408E-4U**	NL200	9,53	16,60	4,76	0,80	3,81		Roughing

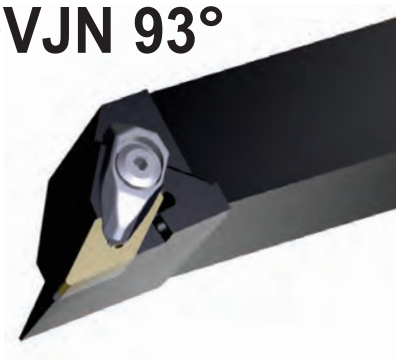
For Toolholders External: see pages 160 - 162 | Internal: see page 163

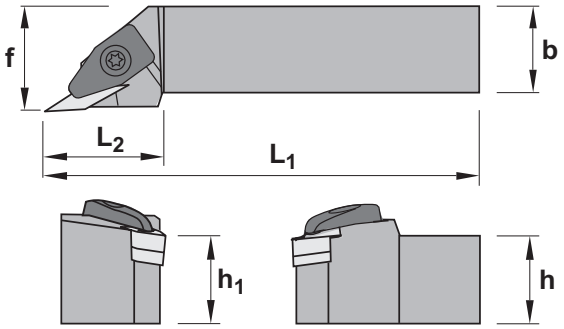
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DVJN 93°





DVJN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033401	**DVJNL 2020 K16**	LH	VN_1604	20	20	25	125	38
033402	**DVJNL 2525 M16**	LH	VN_1604	25	25	32	150	38
033403	***DVJNL 3225 P16**	LH	VN_1604	32	25	32	170	38
033404	**DVJNR 2020 K16**	RH	VN_1604	20	20	25	125	38
033405	**DVJNR 2525 M16**	RH	VN_1604	25	25	32	150	38
033406	***DVJNR 3225 P16**	RH	VN_1604	32	25	32	170	38

* Non Stock Items, subject to extended delivery time



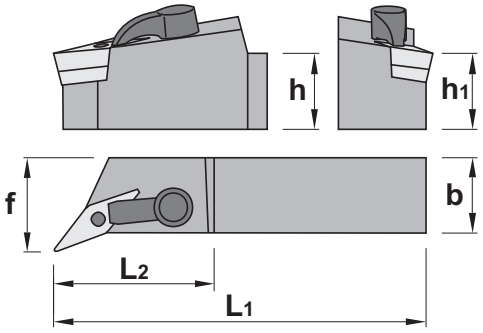
D Style External Toolholder
for Negative Inserts: VN_1604
Application: O/D Turn and Profile
Axial Approach 93°
Axial -6°
Radial -6°
Profiling Clearance Angle β = 49°
RH Holder Shown

DVJNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Spring EDP		Anvil EDP		Anvil Screw EDP		Clamp & Anvil Screw Key	
DVJNL/R 2020 K16	033711	1695	033709	DC2708	033720/	4294	001695	IVSN322	033718	1764	018286	KH5003
DVJNL/R 2525 M16												
***DVJNL/R 3225 P16**												

* Non Stock Items, subject to extended delivery time

MVQN 117,5°





MVQN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033413	**MVQNL 2020 K16**	LH	VN_1604	20	20	25	125	42
033414	**MVQNL 2525 M16**	LH	VN_1604	25	25	32	150	42
033415	***MVQNL 3225 P16**	LH	VN_1604	32	25	32	170	42
033416	**MVQNR 2020 K16**	RH	VN_1604	20	20	25	125	42
033417	**MVQNR 2525 M16**	RH	VN_1604	25	25	32	150	42
033418	***MVQNR 3225 P16**	RH	VN_1604	32	25	32	170	42

* Non Stock Items, subject to extended delivery time



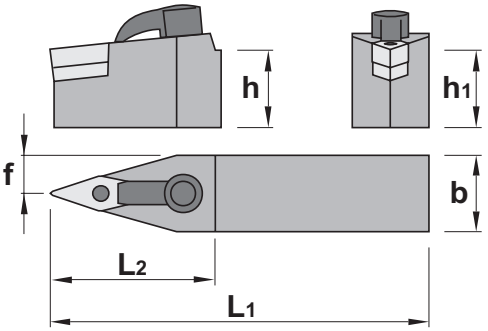
M Style External Toolholder
for Negative Inserts: VN_1604
Application: Face and Profile Turn
Axial Approach 117,5°
Axial -8°
Radial -10°
Profiling Clearance Angle β = 36,5°
RH Holder Shown

MVQNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Key EDP		Lock Pin EDP		Lock Pin Key EDP		Anvil EDP	
MVQNL/R 2020 K16	028575	1086	034492	CL2616	018286	KH5003	034511	1665	028578	KH5002	001695	IVSN322
MVQNL/R 2525 M16												
***MVQNL/R 3225 Q16**												

* Non Stock Items, subject to extended delivery time

MVVNN 72,5°





MVVNN Neutral External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
028549	**MVVNN 2020 K16**	Neutral	VN_1604	20	20	10	125	42
028550	**MVVNN 2525 M16**	Neutral	VN_1604	25	25	12,5	150	42

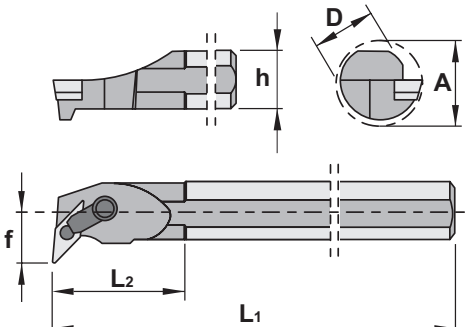


M Style External Toolholder
for Negative Inserts: VN_1604
Application: O/D Plunge and Profile
Axial Approach 72,5°
Axial -6 °
Radial 0°
Profiling Clearance Angle β = 69,5°
Neutral Holder Shown

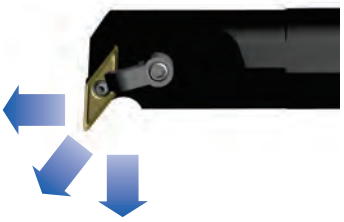
MVVNNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Key EDP		Lock Pin EDP		Lock Pin Key EDP		Anvil EDP	
MVVNN 2020 K16	028575	1086	034492	CL2616	018286	KH5003	034511	1665	028578	KH5002	001695	IVSN322
MVVNN 2525 M16												

S..MVUN 93°





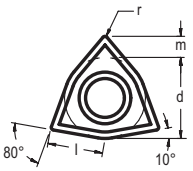
S..MVUN LH & RH Internal Boring Bars											
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)							
				Min Bore Ø A	ØD	f	L_1	L_2	h	Through Coolant	
033471	**S25T MVUNL 16**	LH	VN_1604	31	25	17	300	42	23		
033472	**S32U MVUNL 16**	LH	VN_1604	39	32	22	350	45	30		
033473	**S40V MVUNL 16**	LH	VN_1604	48	40	27	400	50	37		
033474	**S25T MVUNR 16**	RH	VN_1604	31	25	17	300	42	23		
033475	**S32U MVUNR 16**	RH	VN_1604	39	32	22	350	45	30		
033476	**S40V MVUNR 16**	RH	VN_1604	48	40	27	400	50	37		

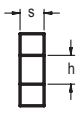


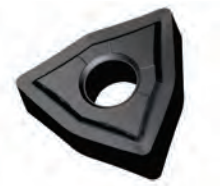
M Style External Toolholder
for Negative Inserts: VN_1604
Application: Internal I/D Boring and Profile
Axial Approach 93°
Axial -5°
Radial -15°
Profiling Clearance Angle β = 51°
RH Bar Shown

S.. MVUNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Key EDP		Lock Pin EDP		Lock Pin Key EDP		Anvil EDP	
S25T MVUNL/R 16	034493	1186	034491	CL2614	018286	KH5003	034511	1665	028578	KH5002	001695	IVSN322
S32U MVUNL/R 16	028575	1086										
S40V MVUNL/R 16												

WNGG
3F Geometry



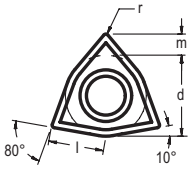


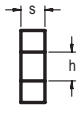


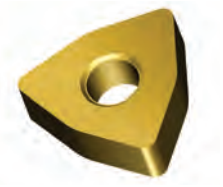
EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
031552	**WNGG080402F-3F**	SP0819	12,70	8,69	4,76	0,20	5,16		Medium
031553	**WNGG080404F-3F**	SP0819	12,70	8,69	4,76	0,40	5,16		Medium
031554	**WNGG080408F-3F**	SP0819	12,70	8,69	4,76	0,80	5,16		Medium

For Toolholders External: see page 170 | Internal: see page 171

WNMA
Flat Top







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032877	**WNMA080408E**	NL250	12,70	8,69	4,76	0,80	5,16		Heavy Roughing
032878	**WNMA080412E**	NL250	12,70	8,69	4,76	1,20	5,16		Heavy Roughing

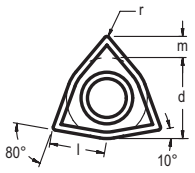
For Toolholders External: see page 170 | Internal: see page 171

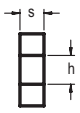
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

WNMG
1B Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030884	**WNMG060404E-1B**	SP0819	9,53	6,52	4,76	0,40	3,81		Finishing
032879	**WNMG060408E-1B**	NL250	9,53	6,52	4,76	0,80	3,81		Finishing
030885	**WNMG060408E-1B**	SP0819	9,53	6,52	4,76	0,80	3,81		Finishing
032880	**WNMG080404E-1B**	NL250	12,70	8,69	4,76	0,40	5,16		Finishing
030886	**WNMG080404E-1B**	SP0819	12,70	8,69	4,76	0,40	5,16		Finishing
032881	**WNMG080408E-1B**	NL250	12,70	8,69	4,76	0,80	5,16		Finishing
030887	**WNMG080408E-1B**	SP0819	12,70	8,69	4,76	0,80	5,16		Finishing
032882	**WNMG080412E-1B**	NL250	12,70	8,69	4,76	1,20	5,16		Finishing
030888	**WNMG080412E-1B**	SP0819	12,70	8,69	4,76	1,20	5,16		Finishing

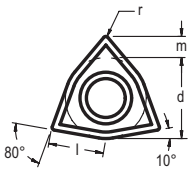
For Toolholders External: see page 170 | Internal: see page 171

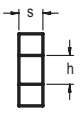
Material Guide – Key to Recommended Inserts

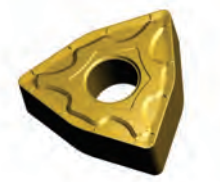
Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

WNMG
2N Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032884	WNMG060404E-2N	NL250	9,53	6,52	4,76	0,40	3,81		Medium
032885	WNMG060408E-2N	NL300	9,53	6,52	4,76	0,80	3,81		Medium
032886	WNMG060408E-2N	NL920	9,53	6,52	4,76	0,80	3,81		Medium
032887	WNMG080404E-2N	NL250	12,70	8,69	4,76	0,40	5,16		Medium
032888	WNMG080404E-2N	NL300	12,70	8,69	4,76	0,40	5,16		Medium
032889	WNMG080404E-2N	NL920	12,70	8,69	4,76	0,40	5,16		Medium
032890	WNMG080408E-2N	NL250	12,70	8,69	4,76	0,80	5,16		Medium
032891	WNMG080408E-2N	NL300	12,70	8,69	4,76	0,80	5,16		Medium
032892	WNMG080408E-2N	NL920	12,70	8,69	4,76	0,80	5,16		Medium
032893	WNMG080412E-2N	NL250	12,70	8,69	4,76	1,20	5,16		Medium
032894	WNMG080412E-2N	NL300	12,70	8,69	4,76	1,20	5,16		Medium
032895	WNMG080412E-2N	NL920	12,70	8,69	4,76	1,20	5,16		Medium
032896	WNMG080416E-2N	NL250	12,70	8,69	4,76	1,60	5,16		Medium
032897	WNMG080416E-2N	NL300	12,70	8,69	4,76	1,60	5,16		Medium
032898	WNMG080416E-2N	NL920	12,70	8,69	4,76	1,60	5,16		Medium

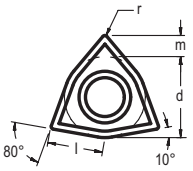
For Toolholders External: see page 170 | Internal: see page 171

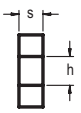
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

WNMG
3J Geometry



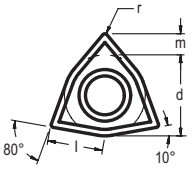


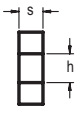


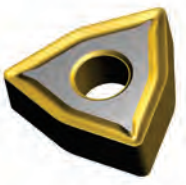
EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032899	**WNMG060404E-3J**	SP4019	9,53	6,52	4,76	0,40	3,81		Medium
032900	**WNMG060408E-3J**	SP4019	9,53	6,52	4,76	0,80	3,81		Medium
032901	**WNMG080404E-3J**	SP4019	12,70	8,69	4,76	0,40	5,16		Medium
032902	**WNMG080408E-3J**	SP4019	12,70	8,69	4,76	0,80	5,16		Medium
032903	**WNMG080412E-3J**	SP4019	12,70	8,69	4,76	1,20	5,16		Medium

For Toolholders External: see page 170 | Internal: see page 171

WNMG
4E Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
030519	**WNMG060404E-4E**	SP0819	9,53	6,52	4,76	0,40	3,81		Medium-Roughing
030520	**WNMG060408E-4E**	SP0819	9,53	6,52	4,76	0,80	3,81		Medium-Roughing
031183	**WNMG060412E-4E**	SP0819	9,53	6,52	4,76	1,20	3,81		Medium-Roughing
030521	**WNMG080404E-4E**	SP0819	12,70	8,69	4,76	0,40	5,16		Medium-Roughing
032904	**WNMG080404E-4E**	NL400	12,70	8,69	4,76	0,40	5,16		Medium-Roughing
030522	**WNMG080408E-4E**	SP0819	12,70	8,69	4,76	0,80	5,16		Medium-Roughing
032905	**WNMG080408E-4E**	NL400	12,70	8,69	4,76	0,80	5,16		Medium-Roughing
032906	**WNMG080412E-4E**	NL400	12,70	8,69	4,76	1,20	5,16		Medium-Roughing
030523	**WNMG080412E-4E**	SP0819	12,70	8,69	4,76	1,20	5,16		Medium-Roughing

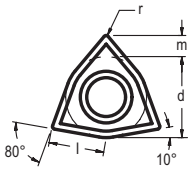
For Toolholders External: see page 170 | Internal: see page 171

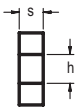
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

WNMG
4T Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
034458	**WNMG060408E-4T**	NL300	9,53	6,52	4,76	0,80	3,81		Roughing
034459	**WNMG060408E-4T**	NL920	9,53	6,52	4,76	0,80	3,81		Roughing
032909	**WNMG060412E-4T**	NL300	9,53	6,52	4,76	1,20	3,81		Roughing
032910	**WNMG060412E-4T**	NL920	9,53	6,52	4,76	1,20	3,81		Roughing
032911	**WNMG080408E-4T**	NL250	12,70	8,69	4,76	0,80	5,16		Roughing
032912	**WNMG080408E-4T**	NL300	12,70	8,69	4,76	0,80	5,16		Roughing
032913	**WNMG080408E-4T**	NL400	12,70	8,69	4,76	0,80	5,16		Roughing
032914	**WNMG080408E-4T**	NL920	12,70	8,69	4,76	0,80	5,16		Roughing
032915	**WNMG080412E-4T**	NL250	12,70	8,69	4,76	1,20	5,16		Roughing
032916	**WNMG080412E-4T**	NL300	12,70	8,69	4,76	1,20	5,16		Roughing
032917	**WNMG080412E-4T**	NL400	12,70	8,69	4,76	1,20	5,16		Roughing
032918	**WNMG080412E-4T**	NL920	12,70	8,69	4,76	1,20	5,16		Roughing
032919	**WNMG080416E-4T**	NL300	12,70	8,69	4,76	1,60	5,16		Roughing
032920	**WNMG080416E-4T**	NL400	12,70	8,69	4,76	1,60	5,16		Roughing
032921	**WNMG080416E-4T**	NL920	12,70	8,69	4,76	1,60	5,16		Roughing

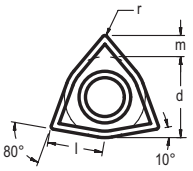
For Toolholders External: see page 170 | Internal: see page 171

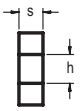
Material Guide – Key to Recommended Inserts

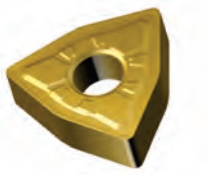
Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

WNMG
4U Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032922	**WNMG080408E-4U**	NL200	12,70	8,69	4,76	0,80	5,16		Roughing
032923	**WNMG080412E-4U**	NL200	12,70	8,69	4,76	1,20	5,16		Roughing

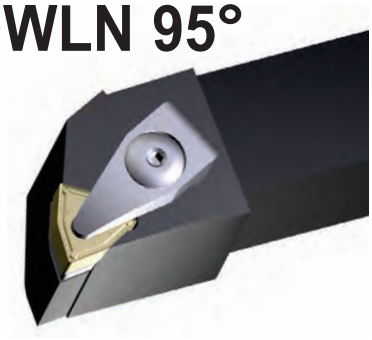
For Toolholders External: see page 170 | Internal: see page 171

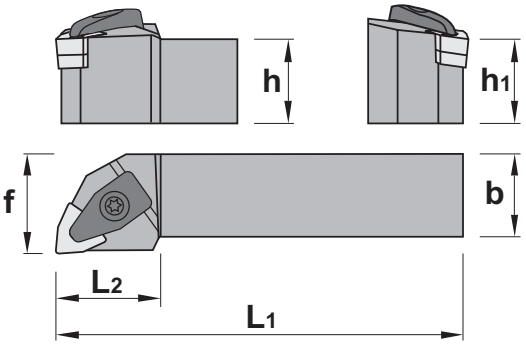
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

DWLN 95°





DWLN LH & RH External Square Shank Toolholders								
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)				
				h = h1	b	f	L1	L2
033430	**DWLNL 2020 K06**	LH	WN_0604	20	20	25	125	25
033431	**DWLNL 2525 M06**	LH	WN_0604	25	25	32	150	25
033432	**DWLNR 2020 K06**	RH	WN_0604	20	20	25	125	25
033433	**DWLNR 2525 M06**	RH	WN_0604	25	25	32	150	25
033434	**DWLNL 2020 K08**	LH	WN_0804	20	20	25	125	34
033435	**DWLNL 2525 M08**	LH	WN_0804	25	25	32	150	34
033436	**DWLNL 3232 P08**	LH	WN_0804	32	32	40	170	34
033437	**DWLNR 2020 K08**	RH	WN_0804	20	20	25	125	34
033438	**DWLNR 2525 M08**	RH	WN_0804	25	25	32	150	34
033439	**DWLNR 3232 P08**	RH	WN_0804	32	32	40	170	34

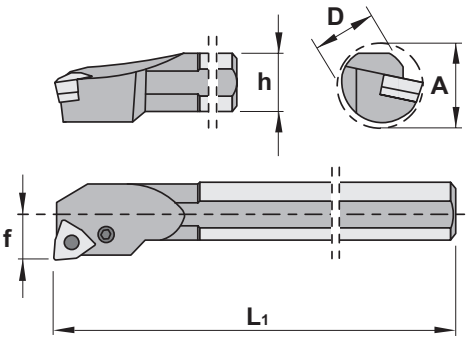


D Style External Toolholder
for Negative Inserts:
WN_0604, & WN_0804
Application: O/D Face and Turn
Axial Approach 95°
Axial -6°
Radial -6°
Profiling Clearance Angle β = 0°
RH Holder Shown

DWLNL/R Spare Parts												
Item Description	Clamp Screw EDP		Clamp EDP		Clamp Spring EDP		Anvil EDP		Anvil Screw EDP		Clamp & Anvil Screw Key	
DWLNL/R 2020 K06	033711	1695	033709	DC2708	033720	4294	030973	IWSN323	033718	1764	018286	KH5003
DWLNL/R 2525 M06												
DWLNL/R 2020 K08	033710	1696	033707	DC2712	033719	4295	009251	IWSN433	033716	1766	018287	KH5004
DWLNL/R 2525 M08												
DWLNL/R 3232 P08												

S..PWLN 95°





S.. PWLN LH & RH Internal Boring Bars									
EDP	Item Description	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	h	Through Coolant
033450	**S16R PWLNL 06**	LH	WN_06	20	16	11	200	15	
033451	**S20S PWLNL 06**	LH	WN_06	27	20	13	250	18	
033452	**S25T PWLNL 06**	LH	WN_06	31	25	17	300	23	
033453	**S16R PWLNR 06**	RH	WN_06	20	16	11	200	15	
033454	**S20S PWLNR 06**	RH	WN_06	27	20	13	250	18	
033455	**S25T PWLNR 06**	RH	WN_06	31	25	17	300	23	
033456	**S25T PWLNL 08**	LH	WN_08	31	25	17	300	23	
033457	**S32U PWLNL 08**	LH	WN_08	39	32	22	350	30	
034457	***S40V PWLNL 08**	LH	WN_08	48	40	27	400	37	
033458	**S25T PWLNR 08**	RH	WN_08	31	25	17	300	23	
033459	**S32U PWLNR 08**	RH	WN_08	39	32	22	350	30	
033460	***S40V PWLNR 08**	RH	WN_08	48	40	27	400	37	

* Non Stock Items, subject to extended delivery time

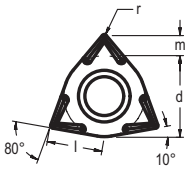


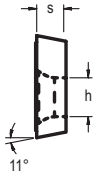
P Style External Toolholder
for Negative Inserts:
WN_0604 & WN_0804
Application:- O/D Face and Turn
Axial Approach 95°
Axial -6°
Raial -13,5°
Profiling Clearance Angle β = 0°
RH Bar Shown

S.. PWLNL/R Spare Parts												
Item Description	Lever EDP		Lever Screw EDP		Anvil EDP		Anvil Clip EDP		Clip Punch EDP		Key EDP	
S16R PWLNL/R 06	022652	PL8216	028741	PLS1605	-	-	-	-	-	-	028578	KH5002
S20S PWLNL/R 06												
S25T PWLNL/R 06	017442	PL8009	017447	PLS1606	028460	PA3007	034503	PC4109	028053	PCP0009	018285	KH5025
S25T PWLNL/R 08	028047	PL8312	022625	PLS1648	-	-	-	-	-	-	018286	KH5003
S32U PWLNL/R 08	017443	PL8012	017448	PLS1608	028461	PA3008	017453	PC4112	028054	PCP0012		
***S40V PWLNL/R 08**												

* Non Stock Items, subject to extended delivery time

WPMT
61 Geometry







EDP	ISO Description	Grade	Dimensions (mm)					Material	Application
			d	l	s	r_ε	h		
032293	**WPMT020102E-61**	SP4019	3,97	2,92	1,59	0,20	1,95		Finishing
032291	**WPMT050304E-61**	SP4019	7,94	5,43	3,18	0,40	3,40		Finishing

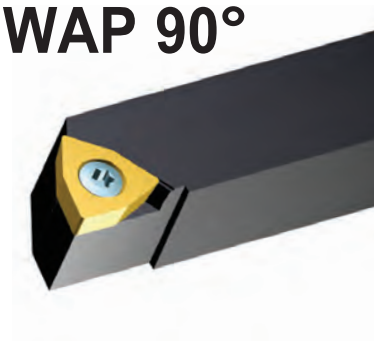
For Toolholders External: see page 173 | Internal: see page 174

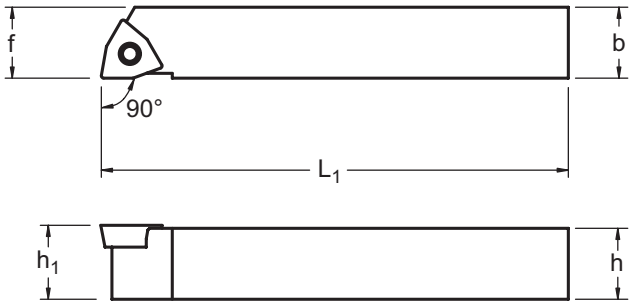
Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

SWAP 90°





SWAP LH & RH External Square Shank Toolholders								
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)				
				$h = h_1$	b	f	L_1	L_2
025257	**SWAPL 1212 F05**	LH	WP_05	12	12	12,5	80	-
025256	**SWAPR 1212 F05**	RH	WP_05	12	12	12,5	80	-

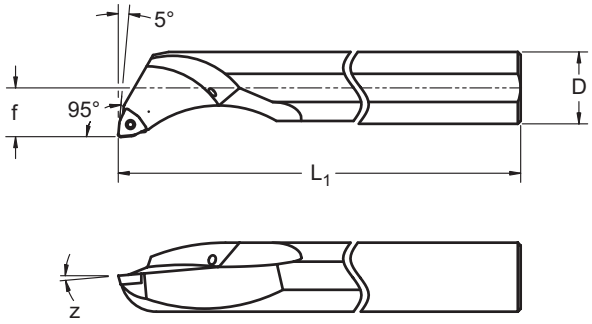


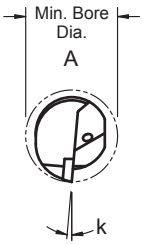
S Style External Toolholder
for Positive Inserts: WPMT_0503
Application: Face & Turn O/D
Approach Angle 90°
Axial 0°
Radial 0°
Profilling Clearance Angle β = 7°
RH Holder Shown

SWAPL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
SWAPL/R 1212 F09	*017032*	A3006T	*013214*	T9	-	-	-	-

SWLP 95°







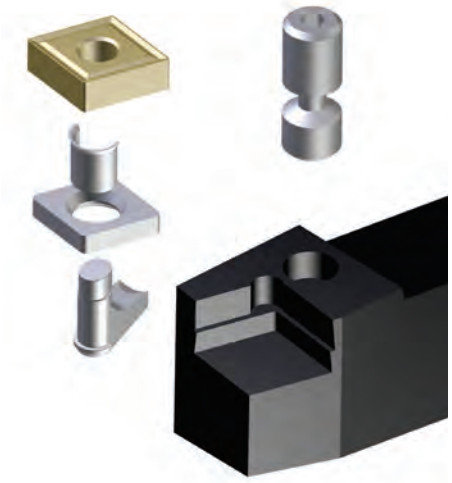
A.. SWLP LH & RH Internal Boring Bars									
EDP	**Item Description**	Hand	Insert Sizes	Dimensions (mm)					
				Min Bore Ø A	ØD	f	L_1	L_2	Through Coolant
033688	**S06F SWLPL 02**	LH	WP_0201	7,50	6,00	3,20	80,00	-	
018450	**A08H SWLPL 02**	LH	WP_0201	11,00	8,00	6,00	100,00	-	
018451	**A10H SWLPL 02**	LH	WP_0201	13,00	10,00	7,00	100,00	-	
033689	**S06F SWLPR 02**	RH	WP_0201	7,50	6,00	3,20	80,00	-	
018327	**A08H SWLPR 02**	RH	WP_0201	11,00	8,00	6,00	100,00	-	
018328	**A10H SWLPR 02**	RH	WP_0201	13,00	10,00	7,00	100,00	-	
018453	**A12K SWLPL 05**	LH	WP_0503	16,00	12,00	9,00	125,00	-	
033690	**A12K SWLPR 05**	RH	WP_0503	16,00	12,00	9,00	125,00	-	



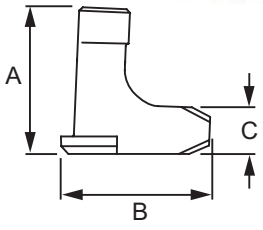
S Style Boring Bar
for Positive Inserts:
WP0503 & WP0201
Application: Facing and Profiling
Approach Angle 95°
Axial 0°
Radial 5°
Profilling Clearance Angle β = 0°
RH Boring Bar Shown

SWLPL/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
S06F SWLPL/R 02	*018489*	55F1803T	*018487*	T6	-	-	-	-
A08H SWLPL/R 02								
A10H SWLPL/R 02								
A12K SWLPL/R 05	*017032*	A3006T	*013214*	T9	-	-	-	-

P - Lever Lock (Negative Inserts)





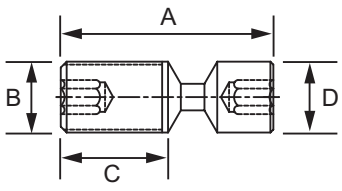


This system has a pivoted lever which tilts when the clamping screw is adjusted pulling the insert back against the pocket walls, for a strong location for the insert, with no obstruction to the chip flow. Also only one key is needed to facilitate the installation and removal of the insert.

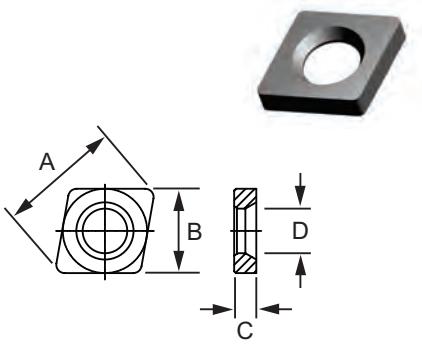


Lever Lock				
EDP	**Item Description**	Dimensions (mm)		
		A	B	C
017442	**PL8009**	12	10,2	3,4
017443	**PL8012**	13,1	13,5	4,2
017445	**PL8016**	17,1	16,5	5,4
017446	**PL8019**	20,8	20,4	7,3
028408	**PL8025**	25,2	25,7	8,2
034475	**PL8110**	11,7	11	4
034476	**PL8112**	13,3	13	4,4
034477	**PL8116**	18	18,6	6,7
034478	**PL8120**	18,7	20,4	6,7
034479	**PL8125**	23	24	7,5
028742	**PL8212**	12,1	13,4	4,7
022652	**PL8216**	9,5	10,1	3,4
028047	**PL8312**	13,2	13,5	4,2
017444	**PL8415**	14,7	16,2	5,1

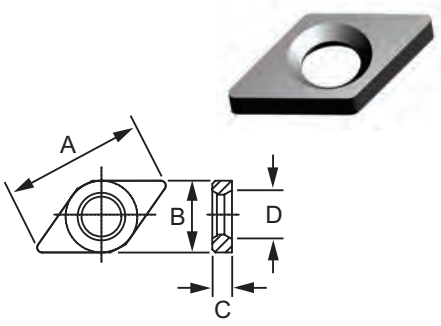




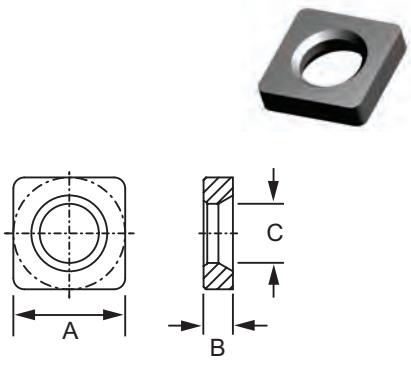
Lever Screws					
EDP	**Item Description**	Dimensions (mm)			
		A	B	C	D
028741	**PLS1605**	12	M5x0,8	6,10	M5x0,8
017447	**PLS1606**	16,7	M6x1	8,65	M6x1
017448	**PLS1608**	20,7	M8x1	8,75	M8x1
028409	**PLS1612**	36	M12x1	17,30	M12x1
017450	**PLS1618**	22,5	M8X1	11,25	M8X1
017449	**PLS1638**	21,1	M8X1	10,35	M8X1
022625	**PLS1648**	17	M8X1	9,1	M8X1
017451	**PLS1610**	27,2	M10x1	13,35	M10x1
028743	**PLS1626**	13,4	M6x1	8	M6x1
034480	**PLS1705**	14	M5x0,8	8,1	M5x0,8
034481	**PLS1706**	20,7	M6x1	12,65	M6x1
028458	**PLS1708**	23,5	M8X1	11,25	M8X1
034482	**PLS1710**	30,4	M10x1	16,35	M10x1



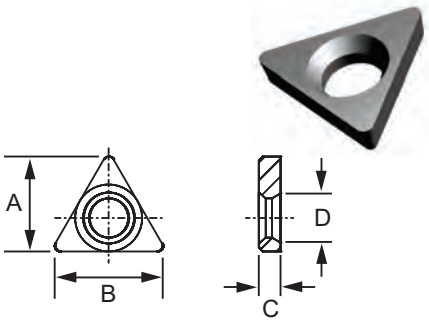
Anvils C-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
017456	**PA3612**	17,16	11,68	3,18	6,8
017457	**PA3616**	20,9	10,94	4,76	9,5
034483	**PA3625**	36	24,9	6,6	12,8



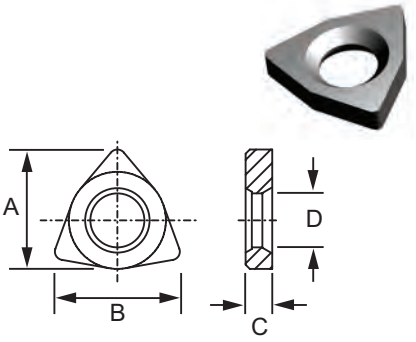
Anvils D-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
028376	**PA3711**	17	8,5	2,7	4,9
017459	**PA3715**	23,4	11,6	3,18	6,4



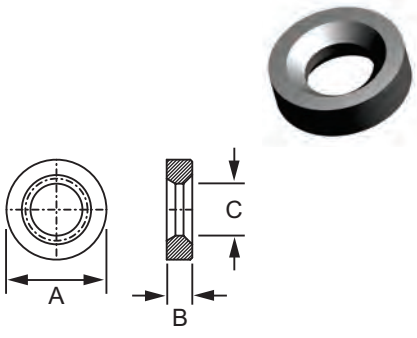
Anvils S-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
017460	**PA3512**	11,66	3,18	6,35
017461	**PA3515**	14,5	4,76	7,9
017462	**PA3519**	18,1	4,76	7,9
028416	**PA3525**	24,6	4,76	13



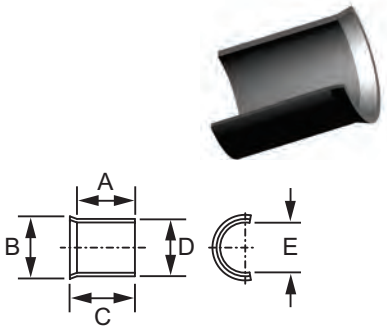
Anvils T-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
017463	**PA3416**	11,98	13,52	2,76	4,9
017464	**PA3422**	16,6	18,92	3,18	6,4



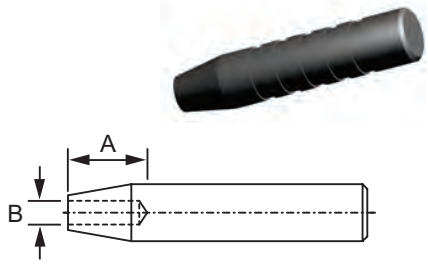
Anvils W-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
028460	**PA3007**	10,85	11,3	3,18	6,4
028461	**PA3008**	15,2	15,88	3,18	6,4



Anvils R-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
034484	**PA3810**	8,34	3,18	4,9
034485	**PA3812**	9,9	3,18	4,9
034486	**PA3816**	13,55	4,76	6,4
034487	**PA3820**	17,25	4,76	8,05
034488	**PA3825**	21,9	6,35	9,6
034489	**PA3925**	24,8	6,35	12,9
001670	**IRSN84**	25,15	6,35	14,5



Clips						
EDP	**Item Description**	Dimensions (mm)				
		A	B	C	D	E
034503	**PC4109**	4,6	5,76	5,2	4,9	4,4
028417	**PC4110**	6,1	5,6	6,8	4,9	3,8
017453	**PC4112**	5,2	7	5,8	6,6	5,5
028051	**PC4115**	7,7	9	8,7	8,2	7
034504	**PC4116**	8,5	6,82	9,1	6,5	5,4
017455	**PC4119**	9,8	10,57	11	9,7	8,5
028418	**PC4125**	9,7	14,7	11,8	13,2	10,5

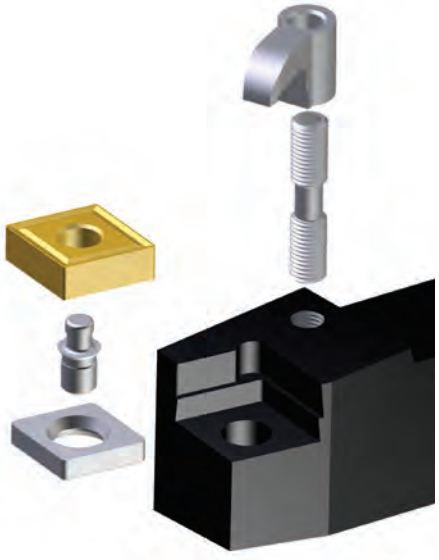


Clip Fixing Pin			
EDP	**Item Description**	Dimensions (mm)	
		A	B
028053	**PCP009**	9	4
028054	**PCP0012**	9	4,750
034505	**PCP0015**	12	6,5
028056	**PCP0019**	12	8
034506	**PCP0025**	20	12,5



Keys		
EDP	**Item Description**	mm
028578	**KH5002**	2
018286	**KH5003**	3
018287	**KH5004**	4
018288	**KH5005**	5
018285	**KH5025**	2,5

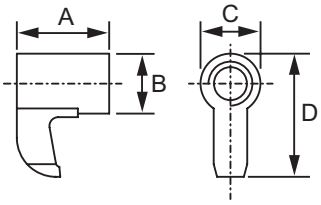
M - Clamp Lock (Negative Inserts)



The combination of lock pin and top clamp makes this one of the most secure clamping systems available. The lock pin locates the insert against the pocket wall while the top clamp secures the insert down.

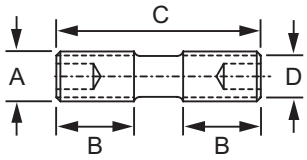






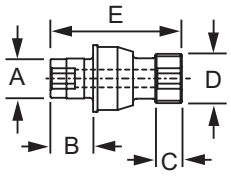
M Style Clamps					
EDP	**Item Description**	Dimensions (mm)			
		A	B	C	D
030974	**CL6**	10,90	3,99	7,62	14,73
029071	**CL12**	16,6	5,99	10,77	22,50
028996	**CL20**	13	5,31	9,35	18,34
029072	**CL22**	13,36	5,99	9,35	21,74
029073	**CL30**	16,84	5,84	10,74	24,64
034490	**CL2613**	13,5	-	9,5	18,5
034491	**CL2614**	13,5	-	9,5	21,7
034492	**CL2616**	13,5	-	9,5	24



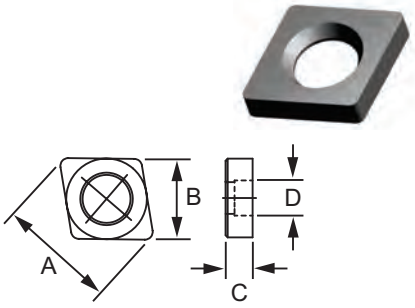


Clamp Screws					
EDP	**Item Description**	Dimensions (mm)			
		A	B	C	D
029074	**XNS36**	-	6,99	19,17	-
029075	**XNS47**	-	6,78	20,5	-
028997	**XNS48**	-	4,6	25,4	-
029076	**XNS510**	-	5,31	31,7	-
028575	**1086**	M6x1 (LH)	11,4	29,4	M6x1 (RH)
034493	**1186**	M6x1 (LH)	7,11	20,50	M6x1 (LH)

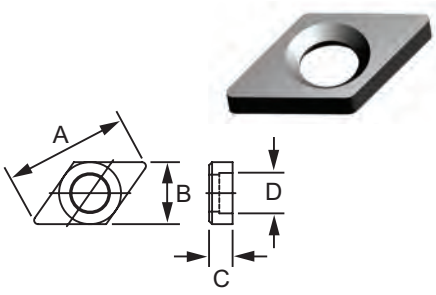




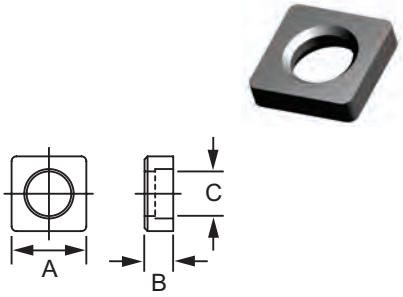
NL Pins						
EDP	**Item Description**	A	B	C	D	E
		mm	mm	mm	mm	Thread Form
004703	**NL33L**	5,00	14,71	5,21	6,71	8-32 UNC
004705	**NL34L**	3,66	13,13	5	2,69	10-32L
004707	**NL44**	5	13,2	5,4	3,2	1/4-28 UNC
004708	**NL46**	5	13,2	5,4	3,2	1/4-28 UNC
004710	**NL58**	6,25	22	6,9	5,3	5/16-24 UNC
004713	**NL68**	6,25	22	6,9	4,8	3/8-24
004716	**NL810**	9	29,69	9,8	5,58	7/16-20
034511	**1665**	3,68	13	5	2,3	M5X0,8



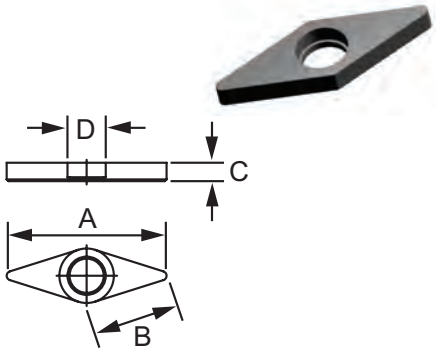
Anvils C-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
029079	**ICSN432**	18,39	12,45	4,75	7,44
001685	**ICSN533**	22,94	15,62	4,75	9,78



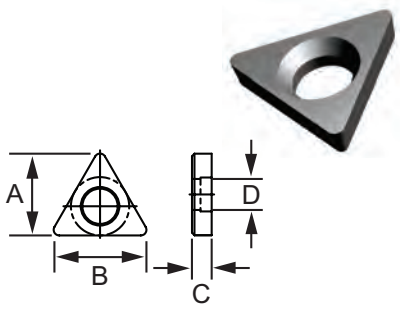
Anvils D-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
001689	**IDSN433**	25,07	12,57	4,76	7,47



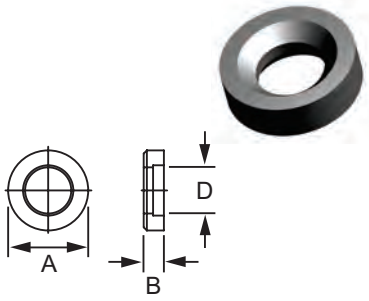
Anvils S-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
001704	**ISSN433**	12,45	4,75	7,49
001707	**ISSN533**	15,65	4,75	9,83
001709	**ISSN633**	18,72	4,75	11,38



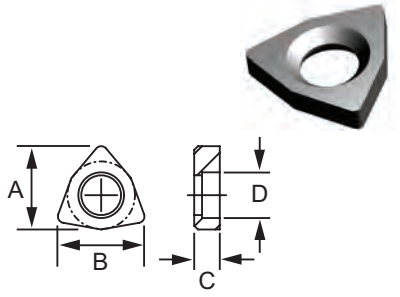
Anvils V-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
001695	**IVSN322**	28,70	9,19	3,18	5,99



Anvils T-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
001714	**ITSN323**	12,9	14,6	3,18	5,9
001718	**ITSN433**	17,3	19,7	4,76	7,4



Anvils R-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
001670	**IRSN84**	25,15	6,35	14,5



Anvils W-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
009251	**IWSN433**	15,34	16,00	4,76	7,416



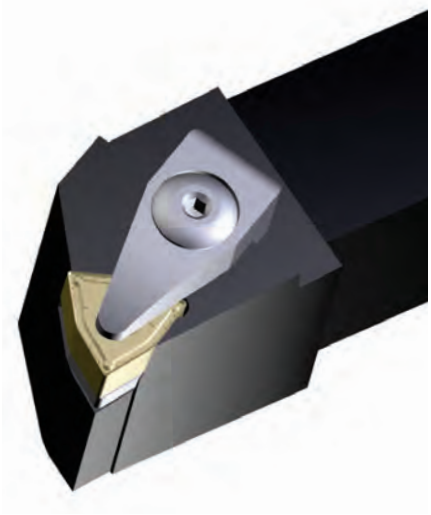
Keys		
EDP	Item Description	mm
028578	**KH5002**	2
018286	**KH5003**	3
018285	**KH5025**	2,5

D - Dimple Lock (Negative Inserts)

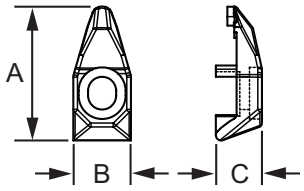


This system combines a pull back pin and top clamp in one, using a wedge action to locate the insert into the pocket, with the clamp screw pulling down on the insert. This clamping method provides a strong and rigid set-up, with the added benefit of only one key for replacement of inserts.

The “D” clamping system ensures zero insert movement during high feed or heavy interrupted machining, due to its accurate positioning that holds the insert securely clamped.

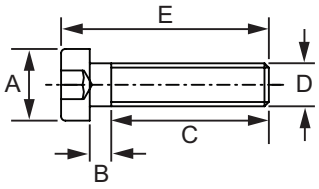






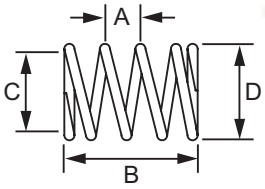
D Style Clamps				
EDP	**Item Description**	Dimensions (mm)		
		A	B	C
034494	**DC 2312**	28,90	14,00	12,00
033709	**DC 2708**	24,90	10,90	9,20
033707	**DC 2712**	29,00	12,50	10,00
034495	**DC 2716**	33,80	13,00	10,50
033708	**DC 2719**	35,20	13,50	10,50



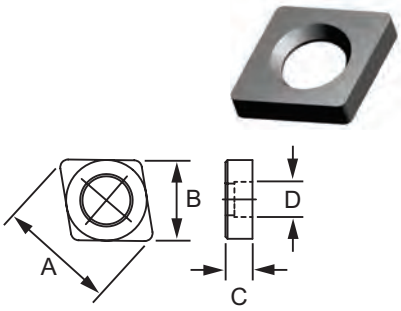


Clamp Screws						
EDP	**Item Description**	Dimensions (mm)				
		A	B	C	D	E
033711	**1695**	8,4	-	20	M5x0,8	23,5
033710	**1696**	9,8	-	25	M6x1	29
034512	**1907**	10,7	10,6	14	M7X0,75	27,5

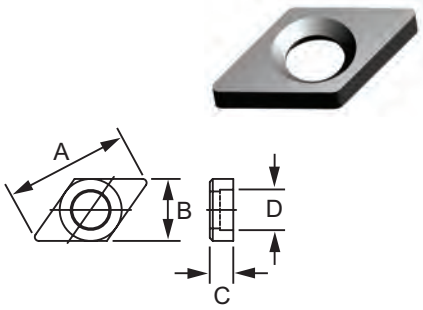




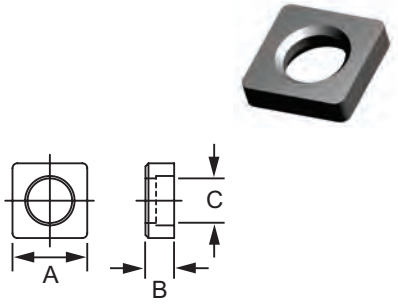
Clamp Spring					
EDP	**Item Description**	Dimensions (mm)			
		A	B	C	D
033720	**4294**	3	11,20	5	6,50
033719	**4295**	3,50	13	7	9,50



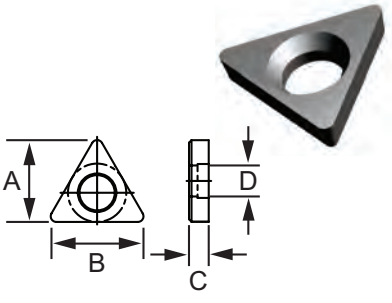
Anvils C-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
017456	**PA3612**	17,17	11,68	3,18	6,81
029079	**ICSN432**	18,39	12,45	4,75	7,44
033712	**ICSN442**	18,39	12,45	6,35	7,44
001685	**ICSN533**	22,94	15,62	4,75	9,78
001686	**ICSN633**	25,527	18,8	4,76	11,3



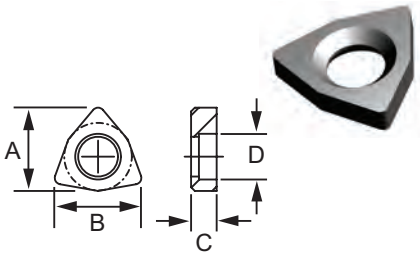
Anvils D-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
034496	**IDSN-322**	18,72	9,40	3,18	6,48
001689	**IDSN-433**	25,66	12,57	4,76	7,40



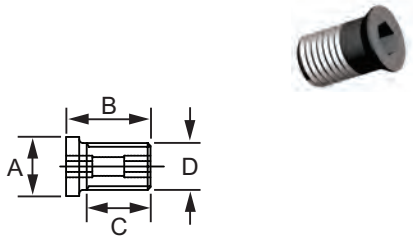
Anvils S-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
001704	**ISSN433**	12,45	4,75	7,49
033715	**ISSN442**	12,45	6,35	7,49
001707	**ISSN533**	15,65	4,76	9,83
001709	**ISSN633**	18,72	4,76	11,38



Anvils T-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
033714	**ITSN342**	12,93	14,63	3,18	5,99



Anvils W-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
030973	**IWSN323**	11,32	11,82	3,18	5,89
009251	**IWSN433**	15,35	15,95	4,76	7,4



Anvil Screw					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
034507	**1160**	8	13,5	9,5	M6x1
034508	**1161**	8	10,5	6,5	M6x1
033718	**1764**	6,20	9,00	7,60	M5x0,8
029095	**1765**	7,5	10	6	M6x0,75
033716	**1766**	7,8	13,0	10,6	1/4 -26
034509	**1768**	10,5	15,5	13,3	M8x1
033717	**1770**	11,90	15,00	12,80	3/8 -24



Keys		
EDP	Item Description	mm
018287	**KH5004**	4
018285	**KH5025**	2,5
018286	**KH5003**	3

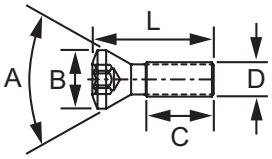
S - Screw Lock (Positive Inserts)



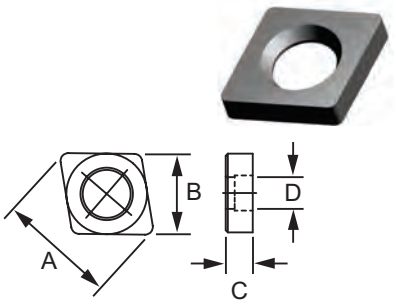
This innovated system was first introduced into the marketplace by Stellram as Posicut® S - Style. Its benefits are secure clamping, repeatability, minimal number of spare parts and no obstruction of the chip flow. Which make this ideal for internal boring bars and places were accessibility is limited.



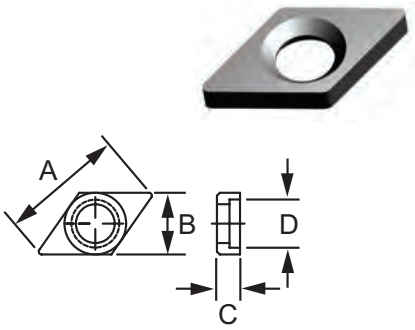




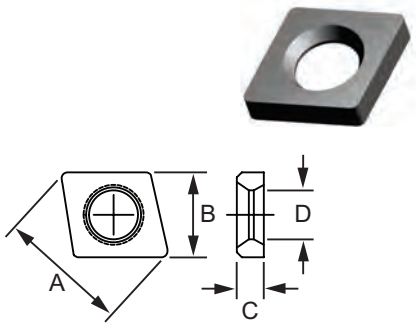
Insert Screws						
EDP	**Item Description**	Dimensions (mm)				
		A	B	C	L	D
017032	**A3006T**	48°	4,4	4	6	M3x0,5
023081	**A5025T**	43°	6,6	6,9	25	M5x0,8
015059	**F2004T**	43°	3	2,50	4,50	M2x0,4
015060	**F2505T**	43°	3,8	3,5	5	M2,5x0,45
015061	**F2507T**	43°	3,8	4	7	M2,5x0,45
015262	**D4010T**	43°	5,1	5,1	10	M4x0,7
034497	**1335**	55°	5,30	10,20	15	M3,5x0,6
034498	**1425**	55°	3,30	3	5,50	M2,5x0,45
034499	**1440**	55°	5,30	4	7	M4x0,7
034500	**1540**	60°	6,80	7,90	14,10	M4x0,7
015063	**F3008T**	48°	4,4	5	8	M3x0,5
018489	**55F1803T**	55°	2,75	1,60	3,30	M1,8x0,2



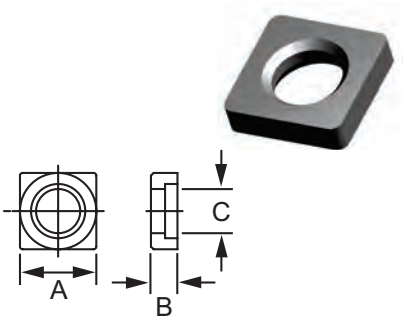
Anvils C-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
028571	**SA3614**	17,40	11,40	39,50	6,50



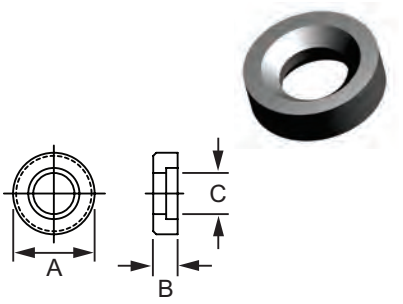
Anvils D-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
028477	**SA3714**	17,48	8,50	3,18	6,60



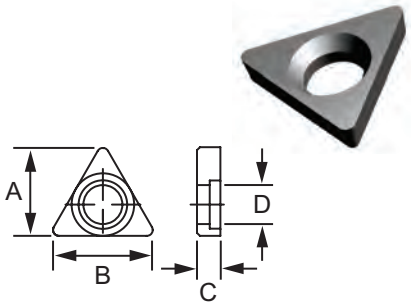
Anvils E-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
029091	**SA3712**	16,9	11,0	3,18	6,5



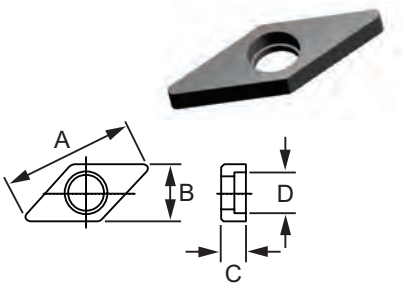
Anvils S-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
028738	**SA3514**	11,40	3,96	8,10



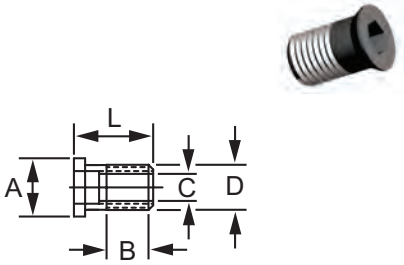
Anvils R-Style				
EDP	Item Description	Dimensions (mm)		
		A	B	C
034501	**SA3811**	8,80	3,18	6,60
034502	**SA3814**	10,60	3,18	6,60



Anvils T-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
028580	**SA3414**	11,95	13,55	3,18	6,60



Anvils V-Style					
EDP	Item Description	Dimensions (mm)			
		A	B	C	D
028740	**SA3718**	26,4	8,4	3,18	5,5



Anvil Screw						
EDP	Item Description	Dimensions (mm)				
		A	B	L	C	D
028478	**SAS1750**	6,25	5	8,5	M3,5x0,6	M5x0,5
028739	**SAS1760**	7,60	5,5	10	M4x0,5	M6x0,75
029095	**1765**	7,5	6	10	M4x0,5	M6x0,75



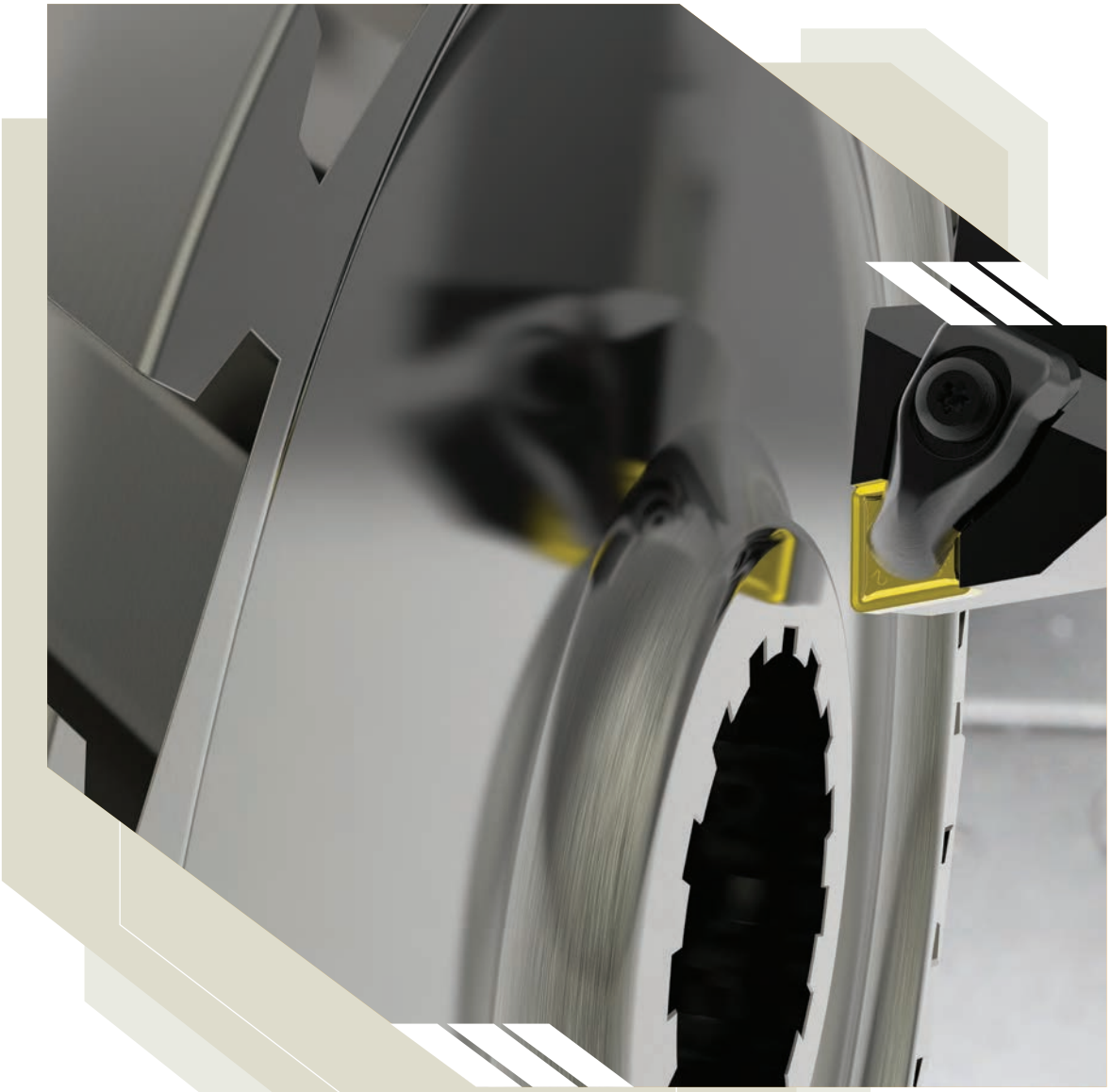
Torx Driver		
EDP	Item Description	Torx Number
018487	**T6**	T6
018488	**T7**	T7
013214	**T9**	T9
015240	**T15**	T15
028475	**K5516**	T16
034577	**K5517**	T17
015241	**T20**	T20

Turning



All Stellram's products are supported by a confident and technical sales team backed by an extensive customer care policy.

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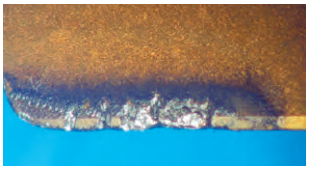
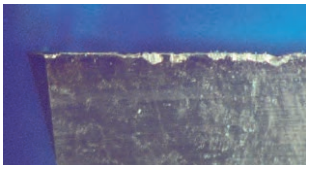
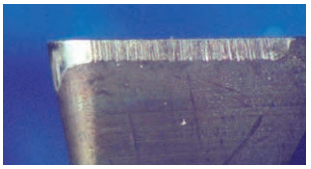
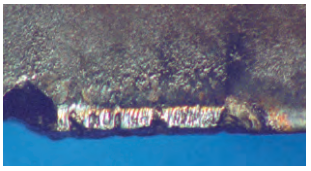
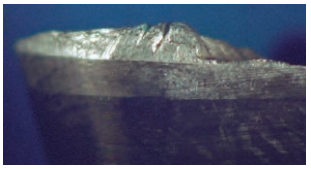
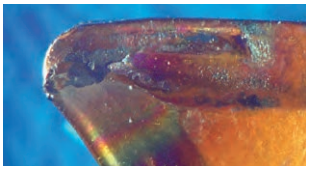


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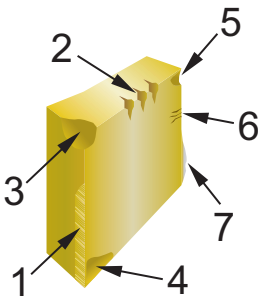
Please contact us for additional information on any of the products illustrated in this catalog or any other part of Stellram's comprehensive tooling program.

TOLL FREE CUSTOMER SERVICE & TECHNICAL HELPLINE

UNITED KINGDOM	TEL: **0800 731 6660**	FAX: **0800 731 6662**
SUISSE ROMANDE	TEL: **0800 807 778**	FAX: **0800 807 701**
DEUTSCHE SCHWEIZ	TEL: **0800 807 721**	FAX: **0800 807 701**
SVIZZERA ITALIANA	TEL: **0800 807 722**	FAX: **0800 807 701**

Cause	Correction	Failure
Intermittent heating of the cutting edge. High V_C and high volume metal removal.	**A** Use a heat resistant grade increased TaC. **B** Use positive rake tools. **C** Increase nose radius. **D** Reduce in the following order: surface speed, feed or depth of cut. **E** Avoid use of coolant.	 **Thermal Cracking**
Cutting tool excessively brittle. Tool too hard for application conditions.	**A** Use a tougher grade. **B** Use negative rake angle inserts. **C** Increase nose radius. **D** Use increased edge land. **E** Increase cutting speed.	 **Chipping**
Grade not hard enough for application. High surface speed.	**A** Use a harder, more wear resistant grade. **B** Decrease surface speed. **C** Increase feed. **D** Use coolant.	 **Excessive Flank Wear**
Notching occurs at depth of cut line. Usually due to work hardened surface, scale or abrasion.	**A** Increase approach angle to maximum. **B** Increase nose radius for shallow cuts. **C** Reduce V_C surface speed and feed. **D** Vary the depth of cut.	 **Notching**
Surface speed too low for material being machined.	**A** Increase surface speed. **B** Use inserts that reduce friction. i.e. TiALN PVD Coated **C** Use high lubricity coolant.	 **Built-Up-Edge**
Heavy feed or high surface speed.	**A** Reduce surface speed. **B** Reduce feed. **C** Use a harder grade. **D** Use a more heat resistant grade.	 **Deformation**
Excessive heat and pressure causing chip to weld to rake angle.	**A** Use a harder grade. **B** Reduce surface speed. **C** Reduce feed. **D** Increase the rake angle.	 **Crater Wear**

N°	Failure type	
1	Flank wear	Physical
2	Chipping	
3	Partial fracture	
4	Crater wear	Chemical
5	Deformation	
6	Thermal Crack	
7	Built up edge	

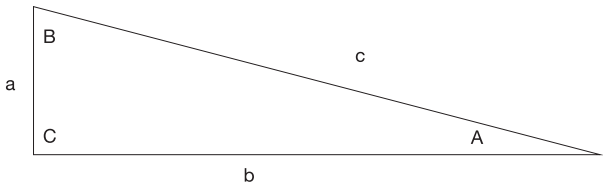


Formula

V_c	=	$\frac{D_m \times \pi \times n}{1000}$	**Cutting speed (m/min)**
n	=	$\frac{V_c \times 1000}{Dm \times \pi}$	**Spindle speed (rev/min)**
P_c	=	$\frac{V_c \times a_p \times f_n \times k_c}{60 \times 1000 \times \eta}$	**Power demand (kW)**
Q_z	=	$V_c \times f_n \times a_p$	**Metal removal (cm^3/min)**
T_c	=	$\frac{l_m}{f_n \times n}$	**Period of engagement (min)**

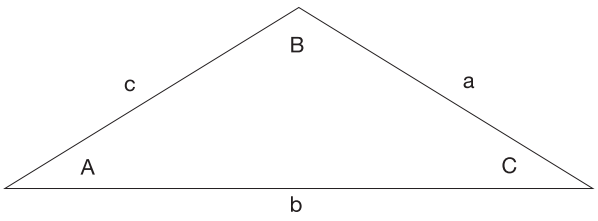
Terminology

D_m	=	Machined diameter	mm
V_c	=	Cutting speed	m/min
n	=	Spindle speed	rev/min
T_c	=	Period of engagement	min
Q_z	=	Metal removal	cm^3/min
l_m	=	Machined length	mm
P_c	=	Power demand	kW
K_c	=	Specific cutting force	N/mm^2
f_n	=	Feed per revolution	mm/rev
k_r	=	Cutting edge angle	degree
R max	=	Profile depth	µm
r_ε	=	Insert nose radius	mm
a_p	=	Depth of cut	mm
η	=	Efficiency	



Trigonometrical Equivalents

Dimension Given	Part to be Found				
	A	B	a	b	c
a & c	sin A = a ÷ c	cos B = a ÷ c		$b = \sqrt{c^2 - a^2}$	
a & b	tan A = a ÷ b	cos B = a ÷ b			$c = \sqrt{a^2 + b^2}$
c & b	cos A = b ÷ c	sin B = b ÷ c	$a = \sqrt{c^2 - b^2}$		
A & a		B = 90° - A		b = a x cot A	c = a ÷ sin A
A & b		B = 90° - A	a = b x tan A		c = b ÷ cos A
A & c		B = 90° - A	a = c x sin A	b= c x cos A	



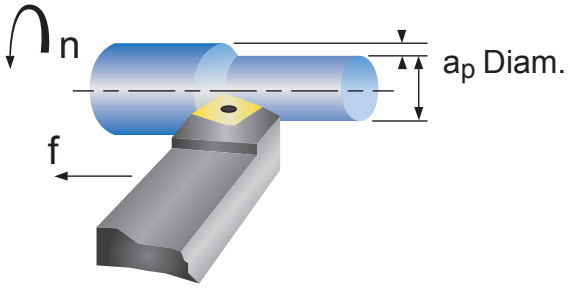
Trigonometrical Equivalents

Dimension Given	Parts to be Found	Formula
a b c	A	$\cos A = b^2+c^2-a^2 \div 2bc$
a b A	B	sin B = b x sin A ÷ a
a b A	C	C = 180 - (A + B)
a A B	b	b = a x sin B ÷ sin A
a A B	c	c = (a x sin C ÷ sin A) x (a x sin (180 - A - B) ÷ sin A)
a b C	B	B = 180 - (A + C)

Cutting Data

In the turning operation we can distinguish three important elements:

- Work piece' s rotation at a determined speed of the spindle, "n"
- linear movement of the tool at a determined feed, "f"
- Cut depth, a_p



Terminology

Vc - Indicated in meters/min. It refers to the speed at the insert edge removing the material at the periphery of the work piece. The cutting speed is related to the diameter of the work piece.

F - Defined in mm/rev and it is the distance covered by the tool during every rotation of the work piece. "f"- refers to the distance covered by the tool in a one minute, that is the feed vf (mm/min)

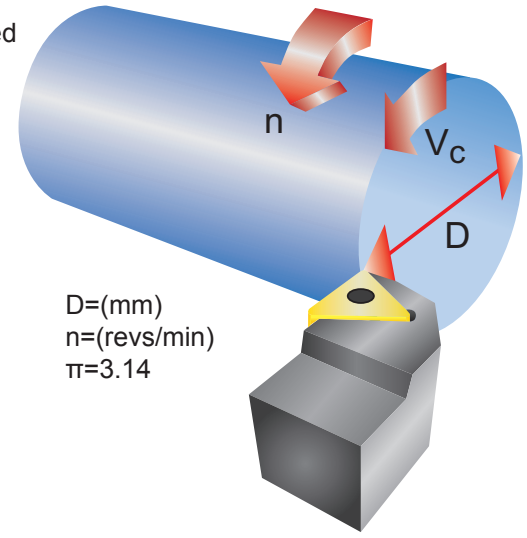
-ap - Depth of Cut

Cutting Parameters

The spindle speed n is the number of rotations the work piece rotates in one minute and it is indicated in revolutions/minute.

The Surface Speed can be calculated with the following formula:

D=Diameter
n=Spindle speed
π=Constant



D=(mm)
n=(revs/min)
π=3.14

Formula

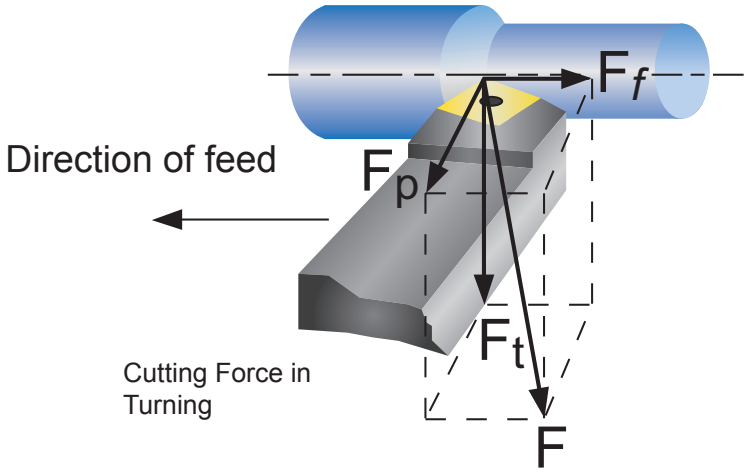
Volume "Q": Metal Removal Rate
This value takes into consideration Vc, Ap and feed to calculate the amount of material removed.

Q in3/min = Vc x fp x ar
Q in3/min = 12 x ar x f x vc = 1
Q in3/min = n x IPR X Doc = 4248 (3)

Metric

$$V_c = \frac{D \times \pi \times n}{1000} \quad \textbf{(m/min)}$$

Calculations of Cutting Forces



* The specific cutting force (kc) is constant for each material. It is unique for each material and it refers to the material machinability. See catalog page 198.

Calculations of Power

The availability for the power calculation for the material removal is particularly important for roughing, so it is necessary to verify if the machine's power is enough for the application.

The parameters for the power calculation are v_c and F_c.

The machine efficiency η, is also a factor to be considered referring to the energy loss because of the drive and the motor efficiency. This value is between 0,7-0,9 depending on the machine.

Terminology

The main force **F** can be split into 3 different forces:

F_t(N)= Tangential force, downward and usually the largest

F_f (N)= Axial force or feed force, toward the longitudinal axis of the workpiece

F_p (N)= Radial force on the perpendicular of the centre line of the workpiece

Formula

Values F_f and F_p are affected by the approach angle, the cutting depth and the nose radius of the tool. The following formula can be used for the tangential cutting force:

$$Fc = Kc \times a_r \times f$$

in which:
Kc = Specific cutting force(N/mm2)*
a_r = Cutting depth (mm)
f = Feed (mm/rev)

Formula

The formula for the net cutting power calculation is:

$$P = \frac{Vc \times F_c}{\eta \times 60 \times 1000} \quad (KW)$$

$$\text{Where } F_c = a_p \times f \times K_c$$

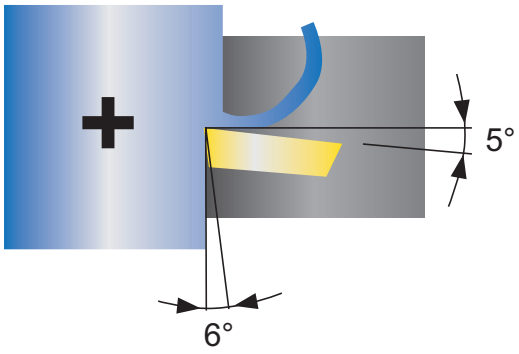
$$\text{then } P = \frac{Vc \times a_p \times f \times K_c}{\eta \times 60 \times 1000} \quad (KW)$$

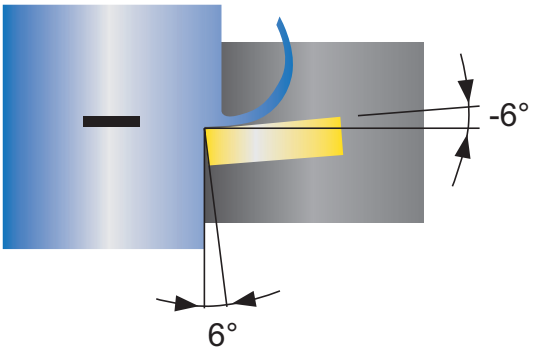
KW to HP conversion: 1 KW = 1.34102209 hp

ISO	Materials	Rm	Kc:N/mm²
P	Unalloyed Steel	400-600 N/mm² 120-180 HBN	2050
		600-950 N/mm² 180-200 HBN	2300
	Alloyed Steel	700-950 N/mm² 200-280 HBN	2599
		950-1200 N/mm² 280-355 HBN	2851
		1200-1400 N/mm² 355-415 HBN	3172
	Tool Steel	1200-1400 N/mm² 355-415 HBN	3895
M	Stainless Steel	Austenitic + Ferritic 300 series	1847
		Martensitic 400 series	2599
	PH Stainless	Refractory P.H.	3199
K	Cast Iron	Grey GG-Ft	1200
		Spheroidal-Ductile GGG-FGS	1500
		Nodular GGGNi - L- N	1600
		Malleable GTS - MN/MP	1050
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HBN	827
		Aluminium + Silicon > 16% 92 HBN	965
S	High Temperature Alloys	Iron Based	2999
		Cobalt Based	3799
		Nickel Based	3500
		Titanium Based 425-456 HBN	1500

Top Rake

Positive: Produces low shearing stress and may eliminate vibration during finish machining, machining of long workpieces, or poor workholding.



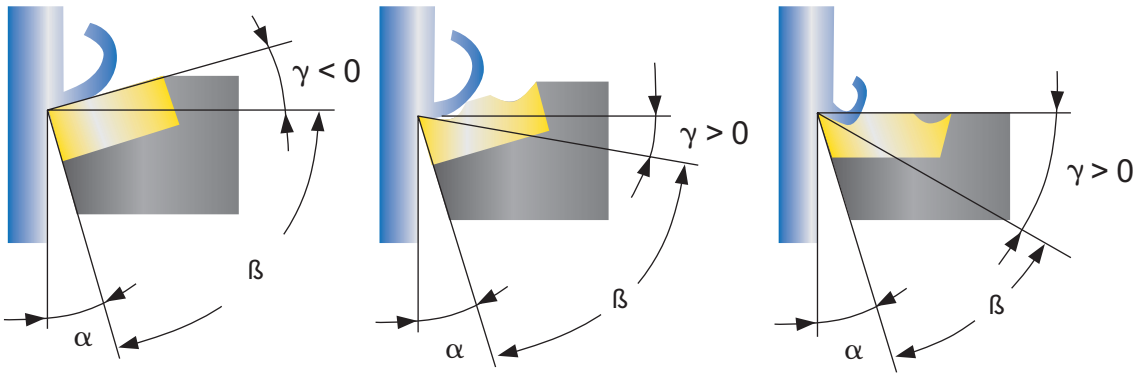


Negative: Produces larger shearing stress which causes a high chip strain. It is much stronger in comparison to the positive rake and requires good workpiece and tool stability.

Effective Cutting Angle

The position of the insert seat determines the cutting rake:

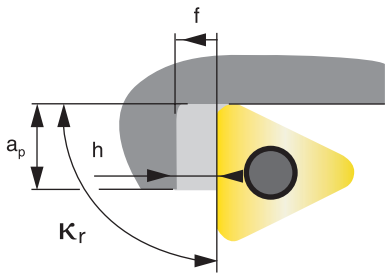
- This can be negative or 0°.
- The effective cutting angle is also determined by the insert geometry located on the seat, as this could be flat face or a chip breaker and it could change the effective cutting angle.
- The effective cutting angle is the sum of the angle in the insert seat and the geometry of the seated inserts.



The approach angle or attack angle is very important because it influences the tool life.

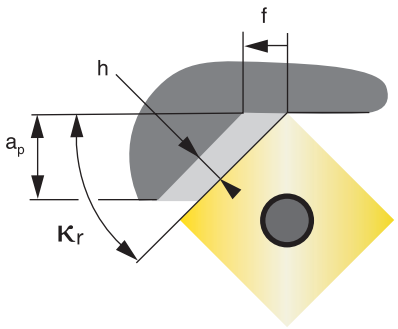
In the first picture we can see how it affects the chip thickness.

h = f



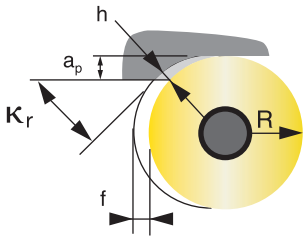
$\kappa_r = 90°$

h = f. sin [K_r]



$\kappa_r < > 90°$

h = 2f. Root [(a_p/2R). (1-a_p/2R)]

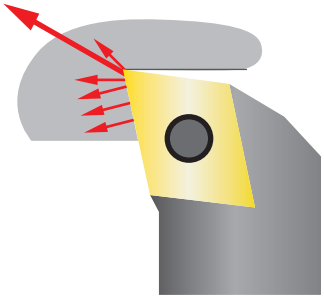


κ_r = cos-1. [1-a_p/R]

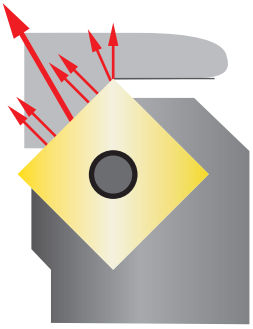
- h is the same as the feed f when the entering angle is 90°or equal to the sin of the approach angle * f
- A 45° approach angle will produce a lower chip thickness with a higher feed

In the second picture we can see the effect on cutting the force distribution.

$\kappa_r = 95°$



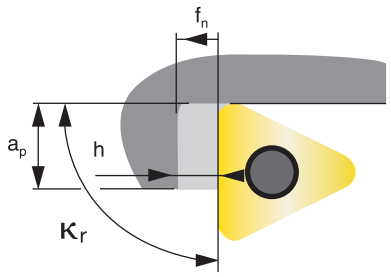
$\kappa_r = 45°$



- In the first case the first contact is between the workpiece and the insert point, and it is focused on the radius making the situation difficult
- On the second case, the approach angle on the workpiece is softer and the cutting forces, are distributed in a more uniform way, and not directly on the insert point.

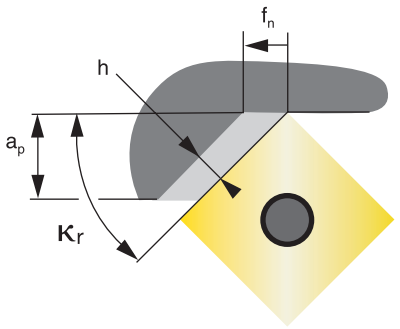
When deciding on the maximum depth of cut (a_p) for a given insert, the angle of the principal edge plays a significant role in the type of the chip formed. For an angle close to 90°, the thickness of the chip will be equal to the feed. In the other cases, it will be necessary to calculate it.

$h = f$



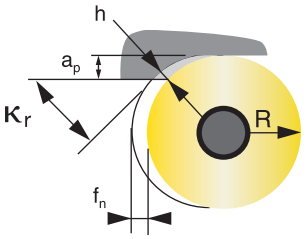
$\kappa_r = 90°$

$h = f \sin [\kappa_r]$



$\kappa_r < 90°$

$h = 2f \sqrt{[(a_p/2R).(1-a_p/2R)]}$



$\kappa_r = \cos\text{-}1.\ [1-a_p/R]$

The type of insert used plays a significant role in the rigidity of the cutting edge. A cutting edge angle of kr 75° or 45° allows for difficult machining operations, i.e. interrupted and heavy roughing, but reduces the capacity to machine profiles. The most robust insert shape is round and the most fragile standard insert is the 35°diamond (V).

The size and type of insert determines the maximum depth of cut. In general, it is advisable to select a cutting edge length in relation to the maximum depth of cut to be machined.

Cutting Edge Length for a given depth of cut (a_p) and κ_r angle

A low depth of cut can still generate a large edge engagement

κ_r/a_p	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00
90	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00
75	1,04	2,06	3,10	4,14	5,18	6,20	7,24	8,28	9,32	10,34
60	1,14	2,31	3,45	4,62	5,77	6,93	8,08	9,25	10,39	11,56
45	1,42	2,82	4,24	5,66	7,06	8,48	9,91	11,30	12,73	14,15
30	2,00	4,00	6,00	8,00	10,00	12,00	14,00	16,00	18,00	20,00

Radius Value / Surface Finish

The radius of the insert has a significant role to play in the quality of the surface finish, which is directly in relation to the feed rate (fn). With a larger radius, better surface finishes can be maintained at higher feeds. The use of a larger radius gives a larger surface contact area and causes an increase in power and cutting force.

For roughing operations, it is preferable to choose a large radius to ensure corner strength of the insert. However, for some materials it is preferable to use a smaller radius to maintain a softer cut. The insert is more fragile but can qualify for operations that are sensitive to vibration.

Generally an insert is used with a maximum feed equal to half its radius. The minimum feed is related to edge preparation or to the start of its chip control. An increase in cutting speed can also contribute to surface quality.

Formula

The formula to calculate the feed rate:

$$f_n = \sqrt{\frac{R_{max} \times 8\, r_\varepsilon}{10^6}}$$

$$R_{max} = \frac{f_n \times 10^6}{8 \times r_\varepsilon}$$

The mean value Ra, can be calculated with following formula:

$$R_a = \frac{f_n^2 \times 50}{r_\varepsilon}$$

Average value of feed for each radius

Radius (mm)	0,4	0,8	1,2	1,6	2,4
f (mm/turn)	0,12-0,25	0,25-0,5	0,36-0,7	0,5-1	0,7-1,6

Rmax = **profile depth**

r_ε = **nose radius**

f_n = **feed**

In finishing operations the insert radius and the feed effect the superficial roughness and the dimensional accuracy.

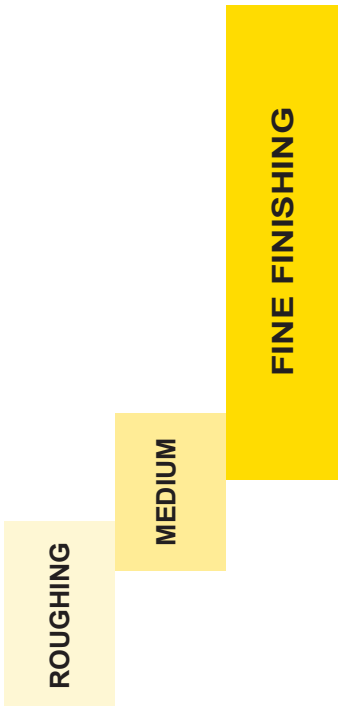
Surface finishing		Radius of insert				
Ra	Rt	0,4	0,8	1,2	1,6	2,4
µm	µm	f mm/r				
0,60	2	0,07	0,10	0,12	0,14	0,17
1,60	4	0,11	0,15	0,19	0,22	0,26
3,20	10	0,17	0,24	0,29	0,34	0,42
6,30	16	0,22	0,30	0,37	0,43	0,53
8,00	25	0,27	0,38	0,47	0,54	0,66

Surface finishing		Diameter of round inserts				
Ra	Rt	10	12	16	20	25
µm	µm	f mm/r				
0,60	2	0,25	0,28	0,32	0,36	0,40
1,60	4	0,40	0,44	0,51	0,57	0,63
3,20	10	0,63	0,69	0,80	0,89	1,00
6,30	16	0,80	0,83	1,01	1,13	1,26
8,00	25	1,00	1,10	1,26	1,42	1,51

Summary: Value of Ra & Rt based on the radius value and feed.

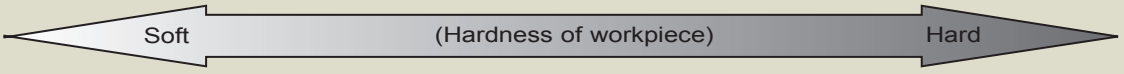
Conversion Value Chart for Surface Finishing

R_{max}	R_a = CLA = AA		RMS		Operation
µm	µm	µinch	µm	µinch	
1,6	0,30	11.8	0,33	13.1	
1,8	0,35	13.8	0,39	15.3	
2,0	0,40	15.7	0,44	17.4	
2,2	0,44	17.5	0,49	19.4	
2,4	0,49	19.2	0,54	21.3	
2,6	0,53	20.8	0,59	23.1	
2,8	0,58	22.7	0,64	25.2	
3,0	0,63	24.6	0,70	27.3	
3,5	0,71	27.8	0,79	30.9	
4,0	0,80	31.4	0,89	34.8	
4,5	0,90	35.2	1,00	39.1	
5,0	0,99	38.8	1,10	43.1	
6,0	1,20	47.2	1,30	52.4	
7,0	1,40	55.1	1,50	61.2	
8,0	1,60	63.0	1,80	70.0	
9,0	1,80	71.0	2,00	78.8	
10,0	2,00	79.0	2,20	87.7	
15,0	3,20	126.0	3,10	140.0	
20,0	4,40	173.0	4,90	192.0	
25,0	5,80	238.0	6,40	264.0	
27,0	6,30	247.0	7,00	274.0	
30,0	7,40	292.0	8,20	324.0	
35,0	8,80	346.0	9,80	384.0	
40,0	10,70	422.0	11,00	468.0	
45,0	12,50	485.0	13,90	538.0	
50,0	14,00	552.0	15,50	613.0	



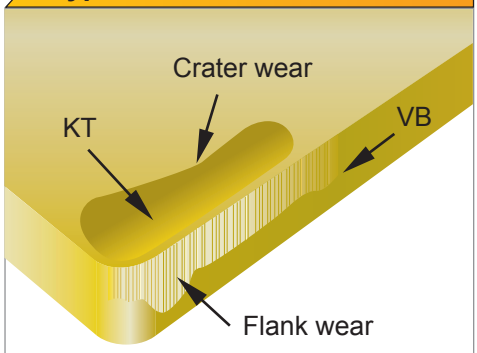
Difference of hardness (HBN):
When the hardness of a workpiece is different from the value shown in the grade speed charts, multiply the cutting speed you have obtained by the factor below to calculate a new cutting speed.

Workpiece Hardness and Cutting Speeds



ISO/ANSI	120HBN	140HBN	160HBN	180HBN	200HBN	220HBN	240HBN	260HBN	280HBN	300HBN	320HBN	340HBN
P	1,42	1,25	1,13	1,0	0,93	0,86	0,75	0,71	0,66	-	-	-
M	1,40	1,22	1,10	1,0	0,93	0,86	0,80	0,70	0,69	-	-	-
K	1,40	1,34	1,30	1,25	1,20	1,10	1,05	1,0	0,94	0,90	0,85	0,82

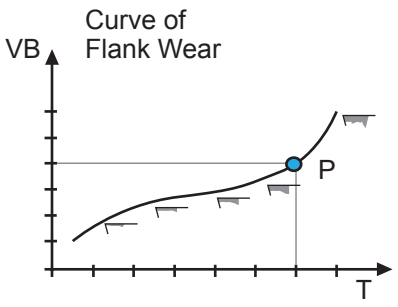
Types of Wear



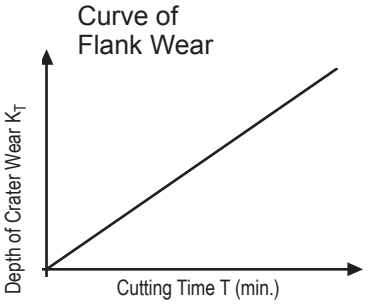
VB= Width of flank wear

KT= Depth of crater wear

Trend of Crater and Flank Wear Based on Cutting Time



P= Point where sudden wear starts and the limit of normal and safe use



Crater wear is more progressive and does not have a sudden breakdown

Factors that could Influence the Tool Life

Tool life depends on many factors, including the type of clamp, type of coolant, (percentage of mix) and type of machine tool. Following, you will see how the surface speed and other data can influence tool life.

Chart “A” below, shows how a different surface speed (Vc) can influence the tool life of the insert. The higher the Vc, the lower the acceptable time life is where V1>V2>V3>V4 you can see respectively that T4>T3>T2>T1.

Chart “B” shows how the wear is influenced by the higher machining data.

Chart A

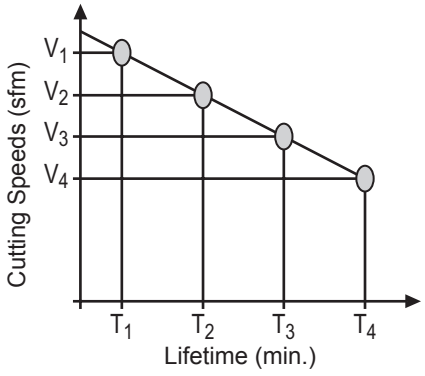
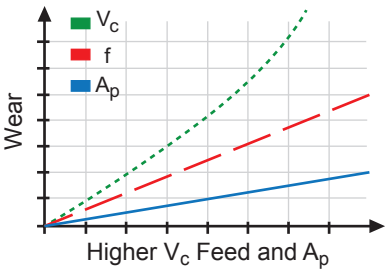


Chart B



Tool Life Criteria

We change the insert when

- It does not create the requested finish or tolerances.
- When the wear under the cutting edge line is too high, causing premature failure
- When the crater depth on the insert face is excessive, causing premature failure
- When the power consumption increases suddenly during the cut

Hardness Comparison Chart

Tensile strength	Vickers	Brinell	Rockwell	
N/mm^2	HV	HBN	HRC	HRB
255	80	76,0	-	-
270	85	80,7	-	41,0
285	90	85,5	-	48,0
305	95	90,2	-	52,0
320	100	95,0	-	56,2
350	110	105	-	62,3
385	120	114	-	66,7
415	130	124	-	71,2
450	140	133	-	75,0
480	150	143	-	78,7
510	160	152	-	81,7
545	170	162	-	85,0
575	180	171	-	87,5
610	190	181	-	89,5
640	200	190	-	91,5
660	205	195	-	92,5
675	210	199	-	93,5
690	215	204	-	94,0
705	220	209	-	95,0
720	225	214	-	96,0
740	230	219	-	96,7
770	240	228	20,3	98,1
800	250	238	22,2	99,5
820	255	242	23,1	-
835	260	247	24,0	(101)
850	265	252	24,8	-
865	270	257	25,6	(102)
900	280	266	27,1	-
930	290	276	28,5	(105)
950	295	280	29,2	-
965	300	285	29,8	-
995	310	295	31,0	-

Tensile strength	Vickers	Brinell	Rockwell
N/mm^2	HV	HBN	HRC
1030	320	304	32,2
1060	330	314	33,3
1095	340	323	34,4
1125	350	333	35,5
1155	360	342	36,6
1190	370	352	37,7
1220	380	361	38,8
1255	390	371	39,8
1290	400	380	40,8
1320	410	390	41,8
1350	420	399	42,7
1385	430	409	43,6
1420	440	418	44,5
1485	460	437	46,1
1555	480	450	47,7
1595	490	457	48,4
1630	500	465	49,1
1665	510	474	49,8
1700	520	482	50,5
1740	530	489	51,1
1775	540	496	51,7
1810	550	503	52,3
1845	560	511	53,0
1880	570	520	53,6
1920	580	527	54,1
1955	590	533	54,7
1995	600	538	55,2
2030	610	543	55,7
2070	620	549	56,3
2105	630	555	56,8
2145	640	561	57,3
2180	650	568	57,8

HV = Vickers hardness
HBN = Brinell hardness
HRC = Rockwell hardness, C scale
HRB = Rockwell hardness, B scale

Notes:

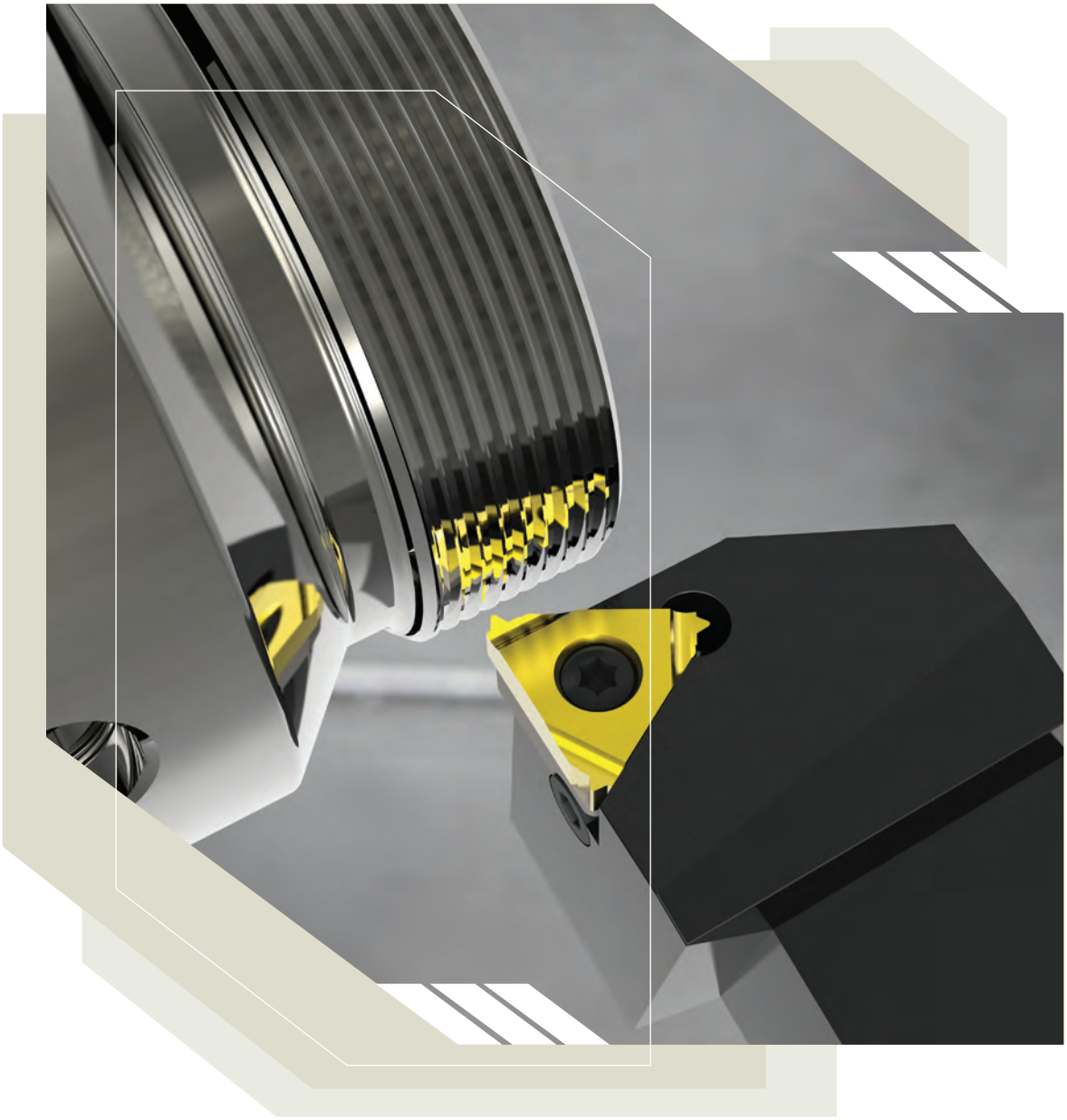
Threading



All Stellram's products are supported by a confident and technical sales team backed by an extensive customer care policy.

stellram.com

Threading



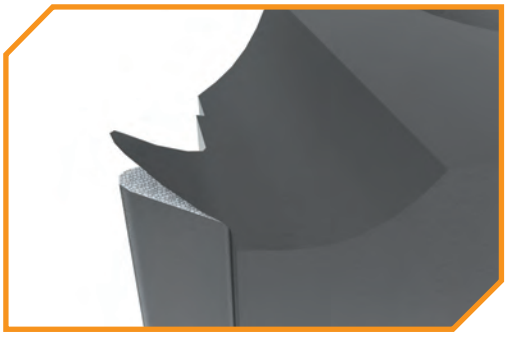
Stellram's comprehensive threading program is available in a wide range of thread forms. Partial and full profile inserts are offered for thread turning.

Stellram offers high performance grades suitable for all machining applications, in a wide range of materials, for maximum productivity.

Stellram offers both external toolholders and internal bars with through coolant. Internal holders to a minimum bore of 6,0mm. Anti vibration holders are also available for difficult applications.

Threading Grade Descriptions

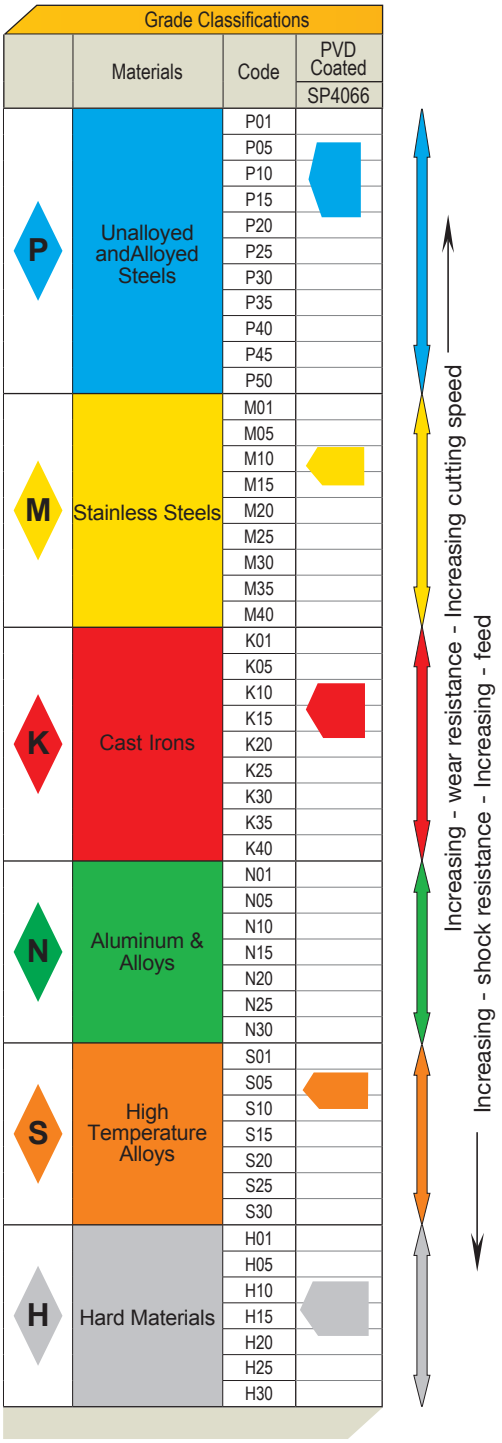
SP4066 has the perfect balance between wear resistance and toughness enabling multiple applications to be covered by one insert. This new grade also allows for longer tool life and is ideal for machining a variety of materials at elevated cutting speeds.



Cutting Speed v_c

ISO	Materials	Rm and Hardness	SP4066 m/min min. - max.
P	Unalloyed Steel	<600 N/mm² <180 HBN	230 - 485
		<950 N/mm² <280 HBN	150 - 315
	Alloyed Steel	700-950 N/mm² 200-280 HBN	135 - 290
		950-1200 N/mm² 280-355 HBN	115 -240
		1200-1400 N/mm² 355-415 HBN	75 - 165
M	Stainless Steel	Austenitic + Ferritic 300 series	155 - 330
		Martensitic 400 series	160 - 340
	PH Stainless	Refractory P.H.	80 - 175
K	Cast Iron	Grey GG-Ft	225 - 480
		Spheroidal-Ductile GGG-FGS	195 - 415
		Malleable GTS - MN/MP	130 - 280
S	High Temperature Alloys	Iron Based	35 - 70
		Cobalt Based	30 - 60
		Nickel Based	30 - 60
		Titanium Based	45 - 95

Optimum Grade Performance



Thread Form Index

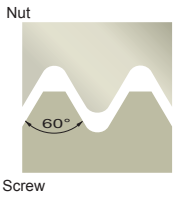
Partial Profile 55°



W, BSPT

PAGES **214**

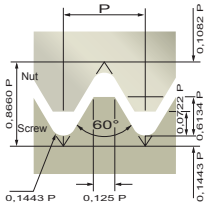
Partial Profile 60°



ISO, UN

PAGES **215** - **216**

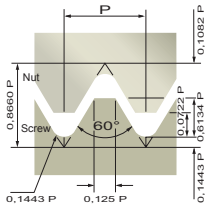
ISO Metric



ISO

PAGES **217** - **221**

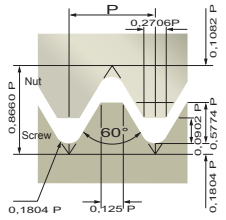
American Unified



UN

PAGES **222** - **224**

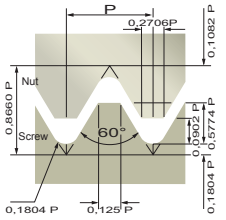
Unified J Form



UNJ

PAGE **225**

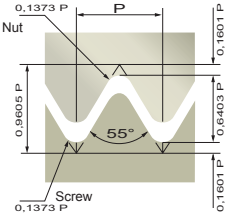
Metric J Form



MJ

PAGE **226**

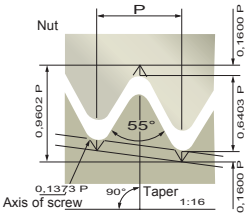
British Standard Whitworth



W

PAGES **227** - **228**

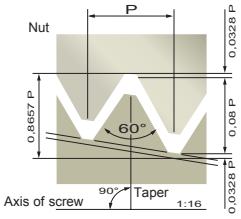
British Standard Pipe Taper Thread



BSPT

PAGE **229**

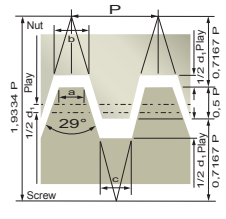
National Taper Pipe Thread



NPT

PAGE **230**

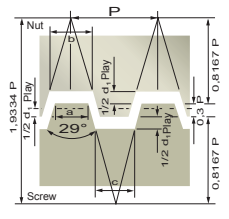
ACME



ACME

PAGE **231**

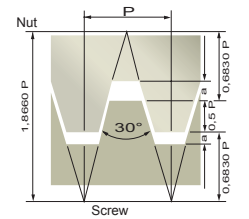
STUB ACME



STUBACME

PAGE **232**

Trapezoidal (DIN 103)

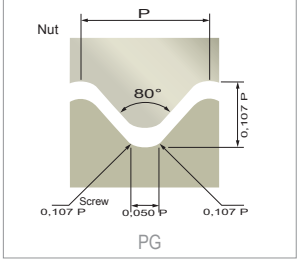


TR

PAGE **233**

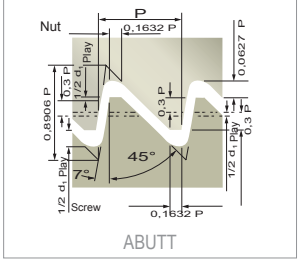
Thread Form Index

Panzer Gewinde (DIN 40431)



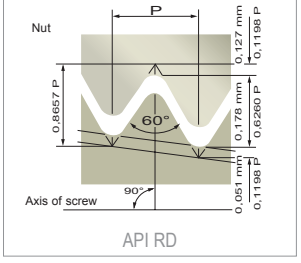
PAGE **234**

American Buttress 45/7°



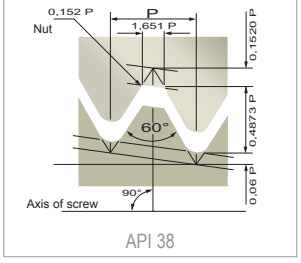
PAGES **235** - **236**

API Casing & Tubing Round



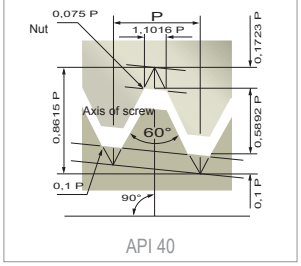
PAGE **237**

API V0.038



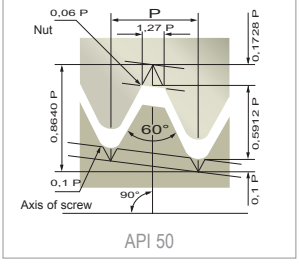
PAGES **238** - **239**

API V0.040



PAGES **238** - **239**

API V0.050



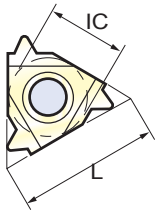
PAGES **238** - **239**

NOTE: Other thread forms available by quotation.

Threading Insert Designation

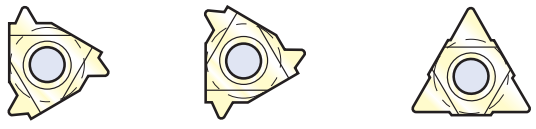
16	E	R	20
1	2	3	4

1 Size



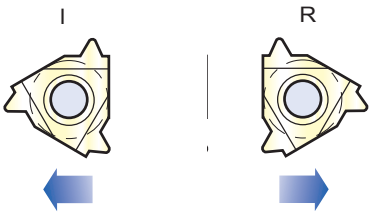
L mm	IC Inch
06	5/32
08	3/16
11	1/4
16	3/8
22	1/2
22U	1/2U
27	5/8
27U	5/8U

2 Utilisation



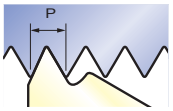
External Internal Neutral

3 Design



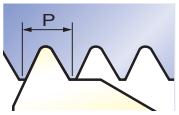
Left Hand Right Hand

4 Thread Pitch or TPI



Partial Profile 60° or 55°

	Thread Pitch mm			Thread Pitch TPI		
A	0,5	-	1,5	48	-	16
G	1,75	-	3	14	-	8
AG	0,5	-	3	48	-	8
N	3,5	-	5	7	-	5
Q	5,5	-	6	4 1/2	-	4
U (22)	5,5	-	8	4 1/2	-	3 1/4
U (27)	6,5	-	9	2 3/4	-	4



Full Profile
0,35 to 8,0 mm (72-3 TPI)
Pitch sizes stated on all
thread form part numbers

Threading Insert Designation

UN 5 **-** 6 **GRADE** 7

5 Thread Form

Partial Profile			Full Profile		
	60°	**60**		60°	**MJ**
	55°	**55**		60°	**NPT**
				60°	**NPTF**
Full Profile					
	45°/7°	**ABUTT**		60°	**PAC**
	29°	**ACME**		80°	**PG**
	60°	**API RD**		30°	**RD**
	60°	**API**		3°/30°	**SAGE**
	47,5°	**BA**		29°	**STACME**
	45°/7°	**BBUTT**		30°	**TR**
	55°	**BSPT**		60°	**UN**
	3°/10°	**BUTT**		60°	**UNJ**
	12°	**ELC**		3°/10°	**VAM**
	60°	**ISO**		55°	**W**

6 Other

SC — Swarf control style

M T Z — Multi-tooth style and number of teeth

7 Type of Grade

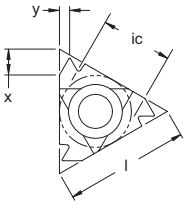
For grade descriptions, refer to page: **209**

55° Partial Profile

External Partial Profile 55° Form

For British Standard Whitworth & British Standard Parallel Pipe

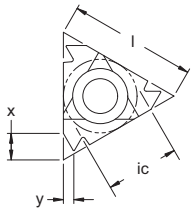




External Right Hand		**Partial Profile 55°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033826	16	**16ERA55**	SP4066	0,5 - 1,5	48 - 16	0,07	0,80	0,90
033828	16	**16ERAG55**	SP4066	0,5 - 3,0	48 - 8	0,07	1,20	1,70
033830	16	**16ERG55**	SP4066	1,75 - 3,0	14 - 8	0,25	1,20	1,70

Internal Partial Profile 55° Form

For British Standard Whitworth & British Standard Parallel Pipe



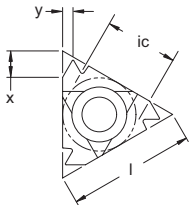
Internal Right Hand		**Partial Profile 55°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033763	8	**08IRA55**	SP4066	0,5 - 1,5	48 - 16	0,07	0,60	0,70
032048	11	**11IRA55**	SP4066	0,5 - 1,5	48 - 16	0,07	0,80	0,90
033865	16	**16IRAG55**	SP4066	0,5 - 3,0	48 - 8	0,07	1,20	1,70
033867	16	**16IRG55**	SP4066	1,75 - 3,0	14 - 8	0,13	1,20	1,70

60° Partial Profile

External Partial Profile 60° Form

For Unified & ISO metric thread forms





External Right Hand		**Partial Profile 60°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033827	16	**16ERA60**	SP4066	0,5 - 1,5	48 - 16	0,09	1,20	1,70
033829	16	**16ERAG60**	SP4066	0,5 - 3,0	48 - 8	0,10	1,20	1,70
033831	16	**16ERG60**	SP4066	1,75 - 3,0	14 - 8	0,15	1,20	1,70
033884	22	**22ERN60**	SP4066	3,5 - 5,0	7 - 5	0,48	1,70	2,50

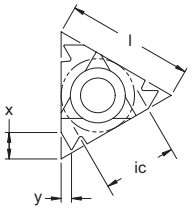
External Left Hand		**Partial Profile 60°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033772	16	**16ELAG60**	SP4066	0,5 - 3,0	48 - 8	0,10	1,20	1,70

60° Partial Profile

Internal Partial Profile 60° Form

For Unified & ISO metric thread forms





Internal Right Hand		**Partial Profile 60°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033739	6	**06IRA60**	SP4066	0,5 - 1,25	48 - 20	0,70	0,60	0,80
033764	8	**08IRA60**	SP4066	0,5 - 1,5	48 - 16	0,09	0,60	0,70
032045	11	**11IRA60**	SP4066	0,5 - 1,5	48 - 16	0,15	0,80	0,90
033864	16	**16IRA60**	SP4066	0,5 - 1,5	48 - 16	0,10	1,20	1,70
033866	16	**16IRAG60**	SP4066	0,5 - 3,0	48 - 8	0,10	1,20	1,70
033868	16	**16IRG60**	SP4066	1,75 - 3,0	14 - 8	0,15	1,20	1,70
033899	22	**22IRN60**	SP4066	3,5 - 5,0	7 - 5	0,32	1,70	2,50

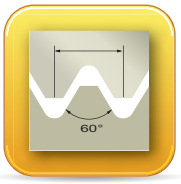
Internal Left Hand		**Partial Profile 60°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033766	11	**11ILA60**	SP4066	0,5 - 1,5	48 - 16	0,15	0,80	0,90

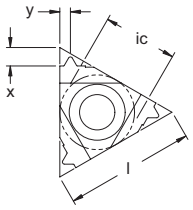
ISO Metric

External ISO Metric

Standard reference: ISO 262 (DIN 13)

Tolerance class: 6g / 6H



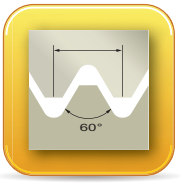


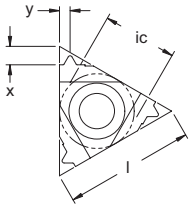
External Right Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm	mm
033773	16	**16ER0.35ISO**	SP4066	0,35	-	0,06	0,80	0,40
033775	16	**16ER0.4ISO**	SP4066	0,40	-	0,07	0,70	0,40
033774	16	**16ER0.45ISO**	SP4066	0,45	-	0,08	0,70	0,40
033776	16	**16ER0.5ISO**	SP4066	0,50	-	0,08	0,60	0,60
033777	16	**16ER0.6ISO**	SP4066	0,60	-	0,09	0,60	0,60
033779	16	**16ER0.7ISO**	SP4066	0,70	-	0,10	0,60	0,60
033778	16	**16ER0.75ISO**	SP4066	0,75	-	0,10	0,60	0,60
033780	16	**16ER0.8ISO**	SP4066	0,80	-	0,13	0,60	0,60
031999	16	**16ER1.0ISO**	SP4066	1,00	-	0,14	0,70	0,70
032000	16	**16ER1.25ISO**	SP4066	1,25	-	0,18	0,80	0,90
032001	16	**16ER1.5ISO**	SP4066	1,50	-	0,22	0,80	1,00
032002	16	**16ER1.75ISO**	SP4066	1,75	-	0,25	0,90	1,20
032003	16	**16ER2.0ISO**	SP4066	2,00	-	0,29	1,00	1,30
033799	16	**16ER2.5ISO**	SP4066	2,50	-	0,36	1,10	1,50
033813	16	**16ER3.0ISO**	SP4066	3,00	-	0,46	1,20	1,60
033814	16	**16ER3.5ISO**	SP4066	3,50	-	0,53	1,60	2,30

ISO Metric

External ISO Metric

Standard reference: ISO 262 (DIN 13)
Tolerance class: 6g / 6H





External Right Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033870	22	**22ER3.5ISO**	SP4066	3,50	-	0,53	1,60	2,30
033871	22	**22ER4.0ISO**	SP4066	4,00	-	0,61	1,60	2,30
033872	22	**22ER4.5ISO**	SP4066	4,50	-	0,68	1,70	2,40
033877	22	**22ER5.0ISO**	SP4066	5,00	-	0,76	1,70	2,50
033880	22	**22ER6.0ISO**	SP4066	6,00	-	0,89	1,80	2,70

External Left Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033767	16	**16EL1.0ISO**	SP4066	1,00	-	0,14	0,70	0,70
033768	16	**16EL1.5ISO**	SP4066	1,50	-	0,22	0,80	1,00
033770	16	**16EL2.5ISO**	SP4066	2,50	-	0,36	1,10	1,50

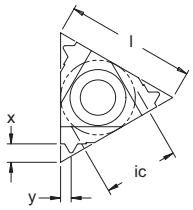
ISO Metric

Internal ISO Metric

Standard reference: ISO 262 (DIN 13)

Tolerance class: 6g / 6H





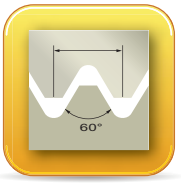
Internal Right Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm	mm
033735	6	**06IR0.5ISO**	SP4066	0,50	-	0,04	0,60	0,50
033736	6	**06IR0.75ISO**	SP4066	0,75	-	0,06	0,60	0,50
033737	6	**06IR1.0ISO**	SP4066	1,00	-	0,80	0,60	0,60
033738	6	**06IR1.25ISO**	SP4066	1,25	-	0,10	0,60	0,70
033741	8	**08IR0.5ISO**	SP4066	0,50	-	0,04	0,60	0,50
033742	8	**08IR0.75ISO**	SP4066	0,75	-	0,06	0,60	0,50
033743	8	**08IR1.0ISO**	SP4066	1,00	-	0,11	0,60	0,60
033744	8	**08IR1.25ISO**	SP4066	1,25	-	0,10	0,60	0,70
033745	8	**08IR1.5ISO**	SP4066	1,50	-	0,11	0,60	1,00
033746	8	**08IR1.75ISO**	SP4066	1,75	-	0,13	0,60	1,00
032067	11	**11IR0.4ISO**	SP4066	0,40	-	0,04	0,80	0,40
032064	11	**11IR0.5ISO**	SP4066	0,50	-	0,04	0,60	0,60
032057	11	**11IR0.75ISO**	SP4066	0,75	-	0,06	0,60	0,60
032042	11	**11IR1.0ISO**	SP4066	1,00	-	0,08	0,60	0,70
032043	11	**11IR1.5ISO**	SP4066	1,50	-	0,11	0,80	1,00
032062	11	**11IR1.75ISO**	SP4066	1,75	-	0,13	0,80	1,00
032051	11	**11IR2.0ISO**	SP4066	2,00	-	0,14	0,80	1,10
032059	11	**11IR2.5ISO**	SP4066	2,50	-	0,18	0,80	1,30

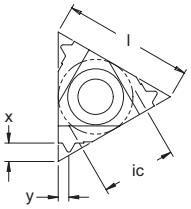
ISO Metric

Internal ISO Metric

Standard reference: ISO 262 (DIN 13)

Tolerance class: 6g / 6H





Internal Right Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm	mm
033833	16	**16IR0.5ISO**	SP4066	0,50	-	0,04	0,60	0,60
033834	16	**16IR0.6ISO**	SP4066	0,60	-	0,05	0,60	0,60
033836	16	**16IR0.7ISO**	SP4066	0,70	-	0,06	0,60	0,60
033835	16	**16IR0.75ISO**	SP4066	0,75	-	0,06	0,60	0,60
033837	16	**16IR0.8ISO**	SP4066	0,80	-	0,06	0,60	0,60
032004	16	**16IR1.0ISO**	SP4066	1,00	-	0,08	0,60	0,70
032005	16	**16IR1.25ISO**	SP4066	1,25	-	0,10	0,80	0,90
032006	16	**16IR1.5ISO**	SP4066	1,50	-	0,11	0,80	1,00
032007	16	**16IR1.75ISO**	SP4066	1,75	-	0,13	0,90	1,20
032008	16	**16IR2.0ISO**	SP4066	2,00	-	0,14	1,00	1,30
033849	16	**16IR2.5ISO**	SP4066	2,50	-	0,18	1,10	1,50
033856	16	**16IR3.0ISO**	SP4066	3,00	-	0,23	1,10	1,50
033857	16	**16IR3.5ISO**	SP4066	3,50	-	0,25	1,20	1,80

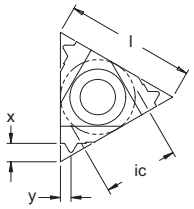
ISO Metric

Internal ISO Metric

Standard reference: ISO 262 (DIN 13)

Tolerance class: 6g / 6H





Internal Right Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm	mm
033885	22	**22IR3.5ISO**	SP4066	3,50	-	0,25	1,60	2,30
033886	22	**22IR4.0ISO**	SP4066	4,00	-	0,33	1,60	2,30
033887	22	**22IR4.5ISO**	SP4066	4,50	-	0,36	1,60	2,40
033892	22	**22IR5.0ISO**	SP4066	5,00	-	0,39	1,60	2,60

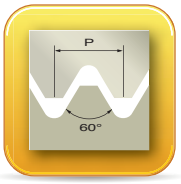
Internal Left Hand		ISO Metric		Pitch	TPI Range	Nose Radius	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm	mm
033740	8	**08IL1.0ISO**	SP4066	1,00	-	0,11	0,60	0,60
033832	16	**16IL1.5ISO**	SP4066	1,50	-	0,11	0,80	1,00

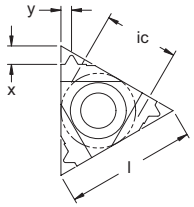
American Unified (UN)

External American Unified (UN)

Standard reference: ANSI B1.1:74

Tolerance class: 2A / 2B





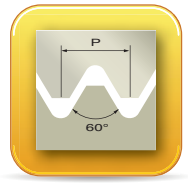
External Right Hand		**American Unified (UN)**		Pitch	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
031995	16	**16ER8UN**	SP4066	3,18	8	0,48	1,20	1,60
033824	16	**16ER9UN**	SP4066	2,82	9	0,38	1,20	1,70
033782	16	**16ER10UN**	SP4066	2,54	10	0,38	1,10	1,50
033784	16	**16ER11UN**	SP4066	2,31	11	0,33	1,10	1,50
031996	16	**16ER12UN**	SP4066	2,12	12	0,29	1,10	1,40
033787	16	**16ER13UN**	SP4066	1,95	13	0,28	1,00	1,30
033788	16	**16ER14UN**	SP4066	1,81	14	0,25	1,00	1,20
033793	16	**16ER16UN**	SP4066	1,59	16	0,22	0,90	1,10
033796	16	**16ER18UN**	SP4066	1,41	18	0,20	0,80	1,00
033802	16	**16ER20UN**	SP4066	1,27	20	0,18	0,80	0,90
033805	16	**16ER24UN**	SP4066	1,06	24	0,17	0,70	0,80
033809	16	**16ER27UN**	SP4066	0,94	27	0,15	0,70	0,80
033810	16	**16ER28UN**	SP4066	0,91	28	0,14	0,60	0,70
033815	16	**16ER32UN**	SP4066	0,79	32	0,13	0,60	0,60
034611	16	**16ER36UN**	SP4066	0,71	36	0,11	0,60	0,60
033819	16	**16ER40UN**	SP4066	0,64	40	0,09	0,60	0,60
033879	22	**22ER5UN**	SP4066	5,08	5	0,76	1,70	2,50
033882	22	**22ER6UN**	SP4066	4,23	6	0,64	1,60	2,30
033883	22	**22ER7UN**	SP4066	3,63	7	0,53	1,60	2,30

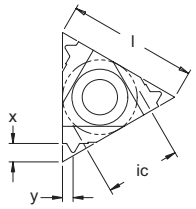
American Unified (UN)

Internal American Unified (UN)

Standard reference: ANSI B1.1:74

Tolerance class: 2A / 2B





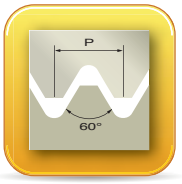
Internal Right Hand		**American Unified (UN)**		Pitch	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033747	08	**08IR14UN**	SP4066	1,81	14	0,15	0,60	0,80
033748	08	**08IR16UN**	SP4066	1,59	16	0,11	0,60	0,70
033751	08	**08IR18UN**	SP4066	1,41	18	0,11	0,60	0,70
033754	08	**08IR20UN**	SP4066	1,27	20	0,11	0,60	0,70
033756	08	**08IR24UN**	SP4066	1,06	24	0,09	0,60	0,60
033761	08	**08IR28UN**	SP4066	0,91	28	0,09	0,60	0,60
032056	11	**11IR32UN**	SP4066	0,79	32	0,09	0,60	0,60
032068	11	**11IR28UN**	SP4066	0,91	28	0,09	0,60	0,70
032055	11	**11IR27UN**	SP4066	0,94	27	0,09	0,70	0,80
032060	11	**11IR24UN**	SP4066	1,06	24	0,09	0,70	0,80
032044	11	**11IR20UN**	SP4066	1,27	20	0,10	0,80	0,90
032049	11	**11IR18UN**	SP4066	1,41	18	0,11	0,80	1,00
032053	11	**11IR16UN**	SP4066	1,59	16	0,11	0,09	1,10
032058	11	**11IR12UN**	SP4066	2,12	12	0,18	0,90	1,10

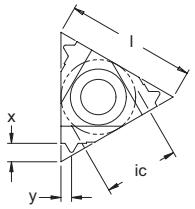
American Unified (UN)

Internal American Unified (UN)

Standard reference: ANSI B1.1:74

Tolerance class: 2A / 2B





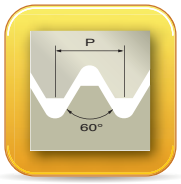
External Right Hand		**Partial Profile 55°**		Pitch Range	**TPI Range**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
031997	16	**16IR8UN**	SP4066	3,18	8	0,24	1,10	1,50
033863	16	**16IR9UN**	SP4066	2,82	9	0,20	1,20	1,70
033839	16	**16IR10UN**	SP4066	2,54	10	0,20	1,10	1,50
033840	16	**16IR11UN**	SP4066	2,31	11	0,18	1,10	1,50
031998	16	**16IR12UN**	SP4066	2,12	12	0,18	1,10	1,40
033842	16	**16IR13UN**	SP4066	1,95	13	0,17	1,00	1,30
033843	16	**16IR14UN**	SP4066	1,81	14	0,15	0,90	1,10
033846	16	**16IR16UN**	SP4066	1,59	16	0,11	0,90	1,10
033848	16	**16IR18UN**	SP4066	1,41	18	0,11	0,80	1,00
033852	16	**16IR20UN**	SP4066	1,27	20	0,10	0,80	0,90
033853	16	**16IR24UN**	SP4066	1,06	24	0,09	0,70	0,80
033855	16	**16IR28UN**	SP4066	0,91	28	0,09	0,60	0,60
033858	16	**16IR32UN**	SP4066	0,79	32	0,06	0,60	0,60
033859	16	**16IR36UN**	SP4066	0,71	36	0,05	0,60	0,60
033860	16	**16IR40UN**	SP4066	0,64	40	0,05	0,60	0,60
033895	22	**22IR5UN**	SP4066	5,08	5	0,37	1,60	2,30
033897	22	**22IR6UN**	SP4066	4,23	6	0,33	1,60	2,30
033898	22	**22IR7UN**	SP4066	3,63	7	0,29	1,60	2,30

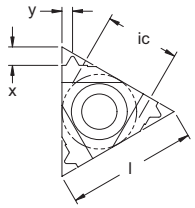
Unified J Form (UNJ)

External Unified J Form (UNJ)

Standard reference: MIL-S8879C

Tolerance class: 3A / 3B





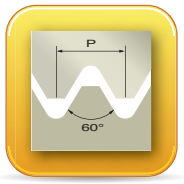
External Right Hand		**Unified J Form (UNJ)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
032345	16	**16ER32UNJ**	SP4066	0,79	32	0,60	0,60
032346	16	**16ER28UNJ**	SP4066	0,91	28	0,60	0,60
032347	16	**16ER24UNJ**	SP4066	1,06	24	0,70	0,80
032348	16	**16ER20UNJ**	SP4066	1,27	20	0,80	0,90
032349	16	**16ER18UNJ**	SP4066	1,41	18	0,80	1,00
032350	16	**16ER16UNJ**	SP4066	1,59	16	0,80	1,00
032351	16	**16ER14UNJ**	SP4066	1,81	14	1,00	1,20
032352	16	**16ER12UNJ**	SP4066	2,12	12	1,10	1,40

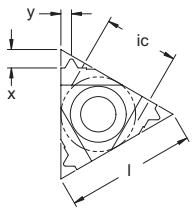
Metric J Form (MJ)

External Unified J Form (UNJ)

Standard reference: ISO 5855

Tolerance class: 4h/6h - 4H/5H





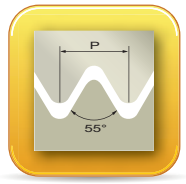
External Right Hand		**Metric J Form (MJ)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
032353	16	**16ER0.8MJ**	SP4066	0,80	-	0,60	0,70
032354	16	**16ER1.0MJ**	SP4066	1,00	-	0,60	0,70
032355	16	**16ER1.25MJ**	SP4066	1,25	-	0,70	0,90
032356	16	**16ER1.5MJ**	SP4066	1,50	-	0,80	1,00
032357	16	**16ER2.0MJ**	SP4066	2,00	-	1,00	1,30
032358	16	**16ER2.5MJ**	SP4066	2,50	-	1,10	1,50
032359	16	**16ER3.0MJ**	SP4066	3,00	-	1,20	1,60

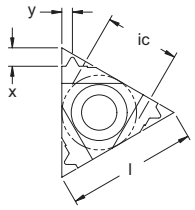
British Standard Whitworth (W)

External British Standard Whitworth (W)

Standard reference: ISO 228/1: 1982, B.S. 84:1956, DIN 259

Tolerance class: Medium Class A





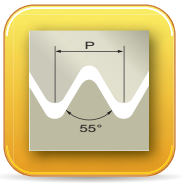
External Right Hand		**British Standard Whitworth (W)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033823	16	**16ER8W**	SP4066	3,18	8	1,20	1,50
033825	16	**16ER9W**	SP4066	2,82	9	1,20	1,70
033783	16	**16ER10W**	SP4066	2,54	10	1,10	1,50
031982	16	**16ER11W**	SP4066	2,31	11	1,10	1,50
033786	16	**16ER12W**	SP4066	2,12	12	1,10	1,40
031981	16	**16ER14W**	SP4066	1,81	14	1,00	1,20
033794	16	**16ER16W**	SP4066	1,59	16	0,90	1,10
033797	16	**16ER18W**	SP4066	1,41	18	0,80	1,00
031980	16	**16ER19W**	SP4066	1,34	19	0,80	1,00
033803	16	**16ER20W**	SP4066	1,27	20	0,80	0,90
033804	16	**16ER22W**	SP4066	1,15	22	0,80	0,90
033806	16	**16ER24W**	SP4066	1,06	24	0,70	0,80
033807	16	**16ER26W**	SP4066	0,98	26	0,70	0,80
031979	16	**16ER28W**	SP4066	0,91	28	0,60	0,70
033816	16	**16ER32W**	SP4066	0,79	32	0,60	0,60
033818	16	**16ER36W**	SP4066	0,71	36	0,60	0,60
033820	16	**16ER40W**	SP4066	0,64	40	0,60	0,60

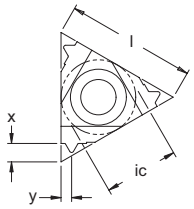
British Standard Whitworth (W)

Internal British Standard Whitworth (W)

Standard reference: ISO 228/1: 1982, B.S. 84:1956, DIN 259

Tolerance class: Medium Class A



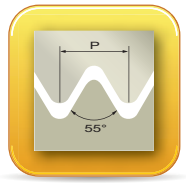


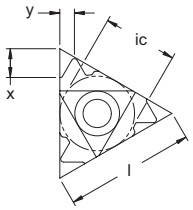
Internal Right Hand		**British Standard Whitworth (W)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033749	08	**08IR16W**	SP4066	1,59	16	0,60	0,70
033752	08	**08IR18W**	SP4066	1,41	18	0,60	0,70
033753	08	**08IR19W**	SP4066	1,34	19	0,60	0,70
033755	08	**08IR20W**	SP4066	1,27	20	0,60	0,70
033757	08	**08IR24W**	SP4066	1,06	24	0,60	0,70
033759	08	**08IR26W**	SP4066	0,98	26	0,60	0,60
033762	08	**08IR28W**	SP4066	0,91	28	0,60	0,60
032069	11	**11IR28W**	SP4066	0,91	28	0,60	0,70
032063	11	**11IR26W**	SP4066	0,98	26	0,70	0,80
032046	11	**11IR19W**	SP4066	1,34	19	0,80	1,00
032047	11	**11IR14W**	SP4066	1,81	14	0,90	1,10
032066	11	**11IR11W**	SP4066	2,31	11	0,90	1,20
031983	16	**16IR28W**	SP4066	0,91	28	0,60	0,70
031984	16	**16IR19W**	SP4066	1,34	19	0,80	1,00
031985	16	**16IR14W**	SP4066	1,81	14	1,00	1,20
031986	16	**16IR11W**	SP4066	2,31	11	1,10	1,50

British Standard Pipe Taper Thread (BSPT)

External British Standard Pipe Taper Thread (BSPT)

Standard reference: B.S 21: 1985
Tolerance class: Standard BSPT

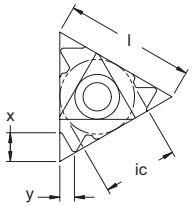




External Right Hand		British Standard Pipe Taper Thread (BSPT)		Pitch	TPI	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm
031987	16	16ER28BSPT	SP4066	0,91	28	0,70	0,80
031988	16	16ER19BSPT	SP4066	1,34	19	0,80	1,00
031989	16	16ER14BSPT	SP4066	1,81	14	0,90	1,20
031990	16	16ER11BSPT	SP4066	2,31	11	1,10	1,50

Internal British Standard Pipe Taper Thread (BSPT)

Standard reference: B.S 21: 1985
Tolerance class: Standard BSPT

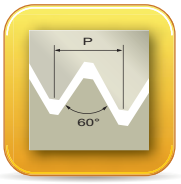


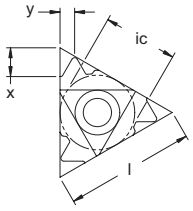
Internal Right Hand		British Standard Pipe Taper Thread (BSPT)		Pitch	TPI	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm
032050	11	11IR19BSPT	SP4066	1,34	19	0,80	1,00
032061	11	11IR14BSPT	SP4066	1,81	14	0,80	1,00
031991	16	16IR28BSPT	SP4066	0,91	28	0,70	0,80
031992	16	16IR19BSPT	SP4066	1,34	19	0,80	1,00
031993	16	16IR14BSPT	SP4066	1,81	14	0,90	1,20
031994	16	16IR11BSPT	SP4066	2,31	11	1,10	1,50

National Taper Thread (NPT)

External National Taper Thread (NPT)

Standard reference: USAS B2:1: 1968
Tolerance class: Standard NPT

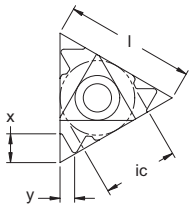




External Right Hand		**National Taper Thread (NPT)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
031971	16	**16ER18NPT**	SP4066	1,41	18	0,80	1,00
031972	16	**16ER14NPT**	SP4066	1,81	14	0,90	1,20
031973	16	**16ER11.5NPT**	SP4066	2,21	11,5	1,10	1,50
031974	16	**16ER8NPT**	SP4066	3,18	8	1,30	1,80

Internal National Taper Thread (NPT)

Standard reference: USAS B2:1: 1968
Tolerance class: Standard NPT



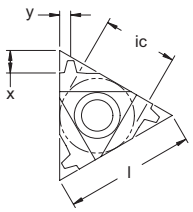
Internal Right Hand		**National Taper Thread (NPT)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033760	08	**08IR27NPT**	SP4066	0,94	27	0,60	0,60
033750	08	**08IR18NPT**	SP4066	1,41	18	0,60	0,60
032054	11	**11IR18NPT**	SP4066	1,41	18	0,80	1,00
032052	11	**11IR14NPT**	SP4066	1,81	14	0,80	1,00
031975	16	**16IR18NPT**	SP4066	1,41	18	0,80	1,00
031976	16	**16IR14NPT**	SP4066	1,81	14	0,90	1,20
031977	16	**16IR11.5NPT**	SP4066	2,21	11,5	1,10	1,50
031978	16	**16IR8NPT**	SP4066	3,18	8	1,30	1,80

ACME

External ACME

Standard reference: ANSI B 1.5: 1988
Tolerance class: 3G

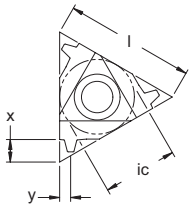




External Right Hand		ACME		Pitch	TPI	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm
032011	16	**16ER12ACME**	SP4066	2,12	12	1,10	1,20
032010	16	**16ER10ACME**	SP4066	2,54	10	1,30	1,30
032009	16	**16ER8ACME**	SP4066	3,18	8	1,50	1,50
032022	22	**22ER6ACME**	SP4066	4,23	6	1,80	2,10
032021	22	**22ER5ACME**	SP4066	5,08	5	2,00	2,30
032029	27	**27ER4ACME**	SP4066	6,35	4	2,30	2,70

Internal ACME

Standard reference: ANSI B 1.5: 1988
Tolerance class: 3G



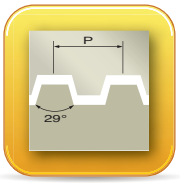
Internal Right Hand		ACME		Pitch	TPI	X	Y
EDP	L (mm)	Description	Grade	mm		mm	mm
032014	16	**16IR12ACME**	SP4066	2,12	12	1,10	1,20
032013	16	**16IR10ACME**	SP4066	2,54	10	1,30	1,30
032012	16	**16IR8ACME**	SP4066	3,18	8	1,50	1,50
032024	22	**22IR6ACME**	SP4066	4,23	6	1,80	2,10
032023	22	**22IR5ACME**	SP4066	5,08	5	2,00	2,30
032031	27	**27IR4ACME**	SP4066	6,35	4	2,30	2,70

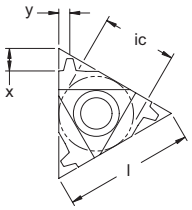
Stub ACME (STACME)

External Stub ACME (STACME)

Standard reference: ANSI B1.8:1988

Tolerance class: 2G



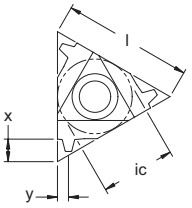


External Right Hand		**Stub ACME (STACME)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
032017	16	**16ER12STACME**	SP4066	2,12	12	1,20	1,20
032016	16	**16ER10STACME**	SP4066	2,54	10	1,30	1,30
032015	16	**16ER8STACME**	SP4066	3,18	8	1,50	1,50
033821	16	**16ER6STACME**	SP4066	4,23	6	1,50	1,80
032026	22	**22ER6STACME**	SP4066	4,23	6	1,80	1,80
032025	22	**22ER5STACME**	SP4066	5,08	5	2,00	2,30
032030	27	**27ER4STACME**	SP4066	6,35	4	2,30	2,40

Internal Stub ACME (STACME)

Standard reference: ANSI B1.8:1988

Tolerance class: 2G

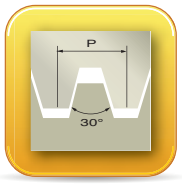


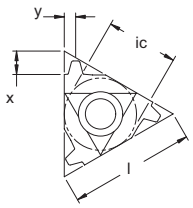
Internal Right Hand		**ACME**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
032020	16	**16IR12STACME**	SP4066	2,12	12	1,20	1,20
032019	16	**16IR10STACME**	SP4066	2,54	10	1,30	1,30
032018	16	**16IR8STACME**	SP4066	3,18	8	1,50	1,50
033861	16	**16IR6STACME**	SP4066	4,23	6	1,50	1,80
032028	22	**22IR6STACME**	SP4066	4,23	6	1,80	1,80
032027	22	**22IR5STACME**	SP4066	5,08	5	2,00	2,30
032032	27	**27IR4STACME**	SP4066	6,35	4	2,30	2,40

Trapezoidal (TR)

External Trapezoidal (TR)

Standard reference: DIN 103
Tolerance class: 7e/7H

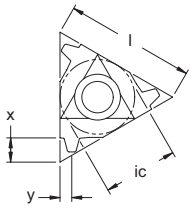




External Right Hand		**Trapezoidal (TR)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033876	22	**22ER4.0TR**	SP4066	4,00	-	1,80	1,90
033878	22	**22ER5.0TR**	SP4066	5,00	-	2,00	2,40
033881	22	**22ER6.0TR**	SP4066	6,00	-	2,10	2,70

Internal Trapezoidal (TR)

Standard reference: DIN 103
Tolerance class: 7e/7H

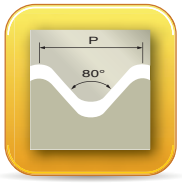


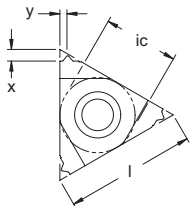
Internal Right Hand		**Trapezoidal (TR)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033891	22	**22IR4.0TR**	SP4066	4,00	-	1,80	1,90
033894	22	**22IR5.0TR**	SP4066	5,00	-	2,00	2,40
033896	22	**22IR6.0TR**	SP4066	6,00	-	2,10	2,70

Panzer Gerwinde (PG) DIN40431

External Panzer Gerwinde (PG)

Standard reference: DIN 40430
Tolerance class: Standard



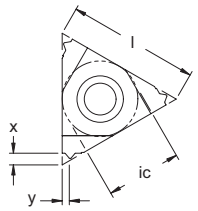


External Right Hand		**Panzer Gerwinde (PG) DIN40431**		Pitch	**TPI**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033792	16	**16ER16PG**	SP4066	1,59	16	Pg 21-29-36-42-48	0,80	1,00
033795	16	**16ER18PG**	SP4066	1,41	18	Pg 9-11-13.5-16	0,80	0,90
033801	16	**16ER20PG**	SP4066	1,27	20	Pg 7	0,70	0,80

External Left Hand		**Panzer Gerwinde (PG) DIN40431**		Pitch	**TPI**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
033769	16	**16EL16PG**	SP4066	1,59	16	Pg 21-29-36-42-48	0,80	1,00

Internal Panzer Gerwinde (PG)

Standard reference: DIN 40430
Tolerance class: Standard



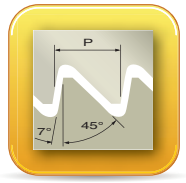
Internal Right Hand		**Panzer Gerwinde (PG) DIN40431**		Pitch	**TPI**	Nose Radius	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm	mm
032065	11	**11IR18PG**	SP4066	1,41	18	Pg 9-11-13.5-16	0,80	0,90
033845	16	**16IR16PG**	SP4066	1,59	16	Pg 21-29-36-42-48	0,80	1,00
033847	16	**16IR18PG**	SP4066	1,41	18	Pg 9-11-13.5-16	0,80	0,90
033851	16	**16IR20PG**	SP4066	1,27	20	Pg 7	0,70	0,80

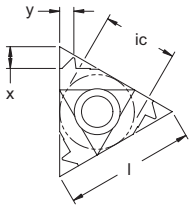
American Buttress

External American Buttress

Standard reference: ANSI B1.9 :1973

Tolerance class: Class 2





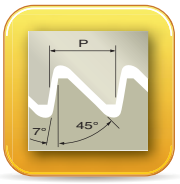
External Right Hand		**American Buttress**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
034604	16	**16ER10ABUTT**	SP4066	2,54	10	1,50	2,30
033785	16	**16ER12ABUTT**	SP4066	2,12	12	1,40	2,00
033791	16	**16ER16ABUTT**	SP4066	1,59	16	1,00	1,50
033800	16	**16ER20ABUTT**	SP4066	1,27	20	1,00	1,30
034605	22	**22ER8ABUTT**	SP4066	3,18	8	2,10	3,30
034606	22	**22ER12ABUTT**	SP4066	2,12	12	1,60	2,10

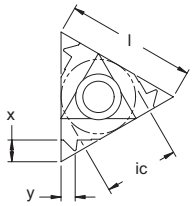
American Buttress

Internal American Buttress

Standard reference: ANSI B1.9 :1973

Tolerance class: Class 2



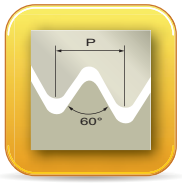


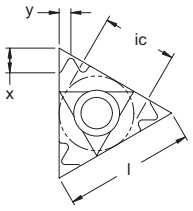
Internal Right Hand		**American Buttress**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
034608	16	**16IR10ABUTT**	SP4066	2,54	10	1,50	2,30
033841	16	**16IR12ABUTT**	SP4066	2,12	12	1,40	2,00
033844	16	**16IR16ABUTT**	SP4066	1,59	16	1,00	1,30
033850	16	**16IR20ABUTT**	SP4066	1,27	20	1,00	1,30
034609	22	**22IR8ABUTT**	SP4066	3,18	8	2,10	3,30
034610	22	**22IR12ABUTT**	SP4066	2,12	12	1,60	2,10

API Round (APIRD)

External API Round (APIRD)

Standard reference: API Standard 5B :1979
Tolerance class: Standard API Round

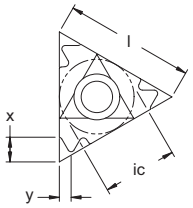




External Right Hand		**API Round (APIRD)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033822	16	**16ER8APIRD**	SP4066	3,18	8	1,30	1,50
033781	16	**16ER10APIRD**	SP4066	2,54	10	1,20	1,40
032035	22	**22ER8APIRD**	SP4066	3,18	8	1,60	2,10

Internal API Round (APIRD)

Standard reference: API Standard 5B :1979
Tolerance class: Standard API Round

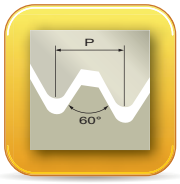


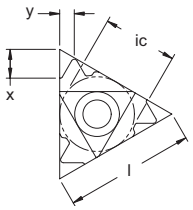
Internal Right Hand		**API Round (APIRD)**		Pitch	**TPI**	X	Y
EDP	L (mm)	**Description**	Grade	mm		mm	mm
033862	16	**16IR8APIRD**	SP4066	3,18	8	1,30	1,50
033838	16	**16IR10APIRD**	SP4066	2,54	10	1,20	1,40
032036	22	**22IR8APIRD**	SP4066	3,18	8	1,60	2,10

API (Oilfield)

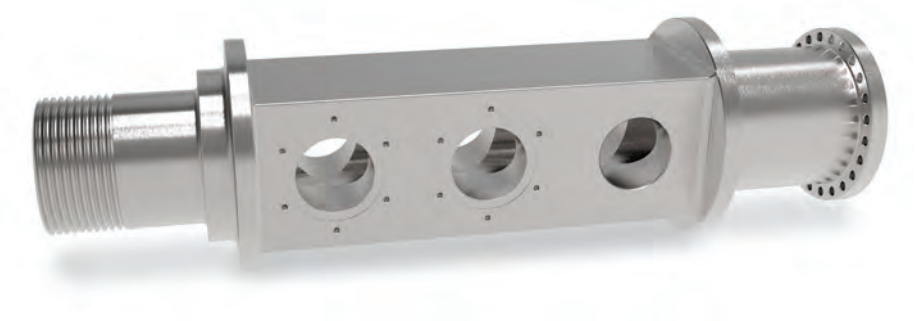
External API (Oilfield)

Standard reference: API Specification 7: 1990
Tolerance class: Standard API





External Right Hand		**API (Oilfield)**		Pitch Range	**TPI**	Taper		X	Y
EDP	L (mm)	**Description**	Grade	mm		IPF	Angle	mm	mm
032039	22	**22ER5API403**	SP4066	5,08	5	3	7° - 1'	1,80	2,50
032034	22	**22ER4API383**	SP4066	6,35	4	3	7° - 1'	2,10	2,80
032033	22	**22ER4API382**	SP4066	6,35	4	2	4° - 43'	2,10	2,80
033874	22	**22ER4API502**	SP4066	6,35	4	2	4° - 43'	2,00	3,00
033875	22	**22ER4API503**	SP4066	6,35	4	3	7° - 1'	2,00	3,00
032037	27	**27ER4API382**	SP4066	6,35	4	2	4° - 43'	2,10	2,80
032038	27	**27ER4API383**	SP4066	6,35	4	3	7° - 1'	2,10	2,80
032040	27	**27ER4API502**	SP4066	6,35	4	2	4° - 43'	2,00	3,00
032041	27	**27ER4API503**	SP4066	6,35	4	3	7° - 1'	2,00	2,00

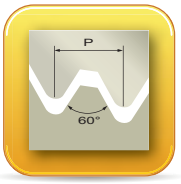


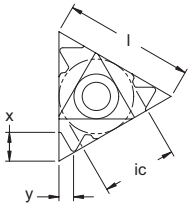
API (Oilfield)

Internal API (Oilfield)

Standard reference: API Specification 7: 1990

Tolerance class: Standard API





Internal Right Hand		API (Oilfield)		Pitch Range	TPI	Taper		X	Y
EDP	L (mm)	Description	Grade	mm		IPF	Angle	mm	mm
033132	22	**22IR5API403**	SP4066	5,08	5	3	7° - 1'	1,80	2,50
033133	22	**22IR4API383**	SP4066	6,35	4	3	7° - 1'	2,10	2,80
033134	22	**22IR4API382**	SP4066	6,35	4	2	4° - 43'	2,10	2,80
033888	22	**22IR4API502**	SP4066	6,35	4	2	4° - 43'	2,00	3,00
033889	22	**22IR4API503**	SP4066	6,35	4	3	7° - 1'	2,00	3,00
033135	27	**27IR4API382**	SP4066	6,35	4	2	4° - 43'	2,10	2,80
033136	27	**27IR4API383**	SP4066	6,35	4	3	7° - 1'	2,10	2,80
033137	27	**27IR4API502**	SP4066	6,35	4	2	4° - 43'	2,00	3,00
033138	27	**27IR4API503**	SP4066	6,35	4	3	7° - 1'	2,00	2,00

OILFIELD CONNECTORS			
Reference to Part Number	TPI	Taper IPF	Connector No. or size
API V 0.038R	4	2	NC23, NC28, NC31, NC35, NC38, NC40, NC44, NC46 NC50, 4 FH, 2 3/8" IF, 3 1/2" IF, 4 1/2" IF, 5 1/2" IF
API V 0.038R	4	3	NC56, NC61, NC70, NC77
API V 0.040	5	3	2 3/8" REG, 2 7/8" REG, 3 1/2" REG, 4 1/2" REG 3 1/2" FH, 4 1/2" FH
API V 0.050	4	3	5 1/2" REG, 7 5/8" REG, 8 5/8" REG
API V 0.050	4	2	6 5/8" REG, 5 1/2" FH, 6 5/8" FH
API V 0.055	6	1.5	NC10, NC12, NC13, NC16
API V 0.065	4	2	Superceded by API V 0.038R

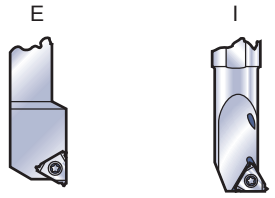
API Rotary Connections

API Rotary Connections					
API Connections	*TPI*	*TPF*	*API Code*	*Stellram Part Number*	*Catalog Page Number*
API Number					
NC10 - NC16	6.0	1.5	V-0.055	**6API551.5**	-
NC23 - NC50	4.0	2.0	V-0.038R	**4API382**	238 - 239
NC56 -NC77	4.0	3.0	V-0.038R	**4API383**	238 - 239
API Regular					
2 3/8 REG - 4 1/2 REG	5.0	3.0	V-0.040	**5API403**	238 - 239
5 1/2 REG - 7 5/8 REG, 8 5/8 REG	4.0	3.0	V-0.050	**4API503**	238 - 239
6 5/8 REG	4.0	2.0	V-0.050	**4API502**	238 - 239
Internal Flush					
2 3/8 IF - 6 5/8 IF	4.0	2.0	V-0.038R	**4API382**	238 - 239
Full Hole					
3 1/2 FH, 4 1/2 FH	5.0	3.0	V-0.040	**5API403**	238 - 239
4FH	4.0	2.0	V-0.038R	**4API382**	238 - 239
5 1/2 FH, 6 5/8 FH	4.0	2.0	V-0.050	**4API502**	238 - 239
Hughes External Flush					
2 3/8, 2 7/8	6.0	2.0	Drawing On Request		-
3 1/2, 4 1/2	4.0	2.0	V-0.038R	**4API382**	238 - 239
Hughes Xtra Hole					
2 7/8 -5	4.0	2.0	V-0.038R	**4API382**	238 - 239
Hughes Slim Hole					
2 3/8 - 4 1/2	4.0	2.0	V-0.038R	**4API382**	238 - 239
Hughes Double Streamline					
3 1/2 - 5 1/2	4.0	2.0	V-0.038R	**4API382**	238 - 239
Hughes H90					
3 1/2 - 6 5/8	3.5	2.0	Drawing On Request		-
7 - 8 5/8	3.5	3	Drawing On Request		-
Hughes Slimline H90					
2 3/8 - 3 1/2	3.0	1.25	Drawing On Request		-
PAC					
2 3/8 PAC - 2 7/8 PAC	4.0	1.5	-	**4 PAC**	-

Threading Toolholder Designation

	1	2	3	4	5	6	7	8
External	E	R	-	20	20	K	16	-
Internal	I	R	N	16	18	M	16	-

1 Utilisation



2 Hand

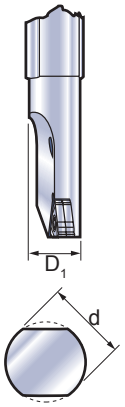


3 Option

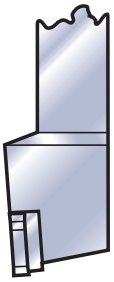
N = No Anvil

4 Shank Size or Tool Diameter

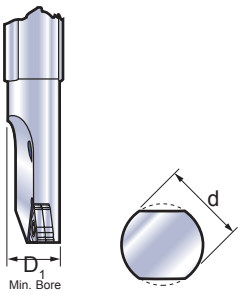
4. Internal Shank Diameter
e.g. 16 = d 16 mm



4 & 5. External Square Shank
e.g. 2020 = 20 x 20mm



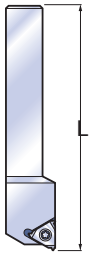
5 Minimum Bore Size (Internal)



Internal:
e.g. 18 =
D_1 Ø, 8mm

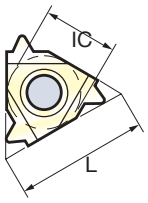
6 Tool Length

D	=	60	Q	=	180
F	=	80	R	=	200
H	=	100	S	=	250
K	=	125	T	=	300
L	=	140	U	=	350
M	=	150	V	=	400
P	=	170			

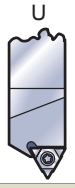


7 Insert Size

L mm	IC Inch
06	5/32
08	3/16
08U	3/16
11	1/4
16	3/8
22	1/2
22U	1/2U
27	5/8
27U	5/8U

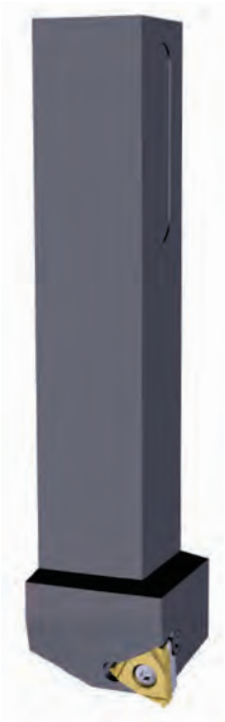


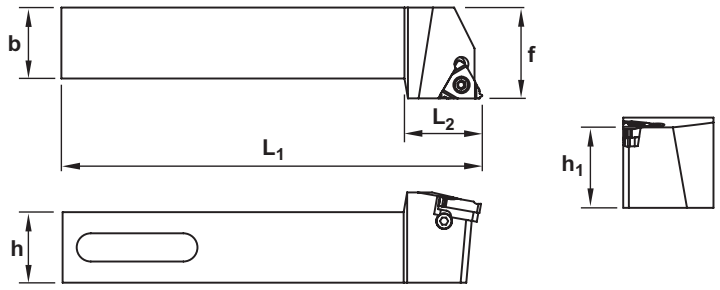
8 Option



Neutral

ER/EL 90°

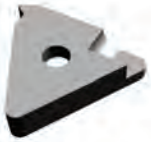




LH & RH External Square Shank Tool Holder										
EDP	Item Description	Hand	Insert Sizes & Types	Dimensions (mm)					Anvil Type	
				h = h1	b	f	L1	L2	Anvil	Anvil Hand
021548	**ERNM1010H11**	RH	ER11	10	10	14	100	13	-	-
025179	**ERN1010M16**	RH	ER16	10	10	13	150	19	-	-
021361	**EL1212F16**	LH	EL16	12	12	16	80	22	YI3	
021363	**EL1616H16**	LH	EL16	16	16	20	100	22		
021365	**EL2020K16**	LH	EL16	20	20	25	125	27		
021367	**EL2525M16**	LH	EL16	25	25	32	150	27		
021369	**EL3232Q16**	LH	EL16	32	32	40	180	27		
021362	**ER1212F16**	RH	ER16	12	12	16	80	22	YE3	
021364	**ER1616H16**	RH	ER16	16	16	20	100	22		
021366	**ER2020K16**	RH	ER16	20	20	25	125	27		
021368	**ER2525M16**	RH	ER16	25	25	32	150	27		
021370	**ER3232Q16**	RH	ER16	32	32	40	180	27		
021371	**EL2525M22**	LH	EL22	25	25	32	150	30	YI4	
021373	**EL3232Q22**	LH	EL22	32	32	40	180	30		
021375	**EL4040R22**	LH	EL22	40	40	50	200	30		
021372	**ER2525M22**	RH	ER22	25	25	32	150	30	YE4	
021374	**ER3232Q22**	RH	ER22	32	32	40	180	30		
021376	**ER4040R22**	RH	ER22	40	40	50	200	30		
021381	**EL3232Q27**	LH	EL27	32	32	40	180	35	YI5	
021383	**EL4040R27**	LH	EL27	40	40	50	200	35		
021382	**ER3232Q27**	RH	ER27	32	32	40	180	35	YE5	
021384	**ER4040R27**	RH	ER27	40	40	50	200	35		

Right Hand Toolholders and Inserts, Specify R = RH | Left Hand Toolholders and Inserts, Specify L = LH

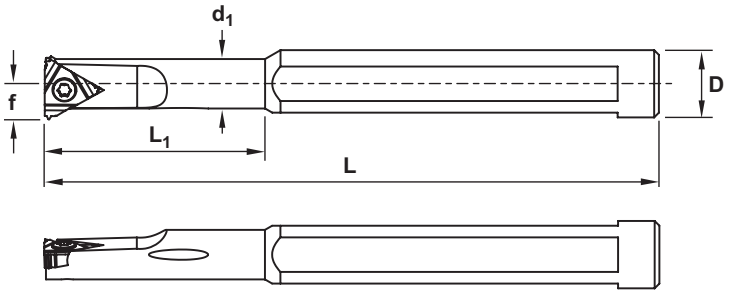





ER/EL 90° L/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
ERNM1010H11	*015558*	SN2T	*015554*	T8F	-	-	-	-
ERN1010M16	*015560*	SA3T	*023379*	T10F	-	-	-	-
EL 1212F16	*015560*	SA3T	*023379*	T10F	*015389*	YI3	*015551*	SY3T
EL 1616H16								
EL 2020K16								
EL 2525M16								
EL 3232Q16								
ER 1212F16	*015560*	SA3T	*023379*	T10F	*015447*	YE3	*015551*	SY3T
ER 1616H16								
ER 2020K16								
ER 2525M16								
ER 3232Q16								
EL2525M22	*015561*	SA4T	*015556*	T20F	*015483*	YI4	*015552*	SY4T
EL3232Q22								
EL4040R22								
ER2525M22	*015561*	SA4T	*015556*	T20F	*015463*	YE4	*015552*	SY4T
ER3232Q22								
ER4040R22								
EL3232Q27	*015562*	SA5T	*015557*	T25F	*015523*	YI5	*015553*	SY5T
EL4040R27								
ER3232Q27	*015562*	SA5T	*015557*	T25F	*015503*	YE5	*015553*	SY5T
ER4040R27								

IR 90°





IR LH & RH Internal Boring Bars

EDP	Item Description	Hand	Insert Sizes & Types	Dimensions (mm)						
				Min Bore Thread Ø A	ØD	d_1	f	L	L_1	Through Coolant
021394	**IRN1206H06**	IR	06IR	6	12	5,80	4,20	100	13	
021396	**IRN1608K08**	IR	08IR	8	16	6,30	5,10	125	17	
021400	**IRN1610K08**	IR	08IR	10	16	7,80	6	125	17	
021402	**IRN1013K11**	IR	11IR	13	10	9,50	7,30	125	25	
023231	**IRN2013M11**	IR	11IR	13	20	10	7,30	150	25	
021406	**IRN1616M11**	IR	11IR	16	16	12,50	8,90	150	40	
021408	**IRN1618M16**	IR	16IR	18	16	12	9,40	150	40	
021410	**IRN2021Q16**	IR	16IR	21	20	15,80	12,40	180	40	
021412	**IR2024Q16**	IR	16IR	24	20	18,50	13	180	50	
021414	**IR2529R16**	IR	16IR	29	25	24	16	200	60	
021416	**IR3236S16**	IR	16IR	36	32	31,50	19,60	250	60	
021418	**IR4044T16**	IR	16IR	44	40	40	23,80	300	-	
021422	**IRN2027Q22**	IR	221R	27	20	20	15,60	180	-	
021424	**IR2532R22**	IR	221R	32	25	24,50	17,80	200	-	
021426	**IR3239S22**	IR	221R	39	32	32	21,50	250	-	
021428	**IR4047T22**	IR	221R	47	40	40	25,80	300	-	
021446	**IR3240S27**	IR	27IR	40	32	32	22,40	250	-	
021448	**IR4048T27**	IR	27IR	48	40	40	26,40	300	-	

IL = Left Hand Tooling is available on request

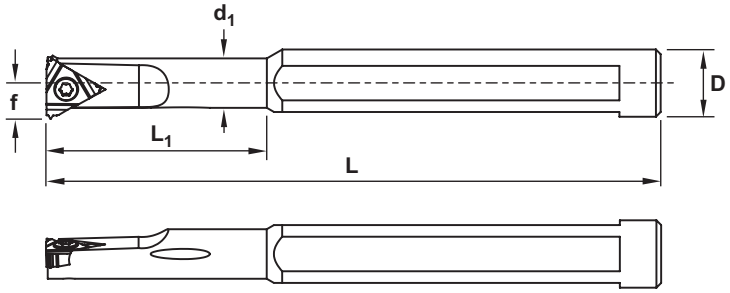





IR 90° L/R Spare Parts								
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
IR1206H06	*015563*	S6T	*018487*	T6	-	-	-	-
IRN1608K08	*015564*	S8T	*018487*	T6	-	-	-	-
IRN1610K08								
IRN1013K11	*015558*	SN2T	*015554*	T8F	-	-	-	-
IRN2013M11								
IRN1616M11								
IRN1618M16	*015560*	SA3T	*023379*	T10F	-	-	-	-
IRN2021Q16								
IR2024Q16	*015560*	SA3T	*023379*	T10F	*015389*	YI3	015551	SY3T
IR2529R16								
IR3236S16								
IR4044T16								
IRN2027Q22	*015561*	SA4T	*015556*	T20F	*015483*	YI4	015552	SY4T
IR2532R22								
IR3239S22								
IR4047T22								
IR3240S27	*015562*	SA5T	*015557*	T25F	*015523*	YI5	015553	SY5T
IR4048T27								

IR 90° CF Anti Vibration





IR LH & RH Internal Boring Bars

EDP	Item Description	Hand	Insert Sizes & Types	Dimensions (imm)						
				Min Bore Thread Ø A	ØD	d_1	f	L	L_1	Through Coolant
021540	**IRN1206H06CF**	IR	06IR	6	12	5.80	4.20	100	18	💧
021498	**IRN1608H08CF**	IR	08IR	8	16	6.30	5.10	100	23	💧
021502	**IRN1610H08CF**	IR	08IR	10	16	8.10	6	100	23	💧
021504	**IRN1013H11CF**	IR	11IR	13	10	9.50	7.30	100	33	💧
021506	**IRN1616M11CF**	IR	11IR	16	16	12.50	8.90	150	53	💧
021508	**IRN1618M16CF**	IR	16IR	18	16	12	9.40	150	53	💧
021510	**IRN2021M16CF**	IR	16IR	21	20	15.80	12.40	150	53	💧
021512	**IR2024R16CF**	IR	16IR	24	20	18.50	13	200	67	💧

IL = Left Hand Tooling is available on request | CF = Chatter Free

IR 90° CF Spare Parts

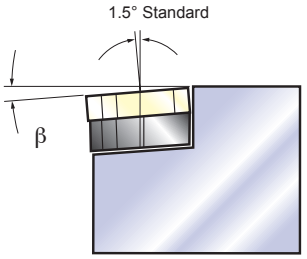
Item Description	*Insert Screw EDP*		*Insert Key EDP*		*Anvil EDP*		*Anvil Screw EDP*	
IRN1206H06CF	*015563*	S6T	*018487*	T6	-	-	-	-
IRN1608H08CF	*015564*	S8T	*018487*	T6	-	-	-	-
IRN1610H08CF								
IRN1013H11CF	*015558*	SN2T	*015554*	T8F	-	-	-	-
IRN1616M11CF								
IRN1618M16CF	*015560*	SA3T	*023379*	T10F	-	-	-	-
IRN2021M16CF								
IR2024R16CF	*015560*	SA3T	*023379*	T10F	*015389*	YI3	*015551*	SY3T

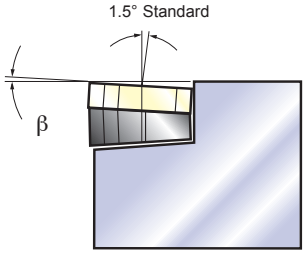
With the Stellram threading system, a wide range of thread helix angles can be obtained without changing or modifying toolholders. This is obtained by simply changing the carbide anvil.

Most toolholders are produced with 1.5° helix machined into the body. These tools are supplied with this angle as standard.

Interchangeable anvils allow helix variations between +4.5° and -1.5° with the insert cutting edge remaining constant.

Negative helix angles are used for producing right hand threads with left hand holders or left hand threads with right hand holders.





Negative Helix

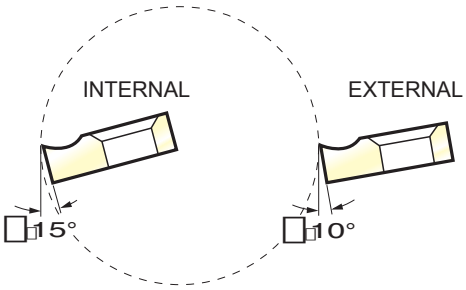
Insert size		Toolholder	ß Helix Angle							
			4.5°	3.5°	2.5°	1.5°	0.5°	0°	-0.5°	-1.5°
mm	Inch		Anvil Part Numbers							
16	3/8"	EX RH / IN LH	YE33P	YE32P	YE31P	YE3	YE31N	YE31.5N	YE32N	YE33N
		EX LH / IN RH	YI33P	YI32P	YI31P	YI3	YI31N	YI31.5N	YI32N	YI33N
22	1/2"	EX RH / IN LH	YE43P	YE42P	YE41P	YE4	YE41N	YE41.5N	YE42N	YE43N
		EX LH / IN RH	YI43P	YI42P	YI41P	YI4	YI41N	YI41.5N	YI42N	YI43N
22U	1/2"	EX RH / IN LH	YE4U3P	YE4U2P	YE4U1P	YE4U	YE4U1N	YE4U1.5N	YE4U2N	YE4U3N
		EX LH / IN RH	YI4U3P	YI4U2P	YI4U1P	YI4U	YI4U1N	YI4U1.5N	YI4U2N	YI4U3N
27	5/8"	EX RH / IN LH	YE53P	YE52P	YE51P	YE5	YE51N	YE51.5N	YE52N	YE53N
		EX LH / IN RH	YI53P	YI52P	YI51P	YI5	YI51N	YI51.5N	YI52N	YI53N
27U	5/8"	EX RH / IN LH	YE5U3P	YE5U2P	YE5U1P	YE5U	YE5U1N	YE5U1.5N	YE5U2N	YE5U3N
		EX LH / IN RH	YI5U3P	YI5U2P	YI5U1P	YI5U	YI5U1N	YI5U1.5N	YI5U2N	YI5U3N

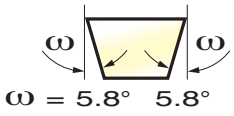
Note: Standard toolholders are supplied with 1.5° helix angle as standard.

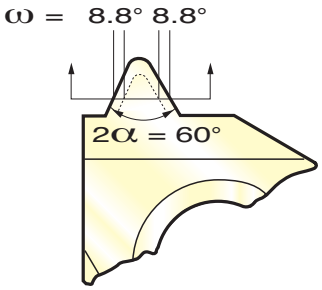
Calculation of thread helix angle for a given thread

$$\text{Helix angle - } \tan^{-1}\theta = \frac{\text{Lead of the Thread}}{\text{Pitch/Effective Diameter x } \pi}$$

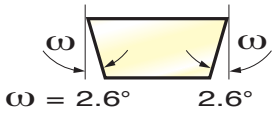
Flank Clearance Angle Selection

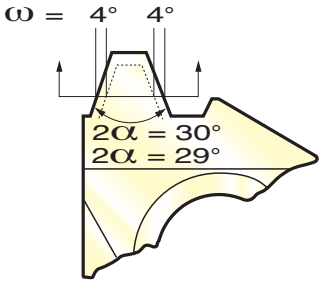




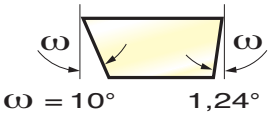


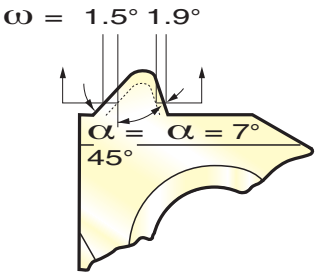
ISO
UN
PARTIAL 60˚
NPT



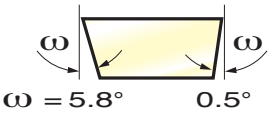


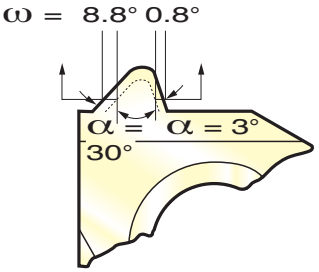
TRAPEZOIDAL
ACME
STUB ACME



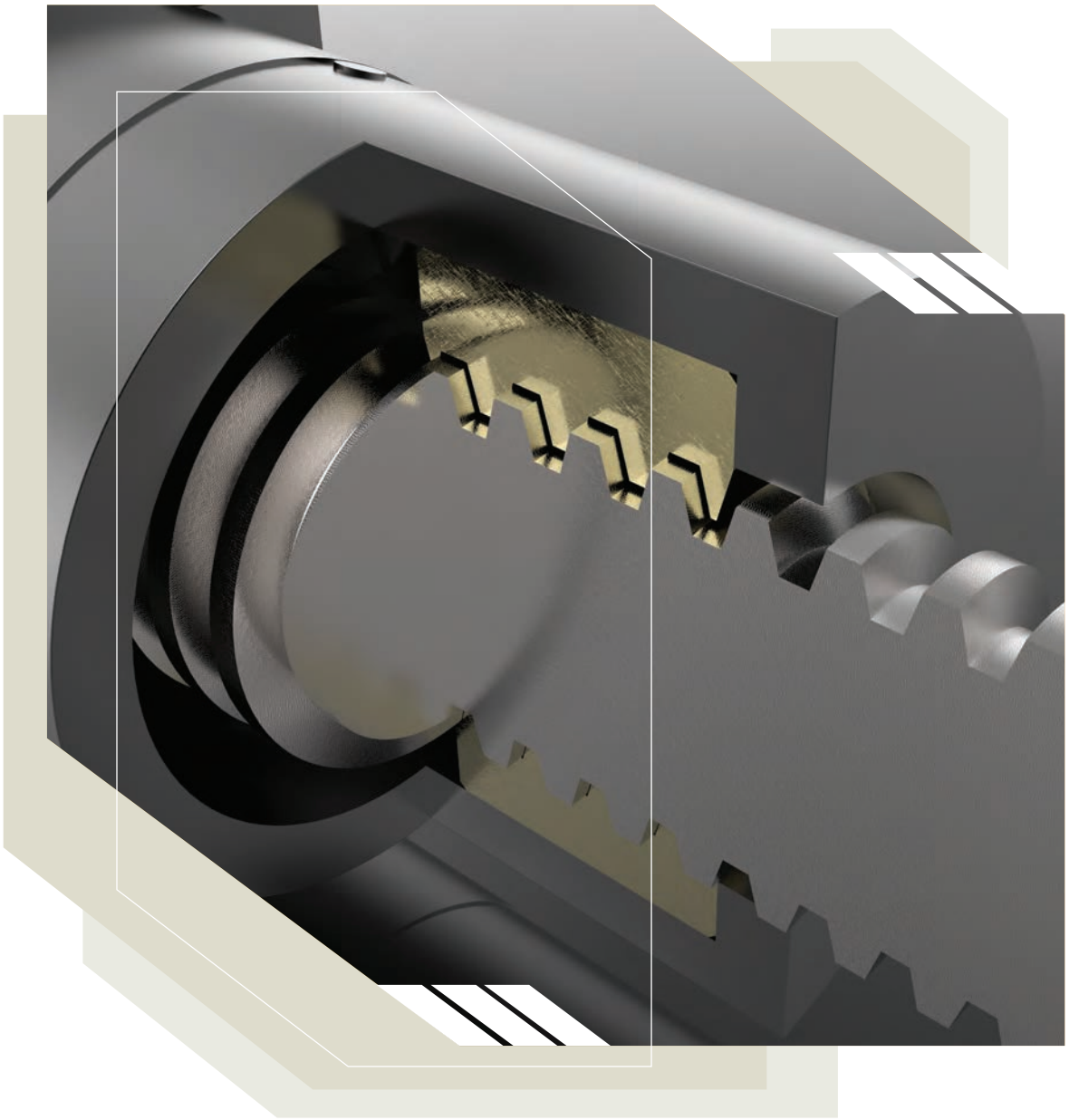


AMERICAN BUTTRESS

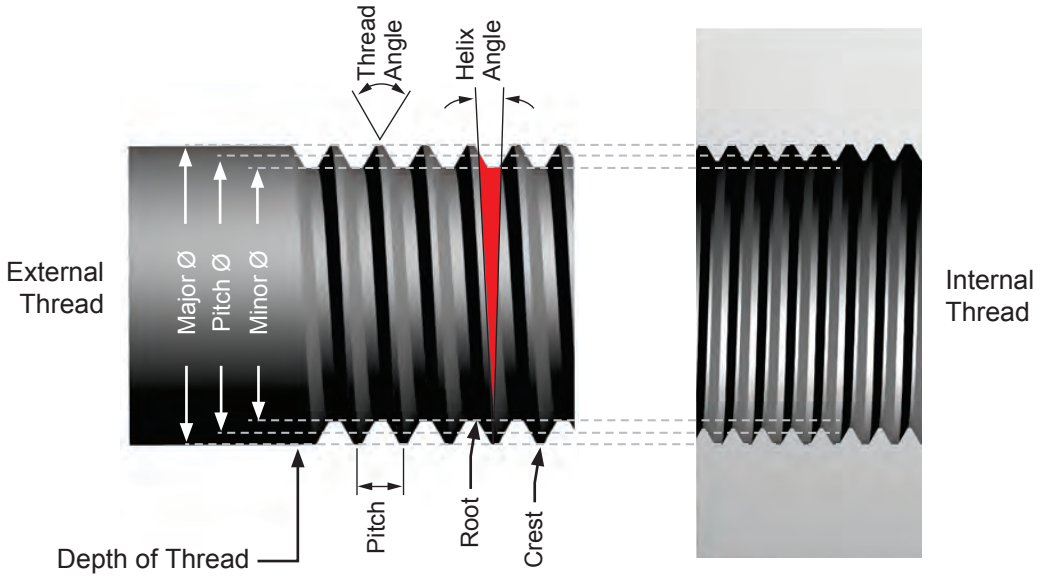




SAGE (DIN 513)



Depth of Thread



Depth of Thread
The distance between the Crest and Root.

Pitch
The distance between two thread form peaks, defined as TPI (thread per inch) in millimeters or as an inch decimal.

Pitch or Effective Diameter
Is where the theoretical cylinder diameter cuts the thread form, when the thread form width and groove depth are equal, applies to parallel/straight threads forms only.

Helix Angle: (Parallel/Straight Thread Forms)
Where the lead of the thread and the pitch diameter cylinder form a right angle triangle. The helix angle is the angle opposite the lead.

Major Diameter
The largest diameter of the thread form.

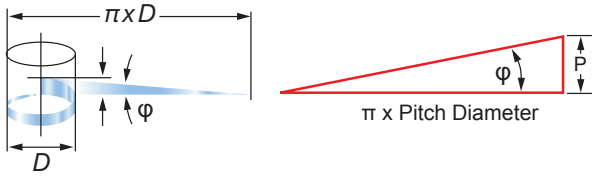
Minor or Root Diameter
The smallest diameter of the thread form.

Thread Angle
The included angle between the individual flanks.

Root
The inner most surface of the thread, connecting the flanks.

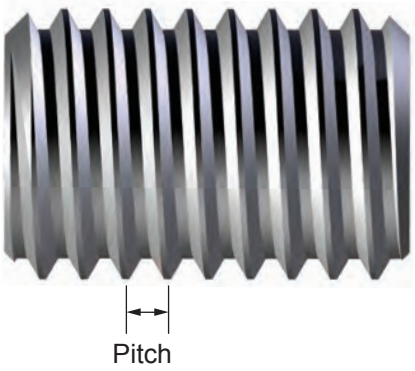
Crest
The outer most surface of the thread, connecting the flanks.

Helix Angle

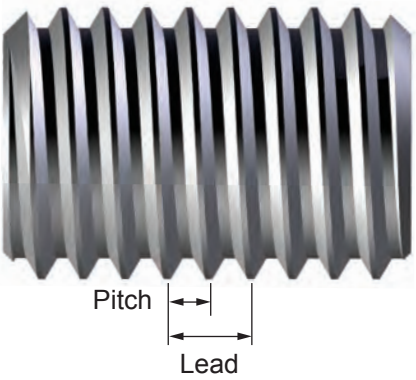


D = Pitch/Effected Diameter
P = Pitch or Lead
φ = Helix Angle

Pitch & Lead with Multi Start Thread



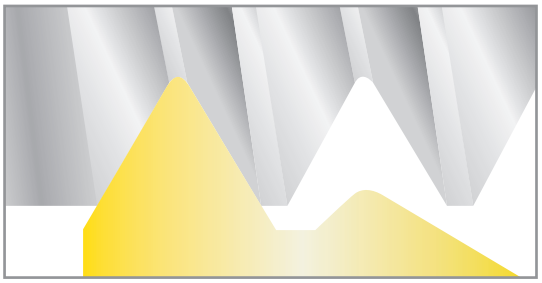
Pitch =
Axial distance from one thread point to the corresponding point on the next form



Lead =
Pitch x Number of starts
Or the distance travelled in one rotation of the work-piece

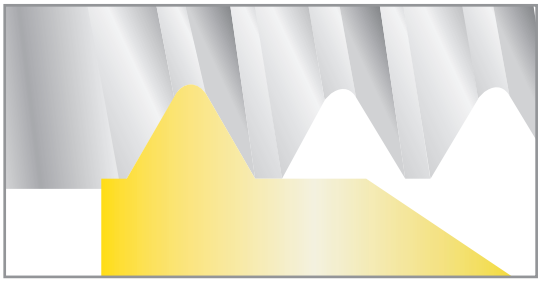
Example for two start thread

Threading Insert Profile Types

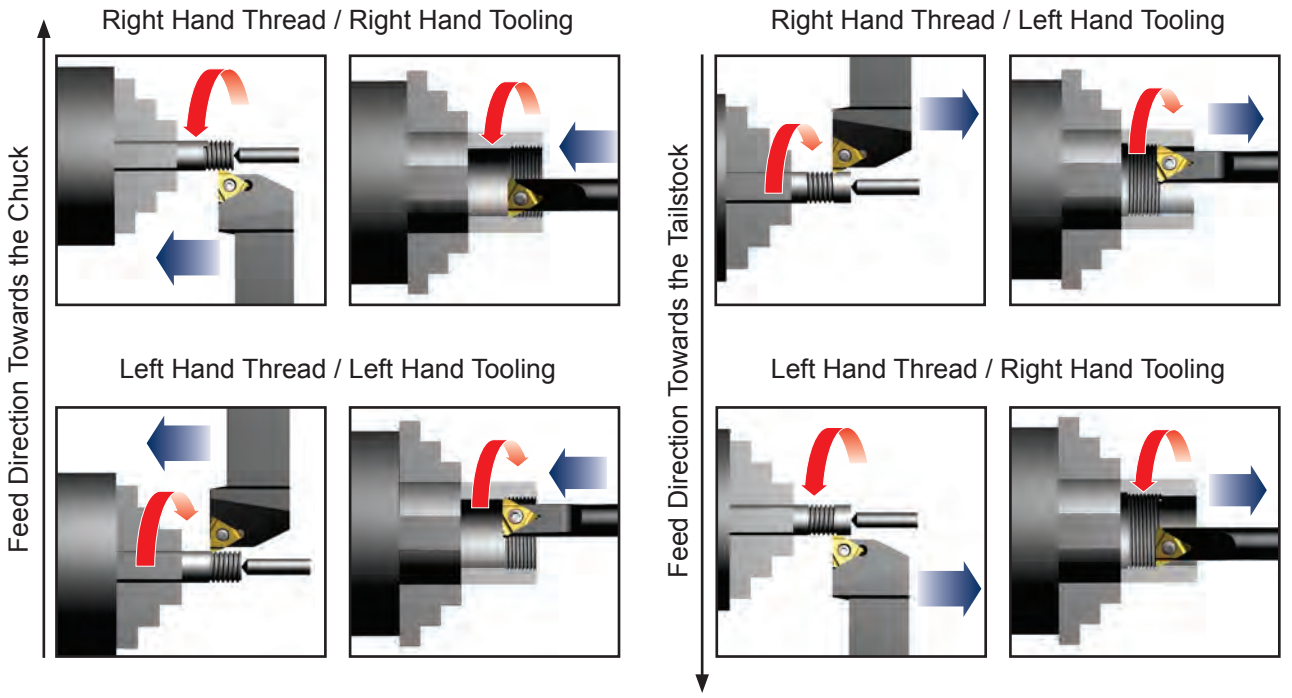


Partial Profile
The partial profile insert does not crest or top the outer diameter of the thread profile but, can be used on multi thread pitches with the same thread angle.

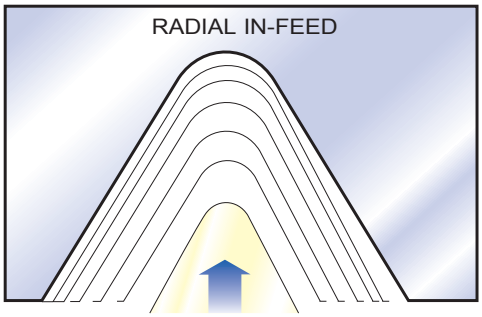
Full Profile
The full form insert controls the complete thread profile by cresting/topping the form. A different insert is required for each pitch.



Direction of cut using LH & RH Tooling

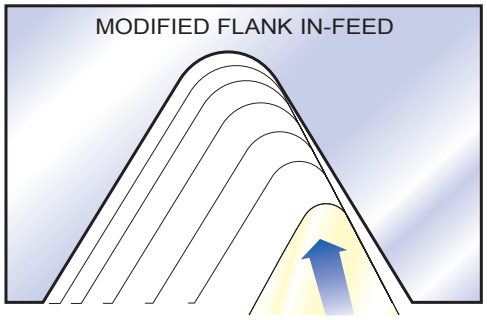


Radial In-Feed



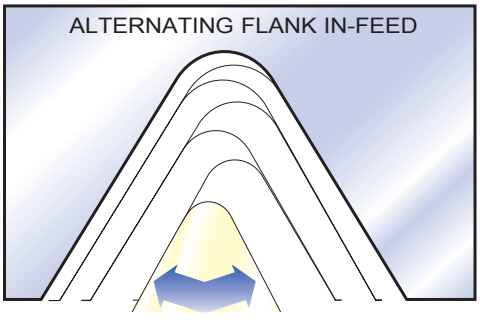
- Most commonly used method on manual lathes.
- Equal wear on leading and trailing edge.
- Good surface finish on trailing edge.
- Use on work hardening materials.
- Use on short chipping materials.
- For pitches of less than 1,5mm or 16 T.P.I.

Modified Flank In-Feed



- For threads greater than 1,5mm or 16 T.P.I.
- Reduced cutting pressure on larger pitches.
- Reduced chatter.
- Directs chip away from the cutting edge.
- Displaced in-feed angle improves surface finish.
- First choice for internal threading.

Alternating Flank In-Feed



- Recommended for large pitches, square ACME and trapezoidal forms.
- Recommended for long chipping materials.
- Method divides the work between both flanks.
- Results in equal wear.
- Less cutting pressure.
- Not available on all lathes.

Helix Angle Calculation (mm)

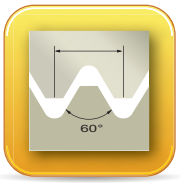
Outside Diameter mm	Pitch								
	1	1,25	1,5	1,75	2	3	4	5	6
	Helix Angles (Degrees and Minutes)								
5	3° - 38'	4° - 33'	5° - 27'	-	-	-	-	-	-
6	3° - 2'	3° - 48'	4° - 33'	5° - 18'	6° - 33'	-	-	-	-
8	2° - 17'	2° - 51'	3° - 25'	3° - 59'	4° - 33'	6° - 49'	-	-	-
10	1° - 49'	2° - 16'	2° - 44'	3° - 11'	3° - 39'	5° - 27'	-	-	-
12	1° - 31'	1° - 54'	2° - 17'	2° - 39'	3° - 2'	4° - 33'	-	-	-
14	1° - 18'	1° - 38'	1° - 57'	2° - 17'	2° - 36'	3° - 54'	-	-	-
16	1° - 8'	1° - 42'	1° - 42'	2° - 0'	2° - 17'	3° - 25'	-	-	-
18	1° - 1'	1° - 16'	1° - 31'	1° - 46'	2° - 2'	3° - 2'	4° - 3'	-	-
20	55´	1° - 8'	1° - 22'	1° - 36'	1° - 49'	2° - 44'	3° - 39'	-	-
25	44´	55´	1° - 6'	1° - 16'	1° - 28'	2° - 11'	2° - 55'	-	-
30	36´	46´	55´	1° - 4'	1° - 13'	1° - 49'	2° - 26'	3° - 2'	3° - 39'
35	31´	39´	47´	55´	1° - 3'	1° - 33'	2° - 5'	2° - 36'	3° - 8'
40	27´	34´	41´	48´	55´	-	1° - 49'	2° - 17'	2° - 44'
45	24´	30´	36´	43´	48´	1° - 13'	1° - 37'	2° - 2'	2° - 26'
50	-	-	-	38´	44´	1° - 6'	1° - 28'	1° - 49'	2° - 11'
60	-	-	-	-	36´	55´	1° - 13'	1° - 31'	1° - 49'
70	-	-	23´	-	31´	47´	1° - 3'	1° - 18'	1° - 34'
80	-	-	-	-	-	41´	55´	1° - 8'	1° - 22'
90	-	-	-	21´	24´	36´	48´	1° - 1'	1° - 13'
100	-	-	17´	19´	-	33´	-	55´	1° - 6'

Calculation of thread helix angle for a given Thread

$$\text{Helix angle - } \tan^{-1}\theta = \frac{\text{Lead of the Thread}}{\text{Pitch / Effective Diameter x } \pi}$$

Threading

The table below provides recommendations for depths of cut for the different passes. These recommendations are intended as starting values for machining in steel and include stock 0,020mm - 0,075mm above crest. The suitable number of passes must be determined by optimom trials.



I.S.O Metric (ISO) 60°, External (mm)

Number of Passes	Pitch (mm)															
	0,5	0,75	0,8	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0
	Radial in-feed per pass (mm)															
1	0,102	0,178	0,178	0,178	0,178	0,229	0,229	0,254	0,279	0,279	0,330	0,330	0,381	0,406	0,432	0,457
2	0,102	0,152	0,152	0,178	0,178	0,203	0,203	0,229	0,254	0,254	0,305	0,330	0,330	0,381	0,406	0,432
3	0,076	0,102	0,127	0,127	0,152	0,178	0,152	0,178	0,203	0,203	0,254	0,254	0,279	0,330	0,330	0,356
4	0,076	0,076	0,076	0,102	0,127	0,152	0,152	0,152	0,178	0,178	0,203	0,229	0,229	0,279	0,279	0,305
5	**0,356**	**0,508**	**0,533**	0,076	0,102	0,127	0,127	0,152	0,152	0,152	0,178	0,178	0,229	0,229	0,229	0,279
6				**0,660**	0,076	0,076	0,102	0,127	0,127	0,152	0,178	0,178	0,203	0,229	0,229	0,229
7					**0,813**	**0,965**	0,102	0,102	0,127	0,127	0,152	0,152	0,178	0,203	0,203	0,229
8							0,076	0,076	0,102	0,127	0,152	0,152	0,178	0,178	0,178	0,203
9							**1,143**	**1,270**	0,102	0,127	0,152	0,152	0,152	0,178	0,178	0,203
10									0,076	0,102	0,127	0,127	0,152	0,178	0,178	0,178
11									**1,600**	0,102	0,102	0,127	0,152	0,152	0,152	0,178
12										0,076	0,076	0,127	0,127	0,152	0,152	0,152
13										**1,880**	**2,210**	0,102	0,127	0,127	0,127	0,152
14												0,076	0,102	0,102	0,127	0,152
15												**2,515**	**2,819**	**3,124**	0,127	0,127
16															0,102	0,102
															3,429	**3,734**

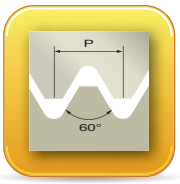
Last pass equals total depth of thread.



I.S.O Metric (ISO) 60°, Internal (mm)

Number of Passes	Pitch (mm)														
	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0
	Radial in-feed per pass (mm)														
1	0,102	0,178	0,178	0,203	0,254	0,229	0,254	0,279	0,279	0,305	0,330	0,356	0,381	0,381	0,406
2	0,102	0,127	0,152	0,178	0,203	0,203	0,229	0,229	0,229	0,279	0,305	0,330	0,356	0,356	0,406
3	0,076	0,102	0,102	0,127	0,152	0,152	0,178	0,178	0,203	0,229	0,229	0,279	0,305	0,305	0,356
4	0,076	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,152	0,203	0,203	0,229	0,254	0,254	0,279
5	**0,356**	**0,483**	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,178	0,178	0,203	0,229	0,229	0,229
6			**0,610**	0,076	0,076	0,102	0,102	0,127	0,152	0,152	0,152	0,178	0,203	0,203	0,229
7				**0,787**	**0,889**	0,102	0,102	0,102	0,127	0,152	0,152	0,152	0,178	0,178	0,203
8						0,076	0,076	0,102	0,102	0,152	0,152	0,152	0,152	0,178	0,178
9						**1,092**	**1,219**	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,178
10								0,076	0,102	0,102	0,127	0,152	0,152	0,152	0,152
11								**1,499**	0,102	0,102	0,102	0,127	0,152	0,152	0,152
12									0,076	0,076	0,102	0,127	0,152	0,152	0,152
13									**1,778**	**2,057**	0,102	0,102	0,127	0,152	0,152
14											0,076	0,102	0,102	0,127	0,152
15											**2,337**	**2,642**	**2,896**	0,127	0,127
16														0,102	0,102
														3,200	**3,454**

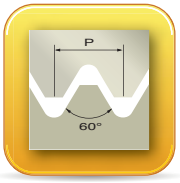
Last pass equals total depth of thread.



UNIFIED (UN) 60°, External (mm)

Number of Passes	T.P.I.																	
	32	28	24	20	18	16	14	13	12	11	10	9	8	7	6	5	4.5	4
	Radial in-feed per pass (mm)																	
1	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,254	0,279	0,279	0,279	0,279	0,305	0,356	0,356	0,432	0,406	0,483
2	0,152	0,152	0,178	0,178	0,203	0,203	0,229	0,229	0,229	0,254	0,229	0,229	0,254	0,330	0,330	0,406	0,381	0,432
3	0,127	0,127	0,152	0,152	0,152	0,152	0,178	0,178	0,203	0,203	0,203	0,203	0,229	0,254	0,254	0,330	0,330	0,356
4	0,076	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,152	0,178	0,178	0,178	0,178	0,229	0,229	0,279	0,279	0,330
5	**0,533**	0,076	0,076	0,102	0,127	0,127	0,127	0,152	0,152	0,152	0,152	0,152	0,178	0,178	0,203	0,229	0,254	0,305
6		**0,635**	**0,711**	0,076	0,076	0,102	0,102	0,127	0,152	0,152	0,152	0,152	0,152	0,178	0,178	0,229	0,229	0,254
7				**0,838**	**0,940**	0,076	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,178	0,203	0,203	0,229
8						**1,041**	0,076	0,076	0,076	0,102	0,127	0,127	0,152	0,152	0,152	0,178	0,203	0,229
9							**1,194**	**1,270**	**1,372**	0,076	0,102	0,127	0,127	0,152	0,152	0,178	0,178	0,229
10										**1,499**	0,076	0,102	0,127	0,127	0,152	0,178	0,178	0,203
11											**1,651**	0,076	0,102	0,102	0,152	0,178	0,152	0,178
12												**1,778**	0,076	0,076	0,127	0,152	0,152	0,178
13													**2,032**	**2,286**	0,102	0,127	0,152	0,152
14															0,102	0,102	0,152	0,152
15															**2,667**	**3,200**	0,152	0,127
16																	0,127	0,102
																	3,531	**3,937**

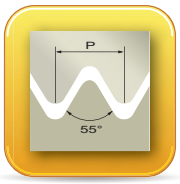
Last pass equals total depth of thread.



UNIFIED (UN) 60°, Internal (mm)

Number of Passes	T.P.I.																	
	32	28	24	20	18	16	14	13	12	11	10	9	8	7	6	5	4.5	4
	Radial in-feed per pass (mm)																	
1	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,254	0,279	0,279	0,279	0,279	0,305	0,330	0,356	0,406	0,406	0,457
2	0,152	0,152	0,152	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,229	0,229	0,279	0,305	0,330	0,356	0,406	0,432
3	0,102	0,102	0,152	0,127	0,152	0,152	0,152	0,152	0,178	0,178	0,152	0,178	0,203	0,229	0,229	0,305	0,330	0,356
4	0,076	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,152	0,152	0,178	0,203	0,203	0,254	0,254	0,305
5	**0,508**	0,076	0,076	0,102	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,178	0,178	0,229	0,229	0,254
6		**0,610**	**0,660**	0,076	0,076	0,102	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,203	0,203	0,229
7				**0,787**	**0,864**	0,076	0,102	0,102	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,178	0,178	0,229
8						**0,940**	0,076	0,076	0,076	0,102	0,102	0,102	0,102	0,152	0,152	0,178	0,178	0,178
9							**1,118**	**1,194**	**1,245**	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,178	0,178
10										**1,397**	0,076	0,102	0,102	0,127	0,127	0,152	0,152	0,178
11											**1,499**	0,076	0,102	0,102	0,127	0,152	0,152	0,178
12												**1,651**	0,076	0,076	0,102	0,152	0,152	0,152
13													**1,880**	**2,134**	0,102	0,127	0,152	0,152
14															0,102	0,102	0,127	0,152
15															**2,464**	**2,946**	0,127	0,127
16																	0,102	0,102
																	3,277	**3,658**

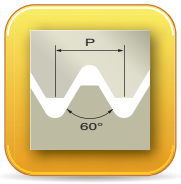
Last pass equals total depth of thread.



Whitworth (mm)

Number of Passes	T.P.I.																
	28	26	20	19	18	16	14	12	11	10	9	8	7	6	5	4.5	4
	Radial in-feed per pass (mm)																
1	0,203	0,203	0,203	0,229	0,229	0,203	0,254	0,279	0,279	0,305	0,279	0,305	0,356	0,356	0,381	0,406	0,457
2	0,178	0,152	0,203	0,203	0,203	0,203	0,229	0,254	0,254	0,254	0,229	0,279	0,305	0,305	0,381	0,406	0,432
3	0,127	0,152	0,152	0,152	0,178	0,152	0,178	0,203	0,203	0,203	0,229	0,229	0,279	0,279	0,356	0,356	0,356
4	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,178	0,178	0,178	0,203	0,203	0,229	0,254	0,305	0,305	0,330
5	0,076	0,076	0,102	0,127	0,127	0,127	0,127	0,152	0,152	0,152	0,178	0,178	0,203	0,203	0,279	0,279	0,330
6	**0,635**	**0,686**	0,076	0,076	0,102	0,127	0,127	0,152	0,152	0,127	0,152	0,152	0,203	0,203	0,254	0,254	0,279
7			**0,864**	**0,914**	0,076	0,102	0,102	0,127	0,127	0,127	0,152	0,152	0,178	0,203	0,229	0,229	0,279
8					**1,067**	0,076	0,076	0,076	0,127	0,127	0,127	0,152	0,152	0,178	0,203	0,229	0,254
9						**1,143**	**1,245**	**1,422**	0,076	0,127	0,127	0,127	0,152	0,152	0,203	0,203	0,254
10									**1,549**	0,076	0,127	0,127	0,152	0,152	0,203	0,178	0,229
11										**1,676**	0,076	0,127	0,127	0,152	0,178	0,178	0,203
12											**1,880**	0,076	0,076	0,152	0,152	0,152	0,203
13												**2,108**	**2,413**	0,127	0,127	0,152	0,178
14														0,102	0,102	0,152	0,152
15														**2,819**	**3,353**	0,147	0,127
16																0,102	0,102
																3,708	**4,166**

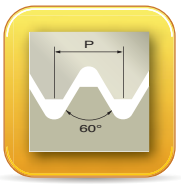
Last pass equals total depth of thread.



UNIFIED "J" for Aircraft (UNJ), External (mm)

Number of Passes	T.P.I.									
	32	28	24	20	18	16	14	12	10	8
	Radial in-feed per pass (mm)									
1	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,279	0,279	0,305
2	0,152	0,152	0,152	0,178	0,203	0,203	0,203	0,229	0,229	0,279
3	0,127	0,102	0,152	0,152	0,152	0,152	0,152	0,203	0,203	0,203
4	0,076	0,102	0,102	0,102	0,127	0,127	0,127	0,152	0,152	0,178
5	**0,533**	0,076	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,152
6		**0,610**	**0,660**	0,076	0,076	0,102	0,102	0,102	0,127	0,152
7				**0,813**	**0,889**	0,076	0,102	0,102	0,127	0,127
8						**0,991**	0,076	0,076	0,102	0,127
9							**1,118**	**1,295**	0,102	0,127
10									0,076	0,102
11									**1,549**	0,102
12										0,076
										1,930

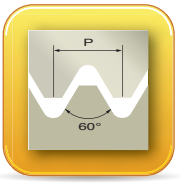
Last pass equals total depth of thread.



Metric "J" for Aircraft (MJ), External (mm)

Number of Passes	Ptich (mm)			
	1,0	1,5	1,75	2,0
	Radial in-feed per pass (mm)			
1			0,2286	0,254
2			0,2032	0,2286
3			0,1524	0,1778
4			0,1524	0,1524
5			0,127	0,127
6			0,0762	0,127
7			**0,9398**	0,1016
8				0,0762
				1,2446

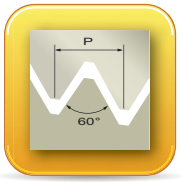
Last pass equals total depth of thread.



National Pipe Taper Dryseal (NPTF) External and Internal (mm)

Number of Passes	T.P.I.				
	27	18	14	11.5	8
	Radial in-feed per pass (mm)				
1	0,178	0,229	0,254	0,254	0,254
2	0,152	0,203	0,229	0,254	0,229
3	0,127	0,152	0,152	0,203	0,229
4	0,102	0,127	0,152	0,152	0,203
5	0,102	0,102	0,127	0,152	0,178
6	0,076	0,102	0,127	0,127	0,152
7	**0,737**	0,102	0,102	0,102	0,152
8		0,076	0,102	0,102	0,152
9		**1,092**	0,102	0,102	0,127
10			0,076	0,102	0,127
11			**1,422**	0,102	0,127
12				0,076	0,127
13				**1,727**	0,102
14					0,102
15					0,102
16					0,102
					2,464

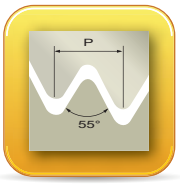
Last pass equals total depth of thread.



National Pipe Taper (NPT) External & Internal (mm)

Number of Passes	T.P.I.				
	27	18	14	11.5	8
	Radial in-feed per pass (mm)				
1	0,203	0,229	0,229	0,229	0,254
2	0,152	0,178	0,203	0,203	0,229
3	0,127	0,152	0,178	0,178	0,203
4	0,102	0,152	0,152	0,152	0,203
5	0,102	0,127	0,152	0,152	0,178
6	0,076	0,127	0,127	0,152	0,178
7	**0,762**	0,102	0,127	0,152	0,178
8		0,076	0,102	0,127	0,178
9		**1,143**	0,102	0,127	0,152
10			0,076	0,102	0,152
11			**1,448**	0,102	0,152
12				0,076	0,127
13				**1,753**	0,127
14					0,102
15					0,076
					2,489

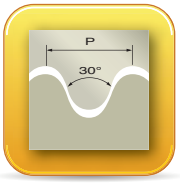
Last pass equals total depth of thread.



British Standard Pipe Taper (BSPT) External & Internal (mm)

Number of Passes	T.P.I.				
	27	18	14	11.5	8
	Radial in-feed per pass (mm)				
1	0,178	0,229	0,254	0,254	0,279
2	0,152	0,203	0,203	0,229	0,279
3	0,127	0,152	0,178	0,203	0,229
4	0,102	0,127	0,152	0,178	0,203
5	0,076	0,127	0,127	0,152	0,178
6	**0,660**	0,076	0,127	0,152	0,152
7		**0,914**	0,102	0,127	0,152
8			0,076	0,127	0,152
9			**1,219**	0,076	0,127
10				**1,499**	0,127
11					0,127
12					0,076
					2,083

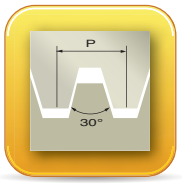
Last pass equals total depth of thread.



Round DIN 405, External & Internal (mm)

Number of Passes	T.P.I.			
	10	8	6	4
	Radial in-feed per pass (mm)			
1	0,229	0,229	0,279	0,356
2	0,229	0,229	0,254	0,330
3	0,203	0,203	0,229	0,305
4	0,203	0,203	0,229	0,279
5	0,152	0,178	0,203	0,279
6	0,127	0,152	0,203	0,254
7	0,102	0,152	0,178	0,254
8	0,076	0,127	0,152	0,229
9	**1,321**	0,102	0,152	0,203
10		0,076	0,127	0,178
11		**1,651**	0,102	0,152
12			0,076	0,127
13			**2,184**	0,127
14				0,102
				3,200

Last pass equals total depth of thread.



Trapezoidal DIN 103 (mm)

Number of Passes	Ptich (mm)							
	1,5	2	3	4	5	6	7	8
	Radial in-feed per pass (mm)							
1	0,229	0,254	0,279	0,279	0,305	0,356	0,356	0,381
2	0,203	0,229	0,229	0,229	0,305	0,330	0,330	0,330
3	0,152	0,178	0,203	0,229	0,254	0,305	0,305	0,330
4	0,127	0,152	0,152	0,203	0,229	0,279	0,279	0,330
5	0,102	0,127	0,152	0,178	0,203	0,254	0,254	0,279
6	0,076	0,127	0,127	0,178	0,203	0,254	0,254	0,279
7	**0,889**	0,102	0,127	0,152	0,203	0,203	0,254	0,254
8		0,076	0,102	0,152	0,203	0,203	0,229	0,254
9		**1,245**	0,102	0,152	0,178	0,203	0,203	0,229
10			0,102	0,152	0,152	0,203	0,203	0,229
11			0,102	0,127	0,152	0,178	0,203	0,229
12			0,076	0,127	0,127	0,152	0,203	0,203
13			**1,753**	0,102	0,127	0,152	0,178	0,203
14				**2,261**	0,102	0,152	0,178	0,178
15					**2,743**	0,152	0,178	0,178
16						0,127	0,127	0,178
17						**3,505**	**3,734**	0,152
18								0,152
19								0,127
								4,496

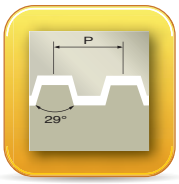
Last pass equals total depth of thread.



ACME (mm)

Number of Passes	T.P.I.								
	16	14	12	10	8	6	5	4	3
	Radial in-feed per pass (mm)								
1	0,229	0,229	0,254	0,254	0,279	0,330	0,356	0,356	0,381
2	0,203	0,203	0,203	0,229	0,254	0,279	0,330	0,330	0,356
3	0,178	0,178	0,178	0,203	0,203	0,229	0,254	0,305	0,330
4	0,152	0,152	0,152	0,178	0,178	0,203	0,229	0,279	0,279
5	0,127	0,127	0,127	0,152	0,152	0,178	0,229	0,254	0,279
6	0,076	0,102	0,127	0,127	0,127	0,178	0,203	0,254	0,279
7	**0,965**	0,076	0,102	0,127	0,127	0,152	0,203	0,203	0,279
8		**1,067**	0,102	0,102	0,127	0,152	0,203	0,203	0,254
9			**1,245**	0,102	0,127	0,152	0,178	0,203	0,229
10				0,102	0,102	0,152	0,152	0,178	0,229
11				**1,575**	0,102	0,152	0,152	0,178	0,229
12					0,102	0,127	0,152	0,152	0,203
13					**1,880**	0,102	0,127	0,152	0,203
14						**2,515**	0,102	0,152	0,178
15							**2,845**	0,152	0,178
16								0,127	0,178
17								**3,480**	0,178
18									0,152
19									0,127
									4,521

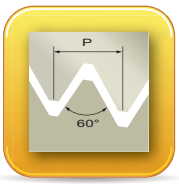
Last pass equals total depth of thread.



STUB-ACME (mm)

Number of Passes	T.P.I.								
	16	14	12	10	8	6	5	4	3
	Radial in-feed per pass (mm)								
1	0,203	0,229	0,229	0,229	0,254	0,279	0,279	0,305	0,356
2	0,152	0,178	0,178	0,203	0,203	0,203	0,254	0,279	0,279
3	0,127	0,152	0,152	0,178	0,203	0,203	0,203	0,254	0,279
4	0,102	0,127	0,127	0,152	0,178	0,178	0,203	0,203	0,229
5	0,102	0,102	0,102	0,152	0,152	0,152	0,178	0,203	0,203
6	**0,686**	**0,787**	0,102	0,127	0,152	0,152	0,152	0,178	0,203
7			**0,889**	0,102	0,127	0,152	0,152	0,152	0,203
8				**1,143**	0,102	0,127	0,152	0,152	0,203
9					**1,372**	0,102	0,127	0,127	0,178
10						**1,549**	0,102	0,127	0,152
11							**1,803**	0,102	0,127
12								0,102	0,127
13								**2,184**	0,127
14									0,102
15									0,102
									3,099

Last pass equals total depth of thread.



API Thread Forms (mm)

API Thread Forms	No. of passes/radial in-feed per pass (mm)															
	Total In-Feed	Passes														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
API Rd																
16ER10APIRD 16IR10APIRD	1,448	0,279	0,203	0,152	0,152	0,127	0,127	0,127	0,102	0,102	0,076	-	-	-	-	-
16ER8APIRD 16IR8APIRD	1,854	0,279	0,229	0,203	0,152	0,152	0,152	0,127	0,127	0,127	0,127	0,102	0,076	-	-	-
API-V-0.038R																
22ER4API382 22IR4API382	3,175	0,457	0,381	0,381	0,330	0,305	0,305	0,254	0,254	0,203	0,127	0,102	0,076	-	-	-
22ER4API383 22IR4API383	3,175	0,457	0,381	0,381	0,330	0,305	0,305	0,254	0,254	0,203	0,127	0,102	0,076	-	-	-
API-V-0.050																
27ER4API502 27IR4API502	3,861	0,457	0,381	0,356	0,330	0,305	0,305	0,279	0,254	0,254	0,229	0,203	0,203	0,127	0,102	0,076
27ER4API503 27IR4API503	3,835	0,457	0,381	0,356	0,330	0,305	0,279	0,279	0,254	0,254	0,229	0,203	0,203	0,127	0,102	0,076
API-V-0.040																
22ER5API403 22IR5API403	3,073	0,432	0,381	0,381	0,330	0,279	0,279	0,254	0,254	0,178	0,127	0,102	0,076	-	-	-

Multi-Tooth Inserts (mm)

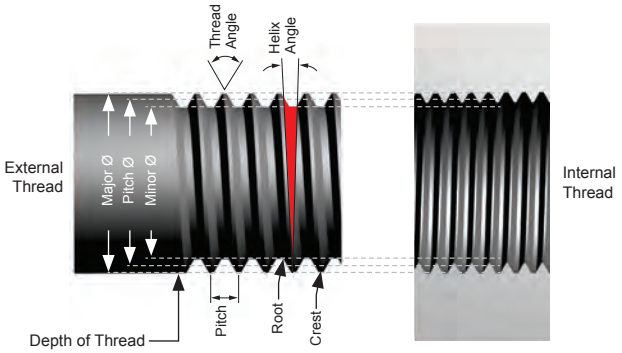
External	Metric 60° (I.S.O) Pitch (mm)					Unified 60° (UN) T.P.I					Whitworth (W) T.P.I			NPT T.P.I
	1,0	1,5	2,0	2,5	3,0	20	18	16	14	12	19	14	11	11.5
Number of Passes	Radial in-feed per pass (mm)					Radial in-feed per pass (mm)					Radial in-feed per pass (mm)			
1	0,356	0,356	0,483	0,457	0,559	0,432	0,483	0,381	0,432	0,533	0,483	0,483	0,457	0,508
2	0,330	0,330	0,483	0,432	0,533	0,381	0,432	0,356	0,406	0,483	0,432	0,432	0,432	0,019
3	**0,686**	0,279	0,330	0,406	0,483	**0,813**	**0,914**	0,279	0,330	0,356	**0,914**	0,330	0,381	0,432
4		**0,965**	**1,295**	0,279	0,330			**1,016**	**1,168**	**1,372**		**1,245**	0,279	0,254
				1,575	**1,905**								**1,549**	**1,676**

Internal	Metric 60° (I.S.O) Pitch (mm)					Unified 60° (UN) T.P.I					Whitworth (W) T.P.I			NPT T.P.I
	1,0	1,5	2,0	2,5	3,0	20	18	16	14	12	19	14	11	11.5
Number of Passes	Radial in-feed per pass (inch)					Radial in-feed per pass (inch)					Radial in-feed per pass (inch)			
1	0,330	0,330	0,457			0,356	0,483				0,356	0,483	0,457	0,508
2	0,305	0,305	0,432			0,330	0,432				0,305	0,432	0,432	0,483
3	**0,635**	0,254	0,330			0,254	0,330				0,254	0,330	0,381	0,432
4		**0,889**	**1,219**			**0,940**	**1,245**				**0,914**	**1,245**	0,279	0,254
													1,549	**1,676**

Last pass equals total depth of thread.

1 What's the Application

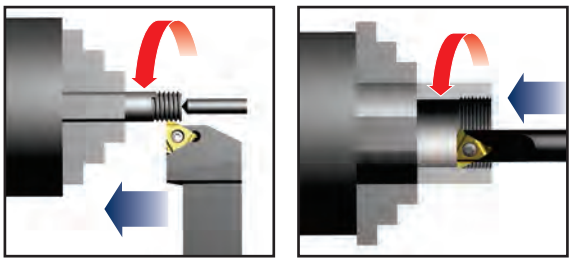
A) Internal or External
B) Type of thread form
C) Material being machined



2 Machine Set-Up

D) LH or RH thread form
E) Machine Set-Up

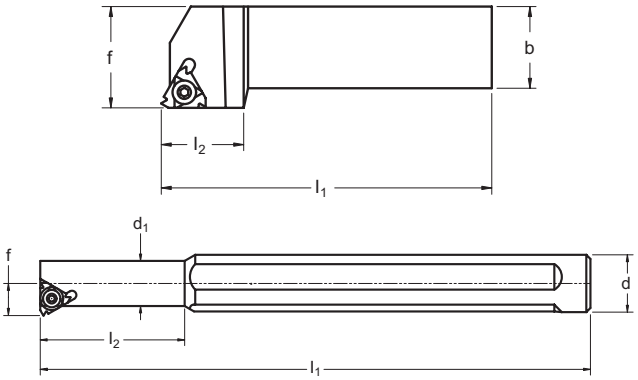
Right Hand Thread / Right Hand Tooling



See page 252

3 Select Tooling

F) External
G) Internal



See pages 242 – 246

4 Check Helix Angle

Note: The 1.5°

Calculation of thread helix angle for a given thread

$$\text{Helix angle - } \text{Tan}^{-1}\,\theta = \frac{\text{Lead of the Thread}}{\text{Pitch/Effective Diameter x } \pi}$$

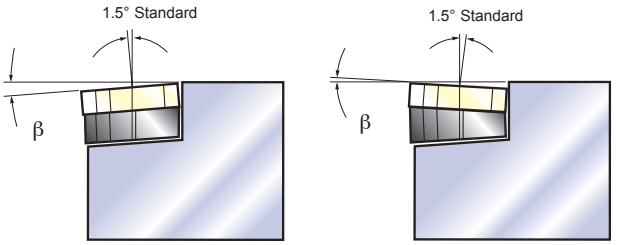
Helix Angle Calculation (mm)

Outside Diameter mm	1	1,25	1,5	1,75
				Helix A
5	3° - 38'	4° - 33'	5° - 27'	-
6	3° - 2'	3° - 48'	4° - 33'	5° - 18'
8	2° - 17'	2° - 51'	3° - 25'	3° - 59'
10	1° - 49'	2° - 16'	2° - 44'	3° - 11'
12	1° - 31'	1° - 54'	2° - 17'	2° - 39'
14	1° - 18'	1° - 38'	1° - 57'	2° - 17'
16	1° - 8'	1° - 42'	1° - 42'	2° - 0'

See page 254

5 Select Anvil

Note: The 1.5° angle is Standard with all toolholders



Insert size			ß Helix Ar				
			4.5°	3.5°	2.5°	1.5°	
mm	Inch	Toolholder	Anvil Part Numbers				
16	3/8"	EX RH / IN LH EX LH / IN RH	YE33P YI33P	YE32P YI32P	YE31P YI31P	**YE3** **YI3**	Y Y
22	1/2"	EX RH / IN LH EX LH / IN RH	YE43P YI43P	YE42P YI42P	YE41P YI41P	**YE4** **YI4**	Y Y
22U	1/2"	EX RH / IN LH EX LH / IN RH	YE4U3P YI4U3P	YE4U2P YI4U2P	YE4U1P YI4U1P	**YE4U** **YI4U**	Y Y
27	5/8"	EX RH / IN LH EX LH / IN RH	YE53P YI53P	YE52P YI52P	YE51P YI51P	**YE5** **YI5**	Y Y
27U	5/8"	EX RH / IN LH EX LH / IN RH	YE5U3P YI5U3P	YE5U2P YI5U2P	YE5U1P YI5U1P	**YE5U** **YI5U**	Y Y

Note: Standard toolholders are supplied with 1.5° helix angle as standard.

See page 247

6 Select Cutting Speed

Speed vc (feet/min)

ISO	Materials	Rm
P	Unalloyed Steel	400-600 N/mm² 120-180 HBN
		600-950 N/mm² 180-200 HBN
	Alloyed Steel	700-950 N/mm² 200-280 HBN
		950-1200 N/mm² 280-355 HBN
		1200-1400 N/mm² 355-415 HBN
	Tool Steel	1200-1400 N/mm² 355-415 HBN
M	Stainless Steel	Austenitic + Ferritic 300 series
		Martensitic 400 series
	PH Stainless	Refractory P.H.

See page 209

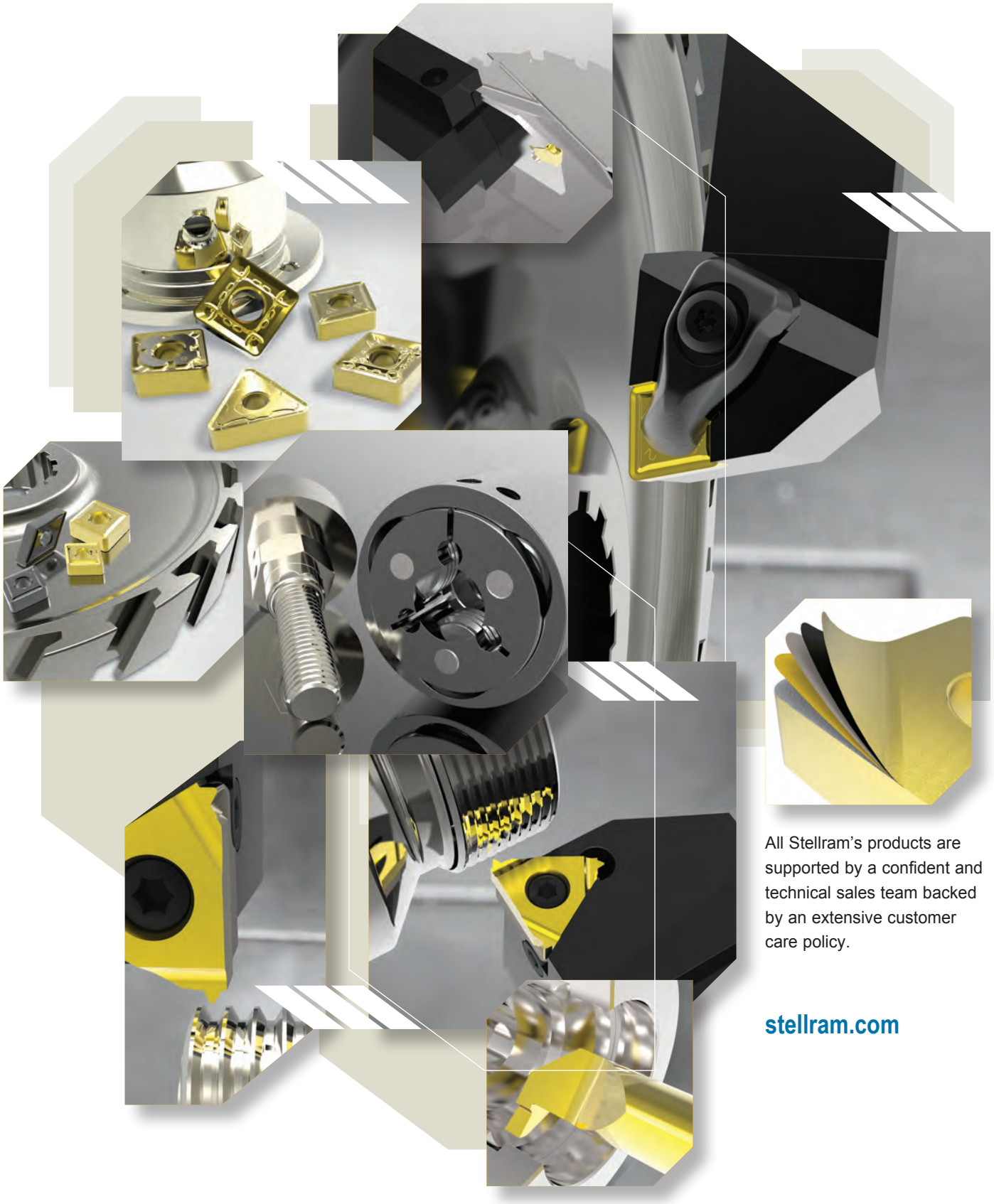
7 Select number and depth of passes

I.S.O Metric (ISO) 60°, External (mm)

Number of Passes	0,5	0,75	0,8	1,0	1,25	1,5	1,75
							R
1	0,102	0,178	0,178	0,178	0,178	0,229	0,229
2	0,102	0,152	0,152	0,178	0,178	0,203	0,203
3	0,076	0,102	0,127	0,127	0,152	0,178	0,152
4	0,076	0,076	0,076	0,102	0,127	0,152	0,152
5	**0,356**	**0,508**	**0,533**	0,076	0,102	0,127	0,127
6				**0,660**	0,076	0,076	0,102
7					**0,813**	**0,965**	0,102
8							0,076
9							**1,143**
10							
11							
12							
13							

See pages 255 – 263

Threading



All Stellram's products are supported by a confident and technical sales team backed by an extensive customer care policy.

stellram.com

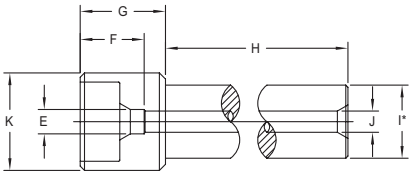
Landis® CNC EZ Roller™ Thread Rolling Tools



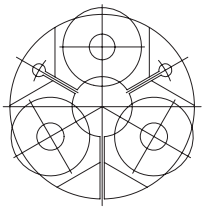
Stellram – Landis Threading Systems offers a line of thread rolling tools designed especially for CNC style machines. The Landis® CNC EZ Roller™ thread rolling tools offer a low cost, small tool envelope, alternative to the conventional opening style rolling heads. When married to CNC machines that run a Rigid or Synchronous tapping cycle to roll-on/roll-off, savings can be achieved by eliminating the extraneous moves necessary to reset the rolling head. Six sizes of CNC EZ Roller™ tools cover a standard thread range of M1,6 through M30 diameters. They can be furnished with plain cylindrical shanks in both inch and metric diameters, or other mountings available include CAT, BT, VDI, Morse Taper and Tap drive. Thread rolls are available in several die materials and thread leads to suit the application.



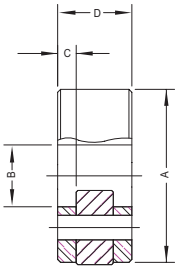
Die Holder



Die Body



Front View



Side View

#1.5 Tooling Dimensions	
Dimensions	mm
A	20,61
B	see thread size chart
C	2,38
D	10,32
E	6,50
F	16,50
G	22,50
H	50,00
I*	20,00
J	6,00
K	26,00

Components

Part #	**Description**	Quantity
L0C143453	**Die Holder - Metric**	1
L0E059614	**Thread Roll Shaft**	3
L0E069852	**Thread Roll Shaft - "A", "AA", "B"**	3
L0E143454	**Adjusting Screw**	1
LFA001056	**Set Screw**	4
LGD001105	**2mm Hex Wrench**	1

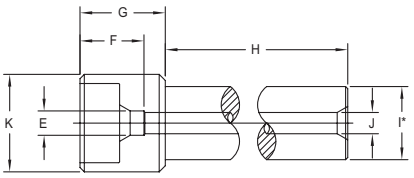
Thread Size	*Sub- Assembly Shank EDP*	*Die Body EDP*	Die Body Size	B - Dimension	*Thread Roll EDP*
	mm			mm	
#0-80 UNF	*LSB143535*	*L0B063650*	A - 4º-35'	3,2	*L0C063633*
#1-64 UNC	*LSB143536*	*L0B063645*	AA - 4º-25'	4	*L0C065380*
#1-72 UNF	*LSB143536*	*L0B063645*	AA - 4º-25'	4	*L0C063644*
#2-56 UNC	*LSB143537*	*L0B063312*	B - 4º-25'	5,2	*L0C063315*
#2-64 UNF	*LSB143538*	*L0B118675*	BF - 3º-45'	5,2	*L0C063314*
#3-48 UNC	*LSB143537*	*L0C063312*	B - 4º-25'	5,2	*L0C063317*
#3-56 UNF	*LSB143538*	*L0B118675*	BF - 3º-45'	5,2	*L0C063316*

Threading

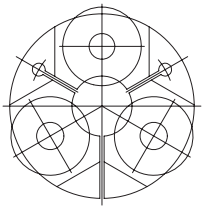
Thread Size	Sub- Assembly Shank EDP	Die Body EDP	Die Body Size	B - Dimension	Thread Roll EDP
	mm			mm	
#4-40 UNC	LSB143539	L0B059611	C - 4°-45'	6,7	L0C059613
#4-48 UNF	LSB143540	L0B118676	CF - 4°-0'	6,7	L0C063318
#5-40 UNC	LSB143539	L0B059611	C - 4°-45'	6,7	L0C063320
#5-44 UNF	LSB143540	L0B118676	CF - 4°-0'	6,7	L0C063319
#6-32 UNC	LSB143539	L0B059611	C - 4°-45'	6,7	L0C059612
#6-40 UNF	LSB143540	L0B118676	CF - 4°-0'	6,7	L0C063321
#8-32 UNC	LSB143541	L0B059624	D - 4°-45'	8	L0C063323
#8-36 UNF	LSB143542	L0B109833	DF - 3°-30'	8	L0C063322
#10-24 UNC	LSB143541	L0B059624	D - 4°-45'	8	L0C063324
#10-32 UNF	LSB143542	L0B109833	DF - 3°-30'	8	L0C062473
#12-24 UNC	LSB143541	L0B059624	D - 4°-45'	8	L0C063332
#12-28 UNF	LSB143542	L0B109833	DF - 3°-30'	8	L0C063348
M1,6 X ,35 ISO	LSB143535	L0B063650	A - 4°-35'	3,2	L0C141599
M1,8 X ,35 ISO	LSB143536	L0B063645	AA - 4°-25'	4	L0C141600
M2 X ,4 ISO	LSB143537	L0B063312	B - 4°-25'	5,2	L0C065218
M2,2 X ,45 ISO	LSB143537	L0B063312	B - 4°-25'	5,2	L0C141608
M2,5 X ,45 ISO	LSB143538	L0B118675	BF - 3°-45'	5,2	L0C121521
M3 X ,5 ISO	LSB143543	L0B106668	CX - 3°-30'	6,7	L0C063998
M3,5 X ,6 ISO	LSB143543	L0B106668	CX - 3°-30'	6,7	L0C065953
M4 X ,7 ISO	LSB143543	L0B106668	CX - 3°-30'	6,7	L0C064998
M4,5 X ,75 ISO	LSB143542	L0B109833	DF - 3°-30'	8	L0C115099
M5 X ,8 ISO	LSB143542	L0B109833	DF - 3°-30'	8	L0C065200



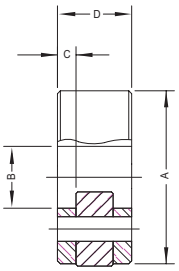
Die Holder



Die Body



Front View



Side View

#3 Tooling Dimensions	
Dimensions	mm
A	33,30
B	see thread size chart
C	3,17
D	14,28
E	13,50
F	24,00
G	29,00
H	63,50
I*	25,00
J	10,50
K	42,00

Components		
Part #	**Description**	Quantity
L0C143455	**Die Holder - Metric**	1
L0E062987	**Thread Roll Shaft**	3
LFA001057	**Set Screw**	5
LGD001106	**2,5mm Hex Wrench**	1

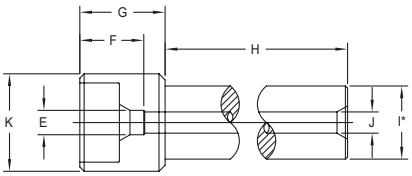
Thread Size	*Sub- Assembly Shank EDP*	*Die Body EDP*	Die Body Size	B - Dimension	*Thread Roll EDP*
	mm			mm	
#8 - 32 UNC	*LSB143573*	*L0B141720*	FX - 4º-0'	12	*L0B141721*
#10 - 24 UNC	*LSB143544*	*L0B062984*	F - 4º-45'	12	*L0C118886*
#10 - 32 UNF	*LSB143545*	*L0B129458*	FX - 3º-30'	12	*L0B122271*
#12 - 24 UNC	*LSB143573*	*L0B141720*	FX - 4º-0'	12	*L0B140426*
#12 - 28 UNF	*LSB143545*	*L0B129458*	FX - 3º-30'	12	*L0B063313*
1/4 - 20 UNC	*LSB143544*	*L0B062984*	F - 4º-45'	12	*L0B063326*
1/4 - 28 UNF	*LSB143546*	*L0B068825*	FF - 3º-0'	12	*L0B063325*

Threading

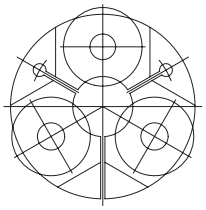
Thread Size	Sub- Assembly Shank EDP	Die Body EDP	Die Body Size	B - Dimension	Thread Roll EDP
	mm			mm	
5/16 - 18 UNC	LSB143547	L0B062988	G - 3º-45'	14	L0B063328
5/16 - 24 UNF	LSB143548	L0B109834	GF - 2º-45'	14	L0B063327
3/8 - 16 UNC	LSB143547	L0B062988	G - 3º-45'	14	L0B063330
3/8 - 24 UNF	LSB143548	L0B109834	GF - 2º-45'	14	L0B063329
M5 x 0,8	LSB143545	L0B129458	FX - 3º-30'	12	L0B141885
M6 x 1,0	LSB143545	L0B129458	FX - 3º-30'	12	L0B064254
M7 x 1,0	LSB143546	L0B068825	FF - 3º-0'	12	L0B064965
M8 x 1,0	LSB143548	L0B109834	GF - 2º-45'	14	L0B059144
M8 x 1,25	LSB143549	L0B141511	GX - 3º-15'	14	L0B064966
M10 x 1,25	LSB143548	L0B109834	GF - 2º-45'	14	L0B059145
M10 x 1,5	LSB143549	L0B141511	GX - 3º-15'	14	L0B064270



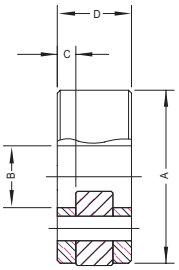
Die Holder



Die Body



Front View



Side View

#3.5 Tooling Dimensions	
Dimensions	mm
A	68,26
B	see thread size chart
C	4,76
D	28,58
E	--
F	Thru Bore
G	35,00
H	63,50
I*	25,00
J	13,50
K	83,00

Components		
Part #	**Description**	Quantity
L0B143456	**Die Holder - Metric**	1
L0D142295	**Thread Roll Shaft**	3
LFA001058	**Adjusting & Retaining Screws**	5
LGD001107	**3mm Hex Wrench**	1

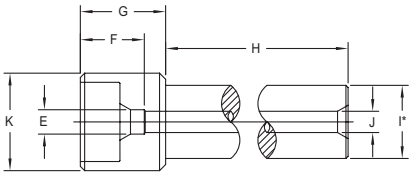
Thread Size	*Sub- Assembly Shank EDP*	*Die Body EDP*	Die Body Size	B - Dimension	*Thread Roll EDP*
	mm			mm	
1/4 - 20 UNC	*LSB143551*	*L0B142296*	T - 4°-15'	15,1	*L0B142326*
1/4 - 28 UNF	*LSB143552*	*L0B142299*	TF - 2°-40'	15,1	*L0B142328*
5/16 - 18 UNC	*LSB143553*	*L0B142297*	U - 3°-20'	22,6	*L0B118808*
5/16 - 24 UNF	*LSB143554*	*L0B142300*	UF - 2°-40'	22,6	*L0B118812*
3/8 - 16 UNC	*LSB143555*	*L0B142298*	V - 3°-10'	22,6	*L0B118809*
3/8 - 24 UNF	*LSB143556*	*L0B142301*	VF - 2°-0'	22,6	*L0B118813*

Threading

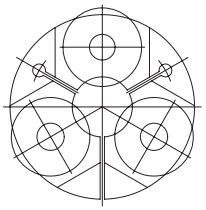
Thread Size	Sub- Assembly Shank EDP	Die Body EDP	Die Body Size	B - Dimension	Thread Roll EDP
	mm			mm	
7/16 - 14 UNC	LSB143555	L0B142298	V - 3º-10'	22,6	L0B118810
7/16 - 20 UNF	LSB143556	L0B142301	VF - 2º-0'	22,6	L0B118814
1/2 - 13 UNC	LSB143555	L0B142298	V - 3º-10'	22,6	L0B118853
1/2 - 20 UNF	LSB143556	L0B142301	VF - 2º-0'	22,6	L0B140479
M6 x 1,0	LSB143557	L0B142302	TX - 3º-20'	15,1	L0B142330
M6 X 0,75	LSB143552	L0B142299	TF - 2º-40'	15,1	L0B142332
M7 x 1,0	LSB143553	L0B142297	U - 3º-20'	22,6	L0B121074
M8 x 1,0	LSB143554	L0B142300	UF - 2º-40'	22,6	L0B140480
M8 x 1,25	LSB143553	L0B142297	U - 3º-20'	22,6	L0B121075
M10 x 1,0	LSB143556	L0B142301	VF - 2º-0'	22,6	L0B140481
M10 x 1,5	LSB143555	L0B142298	V - 3º-10'	22,6	L0B119706
M12 X 1,0	LSB143556	L0B142301	VF - 2º-0'	22,6	L0B142274
M12 x 1,75	LSB143555	L0B142298	V - 3º-10'	22,6	L0B121076



Die Holder



Die Body



Front View

Side View

#5 Tooling Dimensions	
Dimensions	mm
A	85,73
B	see thread size chart
C	4,76
D	28,58
E	-
F	Thru Bore
G	35,00
H	63,50
I*	25,00
J	17,50
K	99,00

Components		
Part #	**Description**	Quantity
L0B143457	**Die Holder - Metric**	1
L0D141679	**Thread Roll Shaft**	3
LFA001055	**Set Screw**	1
LFA001053	**Socket Head Cap Screw**	1
LFA001054	**Retaining Screw**	3
LGD001108	**4mm Hex Wrench**	1
LGD001109	**5mm Hex Wrench**	1

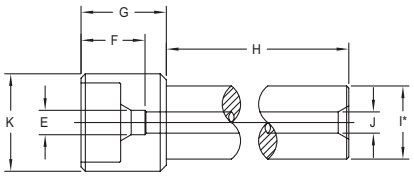
Thread Size	*Sub- Assembly Shank EDP*	*Die Body EDP*	Die Body Size	B - Dimension	*Thread Roll EDP*
	mm			mm	
5/16 - 18 UNC	*LSB143558*	*L0B141738M*	H - 3°-20'	22,6	*L0B118891*
5/16 - 24 UNF	*LSB143559*	*L0B141740M*	HF - 2°-30'	22,6	*L0B118897*
3/8 - 16 UNC	*LSB143558*	*L0B141738M*	H - 3°-20'	22,6	*L0B118892*
3/8 - 24 UNF	*LSB143559*	*L0B141740M*	HF - 2°-30'	22,6	*L0B118898*
7/16 - 14 UNC	*LSB143558*	*L0B141738M*	H - 3°-20'	22,6	*L0B118893*
7/16 - 20 UNF	*LSB143559*	*L0B141740M*	HF - 2°-30'	22,6	*L0B118584*

Threading

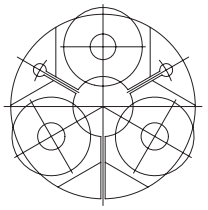
Thread Size	Sub- Assembly Shank EDP	Die Body EDP	Die Body Size	B - Dimension	Thread Roll EDP
	mm			mm	
1/2 - 13 UNC	LSB143560	L0B141739M	I - 2°-45'	22,6	L0B118894
1/2 - 20 UNF	LSB143561	L0B141741M	IF - 1°-50'	22,6	L0B118577
9/16 - 12 UNC	LSB143560	L0B141739M	I - 2°-45'	22,6	L0B118895
9/16 - 18 UNF	LSB143561	L0B141741M	IF - 1°-50'	22,6	L0B118899
5/8 - 11 UNC	LSB143560	L0B141739M	I - 2°-45'	22,6	L0B141745
5/8 - 18 UNF	LSB143561	L0B141741M	IF - 1°-50'	22,6	L0B118585
M8 x ,75	LSB143562	L0B141744M	HMF - 1°-45'	22,6	L0B140460
M8 x 1,0	LSB143559	L0B141740M	HF - 2°-30'	22,6	L0B140461
M8 x 1,25	LSB143558	L0B141738M	H - 3°-20'	22,6	L0B140605
M10 x ,75	LSB143562	L0B141744M	HMF - 1°-45'	22,6	L0B142462
M10 x 1,0	LSB143562	L0B141744M	HMF - 1°-45'	22,6	L0B142077
M10 x 1,5	LSB143558	L0B141738M	H - 3°-20'	22,6	L0B120613
M12 x 1,25	LSB143562	L0B141744M	HMF - 1°-45'	22,6	L0B128899
M12 x 1,5	LSB143559	L0B141740M	HF - 2°-30'	22,6	L0B140463
M12 x 1,75	LSB143560	L0B141739M	I - 2°-45'	22,6	L0B125521
M14 x 2,0	LSB143560	L0B141739M	I - 2°-45'	22,6	L0B120614
M16 x 1,5	LSB143561	L0B141741M	IF - 1°-50'	22,6	L0B140464
M16 x 2,0	LSB143560	L0B141739M	I - 2°-45'	22,6	L0B139490



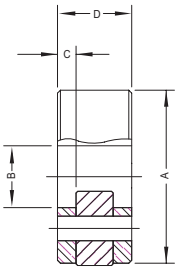
Die Holder



Die Body



Front View



Side View

#7 Tooling Dimensions	
Dimensions	mm
A	98,43
B	see thread size chart
C	9,53
D	44,45
E	--
F	Thru Bore
G	54,00
H	63,50
I*	38,00
J	27,00
K	115,00

Components		
Part #	**Description**	Quantity
L0B143458	**Die Holder - Metric**	1
L0D142222	**Thread Roll Shaft**	3
LFA001055	**Set Screw - Size Adjustment**	1
LFA001053	**Socket Head Cap Screw**	1
LFA001054	**Retaining Screw - Oval Point**	3
LGD001108	**4mm Hex Wrench**	1
LGD001109	**5mm Hex Wrench**	1

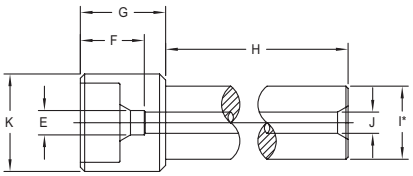
Thread Size	*Sub- Assembly Shank EDP*	*Die Body EDP*	Die Body Size	B - Dimension	*Thread Roll EDP*
	mm			mm	
7/16 - 14 UNC	*LSB143563*	*L0B142216M*	J - 3º-20'	33,4	*L0B118563*
7/16 - 20 UNF	*LSB143564*	*L0B142218M*	JF - 2º-15'	33,4	*L0B116060*
1/2 - 13 UNC	*LSB143563*	*L0B142216M*	J - 3º-20'	33,4	*L0B115752*
1/2 - 20 UNF	*LSB143564*	*L0B142218M*	JF - 2º-15'	33,4	*L0B116061*
9/16 - 12 UNC	*LSB143563*	*L0B142216M*	J - 3º-20'	33,4	*L0B118562*
9/16 - 18 UNF	*LSB143564*	*L0B142218M*	JF - 2º-15'	33,4	*L0B116062*

Threading

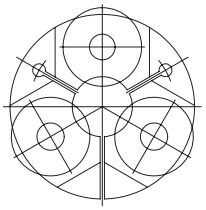
Thread Size	Sub- Assembly Shank EDP	Die Body EDP	Die Body Size	B - Dimension	Thread Roll EDP
	mm			mm	
5/8 - 11 UNC	LSB143565	L0B142217M	K - 2°-45'	33,4	L0B118567
5/8 - 18 UNF	LSB143566	L0B142219M	KF - 1°-40'	33,4	L0B112092
3/4 - 10 UNC	LSB143565	L0B142217M	K - 2°-45'	33,4	L0B112091
3/4 - 16 UNF	LSB143566	L0B142219M	KF - 1°-40'	33,4	L0B115236
7/8 - 9 UNC	LSB143565	L0B142217M	K - 2°-45'	33,4	L0B118568
7/8 - 14 UNF	LSB143566	L0B142219M	KF - 1°-40'	33,4	L0B112566
1 - 8 UNC	LSB143567	L0B142220M	L - 2°-30'	33,4	L0B142231
1 - 12 UNF	LSB143568	L0B142221M	LF - 1°-30'	33,4	L0B142232
1 - 14 UN	LSB143568	L0B142221M	LF - 1°-30'	33,4	L0B142233
M12 x 1,75	LSB143563	L0B142216M	J - 3°-20'	33,4	L0B129043
M12 x 1,25	LSB143564	L0B142218M	JF - 2°-15'	33,4	L0B133928
M14 x 2,0	LSB143563	L0B142216M	J - 3°-20'	33,4	L0B115468
M14 x 1,5	LSB143564	L0B142218M	JF - 2°-15'	33,4	L0B134223
M16 x 2,0	LSB143565	L0B142217M	K - 2°-45'	33,4	L0B112592
M16 x 1,5	LSB143566	L0B142219M	KF - 1°-40'	33,4	L0B132163
M20 x 2,5	LSB143565	L0B142217M	K - 2°-45'	33,4	L0B123573
M20 x 1,5	LSB143566	L0B142219M	KF - 1°-40'	33,4	L0B131276
M22 x 2,5	LSB143565	L0B142217M	K - 2°-45'	33,4	L0B068827
M22 x 1,5	LSB143566	L0B142219M	KF - 1°-40'	33,4	L0B131211
M24 x 3,0	LSB143567	L0B142220M	L - 2°-30'	33,4	L0B142237
M24 x 1,5	LSB143568	L0B142221M	LF - 1°-30'	33,4	L0B142239



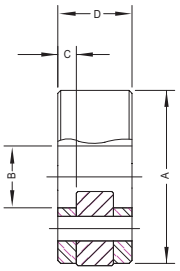
Die Holder



Die Body



Front View



Side View

#10 Tooling Dimensions	
Dimensions	mm
A	174,62
B	see thread size chart
C	9,53
D	50,80
E	--
F	see thread size chart
G	67,00
H	83,00
I*	50,00
J	34,00
K	197,00

Components		
Part #	**Description**	Quantity
L0A143477	**Die Holder - Metric**	1
L0D142162	**Thread Roll Shaft**	3
LFA001060	**Set Screw - Size Adjustment**	1
LFA001059	**Socket Head Cap Screw**	1
LFA001054	**Retaining Screw - Oval Point**	3
LGD001109	**5mm Hex Wrench**	1

Thread Size	*Sub- Assembly Shank EDP*	*Die Body EDP*	Die Body Size	B - Dimension	*Thread Roll EDP*
	mm			mm	
5/8 - 11 UNC	*LSB143569*	*L0B142192M*	Q - 2º-45'	59,5	*L0B118560*
5/8 - 18 UNF	*LSB143570*	*L0B142194M*	QF - 1º-40'	59,5	*L0B118624*
3/4 - 10 UNC	*LSB143569*	*L0B142192M*	Q - 2º-45'	59,5	*L0B118586*
3/4 - 16 UNF	*LSB143570*	*L0B142194M*	QF - 1º-40'	59,5	*L0B118570*
7/8 - 9 UNC	*LSB143569*	*L0B142192M*	Q - 2º-45'	59,5	*L0B118571*
7/8 - 14 UNF	*LSB143570*	*L0B142194M*	QF - 1º-40'	59,5	*L0B118572*

Threading

Thread Size	Sub- Assembly Shank EDP	Die Body EDP	Die Body Size	B - Dimension	Thread Roll EDP
	mm			mm	
1 - 8 UNC	LSB143571	L0B142193M	R - 2º-25'	59,5	L0B118550
1 - 12 UNF	LSB143572	L0B142195M	RF - 1º-20'	59,5	L0B118561
1-1/8 7 UNC	LSB143571	L0B142193M	R - 2º-25'	59,5	L0B118548
1-1/8 - 12 UNF	LSB143572	L0B142195M	RF - 1º-20'	59,5	L0B114092
1-1/4 -7 UNC	LSB143571	L0B142193M	R - 2º-25'	59,5	L0B118547
1-1/4 - 12 UNF	LSB143572	L0B142195M	RF - 1º-20'	59,5	L0B118559
M16 x 2,0	LSB143569	L0B142192M	Q - 2º-45'	59,5	L0B139598
M20 x 2,5	LSB143569	L0B142192M	Q - 2º-45'	59,5	L0B132225
M24 x 3,0	LSB143569	L0B142192M	Q - 2º-45'	59,5	L0B067483
M24 x 2,0	LSB143570	L0B142194M	QF - 1º-40'	59,5	L0B135232
M30 x 3,5	LSB143571	L0B142193M	R - 2º-25'	59,5	L0B132298
M30 x 2,0	LSB143572	L0B142195M	RF - 1º-20'	59,5	L0B118782

Oil and Gas Industry Threads

Sucker Rod Size	Sucker Rod Thread	Sub-Assembly Standard Shank EDP	Thread Rolls* EDP	Die Bodies EDP	Die Body Size	B-Dimension
						mm
5/8	15/16 - 10 API		LOB136461	LOA142208	SR - 2º-0'	59,5
3/4	1-1/16 - 10 API	LSB142159	LOB135883	LOA142161	SR - 1º-40'	59,5
7/8	1-3/16 - 10 API	LSB142159	LOB142293	LOA142161	SR - 1º-40'	59,5
1	1-3/8 - 10 API	LSB142159	LOB136463	LOA142161	SR - 1º-40'	59,5
1-1/8	1-9/16 - 10 API	LSB142159	LOB136464	LOA142161	SR - 1º-40'	59,5

* Sucker Rod Thread Rolls have Truncated Progressive Long Throats

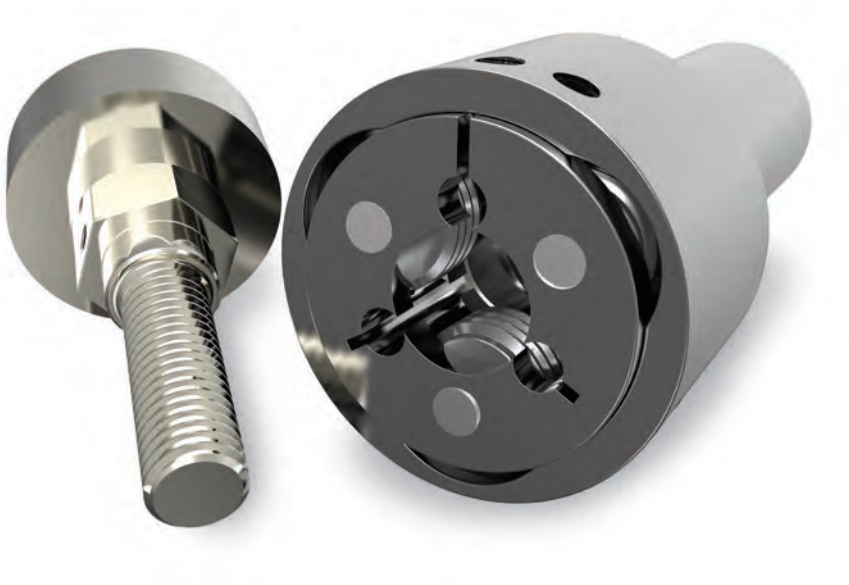
Using the Landis EZ Roller™ thread rolling tool begins with the application to the machine on which threads are to be rolled. They are ideally suited for use on CNC style machines that have a Rigid or Synchronous Tapping Cycle as part of their program selection. This cycle, normally used for tapping an internal thread, is a thread-on/thread-off operation that retracts the tap back out of the hole. It synchronizes the feed pitch to the spindle rotation, so that when the tool reaches its end-point, the feed matches the spindle speed as the spindle slows down to a stop and then reverses. This feature eliminates the old-style floating holder. So, applying an EZ Roller™ thread rolling tool to the same Rigid tapping cycle permits an external thread to be rolled in a similar manner. By utilizing this cycle, it allows for a simplified rolling tool design with no moving parts or mechanisms. Cycle times can be reduced by the elimination of extra turret movements in order to reset opening style thread cutting and rolling heads. All EZ Roller™ thread rolling tools can be furnished with inch or metric shanks for use in standard tool holders, which allows the tool to be applied to CNC machines with automatic tool changers.

While considerable time can be saved in the overall cycle when threading a part with an EZ Roller™ thread rolling tool, it may not be practical to do so if the length of the thread is excessively long. At some point, the cycle time to thread-on and thread-off will be longer than that time required to move and reset an opening style rolling head.

This determination will need to be made as part of the overall part run. Landis typically suggests that the thread length be limited to 2 to 3 times the thread diameter, however, longer length threads can be run under certain conditions.

Another feature of the EZ Roller™ thread rolling tool is its capacity to be pre-set for a thread size off the machine. Spare or extra Die Bodies and Thread Rolls can be used for the same or additional sizes and then exchanged with the used one. With the #1.5, #3 and the #3.5, the unit cost is low enough to possibly justify exchanging the entire pre-set tool. Conversely, on the #5, #7 and #10 where the Die Body and Rolls are independent of the Die Holder, a Die Body unit can be exchanged without removing the Die Holder from the machine, in just a matter of minutes. Pre-setting the EZ Roller™ thread rolling tools on the bench can be accomplished by using either a thread set-gage or a master part, if one is available.

Or, on the smaller sizes, a plug gage equal to the thread minor diameter can be used by inserting it in between the Thread Rolls. In using either method of pre-setting, the tool is sized to just finger-tight on the gage. All 6 sizes of EZ Roller™ thread rolling tools are designed with enough size adjustment capacity to permit adjustment thru the Pitch Diameter tolerance ranges of all UN and Metric threads.



The Landis EZ ROLLER™ thread rolling tool is one of the most versatile thread rolling tools for CNC threading operations being made today. The refined design, that has eliminated all moving components, combined with a standardization of manufacturing processes, offers the flexibility to tailor the EZ Roller™ thread rolling tool to meet the customers' workpiece requirements and still fit within the machines tooling envelope.

For this purpose, Landis has developed the "T" version of the EZ Roller™ thread rolling tool. Landis can design a tool to fit your product and machine requirements. To illustrate the concept of the "T" version, we outlined two examples of tools that were designed and built for specific purposes.

- The #7T EZ Roller™ thread rolling tool, designed to thread roll a M33 x 3,0 thread on an automotive axle housing. The application was to a special-built CNC machine. This #7T utilizes 5 Thread Rolls per set. The Thread Roll is based on the smaller #5 EZ Roller™ thread rolling tool, in order to help keep the overall tool size to a minimum, yet still provide sufficient roll diameter for long life. The 5-roll design minimizes arch-length which helps insure stability during the rolling cycle.



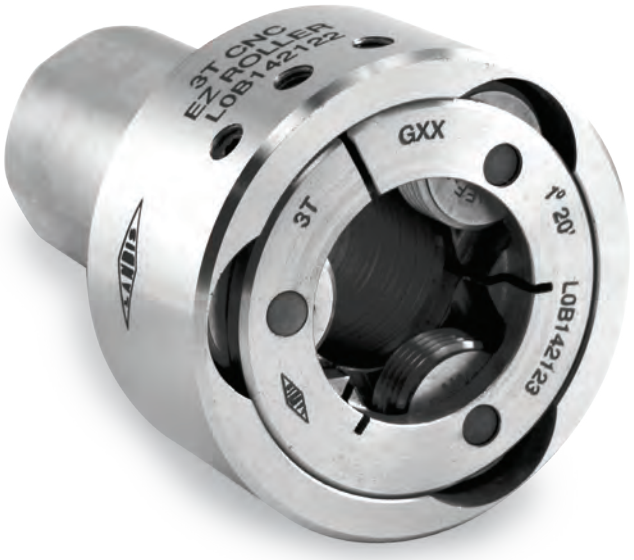
- The #3T EZ Roller™ thread rolling tool was designed to thread roll a M20 X 1,5 ISO thread on a hex fitting. In this case, the tool envelop of the CNC machine dictated the size of the tool. The thread was to be rolled close to the hex shoulder, so thread rolls from a #3CNC were used in a tailor-made Die Body that would clear the hex. The Holder was then sized to fit within that required tooling envelope.

APPLICATIONS OF EZ ROLLER™ THREAD ROLLING TOOLS

Being round, the majority of threading operations are naturally done on lathes. However, in some instances, parts that are not round may also have a thread on them.

Eliminate the secondary threading operation by installing a Landis EZ Roller on your machining center using a direct-mount V-flange shank. With the EZ Roller, there is no resetting operation needed, so the machine cycle can index the tool into the spindle, roll the thread, and then index out. Landis can supply any size CAT or BT style shank on our full range of EZ Rollers.

The Landis® CNC EZ roller can be supplied with specialized tool adaption systems such as the VDI system as well as those with through coolant.



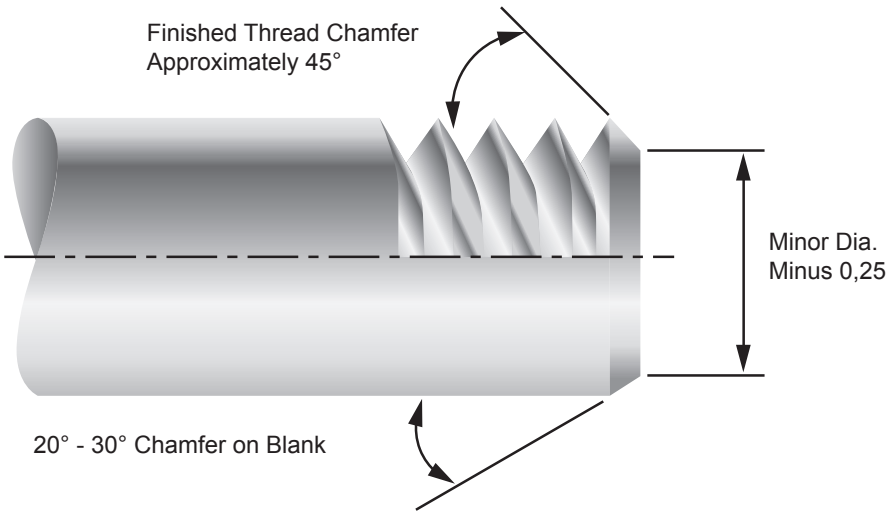
Recommended Blank Diameters

Preparing and Controlling Blank Diameters

- The process of maintaining a properly sized blank diameter within specific limits is critical to forming a functionally correct thread
- Compressing excess material between thread rolls increases pressure on the roll thread form (over rolling). Causing roll breakage and/or oversized threads.
- Compressing little material causes thread to be incorrectly formed.
- To help eliminate these issues, Landis provides recommended starting blank diameter for both inch and metric threads
- Depending on the material and metallurgical makeup the final blank diameter must be established by actual rolling.

Preparing the blank

- Rolled Threads have a seam which results from material flowing from the root area up to and folded in at the crest. Seams will be more visible on some threads than others.
- Starting with the minimum acceptable blank diameter will increase roll life and result in a larger seam
- Seams have no bearing on thread strength but sometimes they are aesthetically objectionable. If this is the case, they can be rolled tighter if the decreased roll life is acceptable, or the thread can be rolled with an oversized addendum that can be ground away to remove the seam.
- Starting at minimum blank diameter also allows for blank growth due to tool wear and longer run times before the maximum allowable blank diameter is reached.



Blank Diameters for Parallel Rolled Metric Threads

Size		Steels						Brass & Bronze	Aluminum Alloys	
		10-50 C Soft	30-50 C Soft	30-50 C or Alloy 15-25 RC	30-50 C or Alloy 26-32 RC	Stainless Chrome Nickel 300 Series	Stainless Chrome 400 Series		Soft	Hard
Size	**Pitch**	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.
3	0,35	2,743 - 2,756	2,751 - 2,764	2,756 - 2,769	2,758 - 2,771	2,766 - 2,779	2,758 - 2,771	2,751 - 2,764	2,756 - 2,769	2,751 - 2,764
3	0,5	2,639 - 2,652	2,647 - 2,659	2,652 - 2,664	2,654 - 2,667	2,662 - 2,675	2,654 - 2,667	2,647 - 2,659	2,652 - 2,664	2,647 - 2,659
3,5	0,35	3,244 - 3,256	3,249 - 3,261	3,254 - 3,266	3,256 - 3,269	3,264 - 3,277	3,256 - 3,269	3,249 - 3,261	3,254 - 3,266	3,249 - 3,261
3,5	6	3,071 - 3,084	3,081 - 3,094	3,084 - 3,0960	3,089 - 3,101	3,096 - 3,109	3,089 - 3,101	3,081 - 3,094	3,084 - 3,096	3,081 - 3,094
4	0,5	3,64 - 3,653	3,647 - 3,660	3,65 - 3,663	3,655 - 3,668	3,663 - 3,675	3,655 - 3,668	3,647 - 3,660	3,650 - 3,663	3,647 - 3,660
4	0,7	3,505 - 3,52	3,513 - 3,528	3,518 - 3,533	3,523 - 3,538	3,533 - 3,548	3,523 - 3,538	3,513 - 3,5280	3,518 - 3,533	3,513 - 3,5280
4,5	0,5	4,14 - 4,153	4,648 - 4,161	4,15 - 4,663	4,155 - 4,168	4,163 - 4,176	4,155 - 4,168	4,148 - 4,161	4,15 - 4,163	4,148 - 4,161
5	0,5	4,638 - 4,651	4,148 - 4,661	4,651 - 4,1630	4,653 - 4,666	4,663 - 4,676	4,653 - 4,666	4,648 - 4,661	4,6510 - 4,663	4,648 - 4,661
5	0,8	4,437 - 4,455	4,448 - 4,463	4,453 - 4,4680	4,458 - 4,473	4,465 - 4,483	4,463 - 4,473	4,468 - 4,448	4,4630 - 4,453	4,447 - 4,448
6	0,75	5,469 - 5,484	5,479 - 5,494	5,484 - 5,499	5,489 - 5,504	5,496 - 5,512	5,489 - 5,504	5,479 - 5,494	5,484 - 5,499	5,479 - 5,494
6	1	5,293 - 5,314	5,306 - 5,326	5,314 - 5,334	5,319 - 5,339	5,331 - 5,352	5,319 - 5,339	5,306 - 5,326	5,314 - 5,334	5,306 - 5,326
7	0,75	6,469 - 6,485	6,48 - 6,495	6,485 - 6,5000	6,49 - 6,505	6,497 - 6,513	6,49 - 6,505	6,48 - 6,495	6,4890 - 6,5000	6,4800 - 6,495
7	1	6,294 - 6,314	6,307 - 6,3270	6,314 - 6,335	6,32 - 6,340	6,332 - 6,353	6,32 - 6,340	6,307 - 6,327	6,314 - 6,335	6,307 - 6,327
8	1	7,295 - 7,3150	7,308 - 7,328	7,315 - 7,336	7,32 - 7,341	7,333 - 7,353	7,320 - 7,341	7,308 - 7,328	7,315 - 7,336	7,308 - 7,328
8	1,25	7,13 - 7,150	7,142 - 7,1630	7,148 - 7,168	7,155 - 7,1790	7,168 - 7,1880	7,155 - 7,176	7,142 - 7,163	7,1480 - 7,168	7,142 - 7,163
9	1	8,293 - 8,313	8,306 - 8,326	8,313 - 8,334	8,319 - 8,339	8,331 - 8,352	8,319 - 8,339	8,306 - 8,326	8,1310 - 8,334	8,306 - 8,326
9	1,25	8,131 - 8,151	8,143 - 8,164	8,148 - 8,169	8,156 - 8,176	8,169 - 8,189	8,156 - 8,176	8,143 - 8,164	8,148 - 8,169	8,143 - 8,164
10	1	9,294 - 9,314	9,307 - 9,327	9,314 - 9,335	9,319 - 9,340	9,332 - 9,352	9,319 - 9,34	9,307 - 9,327	9,314 - 9,335	9,307 - 9,327
10	1,5	8,956 - 8,9840	8,971 - 8,999	8,979 - 9,007	8,989 - 9,014	9,004 - 9,030	8,989 - 9,014	8,971 - 8,999	8,979 - 9,007	8,971 - 8,999

Blank Diameters for Parallel Rolled Metric Threads

Size		Steels						Brass & Bronze	Aluminum Alloys	
		10-50 C Soft	30-50 C Soft	30-50 C or Alloy 15-25 RC	30-50 C or Alloy 26-32 RC	Stainless Chrome Nickel 300 Series	Stainless Chrome 400 Series		Soft	Hard
Size	**Pitch**	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.
11	1,5	9,954 - 9,982	9,97 - 9,997	9,977 - 10,005	9,987 - 10,012	10,003 - 10,027	9,987 - 10,012	9,97 - 9,997	9,977 - 10,005	9,97 - 9,997
12	1,5	10,955 - 10,983	10,97 - 10,998	10,978 - 11,006	10,988 - 11,013	11,003 - 11,029	10,988 - 11,013	10,97 - 10,998	10,978 - 11,006	10,97 - 10,998
12	1,75	10,785 - 10,818	10,803 - 10,836	10,81 - 10,843	10,82 - 10,853	10,838 - 10,871	10,82 - 10,853	10,803 - 10,836	10,81 - 10,843	10,803 10,836
14	1,5	1,2954 - 12,982	12,969 - 12,997	12,977 - 13,005	12,987 - 13,012	13,002 - 13,028	12,987 - 13,012	12,969 - 12,997	12,977 - 13,005	12,969 - 12,997
14	2	12,614 - 12,647	12,631 - 12,664	12,642 - 12,675	12,652 - 12,685	12,672 - 12,705	12,652 - 12,685	12,631 - 12,664	12,642 - 12,657	12,631 - 12,664
16	1,5	14,956 - 14,983	14,971 - 14,999	14,987 - 15,006	14,989 - 15,014	15,004 - 15,029	14,989 - 15,014	14,971 - 14,999	14,978 - 15,006	14,971 - 14,999
16	2	14,615 - 14,648	14,633 - 14,666	14,643 - 14,676	14,653 - 14,686	14,674 - 14,707	14,653 - 14,686	14,633 - 14,666	14,643 - 14,676	14,633 - 14,666
18	1,5	16,955 - 16,982	16,97 - 16,998	16,977 - 17,005	16,988 - 17,013	17,003 - 17,028	16,988 - 17,013	16,97 - 16,998	16,977 - 17,005	16,97 - 16,998
18	2,5	16,274 - 16,312	16,297 - 16,335	16,307 - 16,345	16,32 - 16,358	16,342 - 16,380	16,320 - 16,358	16,297 - 16,335	16,307 - 16,345	16,297 - 16,335
20	1,5	18,956 - 18,984	18,971 - 18,999	18,979 - 19,007	18,989 - 19,014	19,004 - 19,030	18,989 - 19,014	18,971 - 18,999	18,979 - 19,007	18,971 - 18,999
20	2,5	18,275 - 18,313	18,298 - 18,336	18,308 - 18,346	18,321 - 18,359	18,344 - 18,382	18,321 - 18,359	18,298 - 18,336	18,308 - 18,346	18,298 - 18,336
22	1,5	20,955 - 20,983	20,97 - 20,998	20,978 - 21,006	20,988 - 21,013	21,003 - 21,029	20,988 - 21,013	20,97 - 20,998	20,978 - 21,006	20,970 - 20,998
22	2,5	20,274 - 20,312	20,297 - 20,335	20,307 - 20,345	20,32 - 20,358	20,343 - 20,381	20,320 - 20,358	20,297 - 20,335	20,307 - 20,345	20,297 - 20,335
24	2	22,614 - 22,647	22,631 - 22,664	22,642 - 22,675	22,652 - 22,685	22,672 - 22,705	22,652 - 22,685	22,631 - 22,664	22,642 - 22,675	22,631 - 22,664
24	3	21,930 - 21,979	21,958 - 22,004	21,971 - 22,017	21,984 - 22,029	22,007 - 22,055	21,984 - 22,029	21,958 - 22,004	21,971 - 22,017	21,958 - 22,004
27	2	25,613 - 25,646	15,631 - 25,664	25,641 - 25,674	25,651 - 25,684	25,672 - 25,705	25,651 - 25,684	25,631 - 25,664	25,641 - 25,674	25,631 - 25,664
27	3	24,933 - 24,981	24,961 - 25,006	24,973 - 25,019	24,986 - 25,032	25,011 - 25,060	24,986 - 25,032	24,961 - 25,006	24,973 - 25,109	24,961 - 25,006

Blank Diameters for Parallel Rolled Metric Threads

Size		Steels						Brass & Bronze	Aluminum Alloys	
		10-50 C Soft	30-50 C Soft	30-50 C or Alloy 15-25 RC	30-50 C or Alloy 26-32 RC	Stainless Chrome Nickel 300 Series	Stainless Chrome 400 Series		Soft	Hard
Size	**Pitch**	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. - Max.	Min. -.Max.
30	2	28,613 - 28,646	28,631 - 28,664	28,641 - 28,679	28,651 - 28,684	28,672 - 28,705	28,651 - 28,684	28,631 - 28,664	28,641 - 28,674	28,631 - 28,664
30	3,5	27,595 - 27,643	27,623 - 27,763	27,638 - 27,689	27,653 - 27,704	27,683 - 27,732	27,653 - 27,704	27,623 - 27,673	27,638 - 27,689	27,623 - 27,673
33	2	31,615 - 31,648	31,633 - 31,666	31,643 - 31,676	31,653 - 31,687	31,674 - 31,707	31,653 - 31,687	31,633 - 31,666	31,643 - 31,676	31,633 - 31,666
33	3,5	30,594 - 30,643	30,622 - 30,673	30,637 - 30,688	30,653 - 30,704	30,683 - 30,731	30,653 - 30,704	30,622 - 30,673	30,637 - 30,688	30,622 - 30,673
36	3	33,925 - 33,973	33,953 - 34,001	33,967 - 34,016	33,981 - 34,029	34,009 - 34,057	33,981 - 34,029	33,953 - 34,001	33,967 - 34,015	33,953 - 34,001
36	4	33,265 - 33,316	33,295 - 33,346	33,311 - 33,361	33,326 - 33,377	33,356 - 33,407	33,326 - 33,377	33,295 - 33,346	33,311 - 33,3661	33,295 - 33,346
39	3	36,925 - 36,973	36,953 - 37,001	36,967 - 37,015	36,981 - 37,029	37,009 - 37,057	36,981 - 37,029	36,953 - 37,001	36,967 - 37,015	36,953 - 37,001
39	4	36,265 - 36,316	36,295 - 36,346	36,311 - 36,361	36,326 - 36,377	36,356 - 36,407	36,326 - 36,377	36,295 - 36,346	36,311 - 36,361	36,295 - 36,346
42	3	39,923 - 39,971	39,951 - 39,999	39,966 - 40,014	39,98 - 40,028	40,008 - 40,056	39,980 - 40,028	39,951 - 39,999	39,966 - 40,014	39,951 - 39,999
42	4,5	38,928 - 38,987	38,9613 - 39,02	38,978 - 9,036	38,994 - 39,053	39,027 - 39,086	38,994 - 39,053	38,961 - 39,020	38,978 - 39,036	38,961 - 39,020
45	3	42,923 - 42,971	42,951 - 42,999	42,966 - 43,014	42,98 - 43,028	43,008 - 43,056	42,980 - 43,028	42,951 - 42,999	42,966 - 43,014	42,951 - 42,99
45	4,5	41,928 - 41,987	41,961 - 42,020	41,978 - 42,036	41,994 - 42,053	42,027 - 42,086	41,994 - 42,053	41,961 - 42,02	41,978 - 42,036	41,961 - 42,020
48	3	45,921 - 45,971	45,950 - 46,000	45,964 - 46,015	45,979 - 46,029	46,008 - 46,058	45,979 - 46,029	45,950 - 46,000	45,964 - 46,015	45,950 - 46,000
48	5	44,592 - 44,655	44,628 - 44,691	44,645 - 44,709	44,663 - 44,727	44,699 - 44,762	44,663 - 44,727	44,628 - 44,691	44,645 - 44,709	44,628 - 44,691
52	3	49,918 - 49,969	49,948 - 49,999	49,963 - 50,013	49,977 - 50,028	50,007 - 50,058	49,977 - 50,028	49,948 - 49,999	49,963 - 50,013	49,948 - 49,999
52	5	48,592 - 48,643	48,628 - 48,678	48,645 - 48,696	48,663 - 48,714	48,699 - 48,749	48,663 - 48,714	48,628 - 48,678	48,645 - 48,696	48,628 - 48,678

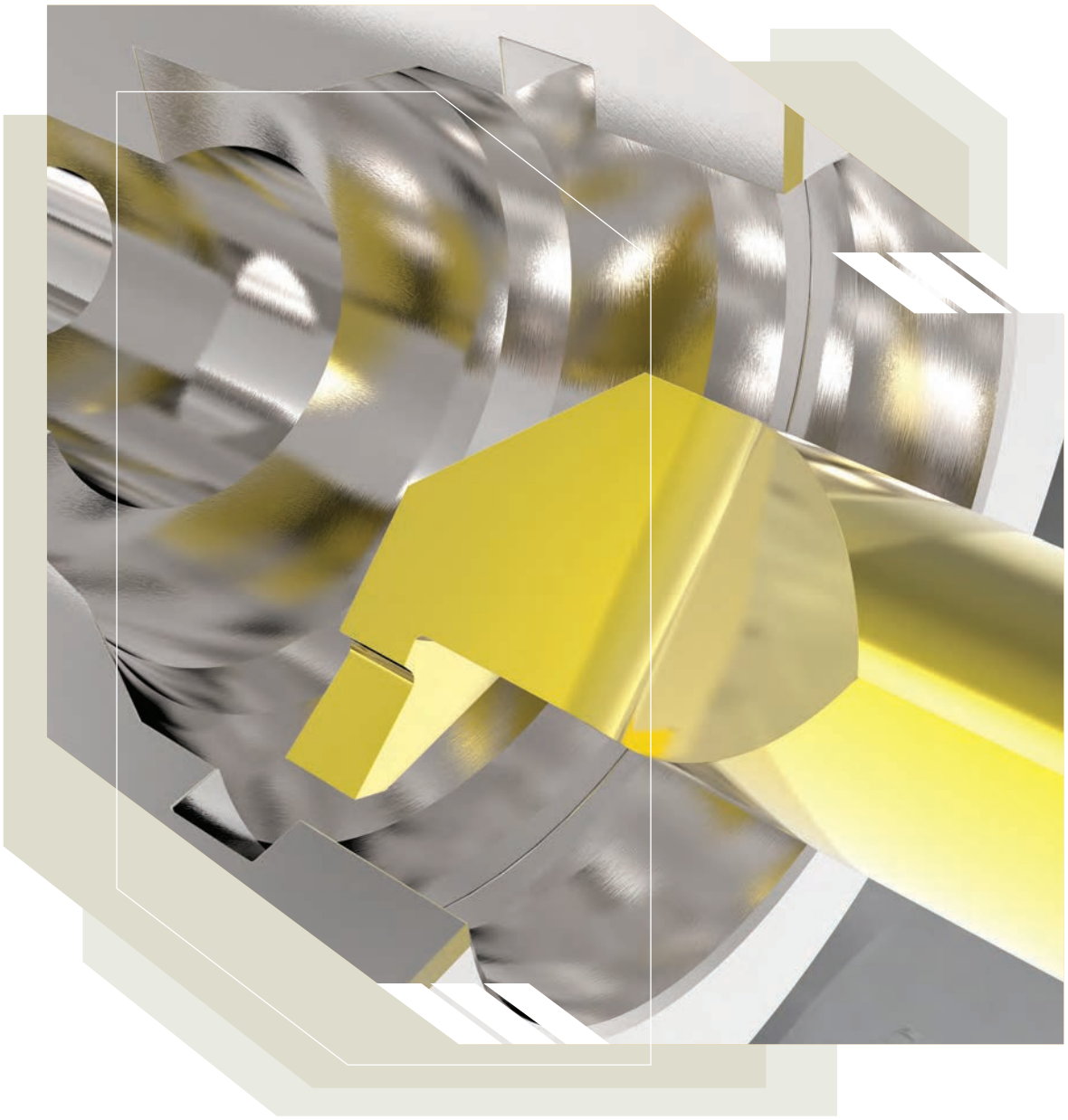
Grooving



All Stellram's products are supported by a confident and technical sales team backed by an extensive customer care policy.

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Grooving



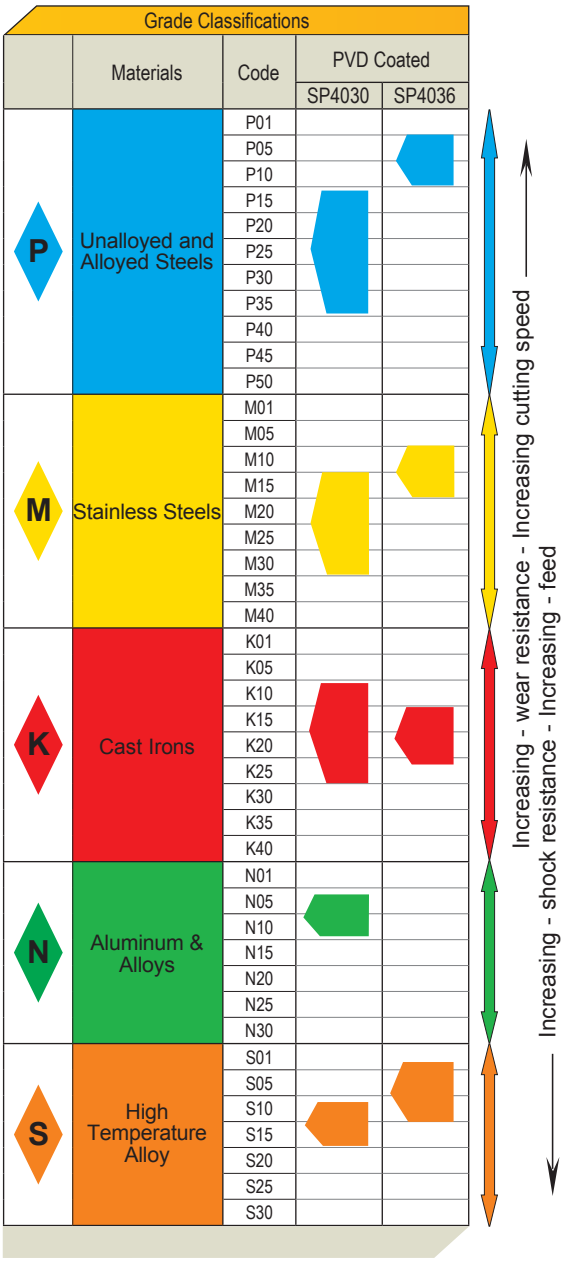
Grooving Grades

SP4030 and SP0436 are PVD coated grades with a micrograin substrate for machining at higher speeds with lower feed. Ideal for Stainless Steels and Ductile materials.

Cutting Speed v_c

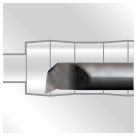
ISO	Materials	Rm and Hardness	SP4030 m/min min. - max.	SP4036 m/min min. - max.
P	Unalloyed Steel	<600 N/mm² <180 HBN	135 - 271	162 - 325
		<950 N/mm² <280 HBN	88- 176	105- 211
	Alloyed Steel	700-950 N/mm² 200-280 HBN	80 - 161	97 - 193
		950-1200 N/mm² 280-355 HBN	73 - 146	88 - 176
		1200-1400 N/mm² 355-415 HBN	50 - 100	60 - 120
M	Stainless Steel	Austenitic + Ferritic 300 series	107 - 229	128 - 274
		Martensitic 400 series	102 - 220	123 - 263
	PH Stainless	Refractory P.H.	57 - 122	68 - 146
K	Cast Iron	Grey GG-Ft	134 - 268	161 - 322
		Spheroidal-Ductile GGG-FGS	116 - 232	139 - 278
		Malleable GTS - MN/MP	78 - 156	94 - 187
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB	366 - 915	439 - 1098
		Aluminium + Silicon > 16% 92 HB	244 - 610	293 - 732
S	High Temperature Alloys	Iron Based	20 - 39	23 - 47
		Cobalt Based	16 - 32	19 - 38
		Nickel Based	17 - 34	20 - 41
		Titanium Based	27 - 54	32 - 64

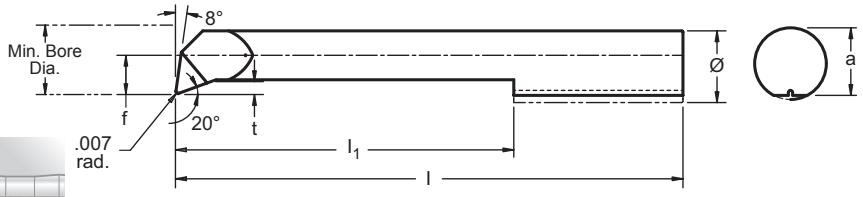
Optimum Grade Performance



050...





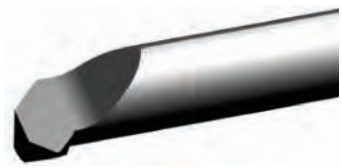


Type 050... Boring and Profiling Operation

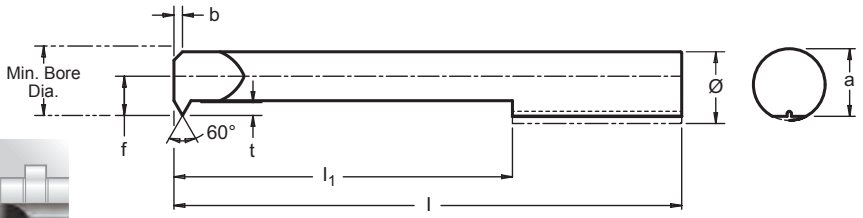
EDP	Description	Grade	Dimensions (mm)								
			b	f	a	l	l_1	t	D min	Ø	Toolholder
026360	**R050205**	SP4030	-	-	3,5	19	5	0,1	2	4	645...
026364	**R050210**			-	3,5	24	10	0,1	2	4	
026368	**R050215**			-	3,5	29	15	0,1	2	4	
026372	**R050310**			0,6	3,5	24	10	0,2	2,8	4	
026376	**R050316**			0,6	3,5	30	16	0,2	2,8	4	
026380	**R050320**			0,6	3,5	34	20	0,2	2,8	4	
026384	**R050410**			1,5	3,5	24	10	0,3	4	4	
026388	**R050416**			1,5	3,5	30	16	0,3	4	4	
026392	**R050420**			1,5	3,5	34	20	0,3	4	4	
026396	**R050510**			1,9	4,4	25	10	0,5	5	5	
026400	**R050515**			1,9	4,4	30	15	0,5	5	5	
026404	**R050520**			1,9	4,4	35	20	0,5	5	5	
026407	**R050525**			1,9	4,4	40	25	0,5	5	5	
026411	**R050530**			1,9	4,4	45	30	0,5	5	5	
026414	**R050615**			2,3	5,3	30	15	0,5	6	6	676...
026418	**R050622**			2,3	5,3	37	22	0,5	6	6	
026422	**R050625**			2,3	5,3	40	25	0,5	6	6	
026426	**R050630**			2,3	5,3	45	30	0,5	6	6	
026430	**R050720**			2,7	6,3	35	20	0,6	6,8	7	
026434	**R050725**			2,7	6,3	40	25	0,6	6,8	7	
026438	**R050730**			2,7	6,3	45	30	0,6	6,8	7	

For Toolholders See page 293

060...





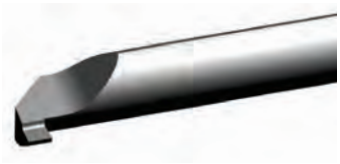


Type 060... Boring, Profiling and Chamfering Operation

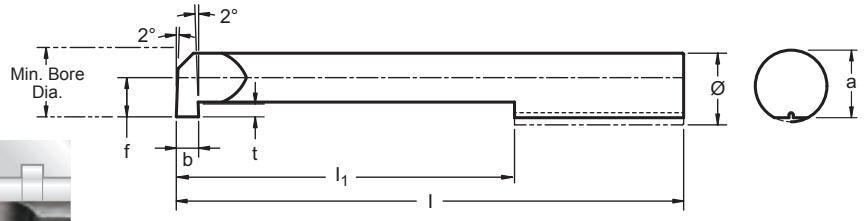
EDP	Description	Grade	Dimensions (mm)								
			b	f	a	l	l_1	t	D min	Ø	Toolholder
026446	**R060520**	SP4030	0,2	1,9	4,4	35	20	0,7	5	5	645...
026450	**R060720**			2,8	6,3				6,8	7	676...

For Toolholders See page 293

004...







Type 004... Grooving Internal Boring Operation

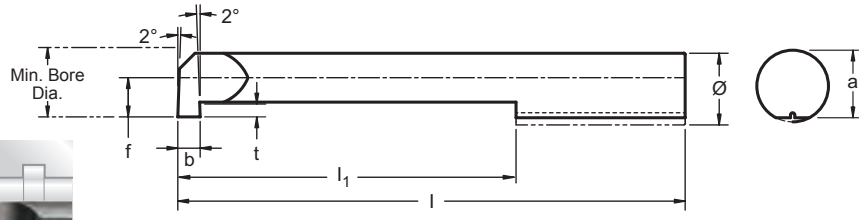
EDP	Description	Grade	Dimensions (mm)								
			b	f	a	l	l_1	t	D min	Ø	Toolholder
026168	**R004010010**	SP4030	1	1,5	3,5	24	10	0,8	4	4	645...
026172	**R004010016**					30	16				
026176	**R004010020**					34	20				

For Toolholders See page 293

005...







Type 005... Grooving Internal Boring Operation

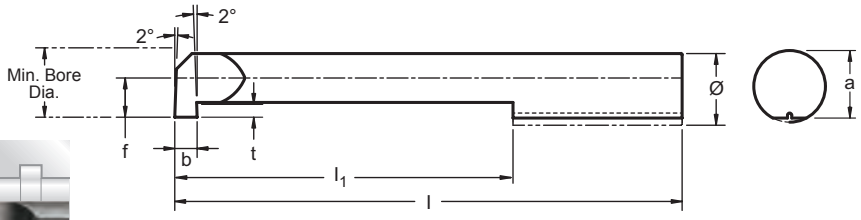
EDP	Description	Grade	Dimensions (mm)								
			b	f	a	l	l_1	t	D min	Ø	Toolholder
026180	**R005010010**	SP4030	1	1,9	4,4	25	10	1	5	5	645...
026184	**R005010015**		1			30	15				
026188	**R005010020**		1			35	20				
026192	**R005010025**		1			40	25				
026204	**R005015015**		1,5			30	15				
026208	**R005015020**		1,5			35	20				
026220	**R005020010**		2			25	10				
026224	**R005020015**		2			30	15				
026228	**R005020020**		2			35	20				
026232	**R005020025**		2			40	25				
023301	**R005051015**		2			45	30				

For Toolholders See page 293

006...







Type 006... Grooving Internal Boring Operation

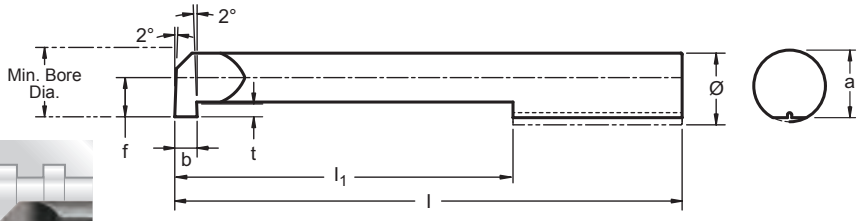
EDP	Description	Grade	Dimensions (mm)								
			b	f	a	l	l_1	t	D min	Ø	Toolholder
026240	**R006010010**	SP4030	1	2,3	5,3	25	10	1,8	6	6	676...
026244	**R006010015**		1			30	15				
026248	**R006010022**		1			37	22				
026252	**R006010025**		1			40	25				
026260	**R006015010**		1,5			25	10				
026264	**R006015015**		1,5			30	15				
026268	**R006015022**		1,5			37	22				
026272	**R006015025**		1,5			40	25				
026280	**R006020010**		2			25	10				
026284	**R006020015**		2			30	15				
026292	**R006020025**		2			40	25				

For Toolholders See page 293

007...





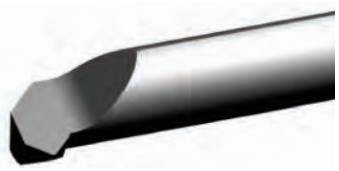


Type 007... Grooving Internal Boring Operation

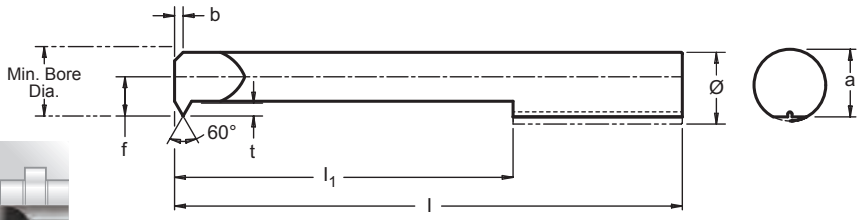
EDP	Description	Grade	Dimensions (mm)								
			b	f	a	l	l_1	t	D min	Ø	Toolholder
026300	**R007010010**	SP4030	1	2,7	6,3	25	10	2,5	6,8	7	676...
026304	**R007010015**		1			30	15				
026312	**R007010025**		1			40	25				
026320	**R007015010**		1,5			25	10				
026324	**R007015015**		1,5			30	15				
026332	**R007015025**		1,5			40	25				
026336	**R007015030**		1,5			45	30				
026340	**R007020010**		2			25	10				
026344	**R007020015**		2			30	15				
026352	**R007020025**		2			40	25				
026356	**R007020030**		2			45	30				

For Toolholders See page 293

004/5/6/7...







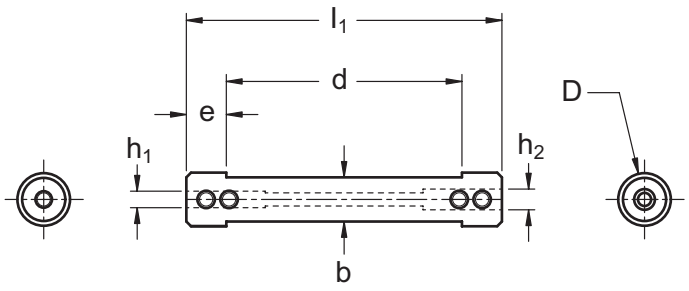
Type 004/5/6/7... Metric ISO Thread Partial Profile 60°

EDP	*Description*	Grade	Dimensions (mm)									
			Pitch	e	f	a	l	l_1	t	D min	Ø	Toolholder
Standard pitch												
026467	**R006051015**	SP4030	1	0.55	1.9	4.4	30	15	0.55	4.8	5	645...
026469	**R006061215**		1.25	0.65	2.3	5.3			0.68	6	6	676...
026471	**R006081515**		1.5	0.75	2.3	5.3			0.81	6	6	
026473	**R007081515**		1.5	0.75	2.7	6.3			0.81	7	7	
Fine pitch												
026460	**R004020515**	SP4030	0.5	0.35	1.5	3.5	30	15	0.27	4	4	645...
026462	**R005020515**		0.5	0.35	1.9	4.4			0.27	5	5	
026464	**R005040715**		0.75	0.45	1.9	4.4			0.4	5	5	

For Toolholders See page 293

645 - 676





Toolholder for Ultra Mini

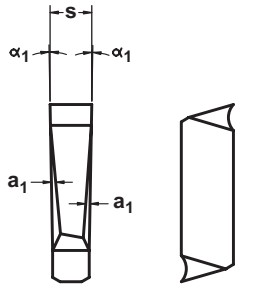
EDP	Description	Dimensions (mm)						
		D	b	d	e	l_1	h_1	h_2
026475	**6450012D**	12	10,3	55		75	4	5
026476	**6450016D**	16	14	55		75	4	5
026477	**6450020D**	20	18	70	10	90	4	5
026478	**6760016D**	16	14	55		75	6	7
026479	**6760020D**	20	18	70		90	6	7

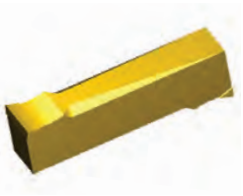
For Inserts See pages 289 - 292

Spare Parts

Description	EDP	Screw
6450012D to 6760020D	*024516*	110645

G217

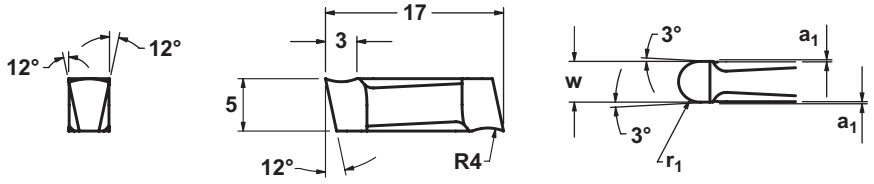


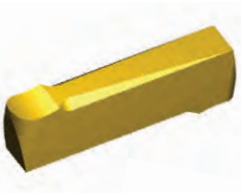


G217 Standard Groove Widths						
EDP	Description	Grade	Dimensions (mm)			Grooving Width
			s	α_1	a_1	
026530	**G217005000**	SP4036	0,57	1°	0,06	1
026532	**G217006000**		0,67			
026534	**G217007000**		0,77			
026536	**G217008000**		0,87			
026538	**G217009000**		0,97			
026540	**G217010000**		1,07			
026542	**G217011000**		1,24	3°	1	
026544	**G217013000**		1,44			
026546	**G217016000**		1,74			
026548	**G217018500**		1,99			2
026550	**G217021500**		2,29			
026552	**G217026500**		2,79			
026554	**G217031500**		3,29			3
026556	**G217041500**		4,29			4
026558	**G217051500**		5,29			

For Toolholders See page 295 - 296

G217 Full Radius

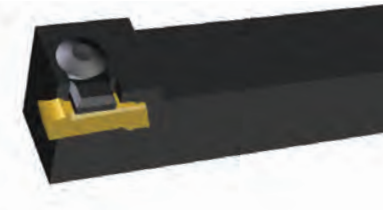


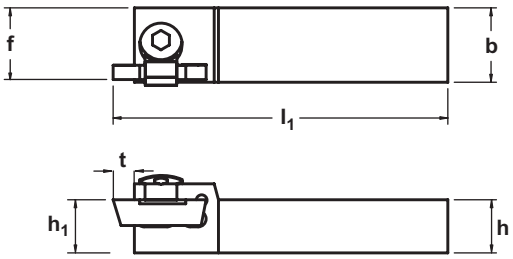


G217 Full Radius Inserts							
EDP	Description	Grade	Dimensions (mm)				Toolholder Width
			w	r_1	a_1	t max	
034397	**G217001020**	SP4036	2	1,00	0,2	3 or 4*	2
034398	**G217001530**		3	1,50			3
034399	**G217002040**		4	2,00			4

* In combination with toolholder, 3mm for internal operation and 4mm for external operation

GR240





External Toolholder GR240 for Insert Type G217

EDP	Version	*Description*	Dimensions (mm)						Grooving Width
			b	h	h_1	l_1	f	t	
025124	Left hand	**GL2401212M01**	12	12	12	150	11,50	4	0,50 - 1,74
025123	Right hand	**GR2401212M01**							
025126	Left hand	**GL2401212M02**	12	12	12	150	11,50	4	1,74 - 2,74
025125	Right hand	**GR2401212M02**							
025132	Left hand	**GL2401616M01**	16	16	16	150	14,50	4	0,50 - 1,74
025131	Right hand	**GR2401616M01**							
025134	Left hand	**GL2401616M02**	16	16	16	150	14,50	4	1,74 - 2,74
025133	Right hand	**GR2401616M02**							
025136	Left hand	**GL2401616M03**	16	16	16	150	14,50	4	2,74 - 3,74
025135	Right hand	**GR2401616M03**							
025140	Left hand	**GL2402020K01**	20	20	20	125	18,50	4	0,50 - 1,74
025139	Right hand	**GR2402020K01**							
025142	Left hand	**GL2402020K02**	20	20	20	125	18,50	4	1,74 - 2,74
025141	Right hand	**GR2402020K02**							
025144	Left hand	**GL2402020K03**	20	20	20	125	18,50	4	2,74 - 3,74
025143	Right hand	**GR2402020K03**							
025146	Left hand	**GL2402020K04**	20	20	20	125	18,50	4	3,74 - 5,29
025145	Right hand	**GR2402020K04**							

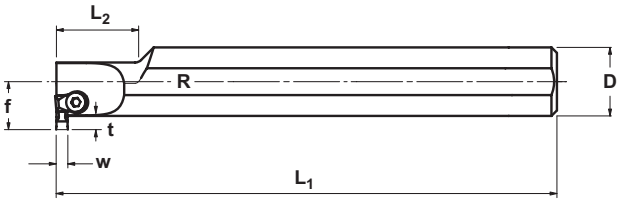
For Inserts See page 294

Spare Parts for External GR240 Toolholder

Description	EDP	Screw	EDP	Clamp	Insert Type
G_2401212M0.. To G_2401616M0	*025385*	SN135	*025387*	SG24083	G217
G_2402020M0...			*025388*	SG24084	

GR233/GR253



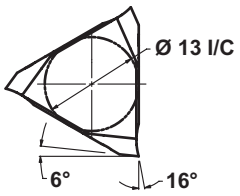


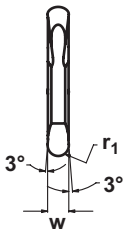
Internal Toolholder GR233/GR253 for Insert Type G217							
EDP	*Description*	Dimensions (mm)					Grooving Width W
		D	L_2	L_1	f	t max	
024170	**GR233002001**	20	25	130	13,30	3,00	0,50 - 1,74
024171	**GR233002002**	20	25	130	13,30	3,00	1,74 - 2,74
034424	**GR233002003**	20	25	130	13,30	3,00	2,74 - 3,74
024172	**GR253002501**	25	30	150	17,50	4,70	0,50 - 1,74
034425	**GR253002502**	25	30	150	17,50	4,70	1,74 - 2,74
024173	**GR253002503**	25	30	150	17,50	4,70	2,74 - 3,74
034426	**GR253002504**	25	30	150	17,50	4,70	3,74 - 5,29
034427	**GR253003202**	32	30	150	21,00	4,70	1,74 - 2,74
024686	**GR253003203**	32	30	150	21,00	4,70	2,74 - 3,74
034428	**GR253003204**	32	30	150	21,00	4,70	3,74 - 5,29

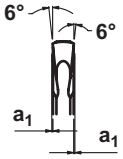
For Inserts See page 294

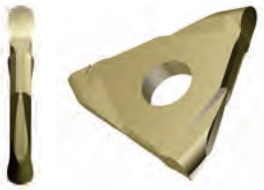
Spare parts for Internal GR233/GR253 Toolholder					
Description	EDP	Screw	EDP	Clamp	Insert Type
GR233.. 01-03	*025387*	SG24083	*025385*	SN135	G217
GR253.. 01-03					
GR253.. 04	*025388*	SG24084			

G312





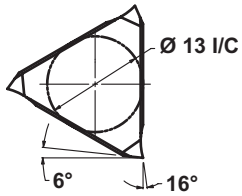


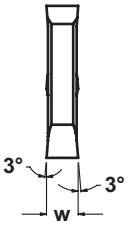


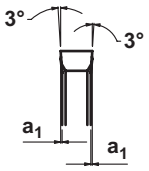
G312 Inserts Full Radius

EDP	Description	Grade	Dimensions (mm)				Toolholder Type
			w	r_1	a_1	t max*	
034401	**G312001020**	SP4030	2	1,00	0,3	6*	G360…02
024174	**G312001530**		3	1,50	0,3	6*	G360…03
024175	**G312002040**		4	2,00	0,3	6*	G360…04

* In combination with toolholder See page 298









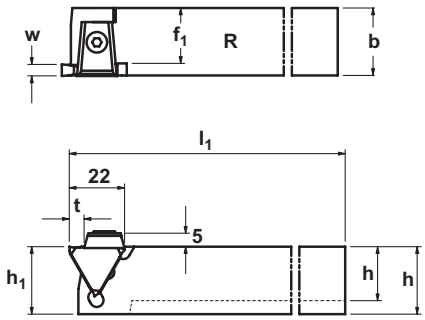
G312 Inserts for Grooving to DIN 471/472 and DIN 983/894

EDP	Description	Grade	Nominal Width of Groove	Dimensions (mm)			Toolholder Type
				w	a_1	t max*	
034402	**G312005000**	SP4030	0,50	0,57	0,06	4*	G360…01
024176	**G312006000**		0,60	0,67	0,06	4*	
024177	**G312007000**		0,70	0,77	0,08	4*	
034392	**G312008000**		0,80	0,87	0,08	4*	
034393	**G312009000**		0,90	0,97	0,08	4*	
024178	**G312010000**		1,00	1,07	0,09	4*	
024179	**G312011000**		1,10	1,24	0,20	4*	
024180	**G312013000**		1,30	1,44	0,22	4*	
024181	**G312016000**		1,60	1,74	0,22	4*	
034394	**G312018500**		1,85	1,99	0,22	6*	G360…02
034395	**G312021500**		2,15	2,30	0,22	6*	
024182	**G312026500**		2,65	2,80	0,22	6*	
024183	**G312031500**		3,15	3,29	0,22	6*	G360…03
034396	**G312041500**		4,15	4,30	0,22	6*	G360…04

* In combination with toolholder See page 298

GR/L360





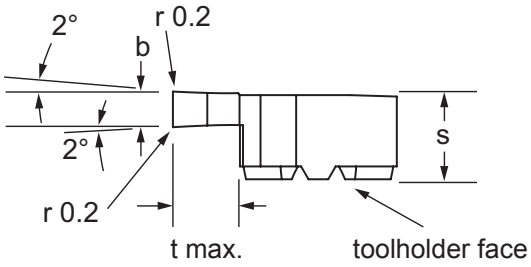
External Toolholder GR360 for Insert Type G312

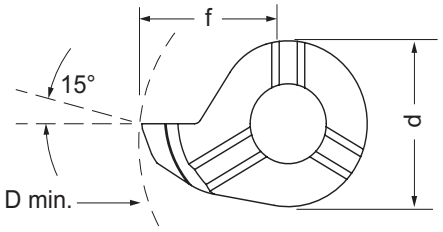
EDP	Description	Dimensions (mm)						Grooving Width W
		b	h	h_1	l_1	f_1	t	
034403	GL360121201	12	12	12	100	10,50	4	0,5 - 1,74
024184	GR360121201							
034404	GL360121202	12	12	12	100	9,50	6	1,74 - 2,74
034405	GR360121202							
034406	GL360121203	12	12	12	100	8,50	6	2,74 - 3,74
024186	GR360121203							
034407	GL360161601	16	16	16	125	14,50	4	0,5 - 1,74
034408	GR360161601							
034409	GL360161602	16	16	16	125	13,50	6	1,74 - 2,74
034410	GR360161602							
034411	GL360161603	16	16	16	125	12,50	6	2,74 - 3,74
034412	GR360161603							
034413	GL360161604	16	16	16	125	11,50	6	3,74 - 5,29
034414	GR360161604							
034415	GL360202001	20	20	20	125	18,50	4	0,5 - 1,74
024187	GR360202001							
034416	GL360202002	20	20	20	125	17,50	6	1,74 - 2,74
024188	GR360202002							
034417	GL360202003	20	20	20	125	16,50	6	2,74 - 3,74
024189	GR360202003							
034418	GL360202004	20	20	20	125	15,50	6	3,74 - 5,29
024190	GR360202004							
024191	GL360252501	25	25	25	150	23,50	4	0,5 - 1,74
024192	GR360252501							
034419	GL360252502	25	25	25	150	22,50	6	1,74 - 2,74
024193	GR360252502							
034420	GL360252503	25	25	25	150	21,50	6	2,74 - 3,74
034421	GR360252503							
034422	GL360252504	25	25	25	150	19,80	6	3,74 - 5,29
034423	GR360252504							

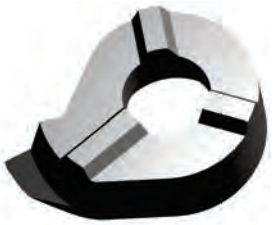
For Inserts See page 297

Spare parts for External GR360 Toolholder

Description	EDP	Clamp	EDP	Screw	Insert Type
G_360121201/02/03	025385	G113	034391	6-25	G312
G_360161601/02/03					
G_360161604	034390	G134			
G_360202001/02/03/04	024522	G164			
G_360252501/02/03/04					

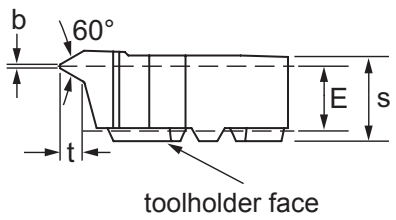


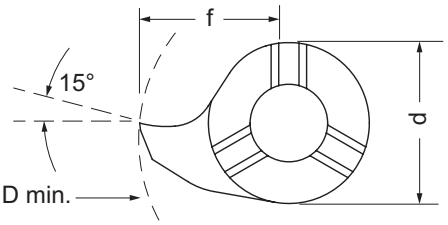




Mini-Cut Groove & Profile

EDP	**Description**	Grade	Dimensions						Type of Holder
			b	f	s	d	t max	D min.	
034433	**LS0815002**	SP4036	1,50	4,80	3,30	6,00	1,00	8,00	608
034434	**LS1115002**		1,50	6,70	4,20	8,00	2,30	11,00	611
034435	**LS1420002**		2,00	9,00	5,30	9,00	4,00	14,00	614
034430	**RS0815002**	SP4036	1,50	4,80	3,30	6,00	1,00	8,00	608
034431	**RS1115002**		1,50	6,70	4,20	8,00	2,30	11,00	611
034432	**RS1420002**		2,00	9,00	5,30	9,00	4,00	14,00	614

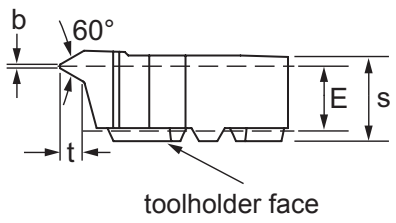


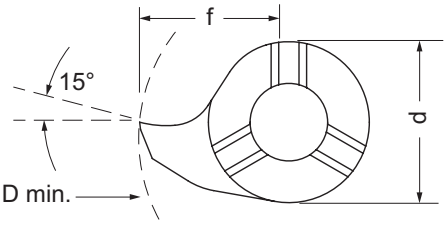




Mini-Cut 60° Threading Partial Profile

EDP	Description	Grade	Dimensions								Type of Holder
			Pitch	t	b	f	s	d	E	D min.	
034446	**LS08081501**	SP4036	1,5 - 1,75	0,95	0,18	4,80	3,50	6,00	2,50	8,00	608
034447	**LS11102001**		2	1,08	2,25	6,70	4,30	8,00	3,00	11,00	611
034448	**LS14102001**		2	1,08	0,25	9,00	5,40	9,00	4,20	14,00	614
034449	**LS14132501**		2,5	1,35	0,31	9,00	5,40	9,00	4,70	14,00	614
034450	**LS08020501**		0,5 - 0,75	0,43	0,06	4,80	3,50	6,00	2,70	8,00	608
034451	**LS08051001**		1,0 - 1,25	0,55	0,12	4,80	3,50	6,00	2,70	8,00	608
034452	**LS11051001**		1,0 - 1,25	0,55	0,12	6,70	4,30	8,00	3,50	11,00	611
034453	**LS11081501**		1,5 - 1,75	0,81	0,18	6,70	4,30	8,00	3,50	11,00	611
034454	**LS14051001**		1,0 - 1,25	0,55	0,12	9,00	5,40	9,00	4,70	14,00	614
034455	**LS14081501**		1,5 - 1,75	0,81	0,18	9,00	5,40	9,00	4,50	14,00	614





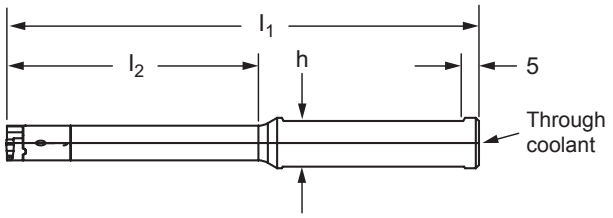


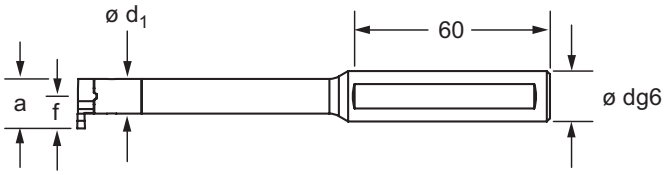
Mini-Cut 60° Threading Partial Profile

EDP	Description	Grade	Dimensions								Type of Holder
			Pitch	t	b	f	s	d	E	D min.	
034436	**RS08081501**	SP4036	1,5 - 1,75	0,95	0,18	4,80	3,50	6,00	2,50	8,00	608
034437	**RS11102001**		2	1,08	2,25	6,70	4,30	8,00	3,00	11,00	611
034438	**RS14102001**		2	1,08	0,25	9,00	5,40	9,00	4,20	14,00	614
034439	**RS14132501**		2,5	1,35	0,31	9,00	5,40	9,00	4,70	14,00	614
034440	**RS08020501**		0,5 - 0,75	0,43	0,06	4,80	3,50	6,00	2,70	8,00	608
034441	**RS08051001**		1,0 - 1,25	0,55	0,12	4,80	3,50	6,00	2,70	8,00	608
034442	**RS11051001**		1,0 - 1,25	0,55	0,12	6,70	4,30	8,00	3,50	11,00	611
034443	**RS11081501**		1,5 - 1,75	0,81	0,18	6,70	4,30	8,00	3,50	11,00	611
034444	**RS14051001**		1,0 - 1,25	0,55	0,12	9,00	5,40	9,00	4,70	14,00	614
034445	**RS14081501**		1,5 - 1,75	0,81	0,18	9,00	5,40	9,00	4,50	14,00	614









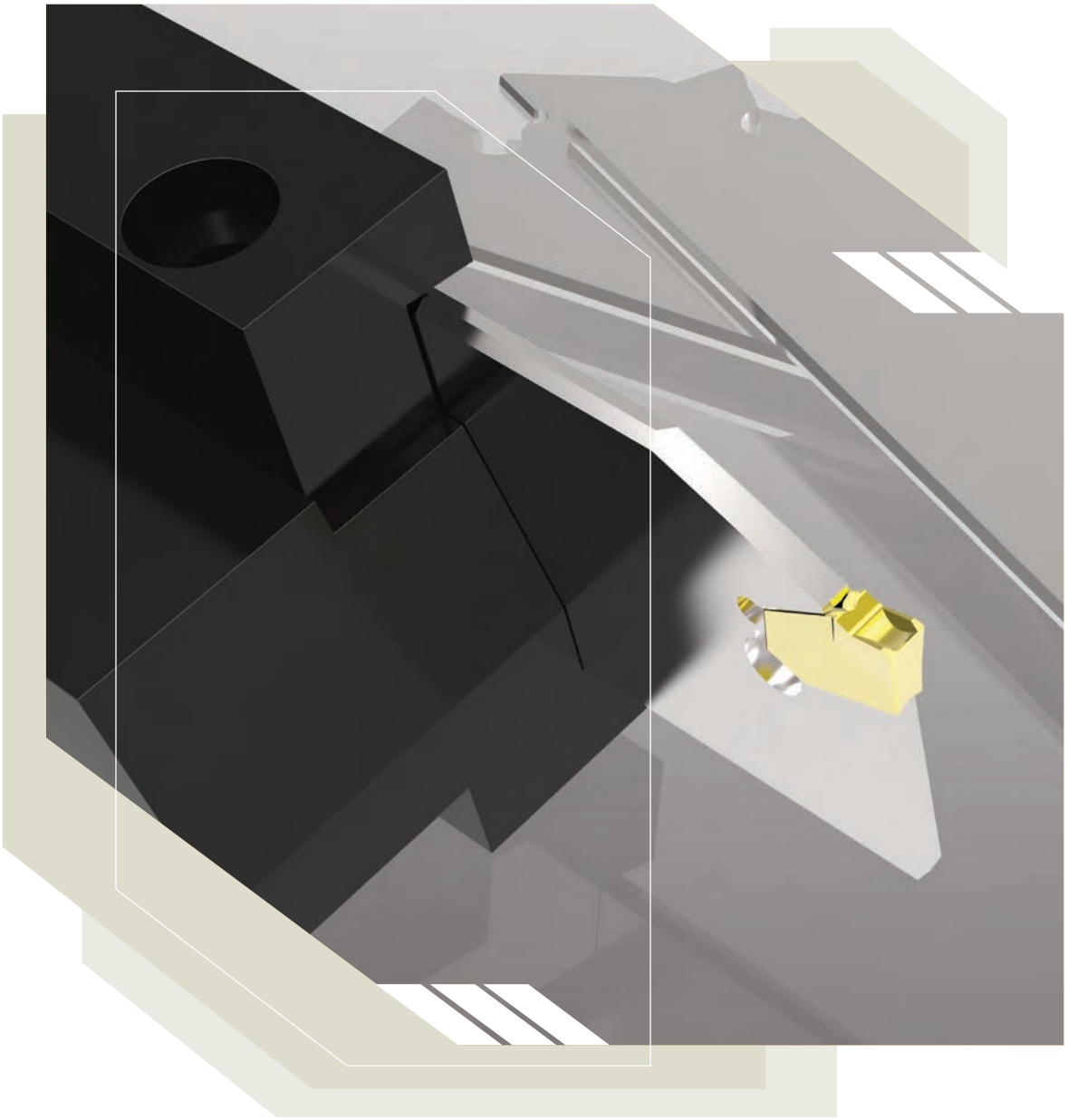
Mini-Cut Carbide Toolholders

EDP	Description	Dimensions									
		Ø dg6	d1	l1	l2	f	a	h	Insert Type	t max	Min Bore
034466	**GHM60800122**	12,00	6,00	90,00	30,00	4,80	7,80	11,00	R/L S08	1,00	8,00
034467	**GHM60800124**		6,00	115,00	50,00	4,80	7,80	11,00	R/L S08	1,00	8,00
034468	**GHM61100123**		8,00	120,00	56,00	6,70	10,70	10,50	R/L S11	2,30	11,00
034469	**GHM61400162**	16,00	9,50	110,00	45,00	8,75	13,50	14,50	R/L S14	4,0	14
034470	**GHM61400164**		9,50	145,00	75,00	8,75	13,50	15,00	R/L S14	4,0	14

For Inserts See pages 299 - 301

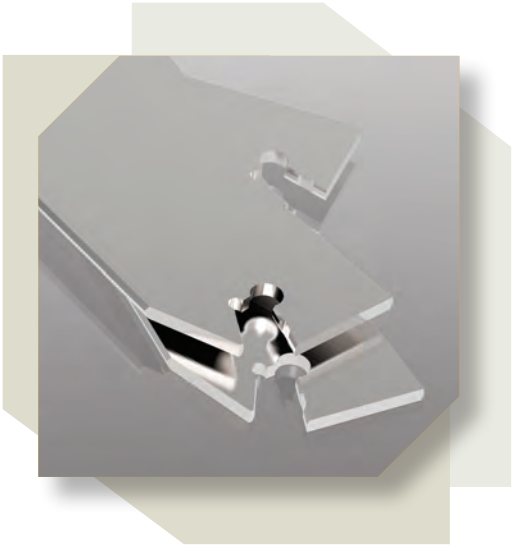
* dimension as per insert

Part-Off



Part-Off Grade Description

MP91M CVD Coated grade offering good wear, and shock resistance. Ideal for Steels and Cast Irons

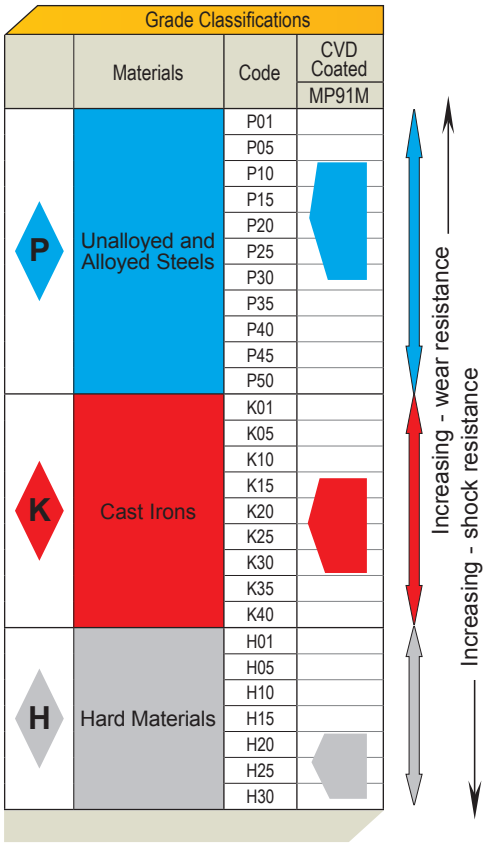


Cutting Speed v_c

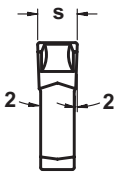
ISO	Materials	Rm and Hardness	CVD MP91M m/min min. - max.
P	Unalloyed Steel	<600 N/mm² <180 HBN	140- 345
		<950 N/mm² <280 HBN	125 - 300
	Alloyed Steel	700-950 N/mm² 200-280 HBN	105 - 270
		950-1200 N/mm² 280-355 HBN	80 - 205
		1200-1400 N/mm² 355-415 HBN	50 - 130
K	Cast Iron	Grey GG-Ft	145 - 365
		Spheroidal-Ductile GGG-FGS	115 - 285
		Malleable GTS - MN/MP	105 - 260
H	Hard Materials	Hard Steel >1400 N/mm² >415 HBN	50 - 80
		Chilled Cast Iron² 1400 N/mm² 400 HBN	40 - 65



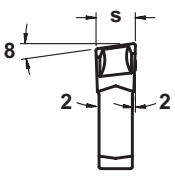
Optimum Grade Performance



TGT Inserts



TGTN



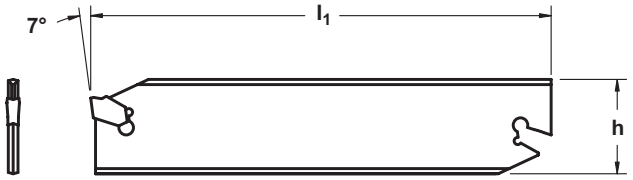
TGTR/L



TGT Inserts			
EDP	**Description**	Grade	Dimensions s (mm)
012958	**TGTN2**	MP91M	2,21
012959	**TGTN2,4**	MP91M	2,39
012960	**TGTN3**	MP91M	3,1
012961	**TGTN4**	MP91M	4,09
012962	**TGTN4,8**	MP91M	4,78
012963	**TGTN5**	MP91M	5,08
012964	**TGTN6**	MP91M	6,35
014091	**TGTR38**	MP91M	3,1
014092	**TGTL38**	MP91M	3,1

Hardened Steel Blades

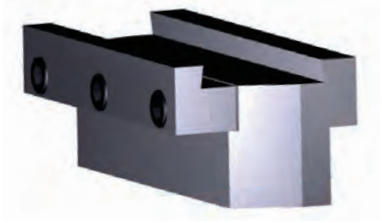


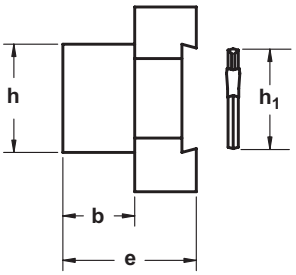


Blade					
EDP	**Description**	Dimensions (mm)			
		h	l_1	Ø Max	Inserts
015199	**SGIH26.2PSHD**	26	110	75	TGT 2/2,4
015200	**SGIH26.3PSHD**	26	110	75	TGT 3
015201	**SGIH26.4PSHD**	26	110	75	TGT 4
017232	**SGIH26.5PSHD**	26	110	75	TGT 4,8/5
015202	**SGIH32.3PSHD**	32	150	100	TGT 3
015203	**SGIH32.4PSHD**	32	150	100	TGT 4
017234	**SGIH32.5PSHD**	32	150	125	TGT 4,8/5
017235	**SGIH32.6PSHD**	32	150	125	TGT 6

Spare Part		
Extracting Key	**Description**	*EDP*
SGIH26.2PSHD - SGIH32.6PSHD	**E219EXTKEY**	*017031*

Tool Blocks





Block

EDP	Description	Dimensions (mm)			Spare Parts			
		h1	b	h	EDP	Screw	EDP	Key
030659	**SGTB2620**	26	20	20	*034612*	1076	*018288*	K5005
030660	**SGTB2625**	26	25	25				
030661	**SGTB3220**	32	20	20				
030662	**SGTB3225**	32	25	25				
030663	**SGTB3232**	32	32	32				

Materials Cross Reference Chart

Unalloyed Steels

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Unalloyed Steels											
1006 / Fd5	1006			1160	1006	1.0201	St36	Fd5			
1010 / XC10	1010		045M10	1265	1010	1.1121	Ck10	XC10	C10	F.1510	
1015 / CC12	1015		080M15	1350	1015	1.0401	C15	CC12	C15C16	F.111	
1020 / CC20			050A20	1450	1020	1.0402	C22	CC20	C20C21	F.112	
1022 / 20M5	1022		120M19	1410	1022	1.1133	GS.20Mn5	20M5	G22Mn3	F.1515	
1025 /	1025				1025	1.1158	Ck25				S25C
1035 / CC35	1035		060A35	1550	1035	1.0501	C35	CC35	C35	F.113	
1035 / XC38TS	1035		060A35	1572	1035	1.1183	Ck35	XC38TS	C36		S35C
1039 / 35M5	1039		150M36		1039	1.1157	40Mn4	35M5			
1040 / 1C40			080M40		1040	1.0511	C40	1C40/AF60C40	C40/1C40	F.114.A	
1043 / CC45	1043							CC45			
1045 / CC45	1045		080M46	1650	1045	1.0503	C45	CC45	C45	F.114	
1045 / XC42	1045		080M46	1672	1045	1.1191	Ck45	XC42	C45	C45K	S45C
1049 / XC42H1			080M46	1660	1049	1.1201	Cm45	3C45/XC42H1/XC48H1		F.1145.C45k-1/F.1147-C48k-1	S50C
1049 / XC48H1			080M50		1049/1050	1.1206	Ck50	2C50/XC48H1			
1050 / XC48TS	1050		060A52	1674	1050	1.1213	Cf53	XC48TS	C53		S50C
1055 / XC55	1055		070M55		1055	1.1203	Ck55	XC55	C50	C55K	S55C
105WC13			BO1	2140	O1	1.2510	105WCr6	105WC13	10WCr6-107WCr5KU	105WCr5	SKS31-SKS2-SKS3
1060 / CC55	1060		080A62		1060	1.0601	C60	CC55	C60		
1070 / XC68	1070		070A72	1770	1070	1.1231	Ck67	XC68	C70	F.5103	
1080 / XC75	1080		060A78	1774	1080	1.1248	Ck75	XC75		F.5107	
1086 / XC90					1086	1.1269	Ck85	XC90	C90		
1095 / XC100	1095		060A96	1870	1095	1.1274	Ck101	XC100		F.5117	SUP4
10PbF2						1.0722	10SPb20	10PbF2	CF10SPb20	10SPb20	
1108 / 10F1			(210M15)		1108/1109	1.0721	10S20	10F1	CF10S20	F.2121-10S20	
1140 / 35MF4			212M36	1957	1140	1.0726	35S20	35MF4		F210G	
1151 / 45MF4	1151		212M44	1973	1151	1.0727	45S20	45MF4			
120WV10			BF1			1.2516	120WV4	120WV10	110W4KU		
1213 / S250			230M07	1912	1213	1.0715	9SMn28	S250	CF9SMn28	11SMn28	SUM22
1215 / S300			240M07		1215	1.0736	9SMn36	S300	CF9SMn36	12SMn35	
12L13 / S250Pb				1914	12L13	1.0718	9SMnPb28	S250Pb	CF9SMnPb28	11SMnPb28	SUM22L
12L14 / S300Pb				1926	12L14	1.0737	9SMnPb36	S300Pb	CF9SMnPb36	12SMnP35	
18NCD6			820A16			1.6587	17CrNiMo6	18NCD6		14NiCrMo13	
20MC5						1.7139	16MnSCr5	20MC5	20MnCr5	F.150.D	SMnC420H
2515 / Z18N5					2515	1.5680	12Ni19	Z18N5			
30CD12			722M24	2240		1.8515	32CrMo12	30CD12	32CrMo12	F.124.A	
3115 / 16NC6					3115	1.5919	15CrNi6	16NC6			
3415 / 12NC15			655M13-655A12		3415-3310	1.5752	14NiCr14	12NC15			SNC815(H)
38C2						1.7003	38Cr2	38C2/38Cr2	38Cr2/41Cr2KB	F.1200-38Cr3	
40CrMnNiMo8						1.2738	40CrMnNiMo8				
4130 / 25CD4			1717CDS110	2225	4130	1.7218	25CrMo4	25CD4	25CrMo4(KB)	55Cr3AM-26CrMo4	SCM420-SCM430

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

Unalloyed Steels

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Unalloyed Steels																			
	390																		
	390																		
	590-780																		
	500-650																		
	500-650																		
	500-650																		
	550-750																		
	540-730																		
	690-930																		
	580-800																		
	630-800																		
	630-800																		
	630-800																		
	620-850																		
	650-900																		
	640-830																		
	640-830																		
	750-850																		
	750-900																		
	810																		
	630																		
	670																		
	1000-1100																		
	390-710																		
	350-780																		
	510-740																		
	650																		
	775																		
	410-710																		
	430-740																		
	410-710																		
	430-740																		
	980-1320																		
	480-640																		
	510-710																		
	980-1420																		
	500-850																		
	880-1230																		
	800-950																		
	785																		
	650-950																		

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Unalloyed Steels											
4137-4135 / 35CD4			708A37	2234	4137-4135	1.7220	34CrMo4	35CD4	35CrMo4	34CrMo4	SCM432;SCCRM3
4140 / 42CD4			708M40	2244	4140	1.7225	42CrMo4	42CD4	42CrMo4	42CrMo4	SCM440(H)
4140 / 42CD4(HT)			708M40	2244	4140	1.7225	42CrMo4	42CD4	42CrMo4	42CrMo4	SCM440(H)
4140-4142 / 42CD4TS			708M40	2244	4140-4142	1.7223	41CrMo4	42CD4TS	41CrMo4	42CrMo4	SCM440
4150 / 50CrMo4			708A47		4150	1.7228	50CrMo4	50CrMo4			SCM445(H)
4340 / 35NCD6			817M40	2541	4340	1.6582	35CrNiMo6	35NCD6	35NiCrMo6(KB)	F.1280	
4419 /			1503-243-430	2512	4419	1.5419	22Mo4		G20Mo5/G22Mo5		SCPH11
5015 / 12C3			523M15		5015	1.7015	15Cr3	12C3			SCr415(H)
5045 / 45Cr2					5045-5046	1.7006	46Cr2	42C2/46Cr2	45Cr2		
5130 /			530A30		5130	1.7030	28Cr4				
5132 / 32C4			530A32		5132	1.7033	34Cr4	32C4	34Cr4(KB)	35Cr4	SCr430(H)
5135 / 37Cr4			530A36/530H36		5135	1.7034	37Cr4	37Cr4/38C4	36CrMn4/36Cr-Mn5/38Cr4KB/38Cr-Mn4KB	F.1210-38Cr4DF/ F.1201-38Cr4	SCr435H
5140 / 42C4			530M40		5140	1.7035	41Cr4	42C4	41Cr4	42Cr4	SCr440(H)
5155 / 55C3			524A60	2253	5155	1.7176	55Cr3	55C3			SUP9(A)
55NCDV6						1.2711	54NiCrMoV6	55NCDV6			
57NiCrMoV77						1.2744	57NiCrMoV77				
6150 / 50CV4			735A50	2230	6150	1.8159	50CrV4	50CV4	50CrV4	51CrV4	SUP10
6F3 / 55NCDV7					6F3	1.2714	56NiCrMoV7	55NCDV7			
6F5 / 55NC10					6F5	1.2718	55NiCr10	55NC10			
75CrMoNiW67						1.2762	75CrMoNiW67				
8620 / 20NCD2			805M20	2506	8620	1.6523	21NiCrMo2	20NCD2	20NiCrMo2	20NiCrMo2	SNCM220(H)
90MCV8			BO2		2	1.2842	90MnCrV8	90MCV8	90MnCr8KU		
9310 / 16NCD13			832H13/832M13/S157		9310	1.6657	14NiCrMo134	16NCD13	15NiCrMo13	F.1560-14NiCrMo13/F. 1569-14NiCrMo131	
A105 / A48CP		K03501			A105		C22-8	A48CP			
A106GB / TUE250B							P235GH	TUE250B			
A182 / 12CD9			1501-622	2218	ASTMA182F22	1.7380	10CrMo910	12CD9.10	12CrMo910	TU.H	
A182 / 15CD3.5			1501-620Gr27		ASTMA182F11-F12	1.7335	13CrMo44	15CD3.5-15CD4.5	14CrMo45	14CrMo45	
A204Gr.A / 15D3			1501-240	2912	ASTMA204Gr.A	1.5415	15Mo3	15D3	16Mo3KW	16Mo3	
A234WPB / AE250B								AE250B			
A234WPL6 / 42BT		K03006						42BT			
A27 65.35 / E23.45M			A1	1305	A27 65.35	1.0443	GS.45	E23.45M		F.221	
A33			Fe310-0/144915HR,HS	1300		1.0035	Fe310.0 (St33)	A33	Fe320	A310-0/FE310-0	
A333G6 / TU42BT							P265GH	TU42BT			
A34-2						1.0028	Ust34-2	A34-2	Fe330Fe/330BFU		SS330
A34-2NE			144934/20HR,HS,CR,CS			1.0034	RSt34-2	A34-2NE	Fe330BFN		
A350LF2 / A48FP		K03504						A48FP			
A36 / E28					A36			E28			
A515.65 / A37CP			1501 161	1330	A515 65	1.0345	H I	A37CP		F.1110	
A516 / A48CP					A516Gr.70	1.0481	17Mn4/ A515Gr.70/ A414Gr.F	A48CP	Fe510-1KG;KT;KW/ Fe510-2KG;KT;KW	A47RCI/RAII	SG365/SGV410/ SGV450/SGV480
A516G60 / E24-2							P265GH	E24-2			
A516G70 / E36-4							P295GH	E36-4			

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Materials Cross Reference Chart

Unalloyed Steels

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Unalloyed Steels																			
	750-1100																		
	740-1080																		
	800-1200																		
	750-1100																		
	1100-1300																		
241-277HB	890																		
	440-590																		
	690-880																		
	900-1100																		
	530-860																		
	700-950																		
	950-1150																		
	700-750																		
	1050-1100																		
	800																		
	850																		
	780-1180																		
	850																		
	800																		
	705																		
	510-710																		
	740																		
	560-1200																		
187HB	600		0.4	0.3		0.12		0.15-0.35	0.6-1.05	0.35				0.035	0.04			0.4	Nb 0.4
			0.4	0.4		0.15		0.10 min	0.29-1.06	0.3				0.048	0.058			0.4	Nb 0.4
	440-590																		
	440-590																		
	440-570																		
197HB	660		0.4	0.4		0.15		0.10 min	0.29-1.06	0.3				0.05	0.058			0.4	Nb 0.4
			0.4	0.3				0.10 min	0.6-1.35	0.3				0.035	0.04			0.4	
	750																		
	290-540																		
				0.4				0.10 min	0.29-1.06	0.3				0.025	0.025				
	300-500																		
	460-500																		
197HB	660		0.4	0.3		0.12		0.15-0.30	0.6-1.35	0.3				0.035	0.04			0.4	Nb 0.4
	750																		
	750																		
	460-580																		
								0.1-0.35	1.4	0.2				0.05	0.05				
								0.1-0.35	1.6	0.22				0.04	0.04				

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Unalloyed Steels											
A537 / A52CP				2101/2102	A537Cl.1/ A414Gr.G/A612	1.0473	19Mn6	A52CP		A52RCI/RAII	SGV410/SGV450/ SGV480
A570 / A50-2			Fe490-2FN/4360-50B	1550/2172	A570Gr.50/ A572Gr.50	1.0050	Fe490-2 (St50-2)	A50-2	Fe490	A490-2/Fe490-2FN	SS490
A570 / E24-2			Fe360B/4360-40B	1311/1312	A570Gr.33,36	1.0036	Fe360B (Ust37-2)	E24-2	Fe360BFU	AE235B/Fe360B	
A570 / E28-2			Fe430BFN/144943/25HR, HS/4360-43B	1411/1412	A570Gr.40	1.0044	Fe430B (St44-2)	E28-2	FE430B/Fe430BFN	AE275B/Fe430BFN	SM400A;B;C
A570.36 / E24.2Ne			4360 40 C	1311	A570 36	1.0038	RSt37.2	E24.2Ne			
A572 / A60-2			Fe590-2FN/4360-55E;55C	1650	A572Gr.65	1.0060	Fe590-2 (St60-2)	A60-2	Fe60-2/Fe590	A590-2/Fe590-2FN	SM570
A572.60 / E36								E36			
A573 / E38-3			Fe430D1FF/4360-43C;43D	1411/1412/1414	A573Gr.70/ A611Gr.D	1.0144	Fe430D1 (St44-3)	E28-3/E28-4	Fe430B/Fe430C(FN)/ Fe430D(FF)	AE275D/Fe-430D1FF	SM400A;B;C
A573.81.65 / E24.U				1312	A573.81 65	1.0116	St37.3	E24.U	Fe37.3		
A619			14493CR		A619(1008)	1.0347	RRSt3	E	FeP02		
A633 / FeE355KGN			A588		A633Gr.C	1.0562	StE355	FeE355KGN/ E335R/FP	FeE355KG;KW	AE355KG;DD	SM490A;B;C;YA;YB
A70-2			Fe690-2FN	1655		1.0070	Fe690-2 (St70-2)	A70-2	Fe70-2/Fe690	A690-2/Fe690-2FN	
A738 / A52FP			Fe510D2F-F/1501Gr.224-460/1501Gr.224-490		A738	1.0577	Fe510D2 (Ast52)	A52FP		A52RBII	
C25			070M26		(M)1025	1.0406	C25	C25/1C25	C25/1C25		
E24-2			Fe360B/144937/23HR	1311		1.0037	Fe360B (St37-2)	E24-2	Fe360B;C;D	AE235B/Fe360B	STKM12A;C
E36-3			Fe510D1FF/144950/35HR, HS/4360-50D	2132/2133/2134		1.0570	Fe510D1 (St52-3)	E36-3/E36-4	Fe510CFN/ Fe510510B;C;D/ Fe510BFN	AE355D/Fe-510D1FF	SM490A;B;C;YA;YB
L6 / 55NCDV07	L6			2550	L6	1.2713	55NiCrMoV6	55NCDV7		F.520.S	SKT4
P2 / 20MC5					P2	1.2162	21MnCr5	20MC5			SCR420H
P20 / 40CMD8			P20		P20	1.2311	40CrMnMo7	40CMD8			
P20+S / 40CMD8+S			P20+S		P20+S	1.2312	40CrMnMoS86	40CMD8+S			
S1 / 55WC20	S1		BS1	2710	S1	1.2542	45WCrV7	55WC20	45WCrV8KU	45WCrSi8	
S4					S4	1.2826	60MnSiCr4				
W110 / Y1105								Y1105			
W112 / Y2120					W112	1.1663	C125W	Y2120	C120KU	C120	SK2
W210 / Y1105V			BW2		W210	1.2833	100V1	Y1105V	102V2KUSKS43		
Alloyed Steels											
12CD4			1501620	2216	A38712-2	1.7262	15CrMo5	12CD4	12CrMo910	12CrMo4	SCM415(H)
1330 / 20M5			150M28		1330	1.1170	28Mn6	20M5	C28Mn		SCMn1
1335 / 40M5				2120	1335	1.1167	36Mn5	40M5		36Mn5	SMn438(H)
20AP											
22CMSD4								22CMS4			
3135 / 35NC6			640A35		3135	1.5710	36NiCr6	35NC6			SNC236
3415 / 14NC11					3415	1.5732	14NiCr10	14NC11	16NiCr11	15NiCr11	SNC415(H)
35NCD14								35NCD14			
40CMD8								40CMD8			
420 / Z40C14				2314	420	1.2083	X42Cr13	Z40C14			SUS420J2
429					429						
4340 / 35NCD6					4340			35NCD6			
440C / Z100CD17					440C	1.4125	X105CrMo17	Z100CD17			
4520					4520						

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Materials Cross Reference Chart

Unalloyed Steels / Alloyed Steels

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Unalloyed Steels																			
	480-650																		
	470-800																		
	340-690																		
	410-790																		
	750																		
	570-920																		
	750																		
	790																		
	750																		
	210-690																		
	490-800																		
	670-1000																		
	450-680																		
	470-650																		
	340-690																		
	490-800																		
	800-850																		
	705																		
	790																		
	790																		
	750-800																		
	740																		
	640-830																		
	650-750																		
	675																		
Alloyed Steels																			
	640-1080																		
	640-840																		
	600																		
	720-950							0.3	0.25-0.50	1				0.035	0.045				Pb0.2
255-300HB	970																		
	690-930																		
	830-1180																		
	1100-1350																		
	1100-1300																		
	770																		
	600																		
	900-1200																		
	870																		
	450-590																		

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Alloyed Steels

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Alloyed Steels											
45NCD17 / 6F7			EN30B		6F7	1.2767	X45NiCrMo4	45NCD17	KV		
5115 / 16MC5			527M20	2511	5115	1.7131	16MnCr5	16MC5	16MnCr5	16MnCr5	
5120 / 20MC5			150M19	2172	5120	1.0841	St52-3	20MC5	Fe52BFN/Fe52CFN	F.431	
5140 / 42C4 (HT)			530M40		5140	1.7035	41Cr4	42C4	41Cr4	42Cr4	SCr440(H)
52100 / 100C6			534A99	2258	52100	1.3505	100Cr6	100C6	100Cr6	F.131	SUJ2
55MnSi4-4								55MS4-4			
55W1								XC55			
8630					8630						
8740 / 40NiCrMo22			311Type7		8740	1.6546	40NiCrMo22		40NiCrMo2(KB)	40NiCrMo2	SNCM240
9255 / 55S7			250A53	2090	9254	1.0904	55Si7	55S7	55Si8	F.144	
9262 / 60SC7					9262	1.0961	60SiCr7	60SC7	60SiCr8	60SiCr8	
9840 / 40NCD3			816M40		9840	1.6511	36CrNiMo4	40NCD3	38NiCrMo4(KB)	35NiCrMo4	
A128.75 / Z120M12			BW10	2183	A12875	1.3401	GX120Mn12	Z120M12	XG120Mn12	X120Mn12	
A2 / Z100CDV5	A2		BA2	2260	A2	1.2363	X100CrMoV51	Z100CDV5	X100CrMoV51KU	X100CrMoV5F5227	SKD12
A350LF5 / 16N6					ASTMA350LF5	1.5622	14Ni6	16N6	14Ni6	15Ni6	
A355A / 40CAD06.12					A335A			40CAD0612			
A6	A6				A6						
A7	A7				A7						
Aermet 100		UNSK92580									
Aermet 310											
Aermet 340											
D2 / Z160CDV12	D2		BD2	2310	D2	1.2601	X165CrMoV12	Z160CDV12	X165CrMoW12KU	X160CrMoV12	
D2 / Z210CW12			BD2		D2	1.2379	X155CrVMo12.1	Z210CW12			
D3 / Z200Cr12			BD3		D3	1.2080	X210Cr12	Z200Cr12	X210Cr13KU / X250Cr12KU	X210Cr12	SKD1
D4(D6) / Z200CD12			BD6	2312	D4(D6)	1.2436	X210CrW12	Z200CD12	X215CrW121KU	X210CrW12	SKD2
FV535	ATIFV535™										
H10 / 30CDV12-28			BH10		H10	1.2365	X32CrMoV33	30CDV12-28	30CrMoV1227KU	F.5313	
H10A / 30CKDV28			BH10A		H10A	1.2885	X32CrMoCoV33.3	30CKDV28			
H11 / Z38CDV5			BH11		H11	1.2343	X38CrMoV51	Z38CDV5	X37CrMoV51KU	F.5137	SKD6
H13 / Z40CDV5	H13		BH13	2242	H13	1.2344	X40CrMoV51	Z40CDV5	X35CrMoV05KU / X40CrMoV511KU	X40CrMoV5	SKD61
H21 / Z30WCV9-3			BH21		H21	1.2581	X30WCrV93	Z30WCV9-3	X30WCrV93KU	F.5323	SKD5
Hardox400											
HardoxHiTuf											
HW3 / Z45CS9			401S45		HW3	1.4718	X45GrSi93	Z45CS9	X45GrSi8	F.322	SUH1
L1					L1						
L3 / Y100C6	L3		BL3		L3	1.2067	100Cr6	Y100C6		100Cr6	
M2 / Z85WDCV06050402	M2				M2			Z85WDCV06050402			
M3	M3				M3						
M35 / Z85WDKCV				2723	M35	1.3243	S6/5/2/5	Z85WDKCV	HS6.5.2.5	F.5613	SKH55
M7 / Z100WCV09040202								Z100WCV09040202			
O1	O1				O1						
P21					P21	1.2764	X19NiCrMo4				
P4					P4	1.2341	X6CrMo4				
S7	S7				S7						
T1 / Z80WCV180401			BT1		T1	1.3355	S18.0.1	Z80WCV180401	X75W18KU	HS18.0.1	SKH2

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Alloyed Steels

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Alloyed Steels																			
	880																		
	640-1080																		
	650																		
	800-1100																		
	650-750																		
269-302HB	970																		
248-285HB	900																		
	690-930																		
	690-930																		
	950-1050																		
	1050-1100																		
	800-1100																		
	780-1080																		
	750-850																		
	490-640																		
	700																		
	720-775																		
	795-910																		
40HRC	1250	71	11.1	3	13.4	1.2				0.23									
40HRC	1250	70	11	2.4	15	1.4				0.25									
37-42HRC	1330	68	12	2.25	15.6	1.85				0.33									
	850-900																		
	850																		
	850-900																		
	850-900																		
34HRC	1070		0.2-0.8	9.8-11.2		0.5-1.0	0.7	0.1-0.7	0.6-1.15	0.06-0.11									
	770																		
	770																		
	770																		
	1180-1620																		
	850																		
400HBW	1300																		
350HBW	1130																		
	970																		
	630																		
	750-850																		
	775-990																		
	795-870																		
	775-990																		
	775-990																		
	640-670																		
	850																		
	400																		
	640-720																		
	800-1050																		

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Alloyed Steels / Stainless Steels

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Alloyed Steels											
T4 / Z80WKCV18050401			BT4		T4	1.3255	S18.1.2.5	Z80WKCV18050401	X78WCo1805KU	HS18.1.1.5	SKH3
Z2NKDT18-10-5						1.2709	X3NiCoMoTi18.9.5	Z2NKDT18-10-5			
Z38CDV5-3						1.2367	X40CrMoV53	Z38CDV5-3	Z155CVD12-1		
Stainless Steels											
50	ATI 50™	UNS S20910									
202			284S16		202	1.4371	X3CrMnNiN18-8-7	Z8CMN18.08.05			
215											
284											
301	ATI 301™			2331	301	1.4310	X12CrNi17-7	Z12CN17.07	X12CrNi17 07	F.3517	SUS301
302	ATI 302™		302S31	2330	302	1.4319	X12CrNi18-9	Z10CN18.09	X10CrNi18 09	F.314	
303	ATI 303™		303S21, 58M	2346	303	1.4305	X8CrNiS18-9	Z10CNF18.09	X10CrNiS 18.09	F.3508	SUS303
304	ATI 304™		304S31, 58E	2332/2333	304	1.4350	X5CrNi18-9	Z6CN18.09	X5CrNi18 10	F.3551;F.3541;F.3504	SUS304
305	ATI 305™		305S19		305	1.4312	X8CrNi18-12		X8CrNi1910	F.3503	
311											
315											
316	ATI 316™		316S33, 58J	2343	316	1.4401	X5CrNiMo17-13-3	Z6CND19.12.03	X5CrNiMo1713	F.3543	SUS316
317	AL 317L		317S16		317	1.4449	X5CrNiMo17-13				
318					318	1.4583	X10CrNiMoNb18-12	Z6CNDNb17.13B	X6CrNiMoNb17 13		
320											
321	ATI 321™	UNS S32100	321S12, 58B	2337	321	1.4541	X10CrNiTi18-9	Z6CNT18.10	X6CrNiTi18 11	F.3553;F.3523	SUS321
325											
326											
329				2324	329	1.4460	X8CrNiMo27-5	Z5CND27.05AZ			SUS329L
331											
332	ATI 332™										
334	ATI 334™				70334		X8CrNiAlTi20-20				
347	ATI 347™	UNS S34700	347S17, 58F	2338	347	1.4550	X10CrNiNb18-9	Z6CNNb18.10	X6CrNiNb18 11	F.3552;F.3524	SUS347
348	ATI 348™	UNS S34800				1.4546	X5CrNiNb18-10	Z10CrNiNb18 10			
394											
403	ATI 403™		403S17	2301	403	1.4000	X7Cr13	Z6C13	X6Cr13	F.3110	SUS403
409			409S19		409	1.4510	X6CrTi12	Z6CT12	X6CrTi12		
410	ATI 410™		410S21, 56A	2302	410	1.4006	X10Cr13	Z10C14	X12Cr13	F.3401	SUS410
416	ATI 416™		416S21	2380	41600	1.4005	X12CrS13	Z11CF13	X12CrS13	F.3411	SUS416
420	ATI 420™		420S37	2303	420	1.4021	X20Cr13	Z20C13	X20Cr13	F.5261	
425											
430	ATI 430™		430S15, 60	2320	430	1.4016	X8Cr17	Z8C17	X8Cr17	F.3113	SUS430
431			431S29, 57	2321	431	1.4057	X22CrNi17	Z15CNi16.02	X16CrNi16	F.3427	SUS431
433	ATI 433™										
434	AL 434™		434S17	2325	434	1.4113	X6CrMo17	Z8CD17.01	X8CrMo17		SUS434
441											
444	ATI 444™	UNS S44400		2326	444	1.4521		Z3CDT18 02			
452											
455	ATI 455™	UNS S45500									

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Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Alloyed Steels																			
	820-1050																		
	1125																		
	785																		
Stainless Steels																			
		63.7	6	21					9										
			4.0/6.0	17.0/19.0		-		1	7.5/10.0	0.15				0.06	0.03				
			9.00/11.00	14.0/16.0		0.08/1.20		0.20/1.00	5.50/7.00	0.06/0.15				0.04	0.03				
			4.00/6.50	16.5/18.5		-		1	7.00/10.0	0.07				0.06	0.03				
	700-950		7.00	17.00				1.00	2.00	0.14				0.05	0.03				
			6.0/10.0	17.0/22.0		1.5		2	2	0.2/0.4				0.05	0.05				
	500-700		10.50	19.50		0.60		2.00	1.50	0.16				0.04	0.30				
	500-700		9.00	19.50				2.00	1.50	0.08				0.04	0.04				
	490-690		11.50	18.00				1.00	2.00	0.12				0.04	0.03				
			23.0/28.0	17.0/23.0		1.5		3	2	0.5				0.05	0.05				
			9.0/11.0	16.5/18.5		1.25/1.75		1	2	0.07				0.045	0.03				
	510-710		13.00	17.00		1.50		0.75	2.00	0.08				0.04	0.03				Cu 0.5
	490-690		13.00	19.00		3.50		1.00	1.00	0.02				0.02	0.02				
	490-740		9.0 min	17.0/21.0		2.0/3.0		1.5	2	0.08				0.04	0.04				
			10.5/13.5	16.5/18.5		2.00/2.50		1	2	0.08		5C/0.80		0.045	0.03				
	500-730		9.50	18.00				1.00	2.00	0.08		0.40		0.04	0.03				
			8.0/11.0	17.0/19.0		0.7		1	2	0.12		5C/0.90		0.06	0.15/0.35				
			10.0/13.0	16.5/18.5		2.25/3.00		1	2	0.12				0.06	0.06				
	640-900		3.50	25.50		1.00				0.10				0.04	0.03				
			36.0/46.0	15.0/25.0		1.5		3	2	0.75				0.05	0.05				
			4.0/7.00	21.0/27.0		1.75/3.00		1.5	1.5	0.08				0.04	0.04				
			55.0/65.0	10.0/20.0		1.5		3	2	0.75				0.05	0.05				
	510-740		9.0/13.0	17.0/19.0				0.75	2.00	0.08				0.05	0.03				
	510-740		9.0/13.0	17.0/19.0	0.2			0.75	2.00	0.08				0.05	0.03				Ta 0.10
			8.0/10.5	17.0/19.0		-		1	2	0.07				0.045	0.03				Cu 3.00/4.00
	400-600		0.50	12.00				0.50	0.50	0.15				0.02	0.01				
			1	10.5/12.5		-		1	1	0.08		6C/1.0		0.04	0.03				
	450-650		1.00	12.00		0.50		0.50	0.50	0.15				0.02	0.01				Cu 0.5
	590-780		1.00	13.00		0.60		1.00	1.25	0.15				0.07	0.07				
	750-950		1.00	12.50				1.00	1.00	0.20				0.04	0.04				
			3.5/4.5	11.5/14.0		0.40/1.0		1	1	0.06				0.04	0.03				
	450-650		1.00	16.00				1.00	1.00	0.08				0.04	0.03				
	950		2.00	16.00				1.00	1.00	0.20				0.04	0.03				
79HRB	510	78	0.25	20.00				0.39	0.30	0.01				0.02	0.00			0.50	Nb 0.8
	450-650		1.00	17.00		0.75				0.08									
			2.0/3.0	15.0/18.0		0.6		1	1.5	0.12/0.20				0.04	0.03				
80HRB	500		0.5	18.2		1.9		0.45	0.3	0.013		0.13		0.03	0.002				
			4	25.0/30.0		1.5		2	1	1.0/2.0				0.05	0.05				
40-49HRC	1270-1650		7.5/9.5	11.0/12.5		0.5		0.5	0.5	0.05		0.8/1.4		0.04	0.03			1.5/2.5	

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P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

Stainless Steels

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Stainless Steels											
610	ATI 610™	UNS S30600									
611	ATI 611™	UNS S30601									
0Cr19Ni9											
1Cr12Ni3Mo2VN-5											
201LN	ATI 201LN™-MIL	UNS S20153									
304 L	ATI 304L™		304S11	2352	304L	1.4306		Z2CN1810	X2CrNi18 11		
304 LN			304S62	2371	304LN	1.4311	X2CrNiN18-10	Z2CN18.10	X2CrNiN1811		SUS304LN
316 L	ATI 316L™	UNS S31603 & S31673	316S13	2348	316L	1.4404	X2CrNiMo18-12	Z2CND17.12	X2CrNiMo17 12		SCS16;SUS316L
316 LN	ATI 316LN™		316S63	2375	316LN	1.4429	X2CrNiMoN18-13	Z2CND17.13			SUS316LN
316 LXN	AL 316LXN					1.4429	X2CrNiMoN17-13-3	Z2CND17 13	X2CrNiMoN17-13-3		
316 Ti	ATI 316Ti™		320S31		316Ti	1.4571	X8CrNiMoTi17-12-2		X6CrNiTi18 11	F.3535	
316L (S+Cu)							X2CrNi-Mo17-12-2+S+Cu				
316L Decolletage							X2CrNiMo17-12-2 improved				
317 L	ATI 317L™	UNS S31703	317S12	2367	317L	1.4438	X2CrNiMo18-16	Z2CND19.15	X2CrNiMo18 16		SUS317L
321 H							X8CrNiTi18-10				
403Cb					403Cb						
403Cb+						1.4914	X19CrMoVNb11-1	Z20CDNbV11			SUH600
409 Cb	ATI 409Cb™										
409 HP	ATI 409HP™	UNS S40930									
410 S	ATI 410S™	UNS S41008									
420 F		UNS S42020	420S45	2304	420F	1.4028	X30Cr13	Z29CF13 / Z40C14	X40Cr14	F.3404 / X40Cr13	SUS420J2
430 F				2383	430F	1.4104	X12CrMoS17	Z10CF17	X10CrS17	F.3117	SUS430F
431 (HT)					431	1.4057	X17CrNi16-2				
436 S	ATI 436S™										
439 HP	ATI 439 HP™	UNS S43035									
440 A	ATI 440A™					1.4109	X70CrMo15				
440 C	ATI 440C™				440C		X105CrMo17	Z100CD17	X102CrMo17KU		SUS 440C
441 HP	ATI 441 HP™										
904 L	ATI 904L™	UNS N08904		2562		1.4539	X1CrNiMoCu25-20-5				
A286	A286 Altemp®	UNS S66286	HR5152		ASTM 638		X5NiCrTi26-15	Z06NCT25			
AL 29-4C	AL 29-4C®	UNS S44735									
AL-6XN	AL-6XN®	UNS N08367									
AL-6XN Plus	AL-6XN Plus®	UNS N08367									
AM 350	AM 350®										
Bioline 4C27A					420F						
CF-8			304C15	2333	CF-8	1.4308	X6CrNi18-9	Z6CN18.10M			SCS13
CF-8M			316C6 ANC4B	2343	CF-8M	1.4408	X6CrNiMo18-10		X2CrNiMoN17-12	F.8414-AM-X7CrNi-Mo20-10	SCS14
Custom 465											
Datalloy 2	ATI Datalloy 2®										
Duplex 2003	ATI 2003®	UNS S32003									
Duplex 2102	ATI 2102®	UNS S80211									

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Materials Cross Reference Chart

Stainless Steels

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Stainless Steels																			
HRB86	560	58.9/65.3	14/15.5	17/18.5		2		3.7/4.3	2	0.018				0.02	0.02			0.5	
HRB91	620	58/60	17/18	17/18.5		0.2		5.0/5.6	0.5/0.8	0.015				0.03	0.013			0.35	
			9.00	19.00															
			3.00	12.00		2.00													
217-241HB	840	67.7	5.5	18				1	7.5	0.15				0.06	0.03				
	460-680		10.00	19.00				0.50	1.00	0.02				0.02	0.02				
	550-760		10.00	18.00				1.00	2.00	0.03				0.05	0.03				
	490-690		12.00	17.00		2.50		0.50	1.00	0.02				0.02	0.02				
	490-600		12.00	17.00		2.50		0.50	1.00	0.02				0.02	0.02				Nitrogene 0.14
	580-800		13.00	17.50		2.75		1.00	2.00	0.03				0.05	0.03				
	500-730		12.00	17.50		2.25		1.00	2.00	0.08		5.00		0.05	0.03				
	600-980																		
	600-980																		
HB217	900	63	11.0/15.0	18.0/20.0		3.0/4.0		0.75	2.00	0.03				0.04	0.03				
			9.0/12.0	17.0/19.0		-		1	2	0.04/0.10		5C/0.80		0.04	0.03				
	800-950		0.50	12.00				0.35	0.50	0.14									Nb 0.18
	930-1080		0.55	11.10		0.60		0.35	0.70	0.17									V 0.3 Nb 0.28
84-97HRB	700	86	0.25	12.3		0.04		0.35	0.35	0.15	0.1	0.005		0.025	0.005				Nb 0.45
71HRB	430																		
75HRB	450	87	0.60	12.00				1.00	1.00	0.08				0.04	0.03				
300-500HB	1050-1300			12/14		0.60		1.00	1.25	0.15				0.06	0.15				
	640-840		1.00	17.00		0.50		1.00	1.25	0.12				0.06	0.15				
45/56HRc	1270-1650																		
			-	16.0/18.0		0.75/1.25		1	1	0.12				0.04	0.03				
	568-818	81	0.23	17.0/19.0				0.55	0.45	0.012		0.4		0.02	0.001				
31-54HRC	1000-1800	81	0.5	16.0/18.0		0.75		1	1	0.07				0.04	0.03				
		82		16.5						1									
HRB82	520	79	0.3	18				0.34	0.35	0.009	0.05	0.29		0.023	0.002				Nb 0.71
	620		24.50	20.50		4.50		0.50	1.60	0.02				0.04					Cu 1.5
	620		25.00	14.50		1.25		0.20	0.20	0.04		2.10		0.02	0.00				
90HRB	610	65	0.3	29		4		0.35	0.5	0.02				0.03	0.01				Nb 0.6
183HB	600	48	24	20.5		6.3		0.4	0.4	0.02								0.2	N 0.22
183HB	600	45	25.3	21.8		6.7		0.3	0.3	0.02				0.02				0.2	N 0.24
	1175		4.30	16.50		2.80		0.30	0.80	0.09				0.02					
350-575HV	1130-1860	82.4	< 0.8	13		1.2		0.6	1.6	0.22				0.03	0.18				
	440-640																		
	440-640																		
	1300-1700		10.8/11.3	11/12		0.8/1.2						1.5/1.8							
300-350HB	1100		2.30	15.30		2.10		0.30	15.10	0.03									N 0.4
31HRC	1000	73.8	3.5	21		1.7													
246HB	800		1.5	22		0.55		0.75	2.5	0.03				0.04	0.02			0.4	

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Stainless Steels											
Duplex 2205	ATI 2205™	UNS S31803 & S32205			ASTM A240						
Duplex 2304	ATI 2304™	UNS S32304									
Duplex 255	ATI 255™	UNS S32550									
Duplex F51			318S13	2377	F51	1.4462	X2CrNiMoN22-5-3	Z2CND22.05.03			
Duplex F55											
Duplex LDX2101											
E-Brite Alloy	ATI E-BRITE®				ASTM B625						
FV607	ATI FV607™										
H46	ATI H-46™										
Jethete M152	ATI Jethete™ M152	UNS S64152			5718.9	1.4939	X12CrNiMoV12-3	Z12CND12			
Jethete M448											
Jethete X19							X19CrMoNbVN11-1				
Jethete X20						1.4923	X21CrMoV12-1	Z21CDV12			
Nitronic 50											
Nitronic 60											
REX 734	ATI REX 734™	UNS S31675			ASTM F1586						
S240	ATI S240®										
Staballoy AG17	ATI Staballoy® AG17®										
Staybrite® 4435NCu							X2CrNi18-13-3				
Super duplex 2507							X2CrNiMoCuN25-6-3				
Super Duplex 4565	ATI 4565™	UNS S34565									
Super Duplex Zeron 100	Zeron® 100				ASTM 32760						
Uranus 35N		UNS S32304					X2CrNiN23-4				
Uranus 45N+		UNS S31803		2377		1.4462	X2CrNiMoN22-5-3	Z3CND2205Az			
Uranus 45N22CrMo							X2CrNiMoN22-5-3				
Uranus 47N+							X2CrNiMoN25-6-3				
Uranus 52N+							X2CrNiMoCuN25-6-3				
Uranus 65							X1CrNi25-21				
Uranus B25 6Mo							X1NiCrMoCuN20-18-7				
Uranus B26 6Mo		UNS N08926					X1NiCrMoCuN25-20-7				
Uranus B28		UNS N08028					X1NiCrMoCu31-27-4				
Uranus B6	ATI 904L™	UNS N08904		2562		1.4539	X1NiCrMoCuN25-20-5				
Uranus B66							X1NiCrMoCu22-24-6				
Uranus S1 4%Si		UNS S30600					X1CrNiSi18-15-4				
X12CrNiMoS18-11						1.4427	X12CrNiMoS18-11	Z3CNDF17.13			
X12CrNiWTi16-3							X12CrNiWTi16-3				
X17CrNi16-02						1.4057	X17CrNi16-02				
X20CrNi17-2							X20CrNi17-2				
X20CrNiMo22-5-3							X20CrNiMo22-5-3				
X20CrNiMoS13-1							X20CrNiMoS13-1				
X22CrMoV12.1	ATI FV448™				ASTM A437-76 Grade B4B		X22CrMoV12-1 = ST12T				
X2CrNiMo18-15-3							X2CrNiMo18-15-3				
X30Cr13							X30Cr13				
X30CrMoN15-1			420S45	2304		1.4028	X30CrMoN15-1	Z33C13			
X3CrNiCuTiNb12-9							X3CrNiCuTiNb12-9				

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Materials Cross Reference Chart

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Stainless Steels																			
	1000	68.9	5.8	22		3.3													
	950		4.50	22.50				1.00	2.00	0.03				0.04	0.02				
HRC32	1000	57.0/64.0	4.5/6.5	24.0/27.0		2.9/3.9		1	1.5	0.04				0.04	0.03			1.5/2.5	
225-290HB	900	72.6	4.5/6.5	21.0/23.0		2.50/3.5		1	2	0.03				0.035	0.015				
335HB	1100	58.7	4.5/6.5	24.0/26.0		3.0/4.0	0.08/0.2	1	2	0.03				0.03	0.02				N 2.5/3.5
248HB	850																		
	550			26.00		1.00				0.00									
290-349HV	930-1130		0.62	11.6		0.89		0.4	0.77	0.13									
304HB	1050	86	0.60	11.00		0.75		0.45	0.65	0.16				0.01	0.01			0.20	
	1100		2.60	16.80		1.80		0.18	0.70	0.12				0.03	0.02				
	> 930		1.00	10.50		0.60		0.40	1.00	0.13									Nb 0.4
	980		0.40	10.80		0.70		0.30	0.60	0.20									
			0.60	11.80		1.00		0.30	0.60	0.20									
260HB	860		13.50	23.50		3.00		1.00	6.00	0.06									
260HB	860		9.00	18.00		0.75		4.50	9.00	0.10									
22HRC	780	62	10.00	20.80		2.50		0.38	3.12	0.04				0.01	0.01			0.12	
32-34HRC	1070	69.2	10.75	12.5		1.75	1.5	0.25	0.25	0.03	1.5	0.7		0.01	0.01			1.5	
			0.50	17.00		0.05		0.30	20.00	0.03									N 0.5
	490-690		13	18		2.5		0.7	1.3	0.02								0.5	N 0.12
			7.50	25.00		4.00		0.70	2.00	0.03					0.02			2.50	
180HB	600		16.0/18.0	23.0/25.0		4.0/5.0			5.0/7.0	0.03									
284HB	1000		7	25		3.5		0.75	1	0.05				0.03	0.01			0.75	W 0.75
220HB	770	69.5	3.5/5.5	22.0/24.0		0.10/0.60		1	2	0.03				0.035	0.015				Cu 0.10/0.60
225HB	800	67.8	6	22.6		3.4				0.02					0.001				
225HB	800	72.6	4	23		2		1	2	0.03				0.035	0.015				
28HRC	1000	64.6	6.5	25		3.6				0.03									
28HRC	1000	63	6.5	25		3.5				0.03								1.5	
155HB	600	52.5	20.5	25		0.3			2	0.015									
230HV	810	55	18	20		6.1				0.01					0.001			0.7	
220HV	800	47	25	20.5		6.3				0.01					0.001			1	
300HB	1050	37.4	31	27		3.5		0.7	2	0.02				0.03	0.01			1	
200HB	620		24.50	20.50		4.50		0.50	1.60	0.02				0.04				1.5	
240HB	840	41.1	22	24		6	2		3									1.5	
		64.5	14.5	17				4		0.015									
	750-1000																		
			13.50	16.00				0.50	1.00	0.15		0.50		0.05	0.03				
296HB	950		1.5-2.5	16				1	1.5	0.12-0.22				0.04	0.03				
	750-950		2.00	17.00				0.80	0.80	0.20				0.04	0.03				
			5.00	22.00		3.00													
	1500																		
	980		0.60	11.80		1.00		0.30	0.60	0.21				0.04	0.04				
	900-1150																		
	1000		1	13				1	1	0.26-0.35				0.04	0.03				
53-57HRc																			
	1300-1700																		

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Materials Cross Reference Chart

Stainless Steels / Refractory PH Steels

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Stainless Steels											
X40CrMoVN16-2			420S25		ASTM F899	1.4123	X40CrMoVN16-2	Z40CDV16.02			
X46CrS13							X46CrS13				
X4CrNiMo16-5-1						1.4418	X4CrNiMo16-5-1	Z8CND17.04			
X8CrCoNiMo10-6	ATI FV535™										
X8CrMnMoN23-21-1							X8CrMnMoN23-21-1				
X8CrNiSCu18-9							X8CrNiSCu18-9				
X90CrMoV18							X90CrMoV18				
XM19	ATI XM-19™	UNS S20910			ASTM F1314						
Stainless Steel Refractory PH											
13-8PH	ATI 13-8Mo™	UNS S13800									
15-5PH	ATI 15-5™	UNS S15500				1.454	X4CrNiCuNb16.4	Z6CNU15.05			
15-7PH	ATI 15-7™					1.4532	X7CrNiMoAl15.7	Z8CNDA15.07			
17-4PH	ATI 17-4™	UNS S17400				1.4542	X5CrNiCuNb17-4 = 0Cr17Ni4Cu4Nb	Z6CNU17.04			
17-7PH	ATI 17-7™		316S111		177PH	1.4568/1.4504	X7CrNiAl17.7	Z8CNA17.07	X2CrNiMo17 12		
309	ATI 309™		309S24		309	1.4828	X15CrNiSi20-12	Z15CNS20.12			SUH309
309 S			309S24		309 S	1.4833	X7CrNi23-14	Z20CN24-13	X6CrNi23-14		SUS309S
310 S	ATI 310S™		310S24	2361	310S	1.4845	X12CrNi25-20	Z12CN25.20	X6CrNi25 20	F.331	SUH310
314			314		30314	1.4841	X15CrNiSi25-20				
330			NA17		330	1.4864	X12NiCrSi36-16	Z12NCS35.16			SUH330
405	AL 405		405S17		405	1.4724	X10CrAl13	Z10C13	X6CrAl112	F.311	SUS405
446				2322	446	1.4762	X10CrAl24	Z10CAS24	X16Cr26		SUH446
B163			NA15(H)		B163	1.4876	X10NiCrAlTi32-20	Z10NC32.21		F.3314-X10NiCrAl-Ti32-20	NCF800(TP)
EV8			349S54		EV8	1.4871	X53CrMnNiN21-9	Z52CMN21.09	X53CrMnNiN21-9	F.3217-X53CrMn-NiN21-09	SUH35 / SUH36
HK			310C40 / 310C45		HK	1.4848	X40CrNiSi25-20		GX40CrNi26-20	F.8452-AM-X40Cr-Ni2520	SCH21 / SCH22
HNV3			401S45		HNV3	1.4718	X45CrSi9-3	Z45CS9	X45CrSi8	F.3220-X4SCrSi09-03	SUH1
X10CrAl18						1.4742	X10CrAl18	Z10CAS18	X8Cr17	F.3153-X10CrAl18	SUH21
X40CrSiMo10-2						1.4731	X40CrSiMo10-2	Z40CSD10		F.3221-X40CrSi-Mo10-02	SUH3
X40NiCrSi38-18			330C11 / 330C40 / 331C40			1.4865	X40NiCrSi38-18		GX50NiCr39-19		SCH15 / SCH16
X45CrNiW18-9						1.4873	X45CrNiW18-9	Z35CNWS14.14	X45CrNiW18-9	F.3211-X45CrNi-SiW18-09	SUH31

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Stainless Steels / Refractory PH Steels

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Stainless Steels																			
58HRc																			
55HRc																			
	1200		6.00	15.50		1.50		1.00	1.50	0.05				0.04	0.02				
34HRC	1070		0.2-0.8	9.8-11.2		0.5-1.0	0.7	0.1-0.7	0.6-1.15	0.06-0.11									
	1300																		
	500-700																		
60HRC																			
90HRB	600	57	12.00	22.00		2.30		0.50	5.00	0.03				0.02	0.02				
Stainless Steel Refractory PH																			
	1300		8.00	13.00		2.20		0.10	0.20	0.05				0.01	0.01				
	<1400		4.50	14.80				0.50	0.50	0.03				0.02	0.02			3.50	
	<1620		7.00	15.00		2.50		0.50	0.50	0.05				0.02	0.02				
	<1380		4.00	16.30				0.50	0.50	0.04				0.02	0.02			4.00	
	<1560		7.00	17.00				0.50	0.50	0.05				0.02	0.02				
	500-750		14.00	23.50				2.00	1.50	0.20				0.04	0.04				
	500-700																		
	500-750		20.50	25.00				0.75	2.00	0.15				0.05	0.03				
			19.0/22.0	23.0/26.0		-		1.50/3.00	2.5	0.25				0.045	0.03				
	390-590		38.00	18.80				1.75	1.00	0.40				0.05	0.03				
	450-650		0.50	12.00				0.50	1.00	0.08				0.04	0.03				
	520-720			25.00				1.00	1.00	0.12				0.04	0.03				
	450-680																		
	950-1300																		
	440-640																		
	900-1100																		
	500-700																		
	130-1100																		
	400-600																		
	800-1300																		

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Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

Cast Irons

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Gray Iron											
GG-30 / EN-GJL-300			Grade 300	130-00	A48-45B	0.6030	GG-30	Ft30D	G30	FG30	FC30
GG-35 / EN-GJL-350			Grade 350	135-00	A48-50B	0.6035	GG-35	Ft35D	G35	FG35	FC35
GG-40 / EN-GJL-400			Grade 400	140-00	A48-55B	0.6040	GG-40	Ft40D			
GG10 / EN-GJL-100			Grade 100	110-00	A48-20B	0.6010	GG10	Ft10D	G10	FG10	FC10
GG15 / EN-GJL-150			Grade 150	115-00	A48-25B	0.6015	GG15	Ft15D	G15	FG15	Fc15
GG20 / EN-GJL-200			Grade 200	120-00	A48-30B	0.6020	GG20	Ft20D	G20	FG20	FC20
GG25 / EN-GJL-250			Grade 250	125-00	A48-35B	0.6025	GG25	Ft25D	G25	FG25	FC25
Spheroidal-Ductile Iron											
GGG--40Mo0.5			500/7	0727-02	65-45-12	0.7050	GGG-50	FGS 500-7	GS 500/7	FGE 50-7	FCD 50
GGG--SiMo3.08											
GGG--SiMo4.10											
GGG--SiMo5.10											
GGG-35.3 / EN-GJS350-22				0717-15		0.7033	GGG-35.3				
GGG-40 / EN-GJS400-1			420/12	0717-02	60-40-18	0.7040	GGG-40	FGS 400-12	GS 400-12	FGE 38-17	FCD 40
GGG-50 / EN-GJS500-7											
GGG-60 / EN-GJS600-3			600/3	0732-03	80-55-06	0.7060	GGG-60	FGS 600-3	GS 600/3		FCD 60
GGG-70 / EN-GJS700-2			700/2	0737-01	100-70-03	0.7070	GGG-70	FGS 700-2	GS 700-2	FGS 70-2	FCD 70
GGG-80 / EN-GJS800-2			800/2		120-90-02	0.7080	GGG-80	FGS 800-2	GS 800-2		
GGG-Ni22 / EN-GJSAXNi22			S-Ni 22		A 439 Type D-2C	0.7670	GGG-Ni22	S-N 22			
GGG-Ni35 / EN-GJSAXNi35			S-Ni 35		A 439 Type D-5	0.7683	GGG-Ni35	S-N 35			
GGG-NiCr20.3			S-NiCr 20 3		A 439 Type D-2B	0.7661	GGG-NiCr20.3	S-NC 20 3			
GGG-NiCr202 / EN-GJSAXNiCr20-2			S-NiCr 20 2		A 439 Type D-2	0.7660	GGG-NiCr20.2	S-NC 20 2			
GGG-NiCr30.1			S-NiCr 30 1		A 439 Type D-3A	0.7677	GGG-NiCr30.1	S-NC 30 1			
GGG-NiCr303 / EN-GJSAXNiCr30-3			S-NiCr 30 3		A 439 Type D-3	0.7676	GGG-NiCr30.3	S-NC 30 3			
GGG-NiCr353 / EN-GJSAXNiCr35-3			S-NiCr 35 3		A 439 Type D-5B	0.7685	GGG-NiCr35.3	S-NC 35 3			
GGG-NiCrNb20.2						0.7659	GGG-NiCrNb20.2				
GGG-NiMn13.7			S-NiMn 13 7			0.7652	GGG-NiMn13.7	S-NM 13 7			
GGG-NiMn234 / EN-GJSAXNiMn23-4			S-NiMn 23 4		A 571 Type D-2M	0.7673	GGG-NiMn23.4	S-NM 23 4			
GGG-NiSi3055 / EN-GJSAXNiSi-Cr30-5-5			S-NiSiCr 30 5 5		A 439 Type D-4	0.7680	GGG-NiSiCr30.5.5	S-NSC 30 5 5			
GGG-NiSiCr20.5.2			S-NiSiCr 20 5 2			0.7665	GGG-NiSiCr20.5.2	S-NSC 20 5 2			
GGG-NiSiCr30.5.2						0.7679	GGG-NiSiCr30.5.2				
GGG-NiSiCr35.5.2						0.7688	GGG-NiSiCr35.5.2				
Malleable Iron											
GTS-35-10 / MN35-10			B 340/12	815	32510	0.8135	GTS-35-10	MN 35-10			
GTS-45-06 / MN450-6							GTS-45-06	MN450-6			
GTS-55-04 / MP50-5								MP50-5			
GTS-65-02 / MN650-3			P 570/3	858	70003	0.8165	GTS-65-02	MN650-3			
GTS-70-02 / MN700-2			P 690/2	862	A220-80002	0.8170	GTS-70-02	MN700-2	GMN 70		
GTW-35-04						0.8035	GTW-35-04				
GTW-40-05						0.8040	GTW-40-05				
GTW-45-07						0.8045	GTW-45-07				

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Materials Cross Reference Chart

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Gray Iron																			
230HB	760																		
235HB	770																		
250HB	810																		
175HB	570																		
185HB	620																		
205HB	660																		
220HB	730																		
Spheroidal-Ductile Iron																			
150-200HB	660																		
200-250HB	810																		
200-250HB	810																		
200-250HB	810																		
150-180HB	600																		
155-220HB	730																		
190-255HB	820																		
200-260HB	840																		
240-300HB	970																		
265-300HB	970																		
130-170HB	570																		
130-180HB	600																		
	390																		
140-200HB	660																		
	370																		
140-200HB	660																		
140-190HB	630																		
	370																		
	390																		
120-170HB	570																		
170-240HB	780																		
	370																		
	380																		
	370																		
Malleable Iron																			
150HB	350-500																		
175HB	580																		
205HB	670																		
230HB	650-880																		
265HB	700-950																		
	340-740																		
	360-740																		
	400-740																		

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Materials Cross Reference Chart

Aluminum & Alloys

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Aluminum & Alloys <16% Si											
1050			1B			3.0255	Al99,5	A5	4507		
1070						3.0275	Al99,7		4508		
1080			1A			3.0128	Al99,8	A8	4509		
1100											
2011			FC1		2011	3.1655	AlCuBiPb	A-U5PbBi	6362		
2014			H15			3.1255	AlCuSiMn	A-U4SG	3581		
2017					2017	3.1325	AlCuMg1	A-U4G	3579		
2024			L97		2024	3.1355	AlCuMg2	A-U4G1			
2117											
2218							AlCuMgNi2				
2224											
3003						3.0517	AlMnCu	A-M1	3568		
3004						3.0526	AlMn1Mg1	A-M1G			
3005						3.0525	AlMn1Mg0.5	A-MG0.5			
3103			N3			3.0515	AlMn1		7780		
3105											
5005			N41		5005	3.3315	AlMg1	A-G0,6	5764-66		
5052			2L56		5052	3.3523	AlMg2,5	A-G2,5C	4574		
5056			N6		5056	3.3555	AlMg5	A-G5	3576		
5083			N8		5083	3.3547	ASlMg4,5Mn	A-G4,5MC	7790		
5086						3.3545	AlMg4Mn				
5154			N5			3.3535	AlMg3,5	A-G3	3575		
5251			N4			3.3525	AlMg2Mo3	A-G2M	3574		
5454			N51		5454	3.3537	AlMg2,5Mn	A-G2,5MC	7789		
5657							AlMg0,8Si				
5754			N5		5754	3.3535	AlMg3	A-G3M	3575		
6061			H20					A-GSUC	6170		
6063			H9		6063	3.3206	AlMgSi0,5	A-GS	3569		
6070											
6151											
6262											
6351			H30		6351	3.2315	AlMgSi1	A-SGM0,7	3571		
6463			91E			3.3207	EAlMgSi0,5		3570		
7001											
7003											
7020			H17			3.4335	AlZn4,5Mg1	A-Z5G	7791		
7022						3.4345	AlZnMgCu0,5				
7050											
7075			DTD5074		7075	3.4365	AlZnMgCu1,5	A-Z5GU	3735		
7175								AS5U3			
7178											
7475											
AS7G							AlSi7Mg				
Aluminum & Alloys >16% Si											
4032											

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Materials Cross Reference Chart

Aluminum & Alloys

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Aluminum & Alloys <16% Si																			
	105	0.4		-				0.25	0.5		99.50min	-				0.05	0.05	0.05	-
	100	0.25						0.25	0.03		rem	0.03				0.03	0.04	0.04	
	100	0.15						0.25	0.02		rem	0.03				0.02	0.03	0.03	
	90	Si+Fe1.0max		-					0.05		99.00min	-				-	0.1	0.05~0.20	-
	310	0.7		-				0.4	-		rem	-				-	0.3	50.~60.	Pb,Bi 0.2~0.6
	430	0.7		0.1				0.5~1.2	0.4~1.2		rem	0.15				0.2~0.8	0.25	3.9~5.0	-
	390	0.7		0.1				0.2~0.8	0.4~1.0		rem	0.15				0.4~0.8	0.25	3.5~4.5	-
	465	0.5		0.1				0.5	0.3~0.9		rem	0.15				1.2~1.8	0.25	3.8~4.9	-
	296	0.7		0.1				0.8	0.2		rem					0.2-0.5	0.25	2.2-3.0	
	331	1	1.7~2.3	0.1				0.9	0.2		rem	-				1.2~1.8	0.25	3.5~4.5	
		0.15		0.1				0.12	0.30~0.9		rem	0.15				1.2~1.8	0.25	3.8~4.4	-
	140	0.7		-				0.6	1.0~1.5		rem	-				-	0.1	0.05~0.20	-
	200	0.7						0.3	0.51-1.0		rem					0.8-1.3	0.25	0.25	
	165	0.7		0.1				0.6	1.0-1.5		rem	0.1				0.2-0.6	0.25	0.3	
		0.7		0.1				0.5	0.9-1.5		rem	0.1+Zr				0.3	0.2	0.1	
	175	0.7		0.2				0.6	0.3-0.8		rem	0.1				0.2-0.8	0.4	0.3	
	159	0.7		0.1				0.3	0.2		rem					0.5-1.1	0.25	0.2	
	260	0.4		0.15~0.35				0.25	0.1		rem	-				2.2~2.8	0.1	0.1	-
	300	0.4		0.05~0.20				0.3	0.05~0.20		rem	-				4.5~5.6	0.1	0.1	-
	335	0.4		0.05~0.25				0.4	0.4~1.0		rem	0.15				4.0~4.9	0.25	0.1	-
	300	0.5		0.05~0.25				0.4	0.20~0.7		rem	0.15				3.5~4.5	0.25	0.1	-
	269	0.4						0.45	0.1		rem					3.1-3.9	0.2	0.1	
		0.7		0.1				0.5	0.2-0.7		rem	0.1				1.6-2.2	0.25	0.25	
	276	0.4		0.05-0.2				0.25	0.5-1.0		rem	0.05-0.2				2.4-3.0	0.25	0.1	
	193	0.1						0.08	0.03		rem					0.6-1.0		0.1	
		0.4		0.3				0.4	0.5		rem	0.15				2.6-3.6	0.2	0.1	
	300	0.7		0.04~0.35				0.4~0.8	0.15		rem	0.15				0.8~1.2	0.25	0.15~0.40	-
	200	0.35		0.1				0.2~0.6	0.1		rem	0.1				0.45~0.9	0.1	0.1	-
	379	0.5		0.1				1.0~1.7	0.40~1.0		rem	0.15				0.50~1.2	0.25	0.15~0.40	-
		1		0.15~0.35				0.6~1.2	0.2		rem	0.15				0.45~0.8	0.25	0.35	-
	400	0.7		0.04~0.14				0.4~0.8	0.15		rem	0.15				0.8~1.2	0.25	0.15~0.40	Pb, Bi 0.40~0.7
	310	0.5		-				0.7~1.3	0.4~0.8		rem	0.2				0.40~0.8	0.2	0.1	-
	241	0.15		-				0.20~0.6	0.05		rem	-				0.45~0.9	0.05	0.2	-
		0.4		0.18~0.35				0.35	0.2		rem	0.2				2.6~3.4	6.8~8.0	1.6~2.6	-
	400	0.35		0.2				0.3	0.3		rem	0.2				0.50~1.0	5.0~6.5	0.2	Zr0.05~0.25
		0.4		0.1-0.35				0.35	0.05-0.5		rem					1.0-1.4	4.0-5.0	0.2	Zr0.08-0.2
		0.5		0.1-0.3				0.5	0.1-0.4		rem					2.6-3.7	4.3-5.2	0.5-1.0	
	530	0.15		0.04				0.12	0.1		rem	0.06				1.9~2.6	5.7~6.7	2.0~2.6	Zr0.08~0.15
	570	0.5		0.18~0.28				0.4	0.3		rem	0.2				2.1~2.9	5.1~6.1	1.2~2.0	-
	590	0.2		0.18-0.28				0.15	0.1		rem	0.1				2.1-2.9	5.1-6.1	1.2-2.0	
	600	0.5		0.18~0.35				0.4	0.3		rem	0.2				2.4~3.1	6.3~7.3	1.6~2.4	-
	565	0.12		0.18~0.25				0.1	0.06		rem	0.06				1.9~2.6	5.2~6.2	1.2~1.9	-
50/90HB	250																		
Aluminum & Alloys >16% Si																			
	379	1	0.5~1.3	0.1				11.0~13.5	-		rem	-				0.8~1.3	0.25	0.5~1.3	

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Materials Cross Reference Chart

Aluminum & Alloys / High Temp. Alloys

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
Aluminum Lithium											
2050											
2090											
2091											
2094											
2095											
2097											
2098											
2099											
2195											
2196											
2197											
2198											
2199											
2297											
2397											
8017											
8024											
8090											
8091											
8093											
HTA Iron Based Alloys											
20CB-3	AL 20				ASTM B463						
21-6-9	AL 40				ASTM A666						
AL 4750	AL 4750				ASTM B753						
Armco 18											
Armco 20-45-5											
RA 330					5592, 5716						
Crucible A-286	ATI A286™	UNS S66286	HR 5152		ASTM 368	1.4980	X5NiCrTi2515	Z06 NCT 25			
Discaloy 16/25/6					5725			Z3NCT25			
Discaloy 24					ASTM A638			Z3NCT25			
Greek Ascoloy	AL 418™				5508						
Haynes 556					5768		X12CrCoNi2120	Z12CKND-WNb21.20.20			
Incoloy 800	ATI 800™	UNS N08800	3082.76		ASME SB409		X10NiCrAlTi3220	Z10NC3221			
Incoloy 801		UNS N08801			5552	1.4868	G.X50CrNi3030	Z5NCT3220			
Incoloy 802								Z4NC3221			
Incoloy 803											
Incoloy DS			3072.76				X12NiCrSi3616				
Invar 36	ATI 36™	UNS K93600 K93603			ASTM F1684						
Invar 42	AL 42™				ASTM F30						
Maraging C200	ATI VascoMax® C-200	UNS K92810									
Maraging C250	ATI VascoMax® C-250	UNS K92890			6501, 6512, 6520			Z2NKD18.8			
Maraging C300	ATI VascoMax® C-300	UNS K93120			6514						
Maraging C350	ATI VascoMax® C-350										
Maraging T200	ATI VascoMax® T-200										

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Materials Cross Reference Chart

Aluminum & Alloys / High Temp. Alloys

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
Aluminum Lithium																			
	520			0.05				0.08	0.20-0.50		rem	0.1	0.70-1.30			0.20-0.60	0.25	3.20-3.90	Zr0.25
	510			0.05				0.1	0.05		rem	0.15	1.90-2.60			0.25	0.1	2.40-3.0	Zr0.08-0.15
	400			0.1				0.2	0.1		rem	0.1	1.70-2.3			1.10-1.90	0.25	1.80-2.50	Zr0.04-0.16
								0.12	0.25		rem	0.1	0.70-1.40			0.25-0.80	0.25	4.40-5.20	Zr0.04-0.18
								0.12	0.25		rem	0.1	0.70-1.40			0.25-0.80	0.25	3.90-4.60	Zr0.04-0.18
								0.12	0.10-0.60		rem	0.15	1.20-1.80			0.35	0.35	2.50-3.10	Zr0.08-0.16
								0.12	0.35		rem	0.1	0.80-1.30			0.25-0.80	0.35	3.20-3.80	Zr0.04-0.18
								0.05	0.10-0.50		rem	0.1	1.60-2.00			0.10-0.50	0.40-1.00	2.40-3.00	Zr0.05-0.12
								0.12	0.25		rem	0.1	0.08-0.16			0.25-0.80	0.25	3.70-4.30	Zr0.08-0.16
								0.12	0.35		rem	0.1	1.40-2.10			0.25-0.80	0.35	2.50-3.30	Zr0.04-0.18
								0.1	0.10-0.50		rem	0.12	1.20-1.70			0.25	0.05	2.50-3.10	Zr0.08-0.15
				0.05				0.08	0.5		rem	0.1	0.80-1.10			0.25-0.80	0.35	2.90-3.50	Zr0.04-0.18
								0.05	0.10-0.50		rem	0.1	1.40-1.80			0.050-0.40	0.20-0.90	2.30-2.90	Zr0.05-0.12
								0.1	0.10-0.50		rem	0.12	1.10-1.70			0.25	0.05	2.50-3.10	Zr0.08-0.15
								0.1	0.10-0.50		rem	0.12	1.10-1.70			0.25	0.05-0.15	2.50-3.10	Zr0.08-0.15
								0.1	0.01-0.05		rem		0.003				0.05	0.10-0.20	
								0.1			rem		3.40-4.20						Zr0.08-0.25
	450			0.1				0.2	0.1		rem	0.1	2.20-2.70			0.60-1.30	0.25	1.00-1.60	Zr0.04-0.16
				0.1				0.3	0.1		rem	0.1	2.40-2.80			0.50-1.20	0.25	1.60-2.20	Zr0.08-0.16
				0.1				0.1	0.1		rem	0.1	1.90-2.60			0.90-1.60	0.25	1.00-1.60	Zr0.04-0.14
HTA Iron Based Alloys																			
95HRB	690	41.0	33.0	20.0		2.2		1	2	0.07									Cu 3.3
93HRB	660	62.0	6.5	21.0				1	9	0.08									No 0.3
55HRB	350	50.0	48.0	0.1	0.5	0.3			0.3	0.01				0.03	0.01				Cu 0.3
		66.0	3.7	17.2				0.47	12.5	0.06									
		25.6	46.0	20.0		2.3		1	5	0.08									Nb 0.4
		43.8	35.5	18.5				1.13	1	0.04				0.01	0.01				Cu 0.5
250HB	810	56.0	25.0	14.5		1.3		0.2	0.2	0.05	0.2	2.1							
290HB	930	50.1	25.0	16.0		6.0		0.7	1.35	0.12		0.3							Nb 0.4
280HB	900	54.3	26.0	13.5		2.7		0.8	0.9	0.04	0.1	1.7							
300HB	970	80.0	2.0	12.0		0.2	2.5	0.3	0.4	0.15									
260HB	840	29.0	20.0	21.0	20.0	3.0	2.5	0.4	1.5	0.1	0.3								Nb + Ta
184HB	630	44.5	32.5	21.0				0.5	0.75	0.05	0.37	0.37			0.007				Cu 0.37
180HB	600	45.1	32.0	20.5				0.5	0.8	0.05		1.1							
180HB	600	44.4	32.5	21.5				0.4	0.8	0.4									
		39.0	35.0	25.0						0.08	0.15	0.15							
180HB	600	41.7	37.0	18.0				2.3	1	0.06									
75HRB	460	62.0	36.0		0.4	0.0		0.15	0.3	0.008	0.03				0.001				
55HRB	350	58.0	41.0	0.2	0.0				0.2	0.01	0.001			0.01	0.007				
43-48HRC	1360	69.0	18.5		8.5	3.3		0.05	0.05	0.01		0.2		0.005	0.005				
48-52HRC	1590	68.0	18.5		7.8	4.8		0.05	0.05	0.02	0.1	0.4		0.005	0.005				
50-55HRC	1700	67.0	18.5		8.8	4.8		0.05	0.05	0.02	0.1	0.73		0.005	0.005				
55-60HRC	2010	63.0	18.5		12.0	4.8		0.05	0.05	0.02	0.1	1.4		0.005	0.005				
43-47HRC	1400	77.6	18.5			3.0		0.05	0.05	0.01		0.7		0.005	0.005				

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Materials Cross Reference Chart

High Temp. Alloys

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
HTA Iron Based Alloys											
Maraging T250	ATI VascoMax® T-250				6518, 6519, 6591						
Maraging T300	ATI VascoMax® T-300										
Marval 18											
Marval X12											
Multimet N-155					5768	1.4971		Z12CNKDW20			
Multimet N-156											
S 590					5533		X40CoCrNi2020	Z42CKNDW			
Sanicro 30							X2NiCrAlTi3220				
Super Invar 32-5											
Udimet B-250											
Udimet B-300											
W-545					AISI:665			Z8NCTDA2613			
HTA Cobalt Based Alloys											
F 1537	ATI TJA-1537 ®	UNS R31537 & R31538			ASTM F1537			CoCr28Mo			
Fe50Co50											
HS 21			3531		ASTM F-75		CoCr28Mo	KC27D5NFe			
HS 25					AISI 670		CoCr20W15Ni	KC20WN			
HS 30					5380		CoCr26Ni14Mo				
HS 31			3146		ASTM A567		CoCr25NiW	KC25NW			
HS 36							CoCr19W14NiB				
Jetalloy 209											
K13C20N126		UNS R3003 & R3008			ASTM F1058		K13C20N126Fe15D7	K13C20N126Fe15D7			
L 251											
L 605	ATI L-605™	UNS R30605			5759	2.4964	CoCr20W15Ni	KC20WN			
M 203											
M 204											
M 205											
MAR-M 247											
MAR-M 302							CoCrW10TaZrB	KC21W10Ta9			
MAR-M 322							CoCr22W9TaZrNb	KC21W9Ta			
MAR-M 509			3146.3				CoCr24Ni10WTaZrB	KC23N10W7Ta			
MAR-M 905								KC20N20Ta7			
MAR-M 918							CoCr20Ni20Ta	KC20N20Ta7			
MP159		UNS R30159									
MP35N	ATI 35N™	UNS R30035									
S 816	ALTEMP ® S 816				5534	2.4979	CoCr20Ni20W				
Stellite 1								KC33W13			
Stellite 100											
Stellite 12								KC28W8			
Stellite 151											
Stellite 188	ATI 188™							KC22N22W14Fe			
Stellite 19											
Stellite 20											
Stellite 21											
Stellite 23											

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Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
HTA Iron Based Alloys																			
49-52HRC	1600	76.8	18.5			3.0		0.03	0.05	0.02	0.1	1.4		0.005	0.005				
52-55HRC	1800	76.8	18.5			3.0		0.03	0.05	0.02	0.1	1.4		0.005	0.005				
50HRC	1700	68.0	18.0		8.5	5.0		0.1		0.01	0.1	0.5							
32HRC	1000	75.0	9.4	12.0		2.0		0.05	0.02	0.01	0.7	0.3							
266HB	850	32.0	20.0	21.0	20.0	3.0				0.1									
260HB	840	19.7	33.0	17.0	24.0	3.0	2.0			0.33									
270HB	870	24.9	20.0	21.0	20.0	4.0	4.0	1.25	0.4	0.43									
150HB	510	14.6	34.0	22.0				0.55	0.55	0.03	0.3	0.5							Cu 0.1
	600	62.0	31.8	0.03	5.4			0.09	0.39	0.05	0.07							.08	
470HB	1590	68.6	18.0		7.9	4.9		0.1	0.1	0.08	0.1								
470HB	1590	67.0	18.0		9.0	5.0		0.1	0.1	0.08	0.1								
280HB	900	53.0	26.0	13.3		1.8		0.8	1.5	0.08	0.15								
HTA Cobalt Based Alloys																			
41HRC	1290	0.3	0.2	28.0	64.0	6.0		0.5	0.5	0.1									N 0.2
1050HV																			
		1.0	3.0	27.0	62.0	5.0		0.6	0.6	0.2		0.3							
		3.0	10.0	20.0	48.0		15.0	2.0	1.5			0.1							
		1.0	16.0	24.0	51.4	6.0		0.6	0.6			0.4							
		1.5	10.0	25.0	54.0		8.0	0.8	0.6			0.4							
		2.0	10.0	18.0	53.1		15.0		1.5			0.4							
180/230HB		1.0	10.0	20.0	52.0		15.0				2.0	0.0							
500/700HV	1450-1650																		
		1.0	10.0	19.0	55.6		14.0					0.4							
80HRB	510	0.5	10.0	20.0	52.0		15.0		1.7	0.1									
		1.0	24.5	19.5	38.0		12.0	1.0	0.8	2.2	0.7	0.1							
			24.5	18.5	43.0		12.0	1.0	1.0			0.1							
			24.5	18.5	42.0		12.0			2.8		0.1							
	800	0.5	59.0	8.3	10.0	0.7	10.0				5.5	1.0							Ta 3.0
				21.5	57.0		10.0					0.9							Ta 9.0
				21.5	60.0		9.0	0.1	0.1	1.0	0.8	1.0							Ta 4.5, Zr 2.25
		1.0	10.0	21.5	50.0		7.0	0.1	0.1		0.2	0.6							Ta 3.5, Zr 0.5
			20.0	20.0	55.0						0.5	0.1							Ta 7.5, Zr 0.1
		0.5	20.0	20.0	50.0			0.1	0.1			0.1							Ta 7.5, Zr 0.1
		9.0	25.5	19.0	35.7	7.0					0.2	3.0							Zr 0.6
28HRC	900		35.0	20.0	35.0	9.8				0.013									
		4.0	20.0	20.0	46.0	4.0	4.0	0.4	1.2			0.4							
				33.0	50.0		13.0			2.5									
				34.0	43.0		19.0			2.0									
463HB	1560	2.0	3.0	29.0	59.0		9.0			1.8									
		2.0	1.0	20.0	65.0		13.0			0.5									
		3.0	22.0	22.0	37.0		14.0			0.1									
52HRC	1800	3.0	3.0	31.0	52.0		10.5			1.7									
				33.0	45.0		18.0			2.5									
		3.0	2.5	27.0	60.0	5.5				0.3									
		2.0	1.5	25.0	65.0		5.0			0.4									

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Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
HTA Cobalt Based Alloys											
Stellite 25 (L605)					5759	2.4964	CoCr20W15Ni	KC20WN			
Stellite 3											
Stellite 30											
Stellite 31 (X40)			3146.2		ASTM A567		CoCr25NiW	KC25N10W7Fe			
Stellite 4											
Stellite 45											
Stellite 6								KC26NW			
Stellite 7											
Stellite 8 (F75)											
V-36							CoCr25Ni20MoWNb	KC25N20DFeWNb			
WI-52							CoCr21Mo11W	KC21W11ANbT			
X 40			3146.2		ASTM A567		CoCr25NiW	KC25N10W7Fe			
X 45								KC25N10W7Fe			
X 50											
X 63											
HTA Nickel Based Alloys											
200	ATI 200™	UNS N02200									
201	ATI 201™	UNS N02201									
718 Plus	ATI 718 Plus ®										
Allcorr	Allcorr ®										
Astroloy	ATI Astroloy™	UNS N13017						NK17C15D5AT			
Duraloy 22H											
Duraloy Super 22H											
GMR 235					AISI 686			NC15Fe10D5AT			
GMR 235-D							NiCr16MoAl	NC15D5FeAT			
Hastelloy B	ATI HB				5396A	2.48	S.NiMo30	ND27FeV			
Hastelloy B-2	ATI HB-2™	UNS N10665									
Hastelloy C		UNS N10002			5388C		NiCr17Mo17FeW	NC17DWY			
Hastelloy C-22											
Hastelloy C-276		UNS N10276				2.4819	G-NiMo30	NC15D14KFe			
Hastelloy C-4		UNS N06455									
Hastelloy G		UNS N06007						NC22Fe19D6KTa			
Hastelloy G-3		UNS N06985				2.4619					
Hastelloy N	ATI HN™	UNS N10003									
Hastelloy R235											
Hastelloy S		UNS N06635						NC15D14KFe			
Hastelloy W	ATI HW™	UNS N10004									
Hastelloy X	ATI HX™	UNS N06002	HR6, 204		5536	2.4603	NiCr22FeMo	NC22FeD			
Haynes 188	ATI 188™	UNS R30188			5772			KC22N22W14Fe			
Haynes 25		UNS R30605			5759		LW2.4964	KC20WN			
Haynes 263	ATI C-263™	UNS N07263						NC20K20D6T			
Haynes 600	ATI 600™	UNS N06600			5540	2.4816	NiCr15Fe				
Haynes 601	ATI 601™	UNS N06601			5715	2.4851					
Haynes 625	ATI 625™	UNS N06625			ASME SB443	2.4856	NiCr22Mo9Nb	NC22FeDNB			
Haynes 690	ATI 690™	UNS N06690				2.4642	NiCr29Fe	NC30Fe			
Haynes 75											
Haynes X-750	X-750 Nickelvac®	UNS N07750			5542	2.4669		NC15TNbA			

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Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
HTA Cobalt Based Alloys																			
350HB	1130	2.0	10.0	20.0	52.0		15.0			0.2									
450HB	1490			30.0	52.0		13.0			2.4									
		2.0	15.0	26.0	50.0	6.0				0.5									
			10.0	25.0	56.0		7.0			0.3									
47HRC	1560	3.0	3.0	31.0	53.0		14.0			1.0									
		2.0	10.5	25.0	56.0	0.5	7.5			0.3									
300HB	970	3.0	3.0	26.0	66.0		5.0			1.0									Nb 6.0
				26.0	66.0		5.0			0.4									
				20.0	63.0	6.0				0.2									
		3.0	20.0	25.0	43.2	4.0	2.0	0.4	1.0			0.3							Nb 2.0
		2.0	1.0	21.0	62.6		11.0	0.3	0.3		0.3	0.5							Nb 2.0
		2.0	10.5	25.5	53.0		7.5	0.8	0.8			0.5							
		2.0	10.5	25.5	54.7		7.0		0.7			0.3							B 0.01
		4.0	20.5	22.5	40.3		12.0					0.8							
		1.0	10.0	25.0	57.6	6.0													
HTA Nickel Based Alloys																			
45HRB	310	0.4	99.8					0.35	0.35	0.15					0.01			0.25	
45HRB	310	0.4	99.9					0.35	0.35	0.2					0.01			0.25	
42HRC	1330	9.0	53.0	19.0	9.0	2.8	1	0.01	0.35	0.06	1.6	0.75		0.02	0.01				
85HRB	550		56.0	31.0			2			0.02	0.25	0.25							Nb 0.4
40HRC	1270		55.4	15.0	17.0	5.25				0.06	4	3.5							
			50.0	30.0															
			48.0	28.0	3.0														
	620	10.0	63.3	15.5		5.2		0.4	0.2	0.15	3	2							
	620	4.5	63.0	15.5		5				0.15	3.5	2.5							
90HRB	600	5.0	62.0	1.5	2.5	28		0.05	0.5	0.02									V 0.4
90HRB	600	1.0	81.0	0.5	0.5	16		0.05	0.5	0.01				0.02	0.015				
200HB	660	6.0	54.1	15.0	2.0	17	5			0.04									
94HRB	660	3.0	56.0	22.0	2.5														
191HV	630	5.5	56.0	15.0	2.5														
	750	3.0	58.0	16.0	2.0														
		20.0	46.0	22.0	2.5														
		20.0	40.0	22.0	5.0														
80HRB	510	4.0	72.5	7.0		16.5				0.02									
		10.0	61.0	15.5	2.5	5.5				0.15	2	2.5							
61HRA	780	3.0	67.0	16.0	2.0														
94HRB	660	4.0	66.5	5.0	1.3	24.5				0.02									
80HRB	510	18.5	48.6	21.8	1.5	9	0.6			0.1									
		3.0	22.0	22.0	37.0														
	1000	3.0	10.0	20.0	bal		15		1.5	0.1									
		0.7	51.4	20.0	20.0	6				0.06	1	1.5							
85HRB	550	8.0	72.0	15.5						0.08									
65HRB	430	14.0	60.5	23.0															
95HRB	660	5.0	61.4	21.5		9				0.1									
88HRB	570	9.0	58.0	29.0				0.2	0.2	0.25					0.007				Cu 0.2
		5.0	73.7	20.0						0.12	0.25	0.4							Cu 0.5
		7.0	74.9	16.0						0.08	0.8	0.25							

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HTA Nickel Based Alloys											
IN100		UNS N13100			5397	2.4674	NiCo15Cr10MoAlTi	NK15CAT			
Incoloy 020					ASTM B463	2.4660		20CB-3			
Incoloy 804								NC29Fe25			
Incoloy 825	ATI 825™	UNS N08825	3072.76		ASME SB163	2.4858	NiCr21Mo	NC21FeDU			
Incoloy 901	ATI 901™	UNS N09901			5660	2.4662	NiFe35Cr14MoTi	Z8NCDT42			
Incoloy 903		UNS N19903					NiFe42K15Nb	Z3NK28			
Incoloy 925	ATI 925™	UNS N09925									
Inconel alloy 050											
Inconel alloy 182											
Inconel alloy 22					ASME SB575			NiMo16Cr15			
Inconel alloy 230											
Inconel alloy 600	ATI 600™	UNS N06600	3072.76		5540	2.4640	NiCr15Fe	NC15Fe			
Inconel alloy 600SP											
Inconel alloy 601	ATI 601™	UNS N06601			5715	2.4851		NC23Fe14A			
Inconel alloy 601GC											
Inconel alloy 603XL											
Inconel alloy 604											
Inconel alloy 606											
Inconel alloy 613											
Inconel alloy 617	ATI 617	UNS N06617				2.4663	NiCr23Co12Mo	NC22K12D9A			
Inconel alloy 62											
Inconel alloy 622						2.4602					
Inconel alloy 625	ATI 625™	UNS N06625			ASME SB443.4	2.4856	NiCr22Mo9Nb	NC22FeDNB			
Inconel alloy 625LCF		UNS N06626									
Inconel alloy 657											
Inconel alloy 671											
Inconel alloy 672											
Inconel alloy 686											
Inconel alloy 690	ATI 690™	UNS N06690				2.4642		NC30Fe			
Inconel alloy 691											
Inconel alloy 693											
Inconel alloy 702					5550			NC15A			
Inconel alloy 706	ATI 706™	UNS N09706			AMS 5702			NFe10C16NbT			
Inconel alloy 718	ATI 718™	UNS N07718	HR8		5383	2.4668	NiCr19Fe19NbMo	NC19FeNb			
Inconel alloy 718 DA	ATI 718-DA®										
Inconel alloy 718 OP	ATI 718-OP®	UNS N07718									
Inconel alloy 720	ATI 720™										
Inconel alloy 721								NC16Fe8TM			
Inconel alloy 722	ATI W-722™	UNS N07722			5541		NiCr16FeTi	NC16FeTi			
Inconel alloy 725											
Inconel alloy 725HS											
Inconel alloy 738											
Inconel alloy 740											
Inconel alloy 783		UNS R30783									
Inconel alloy 800	AL 800										
Inconel alloy 800H	ATI 800H™	UNS N08810									

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

High Temp. Alloys

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
HTA Nickel Based Alloys																			
			61.6	10.0	15.0	3				0.18	5.5	4.7							V 1.0
		38.0	34.0	20.0	2.5														Nb 0.6 Cu 3.5
		25.4	41.0	29.5				0.5	0.75	0.06	0.25	0.6							Cu 0.4
80HRB	510	29.5	42.0	21.5			3	0.5	0.65	0.03	0.2	0.9							Cu 2.25
180-300HB	600-970	34.0	44.3	12.5		6.2		0.22	0.48	0.05		2.5							
380HB	1250	41.0	39.0		15.0						0.7	1.4							Nb 3.0
32HRC	1000	25.4	45.0	21.0		3					0.3	2.1							Cu 1.8
36HRC	1130	18.0	50.0	20.0	3.0														
		7.5	66.0	16.0															
90HRB	600	2.5	58.0	22.0															
		1.0	60.0	22.0	1.0														
85HRB	550	8.0	76.0	16.0						0.075									
		8.0	77.0	15.0															
65HRB	400	14.0	61.0	24.0				0.2	0.5	0.05	1.3				0.008				Cu 0.5
77HRB	480	14.0	61.0	24.0															
			73.0	22.0															
		8.0	72.0	16.0				0.2	0.2	0.04									
		1.0	73.0	20.0															
		6.0	76.0	16.0															
180HB	600	1.0	53.0	22.0	13.0	9				0.07	1								
		8.0	74.0	15.0															
100HRB	780	2.5	58.0	22.0		14.2	3.2												
95HRB	690	4.0	61.0	22.0		9				0.05	0.3	0.3							Cb 3.7
		4.0	61.0	22.0															
		0.5	47.5	50.0															
			51.5	48.0															
			54.0	45.0															
90HRB	600	1.0	58.0	21.0															
85HRB	550	9.0	62.0	29.0				0.2	0.2	0.25					0.007				
		9.0	59.0	30.0															
		5.0	60.0	30.0															
		1.0	79.0	16.0				0.2	0.05	0.04	3.4	0.7							
40HRC	1270	37.0	42.0	16.0						0.03		1.8							Cb 2.9
42HRC	1330	18.0	54.0	18.0		3.1				0.02	0.5	0.9							Cb 5.2
40-47HRC	1560	bal	50-55	17-21	1.0	2.8-3.3		0.35	0.35	0.08	.2-.8	.65-1.15		0.015	0.015				Cb+Ta 5-5.5
38HRC	1200	18.0	54.0	18.0		3.1				0.02	0.5	0.9							Cb 5.2
43HRC	1380	14.7	58.0	18.0	14.7	3	1.25				2.5	5							
		7.0	71.0	16.0				0.15	2.25	0.07	0.1	3							Cu 0.2
34HRC	1070	7.0	74.0	16.0						0.04	0.7	2.4							
37HRC	1170	9.0	58.0	21.0		8					0.3	1.5							Nb 3.5
		9.0	58.0	21.0															
		0.5		16.0	8.5	1.8	2.6	0.3	0.2	0.17	3.4	3.4							Nb 0.9 Ta 1.8 Zr 0.1
		1.0	48.0	25.0	20.0														
34HRC	1070	26.0	28.5	3.0	34.0						5.4	0.1							Nb 0.3
86HRB	550	46.0	31.0	21.0															
70HRB	450	44.0	32.0	21.0				0.35	1	0.08	0.4	0.4		0.02	0.01			0.3	

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Materials Cross Reference Chart

High Temp. Alloys

Commercial Name	ATI Allvac ATI Allegheny Ludlum ATI WahChang	UNS Number	UK: BS,EN	Sweden: SS	USA: AISI/SAE	Germany: Wnr	Germany: DIN	France: AFNOR	Italy: UNI	Spain: UNF	Japan: JIS
HTA Nickel Based Alloys											
Inconel alloy 82											
Inconel alloy 939											
Inconel alloy C-276	ATI C-276™	UNS N10276									
Inconel alloy G											
Inconel alloy G-3											
Inconel alloy HX	ATI HX™	UNS N06002					NiCr22Fe18Mo	NC22FeD			
Inconel alloy MA 6000											
Inconel alloy MA754		UNS N07754									
Inconel alloy MA758											
Inconel alloy X-750	ATI X-750™	UNS N07750			5542	2.4669	NiCr16FeTi	NC15FeTNb			
Inconel alloy X-751		UNS N07751									
Jessop G81							NiCr20Co18Ti				
M-252	ATI M-252™	UNS N07252			5551		G-NiCr19Co				
Monel 400	ATI 400™	UNS N04400	3072.76		4544	2.4360	NiCu30Fe	NU30			
Monel K500	ATI K-500™	UNS N05500	3072.76		4676	2.4375	NiCu30Al				
Monel R405		UNS N04405			4674						
Nimocast 713			HC203		5391A		G.NiCr13Al16MoNb	NC13AD			
Nimocast 80			3146								
Nimocast 90											
Nimocast PD16							NiFe33Cr17Mo				
Nimocast PE10			HC202					NC20N13			
Nimocast PK24											
Nimonic 101											
Nimonic 105			HR3			2.4634	NiCo20Cr15MoAlTi	NCKD20ATV			
Nimonic 115			HR401, 601			2.4636	NiCo15Cr15MoAlTi	NCVK15ATD			
Nimonic 75		UNS N06075	HR5, 203.4			2.4630	NiCr20Ti	NC20T			
Nimonic 80A	ATI 80 A™	UNS N07080	HR401, 601			2.4631	NiCr20TiAl	NC20TA			
Nimonic 86											
Nimonic 90	ATI N-90™	UNS N07090	HR2, 202			2.4632	NiCr20Co18Ti	Nc20ATV			
Nimonic 901	ATI 901™	UNS N09901			5660, 5661	2.4662	NiCr15MoTi	Z8NCDT42			
Nimonic 91											
Nimonic 95								NC19K18Fe5TA			
Nimonic C22	ATI 22™	UNS N06022			ASME SB575						
Nimonic C263	ATI 263™	UNS N07263	HR10			2.4650	NiCr20CoMoTi	NCK20D			
Nimonic C276	ATI 276™	UNS N10276			ASME SB575	2.4819		NiMo16Cr15			
Nimonic PE13			HR6, 204		5536E		NiCr22Fe18Mo	NC22FeD			
Nimonic PE16			HR207				NiFe33Cr17Mo	NW11AC			
Nimonic PK25					5751A	2.4666	NiCr18CoMo	NKCD20ATU			
Nimonic PK31											
Nimonic PK33			5057				NiCr20Co16MoTi	NC19KDUN			
R-235					AISI 686						
Refractaloy 26					AISI 690			Z6NKCDT38			
René 100						2.4674	NiCo15Cr10MoAlTi	NK15C10A5T			
René 104											
René 125								NK10C8W7ATaTD			
René 41	ATI Rene™ 41	UNS N07041			5712, 5713	2.4973	NiCr19Co11MoTi	NC19KDT			
René 63								NK15C14D6AWT			

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HTA Nickel Based Alloys																			
		2.0	72.0	19.0															
			48.0	22.5	19.0														
90HRB	600	5.0	59.0	15.5	0.5	16	3.5			0.01									
		20.0	44.0	22.0	1.0														
		20.0	44.0	22.0	3.0														
90HRB	600	18.0	47.0	22.0	1.5	9	0.6												
			55.0	15.0	15.0														
29HRC	930	1.0	77.5	20.0							0.3	0.5							
320HV	1050		68.0	30.0															
32HRC	1000	7.0	72.0	16.0															
35HRC	1100	7.0	73.0	15.0				0.2	0.5	0.05	1.2	2.3			0.005				Cb 1.1 Cu 0.2
		0.5	79.3	20.0	13.0			0.2	0.5	0.08	1.5	2.5							
27-30HRC	900			18.0-20.0	9.0-11.0	9.0-10.5		0.5	0.5	0.15	0.75-1.25	2.25-2.75			0.015				
70HRB	440	1.2	66.0					0.25		0.15					0.01				
27HRC	860	1.0	66.0					0.25	0.7	0.1	2.7	0.6			0.01				
150HB	510	1.3	63.0					0.25	1	0.15									Cu 31.5
			72.6	13.5		4.5				0.12	6	0.9							
		5.0	69.9	20.0	2.0														
		5.0	52.9	20.0	18.0														
		34.0	43.8	16.5						0.06	1.2	1.2							
			56.4	20.0		6	2.5			0.03									
			61.1	9.5	15.5	9				0.17	5.5	4.7							
			48.0	24.2	19.7	1.5					1.4	3							Nb 1
320HB	1040	1.0	54.0	15.0	20.0	5		0.5	0.5	0.1	4.7	1.2							
350HB	1130	1.0	59.0	15.0	14.0	4				0.16	5	4							
170HB	570	4.0	76.0	20.0				0.45	0.45	0.45	0.1	0.35							
350HB	1130	1.5	70.0	19.5	1.0			0.2	0.55	0.08	1.4	2.4							
			65.0	25.0		10													Ce 0.03
28HRC	870	0.3	58.3	19.5	18.0					0.065	1.4	2.4							
36HRC	1130	35.6	43.0	12.5		6				0.05		2.8							B 0.015
			48.0	29.0	20.0														
		5.0	49.9	19.5	18.0			1	1	0.1	2	3.5							
85HRB	550	4.0	57.0	21.2	1.2	13.5	3	0.04	0.2	0.07				0.01					V 0.17
28HRC	870	0.7	54.9	20.0	20.0	5.85				0.06	0.45	2.15							
80HRB	510	5.0	59.5	15.5	0.5	16	3.5			0.01									
		18.5	49.0	21.8	1.5	9	0.6	0.5	0.5	0.1									
250HB	810	1.2	43.0	16.0	2.0	3.5				0.05	1.2	1.2							
			49.9	19.0	19.5	4		0.75	0.75	0.08	2.9	2.9							B 0.01
			53.0	20.0	14.0	4.5					0.4	2.3							Nb 5.0
350HB	1130	1.0	55.0	18.0	14.0	7		0.25	0.25	0.05	2.1	2							
		10.0	63.3	15.0	1.2	5.5		0.3	0.1	0.12	20	2.5							
		16.0	38.0	19.0	20.0	3.2		1	0.8	0.03	0.2	2.8							
			60.6	10.0	15.0	3				0.18	5.5	4.7							V 1.0
			52.4	11.0	20.5	3.7	2			0.04	3.4	3.6							Nb 0.9 Ta 2.4 B 0.03
			60.0	8.9	10.0	2	7			0.1	4.7	2.5							Hf 1.05 Ta 3.0
36HRC	1130	3.0	52.5	19.0	11.0	9.75				0.06	1.6	2.5							B 0.007
		3.5	54.4	14.0	15.0	6	3.5	0.2	0.1	0.05	3.8	2.5							

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HTA Nickel Based Alloys											
René 77								NC15K15ADT			
René 80								NC14K9T5DWA			
René 95								NC14K8			
Stelloy HS27							NiCo32Cr26Mo	KC20WN			
TRW VIA							NiTa9Co8W6CrAl	NTa9K7C6W5A5DT			
Udimet 500		UNS N07500			AISI 684	2.4983	NiCr18CoMoAlTi	NCK19DAT			
Udimet 520	ATI 520™										
Udimet 630							NiCr19NbMo	NC18Fe18Nb6DWT			
Udimet 700					AISI 687	2.4636	NiCo15Cr15MoAlTi	NCKD20AT			
Udimet 710								NCK18TDA			
Udimet 718			HR8		5383	2.4668	NiCr19Fe19NbMo	NC19FeNb			
Udimet 720								NC18K15TDA			
Waspaloy®	ATI Waspaloy	UNS N07001			5544	2.4654	NiCr20Co14MoTi	NC20K14			
HTA Titanium Based Alloys											
Ti-10.2.3	ATI 10-2-3™										
Ti-11.5Mo-6Zr-4.5Sn											
Ti-12Mo-6Zr-2Fe (TMZF)											
Ti-13Nb-13Zr											
Ti-13V-11Cr-3Al	13-11-3				4917		TiV13Cr11Al3				
Ti-15-333	ATI 15-333™	UNS R58153									
Ti-15Mo (Alpha + Beta)	ATI 15Mo™ (Alpha + Beta)										
Ti-15Mo (Beta)	ATI 15Mo™ (Beta)										
Ti-15Mo-3Nb-3Al-0.2Si					ASTM Grade 21						
Ti-3Al-2.5V	ATI 3-2.5-MIL™	UNS R56320			4943, 4944						
Ti-3Al-8V-6Cr-4Mo-4Zr	ATI 38-644™	UNS R58640									
Ti-425	ATI 425®										
Ti-425 MIL	ATI 425®-MIL										
Ti-45Nb	ATI 45Nb™										
Ti-48Al-2Cr-2Nb											
Ti-4Al-4Mo-2Sn-0.5Si	ATI 4-4-2™		5103				TiAl4Mo4Sn2Si0.5	T-A4DE			
Ti-4Al-4Mo-4Sn-0.5Si			5203				TiAl4Mo4Sn4Si0.5				
Ti-5Al-2.5Fe (Tikrutan)											
Ti-5Al-2.5Sn	ATI Grade 6	UNS R54520	TA 14,17		ASTM B 265	3.7115	TiAl5Sn2	T-A5E			
Ti-5Al-2Sn-2Zr-4Cr-4Mo	ATI 17™	UNS R58650			4995		Ti5Al2Sn2Zr4Cr4Mo				
Ti-5Al-5Mo-5V-1Cr-1Fe											TC18
Ti-5Al-5V-5Mo-3Cr	ATI 5-5-5-3 PM™										
Ti-6-2-4-6	ATI 6-2-4-6™	UNS R56260			4981						
Ti-6-7	ATI 6-7™	UNS R56700									
Ti-6Al-2Sn-2Zr-2Mn-2Cr-0.2Si	ATI 6-2222™										
Ti-6Al-4V	ATI 6-4™	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56		4906, 4920, 4928, 4965, 4967		TiAl6V4	T.A6V;AIR:9183			TC4
Ti-6Al-4V ELI	ATI 6-4 ELI™	UNS R56401			4907, 4930, 4931						
Ti-6Al-4V MIL	ATI 6-4-MIL™	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56		4906, 4920, 4928, 4965, 4967		TiAl6V4	T.A6V;AIR:9183			
Ti-6Al-4V MIL (HT)	ATI 6-4-MIL™	UNS R56400	TA10 TA11 TA12 TA13 TA28 TA56		4906, 4920, 4928, 4965, 4967		TiAl6V4	T.A6V;AIR:9183			

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HTA Nickel Based Alloys																			
		0.4	58.0	15.0	15.0	4.2		0.1	0.1	0.17	4.3	3.3							
			61.0	14.0	9.5	4				0.15		4							
		0.3	64.5	14.0	8.0	3.5				0.15		2.5							
		2.0	30.0	25.0	30.0														
			70.5	6.0	7.5	2	5.8			0.13	5.4	1							
		4.0	52.0	19.0	18.0	4		0.1	0.1	0.07	3	3							
40HRC	1270		56.9	19.0	12.0	6	1				2	3							
		18.0	51.0	19.0	18.0	3				0.04	0.6	1.1							
		1.0	53.0	15.0	19.0					0.1	4.4	3.4							
		0.5	55.0	18.0	15.0	1.5				0.07	2.5	5							
42HRC	1330	19.0	54.0	18.0		3				0.05	0.6	1							
	1600		55.0	18.0	14.8	3	1.2			0.035	2.5	5							
38HRC	1200	1.0	57.7	19.5	13.0	4.3				0.05	1.4	3							Zr 0.07
HTA Titanium Based Alloys																			
HRC35	1100																		
	1037	0.085																	Nb13.18 Zr13.49
HRC40	1270																		
HRC32	1000	0.12		3						0.02	3								V 15.0
HRC38	1200	0.1				15													
HRC24	820	0.1				15													
	930	< 0.4				15					3	76.0/80.8							Nb 3.0
HRC24	820	0.13									3								V 2.5
HRC32	1000	0.35		6.5		4.5				0.05	4								V 8.5 Zr 4.5
HRC36	1130	1.5									4								V 2.5 O 0.25
HRC36	1130	1.2/1.8									4.5								V 2.5 O 0.25
												55							Nb 45
HRC22	800			2							48.03	47.97							Nb 2
HRC35	1100																		
	1020	2.5									5								
HRC36	1130																		
HRC38	1200	0.3		3.5/4.5		3.5/4.5					4.5/5.5								Sn 1.5/2.5 Zr 1.5/2.5
HRC40	1270																		
HRC40	1270																		
HRC36	1130																		
HRC32	1000	0.15								0.08	6								Nb 7
				2				0.2	2		6								Sn 2 Zr 2
HRC30-34	1130	0.3								0.1	5.5/6.75								V 4
HRC32	1000	0.25								0.08	5.5/6.75								V 3.5/4.5 O 0.13
HRC30-34	1130	0.3								0.1	5.5/6.75								V 3.5/4.5 O 0.2
HRC35-39	1200	0.3								0.1	5.5/6.75								V 3.5/4.5 O 0.2

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HTA Titanium Based Alloys											
Ti-6Al-4Zr-2Mo-2Sn	ATI 6-2-4-2 PM™	UNS R54620									
Ti-6Al-4Zr-2Mo-2Sn-0.2Si	ATI 6-2-4-2-Si PM™	UNS R54620 modified			4919, 4975, 4976		TiAl6Zr4Mo2Sn2				
Ti-6Al-5Zr-0.5Mo-0.25Si							TiA6Zr5Mo0.5Si0.25	T.AGZ.50			
Ti-6Al-5Zr-4Mo-Cu-0.2Si			M201				TiAl6Zr5Mo4CuSi0.2				
Ti-6Al-6V-2Sn	ATI 6-6-2™	UNS R56620			4971		TiAl16V6Sn2				
Ti-6Al-7Nb							TiAl7Nb				
Ti-7Al-4Mo					ASTM B381		TiAl7Mo4				
Ti-8Al-1Mo-1V	ATI 8-1-1™	UNS R54810			4915, 4933, 4972		TiAl8Mo1V1				
Ti-8Mo-8V-2Fe-3Al											
Ti-99.5	ATI CP Grade 4	UNS R50700			ASTM Grade 1 B381F4		Ti-99.5	AIR:9182T60			
Ti-99.6	ATI CP Grade 3	UNS R50550	TA2, TA3, TA4, TA5		ASTM Grade 2 B381F3		Ti-99.6	AIR:9182T50			
Ti-99.7	ATI CP Grade 2	UNS R50400	TA2.5		ASTM Grade 3 B381F2		Ti-99.7	AIR:9182T40			
Ti-99.8	ATI CP Grade 1	UNS R50250	TA6, TA7, TA8, TA9		ASTM Grade 4 B381F1		Ti-99.8	AIR:9182T35			
Hard Steel >1400Mpa											
500	ATI 500-MIL®										
521	ATI 521™										
600	ATI 600-MIL®										
60SPb20											
70SPb20											
A100											
A2 / Z100CDV5 (HT)	A2		BA2	2260	A2	1.2363	X100CrMoV5 1	Z100CDV5	X100CrMoV51KU	X100CrMoV5 F5227	SKD12
Durimphy							X2NiCoMoTi180905	Z2NKD180905			
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Mh97+Pb											
Z38CDV5											
Chilled Cast Iron 1400Mpa											
GGG120B / EN-GJS-1200-2											
GGG140B / EN-GJS-1400-1											
GGG80B / EN-GJS-800-8											
GGG90B / EN-GJS-1000-5											

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

Materials Cross Reference Chart

High Temp. Alloys / Hard Materials

Hardness HRB HRC HB	Rm N/mm²	Fe	Ni	Cr	Co	Mo	W	Si	Mn	C	Al	Ti	Li	P	S	Mg	Zn	Cu	Others
HTA Titanium Based Alloys																			
HRC28	900																		
HRC28	900	0.05				2		0.12		0.1	6								Zr 4.0
HRC35	1100	0.5								0.05	5.5							0.5	V 5.5 Sn 2 O 0.2
	1000										6	84.5/88.0							Nb 7.0
HRC35	1100	0.13				1					8								V 1 O 0.12
HRB100	780	0.5								0.1									O 0.4
HRB90	600	0.3								0.1									O 0.35
HRB80	510	0.3								0.1									O 0.25
HRB70	430	0.2								0.1									O 0.18
Hard Steel >1400Mpa																			
447-534HB	1490-1730	91.6	4	2		0.37		0.45	1.2	0.32				0.02	0.005				
470-550HB	1590-1800	91.4	4	2		0.5		0.5	1.2	0.32				0.025	0.005				
574-634HB	> 2060	91.8	4.25	1.5		0.37		0.5	1	0.52				0.02	0.005				
55/61HRc																			
63/65HRc																			
64/67HRc																			
55/64HRc																			
	1040-2000																		
54HRC	1930		5.5	10	14	2	1			0.21				0.02	0.005				V 0.3
	1180-1670																		
	1180-1570																		
	1080-1270																		
	1270-1670																		
	1180-1770																		
450HBW	1500																		
500HBW	1730																		
550HBW	1950																		
600HBW	>2000																		
48-54HRC	1590-1930																		
58-64HRC																			
	1200-1700																		
64/66HRC																			
	1400-1500																		
Chilled Cast Iron 1400Mpa																			
341-444HB	1490																		
444-555HB	2010																		
269-321HB	1040																		
302-363HB	1150																		

Material Guide – Key to Recommended Inserts

Material Designation

P Unalloyed Steels | P Alloyed Steels | M Stainless Steels | M PH Stainless | K Cast Irons | N Aluminum & Alloys | S High Temp. Alloys | H Hard Materials

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034500	**1540**		188
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034509	**1768**		187
033717	**1770**		187
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033752	**08IR18W**	SP4066	228
033753	**08IR19W**	SP4066	228
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033755	**08IR20W**	SP4066	228
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032042	**11IR1.0ISO**	SP4066	219
32043	**11IR1.5ISO**	SP4066	219
032062	**11IR1.75ISO**	SP4066	219
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032058	**11IR12UN**	SP4066	223
032061	**11IR14BSPT**	SP4066	229
032052	**11IR14NPT**	SP4066	230
032047	**11IR14W**	SP4066	228
032053	**11IR16UN**	SP4066	223
032054	**11IR18NPT**	SP4066	230
032065	**11IR18PG**	SP4066	234
032049	**11IR18UN**	SP4066	223
032050	**11IR19BSPT**	SP4066	229
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032011	**16ER12ACME**	SP4066	231
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031972	**16ER14NPT**	SP4066	230
033788	**16ER14UN**	SP4066	222
032351	**16ER14UNJ**	SP4066	225
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033898	22IR7UN	SP4066	224
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032038	27ER4API383	SP4066	238
032040	27ER4API502	SP4066	238
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018364	A32S SDUCR 11		73
033580	A32S STFCL 16		133
033582	A32S STFCR 16		133
033655	A32S SVUCL 16		155
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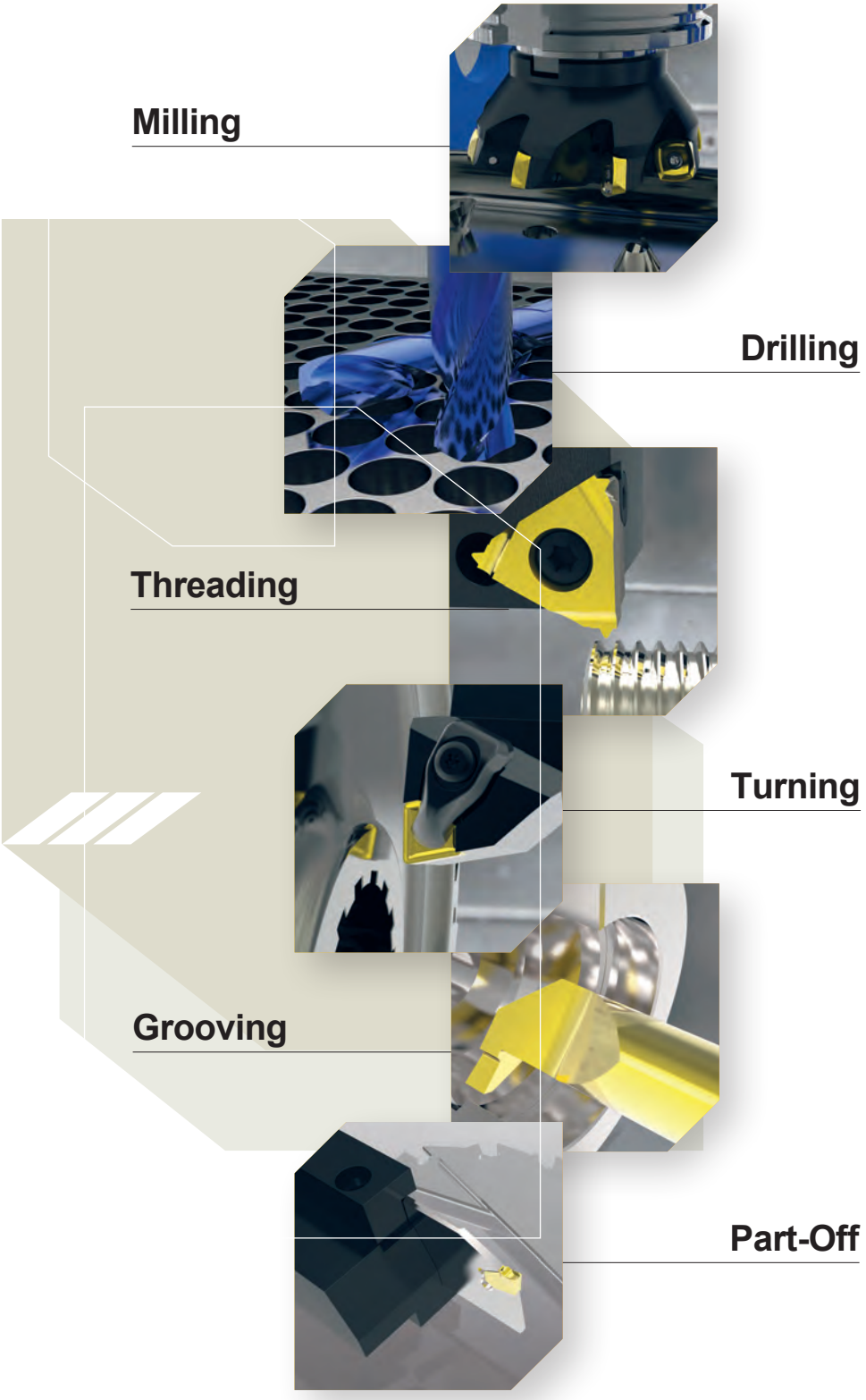
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CATÀLOGO DE HERRAMIENTAS



Stellram® gama de herremientas para todos sus requerimientos.

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El éxito de nuestros clientes es nuestro éxito

Ideas como reducir el tiempo de producción de horas. Una totalmente nueva tecnología como la de combinar dos calidades de metal duro en una herramienta. Una colección entera de herramientas modulares para fabricantes de moldes.

Las innovaciones de Stellram ofrecen un inmediato resultado en la industria metalúrgica a través de más rápidos rendimientos, más durabilidad, y una mayor calidad de la herramienta. Pero algunas de las innovaciones de Stellram van más allá. Pueden cambiar la manera de pensar sobre el mecanizado de muchas compañías.

El sostén de Stellram es cu innovación, la alta calidad de sus herramientas con algo tan importante como las personas con experiencia que le ayudad a su producción a funcionar a una velocidad optima y con eficiencia.

Este catálogo de herramientas compila un amplio esbozo de información en relación con la totalidad de productos que ofrecemos. Una innovación tal como la Estrella Guía le permitirá seleccionar sus plaquitas en 3 fáciles pasos.

Si necesita detalles adicionales sobre nuestros productos, les rogamos no duden en tomar contacto con nuestro equipo técnico el cual contestará con placer a sus preguntas, solucionando problemas de producción y ayudándoles a desarrollar el mejor enfoque para el material que están mecanizando.

Entréguenos su más difícil problema de mecanización. Le mostraremos como Stellram puede ayudarle, y darle ideas para mejorar sus procesos.

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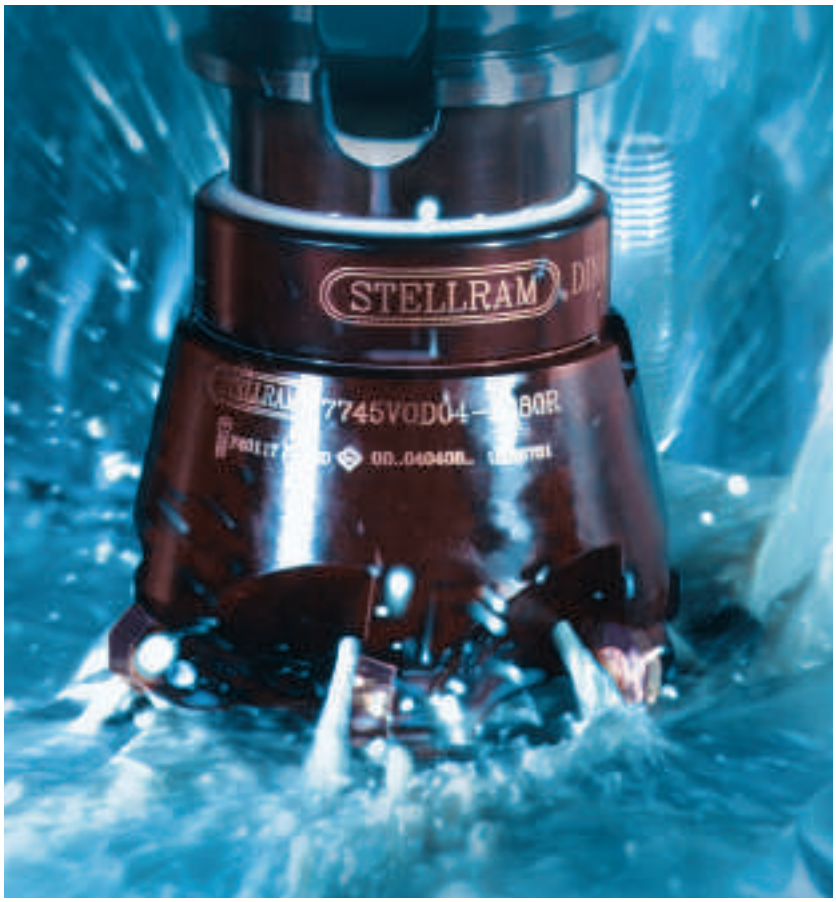
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Fresado





La misión de Stellram es “ ser su elección preferida para incrementar la productividad a través de contínuas mejoras de la calidad de nuestra amplia gama de productos, servicios y tecnología”. Las herramientas de este catalogo dan prueba de ese compromiso.

Nuestras fresas están disponibles de norma hasta ∅ 315mm. Nuestros diseños incluyen desarrollado para la mecanización de las aleaciones refractarias, fresas de perfilar y fresas erizo de perfilar, fresas de taladrado-ranurado, herramientas con 45, 60, y 90 de ángulo de corte, plaquitas octogonales, fresas para vaciado en rampa, fresas ajustables en anchura y fresas de planeado.

Todas nuestra fresas son complementadas por plaquitas con geometrías y calidades únicas.

Haga de Stellram su elección preferida en fresado.

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STELLRAM®

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Índice de aplicaciones Bailarina / Planeado





Planeado



Fresas de escuadrar



Fresas de escuadrar con radio

7690VA



Gama de diámetros
10-125 mm (20-32mm)

PAGINA
A20-A25
(Modular A231)

7690VAF



Gama de diámetros
16-80 mm

PAGINA
A26-A27

7690VM



Gama de diámetros
8-20 mm

PAGINA
A30-A35

7690VT



Gama de diámetros
50-63 mm

PAGINA
A36-A37

7745VOD



Gama de diámetros
25-160 mm

PAGINA
A38-A41

7745VS



Gama de diámetros
16-125 mm

PAGINA
A42-A45

7745VSE



Gama de diámetros
16-125 mm

PAGINA
A46-A49

7790VSE



Gama de diámetros
25-100 mm

PAGINA
A58-A61

7792VXD



Gama de diámetros
25-80 mm (25-32 mm)

PAGINA
A62-A65
(Modular A231)

8000VA



Gama de diámetros
100-315 mm

PAGINA
A72-A73

8010VA



Gama de diámetros
100-200 mm

PAGINA
A72-A73

8000VOD



Gama de diámetros
100-315 mm

PAGINA
A74-A77

8010VOD



Gama de diámetros
100-200 mm

PAGINA
A74-A77

8100VOD



Gama de diámetros
125-250 mm

PAGINA
A74-A77

8000VR



Gama de diámetros
100-315 mm

PAGINA
A78-A79

8010VR



Gama de diámetros
100-200 mm

PAGINA
A78-A79

8100VR



Gama de diámetros
125-250 mm

PAGINA
A78-A79

8000VS



Gama de diámetros
100-315 mm

PAGINA
A80-A81

8100VS



Gama de diámetros
125-250 mm

PAGINA
A80-A81

8000VSE



Gama de diámetros
100-315 mm

PAGINA
A82-A85

STELLRAM®

Bailarina / Planeado (continuación)

8010VSE



Gama de diámetros
100-200 mm

PAGINA
A82-A85

8100VSE



Gama de diámetros
125-250 mm

PAGINA
A82-A85

Contorneado

5210VM



Gama de diámetros
16-25 mm

PAGINA
A148-A151

5210VS



Gama de diámetros
32-100 mm

PAGINA
A152-A155

5315VA



Gama de diámetros
25-80 mm

PAGINA
A156-A159

7690VA



Gama de diámetros
10-125 mm (20-32 mm)

PAGINA
A20-A25
(Modular A231)

7690VAZ



Gama de diámetros
40-80 mm

PAGINA
A28-A29



Contor-
neado

Achaflanado

7745VS



Gama de diámetros
16-125 mm

PAGINA
A42-A45

7745VSE



Gama de diámetros
16-125 mm

PAGINA
A46-A49

7745VT



Gama de diámetros
16-30 mm

PAGINA
A50-A55

7760VT



Gama de diámetros
16-25 mm

PAGINA
A56-A57



Achaflanado

Ranurado

5182VZ



Gama de diámetros
32-63 mm

PAGINA
A208-A213

5500V



Gama de diámetros
8-25 mm (8-25 mm)

PAGINA
A162-A173
(Modular A230)

5505VX



Gama de diámetros
20-50 mm

PAGINA
A174-A183

5702VZ



Gama de diámetros
20-40 mm

PAGINA
A214-A217

7200VA



Gama de diámetros
160-250 mm
Amplia gama
20-26 mm

PAGINA
A94-A99



Fresado
de ranuras

STELLRAM®

Ranurado (continuación)





Fresado de ranuras

7200VM



Gama de diámetros
80-250 mm
Amplia gama
6-20 mm

PAGINA A100-A123

7220VM



Gama de diámetros
63-125 mm
Amplia gama
6-12 mm

PAGINA A124-A141

7690VA



Gama de diámetros
10-125 mm (20-32 mm)

PAGINA A20-A25 (Modular A231)

7690VM



Gama de diámetros
8-20 mm

PAGINA A30-A35

7700VR



Gama de diámetros
16-125 mm

PAGINA A184-A191

7702VRD



Gama de diámetros
12-40 mm (15-35 mm)

PAGINA A192-A199 (Modular A230)

7710VR



Gama de diámetros
40-66 mm

PAGINA A200-A201

7712VRD



Gama de diámetros
52-125 mm (24-42 mm)

PAGINA A202-A205 (Modular A230)

7792VXD



Gama de diámetros
25-80 mm (25-32 mm)

PAGINA A62-A65 (Modular A231)

Contorneado




Contor-neado

5182VZ



Gama de diámetros
32-63 mm

PAGINA A208-A213

5500V



Gama de diámetros
8-25 mm (8-25 mm)

PAGINA A162-A173 (Modular A230)

5505VX



Gama de diámetros
20-50 mm

PAGINA A174-A183

5702VZ



Gama de diámetros
20-40 mm

PAGINA A214-A217

7700VR



Gama de diámetros
16-125 mm

PAGINA A184-A191

7702VRD



Gama de diámetros
12-40 mm (15-35 mm)

PAGINA A192-A199 (Modular A230)

7710VR



Gama de diámetros
40-66 mm

PAGINA A200-A201

7712VRD



Gama de diámetros
52-125 mm (24-42 mm)

PAGINA A202-A205 (Modular A230)

Perfilado y Vaciado

5182VZ



Gama de diámetros 32-63 mm

PAGINA A208-A213

5140VM



Gama de diámetros 14-25 mm

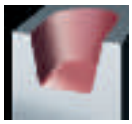
PAGINA A14-A19

5702VZ



Gama de diámetros 20-40 mm

PAGINA A214-A217



Perfilado & Vaciado

Picado

7791VS



Gama de diámetros 40-125 mm (25-32 mm)

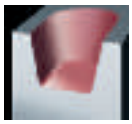
PAGINA A222-A225 (Modular A231)

7792VXD

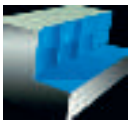


Gama de diámetros 25-80 mm (25-32 mm)

PAGINA A62-A65 (Modular A231)



Perfilado & Vaciado



Perfilado

Fresado de ranuras T

5400VM



Gama de diámetros 18-40 mm

PAGINA A234-A241



Fresado de ranuras T

Taladrado y cajeado

5140VM



Gama de diámetros 14-25 mm

PAGINA A14-A19



Cajeado

Roscado por interpolación con Metal duro Integral/Intercambiable

TMSCN



Metal duro Integral Cilíndrico

PAGINA A250

TMSCEN



Metal duro Integral Cilíndrico y Cónico

PAGINA A251

TMM



Intercambiable

PAGINA A254-A255

5900 V



Con una, dos o cuatro placas

PAGINA A256-A263



Roscado por interpo-lación

ESTRELLA GUIA™ para Plaquitas de Fresado

La Estrella Guía Stellram le ayudara a seleccionar la plaquita adecuada en 3 fáciles pasos. Simplemente siga la punta de la estrella que indique al material que estamos interesados.

1ra Elección

La punta de la Estrella le indicara la plaquita recomendada para cada material. La Estrella Guía de Stellram le ayudara a encontrar la plaquita apropiada para el mecanizado deseado.

1. **Selección del Material**
2. **Siga el código-color de la punta de la estrella hasta la sección plaquitas para su aplicación (desbaste, semi-acabado o acabado).**
3. **Siga el código-color de la punta de la estrella hasta las condiciones de corte para su aplicación.**

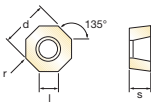
Aplicación

▼ ***Desbaste***

▼▼ ***Semi-acabado***

▼▼▼ ***Acabado***

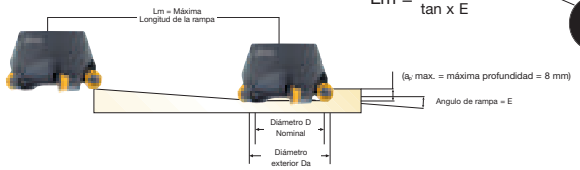
Plaquitas para 7745 VOD 04



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	hm min	
022199	ODET 04 04APEN-44	MP91M			♦	12,7	4,0	4,76	Faceta	0,04	ODET 04_ -44
022198	ODET 04 04APEN-44	X500			♦♦	12,7	4,0	4,76	Faceta	0,04	
027722	ODET 04 04APEN-44	SP6564			♦♦	12,7	4,0	4,76	Faceta	0,04	
024911	ODET 04 04APFN-441	GH1	♦	♦	♦	12,7	4,0	4,76	Faceta	0,02	ODET 04_ -441
027884	ODEW 04 04APTR-4A	SC3025	♦	♦	♦	12,7	4,0	4,76	Faceta	0,19	ODEW 04_ -4A
017775	ODMT 04 04APEN-41	MP91M		♦		12,7	4,0	4,76	Faceta	0,04	ODMT 04_ -41
022061	ODMT 04 04APEN-41	X500		♦♦		12,7	4,0	4,76	Faceta	0,04	
027724	ODMT 04 04APEN-41	SP6564		♦♦		12,7	4,0	4,76	Faceta	0,04	
017303	ODMT 04 0408EN-41	MP91M				12,7	4,0	4,76	0,8	0,04	ODMT 04_ -41
015143	ODMT 04 0408EN-41	X500	♦♦			12,7	4,0	4,76	0,8	0,04	
027723	ODMT 04 0408EN-41	SP6564	♦			12,7	4,0	4,76	0,8	0,04	
017304	ODMW 04 0408SN	MP91M	♦			12,7	4,0	4,76	0,8	0,27	ODMW 04_ -SN
015130	ODMW 04 0408SN	PFZ				12,7	4,0	4,76	0,8	0,27	
029096	ODMW 04 0408SN	SC3025				12,7	4,0	4,76	0,8	0,27	
017671	ODMW 04 0408SN	SF30				12,7	4,0	4,76	0,8	0,27	
024115	ODMW 04 0408SN	X44				12,7	4,0	4,76	0,8	0,27	
017672	ODMW 04 0408SN	X500				12,7	4,0	4,76	0,8	0,27	
027197	ODMW 04 0408SN	SP6564	♦			12,7	4,0	4,76	0,8	0,27	

Fresado en rampa

$$Lm = \frac{a_p}{\tan x\ E}$$



Condiciones de corte recomendadas para OD_04

Material	▼ Desbaste Velocidad Vc (m/min)	Avance hm (mm)	P.D.C. ap (mm)	▼▼ Semi-acabado Velocidad Vc (m/min)	Avance hm (mm)	P.D.C. ap (mm)	▼▼▼ Acabado Velocidad Vc (m/min)	Avance hm (mm)	P.D.C. ap (mm)
Aceros no aleados	180 - 220	0,30 - 0,50	2,0 - 3,5	220 - 260	0,20 - 0,35	1,0 - 2,0	220 - 300	0,08 - 0,15	0,2 - 1,0
Aceros aleados	70 - 110	0,27 - 0,40	2,0 - 3,5	100 - 150	0,20 - 0,30	1,0 - 2,0	100 - 195	0,08 - 0,15	0,2 - 1,0
Aceros inoxidables	120 - 140	0,20 - 0,35	2,0 - 3,5	140 - 180	0,15 - 0,25	1,0 - 2,0	180 - 230	0,05 - 0,15	0,2 - 1,0
Inoxidables PH	55 - 70	0,15 - 0,25	2,0 - 3,5	70 - 85	0,10 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
Fundición	155 - 290	0,30 - 0,35	2,0 - 3,5	195 - 310	0,15 - 0,25	1,0 - 2,0	215 - 360	0,05 - 0,15	0,2 - 1,0
Aluminio y Aleaciones	275 - 450	0,20 - 0,30	2,0 - 3,5	400 - 750	0,10 - 0,25	1,0 - 2,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
Aleaciones refractarias	25 - 40	0,15 - 0,25	2,0 - 3,5	35 - 50	0,10 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

hm = average chip thickness

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

39A

Ahora tienen la fresa adecuada, la plaquita conveniente y las condiciones de corte para su especifica aplicación.



Cada una de las 8 puntas de la estrella representa a uno de los grupos principales de materiales mecanizables. A cada segmento se le ha dado un color para identificar cada grupo de materiales.

Aceros no aleados

Aceros aleados

P

Aceros inoxidables

Inoxidables PH

M

Fundición

K

Aluminio y Aleaciones

N

Aleaciones refractarias

S

Materiales duros (52-56 HRC)

H

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®



Todas las fresas de Stellram se fabrican con acero para herramientas P-20. La refrigeración interna permite una mejor evacuación de la viruta y mayores avances.

Esta versátil herramienta puede ser utilizada para planeado, escuadrado con radio, achaflanado, ranurado, vaciado, contorneado y taladrado por interpolación.



Ejemplos de Escuadrado/Planeado


Planeado


Planeado


Contorneado


Escuadrado con radio


Escuadrado con radio


Achaflanado


Ranurado


Ranurado


Ranurado


Vaciado


Cajeado



La fresa **5140 VM** ha sido diseñada para mecanizar ranuras ciegas, cortando axial y radialmente. Las plaquitas están situadas en la periferia y en el centro, por lo cual esta herramienta puede ser utilizada para hacer taladros poco profundos.

FRESAS A 45 GRADOS

Stellram ofrece una cantidad de fresas a 45 grados que permiten que la parte mas resistente de la placa sea la primera en contacto con la pieza a mecanizar.

La fresa **7745 VS** ha sido diseñada para el mecanizado de acero para herramientas y fundido. La placa de un espesor excepcional permite difíciles condiciones de corte. La parte superior de la placa no esta insertada en la herramienta, por lo cual permite el ranurado.

La fresa **7745 VSE** ha sido diseñada para el mecanizado de los aceros inoxidables y las aleaciones refractarias. Plaquitas cuadradas con 15 grados de ángulo de incidencia se utilizan para disminuir las adherencias en esos materiales. Estas fresas pueden ser utilizadas para planeado, achaflanado y taladrado-ranurado.

La fresa **7745 VOD** ha sido diseñada para el mecanizado de la mayoría de los materiales. Plaquita octogonal ofrece un bajo coste por arista. La fresas VOD hace las mismas operaciones que la 7745VSE pero no son capaces de hacer taladrado-ranurado.

FRESAS A 90 GRADOS

Stellram ofrece un gran número de fresas a 90 grados para el fresado en escuadra, planeado y ranurado.

Las fresas **7690VA** tienen una gran variedad de profundidades de pasada posibles. Se encuentran plaquitas disponibles en tamaños de 9mm, 12mm y 16mm. Hay una amplia variedad de tipos de geometría para todas las aplicaciones.

La fresa **7690 VM** es la versión pequeña de la 7690VA y utiliza plaquitas tipo MP. La gama de diámetros va desde 8 mm hasta 20 mm.

La fresa **7690 VAF** es la mejor opción para la mecanización de aleaciones refractarias, tales como las aleaciones de base níquel o titanio. El diseño único de las plaquitas permite a la fresa de realizar un escuadrado de 90 grados reales hasta una profundidad de corte de 8.5 mm.

La fresa **7690 VAZ** excelente para el fresado de aristas y contorneado en titanio y aluminio. Esta fresa es también capaz de reproducir un escuadrado de 90 grados reales, hasta una profundidad de corte de 33 mm.

La fresa **7790 VSE** es una fresa a 90 grados para el fresado en escuadra, planeado y ranurado. Esta fresa utiliza el mismo tipo de placa que las fresas 7745VSE.

FRESAS DE GRAN AVANCE

La fresa de gran avance **7792 VXD** es capaz de arrancar una gran cantidad de viruta en operaciones de planeado, picado y ranurado. El diseño patentado de la plaquita ofrece un mejor rendimiento que el de las fresas a plaquita redonda.

FRESAS TIPO VT

La fresa **7745 VT11** ha sido diseñada para achaflanar a 45 grados.

Hay dos tipos de fresa **7745 VT16**. Una con dos plaquitas para achaflanar a 45 grados y la otra con una plaquita para las operaciones de punteado.

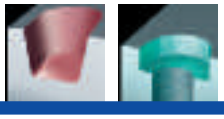
La fresa **7760 VT11** se utiliza para hacer chaflanes a 60 grados.


7792 VXD


7690 VA
90 Grados


7760 VT
60 Grados

5140 VM 04 Fresa para Taladrado-ranurado/Vaciado







Amarre Weldon

5140 VM 04 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max.	No. de Plaquitas	Recambios EDP#		EDP#	
021638	**5140VM 04 WA014R**	14	75	27	16	4	2	*015059*	F2004T	*018487*	T6
021639	**5140VM 04 WA016R**	16	75	27	16	4	2	*015059*	F2004T	*018487*	T6



5140 VM Consejos técnicos

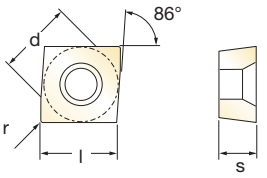
Ejemplo de pedido de la fresa: **5140VM04WA014R**
Ejemplo de pedido de la plaquita: **MPFW0402PPTR SFZ**
Para condiciones completas ver pagina: **A288**

Reducir el avance de 50% en operaciones de taladrado.



Profundidad de corte (a_p)

Plaquitas para 5140 VM 04



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
017645	**MPFW 04 02PPTR**	**SF30**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**		♦		4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**				4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**		♦♦		4,76	4,76	2,38	Faceta	0,07
017666	**MPHW 04 02PPTR**	**X500**		♦		4,76	4,76	2,38	Faceta	0,07

MPFW 04_

MPHW 04_

Condiciones de corte recomendadas para MP_04

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	220 - 260	0,07 - 0,10	0,5 - 4,0	-	-	-
♦ Aceros aleados	-	-	-	100 - 150	0,07 - 0,08	0,5 - 4,0	-	-	-
♦ Aceros inoxidables	-	-	-	140 - 180	0,07 - 0,10	0,5 - 4,0	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	180 - 300	0,07 - 0,08	0,5 - 4,0	-	-	-
♦ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

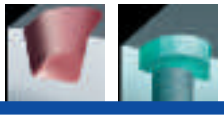
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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5140 VM 06 Fresa para Taladrado-ranurado/Vaciado







Amarre Weldon

5140 VM 06 Amarre Weldon

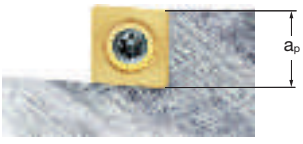
EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max.	No. de Plaquitas	Recambios EDP#		EDP#	
021640	**5140VM 06 WA018R**	18	82	32	20	5,5	2	015060	F2505T	018488	T7
021641	**5140VM 06 WA020R**	20	82	32	20	5,5	2	015060	F2505T	018488	T7



5140 VM Consejos técnicos

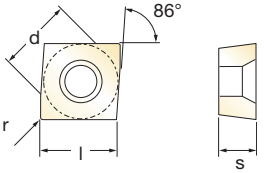
Ejemplo de pedido de la fresa: **5140VM06WA018R**
Ejemplo de pedido de la plaquita: **MPFW0602PPTR SFZ**
Para condiciones completas ver pagina: **A288**

Reducir el avance de 50% en operaciones de taladrado.



Profundidad de corte (a_p)

Plaquitas para 5140 VM 06



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**		◆		6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**		◆		6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**				6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**		◆◆		6,35	6,35	2,38	Faceta	0,07
023247	**MPHT 06 02PPER**	**X44**				6,35	6,35	2,38	Faceta	0,04
017301	**MPHW 06 02PPTR**	**MP91M**				6,35	6,35	2,38	Faceta	0,07
023253	**MPHW 06 02PPTR**	**PFZ**		◆		6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**				6,35	6,35	2,38	Faceta	0,07
015180	**MPMT 06 0204EN-43**	**X500**				6,35	6,35	2,38	0,4	0,04

MPEX 06_ -701



MPFW 06_



MPHT 06_



MPHW 06_



MPMT 06_ -43



Condiciones de corte recomendadas para MP_06

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	220 - 260	0,07 - 0,12	0,5 - 5,5	-	-	-
◆ Aceros aleados	-	-	-	100 - 150	0,07 - 0,10	0,5 - 5,5	-	-	-
◆ Aceros inoxidables	-	-	-	140 - 180	0,07 - 0,12	0,5 - 5,5	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-	-
◆ Fundición	-	-	-	180 - 300	0,07 - 0,10	0,5 - 5,5	-	-	-
◆ Aluminio y Aleaciones	-	-	-	400 - 750	0,04 - 0,12	0,5 - 5,5	-	-	-
◆ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

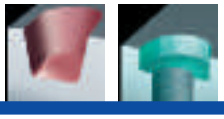
Estrella guía Llave para encontrar la herramienta idónea

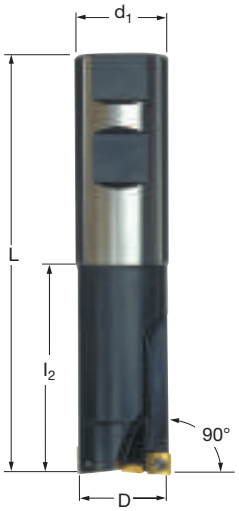


Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

5140 VM 08 Fresa para Taladrado-ranurado/Vaciado







Amarre Weldon

5140 VM 08 Amarre Weldon

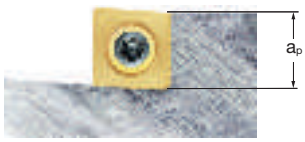
EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max. Lineal	a_p max. Picado	No. de Plaquitas		Recambios EDP#		EDP#	
021642	**5140VM 08 WA025R60**	25	116	60	25	7,5	60	*a.*	1	015062	F3006T	013214	T9
								b.	2	015060	F2505T	018488	T7



5140 VM Consejos técnicos

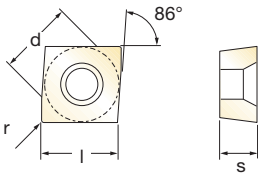
Ejemplo de pedido de la fresa: **5140VM08WA025R60**
Ejemplo de pedido de la plaquita: **MPFW0803PPTR SFZ**
Para condiciones completas ver pagina: **A288**

Reducir el avance de 50% en operaciones de taladrado.



Profundidad de corte (a_p)

Plaquitas para 5140 VM 08



EDP #	Referencia	Calidad		Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	*b.*		♦		6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**	*b.*				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**	*b.*				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**	*b.*				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	*b.*		♦		6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**X44**	*b.*				6,35	6,35	2,38	Faceta	0,07
023247	**MPHT 06 02PPER**	**X44**	*b.*				6,35	6,35	2,38	Faceta	0,04
017301	**MPHW 06 02PPTR**	**MP91M**	*b.*				6,35	6,35	2,38	Faceta	0,07
023253	**MPHW 06 02PPTR**	**PFZ**	*b.*				6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	*b.*		♦		6,35	6,35	2,38	Faceta	0,07
017640	**MPEX 08 03PPER-701**	**PFZ**	*a.*				7,94	6,35	3,18	Faceta	0,02
017642	**MPEX 08 03PPER-701**	**GH1**	*a.*		♦		7,94	6,35	3,18	Faceta	0,02
017489	**MPEX 08 03PPER-701**	**SFZ**	*a.*				7,94	6,35	3,18	Faceta	0,02
017655	**MPFW 08 03PPTR**	**GH1**	*a.*				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**	*a.*				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	*a.*		♦♦♦		7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**	*a.*				7,94	7,94	3,18	Faceta	0,1
017302	**MPHT 08 03PPER**	**SF30**	*a.*				7,94	7,94	3,18	Faceta	0,04
017664	**MPHT 08 03PPER**	**SFZ**	*a.*				7,94	7,94	3,18	Faceta	0,04
017665	**MPHT 08 03PPER**	**GH1**	*a.*				7,94	7,94	3,18	Faceta	0,04
015180	**MPMT 06 0204EN-43**	**X500**	*b.*				6,35	6,35	2,38	0,4	0,04

MPEX 06_ -701



MPFW 06_



MPHT 06_



MPHW 06_



MPEX 08_ -701



MPFW 08_



MPHT 08_



MPMT 06_ -43



Condiciones de corte recomendadas para MP_

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	220 - 260	0,20 - 0,35	1,0 - 7,5	-	-	-
♦ Aceros aleados	-	-	-	100 - 150	0,20 - 0,30	1,0 - 7,5	-	-	-
♦ Aceros inoxidables	-	-	-	140 - 180	0,15 - 0,25	1,0 - 7,5	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	180 - 300	0,15 - 0,25	1,0 - 7,5	-	-	-
♦ Aluminio y Aleaciones	-	-	-	400 - 750	0,10 - 0,25	1,0 - 7,5	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

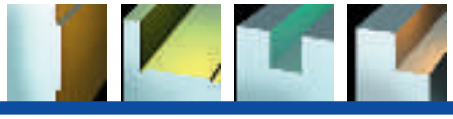
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ♦ Aceros no aleados	M ♦ Aceros inoxidables	K ♦ Fundición	S ♦ Aleaciones refractarias
P ♦ Aceros aleados	M ♦ Inoxidables PH	N ♦ Aluminio y Aleaciones	H ♦ Materiales duros

STELLRAM®

Fresa 7690 VA 09







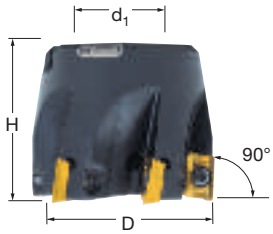
Amarre Weldon

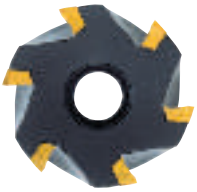
7690 VA 09 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021693	**7690VA 09 WA010R**	10	68	20	16	8,5	1	015267	F2505TP	018488	T7
021694	**7690VA 09 WA012R**	12	70	22	16	8,5	1	015267	F2505TP	018488	T7
021695	**7690VA 09 WA014R**	14	73	25	16	8,5	1	015267	F2505TP	018488	T7
021696	**7690VA 09 WA016R**	16	75	27	16	8,5	2	015267	F2505TP	018488	T7
021697	**7690VA 09 WA018R**	18	80	30	20	8,5	2	015268	F2506TP	018488	T7
021698	**7690VA 09 WA020R**	20	82	32	20	8,5	3	015268	F2506TP	018488	T7
021699	**7690VA 09 WA025R**	25	96	40	25	8,5	4	015268	F2506TP	018488	T7
023055	**7690VA 09 WA032R**	32	96	40	25	8,5	5	015268	F2506TP	018488	T7

7690 VA 09 Montaje en el eje

021690	**7690VA 09 -A032R**	32	28	-	13	8,5	5	015268	F2505TP	018488	T7
017986	**7690VA 09 -A040R**	40	32	-	16	8,5	6	015268	F2505TP	018488	T7
021691	**7690VA 09 -A050R**	50	40	-	22	8,5	7	015268	F2505TP	018488	T7
021697	**7690VA 09 -A063R**	63	40	-	22	8,5	8	015268	F2505TP	018488	T7





Montaje en el eje



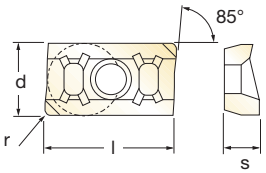
7690 VA 09 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VA09WA010R**
Ejemplo de pedido de la plaquita: **ADET0903PDFR-441 GH1**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7690 VA 09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
024914	**ADET 09 03PDER-44**	**MP91M**				6,35	9,2	3,18	Faceta	0,04
024915	**ADET 09 03PDER-44**	**PFZ**				6,35	9,2	3,18	Faceta	0,04
024916	**ADET 09 03PDFR-441**	**GH1**				6,35	9,2	3,18	Faceta	0,03
017286	**ADKT 09 03PDER-43**	**MP91M**				6,35	9,2	2,38	Faceta	0,07
024917	**ADKT 09 03PDER-43**	**PFZ**				6,35	9,2	2,38	Faceta	0,07
015150	**ADKT 09 03PDER-43**	**X500**				6,35	9,2	2,38	Faceta	0,07
027888	**ADKT 09 03PDER-43**	**SC3025**				6,35	9,2	2,38	Faceta	0,07
027715	**ADKT 09 03PDER-43**	**SP6564**				6,35	9,2	2,38	Faceta	0,07
024138	**ADKT 09 0310ER-43**	**X500**				6,35	9,2	2,38	1,0	0,07
024912	**ADET 09 0310SR-42**	**MP91M**				6,35	9,2	3,18	1,0	0,1
024913	**ADET 09 0310SR-42**	**X500**				6,35	9,2	3,18	1,0	0,1

ADET 09_ -44



ADET 09_ -441



ADKT 09_ -43



ADET 09_ -42



Condiciones de corte recomendadas para AD_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,14 - 0,24	4,5 - 8,0	220 - 260	0,12 - 0,26	2,0 - 4,5	220 - 300	0,08 - 0,15	0,2 - 2,0
Aceros aleados	70 - 110	0,12 - 0,20	4,5 - 8,0	100 - 150	0,10 - 0,18	2,0 - 4,5	100 - 195	0,08 - 0,15	0,2 - 2,0
Aceros inoxidables	-	-	-	140 - 180	0,08 - 0,12	2,0 - 4,5	180 - 230	0,05 - 0,15	0,2 - 2,0
Inoxidables PH	-	-	-	70 - 85	0,06 - 0,10	2,0 - 4,5	80 - 100	0,05 - 0,10	0,2 - 2,0
Fundición	140 - 280	0,10 - 0,16	4,5 - 8,0	180 - 300	0,10 - 0,12	2,0 - 4,5	200 - 350	0,05 - 0,15	0,2 - 2,0
Aluminio y Aleaciones	275 - 450	0,05 - 0,18	4,5 - 8,0	400 - 750	0,05 - 0,15	2,0 - 4,5	700 - 1000	0,05 - 0,15	0,2 - 2,0
Aleaciones refractarias	-	-	-	35 - 50	0,06 - 0,10	2,0 - 4,5	45 - 60	0,05 - 0,10	0,2 - 2,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

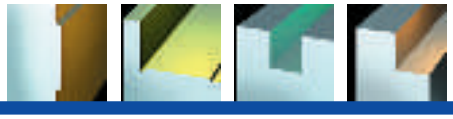
Estrella guía Llave para encontrar la herramienta idónea

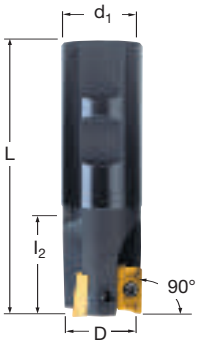


Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa 7690 VA 12





Amarre Weldon

7690 VA 12 Amarre Weldon Paso medio

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_p max.	No. de dientes	Recambios EDP #		EDP #	
027917	**7690VA12WA020Z02R032**	20	82	32	20	11	2	027860	F3007T	022157	T8
027918	**7690VA12WA025Z02R040**	25	96	40	25	11	2	027860	F3007T	022157	T8
027919	**7690VA12WA032Z03R040**	32	100	40	32	11	3	027860	F3007T	022157	T8
027920	**7690VA12WA040Z04R050**	40	110	50	32	11	4	027860	F3007T	022157	T8

7690 VA 12 Amarre Weldon Paso fino

027921	**7690VA12WA025Z03R040**	25	96	40	25	11	3	027860	F3007T	022157	T8
027922	**7690VA12WA032Z04R040**	32	100	40	32	11	4	027860	F3007T	022157	T8
027923	**7690VA12WA040Z05R050**	40	110	50	32	11	5	027860	F3007T	022157	T8



Amarre cilíndrico

7690 VA12 Versión larga Mango cilíndrico

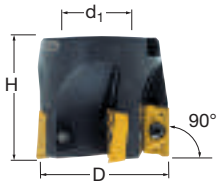
027924	**7690VA12CA020Z02R154**	20	204	154	20	11	2	027860	F3007T	022157	T8
027925	**7690VA12CA025Z03R154**	25	210	154	25	11	3	027860	F3007T	022157	T8
027926	**7690VA12CA032Z04R190**	32	250	190	32	11	4	027860	F3007T	022157	T8
029453	**7690VA12CA020Z02R065**	20	115	65	20	11	2	027860	F3007T	022157	T8
029454	**7690VA12CA025Z03R074**	25	130	74	25	11	3	027860	F3007T	022157	T8

7690 VA 12 Fijación por el eje Paso medio

027927	**7690VA12-A040Z04R**	40	32	-	16	11	4	027860	F3007T	022157	T8
027928	**7690VA12-A050Z05R**	50	40	-	22	11	5	027860	F3007T	022157	T8
027929	**7690VA12-A063Z06R**	63	40	-	22	11	6	027860	F3007T	022157	T8
027930	**7690VA12-A080Z07R**	80	50	-	27	11	7	027860	F3007T	022157	T8

7690 VA 12 Fijación por el eje Paso fino

027931	**7690VA12-A040Z05R**	40	32	-	16	11	5	027860	F3007T	022157	T8
027932	**7690VA12-A050Z06R**	50	40	-	22	11	6	027860	F3007T	022157	T8
027933	**7690VA12-A063Z08R**	63	40	-	22	11	8	027860	F3007T	022157	T8
027934	**7690VA12-A080Z10R**	80	50	-	27	11	10	027860	F3007T	022157	T8



Montaje en el eje

7690 VA 12 Cabeza modular

EDP #	Referencia	Dimensiones (mm) D	D_2	L	M	d_1	a_p	No. de dientes	Recambios EDP #		EDP #	
029134	**7690VA12S020R35**	20	-	35	M10	10,5	11	2	027860	F3007T	022157	T8
029135	**7690VA12S025R35**	25	-	35	M12	12,5	11	3	027860	F3007T	022157	T8
029136	**7690VA12S032R43**	32	-	43	M16	17,0	11	4	027860	F3007T	022157	T8

Nota: para radios superiores a 1,2mm el cuerpo debe de ser modificado.
Amarres para cabezas modulares ver página A228 - A229.



Cabeza modular

7690VA12 Consejos técnicos

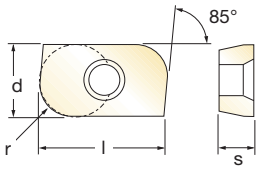
Ejemplo de pedido de la fresa: **7690VA12WA020Z02R032**
Ejemplo de pedido de la plaquita: **ADHT12T3PDER-46 SP6564**
Para condiciones completas ver pagina: **A288**





Profundidad de corte (a_p)

Plaquitas para 7690VA12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
027915	**ADKT12T3PDER-45**	**MP91M**	◆	◆	◆	7,87	12,70	3,97	Faceta	0,05
027916	**ADKT12T3PDER-45**	**SC3025**	◆	◆	◆	7,87	12,70	3,97	Faceta	0,05
027914	**ADKT12T3PDER-45**	**SP6564**		◆	◆	7,87	12,70	3,97	Faceta	0,05
027913	**ADKT12T3PDER-45**	**X500**	◆			7,87	12,70	3,97	Faceta	0,05
029098	**ADGT12T3PDFR-721**	**GH1**	◆	◆	◆	7,96	12,9	3,97	Faceta	0,05
029326	**ADHT12T3PDER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	Faceta	0,05
029327	**ADHT12T3PDER-46**	**X500**	◆◆◆			8,0	12,9	3,97	Faceta	0,05
029328	**ADHT12T308ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	0,8	0,05
029329	**ADHT12T308ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	0,8	0,05
029330	**ADHT12T316ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	1,6	0,05
029331	**ADHT12T316ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	1,6	0,05
029336	**ADHT12T320ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	2,0	0,05
029337	**ADHT12T320ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	2,0	0,05
029332	**ADHT12T324ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	2,4	0,05
029333	**ADHT12T324ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	2,4	0,05
029338	**ADHT12T330ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	3,0	0,05
029339	**ADHT12T330ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	3,0	0,05
029037	**ADHT12T332ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	3,2	0,05
029036	**ADHT12T332ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	3,2	0,05
029334	**ADHT12T340ER-46**	**SP6564**		◆◆◆	◆◆◆	8,0	12,9	3,97	4,0	0,05
029335	**ADHT12T340ER-46**	**X500**	◆◆◆			8,0	12,9	3,97	4,0	0,05

ADKT 12_ -45



ADGT 12_ -721



ADHT 12_ -46



Condiciones de corte recomendadas para AD_12

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	120 - 225	0,08 - 0,15	7,0 - 11,0	205 - 260	0,08 - 0,20	2,5 - 7,0	230 - 305	0,08 - 0,25	0,2 - 2,5
Aceros aleados	250 - 450	0,12 - 0,20	7,0 - 11,0	120 - 145	0,08 - 0,20	2,5 - 7,0	120 - 160	0,08 - 0,25	0,2 - 2,5
Aceros inoxidables	375 - 525	0,08 - 0,15	7,0 - 11,0	125 - 200	0,08 - 0,18	2,5 - 7,0	150 - 270	0,08 - 01,8	0,2 - 2,5
Inoxidables PH	310 - 490	0,08 - 0,15	7,0 - 11,0	115, 180	0,08 - 0,18	2,5 - 7,0	125 - 240	0,08 - 01,8	0,2 - 2,5
Fundición	500 - 920	0,08 - 0,15	7,0 - 11,0	230 - 315	0,08 - 0,18	2,5 - 7,0	275 - 365	0,08 - 0,20	0,2 - 2,5
Aluminio y Aleaciones	655 - 2625	0,05 - 0,15	7,0 - 11,0	300 - 1200	0,05 - 0,18	2,5 - 7,0	400 - 1600	0,05 - 0,20	0,2 - 2,5
Aleaciones refractarias	80 - 130	0,05 - 0,10	7,0 - 11,0	30 - 50	0,05 - 0,13	2,5 - 7,0	30 - 60	0,05 - 0,15	0,2 - 2,5
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

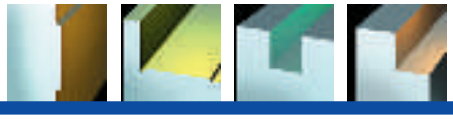


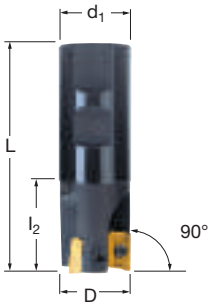
Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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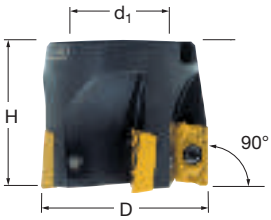
Fresa 7690 VA 16

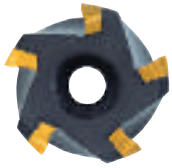






Amarre Weldon





Montaje en el eje





Amarre cono Morse



Profundidad de corte (a_p)

7690 VA 16 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	l_3	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021707	**7690VA 16 WA025R**	25	96	40	-	25	16	2	015260	D4008T	015240	T15
021708	**7690VA 16 WA032R**	32	100	40	-	32	16	3	015262	D4010T	015240	T15
021708	**7690VA 16 WA032R**	40	110	50	-	32	16	4	015262	D4010T	015240	T15

7690 VA 16 Montaje en el eje

017985	**7690VA 16 -A040R**	40	40	-	-	16	16	4	015262	D4010T	015240	T15
021700	**7690VA 16 -A050R**	50	40	-	-	22	16	5	015262	D4010T	015240	T15
021701	**7690VA 16 -A063R**	63	40	-	-	22	16	5	015262	D4010T	015240	T15
021702	**7690VA 16 -A080R**	80	50	-	-	27	16	6	015262	D4010T	015240	T15
021703	**7690VA 16 -A100R**	100	50	-	-	32	16	7	015262	D4010T	015240	T15
021704	**7690VA 16 -A125R**	125	63	-	-	40	16	8	015262	D4010T	015240	T15

7690 VA 16 Amarre cono Morse

018291	**7690VA 16 M025R**	25	124	38	43	CM3	16	2	015260	D4008T	015240	T15
021705	**7690VA 16 M032R**	32	124	38	43,5	CM3	16	3	015262	D4010T	015240	T15
021706	**7690VA 16 M040R**	40	157	48	54,5	CM4	16	4	015262	D4010T	015240	T15

7690 VA 16 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VA16WA025R**
Ejemplo de pedido de la plaquita: **APHT1604PDTR-42 PFZ**
Para condiciones completas ver pagina: **A288**

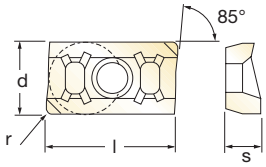
Cuando se utilicen plaquitas con radios superiores a 2 mm, la fresa debe de ser modificada.



Condiciones de corte recomendadas para AP_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,14 - 0,24	8,0 - 16,0	220 - 260	0,12 - 0,35	3,0 - 8,0	220 - 300	0,15 - 0,45	0,2 - 3,0
Aceros aleados	70 - 110	0,12 - 0,20	8,0 - 16,0	100 - 150	0,12 - 0,30	3,0 - 8,0	100 - 195	0,15 - 0,40	0,2 - 3,0
Aceros inoxidables	-	-	-	140 - 180	0,12 - 0,25	3,0 - 8,0	180 - 230	0,15 - 0,28	0,2 - 3,0
Inoxidables PH	-	-	-	70 - 85	0,10 - 0,20	3,0 - 8,0	80 - 100	0,10 - 0,20	0,2 - 3,0
Fundición	140 - 280	0,10 - 0,16	8,0 - 16,0	180 - 300	0,12 - 0,25	3,0 - 8,0	200 - 350	0,18 - 0,30	0,2 - 3,0
Aluminio y Aleaciones	275 - 450	0,06 - 0,25	8,0 - 16,0	400 - 750	0,04 - 0,20	3,0 - 8,0	700 - 1000	0,08 - 0,30	0,2 - 3,0
Aleaciones refractarias	-	-	-	35 - 50	0,10 - 0,20	3,0 - 8,0	45 - 60	0,10 - 0,20	0,2 - 3,0
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,04 - 0,08	1,5 - 3,5	50 - 100	0,06 - 0,10	0,2 - 1,5

Plaquitas para 7690 VA 16



EDP #	Referencia	Calidad	Operaciones & Material: Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
017621	**APEX 16 04PDER-701**	**PFZ**				9,52	16,66	4,76	Faceta	0,02
017623	**APEX 16 04PDFR-701**	**SFZ**				9,52	16,66	4,76	Faceta	0,02
014066	**APEX 16 04PDFR-701**	**GH1**				9,52	16,66	4,76	Faceta	0,02
017291	**APFW 16 04PDER**	**MP91M**				9,52	16,66	4,76	Faceta	0,04
017627	**APFW 16 04PDTR**	**X44**				9,52	16,66	4,76	Faceta	0,1
017628	**APFW 16 04PDTR**	**GH1**				9,52	16,66	4,76	Faceta	0,1
027883	**APFW 16 04PDTR**	**SC3025**				9,52	16,66	4,76	Faceta	0,1
017626	**APFW 16 04PDTR**	**SF30**				9,52	16,66	4,76	Faceta	0,1
017629	**APFW 16 04PDER**	**SFZ**		◆	◆	9,52	16,66	4,76	Faceta	0,05
017632	**APHT 16 04PDER**	**SF30**				9,52	16,66	4,76	Faceta	0,05
017633	**APHT 16 04PDFR**	**SFZ**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,05
015154	**APHT 16 04PDFR**	**GH1**				9,52	16,66	4,76	Faceta	0,02
017293	**APHT 16 04PDTR-42**	**MP91M**				9,52	16,66	4,76	Faceta	0,1
017634	**APHT 16 04PDTR-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
015155	**APHT 16 04PDTR-42**	**X500**				9,52	16,66	4,76	Faceta	0,1
027718	**APHT 16 04PDTR-42**	**SP6564**				9,52	16,66	4,76	Faceta	0,1
011649	**APKT 16 04PDER-3M**	**MP91M**				9,52	16,66	4,76	Faceta	0,1
017294	**APKT 16 04PDER-43**	**MP91M**	◆			9,52	16,66	4,76	Faceta	0,08
014067	**APKT 16 04PDER-43**	**PFZ**				9,52	16,66	4,76	Faceta	0,08
015156	**APKT 16 04PDER-43**	**X500**				9,52	16,66	4,76	Faceta	0,08
027887	**APKT 16 04PDER-43**	**SC3025**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,08
027720	**APKT 16 04PDER-43**	**SP6564**	◆◆			9,52	16,66	4,76	Faceta	0,08
023115	**APKT 16 04PDER-45**	**X500**				9,52	16,66	4,76	Faceta	0,06
023114	**APKT 16 04PDER-45**	**MP91M**				9,52	16,66	4,76	Faceta	0,06
027887	**APKT 16 04PDER-45**	**SP6564**		◆◆	◆◆	9,52	16,66	4,76	Faceta	0,06
023102	**APET 16 0402TR-42**	**PFZ**				9,52	16,66	4,76	0,2	0,1
023103	**APET 16 0408TR-42**	**PFZ**				9,52	16,66	4,76	0,8	0,1
023104	**APET 16 0410TR-42**	**PFZ**				9,52	16,66	4,76	1,0	0,1
023105	**APET 16 0415TR-42**	**PFZ**				9,52	16,66	4,76	1,5	0,1
023106	**APET 16 0420TR-42**	**PFZ**				9,52	16,66	4,76	2,0	0,1
017618	**APET 16 0425TR-42**	**MP91M**				9,52	16,66	4,76	2,5	0,1
017619	**APET 16 0425TR-42**	**X500**				9,52	16,66	4,76	2,5	0,1
023107	**APET 16 0430TR-42**	**PFZ**				9,52	16,66	4,76	3,0	0,1
017290	**APET 16 0440TR-42**	**MP91M**				9,52	16,66	4,76	4,0	0,1
024921	**APET 16 0440TR-42**	**PFZ**				9,52	16,66	4,76	4,0	0,1
017620	**APET 16 0440TR-42**	**X500**				9,52	16,66	4,76	4,0	0,1
025804	**APET 16 0460TR-42**	**PFZ**				9,52	16,66	4,76	6,0	0,1
027863	**APHT 16 0408ER-46**	**SP6564**		◆◆◆	◆◆◆	9,52	16,66	4,76	0,8	0,1
027869	**APHT 16 0408ER-46**	**X500**	◆◆◆			9,53	16,67	4,76	0,8	0,1
027864	**APHT 16 0416ER-46**	**SP6564**		◆◆◆	◆◆◆	9,54	16,68	4,76	1,6	0,1
027870	**APHT 16 0416ER-46**	**X500**	◆◆◆			9,55	16,69	4,76	1,6	0,1
027865	**APHT 16 0424ER-46**	**SP6564**		◆◆◆	◆◆◆	9,56	16,70	4,76	2,4	0,1
027871	**APHT 16 0424ER-46**	**X500**	◆◆◆			9,57	16,71	4,76	2,4	0,1
027862	**APHT 16 0432ER-46**	**SP6564**		◆◆◆	◆◆◆	9,58	16,72	4,76	3,2	0,1
027866	**APHT 16 0432ER-46**	**X500**	◆◆◆			9,59	16,73	4,76	3,2	0,1
027873	**APHT 16 0440ER-46**	**SP6564**		◆◆◆	◆◆◆	9,60	16,74	4,76	4,0	0,1
027873	**APHT 16 0440ER-46**	**X500**	◆◆◆			9,61	16,75	4,76	4,0	0,1
027887	**APHT 16 0450ER-46**	**SP6564**		◆◆◆	◆◆◆	9,62	16,76	4,76	5,0	0,1
027874	**APHT 16 0450ER-46**	**X500**	◆◆◆			9,63	16,77	4,76	5,0	0,1
027868	**APHT 16 0464ER-46**	**SP6564**		◆◆◆	◆◆◆	9,64	16,78	4,76	6,4	0,1
027875	**APHT 16 0464ER-46**	**X500**	◆◆◆			9,65	16,79	4,76	6,4	0,1
017636	**APHW 16 0440TR**	**X44**				9,52	16,66	4,76	4,0	0,1
011488	**APKT 16 0408E-2C**	**MP91M**				9,52	16,66	4,76	0,8	0,10
010796	**APKT 16 0408E-2C**	**PFZ**				9,52	16,66	4,76	0,8	0,10
017228	**APMT 16 0412E-2C**	**MP91M**				9,52	16,66	4,76	1,2	0,1
013944	**APMT 16 0416E-2C**	**MP91M**				9,52	16,66	4,76	1,6	0,1
013945	**APMT 16 0424E-2C**	**MP91M**				9,52	16,66	4,76	2,4	0,1
013946	**APMT 16 0432E-2C**	**MP91M**				9,52	16,66	4,76	3,2	0,1
017229	**APMT 16 0440E-2C**	**MP91M**				9,52	16,66	4,76	4,0	0,1
017230	**APMT 16 0448E-2C**	**MP91M**				9,52	16,66	4,76	4,8	0,1
013947	**APMT 16 0464E-2C**	**MP91M**				9,52	16,66	4,76	6,4	0,1

APEX 16_ -701



APFW 16_



APHT 16_



APHT 16_ -42



APKT 16_ -3M



APKT 16_ -43



APKT 16_ -45



APET 16_ -42



APHT 16_ -46



APHW 16_



APKT 16_ -2C



APMT 16_ -2C

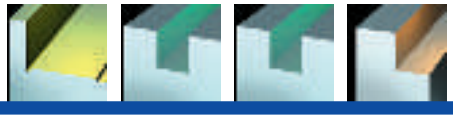


Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresa 7690 VAF 09







Amarre Weldon

7690 VAF 09 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
015236	**7690VAF 09 WA016R**	16	75	27	16	8,5	2	015268	F2506TP	018488	T7
021715	**7690VAF 09 WA020R**	20	82	32	20	8,5	3	015268	F2506TP	018488	T7
021716	**7690VAF 09 WA025R**	25	96	40	25	8,5	4	015268	F2506TP	018488	T7
015237	**7690VAF 09 WA032R**	32	100	40	32	8,5	5	015268	F2506TP	018488	T7

7690 VAF 09 Montaje en el eje

021710	**7690VAF 09 -A032R**	32	28	-	13	8,5	5	015268	F2506TP	018488	T7
021711	**7690VAF 09 -A040R**	40	32	-	16	8,5	6	015268	F2506TP	018488	T7
021712	**7690VAF 09 -A050R**	50	40	-	22	8,5	7	015268	F2506TP	018488	T7
021713	**7690VAF 09 -A063R**	63	40	-	22	8,5	8	015268	F2506TP	018488	T7
021714	**7690VAF 09 -A080R**	80	50	-	27	8,5	10	015268	F2506TP	018488	T7





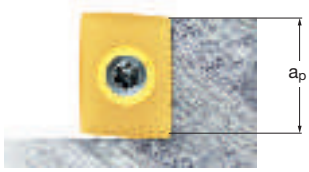
Montaje en el eje

7690 VAF 09 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VAF09WA020R**
Ejemplo de pedido de la plaquita: **AOHW0903PFFR-J SFZ**
Para condiciones completas ver pagina: **A288**

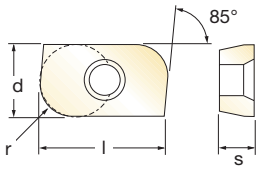
Cuando se utilicen plaquitas con radios superiores a 1,6 mm, la fresa debe de ser modificada.





Profundidad de corte (a_p)

Plaquitas para 7690 VAF 09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
015205	**AOHW 09 03PFFR-J**	**SFZ**				6,9	9,2	3,18	Faceta	0,03
023097	**AOHW 09 03PFTR-J**	**PFZ**		◆◆	◆◆	6,9	9,2	3,18	Faceta	0,10
015206	**AOHW 09 03PFTR-J**	**X500**				6,9	9,2	3,18	Faceta	0,10
017289	**AOHW 09 03PFTR-J**	**MP91M**				6,9	9,2	3,18	Faceta	0,10
027717	**AOHW 09 03PFTR-J**	**SP6564**		◆	◆	6,9	9,2	3,18	Faceta	0,10

AOHW 09_ -J



024918	**AOHW 09 0302ER-J**	**PFZ**				6,9	9,2	3,18	0,2	0,04
023084	**AOHW 09 0302ER-J**	**SFZ**				6,9	9,2	3,18	0,2	0,04
025813	**AOHW 09 0302FR-J**	**SP4036**				6,9	9,2	3,18	0,2	0,04
017287	**AOHW 09 0304ER-J**	**MP91M**				6,9	9,2	3,18	0,4	0,04
023086	**AOHW 09 0304ER-J**	**PFZ**				6,9	9,2	3,18	0,4	0,04
017617	**AOHW 09 0304ER-J**	**SFZ**				6,9	9,2	3,18	0,4	0,04
017288	**AOHW 09 0308ER-J**	**MP91M**				6,9	9,2	3,18	0,8	0,04
023087	**AOHW 09 0308ER-J**	**PFZ**				6,9	9,2	3,18	0,8	0,04
024919	**AOHW 09 0310ER-J**	**PFZ**				6,9	9,2	3,18	1,0	0,04
023088	**AOHW 09 0312ER-J**	**PFZ**				6,9	9,2	3,18	1,2	0,04
024111	**AOHW 09 0315ER-J**	**PFZ**				6,9	9,2	3,18	1,5	0,04
023091	**AOHW 09 0316ER-J**	**PFZ**				6,9	9,2	3,18	1,6	0,04
023093	**AOHW 09 0320ER-J**	**PFZ**				6,9	9,2	3,18	2,0	0,04
023094	**AOHW 09 0324ER-J**	**PFZ**				6,9	9,2	3,18	2,4	0,04
023095	**AOHW 09 0330ER-J**	**PFZ**				6,9	9,2	3,18	3,0	0,04

AOHW 09_ -J



Condiciones de corte recomendadas para AO_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	-	-	-	-	-	-
◆ Aceros aleados	-	-	-	-	-	-	-	-	-
◆ Aceros inoxidables	-	-	-	140 - 180	0,10 - 0,15	2,5 - 6,0	180 - 230	0,12 - 0,18	0,2 - 2,5
◆ Inoxidables PH	-	-	-	70 - 85	0,10 - 0,14	2,5 - 6,0	80 - 100	0,10 - 0,15	0,2 - 2,5
◆ Fundición	-	-	-	-	-	-	-	-	-
◆ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	-	35 - 50	0,10 - 0,14	2,5 - 6,0	45 - 60	0,10 - 0,15	0,2 - 2,5
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa 7690 VAZ 35







Amarre Weldon





Montaje en el eje





Amarre DIN 69871



Profundidad de corte (a_p)

7690 VAZ 35 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	l_3	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
017983	**7690VAZ 35 WA040R070**	40	125	70	-	40	33	4	015262	D4010T	015240	T15

7690 VAZ 35 Montaje por el eje

021717	**7690VAZ 35 -A063R060**	63	60	-	-	27	33	6	015262	D4010T	015240	T15
021718	**7690VAZ 35 -A080R060**	80	60	-	-	32	33	8	015262	D4010T	015240	T15

7690 VAZ 35 Amarre DIN 69871

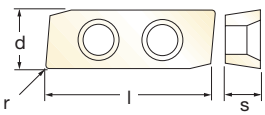
021719	**7690VAZ 35 GA040R070**	40	157,5	70	89,1	G40	33	4	015262	D4010T	015240	T15
021720	**7690VAZ 35 GA050R070**	50	190,8	70	90,4	G50	33	5	015262	D4010T	015240	T15



7690 VAZ 35 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VAZ35WA040R070**
Ejemplo de pedido de la plaquita: **AOCX3504PZER-N701 SFZ**
Para condiciones completas ver pagina: **A288**

Plaquitas para 7690 VAZ 35



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
015024	**AOCW 35 04PZTR-N**	**PFZ**		◆◆◆		11,86	35,8	4,76	Faceta	0,10

AOCW 35_ -N



015152	**AOCX 35 04PZFR-N701**	**SFZ**		◆	◆◆◆◆	11,86	35,8	4,76	Faceta	0,02
015151	**AOCX 35 04PZER-N702**	**SFZ**		◆◆◆	◆◆◆	11,86	35,8	4,76	Faceta	0,04

AOCX 35_ -N701 & -N702



Condiciones de corte recomendadas para AO_35

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	220 - 260	0,10 - 0,20	3,0 - 25,0	220 - 300	0,05 - 0,12	0,15 - 3,0
◆ Aceros aleados	-	-	-	100 - 150	0,10 - 0,18	3,0 - 25,0	100 - 195	0,05 - 0,10	0,15 - 3,0
◆ Aceros inoxidables	-	-	-	140 - 180	0,08 - 0,12	3,0 - 25,0	180 - 230	0,04 - 0,10	0,15 - 3,0
◆ Inoxidables PH	-	-	-	70 - 85	0,05 - 0,10	3,0 - 25,0	80 - 100	0,05 - 0,08	0,15 - 3,0
◆ Fundición	-	-	-	180 - 300	0,10 - 0,15	3,0 - 25,0	200 - 350	0,05 - 0,08	0,15 - 3,0
◆ Aluminio y Aleaciones	-	-	-	400 - 750	0,05 - 0,15	3,0 - 25,0	700 - 1000	0,05 - 0,10	0,15 - 3,0
◆ Aleaciones refractarias	-	-	-	35 - 50	0,05 - 0,10	3,0 - 25,0	45 - 60	0,05 - 0,08	0,15 - 3,0
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa 7690 VM 04





Amarre Weldon

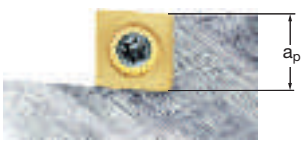
7690 VM 04 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021721	**7690VM 04 WA008R**	8	55	15	10	4	1	015059	F2004T	018487	T6
021722	**7690VM 04 WA010R**	10	60	20	10	4	1	015059	F2004T	018487	T6
021716	**7690VM 04 WA012R**	12	69	22	12	4	2	015059	F2004T	018487	T6



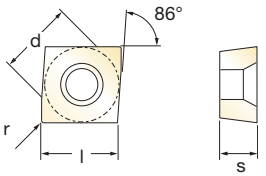
7690 VM 04 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VM04WA010R**
Ejemplo de pedido de la plaquita: **MPFW0402PPTR SFZ**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7690 VM 04



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
017645	**MPFW 04 02PPTR**	**SF30**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**		♦	♦	4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**				4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**		♦♦	♦♦	4,76	4,76	2,38	Faceta	0,07
017666	**MPHW 04 02PPTR**	**X500**		♦	♦	4,76	4,76	2,38	Faceta	0,07

MPFW 04_

MPHW 04_

Condiciones de corte recomendadas para MP_04

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	200 - 240	0,10 - 0,20	1,0 - 4,0	220 - 260	0,05 - 0,10	0,2 - 1,0
♦ Aceros aleados	-	-	-	100 - 150	0,04 - 0,08	1,0 - 4,0	120 - 220	0,04 - 0,08	0,2 - 1,0
♦ Aceros inoxidables	-	-	-	140 - 180	0,04 - 0,10	1,0 - 4,0	180 - 230	0,04 - 0,10	0,2 - 1,0
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	180 - 300	0,04 - 0,08	1,0 - 4,0	200 - 350	0,04 - 0,08	0,2 - 1,0
♦ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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Fresa 7690 VM 06





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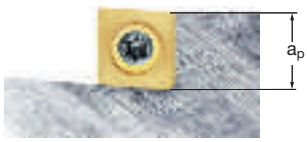
7690 VM 06 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021724	**7690VM 06 WA016R**	16	75	27	16	5,5	2	015060	F2004T	018488	T7



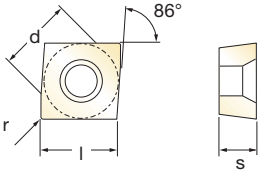
7690 VM 06 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VM06WA016R**
Ejemplo de pedido de la plaquita: **MPFW0602PPTR SFZ**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7690 VM 06



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**		♦	♦	6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**		♦	♦	6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**				6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**		♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
023247	**MPHT 06 02PPER**	**X44**				6,35	6,35	2,38	Faceta	0,04
017301	**MPHW 06 02PPTR**	**MP91M**				6,35	6,35	2,38	Faceta	0,07
023253	**MPHW 06 02PPTR**	**PFZ**				6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**		♦	♦	6,35	6,35	2,38	Faceta	0,07
017302	**MPMT 06 0204EN-43**	**MP91M**				6,35	6,35	2,38	0,4	0,04
015180	**MPMT 06 0204EN-43**	**X500**				6,35	6,35	2,38	0,4	0,04

MPEX 06_ -701



MPFW 06_



MPHT 06_



MPHW 06_



MPMT 06_ -43



Condiciones de corte recomendadas para MP_06

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	200 - 240	0,07 - 0,14	1,0 - 5,5	220 - 260	0,07 - 0,14	0,2 - 1,0
♦ Aceros aleados	-	-	-	100 - 150	0,07 - 0,12	1,0 - 5,5	120 - 220	0,07 - 0,12	0,2 - 1,0
♦ Aceros inoxidables	-	-	-	140 - 180	0,07 - 0,12	1,0 - 5,5	180 - 230	0,07 - 0,12	0,2 - 1,0
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	180 - 300	0,07 - 0,12	1,0 - 5,5	200 - 350	0,07 - 0,12	0,2 - 1,0
♦ Aluminio y Aleaciones	-	-	-	400 - 750	0,04 - 0,12	1,0 - 5,5	700 -1000	0,04 - 0,12	0,2 - 1,0
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

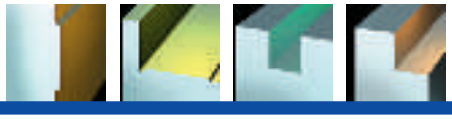
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa 7690 VM 08





Amarre Weldon

7690 VM 08 Amarre Weldona

EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021725	**7690VM 08 WA020R**	20	82	30	20	7,5	2	015062	F3006T	013214	T9



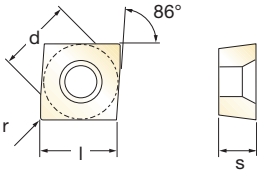
7690 VM 08 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VM08WA020R**
Ejemplo de pedido de la plaquita: **MPFW0803PPTR SFZ**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7690 VM 08



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017640	**MPEX 08 03PPER-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017642	**MPEX 08 03PPFR-701**	**GH1**		♦	♦	7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017655	**MPFW 08 03PPTR**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**				7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**				7,94	7,94	3,18	Faceta	0,1
017663	**MPHT 08 03PPER**	**SF30**				7,94	7,94	3,18	Faceta	0,04
017664	**MPHT 08 03PPER**	**SFZ**				7,94	7,94	3,18	Faceta	0,04
017665	**MPHT 08 03PPFR**	**GH1**				7,94	7,94	3,18	Faceta	0,04
017297	**MPHT 08 03PPTR-42**	**MP91M**		♦	♦	7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**		♦	♦	7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTR-42**	**SP6564**		♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017670	**MPMW 08 0304TN**	**SF30**				7,94	7,94	3,18	0,4	0,1

MPEX 08_ -701



MPFW 08_



MPHT 08_



MPHT 08_ -42



MPMW 08_



Condiciones de corte recomendadas para MP_08

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	200 - 240	0,10 - 0,14	1,0 - 7,5	220 - 260	0,10 - 0,14	0,2 - 1,0
♦ Aceros aleados	-	-	-	100 - 150	0,10 - 0,12	1,0 - 7,5	120 - 220	0,10 - 0,12	0,2 - 1,0
♦ Aceros inoxidables	-	-	-	140 - 180	0,10 - 0,12	1,0 - 7,5	180 - 230	0,10 - 0,12	0,2 - 1,0
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	180 - 300	0,10 - 0,12	1,0 - 7,5	200 - 350	0,10 - 0,12	0,2 - 1,0
♦ Aluminio y Aleaciones	-	-	-	400 - 750	0,04 - 0,12	1,0 - 7,5	700 -1000	0,10 - 0,12	0,2 - 1,0
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

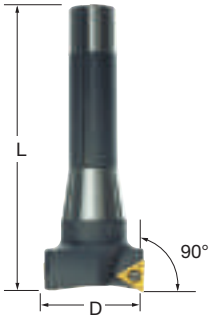


Código ISO de materiales			
P ♦ Aceros no aleados	M ♦ Aceros inoxidables	K ♦ Fundición	S ♦ Aleaciones refractarias
P ♦ Aceros aleados	M ♦ Inoxidables PH	N ♦ Aluminio y Aleaciones	H ♦ Materiales duros

STELLRAM®

Fresa 7690 VT 16







Amarre R8

7690 VT 16 Amarre R8

EDP #	Referencia	Dimensiones (mm) D	L	Amarre	a_p max.	No. de dientes	Recambios EDP#		EDP#	
014398	**7690VT 16 R8050R**	50	35	R8	12	2	*015263*	D4012T	*015240*	T15
023056	**7690VT 16 R8063R**	63	35	R8	12	2	*015263*	D4012T	*015240*	T15

El amarre R8 es valido solo para los cabezales tipo Bridgeport.



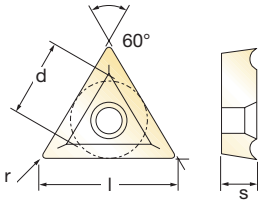
7690 VT 16 Consejos técnicos

Ejemplo de pedido de la fresa: **7690VT16R8050R**
Ejemplo de pedido de la plaquita: **TCMT16T308E MP91M**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7690 VT 16



TCMT_



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024139	**TCMT 16 T308E**	**MP91M**	♦	♦		9,52	16,5	3,97	0,8	0,05
023388	**TCMT 16 T308E**	**PFZ**				9,52	16,5	3,97	0,8	0,05
017743	**TCMT 16 T308E**	**SF30**				9,52	16,5	3,97	0,8	0,05
027901	**TCMT 16 T308E**	**SP6564**	♦♦	♦♦		9,52	16,5	3,97	0,8	0,05
014852	**TCMT 16 T308E**	**X44**				9,52	16,5	3,97	0,8	0,07
024140	**TCMT 16 T308E**	**X500**				9,52	16,5	3,97	0,8	0,05

Condiciones de corte recomendadas para TC_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	115 - 220	0,1 - 0,25	3,0 - 12,0	200 - 240	0,1 - 0,25	1,0 - 3,0	-	-	-
♦ Aceros aleados	50 - 120	0,1 - 0,20	3,0 - 12,0	100 - 150	0,1 - 0,20	1,0 - 3,0	-	-	-
♦ Aceros inoxidables	-	-	-	-	-	-	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	140 - 280	0,1 - 0,20	3,0 - 12,0	180 - 300	0,01 - 0,12	1,0 - 3,0	-	-	-
♦ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa 7745 VOD 04







Amarre Weldon

7745 VOD 04 Amarre Weldon

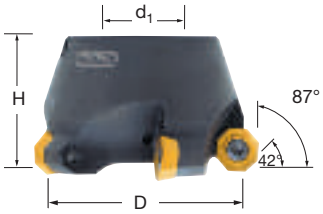
EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_{p1} max.	a_p	No. de dientes	Recambios EDP#		EDP#	
021758	**7745VOD 04 WA025R**	25	90	40	20	8	3,5	2	015270	F4011T	015241	T20
025379	**7745VOD 04 WA025R095**	25	145	95	20	8	3,5	2	015270	F4011T	015241	T20
021759	**7745VOD 04 WA032R**	32	96	40	25	8	3,5	3	015270	F4011T	015241	T20
025380	**7745VOD 04 WA032R095**	32	151	95	25	8	3,5	3	015270	F4011T	015241	T20
023064	**7745VOD04WA25/040R**	40	106	50	25	8	3,5	4	015270	F4011T	015241	T20
021760	**7745VOD 04 WA040R**	40	110	50	32	8	3,5	4	015270	F4011T	015241	T20
025381	**7745VOD 04 WA040R095**	40	155	95	32	8	3,5	4	015270	F4011T	015241	T20

7745 VOD 04 Fijación por el eje Paso medio

021754	**7745VOD 04 -A040R**	40	35	-	16	8	3,5	4	015270	F4011T	015241	T20
021755	**7745VOD 04 -A050R**	50	40	-	22	8	3,5	4	015270	F4011T	015241	T20
021756	**7745VOD 04 -A063R**	63	40	-	22	8	3,5	5	015270	F4011T	015241	T20
017907	**7745VOD 04 -A080R**	80	50	-	27	8	3,5	6	015270	F4011T	015241	T20
021757	**7745VOD 04 -A100R**	100	55	-	32	8	3,5	7	015270	F4011T	015241	T20
023062	**7745VOD 04 -A125R**	125	63	-	40	8	3,5	8	015270	F4011T	015241	T20
025382	**7745VOD 04 -160Z10R**	160	63	-	40	8	3,5	10	015270	F4011T	015241	T20

7745 VOD 04 Fijación por el eje Paso fino

023058	**7745VOD 04 -A050Z06R**	50	40	-	22	8	3,5	6	015270	F4011T	015241	T20
023059	**7745VOD 04 -A063Z07R**	63	40	-	22	8	3,5	7	015270	F4011T	015241	T20
023060	**7745VOD 04 -A080Z09R**	80	50	-	27	8	3,5	9	015270	F4011T	015241	T20
023061	**7745VOD 04 -A100Z11R**	100	55	-	32	8	3,5	11	015270	F4011T	015241	T20
023063	**7745VOD 04 -A125Z12R**	125	63	-	40	8	3,5	12	015270	F4011T	015241	T20
025383	**7745VOD 04 -160Z15R**	160	63	-	40	8	3,5	15	015270	F4011T	015241	T20





Montaje en el eje

7745 VOD 04 Consejos técnicos



Ejemplo de pedido de la fresa: **7745VOD 04 WA025R095**
Ejemplo de pedido de la plaquita: **ODET0404APEN-44 MP91M**
Para condiciones completas ver pagina: **A288**

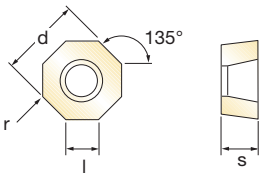
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



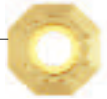
Profundidad de corte (a_p)

Plaquitas para 7745 VOD 04



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
022199	**ODET 04 04APEN-44**	**MP91M**			◆	12,7	4,0	4,76	Faceta	0,04
022198	**ODET 04 04APEN-44**	**X500**			◆◆	12,7	4,0	4,76	Faceta	0,04
027722	**ODET 04 04APEN-44**	**SP6564**			◆◆	12,7	4,0	4,76	Faceta	0,04
024911	**ODET 04 04APFN-441**	**GH1**	◆	◆	◆	12,7	4,0	4,76	Faceta	0,02
027884	**ODEW 04 04APTR-RA**	**SC3025**	◆	◆	◆	12,7	4,0	4,76	Faceta	0,19
017775	**ODMT 04 04APEN-41**	**MP91M**		◆		12,7	4,0	4,76	Faceta	0,04
022061	**ODMT 04 04APEN-41**	**X500**		◆◆		12,7	4,0	4,76	Faceta	0,04
027724	**ODMT 04 04APEN-41**	**SP6564**		◆◆		12,7	4,0	4,76	Faceta	0,04
017303	**ODMT 04 0408EN-41**	**MP91M**				12,7	4,0	4,76	0,8	0,04
015143	**ODMT 04 0408EN-41**	**X500**	◆◆			12,7	4,0	4,76	0,8	0,04
027723	**ODMT 04 0408EN-41**	**SP6564**	◆			12,7	4,0	4,76	0,8	0,04
017304	**ODMW 04 0408SN**	**MP91M**	◆			12,7	4,0	4,76	0,8	0,27
015130	**ODMW 04 0408SN**	**PFZ**				12,7	4,0	4,76	0,8	0,27
029096	**ODMW 04 0408SN**	**SC3025**				12,7	4,0	4,76	0,8	0,27
017671	**ODMW 04 0408SN**	**SF30**				12,7	4,0	4,76	0,8	0,27
024115	**ODMW 04 0408SN**	**X44**				12,7	4,0	4,76	0,8	0,27
017672	**ODMW 04 0408SN**	**X500**				12,7	4,0	4,76	0,8	0,27
027197	**ODMW 04 0408SN**	**SP6564**	◆			12,7	4,0	4,76	0,8	0,27

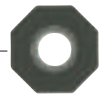
ODET 04_ -44



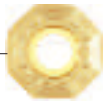
ODET 04_ -441



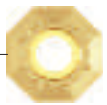
ODEW 04_ -RA



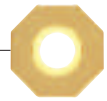
ODMT 04_ -41



ODMT 04_ -41

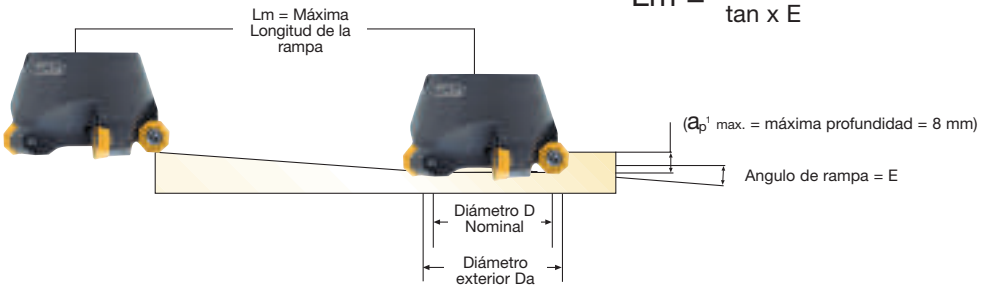


ODMW 04_ -SN



Fresado en rampa

$$Lm = \frac{a_p{}^1}{\tan x\ E}$$



Angulo de rampa	
Ø 25	17,0°
Ø 32	12,1°
Ø 40	8,5°
Ø 50	6,1°
Ø 63	4,3°
Ø 80	3,0°
Ø 100	2,4°
Ø 125	2,0°
Ø 160	1,4°

Condiciones de corte recomendadas para OD_04

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,30 - 0,50	2,0 - 3,5	220 - 260	0,20 - 0,35	1,0 - 2,0	220 - 300	0,08 - 0,15	0,2 - 1,0
Aceros aleados	70 - 110	0,27 - 0,40	2,0 - 3,5	100 - 150	0,20 - 0,30	1,0 - 2,0	100 - 195	0,08 - 0,15	0,2 - 1,0
Aceros inoxidables	120 - 140	0,20 - 0,35	2,0 - 3,5	140 - 180	0,15 - 0,25	1,0 - 2,0	180 - 230	0,05 - 0,15	0,2 - 1,0
Inoxidables PH	55 - 70	0,15 - 0,25	2,0 - 3,5	70 - 85	0,10 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
Fundición	155 - 290	0,30 - 0,35	2,0 - 3,5	195 - 310	0,15 - 0,25	1,0 - 2,0	215 - 360	0,05 - 0,15	0,2 - 1,0
Aluminio y Aleaciones	275 - 450	0,20 - 0,30	2,0 - 3,5	400 - 750	0,10 - 0,25	1,0 - 2,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
Aleaciones refractarias	25 - 40	0,15 - 0,25	2,0 - 3,5	35 - 50	0,10 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

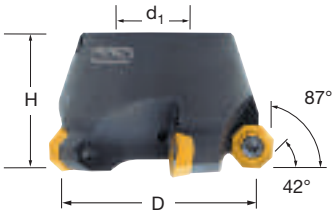


Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa 7745 VOD 06





7745 VOD 06 Fijación por el eje Paso medio

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_{p1} max.	a_p max.	No. de dientes	Recambios EDP#		EDP#	
026581	**7745VOD 06 -A050R**	50	40	-	22	10	4,5	4	015270	F4011T	015241	T20
026582	**7745VOD 06 -A063R**	63	40	-	22	10	4,5	5	015270	F4011T	015241	T20
026583	**7745VOD 06 -A080R**	80	50	-	27	10	4,5	6	015270	F4011T	015241	T20
026584	**7745VOD 06 -A100R**	100	55	-	32	10	4,5	7	015270	F4011T	015241	T20
026585	**7745VOD 06 -A125R**	125	63	-	40	10	4,5	8	015270	F4011T	015241	T20
026586	**7745VOD 06 -160R**	160	63	-	40	10	4,5	10	015270	F4011T	015241	T20

7745 VOD 06 Fijación por el eje Paso fino

027911	**7745VOD 06 -A080Z08R**	80	50	-	27	10	4,5	8	015270	F4011T	015241	T20
027876	**7745VOD 06 -A100Z09R**	100	55	-	32	10	4,5	9	015270	F4011T	015241	T20
027877	**7745VOD 06 -A125Z11R**	125	63	-	40	10	4,5	11	015270	F4011T	015241	T20
027878	**7745VOD 06 -160Z14R**	160	63	-	40	10	4,5	14	015270	F4011T	015241	T20

Fresas con refrigeración interna excepto 160.



Montaje en el eje



7745 VOD 06 Consejos técnicos

Ejemplo de pedido de la fresa: **7745VOD06-A080R**
Ejemplo de pedido de la plaquita: **ODET0605APEN-44 MP91M**
Para condiciones completas ver pagina: **A288**

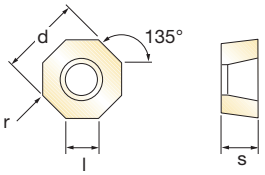
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_Z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar

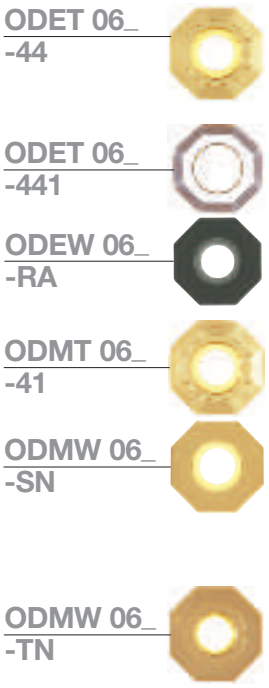


Profundidad de corte (a_p)

Plaquitas para 7745 VOD 06

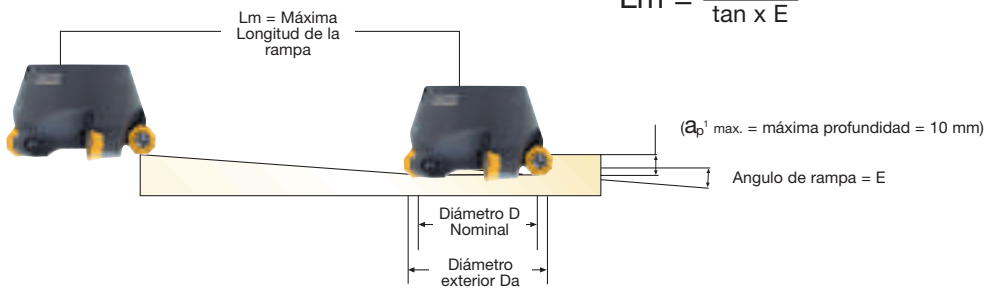


EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
026591	**ODET 06 05APEN-44**	**MP91M**			◆	16,0	6,0	5,55	Faceta	0,04
026598	**ODET 06 05APEN-44**	**SP4036**			◆◆◆	16,0	6,0	5,55	Faceta	0,04
027891	**ODET 06 05APEN-44**	**SP6564**				16,0	6,0	5,55	Faceta	0,04
026592	**ODET 06 05APEN-44**	**X500**			◆◆	16,0	6,0	5,55	Faceta	0,04
026588	**ODET 06 05APFN-441**	**GH1**	◆	◆	◆	16,0	6,0	5,55	Faceta	0,02
027885	**ODEW 06 05APTR-RA**	**SC3025**	◆	◆	◆	16,0	6,0	5,55	Faceta	0,19
026589	**ODMT 06 05APEN-41**	**MP91M**		◆		16,0	6,0	5,55	Faceta	0,04
026597	**ODMT 06 05APEN-41**	**SP4036**		◆◆◆		16,0	6,0	5,55	Faceta	0,04
027892	**ODMT 06 05APEN-41**	**SP6564**				16,0	6,0	5,55	Faceta	0,04
026590	**ODMT 06 05APEN-41**	**X500**	◆	◆◆		16,0	6,0	5,55	Faceta	0,04
025836	**ODMW 06 0512SN**	**MP91M**	◆			16,0	6,0	5,55	1,2	0,27
029097	**ODMW 06 0512SN**	**SC3025**				16,0	6,0	5,55	1,2	0,27
025837	**ODMW 06 0512SN**	**SF30**				16,0	6,0	5,55	1,2	0,27
025838	**ODMW 06 0512SN**	**X500**				16,0	6,0	5,55	1,2	0,27
027743	**ODMW 06 0512SN**	**SP6564**	◆◆			16,0	6,0	5,55	1,2	0,27
026595	**ODMW 06 0512TN**	**MP91M**				16,0	6,0	5,55	1,2	0,17
026599	**ODMW 06 0512TN**	**SP4036**		◆		16,0	6,0	5,55	1,2	0,17
027893	**ODMW 06 0512TN**	**SP6564**				16,0	6,0	5,55	1,2	0,17
026596	**ODMW 06 0512TN**	**X500**	◆			16,0	6,0	5,55	1,2	0,17



Fresado en rampa

$$Lm = \frac{a_p{}^1}{\tan x\ E}$$



Angulo de rampa	
Ø 50	6,0°
Ø 63	4,6°
Ø 80	3,3°
Ø 100	2,6°
Ø 125	2,0°
Ø 160	1,5°

Condiciones de corte recomendadas para OD_06

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,30 - 0,70	2,5 - 4,5	220 - 260	0,20 - 0,40	1,0 - 2,0	220 - 300	0,08 - 0,15	0,2 - 1,0
Aceros aleados	70 - 110	0,27 - 0,50	2,5 - 4,5	100 - 150	0,20 - 0,35	1,0 - 2,0	100 - 195	0,08 - 0,15	0,2 - 1,0
Aceros inoxidables	120 - 140	0,27 - 0,40	2,5 - 4,5	140 - 180	0,15 - 0,25	1,0 - 2,0	180 - 230	0,05 - 0,15	0,2 - 1,0
Inoxidables PH	55 - 70	0,15 - 0,30	2,5 - 4,5	70 - 85	0,10 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
Fundición	155 - 290	0,20 - 0,45	2,5 - 4,5	195 - 310	0,15 - 0,30	1,0 - 2,0	215 - 360	0,05 - 0,15	0,2 - 1,0
Aluminio y Aleaciones	275 - 450	0,20 - 0,35	2,5 - 4,5	400 - 750	0,10 - 0,25	1,0 - 2,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
Aleaciones refractarias	25 - 40	0,17 - 0,25	2,5 - 4,5	35 - 50	0,10 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,06 - 0,12	0,5 - 1,5	50 - 100	0,03 - 0,06	0,2 - 0,5

h_m = espesor de la viruta

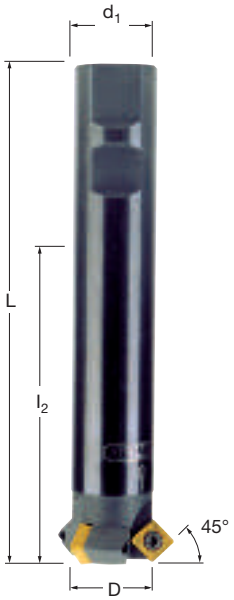
Estrella guía Llave para encontrar la herramienta idónea

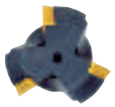
Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa 7745 VS 09







Amarre Weldon

7745 VS 09 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021762	**7745VS 09 WA016R085**	16	135	85	16	5	2	015262	D4010T	015240	T15
021763	**7745VS 09 WA020R085**	20	135	85	20	5	2	015262	D4010T	015240	T15
021764	**7745VS 09 WA025R095**	25	150	95	25	5	3	015262	D4010T	015240	T15



7745 VS 09 Consejos técnicos

Ejemplo de pedido de la fresa: **7745VS09WA016R085**
Ejemplo de pedido de la plaquita: **SCMT09T308EN -41 MP91M**
Para condiciones completas ver pagina: **A288**

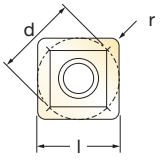
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0{,}707}$ o $\frac{0{,}08}{0{,}707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7745 VS 09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017703	**SCMT 09 T308E**	**SF30**				9,52	9,52	3,97	0,8	0,15
018188	**SCMT 09 T308E**	**SFZ**				9,52	9,52	3,97	0,8	0,15
025852	**SCMT 09 T304T**	**SF30**				9,52	9,52	3,97	0,4	0,15
015225	**SCMT 09 T308T**	**PFZ**				9,52	9,52	3,97	0,8	0,15
017704	**SCMT 09 T308T**	**SF30**				9,52	9,52	3,97	0,8	0,15
017705	**SCMT 09 T308T**	**SFZ**				9,52	9,52	3,97	0,8	0,15
027896	**SCMT 09 T308T**	**SP6564**				9,52	9,52	3,97	0,8	0,15
015224	**SCMT 09 T308T**	**X44**				9,52	9,52	3,97	0,8	0,15
017315	**SCMT 09 T308EN-41**	**MP91M**				9,52	9,52	3,97	0,8	0,04
024107	**SCMT 09 T308EN-41**	**PFZ**				9,52	9,52	3,97	0,8	0,04
015147	**SCMT 09 T308EN-41**	**X500**				9,52	9,52	3,97	0,8	0,04
027731	**SCMT 09 T308EN-41**	**SP6564**				9,52	9,52	3,97	0,8	0,04
018198	**SCMW 09 T304E**	**GH1**				9,52	9,52	3,97	0,4	0,03
018199	**SCMW 09 T308E**	**GH1**				9,52	9,52	3,97	0,8	0,03

SCMT 09_



SCMT 09_ -41



SCMW 09_



Condiciones de corte recomendadas para SC_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	220 - 260	0,05 - 0,15	1,0 - 5,0	-	-	-
Aceros aleados	-	-	-	100 - 150	0,05 - 0,12	1,0 - 5,0	-	-	-
Aceros inoxidables	-	-	-	140 - 180	0,05 - 0,12	1,0 - 5,0	-	-	-
Inoxidables PH	-	-	-	70 - 85	0,05 - 0,08	1,0 - 5,0	-	-	-
Fundición	-	-	-	180 - 300	0,05 - 0,12	1,0 - 5,0	-	-	-
Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
Aleaciones refractarias	-	-	-	35 - 50	0,05 - 0,08	1,0 - 5,0	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

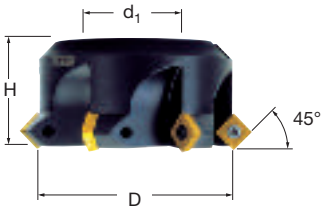


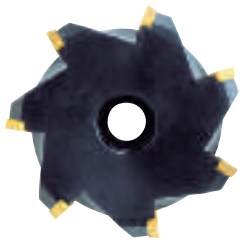
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa 7745 VS 12







Montaje en el eje

7745 VS 12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D	H	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021765	**7745VS 12 -A040R**	40	32	16	7	4	015266	D5013T	015241	T20
021766	**7745VS 12 -A050R**	50	40	22	7	4	015266	D5013T	015241	T20
021767	**7745VS 12 -A063R**	63	40	22	7	5	015266	D5013T	015241	T20
021768	**7745VS 12 -A080R**	80	50	27	7	6	015266	D5013T	015241	T20
021769	**7745VS 12 -A100R**	100	50	32	7	7	015266	D5013T	015241	T20
021770	**7745VS 12 -A125R**	125	63	40	7	8	015266	D5013T	015241	T20



7745 VS 12 Consejos técnicos

Ejemplo de pedido de la fresa: **7745VS12-A050R**
Ejemplo de pedido de la plaquita: **SCMT12M512EN -41 MP91M**
Para condiciones completas ver pagina: **A288**

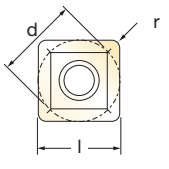
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0{,}707}$ o $\frac{0{,}08}{0{,}707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7745 VS 12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017312	**SCCT 12 M5ACER**	**MP91M**		♦	♦	12,7	12,7	5,0	Faceta	0,03
025811	**SCCT 12 M5ACTR**	**SP4036**		♦	♦♦♦	12,7	12,7	5,0	Faceta	0,15
017695	**SCCT 12 M5ACTR**	**GH1**				12,7	12,7	5,0	Faceta	0,15
017693	**SCCT 12 M5ACTR**	**SF30**				12,7	12,7	5,0	Faceta	0,15
017696	**SCCT 12 M5ACTR**	**SFZ**				12,7	12,7	5,0	Faceta	0,15
017694	**SCCT 12 M5ACTR**	**X44**				12,7	12,7	5,0	Faceta	0,15
017313	**SCHT 12 M5ACTN**	**MP91M**				12,7	12,7	5,0	Faceta	0,15
017697	**SCHT 12 M5ACTN**	**PFZ**		♦♦		12,7	12,7	5,0	Faceta	0,15
027894	**SCHT 12 M5ACTN**	**SP6564**		♦♦♦		12,7	12,7	5,0	Faceta	0,15
017698	**SCHT 12 M5ACTN**	**X500**				12,7	12,7	5,0	Faceta	0,15
015144	**SCKT 12 M5ACSN-41**	**X500**	♦			12,7	12,7	5,0	Faceta	0,12
017314	**SCKT 12 M5ACSN-41**	**MP91M**	♦♦			12,7	12,7	5,0	Faceta	0,12
017699	**SCKT 12 M5ACSN-41**	**PFZ**	♦			12,7	12,7	5,0	Faceta	0,12
027895	**SCKT 12 M5ACSN-41**	**SP6564**				12,7	12,7	5,0	Faceta	0,12
017706	**SCMT 12 M508E**	**SF30**				12,7	12,7	5,0	0,8	0,15
024944	**SCMT 12 M508E**	**X44**				12,7	12,7	5,0	0,8	0,15
025832	**SCMT 12 M508E**	**PFZ**				12,7	12,7	5,0	0,8	0,15
017707	**SCMT 12 M512E**	**SF30**				12,7	12,7	5,0	1,2	0,15
017709	**SCMT 12 M512T**	**GH1**				12,7	12,7	5,0	1,2	0,15
017316	**SCMT 12 M512T**	**MP91M**				12,7	12,7	5,0	1,2	0,15
015227	**SCMT 12 M512T**	**PFZ**				12,7	12,7	5,0	1,2	0,15
017708	**SCMT 12 M512T**	**SF30**				12,7	12,7	5,0	1,2	0,15
017710	**SCMT 12 M512T**	**SFZ**				12,7	12,7	5,0	1,2	0,15
015228	**SCMT 12 M512T**	**X44**				12,7	12,7	5,0	1,2	0,15
024129	**SCMT 12 M512T**	**X500**				12,7	12,7	5,0	1,2	0,12
017317	**SCMT 12 M512EN-41**	**MP91M**				12,7	12,7	5,0	1,2	0,05
024108	**SCMT 12 M512EN-41**	**PFZ**				12,7	12,7	5,0	1,2	0,05
015226	**SCMT 12 M512EN-41**	**X500**				12,7	12,7	5,0	1,2	0,05
027732	**SCMT 12 M512EN-41**	**SP6564**				12,7	12,7	5,0	1,2	0,05

SCCT 12_



SCHT 12_



SCKT 12_ -41



SCMT 12_



SCMT 12_ -41



Condiciones de corte recomendadas para SC_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,20 - 0,60	3,5 - 7,0	220 - 260	0,20 - 0,45	1,0 - 3,5	220 - 300	0,15 - 0,28	0,2 - 1,0
Aceros aleados	70 - 110	0,20 - 0,45	3,5 - 7,0	100 - 150	0,20 - 0,40	1,0 - 3,5	100 - 195	0,15 - 0,28	0,2 - 1,0
Aceros inoxidables	120 - 140	0,20 - 0,35	3,5 - 7,0	140 - 180	0,15 - 0,30	1,0 - 3,5	180 - 230	0,15 - 0,28	0,2 - 1,0
Inoxidables PH	-	-	-	75 - 135	0,15 - 0,28	1,0 - 3,5	-	-	-
Fundición	140 - 280	0,15 - 0,40	3,5 - 7,0	180 - 300	0,15 - 0,30	1,0 - 3,5	200 - 350	0,15 - 0,28	0,2 - 1,0
Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
Aleaciones refractarias	-	-	-	25 - 45	0,10 - 0,25	1,0 - 3,5	-	-	-
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,06 - 0,12	1,0 - 2,5	50 - 100	0,04 - 0,08	0,2 - 1,0

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

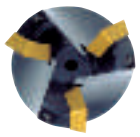
Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa 7745 VSE 09







Amarre Weldon

7745 VSE 09 Amarre Weldon Paso medio

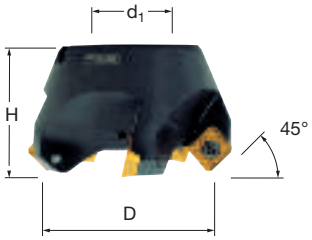
EDP #	Referencia	Dimensiones (mm) D	L/H	l_1	d_1	a_p max.	Penetración max.	No. de dientes	Recambios EDP#		EDP#	
021783	**7745VSE 09 WA016Z02R**	16	75	22	16	5	4	2	015269	F3508T	015240	T15
021784	**7745VSE 09 WA020Z02R**	20	82	28	20	5	4	2	015269	F3508T	015240	T15
021785	**7745VSE 09 WA025Z03R**	25	96	35	25	5	4	3	015064	F3510T	015240	T15
021786	**7745VSE 09 WA032Z03R**	32	100	35	32	5	4	3	015064	F3510T	015240	T15
021787	**7745VSE 09 WA040Z04R**	40	110	45	32	5	4	4	015064	F3510T	015240	T15

7745 VSE 09 Fijación por el eje Paso medio

021771	**7745VSE 09 -A032Z04R**	32	30	-	13	5	4	4	015064	F3510T	015240	T15
021772	**7745VSE 09 -A040Z05R**	40	40	-	16	5	4	5	015064	F3510T	015240	T15
021773	**7745VSE 09 -A050Z05R**	50	42	-	22	5	4	5	015064	F3510T	015240	T15
021775	**7745VSE 09 -A063Z05R**	63	42	-	22	5	4	5	015064	F3510T	015240	T15
021777	**7745VSE 09 -A080Z06R**	80	52	-	27	5	4	6	015064	F3510T	015240	T15
021779	**7745VSE 09 -A100Z07R**	100	52	-	32	5	4	7	015064	F3510T	015240	T15
021781	**7745VSE 09 -A125Z08R**	125	63	-	40	5	4	8	015064	F3510T	015240	T15

7745 VSE 09 Fijación por el eje Paso fino

021774	**7745VSE 09 -A050Z06R**	50	42	-	22	5	4	6	015064	F3510T	015240	T15
021776	**7745VSE 09 -A063Z07R**	63	42	-	22	5	4	7	015064	F3510T	015240	T15
021778	**7745VSE 09 -A080Z09R**	80	52	-	27	5	4	9	015064	F3510T	015240	T15
021780	**7745VSE 09 -A100Z11R**	100	52	-	32	5	4	11	015064	F3510T	015240	T15
021782	**7745VSE 09 -A125Z12R**	125	63	-	40	5	4	12	015064	F3510T	015240	T15





Montaje en el eje

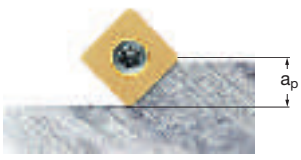
7745 VSE 09 Consejos técnicos



Ejemplo de pedido de la fresa: **7745VSE09WA016Z02R**
Ejemplo de pedido de la plaquita: **SDHT09T3AEEN -421 MP91M**
Para condiciones completas ver pagina: **A288**

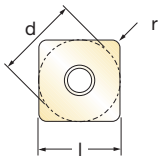
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_Z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0{,}707}$ o $\frac{0{,}08}{0{,}707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7745 VSE 09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017714	SDCT 09 T3AEEN	SF30				9,52	9,52	3,97	Faceta	0,04
025842	SDCT 09 T3AEEN	SP4036				9,52	9,52	3,97	Faceta	0,04
017242	SDCT 09 T3AEFN	GH1	◆	◆	◆	9,52	9,52	3,97	Faceta	0,02
017715	SDCW 09 T3AEFN	SFZ			◆	9,52	9,52	3,97	Faceta	0,02
018204	SDCW 09 T3AETN	CN35				9,52	9,52	3,97	Faceta	0,12
017716	SDCW 09 T3AETN	SF30				9,52	9,52	3,97	Faceta	0,15
027118	SDCW 09 T3AETN	SFZ				9,52	9,52	3,97	Faceta	0,15
017717	SDCW 09 T3AETN	X44				9,52	9,52	3,97	Faceta	0,15
017726	SDEX 09 T3AEEN-701	PFZ				9,52	9,52	3,97	Faceta	0,03
015148	SDEX 09 T3AEFN-701	GH1				9,52	9,52	3,97	Faceta	0,02
015229	SDEX 09 T3AEFN-701	SFZ				9,52	9,52	3,97	Faceta	0,02
017320	SDHT 09 T3AEEN-421	MP91M				9,52	9,52	3,97	Faceta	0,03
023356	SDHT 09 T3AEEN-421	PFZ				9,52	9,52	3,97	Faceta	0,03
015186	SDHT 09 T3AEEN-421	X500			◆	9,52	9,52	3,97	Faceta	0,03
027733	SDHT 09 T3AEEN-421	SP6564				9,52	9,52	3,97	Faceta	0,03
017323	SDHW 09 T3AETN	MP91M				9,52	9,52	3,97	Faceta	0,10
023358	SDHW 09 T3AETN	PFZ				9,52	9,52	3,97	Faceta	0,10
015231	SDHW 09 T3AETN	X500				9,52	9,52	3,97	Faceta	0,10
027741	SDHW 09 T3AETN	SP6564				9,52	9,52	3,97	Faceta	0,10
026600	SDKT 09 T3AEEN-45	MP91M		◆	◆	9,52	9,52	3,97	Faceta	0,05
026602	SDKT 09 T3AEEN-45	X500		◆		9,52	9,52	3,97	Faceta	0,05
027738	SDKT 09 T3AEEN-45	SP6564		◆	◆	9,52	9,52	3,97	Faceta	0,05
017319	SDET 09 T308EN	MP91M				9,52	9,52	3,97	0,8	0,03
017724	SDET 09 T308EN	PFZ				9,52	9,52	3,97	0,8	0,03
017725	SDET 09 T308FN	GH1				9,52	9,52	3,97	0,8	0,02
017325	SDMT 09 T308EN-41	MP91M	◆			9,52	9,52	3,97	0,8	0,04
023362	SDMT 09 T308EN-41	PFZ				9,52	9,52	3,97	0,8	0,04
014410	SDMT 09 T308EN-41	X500				9,52	9,52	3,97	0,8	0,04
027736	SDMT 09 T308EN-41	SP6564	◆			9,52	9,52	3,97	0,8	0,04
017327	SDMW 09 T308TN	MP91M	◆			9,52	9,52	3,97	0,8	0,15
027742	SDMW 09 T308TN	SP6564				9,52	9,52	3,97	0,8	0,15
023363	SDMW 09 T308TN	PFZ				9,52	9,52	3,97	0,8	0,15
015232	SDMW 09 T308TN	X500				9,52	9,52	3,97	0,8	0,12

SDCT 09_



SDCW 09_



SDEX 09_ -701



SDHT 09_ -421



SDHW 09_



SDKT 09_ -45



SDET 09_



SDMT 09_ -41



SDMW 09_



Condiciones de corte recomendadas para SD_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,12 - 0,30	3,0 - 5,0	220 - 260	0,10 - 0,25	1,0 - 3,0	220 - 300	0,08 - 0,15	0,2 - 1,0
Aceros aleados	70 - 110	0,12 - 0,25	3,0 - 5,0	100 - 150	0,10 - 0,20	1,0 - 3,0	100 - 195	0,08 - 0,15	0,2 - 1,0
Aceros inoxidables	120 - 140	0,12 - 0,22	3,0 - 5,0	140 - 180	0,10 - 0,20	1,0 - 3,0	180 - 230	0,05 - 0,15	0,2 - 1,0
Inoxidables PH	-	-	-	75 - 85	0,10 - 0,18	1,0 - 3,0	80 - 100	0,05 - 0,10	0,2 - 1,0
Fundición	140 - 280	0,12 - 0,25	3,0 - 5,0	180 - 300	0,10 - 0,20	1,0 - 3,0	200 - 350	0,05 - 0,15	0,2 - 1,0
Aluminio y Aleaciones	275 - 450	0,10 - 0,22	3,0 - 5,0	400 - 750	0,08 - 0,18	1,0 - 3,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
Aleaciones refractarias	-	-	-	35 - 50	0,10 - 0,18	1,0 - 3,5	45 - 60	0,05 - 0,10	0,2 - 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	0,2 - 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

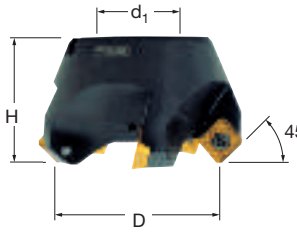


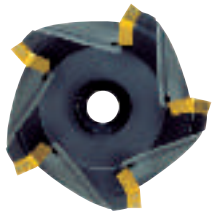
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa 7745 VSE 12







Montaje en el eje

7745 VSE 12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D	H	d_1	$a_{p\ max.}$	Penetración mas.	No. de dientes	Recambios EDP#		EDP#	
021788	**7745VSE 12 -A050Z04R**	50	45	22	7	6	4	015270	F4011T	015241	T20
021789	**7745VSE 12 -A063Z05R**	63	45	22	7	6	5	015270	F4011T	015241	T20
021790	**7745VSE 12 -A080Z06R**	80	50	27	7	6	6	015270	F4011T	015241	T20
021791	**7745VSE 12 -A100Z07R**	100	55	32	7	6	7	015270	F4011T	015241	T20
021792	**7745VSE 12 -A125Z08R**	125	63	40	7	6	8	015270	F4011T	015241	T20



7745 VSE 12 Consejos técnicos

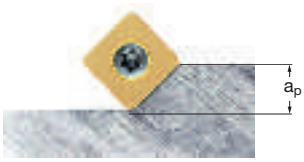
Ejemplo de pedido de la fresa: **7745VSE12-A050Z04R**
Ejemplo de pedido de la plaquita: **SDKT1204AEEN-45 X500**
Para condiciones completas ver pagina: **A288**

Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar

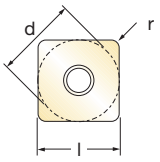
Condiciones de corte recomendadas para SD_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,20 - 0,45	3,0 - 6,0	220 - 260	0,15 - 0,30	1,0 - 3,0	220 - 300	0,15 - 0,17	0,2 - 1,0
Aceros aleados	70 - 110	0,20 - 0,35	3,0 - 6,0	100 - 150	0,15 - 0,25	1,0 - 3,0	100 - 195	0,15 - 0,17	0,2 - 1,0
Aceros inoxidables	120 - 140	0,15 - 0,30	3,0 - 6,0	140 - 180	0,15 - 0,25	1,0 - 3,0	180 - 230	0,15 - 0,17	0,2 - 1,0
Inoxidables PH	55 - 70	0,15 - 0,25	2,0 - 4,0	70 - 85	0,15 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
Fundición	140 - 280	0,15 - 0,30	3,0 - 6,0	180 - 300	0,10 - 0,22	1,0 - 3,0	200 - 350	0,05 - 0,15	0,2 - 1,0
Aluminio y Aleaciones	275 - 450	0,15 - 0,30	3,0 - 6,0	400 - 750	0,10 - 0,22	1,0 - 3,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
Aleaciones refractarias	25 - 40	0,15 - 0,25	2,0 - 4,0	35 - 50	0,15 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,06 - 0,12	0,5 - 1,5	50 - 100	0,03 - 0,06	0,2 - 0,5



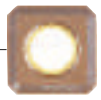
Profundidad de corte (a_p)

Plaquitas para 7745 VSE 12

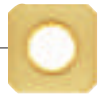


EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
018203	**SDCT 12 04AEEN**	**SF30**				12,7	12,7	4,76	Faceta	0,04
017243	**SDCT 12 04AEFN**	**GH1**	♦	♦	♦	12,7	12,7	4,76	Faceta	0,02
017318	**SDCW 12 04AEEN**	**MP91M**		♦	♦	12,7	12,7	4,76	Faceta	0,03
017722	**SDCW 12 04AETN**	**GH1**				12,7	12,7	4,76	Faceta	0,15
018205	**SDCW 12 04AETN**	**CN35**				12,7	12,7	4,76	Faceta	0,17
017720	**SDCW 12 04AETN**	**SF30**				12,7	12,7	4,76	Faceta	0,15
017723	**SDCW 12 04AETN**	**SFZ**				12,7	12,7	4,76	Faceta	0,10
017721	**SDCW 12 04AETN**	**X44**		♦		12,7	12,7	4,76	Faceta	0,15
017727	**SDEX 12 04AEEN-701**	**PFZ**				12,7	12,7	4,76	Faceta	0,03
015149	**SDEX 12 04AEEN-701**	**GH1**				12,7	12,7	4,76	Faceta	0,02
015230	**SDEX 12 04AEEN-701**	**SFZ**				12,7	12,7	4,76	Faceta	0,02
017321	**SDHT 12 04AEEN-421**	**MP91M**				12,7	12,7	4,76	Faceta	0,04
015133	**SDHT 12 04AEEN-421**	**PFZ**				12,7	12,7	4,76	Faceta	0,04
015187	**SDHT 12 04AEEN-421**	**X500**	♦		♦♦	12,7	12,7	4,76	Faceta	0,04
027734	**SDHT 12 04AEEN-421**	**SP6564**				12,7	12,7	4,76	Faceta	0,04
017322	**SDHT 12 04AETN-42**	**MP91M**				12,7	12,7	4,76	Faceta	0,15
017728	**SDHT 12 04AETN-42**	**PFZ**				12,7	12,7	4,76	Faceta	0,15
027735	**SDHT 12 04AETN-42**	**SP6564**				12,7	12,7	4,76	Faceta	0,15
017729	**SDHT 12 04AETN-42**	**X500**	♦			12,7	12,7	4,76	Faceta	0,10
017324	**SDHW 12 04AETN**	**MP91M**				12,7	12,7	4,76	Faceta	0,15
015134	**SDHW 12 04AETN**	**PFZ**				12,7	12,7	4,76	Faceta	0,15
017730	**SDHW 12 04AETN**	**X500**				12,7	12,7	4,76	Faceta	0,15
029456	**SDKT 12 04AEEN-45**	**MP91M**		♦	♦	12,7	12,7	4,76	Faceta	0,05
029457	**SDKT 12 04AEEN-45**	**X500**		♦♦		12,7	12,7	4,76	Faceta	0,05
029455	**SDKT 12 04AEEN-45**	**SP6564**		♦♦	♦♦	12,7	12,7	4,76	Faceta	0,05
017326	**SDMT 12 0412EN-41**	**MP91M**	♦			12,7	12,7	4,76	1,2	0,05
015135	**SDMT 12 0412EN-41**	**PFZ**				12,7	12,7	4,76	1,2	0,05
014411	**SDMT 12 0412EN-41**	**X500**				12,7	12,7	4,76	1,2	0,05
027737	**SDMT 12 0412EN-41**	**SP6564**	♦♦			12,7	12,7	4,76	1,2	0,05
017328	**SDMW 12 0412TN**	**MP91M**	♦			12,7	12,7	4,76	1,2	0,15
015136	**SDMW 12 0412TN**	**PFZ**				12,7	12,7	4,76	1,2	0,15
015233	**SDMW 12 0412TN**	**X500**				12,7	12,7	4,76	1,2	0,12

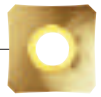
SDCT 12_



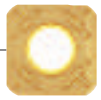
SDCW 12_



SDEX 12_ -701



SDHT 12_ -421



SDHT 12_ -42



SDHW 12_



SDKT 12_ -45



SDMT 12_ -41



SDMW 12_



h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

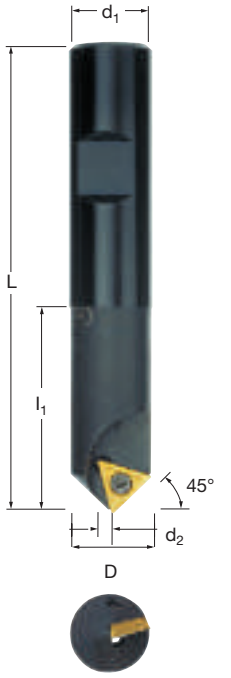


Código ISO de materiales			
P ♦ Aceros no aleados	M ♦ Aceros inoxidables	K ♦ Fundición	S ♦ Aleaciones refractarias
P ♦ Aceros aleados	M ♦ Inoxidables PH	N ♦ Aluminio y Aleaciones	H ♦ Materiales duros

STELLRAM®

Fresa para achaflanar 7745 VT 11





Amarre Weldon

7745 VT 11 Amarre Weldon

		Dimensiones (mm)							Recambios			
EDP #	Referencia	D	L	l_1	d_1	d_2	a_p max.	No. de dientes	EDP#		EDP#	
023065	**7745VT 11 WA016R**	16	90	40	16	4	7,7	1	015060	F2505T	015069	T7F

7745 VT 11 Consejos técnicos



Ejemplo de pedido de la fresa: **7745VT11WA016R**
Ejemplo de pedido de la plaquita: **TPMT110204E-M SFZ**
Para condiciones completas ver pagina: **A288**

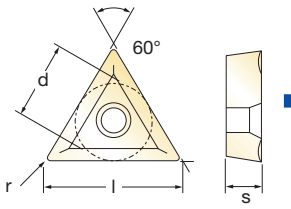
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_Z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7745 VT 11



TPMT 11_
-M



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024948	**TPMT 11 0204E-M**	**GH1**		◆		6,35	11,0	2,38	0,4	0,03
023503	**TPMT 11 0204E-M**	**SFZ**		◆◆		6,35	11,0	2,38	0,4	0,03
023504	**TPMT 11 0204E-M**	**X44**		◆		6,35	11,0	2,38	0,4	0,03
024947	**TPMT 11 0204E-M**	**X500**		◆◆		6,35	11,0	2,38	0,4	0,03

Condiciones de corte recomendadas para TP_11

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	220 - 260	0,05 - 0,12	1,0 - 7,5	-	-	-
◆ Aceros aleados	-	-	-	100 - 150	0,05 - 0,10	1,0 - 7,5	-	-	-
◆ Aceros inoxidables	-	-	-	140 - 180	0,05 - 0,10	1,0 - 7,5	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-	-
◆ Fundición	-	-	-	180 - 300	0,05 - 0,10	1,0 - 7,5	-	-	-
◆ Aluminio y Aleaciones	-	-	-	400 - 750	0,05 - 0,12	1,0 - 7,5	-	-	-
◆ Aleaciones refractarias	-	-	-	35 - 50	0,05 - 0,10	1,0 - 7,5	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa para achaflanar 7745 VT 16







Amarre Weldon

7745 VT 16 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1	d_1	d_2	a_p max.	No. de dientes	Recambios EDP#		EDP#	
023067	**7745VT 16 WA030R**	30	100	32	20	12	11,3	2	015260	D4008T	015240	T15

7745 VT 16 Consejos técnicos



Ejemplo de pedido de la fresa: **7745VT16WA030R**
Ejemplo de pedido de la plaquita: **TCMT16T308E PFZ**
Para condiciones completas ver pagina: **A288**

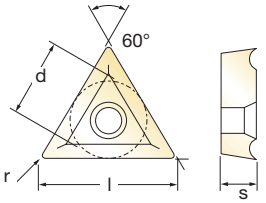
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7745 VT 16



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
023382	**TCEW 16 T304F**	**GH1**		♦		9,52	16,5	3,97	0,4	0,02

TCEW 16_



024139	**TCMT 16 T308E**	**MP91M**		♦		9,52	16,5	3,97	0,8	0,05
023388	**TCMT 16 T308E**	**PFZ**		♦♦		9,52	16,5	3,97	0,8	0,05
017743	**TCMT 16 T308E**	**SF30**				9,52	16,5	3,97	0,8	0,05
014852	**TCMT 16 T308E**	**X44**				9,52	16,5	3,97	0,8	0,07
024140	**TCMT 16 T308E**	**X500**		♦♦		9,52	16,5	3,97	0,8	0,05
014399	**TCMT 16 T308T**	**PFZ**				9,52	16,5	3,97	0,8	0,15
017745	**TCMT 16 T308T**	**SF30**				9,52	16,5	3,97	0,8	0,15
017746	**TCMT 16 T308T**	**X44**				9,52	16,5	3,97	0,8	0,15
025801	**TCMT 16 T308T**	**SFZ**				9,52	16,5	3,97	0,8	0,15

TCMT 16_



023393	**TCMW 16 T308E**	**GH1**				9,52	16,5	3,97	0,8	0,15

TCMW 16_



Condiciones de corte recomendadas para TC_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	220 - 260	0,05 - 0,20	1,0 - 11,0	-	-	-
♦ Aceros aleados	-	-	-	100 - 150	0,05 - 0,15	1,0 - 11,0	-	-	-
♦ Aceros inoxidables	-	-	-	140 - 180	0,05 - 0,15	1,0 - 11,0	-	-	-
♦ Inoxidables PH	-	-	-	70 - 85	0,05 - 0,10	1,0 - 11,0	-	-	-
♦ Fundición	-	-	-	180 - 300	0,05 - 0,15	1,0 - 11,0	-	-	-
♦ Aluminio y Aleaciones	-	-	-	400 - 750	0,05 - 0,20	1,0 - 11,0	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

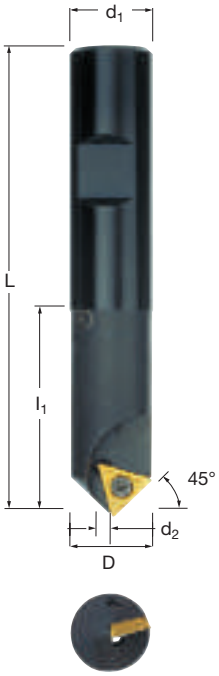


Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa de puntear 7745 VT 16





Amarre Weldon

7745 VT 16 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1	d_1	d_2	a_p max. Lineal	a_p max. Taladrado	No. de dientes	Recambios EDP#		EDP#	
023066	**7745VT 16 WA020R**	20	110	50	20	0	11,0	6	1	015260	D4008T	015240	T15



7745 VT 16 Consejos técnicos

Ejemplo de pedido de la fresa: **7745VT16WA020R**
Ejemplo de pedido de la plaquita: **TCMX16T308E-ZR SFZ**
Para condiciones completas ver pagina: **A288**

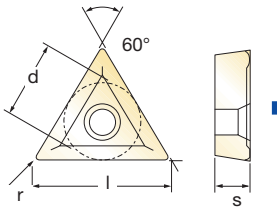
Compensación de avance: Para un ángulo de corte de 45, dividir el valor f_Z por el seno del ángulo de corte (seno de 45 = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7745 VT 16



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
023395	**TCMX 16 T308E-ZR**	**SFZ**		◆◆◆		9,52	16,5	3,97	0,8	0,05

TCMX 16_



Condiciones de corte recomendadas para TC_16

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	220 - 260	0,05 - 0,20	0,5 - 3,0	-	-	-
Aceros aleados	-	-	-	-	-	-	-	-	-
Aceros inoxidables	-	-	-	-	-	-	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	-	-	-	180 - 300	0,05 - 0,20	0,5 - 3,0	-	-	-
Aluminio y Aleaciones	-	-	-	400 - 750	0,05 - 0,20	0,5 - 3,0	-	-	-
Aleaciones refractarias	-	-	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa de achaflanar 7760 VT 11





Amarre Weldon

7760 VT 11 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1	d_1	d_2	a_p max.	No. de dientes	Recambios EDP#		EDP#	
023068	**7760VT 11 WA016R**	16	88	38	16	7	9,5	1	015060	F2505T	015069	T7F
023069	**7760VT 11 WA025R**	24,5	90	40	20	15	9,5	2	015060	F2505T	015069	T7F



7760 VT 11 Consejos técnicos

Ejemplo de pedido de la fresa: **7760VT11WA016R**
Ejemplo de pedido de la plaquita: **TPMT110204E-M SFZ**
Para condiciones completas ver pagina: **A288**

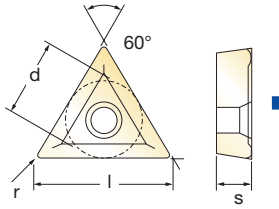
Compensación de avance: Para un ángulo de corte de 60°, dividir el valor h_m por el seno del ángulo de corte (seno de 60° = 0,866)

ej: $\frac{h_m}{0,866}$ o $\frac{0,08}{0,866}$ = 0,092 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 7760 VT 11



TPMT 11_
-M



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024948	**TPMT 11 0204E-M**	**GH1**		◆		6,35	11,0	2,38	0,4	0,03
023503	**TPMT 11 0204E-M**	**SFZ**		◆◆◆		6,35	11,0	2,38	0,4	0,03
023504	**TPMT 11 0204E-M**	**X44**				6,35	11,0	2,38	0,4	0,03
024947	**TPMT 11 0204E-M**	**X500**		◆◆		6,35	11,0	2,38	0,4	0,03

Condiciones de corte recomendadas para TP_11

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	220 - 260	0,05 - 0,12	1,0 - 9,5	-	-	-
Aceros aleados	-	-	-	100 - 150	0,05 - 0,10	1,0 - 9,5	-	-	-
Aceros inoxidables	-	-	-	140 - 180	0,05 - 0,10	1,0 - 9,5	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	-	-	-	180 - 300	0,05 - 0,10	1,0 - 9,5	-	-	-
Aluminio y Aleaciones	-	-	-	400 - 750	0,05 - 0,12	1,0 - 9,5	-	-	-
Aleaciones refractarias	-	-	-	35 - 50	0,05 - 0,08	1,0 - 9,5	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

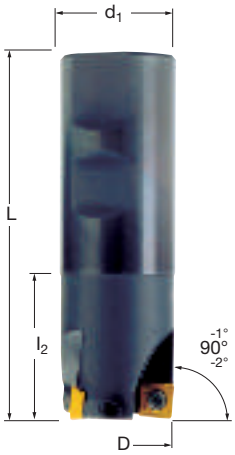


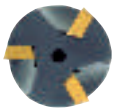
Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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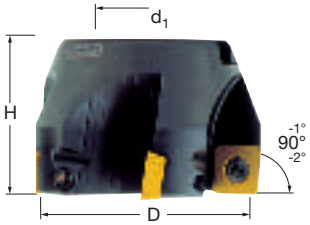
Fresa 7790 VSE 09







Amarre Weldon





Montaje en el eje

7790 VSE 09 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
021809	**7790VSE 09 WA025Z02R**	25	96	40	25	8	2	015269	F3508T	015240	T15
021810	**7790VSE 09 WA032Z03R**	32	100	40	32	8	3	015269	F3508T	015240	T15
021811	**7790VSE 09 WA040Z04R**	40	110	49	32	8	4	015269	F3508T	015240	T15

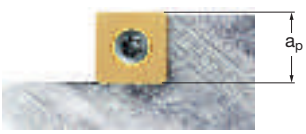
7790 VSE 09 Montaje en el eje

023070	**7790VSE 09 -A040Z04R**	40	32	-	16	8	4	015269	F3508T	015240	T15
021804	**7790VSE 09 -A050Z05R**	50	40	-	22	8	5	015269	F3508T	015240	T15
021805	**7790VSE 09 -A063Z05R**	63	40	-	22	8	5	015269	F3508T	015240	T15
021806	**7790VSE 09 -A080Z06R**	80	50	-	27	8	6	015269	F3508T	015240	T15
021807	**7790VSE 09 -A100Z08R**	100	50	-	32	8	8	015269	F3508T	015240	T15



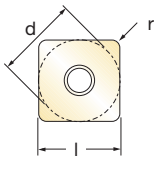
7790 VSE 09 Consejos técnicos

Ejemplo de pedido de la fresa: **7790VSE09-A050Z05R**
Ejemplo de pedido de la plaquita: **SDMT09T308EN-41 PFZ**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7790 VSE 09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017319	**SDET 09 T308EN**	**MP91M**				9,52	9,52	3,97	0,8	0,03
017724	**SDET 09 T308EN**	**PFZ**				9,52	9,52	3,97	0,8	0,03
017725	**SDET 09 T308EN**	**GH1**	♦	♦		9,52	9,52	3,97	0,8	0,02
017325	**SDMT 09 T308EN-41**	**MP91M**		♦♦		9,52	9,52	3,97	0,8	0,04
023362	**SDMT 09 T308EN-41**	**PFZ**				9,52	9,52	3,97	0,8	0,04
014410	**SDMT 09 T308EN-41**	**X500**		♦		9,52	9,52	3,97	0,8	0,04
027736	**SDMT 09 T308EN-41**	**SP6564**		♦♦		9,52	9,52	3,97	0,8	0,04
017327	**SDMW 09 T308TN**	**MP91M**	♦♦			9,52	9,52	3,97	0,8	0,15
027742	**SDMW 09 T308TN**	**SP6564**	♦			9,52	9,52	3,97	0,8	0,15
023363	**SDMW 09 T308TN**	**PFZ**				9,52	9,52	3,97	0,8	0,15
015232	**SDMW 09 T308TN**	**X500**				9,52	9,52	3,97	0,8	0,12

SDET 09_



SDMT 09_ -41



SDMW 09_



Condiciones de corte recomendadas para SD_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	180 - 220	0,15 - 0,25	4,0 - 8,0	220 - 260	0,10 - 0,22	1,0 - 4,0	-	-	-
♦ Aceros aleados	70 - 110	0,15 - 0,22	4,0 - 8,0	100 - 150	0,10 - 0,20	1,0 - 4,0	-	-	-
♦ Aceros inoxidables	-	-	-	140 - 180	0,08 - 0,14	1,0 - 4,0	-	-	-
♦ Inoxidables PH	-	-	-	70 - 85	0,08 - 0,12	1,0 - 4,0	-	-	-
♦ Fundición	140 - 280	0,15 - 0,20	4,0 - 8,0	180 - 300	0,10 - 0,18	1,0 - 4,0	-	-	-
♦ Aluminio y Aleaciones	150 - 400	0,10 - 0,22	3,0 - 7,0	200 - 500	0,08 - 0,18	1,0 - 3,0	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

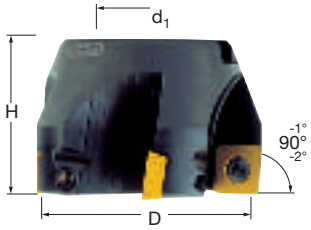


Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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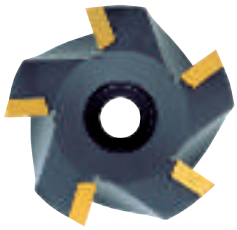
Fresa 7790 VSE 12





7790 VSE 12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D	H	d_1	$a_{p\ max.}$	No. de plaquitas	Recambios EDP#		EDP#	
021812	**7790VSE 12 -A063Z05R**	63	40	22	10,5	5	*015270*	F4011T	*015241*	T20
021813	**7790VSE 12 -A063Z05R**	80	50	27	10,5	6	*015270*	F4011T	*015241*	T20
021814	**7790VSE 12 -A100Z08R**	100	50	32	10,5	8	*015270*	F4011T	*015241*	T20



Montaje en el eje

7790 VSE 12 Consejos técnicos

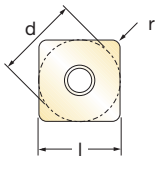


Ejemplo de pedido de la fresa: **7790VSE12-A100Z08R**
Ejemplo de pedido de la plaquita: **SDMW120412TN MP91M**
Para condiciones completas ver pagina: **A288**



Profundidad de corte (a_p)

Plaquitas para 7790 VSE 12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017326	**SDMT 12 0412EN-41**	**MP91M**		◆◆		12,7	12,7	4,76	1,2	0,05
015135	**SDMT 12 0412EN-41**	**PFZ**				12,7	12,7	4,76	1,2	0,05
014411	**SDMT 12 0412EN-41**	**X500**		◆		12,7	12,7	4,76	1,2	0,05
027737	**SDMT 12 0412EN-41**	**SP6564**		◆◆		12,7	12,7	4,76	1,2	0,05
017328	**SDMW 12 0412TN**	**MP91M**	◆◆			12,7	12,7	4,76	1,2	0,15
015136	**SDMW 12 0412TN**	**PFZ**	◆			12,7	12,7	4,76	1,2	0,15
015233	**SDMW 12 0412TN**	**X500**				12,7	12,7	4,76	1,2	0,12

SDMT 12_ -41



SDMW 12_



Condiciones de corte recomendadas para SD_12

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,15 - 0,30	5,0 - 10,0	220 - 260	0,12 - 0,24	1,5 - 5,0	-	-	-
◆ Aceros aleados	70 - 110	0,15 - 0,25	5,0 - 10,0	100 - 150	0,10 - 0,22	1,5 - 5,0	-	-	-
◆ Aceros inoxidables	-	-	-	140 - 180	0,10 - 0,16	1,5 - 5,0	-	-	-
◆ Inoxidables PH	-	-	-	70 - 85	0,08 - 0,14	1,5 - 5,0	-	-	-
◆ Fundición	140 - 280	0,15 - 0,25	5,0 - 10,0	180 - 300	0,10 - 0,20	1,5 - 5,0	-	-	-
◆ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

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Fresa de gran avance 7792 VXD09





Amarre Weldon

7792 VXD09 Mango Weldon Paso ancho

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#	
029461	**7792VXD09WA025Z2R**	25	96	40	25	1,5	2	015269	F3508T	015240	T15
029462	**7792VXD09WA032Z3R**	32	100	40	32	1,5	3	015064	F3510T	015240	T15

7792 VXD09 Montaje en el eje Paso ancho

029463	**7792VXD09-A040Z3R**	40	32	-	16	1,5	3	015064	F3510T	015240	T15

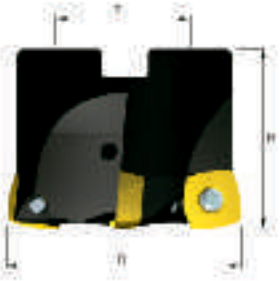
7792 VXD09 Montaje en el eje Paso fino

029464	**7792VXD09-A040Z4R**	40	32	-	16	1,5	4	015064	F3510T	015240	T15

7792 VXD09 Cabeza modular

029465	**7792VXD09S025Z2R35**	25	35	M12	21	1,5	2	015269	F3508T	015240	T15
029466	**7792VXD09S032Z3R43**	32	43	M16	29	1,5	3	015064	F3510T	015240	T15

Amarres para cabezas modulares ver página A228 - A229.



Montaje en el eje



Cabeza modular

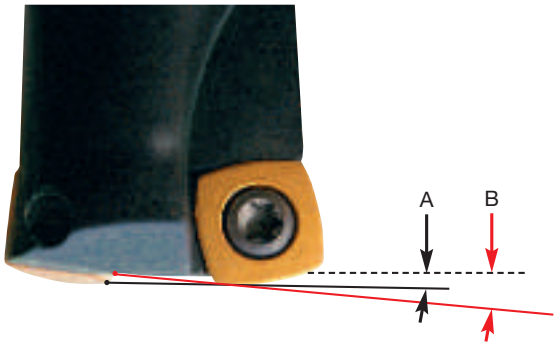
7792 VXD Consejos técnicos

Ejemplo de pedido de la fresa: **7792VXD09WA025Z2R**
Ejemplo de pedido de la plaquita: **XDLW090408SR-D X400**

Angulo de rampa máximo

Referencia	Angulo de rampa máximo A	Angulo de rampa máximo B
7792VXD09WA025Z2R	2.80°	6.30°
7792VXD09WA032Z3R	1.50°	5.00°
7792VXD09-A040Z3R	0.80°	2.70°
7792VXD09-A040Z4R	0.80°	2.70°
7792VXD09S025Z2R35	2.70°	6.30°
7792VXD09S032Z3R43	1.50°	5.00°

Con el ángulo de rampa A, se utiliza solo el exterior de la arista de corte. Con el ángulo de rampa B se utilizan dos aristas de corte (una interior y otra exterior).

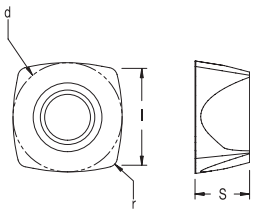


A = max. ángulo de rampa utilizando la totalidad de la arista.
B = max. ángulo de rampa utilizando la totalidad de la arista + el radio interior de la otra.



Profundidad de corte (a_p)

Plaquitas para 7792 VXD09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r
029485	**XDLW090408SR-D**	**X500**				9,52	9,52	4,76	0,8
029486	**XDLW090408SR-D**	**SC3025**				9,52	9,52	4,76	0,8
029487	**XDLW090408SR-D**	**X400**				9,52	9,52	4,76	0,8
029637	**XDLT090408ER-D721**	**GH2**				9,52	9,52	4,76	0,8
029685	**XDLT090408ER-D41**	**X500**				9,52	9,52	4,76	0,8
029686	**XDLT090408ER-D41**	**SP6564**				9,52	9,52	4,76	0,8

XDLW09 -D



XDLT



Condiciones de corte recomendadas para XD_09

Material	▼ *Planeado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p max (mm)	▼▼ *Ranurado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p max (mm)	▼▼▼ *Picado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_e max (mm)
Aceros no aleados	120 - 235	0,3 - 2,0	1,5	120 - 235	0,3 - 1,5	1,5	120 - 235	0,1 - 0,2	6,0
Aceros aleados	70 - 160	0,3 - 2,0	1,5	70 - 160	0,3 - 1,5	1,5	70 - 160	0,1 - 0,16	6,0
Aceros inoxidables	115 - 265	0,2 - 1,0	1,5	115 - 265	0,2 - 0,8	1,5	115 - 265	0,12 - 0,16	6,0
Inoxidables PH	50 - 100	0,02 - 0,6	1,5	50 - 100	0,1 - 0,4	1,5	50 - 100	0,05 - 0,08	6,0
Fundición	150 - 395	0,3 - 2,0	1,5	150 - 395	0,3 - 1,5	1,5	150 - 395	0,1 - 0,2	6,0
Aluminio y Aleaciones	400 - 1000	0,3 - 1,0	1,5	400 - 1000	0,3 - 1,0	1,5	400 - 1000	0,1 - 0,3	6,0
Aleaciones refractarias	25 - 60	0,2 - 0,8	1,5	25 - 60	0,1 - 0,5	1,5	25 - 60	0,05 - 0,1	6,0
Aceros duros (52-56 HRC)	35 - 100	0,3 - 1,0	1,5	35 - 100	0,3 - 0,8	1,5	35 - 100	0,08 - 0,12	6,0

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	**M**	Aceros inoxidables	**K**	Fundición	**S**	Aleaciones refractarias
P	Aceros aleados	**M**	Inoxidables PH	**N**	Aluminio y Aleaciones	**H**	Materiales duros

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Montaje en el eje

7792 VXD12 Montaje en el eje Paso ancho

		Dimensiones (mm)						Recambios			
EDP #	Referencia	D	L/H	l_2	d_1	a_p max.	No. de dientes	EDP#		EDP#	
029467	**7792VXD12-A052Z3R**	52	40	-	22	2,5	3	015263	D4012T	015240	T15
029469	**7792VXD12-A063Z4R**	63	40	-	22	2,5	4	015263	D4012T	015240	T15
029472	**7792VXD12-A066Z4R**	66	40	-	22	2,5	4	015263	D4012T	015240	T15
029471	**7792VXD12-A080Z5R**	80	50	-	27	2,5	5	015263	D4012T	015240	T15

7792 VXD12 Montaje en el eje Paso fino

029468	**7792VXD12-A052Z4R**	52	40	-	22	2,5	4	015263	D4012T	015240	T15
029470	**7792VXD12-A063Z5R**	63	40	-	22	2,5	5	015263	D4012T	015240	T15
029473	**7792VXD12-A066Z5R**	66	40	-	22	2,5	5	015263	D4012T	015240	T15

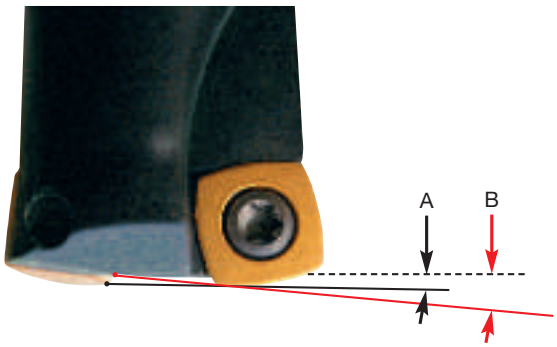
7792 VXD Consejos técnicos

Ejemplo de pedido de la fresa: **7792VXD12-A066Z5R**
Ejemplo de pedido de la plaquita: **XDLW120508SR-D SC3025**

Angulo de rampa máximo

Referencia	Angulo de rampa máximo A	Angulo de rampa máximo B
7792VXD12-A052Z3R	0.80°	2.70°
7792VXD12-A052Z4R	0.80°	2.70°
7792VXD12-A063Z4R	0.60°	1.80°
7792VXD12-A063Z5R	0.60°	1.80°
7792VXD12-A066Z4R	0.45°	1.80°
7792VXD12-A066Z5R	0.45°	1.80°
7792VXD12-A080Z5R	0.45°	0.90°

Con el ángulo de rampa A, se utiliza solo el exterior de la arista de corte. Con el ángulo de rampa B se utilizan dos aristas de corte (una interior y otra exterior).

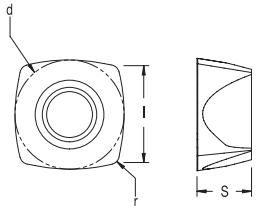


A = max. ángulo de rampa utilizando la totalidad de la arista.
B = max. ángulo de rampa utilizando la totalidad de la arista + el radio interior de la otra.



Profundidad de corte (a_p)

Plaquitas para 7792 VXD12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r
029488	**XDLW120508SR-D**	**X500**				12,7	12,7	5,56	0,8
029489	**XDLW120508SR-D**	**SC3025**				12,7	12,7	5,56	0,8
029490	**XDLW120508SR-D**	**X400**				12,7	12,7	5,56	0,8
029638	**XDLT120508ER-D721**	**GH2**				12,7	12,7	5,56	0,8
029682	**XDLT120508ER-D41**	**X500**				12,7	12,7	5,56	0,8
029683	**XDLT120508ER-D41**	**SP6564**				12,7	12,7	5,56	0,8

XDLW09 -D



XDLT



Condiciones de corte recomendadas para XD_12

Material	▼ *Planeado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p max (mm)	▼▼ *Ranurado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p max (mm)	▼▼▼ *Picado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_e max (mm)
Aceros no aleados	120 - 235	0,3 - 3,0	2,5	120 - 235	0,3 - 2,0	2,0	120 - 235	0,1 - 0,25	9,0
Aceros aleados	70 - 160	0,3 - 3,0	2,5	70 - 160	0,3 - 2,0	2,0	70 - 160	0,1 - 0,18	9,0
Aceros inoxidables	115 - 265	0,2 - 1,2	2,5	115 - 265	0,2 - 1,0	2,0	115 - 265	0,12 - 0,18	9,0
Inoxidables PH	50 - 100	0,02 - 0,7	2,5	50 - 100	0,1 - 0,6	2,0	50 - 100	0,05 - 0,1	9,0
Fundición	150 - 395	0,3 - 3,0	2,5	150 - 395	0,3 - 2,0	2,0	150 - 395	0,1 - 0,25	9,0
Aluminio y Aleaciones	400 - 1000	0,3 - 1,5	2,5	400 - 1000	0,3 - 1,5	2,0	400 - 1000	0,1 - 0,4	9,0
Aleaciones refractarias	25 - 60	0,2 - 1,0	2,5	25 - 60	0,1 - 0,7	2,0	25 - 60	0,05 - 0,12	9,0
Aceros duros (52-56 HRC)	35 - 100	0,3 - 1,5	2,5	35 - 100	0,3 - 1,0	2,0	35 - 100	0,08 - 0,15	9,0

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



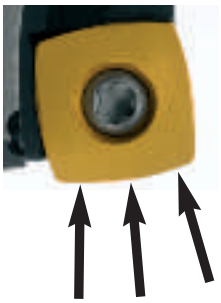
Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Ventajas

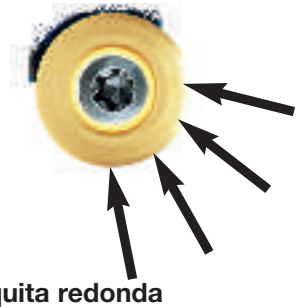
Las ventajas al planear o fabricar cavidades con la fresa de gran avance Stellram son numerosas.

El diseño único del ángulo de ataque de la plaquita así como el del su alojamiento aseguran que las fuerzas de corte vayan predominantemente dirigidas axialmente. El ejemplo muestra que con las plaquitas redondas la herramienta está sometida a fuerzas complejas con el resultado de altos niveles de vibración y deterioro de la arista de corte.



7792VXD

- Esfuerzos de corte predominantemente axiales.
- La relación entre la arista de corte y la pieza a mecanizar es de lo más estable.
- Resultado grandes avances y duración consistente.



Fresa a plaquita redonda

- Fuerzas tangenciales alrededor del radio.
- Conducen a vibraciones y deterioro de la arista de corte.
- Conducen a la disminución del avance y a una menor productividad.

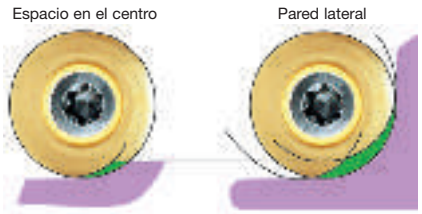
La 7792VXD mecaniza con un volumen constante de viruta a lo largo de toda la mecanización de cavidades y produce una pared lateral cercana al perfil.

Las fresas con plaquita redonda incrementan el volumen de viruta a través del proceso.



7792VXD

- Sección de corte (volumen de viruta) constante independientemente de su posición en la cavidad.
- Produce una pared lateral cercana al perfil.
- Paredes laterales cercanas a escuadra posibles.

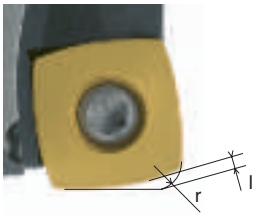


Plaquitas redondas

- Mayor superficie de contacto.
- Incremente la sección de la viruta al mecanizar la pared lateral.
- Vibraciones en las esquinas.
- Ondulación de la pared lateral.

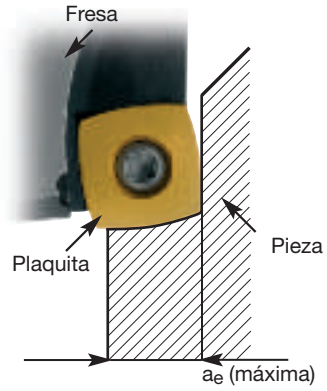
Programa CNC – Definición del radio

Para la utilización de de un CAD/CAM común, el sistema requiere que las dimensiones de una plaquita redonda sean conocidas para mecanizar cavidades. Esto se encuentra disponible con la fresa 7792VXD como se muestra a continuación en la tabla de referencia.

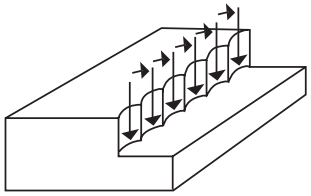


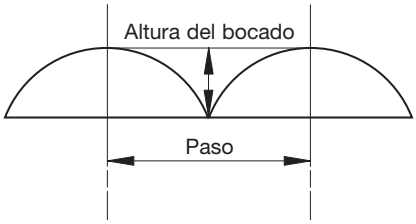
plaquitas	Dimensión (mm)	
Designación	r	l
XD**090408	2.01	0.78
XD**120508	2.50	1.08

Definición de la herramienta – Altura del bocado y paso							
	Definición de la herramienta (mm)						
Diámetro	25	32	40	52	63	66	80
Dimensión de la plaquita	9	9	9	12	12	12	12
a_e max	6,0	6,0	6,0	9,0	9,0	9,0	9,0
Altura del bocado	Paso (mm)						
0,25	4,97	5,63	6,30	7,19	7,92	8,11	8,93
0,50	7,00	7,94	8,89	10,15	11,18	11,45	12,61
0,75	8,53	9,68	10,85	12,40	13,67	13,99	15,42
1,0	9,80	11,14	12,49	14,28	15,75	16,12	17,78
2,0	13,56	15,49	17,44	20,00	22,09	22,63	24,98
3,0	16,25	18,65	21,07	24,25	26,83	27,50	30,40
4,0	18,33	21,17	24,00	27,71	30,72	31,50	34,87
5,0	20,00	23,24	26,46	30,66	34,06	34,93	38,73
6,0	**21,35**	**24,98**	**28,57**	33,23	36,99	37,95	42,14
7,0				35,50	39,60	40,64	45,21
8,0				37,52	41,95	43,08	48,00
9,0				**39,34**	**44,09**	**45,30**	**50,56**



La altura del bocado se calcula en relación con el paso.





La pasada lateral máxima está directamente relacionada con la longitud de la arista de corte de la plaquita.

Para plaquitas tipo: **XD…09 el a_e, max es 6mm.**

Para plaquitas tipo: **XD…12 el a_e, max es 9mm.**

La arista de corte no debería de continuar en contacto con el material tras el mecanizado para mantener la calidad de dicha arista.

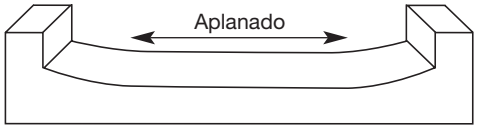
- **Capacidad de interpolación helicoidal para la línea de productos 7792VXD**

Helical interpolation Dia. min max (mm)		
Fresas diá.	**Agujero min.**	**Agujero max.**
25	34	48
32	48	62
40	64	78
52	82	102
63	104	124
66	110	130
80	138	158



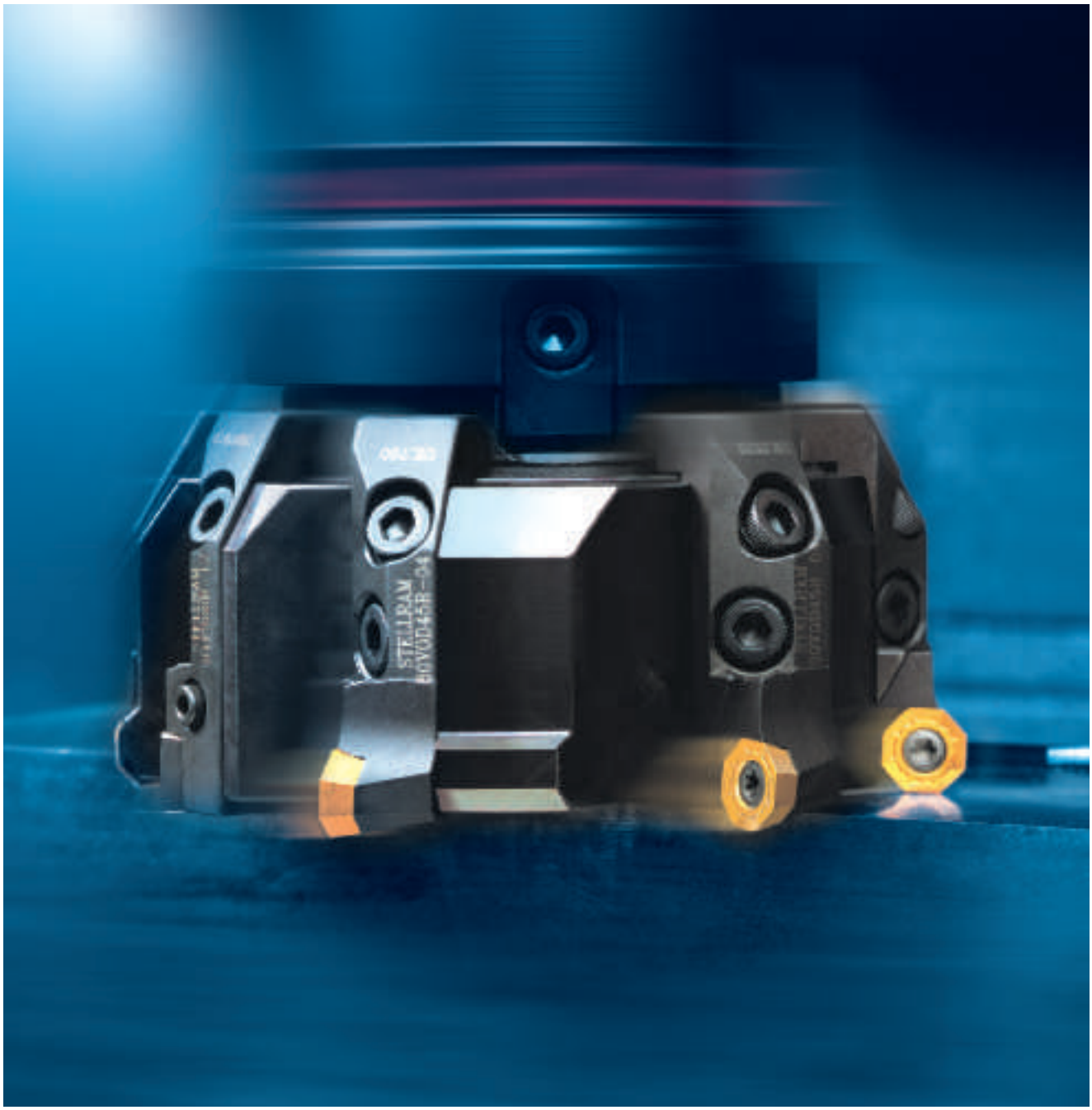
- **Operación de planeado aplanado máximo para 7792VXD**

Superficie máxima planeada (mm)	
Fresas diá.	**Aplanado**
25	11.86
32	18.77
40	26.75
52	33.60
63	44.61
66	47.61
80	61.60



Fresas de Planear/Cartuchos

Cuerpos de fresa, artuchos/Fresas de planear



La característica de la totalidad de los cartuchos Stellram, con diseño patentado es la de mantener la precisión en el posicionamiento aun después de un choque.

El único tornillo de amarre y ajuste trabaja en oposición a los otros permitiendo la regulación de cada uno de ellos con una precisión de 0.004 mm.



Aplicaciones – Fresas de planeado/Cartuchos



Fresas de planeado



Fresas de planeado



FRESAS 8000 V CON PASO DESIGUAL

Fresas de la gama **8000 V** (Ø100 – 315mm) con cartuchos intercambiables tiene un paso medio y una división de los dientes desigual. Este diseño ha sido desarrollado tras un extenso estudio del fenómeno de las vibraciones. Son especialmente recomendadas para el planeado de piezas fundidas así como para todas las piezas con agujeros o con paredes delgadas, también se pueden utilizar para el fresado en escuadra. Para un avance de mesa dado, el paso medio permite un menor avance por diente evitando los riesgos de rotura o despostillado de las aristas de la pieza.

Los cartuchos se cambian rápidamente gracias a su talón rectificado, con lo cual no es necesario ningún tipo de regulación. La precisión entre ellos se encuentra dentro de los 0.05 mm. Si un alto grado de precisión es necesario, cada cartucho puede ser regulado individualmente con una precisión de 2-5 m. En caso de choque accidental, el talón se despega automáticamente permitiendo que el cuerpo permanezca intacto.

8010 V FRESAS CON PASO MEDIO DIVISION IGUAL

Fresas con cartuchos intercambiables (paso medio división igual)
Para el mecanizado de las aleaciones refractarias, hemos modificado nuestra fresa a cartuchos. Disponible en 100 – 200 mm, los cuerpos de las fresas **8010 V** tienen las mismas características que los cuerpos de las fresas **8000 V** y **8100V**, pero la distribución de los dientes es regular.
El numero de dientes es igual que en el caso de las fresas **8000 V**.

La fresa **8010 V** es la mejor opción para el mecanizado de desbaste, semi-acabado y acabado de las aleaciones refractarias

Precauciones
Con velocidades superiores a los 80 m/min, la división desigual es esencial para reducir la posibilidad de vibraciones.

8100 V FRESAS CON PASO ANCHO DIVISION DESIGUAL

La serie de fresas **8100 V** con cartuchos intercambiables son de paso ancho y están disponibles en @ 125 – 250 mm. Están fabricadas con paso de los dientes desigual basándose en el fenómeno de las vibraciones estudiado por universidades de gran prestigio Complementan perfectamente la gama **8000 V**, fresas de paso medio. Tienen una o dos posiciones para plaquitas rascadoras.

Las fresas de la gama **8100 V** son particularmente indicadas para el planeado de grandes piezas de acero o materiales ligeros. Con grades profundidades de corte, su reducido numero de dientes permite la máxima explotación de la potencia de la maquina, y evita las vibraciones que se encuentran trabajando con largos cabezales, o cuando se mecaniza el material a gran distancia de la mesa de la maquina.

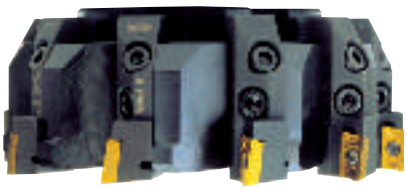
Los cartuchos intercambiables son los mismos que los utilizados en la gama de fresas **8100 V**. Los talones apoyan en una pista de regulación rectificada, permitiendo un rápido montaje con una precisión axial de 0.05 mm. Pero pueden ser ajustados individualmente con una precisión de 2-5 m. si la tolerancia necesaria lo requiere. En caso de choque accidental, el cuerpo de fresa permanece intacto ya que los talones de los cartuchos se separa de la pista de regulación.



8000 V

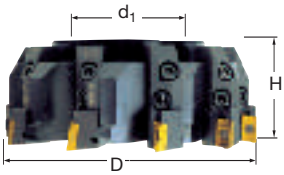


8010 V



8100 V

Cuerpos de fresa 8_0 V





Cuerpo de fresa

8000 V Paso desigual

EDP #	Referencia	Dimensiones (mm) D	D (x90°)	H	d_1	No. de dientes	Recambios EDP#		Kg incl. Cartuchos
021921	**8000V100RBODY**	100	106	68	32	6	022646	7065	2,29
021922	**8000V125RBODY**	125	131	63	40	8	022646	7065	3,04
021923	**8000V160RBODY**	160	166	63	40	10	022646	7065	5,43
021924	**8000V200RBODY**	200	206	63	60	12	022646	7065	8,77
021925	**8000V250RBODY**	250	256	63	60	16	022646	7065	15,48
021926	**8000V315RBODY**	315	321	80	60	20	022646	7065	29,85

8010 V Paso igual

023071	**8010V100RBODY**	100	106	68	32	6	022646	7065	2,29
021973	**8010V125RBODY**	125	131	63	40	8	022646	7065	3,04
021974	**8010V160RBODY**	160	166	63	40	10	022646	7065	5,43
021975	**8010V200RBODY**	200	206	63	60	12	022646	7065	8,77

*8100 V Paso desigual

022042	**8100V125RBODY**	125	131	63	40	6+1	022646	7065	3,04
022043	**8100V160RBODY**	160	166	63	40	8+1	022646	7065	5,43
022044	**8100V200RBODY**	200	206	63	60	10+2	022646	7065	8,77
022045	**8100V250RBODY**	250	256	63	60	10+2	022646	7065	15,48

81 FS 00 Cartuchos

EDP #	Referencia	a mm (x90°)	Recambios EDP#		EDP#		EDP#		Plaquitas
014953	**81FS00R-12**	0,03-0,05	015266	D5013T	15241	T20	016858	72.602	SPHX12M512-EN

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

8_0 V Consejos técnicos

Ejemplo de pedido de la fresa: **8010V100RBODY**

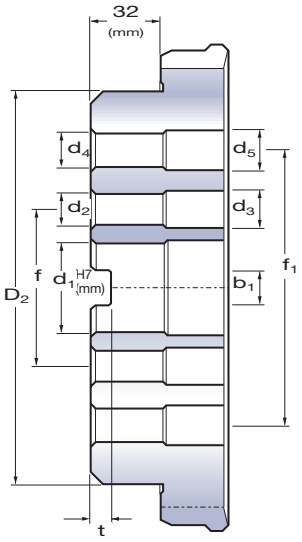




81 FS 00 Cartuchos

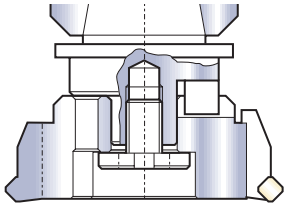
Montaje fresas 8_0 V & Dimensión de los amarres

Ø Fresa D	Amarre	Dimensiones (mm)									
		$d_{1\ H7}$	D_2	f	f_1	d_2	d_3	d_4	d_5	b_1	t
Ø 100	Ø 32 mm Bore	32	53	-	-	-	-	-	-	14,4	8
Ø 125	Ø 40 mm Bore	40	77	-	-	-	-	-	-	16,4	9
Ø 160	Ø 40 mm Bore	40	100	66,7	-	14	20	-	-	16,4	9
Ø 200	Ø 60 mm Bore	60	136	101,6	-	18	26	-	-	25,7	14
Ø 250	Ø 60 mm Bore	60	180	101,6	-	18	26	-	-	25,7	14
Ø 315	Ø 60 mm Bore	60	240	101,6	177,8	18	26	22	32	25,7	14



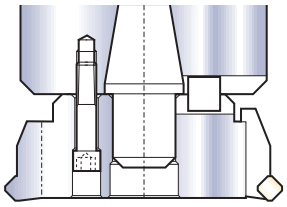
Montaje en cabezal

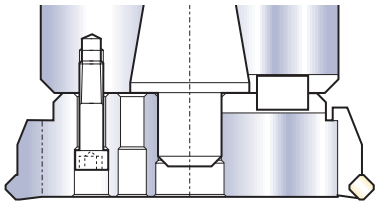
Para fresas 100, 125 & 160 mm.



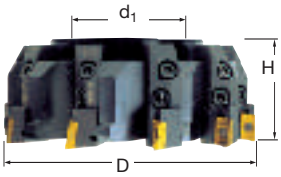
Montaje en cabezal de 7/24 con mandrino de centrado

Cabezal 7/24 No. 40 para fresa 160 mm.
Cabezal 7/24 No. 50 para fresas de 200 a 315 mm.
Cabezal 7/24 N0. 60 para fresas de 315 mm.











Cuerpo de fresa & Cartuchos

8000 VA 90_ 16 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)							Recambios			
EDP #	Referencia	D	H	d_1	a_p	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
021817	**8000VA90-100R 16**	106	68	32	16	6	015390	80VA90R-16	015262	D4010T	015240	T15
021819	**8000VA90-125R 16**	131	63	40	16	8	015390	80VA90R-16	015262	D4010T	015240	T15
021821	**8000VA90-160R 16**	166	63	40	16	10	015390	80VA90R-16	015262	D4010T	015240	T15
021823	**8000VA90-200R 16**	206	63	60	16	12	015390	80VA90R-16	015262	D4010T	015240	T15
021825	**8000VA90-250R 16**	256	63	60	16	16	015390	80VA90R-16	015262	D4010T	015240	T15
021827	**8000VA90-315R 16**	321	80	60	16	20	015390	80VA90R-16	015262	D4010T	015240	T15

8010 VA 90_ 16 Paso igual – Conjunto Fresa & Cartuchos

021929	**8010VA90-100R 16**	106	68	32	16	6	015390	80VA90R-16	015262	D4010T	015240	T15
021931	**8010VA90-125R 16**	131	63	40	16	8	015390	80VA90R-16	015262	D4010T	015240	T15
021933	**8010VA90-160R 16**	166	63	40	16	10	015390	80VA90R-16	015262	D4010T	015240	T15
021935	**8010VA90-200R 16**	206	63	60	16	12	015390	80VA90R-16	015262	D4010T	015240	T15

8_0 VA 90_ 16 Recambios cartuchos

EDP #	Referencia cartucho	EDP#	
015390	**80VA90R- 16**	015255	7065



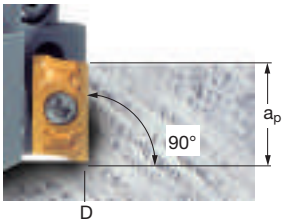
8_0 VA90_ 16 Consejos técnicos

Ejemplo de pedido de la fresa: **8000VA90-315R16**
Ejemplo de pedido de la plaquita: **APHT1604PDTR-42 PFZ**
Para condiciones completas ver pagina: **A288**

En caso de utilización de un radio superior a 2 mm, los cartuchos deben de ser modificados.

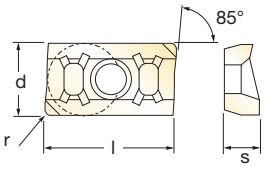
Condiciones de corte recomendadas para AP_16

Material	▼ Desbaste			▼▼ Semi-acabado			▼▼▼ Acabado		
	Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,14 - 0,40	8,0 - 16,0	220 - 260	0,12 - 0,35	3,0 - 8,0	220 - 300	0,15 - 0,45	0,2 - 3,0
Aceros aleados	70 - 110	0,14 - 0,35	8,0 - 16,0	100 - 150	0,12 - 0,30	3,0 - 8,0	100 - 195	0,15 - 0,40	0,2 - 3,0
Aceros inoxidables	-	-	-	140 - 180	0,12 - 0,25	3,0 - 8,0	180 - 230	0,15 - 0,28	0,2 - 3,0
Inoxidables PH	-	-	-	70 - 85	0,10 - 0,20	3,0 - 8,0	80 - 100	0,10 - 0,20	0,2 - 3,0
Fundición	140 - 280	0,14 - 0,28	8,0 - 16,0	180 - 300	0,12 - 0,25	3,0 - 8,0	200 - 350	0,18 - 0,30	0,2 - 3,0
Aluminio y Aleaciones	275 - 450	0,06 - 0,25	8,0 - 16,0	400 - 750	0,04 - 0,20	3,0 - 8,0	700 - 1000	0,08 - 0,30	0,2 - 3,0
Aleaciones refractarias	-	-	-	35 - 50	0,10 - 0,20	3,0 - 8,0	45 - 60	0,10 - 0,20	0,2 - 3,0
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,04 - 0,08	1,5 - 3,5	50 - 100	0,06 - 0,10	0,2 - 1,5

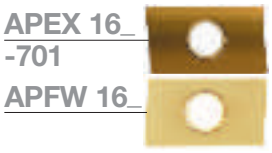


Profundidad de corte (a_p)

Plaquitas para 8_0 VA90_ 16



EDP #	Referencia	Calidad	Operaciones & Material: Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
017621	**APEX 16 04PDER-701**	**PFZ**				9,52	16,66	4,76	Faceta	0,02
017623	**APEX 16 04PDFR-701**	**SFZ**				9,52	16,66	4,76	Faceta	0,02
014066	**APEX 16 04PDFR-701**	**GH1**				9,52	16,66	4,76	Faceta	0,02
017291	**APFW 16 04PDER**	**MP91M**				9,52	16,66	4,76	Faceta	0,04
017627	**APFW 16 04PDTR**	**X44**				9,52	16,66	4,76	Faceta	0,1
017628	**APFW 16 04PDTR**	**GH1**				9,52	16,66	4,76	Faceta	0,1
027883	**APFW 16 04PDTR**	**SC3025**				9,52	16,66	4,76	Faceta	0,1
017626	**APFW 16 04PDTR**	**SF30**				9,52	16,66	4,76	Faceta	0,1
017629	**APHT 16 04PDTR**	**SFZ**		♦	♦	9,52	16,66	4,76	Faceta	0,1
017632	**APHT 16 04PDER**	**SF30**				9,52	16,66	4,76	Faceta	0,05
017633	**APHT 16 04PDER**	**SFZ**	♦	♦	♦	9,52	16,66	4,76	Faceta	0,05
015154	**APHT 16 04PDFR**	**GH1**				9,52	16,66	4,76	Faceta	0,02
017293	**APHT 16 04PDTR-42**	**MP91M**				9,52	16,66	4,76	Faceta	0,1
017634	**APHT 16 04PDTR-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
015155	**APHT 16 04PDTR-42**	**X500**				9,52	16,66	4,76	Faceta	0,1
027718	**APHT 16 04PDTR-42**	**SP6564**				9,52	16,66	4,76	Faceta	0,1
011649	**APKT 16 04PDER-3M**	**MP91M**				9,52	16,66	4,76	Faceta	0,1
017294	**APKT 16 04PDER-43**	**MP91M**	♦			9,52	16,66	4,76	Faceta	0,08
014067	**APKT 16 04PDER-43**	**PFZ**				9,52	16,66	4,76	Faceta	0,08
015156	**APKT 16 04PDER-43**	**X500**				9,52	16,66	4,76	Faceta	0,08
027887	**APKT 16 04PDER-43**	**SC3025**	♦	♦	♦	9,52	16,66	4,76	Faceta	0,08
027720	**APKT 16 04PDER-43**	**SP6564**	♦♦			9,52	16,66	4,76	Faceta	0,08
023115	**APKT 16 04PDER-45**	**X500**				9,52	16,66	4,76	Faceta	0,06
023114	**APKT 16 04PDER-45**	**MP91M**				9,52	16,66	4,76	Faceta	0,06
027887	**APKT 16 04PDER-45**	**SP6564**		♦♦	♦♦	9,52	16,66	4,76	Faceta	0,06
023102	**APET 16 0402TR-42**	**PFZ**				9,52	16,66	4,76	0,2	0,1
023103	**APET 16 0408TR-42**	**PFZ**				9,52	16,66	4,76	0,8	0,1
023104	**APET 16 0410TR-42**	**PFZ**				9,52	16,66	4,76	1,0	0,1
023105	**APET 16 0415TR-42**	**PFZ**				9,52	16,66	4,76	1,5	0,1
023106	**APET 16 0420TR-42**	**PFZ**				9,52	16,66	4,76	2,0	0,1
017618	**APET 16 0425TR-42**	**MP91M**				9,52	16,66	4,76	2,5	0,1
017619	**APET 16 0425TR-42**	**X500**				9,52	16,66	4,76	2,5	0,1
023107	**APET 16 0430TR-42**	**PFZ**				9,52	16,66	4,76	3,0	0,1
017290	**APET 16 0440TR-42**	**MP91M**				9,52	16,66	4,76	4,0	0,1
024921	**APET 16 0440TR-42**	**PFZ**				9,52	16,66	4,76	4,0	0,1
017620	**APET 16 0440TR-42**	**X500**				9,52	16,66	4,76	4,0	0,1
025804	**APET 16 0460TR-42**	**PFZ**				9,52	16,66	4,76	6,0	0,1
027863	**APHT 16 0408ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,66	4,76	0,8	0,1
027869	**APHT 16 0408ER-46**	**X500**	♦♦♦			9,52	16,67	4,76	0,8	0,1
027864	**APHT 16 0416ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,68	4,76	1,6	0,1
027870	**APHT 16 0416ER-46**	**X500**	♦♦♦			9,52	16,69	4,76	1,6	0,1
027865	**APHT 16 0424ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,70	4,76	2,4	0,1
027871	**APHT 16 0424ER-46**	**X500**	♦♦♦			9,52	16,71	4,76	2,4	0,1
027862	**APHT 16 0432ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,72	4,76	3,2	0,1
027866	**APHT 16 0432ER-46**	**X500**	♦♦♦			9,52	16,73	4,76	3,2	0,1
027873	**APHT 16 0440ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,74	4,76	4,0	0,1
027873	**APHT 16 0440ER-46**	**X500**	♦♦♦			9,52	16,75	4,76	4,0	0,1
027887	**APHT 16 0450ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,76	4,76	5,0	0,1
027874	**APHT 16 0450ER-46**	**X500**	♦♦♦			9,52	16,77	4,76	5,0	0,1
027868	**APHT 16 0464ER-46**	**SP6564**		♦♦♦	♦♦♦	9,52	16,78	4,76	6,4	0,1
027875	**APHT 16 0464ER-46**	**X500**	♦♦♦			9,52	16,79	4,76	6,4	0,1
017636	**APHW 16 0440TR**	**X44**				9,52	16,66	4,76	4,0	0,1
011488	**APKT 16 0408E-2C**	**MP91M**				9,52	16,66	4,76	0,8	0,10
017633	**APKT 16 0408E-2C**	**PFZ**				9,52	16,66	4,76	0,8	0,10
017228	**APMT 16 0412E-2C**	**MP91M**				9,52	16,66	4,76	1,2	0,1
013944	**APMT 16 0416E-2C**	**MP91M**				9,52	16,66	4,76	1,6	0,1
013945	**APMT 16 0424E-2C**	**MP91M**				9,52	16,66	4,76	2,4	0,1
013946	**APMT 16 0432E-2C**	**MP91M**				9,52	16,66	4,76	3,2	0,1
017229	**APMT 16 0440E-2C**	**MP91M**				9,52	16,66	4,76	4,0	0,1
017230	**APMT 16 0448E-2C**	**MP91M**				9,52	16,66	4,76	4,8	0,1
013947	**APMT 16 0464E-2C**	**MP91M**				9,52	16,66	4,76	6,4	0,1













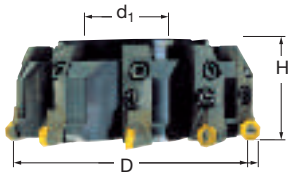
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®







Cuerpo de fresa & Cartuchos

8000 VOD45_ 04 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D	H	d_1	a_p	a_p max.	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
021837	**8000VOD45-100R-04**	100	68	32	3,5	8	6	014313	80VOD45R-04	015270	F4011T	015241	T20
021838	**8000VOD45-125R-04**	125	63	40	3,5	8	8	014313	80VOD45R-04	015270	D4010T	015241	T20
021839	**8000VOD45-160R-04**	160	63	40	3,5	8	10	014313	80VOD45R-04	015270	D4010T	015241	T20
021840	**8000VOD45-200R-04**	200	63	60	3,5	8	12	014313	80VOD45R-04	015270	D4010T	015241	T20
021841	**8000VOD45-250R-04**	250	63	60	3,5	8	16	014313	80VOD45R-04	015270	D4010T	015241	T20
021842	**8000VOD45-315R-04**	315	80	60	3,5	8	20	014313	80VOD45R-04	015270	D4010T	015241	T20

8010 VOD45_ 04 Paso igual – Conjunto Fresa & Cartuchos

021936	**8010VOD45-100R-04**	100	68	32	3,5	8	6	014313	80VOD45R-04	015270	F4011T	015241	T20
021937	**8010VOD45-125R-04**	125	63	40	3,5	8	8	014313	80VOD45R-04	015270	F4011T	015241	T20
021938	**8010VOD45-160R-04**	160	63	40	3,5	8	10	014313	80VOD45R-04	015270	F4011T	015241	T20
021939	**8010VOD45-200R-04**	200	63	60	3,5	8	12	014313	80VOD45R-04	015270	F4011T	015241	T20

8100 VOD45_ 04 Paso desigual – Conjunto Fresa & Cartuchos

021982	**8100VOD45-125R-04**	125	63	40	3,5	8	6+1	014313	80VOD45R-04	015270	F4011T	015241	T20
021983	**8100VOD45-160R-04**	160	63	40	3,5	8	8+1	014313	80VOD45R-04	015270	F4011T	015241	T20
021984	**8100VOD45-200R-04**	200	63	60	3,5	8	10+2	014313	80VOD45R-04	015270	F4011T	015241	T20
021985	**8100VOD45-250R-04**	250	63	60	3,5	8	10+2	014313	80VOD45R-04	015270	F4011T	015241	T20

8_0 VOD45_ 04 Recambios cartuchos

EDP #	Referencia cartucho	EDP#	
014313	**80VOD45R- 04**	015255	7065

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

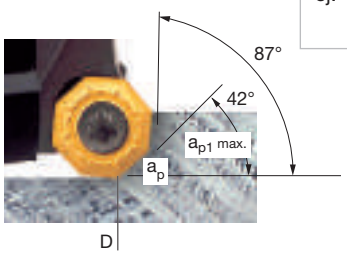


8_0 VOD45_ 04 Consejos técnicos

Ejemplo de pedido de la fresa: **8010VOD45-100R**
Ejemplo de pedido de la plaquita: **ODET0404APEN-44 MP91M**
Para condiciones completas ver pagina: **A288**

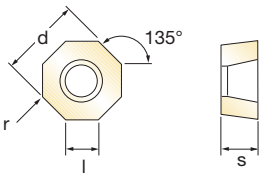
Compensación de avance: Para un ángulo de corte de 45°, dividir el valor h_m por el seno del ángulo de corte (seno de 45° = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 8_0 VOD45_ 04



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
022199	**ODET 04 04APEN-44**	**MP91M**			◆	12,7	4,0	4,76	Faceta	0,04
022198	**ODET 04 04APEN-44**	**X500**			◆◆	12,7	4,0	4,76	Faceta	0,04
027722	**ODET 04 04APEN-44**	**SP6564**			◆◆	12,7	4,0	4,76	Faceta	0,04
024911	**ODET 04 04APFN-441**	**GH1**	◆	◆	◆	12,7	4,0	4,76	Faceta	0,02
027884	**ODEW 04 04APTR-RA**	**SC3025**	◆	◆	◆	12,7	4,0	4,76	Faceta	0,19
017775	**ODMT 04 04APEN-41**	**MP91M**		◆		12,7	4,0	4,76	Faceta	0,04
022061	**ODMT 04 04APEN-41**	**X500**		◆◆		12,7	4,0	4,76	Faceta	0,04
027724	**ODMT 04 04APEN-41**	**SP6564**		◆◆		12,7	4,0	4,76	Faceta	0,04
017303	**ODMT 04 0408EN-41**	**MP91M**				12,7	4,0	4,76	0,8	0,04
015143	**ODMT 04 0408EN-41**	**X500**	◆◆			12,7	4,0	4,76	0,8	0,04
027723	**ODMT 04 0408EN-41**	**SP6564**	◆			12,7	4,0	4,76	0,8	0,04
017304	**ODMW 04 0408SN**	**MP91M**	◆			12,7	4,0	4,76	0,8	0,27
015130	**ODMW 04 0408SN**	**PFZ**				12,7	4,0	4,76	0,8	0,27
029096	**ODMW 04 0408SN**	**SC3025**				12,7	4,0	4,76	0,8	0,27
017671	**ODMW 04 0408SN**	**SF30**				12,7	4,0	4,76	0,8	0,27
024115	**ODMW 04 0408SN**	**X44**				12,7	4,0	4,76	0,8	0,27
017672	**ODMW 04 0408SN**	**X500**				12,7	4,0	4,76	0,8	0,27
027197	**ODMW 04 0408SN**	**SP6564**	◆			12,7	4,0	4,76	0,8	0,27



Condiciones de corte recomendadas para OD_04

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,30 - 0,50	2,0 - 3,5	220 - 260	0,20 - 0,35	1,0 - 2,0	220 - 300	0,08 - 0,15	0,2 - 1,0
◆ Aceros aleados	70 - 110	0,27 - 0,40	2,0 - 3,5	100 - 150	0,20 - 0,30	1,0 - 2,0	100 - 195	0,08 - 0,15	0,2 - 1,0
◆ Aceros inoxidables	120 - 140	0,20 - 0,35	2,0 - 3,5	140 - 180	0,15 - 0,25	1,0 - 2,0	180 - 230	0,05 - 0,15	0,2 - 1,0
◆ Inoxidables PH	55 - 70	0,15 - 0,25	2,0 - 3,5	70 - 85	0,10 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
◆ Fundición	155 - 290	0,30 - 0,35	2,0 - 3,5	195 - 310	0,15 - 0,25	1,0 - 2,0	215 - 360	0,05 - 0,15	0,2 - 1,0
◆ Aluminio y Aleaciones	275 - 450	0,20 - 0,30	2,0 - 3,5	400 - 750	0,10 - 0,25	1,0 - 2,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
◆ Aleaciones refractarias	25 - 40	0,15 - 0,25	2,0 - 3,5	35 - 50	0,10 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

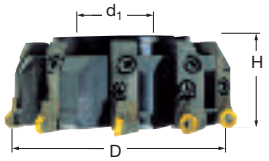
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

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Cuerpo de fresa & Cartuchos

8000 VOD 45_ 06 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D	H	d_1	a_p	$a_{p1\ max.}$	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
026638	**8000VOD45-100R-06**	100	68	32	4,5	10,0	6	026587	80VOD45R-06	015270	F4011T	015241	T20
026639	**8000VOD45-125R-06**	125	63	40	4,5	10,0	8	026587	80VOD45R-06	015270	D4010T	015241	T20
026640	**8000VOD45-160R-06**	160	63	40	4,5	10,0	10	026587	80VOD45R-06	015270	D4010T	015241	T20
026641	**8000VOD45-200R-06**	200	63	60	4,5	10,0	12	026587	80VOD45R-06	015270	D4010T	015241	T20
026642	**8000VOD45-250R-06**	250	63	60	4,5	10,0	16	026587	80VOD45R-06	015270	D4010T	015241	T20
026643	**8000VOD45-315R-06**	315	80	60	4,5	10,0	20	026587	80VOD45R-06	015270	D4010T	015241	T20

8010 VOD45_ 06 Paso igual – Conjunto Fresa & Cartuchos

026645	**8010VOD45-100R-06**	100	68	32	4,5	10,0	6	026587	80VOD45R-06	015270	F4011T	015241	T20
026646	**8010VOD45-125R-06**	125	63	40	4,5	10,0	8	026587	80VOD45R-06	015270	F4011T	015241	T20
026647	**8010VOD45-160R-06**	160	63	40	4,5	10,0	10	026587	80VOD45R-06	015270	F4011T	015241	T20
026648	**8010VOD45-200R-06**	200	63	60	4,5	10,0	12	026587	80VOD45R-06	015270	F4011T	015241	T20

*8100 VOD45_ 06 Paso desigual – Conjunto Fresa & Cartuchos

026649	**8100VOD45-125R-06**	125	63	40	4,5	10,0	6+1	026587	80VOD45R-06	015270	F4011T	015241	T20
026650	**8100VOD45-160R-06**	160	63	40	4,5	10,0	8+1	026587	80VOD45R-06	015270	F4011T	015241	T20
026651	**8100VOD45-200R-06**	200	63	60	4,5	10,0	10+2	026587	80VOD45R-06	015270	F4011T	015241	T20
026652	**8100VOD45-250R-06**	250	63	60	4,5	10,0	10+2	026587	80VOD45R-06	015270	F4011T	015241	T20

8_0 VOD45_ 06 Recambios cartuchos

EDP #	Referencia cartucho	EDP#	
026587	**80VOD45R-06**	015255	7065

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

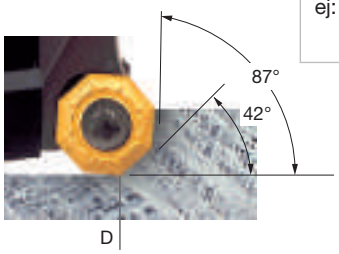


8_0 VOD45_ 06 Consejos técnicos

Ejemplo de pedido de la fresa: **8000VOD45-315R-06**
Ejemplo de pedido de la plaquita: **ODMT0605APEN-41 MP91M**
Para condiciones completas ver pagina: **A288**

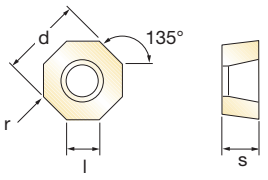
Compensación de avance: Para un ángulo de corte de 45°, dividir el valor h_m por el seno del ángulo de corte (seno de 45° = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 8_0 VOD45_ 06



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
026591	**ODET 06 05APEN-44**	**MP91M**			◆	16,0	6,0	5,55	Faceta	0,04
026598	**ODET 06 05APEN-44**	**SP4036**			◆◆◆	16,0	6,0	5,55	Faceta	0,04
027891	**ODET 06 05APEN-44**	**SP6564**				16,0	6,0	5,55	Faceta	0,04
026592	**ODET 06 05APEN-44**	**X500**			◆◆	16,0	6,0	5,55	Faceta	0,04
026588	**ODET 06 05APFN-441**	**GH1**	◆	◆	◆	16,0	6,0	5,55	Faceta	0,02
027885	**ODEW 06 05APTR-RA**	**SC3025**	◆	◆	◆	16,0	6,0	5,55	Faceta	0,19
026589	**ODMT 06 05APEN-41**	**MP91M**		◆		16,0	6,0	5,55	Faceta	0,04
026597	**ODMT 06 05APEN-41**	**SP4036**		◆◆		16,0	6,0	5,55	Faceta	0,04
027892	**ODMT 06 05APEN-41**	**SP6564**				16,0	6,0	5,55	Faceta	0,04
026590	**ODMT 06 05APEN-41**	**X500**	◆	◆◆		16,0	6,0	5,55	Faceta	0,04
025836	**ODMW 06 0512SN**	**MP91M**	◆			16,0	6,0	5,55	1,2	0,27
029097	**ODMW 06 0512SN**	**SC3025**				16,0	6,0	5,55	1,2	0,27
025837	**ODMW 06 0512SN**	**SF30**				16,0	6,0	5,55	1,2	0,27
025838	**ODMW 06 0512SN**	**X500**				16,0	6,0	5,55	1,2	0,27
027743	**ODMW 06 0512SN**	**SP6564**	◆◆			16,0	6,0	5,55	1,2	0,27
026595	**ODMW 06 0512TN**	**MP91M**				16,0	6,0	5,55	1,2	0,17
026599	**ODMW 06 0512TN**	**SP4036**		◆		16,0	6,0	5,55	1,2	0,17
027893	**ODMW 06 0512TN**	**SP6564**				16,0	6,0	5,55	1,2	0,17
026596	**ODMW 06 0512TN**	**X500**	◆			16,0	6,0	5,55	1,2	0,17



Condiciones de corte recomendadas para OD_06

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,30 - 0,70	2,5 - 4,5	220 - 260	0,20 - 0,40	1,0 - 2,0	220 - 300	0,08 - 0,15	0,2 - 1,0
◆ Aceros aleados	70 - 110	0,27 - 0,50	2,5 - 4,5	100 - 150	0,20 - 0,35	1,0 - 2,0	100 - 195	0,08 - 0,15	0,2 - 1,0
◆ Aceros inoxidables	120 - 140	0,27 - 0,40	2,5 - 4,5	140 - 180	0,15 - 0,25	1,0 - 2,0	180 - 230	0,05 - 0,15	0,2 - 1,0
◆ Inoxidables PH	55 - 70	0,15 - 0,30	2,5 - 4,5	70 - 85	0,10 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
◆ Fundición	155 - 290	0,20 - 0,45	2,5 - 4,5	195 - 310	0,15 - 0,30	1,0 - 2,0	215 - 360	0,05 - 0,15	0,2 - 1,0
◆ Aluminio y Aleaciones	275 - 450	0,20 - 0,35	2,5 - 4,5	400 - 750	0,10 - 0,25	1,0 - 2,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
◆ Aleaciones refractarias	25 - 40	0,17 - 0,25	2,5 - 4,5	35 - 50	0,10 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
◆ Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,06 - 0,12	0,5 - 1,5	50 - 100	0,03 - 0,06	0,2 - 0,5

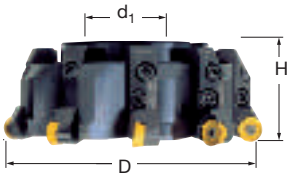
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®







Cuerpo de fresa & Cartuchos

8000 VR00_ 16 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)							Recambios			
EDP #	Referencia	D	H	d_1	a_p	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
021844	**8000VR00-100R**	100	68	32	8	6	014316	80VRP00R-16	015266	D5013T	015241	T20
021845	**8000VR00-125R**	125	63	40	8	8	014316	80VRP00R-16	015266	D5013T	015241	T20
021846	**8000VR00-160R**	160	63	40	8	10	014316	80VRP00R-16	015266	D5013T	015241	T20
021847	**8000VR00-200R**	200	63	60	8	12	014316	80VRP00R-16	015266	D5013T	015241	T20
021848	**8000VR00-250R**	250	63	60	8	16	014316	80VRP00R-16	015266	D5013T	015241	T20
021849	**8000VR00-315R**	315	80	60	8	20	014316	80VRP00R-16	015266	D5013T	015241	T20

8010 VR00_ 16 Paso igual – Conjunto Fresa & Cartuchos

021940	**8010VR00-100R**	100	68	32	8	6	014316	80VRP00R-16	015266	D5013T	015241	T20
021941	**8010VR00-125R**	125	63	40	8	8	014316	80VRP00R-16	015266	D5013T	015241	T20
021942	**8010VR00-160R**	160	63	40	8	10	014316	80VRP00R-16	015266	D5013T	015241	T20
021943	**8010VR00-200R**	200	63	60	8	12	014316	80VRP00R-16	015266	D5013T	015241	T20

*8100 VR00_ 16 Paso desigual – Conjunto fresa & Cartuchos

021988	**8100VR00-125R**	125	63	40	8	6+1	014316	80VRP00R-16	015266	D5013T	015241	T20
021989	**8100VR00-160R**	160	63	40	8	8+1	014316	80VRP00R-16	015266	D5013T	015241	T20
021990	**8100VR00-200R**	200	63	60	8	10+2	014316	80VRP00R-16	015266	D5013T	015241	T20
021991	**8100VR00-250R**	250	63	60	8	10+2	014316	80VRP00R-16	015266	D5013T	015241	T20

8_0 VR00_ 16 Recambios cartuchos

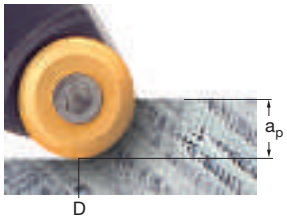
EDP #	Referencia cartucho	EDP#	
014316	**80VRP00R- 16**	015255	7065

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

8_0 VR00_ 16 Consejos técnicos

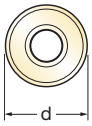
Ejemplo de pedido de la fresa: **8000VR00-315R**
Ejemplo de pedido de la plaquita: **RPHT1606M0E-421 PFZ**
Para condiciones completas ver pagina: **A288**





Profundidad de corte (a_p)

Plaquitas para 8_0 VR00_ 16



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
015131	**RPHT 16 06M0E-421**	**PFZ**		♦♦	♦♦♦	16,0	-	6,35	8,0	0,04
015223	**RPMT 16 06M0E-41**	**X500**	♦♦	♦		16,0	-	6,35	8,0	0,05

RPHT 16_ -421



RPMT 16_ -41



Condiciones de corte recomendadas para RP_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	180 - 220	0,30 - 0,70	3,0 - 8,0	220 - 260	0,20 - 0,40	1,0 - 3,0	220 - 300	0,08 - 0,15	0,2 - 1,0
♦ Aceros aleados	70 - 110	0,25 - 0,60	3,0 - 8,0	100 - 150	0,20 - 0,35	1,0 - 3,0	100 - 195	0,08 - 0,15	0,2 - 1,0
♦ Aceros inoxidables	120 - 140	0,25 - 0,45	3,0 - 8,0	140 - 180	0,15 - 0,25	1,0 - 3,0	180 - 230	0,05 - 0,15	0,2 - 1,0
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	-	-	-	-	-	-
♦ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

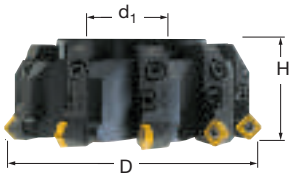
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ♦ Aceros no aleados	M ♦ Aceros inoxidables	K ♦ Fundición	S ♦ Aleaciones refractarias
P ♦ Aceros aleados	M ♦ Inoxidables PH	N ♦ Aluminio y Aleaciones	H ♦ Materiales duros

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Cuerpo de fresa & Cartuchos

8000 VS45_ 12 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)							Recambios			
EDP #	Referencia	D	H	d_1	a_p	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
021851	**8000VS45-100R**	100	68	32	7	6	014946	80VS45R-12	015266	D5013T	015241	T20
021852	**8000VS45-125R**	125	63	40	7	8	014946	80VS45R-12	015266	D5013T	015241	T20
021853	**8000VS45-160R**	160	63	40	7	10	014946	80VS45R-12	015266	D5013T	015241	T20
021854	**8000VS45-200R**	200	63	60	7	12	014946	80VS45R-12	015266	D5013T	015241	T20
021855	**8000VS45-250R**	250	63	60	7	16	014946	80VS45R-12	015266	D5013T	015241	T20
021856	**8000VS45-315R**	315	80	60	7	20	014946	80VS45R-12	015266	D5013T	015241	T20

8100 VS45_ 12 Paso desigual – Conjunto Fresa & Cartuchos

021994	**8100VS45-125R**	125	63	40	7	6+1	014946	80VS45R-12	015266	D5013T	015241	T20
021995	**8100VS45-160R**	160	63	40	7	8+1	014946	80VS45R-12	015266	D5013T	015241	T20
021996	**8100VS45-200R**	200	63	60	7	10+2	014946	80VS45R-12	015266	D5013T	015241	T20
021997	**8100VS45-250R**	250	63	60	7	10+2	014946	80VS45R-12	015266	D5013T	015241	T20

8_0 VS45_ 12 Recambios cartuchos

EDP #	Referencia cartucho	EDP#	
014946	**80VS45R- 12**	015255	7065

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

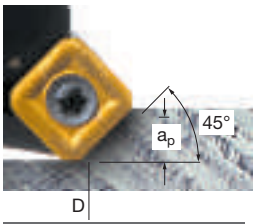
8_0 VS45_ 12 Consejos técnicos



Ejemplo de pedido de la fresa: **8000VS45-315R**
Ejemplo de pedido de la plaquita: **SCMT12M512EN-41 MP91M**
Para condiciones completas ver pagina: **A288**

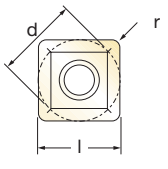
Compensación de avance: Para un ángulo de corte de 45°, dividir el valor h_m por el seno del ángulo de corte (seno de 45° = .707)

ej: $\frac{h_m}{0,707}$ o $\frac{0,08}{0,707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 8_0 VS45_ 12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017312	SCCT 12 M5ACER	MP91M		◆	◆	12,7	12,7	5,0	Faceta	0,03
025811	SCCT 12 M5ACER	SP4036		◆	◆◆◆◆	12,7	12,7	5,0	Faceta	0,15
017695	SCCT 12 M5ACER	GH1				12,7	12,7	5,0	Faceta	0,15
017693	SCCT 12 M5ACER	SF30				12,7	12,7	5,0	Faceta	0,15
017696	SCCT 12 M5ACER	SFZ				12,7	12,7	5,0	Faceta	0,15
017694	SCCT 12 M5ACER	X44				12,7	12,7	5,0	Faceta	0,15
017313	SCHT 12 M5ACTN	MP91M				12,7	12,7	5,0	Faceta	0,15
017697	SCHT 12 M5ACTN	PFZ		◆◆		12,7	12,7	5,0	Faceta	0,15
027894	SCHT 12 M5ACTN	SP6564		◆◆◆		12,7	12,7	5,0	Faceta	0,15
017698	SCHT 12 M5ACTN	X500				12,7	12,7	5,0	Faceta	0,15
015144	SCKT 12 M5ACSN-41	X500	◆			12,7	12,7	5,0	Faceta	0,12
017314	SCKT 12 M5ACSN-41	MP91M	◆◆			12,7	12,7	5,0	Faceta	0,12
017699	SCKT 12 M5ACSN-41	PFZ	◆			12,7	12,7	5,0	Faceta	0,12
027895	SCKT 12 M5ACSN-41	SP6564				12,7	12,7	5,0	Faceta	0,12
017706	SCMT 12 M508E	SF30				12,7	12,7	5,0	0,8	0,15
024944	SCMT 12 M508E	X44				12,7	12,7	5,0	0,8	0,15
025832	SCMT 12 M508E	PFZ				12,7	12,7	5,0	0,8	0,15
017707	SCMT 12 M512E	SF30				12,7	12,7	5,0	1,2	0,15
017709	SCMT 12 M512T	GH1				12,7	12,7	5,0	1,2	0,15
017316	SCMT 12 M512T	MP91M				12,7	12,7	5,0	1,2	0,15
015227	SCMT 12 M512T	PFZ				12,7	12,7	5,0	1,2	0,15
017708	SCMT 12 M512T	SF30				12,7	12,7	5,0	1,2	0,15
017710	SCMT 12 M512T	SFZ				12,7	12,7	5,0	1,2	0,15
015228	SCMT 12 M512T	X44				12,7	12,7	5,0	1,2	0,15
024129	SCMT 12 M512T	X500				12,7	12,7	5,0	1,2	0,12
017317	SCMT 12 M512EN-41	MP91M				12,7	12,7	5,0	1,2	0,05
024108	SCMT 12 M512EN-41	PFZ				12,7	12,7	5,0	1,2	0,05
015226	SCMT 12 M512EN-41	X500				12,7	12,7	5,0	1,2	0,05
027732	SCMT 12 M512EN-41	SP6564				12,7	12,7	5,0	1,2	0,05

SCCT 12_



SCHT 12_



SCKT 12_ -41



SCMT 12_



SCMT 12_ -41



Condiciones de corte recomendadas para SC_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,20 - 0,60	3,5 - 7,0	220 - 260	0,20 - 0,45	1,0 - 3,5	220 - 300	0,15 - 0,28	0,2 - 1,0
Aceros aleados	70 - 110	0,20 - 0,45	3,5 - 7,0	100 - 150	0,20 - 0,40	1,0 - 3,5	100 - 195	0,15 - 0,28	0,2 - 1,0
Aceros inoxidables	120 - 140	0,20 - 0,35	3,5 - 7,0	140 - 180	0,15 - 0,30	1,0 - 3,5	180 - 230	0,15 - 0,28	0,2 - 1,0
Inoxidables PH	-	-	-	75 - 135	0,15 - 0,28	1,0 - 3,5	-	-	-
Fundición	140 - 280	0,15 - 0,40	3,5 - 7,0	180 - 300	0,15 - 0,30	1,0 - 3,5	200 - 350	0,15 - 0,28	0,2 - 1,0
Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
Aleaciones refractarias	-	-	-	25 - 45	0,10 - 0,25	1,0 - 3,5	-	-	-
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,06 - 0,12	1,0 - 2,5	50 - 100	0,04 - 0,08	0,2 - 1,0

h_m = espesor de la viruta

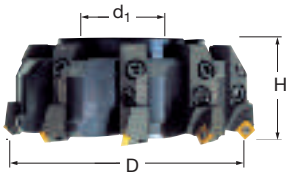
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Cuerpo de fresa & Cartuchos

8000 VSE45_ 09 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)							Recambios			
EDP #	Referencia	D	H	d_1	a_p	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
021858	**8000VSE45-100R09**	100	68	32	5	6	014947	80VSE45R-09	015269	F3508T	015240	T15
021861	**8000VSE45-125R09**	125	63	40	5	8	014947	80VSE45R-09	015269	F3508T	015240	T15
021864	**8000VSE45-160R09**	160	63	40	5	10	014947	80VSE45R-09	015269	F3508T	015240	T15
021867	**8000VSE45-200R09**	200	63	60	5	12	014947	80VSE45R-09	015269	F3508T	015240	T15
021870	**8000VSE45-250R09**	250	63	60	5	16	014947	80VSE45R-09	015269	F3508T	015240	T15
021873	**8000VSE45-315R09**	315	80	60	5	20	014947	80VSE45R-09	015269	F3508T	015240	T15

8010 VSE45_ 09 Paso igual – Conjunto Fresa & Cartuchos

021944	**8010VSE45-100R09**	100	68	32	5	6	014947	80VSE45R-09	015269	F3508T	015240	T15
021947	**8010VSE45-125R09**	125	63	40	5	8	014947	80VSE45R-09	015269	F3508T	015240	T15
021950	**8010VSE45-160R09**	160	63	40	5	10	014947	80VSE45R-09	015269	F3508T	015240	T15
021953	**8010VSE45-200R09**	200	63	60	5	12	014947	80VSE45R-09	015269	F3508T	015240	T15

8100 VSE45_ 09 Paso desigual – Conjunto Fresa & Cartuchos

022000	**8100VSE45-125R09**	125	63	40	5	6+1	014947	80VSE45R-09	015269	F3508T	015240	T15
022003	**8100VSE45-160R09**	160	63	40	5	8+1	014947	80VSE45R-09	015269	F3508T	015240	T15
022006	**8100VSE45-200R09**	200	63	60	5	10+2	014947	80VSE45R-09	015269	F3508T	015240	T15
022009	**8100VSE45-250R09**	250	63	60	5	10+2	014947	80VSE45R-09	015269	F3508T	015240	T15

8_0 VSE45_ 09 Recambios cartuchos

EDP #	Referencia cartucho	EDP#	
014947	**80VSE45R-09**	015255	7065

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

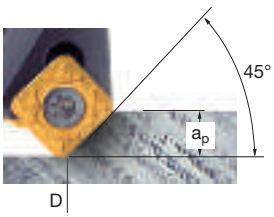


8_0 VSE45_ 09 Consejos técnicos

Ejemplo de pedido de la fresa: **8000VSE45-250R09**
Ejemplo de pedido de la plaquita: **SDKT09T3AEEN-45 X500**
Para condiciones completas ver pagina: **A288**

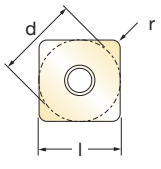
Compensación de avance: Para un ángulo de corte de 45°, dividir el valor h_m por el seno del ángulo de corte (seno de 45° = .707)

ej: $\frac{h_m}{0{,}707}$ o $\frac{0{,}08}{0{,}707}$ = 0,113 mm avance a programar



Profundidad de corte (a_p)

Plaquitas para 8_0 VSE45_ 09



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017714	SDCT 09 T3AEEN	SF30				9,52	9,52	3,97	Faceta	0,04
025842	SDCT 09 T3AEEN	SP4036				9,52	9,52	3,97	Faceta	0,04
017242	SDCT 09 T3AEEN	GH1	◆	◆	◆	9,52	9,52	3,97	Faceta	0,02
017715	SDCW 09 T3AEFN	SFZ			◆	9,52	9,52	3,97	Faceta	0,02
018204	SDCW 09 T3AEFN	CN35				9,52	9,52	3,97	Faceta	0,12
017716	SDCW 09 T3AEFN	SF30				9,52	9,52	3,97	Faceta	0,15
027118	SDCW 09 T3AEFN	SFZ				9,52	9,52	3,97	Faceta	0,15
017717	SDCW 09 T3AEFN	X44				9,52	9,52	3,97	Faceta	0,15
017726	SDEX 09 T3AEEN-701	PFZ				9,52	9,52	3,97	Faceta	0,03
015148	SDEX 09 T3AEEN-701	GH1				9,52	9,52	3,97	Faceta	0,02
015229	SDEX 09 T3AEEN-701	SFZ				9,52	9,52	3,97	Faceta	0,02
017320	SDHT 09 T3AEEN-421	MP91M				9,52	9,52	3,97	Faceta	0,03
023356	SDHT 09 T3AEEN-421	PFZ				9,52	9,52	3,97	Faceta	0,03
015186	SDHT 09 T3AEEN-421	X500			◆◆	9,52	9,52	3,97	Faceta	0,03
027733	SDHT 09 T3AEEN-421	SP6564				9,52	9,52	3,97	Faceta	0,03
017323	SDHW 09 T3AETN	MP91M				9,52	9,52	3,97	Faceta	0,10
023358	SDHW 09 T3AETN	PFZ				9,52	9,52	3,97	Faceta	0,10
015231	SDHW 09 T3AETN	X500				9,52	9,52	3,97	Faceta	0,10
027741	SDHW 09 T3AETN	SP6564				9,52	9,52	3,97	Faceta	0,10
026600	SDKT 09 T3AEEN-45	MP91M		◆◆	◆◆	9,52	9,52	3,97	Faceta	0,05
026602	SDKT 09 T3AEEN-45	X500		◆◆		9,52	9,52	3,97	Faceta	0,05
027738	SDKT 09 T3AEEN-45	SP6564		◆◆	◆◆	9,52	9,52	3,97	Faceta	0,05
017319	SDET 09 T308EN	MP91M				9,52	9,52	3,97	0,8	0,03
017724	SDET 09 T308EN	PFZ				9,52	9,52	3,97	0,8	0,03
017725	SDET 09 T308EN	GH1				9,52	9,52	3,97	0,8	0,02
017325	SDMT 09 T308EN-41	MP91M	◆			9,52	9,52	3,97	0,8	0,04
023362	SDMT 09 T308EN-41	PFZ				9,52	9,52	3,97	0,8	0,04
014410	SDMT 09 T308EN-41	X500				9,52	9,52	3,97	0,8	0,04
027736	SDMT 09 T308EN-41	SP6564	◆◆			9,52	9,52	3,97	0,8	0,04
017327	SDMW 09 T308TN	MP91M	◆			9,52	9,52	3,97	0,8	0,15
027742	SDMW 09 T308TN	SP6564				9,52	9,52	3,97	0,8	0,15
023363	SDMW 09 T308TN	PFZ				9,52	9,52	3,97	0,8	0,15
015232	SDMW 09 T308TN	X500				9,52	9,52	3,97	0,8	0,12

SDCT 09_



SDCW 09_



SDEX 09_ -701



SDHT 09_ -421



SDHW 09_



SDKT 09_ -45



SDET 09_



SDMT 09_ -41



SDMW 09_



Condiciones de corte recomendadas para SD_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,12 - 0,30	3,0 - 5,0	220 - 260	0,10 - 0,25	1,0 - 3,0	220 - 300	0,08 - 0,15	0,2 - 1,0
◆ Aceros aleados	70 - 110	0,12 - 0,25	3,0 - 5,0	100 - 150	0,10 - 0,20	1,0 - 3,0	100 - 195	0,08 - 0,15	0,2 - 1,0
◆ Aceros inoxidables	120 - 140	0,12 - 0,22	3,0 - 5,0	140 - 180	0,10 - 0,20	1,0 - 3,0	180 - 230	0,05 - 0,15	0,2 - 1,0
◆ Inoxidables PH	-	-	-	70 - 85	0,10 - 0,18	1,0 - 3,0	80 - 100	0,05 - 0,10	0,2 - 1,0
◆ Fundición	140 - 280	0,12 - 0,25	3,0 - 5,0	180 - 300	0,10 - 0,20	1,0 - 3,0	200 - 350	0,05 - 0,15	0,2 - 1,0
◆ Aluminio y Aleaciones	275 - 450	0,10 - 0,22	3,0 - 5,0	400 - 750	0,08 - 0,18	1,0 - 3,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
◆ Aleaciones refractarias	-	-	-	35 - 50	0,10 - 0,18	1,0 - 3,0	45 - 60	0,05 - 0,10	0,2 - 1,0
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	0,2 - 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

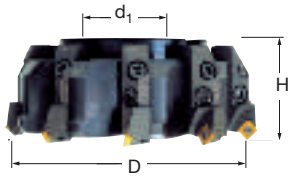


Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

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Cuerpo de fresa & Cartuchos

8000 VSE45_ 12 Paso desigual – Conjunto Fresa & Cartuchos

		Dimensiones (mm)							Recambios			
EDP #	Referencia	D	H	d_1	a_p	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
021859	**8000VSE45-100R 12**	100	68	32	7	6	014948	80VSE45R-12	015270	F4011T	015241	T20
021862	**8000VSE45-125R 12**	125	63	40	7	8	014948	80VSE45R-12	015270	F4011T	015241	T20
021865	**8000VSE45-160R 12**	160	63	40	7	10	014948	80VSE45R-12	015270	F4011T	015241	T20
021868	**8000VSE45-200R 12**	200	63	60	7	12	014948	80VSE45R-12	015270	F4011T	015241	T20
021871	**8000VSE45-250R 12**	250	63	60	7	16	014948	80VSE45R-12	015270	F4011T	015241	T20
021874	**8000VSE45-315R 12**	315	80	60	7	20	014948	80VSE45R-12	015270	F4011T	015241	T20

8010 VSE45_ 12 Paso igual – Conjunto Fresa & Cartuchos

021945	**8010VSE45-100R 12**	100	68	32	7	6	014948	80VSE45R-12	015270	F4011T	015241	T20
021948	**8010VSE45-125R 12**	125	63	40	7	8	014948	80VSE45R-12	015270	F4011T	015241	T20
021951	**8010VSE45-160R 12**	160	63	40	7	10	014948	80VSE45R-12	015270	F4011T	015241	T20
021954	**8010VSE45-200R 12**	200	63	60	7	12	014948	80VSE45R-12	015270	F4011T	015241	T20

*8100 VSE45_ 12 Paso desigual – Conjunto Fresa & Cartuchos

022001	**8100VSE45-125R 12**	125	63	40	7	6+1	014948	80VSE45R-12	015270	F4011T	015241	T20
022004	**8100VSE45-160R 12**	160	63	40	7	8+1	014948	80VSE45R-12	015270	F4011T	015241	T20
022007	**8100VSE45-200R 12**	200	63	60	7	10+2	014948	80VSE45R-12	015270	F4011T	015241	T20
022010	**8100VSE45-250R 12**	250	63	60	7	10+2	014948	80VSE45R-12	015270	F4011T	015241	T20

8_0 VSE45_ 12 Recambios cartuchos

EDP #	Referencia cartucho	EDP#	
014948	**80VSE45R- 12**	015255	7065

* El +1 y +2 situado tras la cantidad de plaquitas en la columna de número de dientes, representa la cantidad de alojamientos previstos para cartuchos a plaquita rascadora.

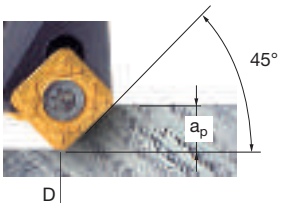
8_0 VSE45_ 12 Consejos técnicos



Ejemplo de pedido de la fresa: **8000VSE45-250R12**
Ejemplo de pedido de la plaquita: **SDKT1204AEEN-45 X500**
Para condiciones completas ver pagina: **A288**

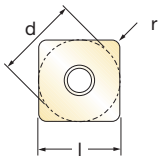
Condiciones de corte recomendadas para SD_12

Material	▼ Desbaste			▼▼ Semi-acabado			▼▼▼ Acabado		
	Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,20 - 0,45	3,0 - 6,0	220 - 260	0,15 - 0,30	1,0 - 3,0	220 - 300	0,15 - 0,17	0,2 - 1,0
Aceros aleados	70 - 110	0,20 - 0,35	3,0 - 6,0	100 - 150	0,15 - 0,25	1,0 - 3,0	100 - 195	0,15 - 0,17	0,2 - 1,0
Aceros inoxidables	120 - 140	0,15 - 0,30	3,0 - 6,0	140 - 180	0,15 - 0,25	1,0 - 3,0	180 - 230	0,15 - 0,17	0,2 - 1,0
Inoxidables PH	55 - 70	0,15 - 0,25	2,0 - 4,0	70 - 85	0,15 - 0,20	1,0 - 2,0	80 - 100	0,05 - 0,10	0,2 - 1,0
Fundición	140 - 280	0,15 - 0,30	3,0 - 6,0	180 - 300	0,10 - 0,22	1,0 - 3,0	200 - 350	0,05 - 0,15	0,2 - 1,0
Aluminio y Aleaciones	275 - 450	0,15 - 0,30	3,0 - 6,0	400 - 750	0,10 - 0,22	1,0 - 3,0	700 - 1000	0,05 - 0,15	0,2 - 1,0
Aleaciones refractarias	25 - 40	0,15 - 0,25	2,0 - 4,0	35 - 50	0,15 - 0,20	1,0 - 2,0	45 - 60	0,05 - 0,10	0,2 - 1,0
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,06 - 0,12	0,5 - 1,5	50 - 100	0,03 - 0,06	0,2 - 0,5



Profundidad de corte (a_p)

Plaquitas para 8_0 VSE45_ 12



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
018203	**SDCT 12 04AEEN**	**SF30**				12,7	12,7	4,76	Faceta	0,04
017243	**SDCT 12 04AEFN**	**GH1**	♦	♦	♦	12,7	12,7	4,76	Faceta	0,02
017318	**SDCW 12 04AEEN**	**MP91M**		♦	♦	12,7	12,7	4,76	Faceta	0,03
017722	**SDCW 12 04AETN**	**GH1**				12,7	12,7	4,76	Faceta	0,15
018205	**SDCW 12 04AETN**	**CN35**				12,7	12,7	4,76	Faceta	0,17
017720	**SDCW 12 04AETN**	**SF30**				12,7	12,7	4,76	Faceta	0,15
017723	**SDCW 12 04AETN**	**SFZ**				12,7	12,7	4,76	Faceta	0,10
017721	**SDCW 12 04AETN**	**X44**		♦		12,7	12,7	4,76	Faceta	0,15
017727	**SDEX 12 04AEEN-701**	**PFZ**				12,7	12,7	4,76	Faceta	0,03
015149	**SDEX 12 04AEEN-701**	**GH1**				12,7	12,7	4,76	Faceta	0,02
015230	**SDEX 12 04AEEN-701**	**SFZ**				12,7	12,7	4,76	Faceta	0,02
017321	**SDHT 12 04AEEN-421**	**MP91M**				12,7	12,7	4,76	Faceta	0,04
015133	**SDHT 12 04AEEN-421**	**PFZ**				12,7	12,7	4,76	Faceta	0,04
015187	**SDHT 12 04AEEN-421**	**X500**	♦		♦♦	12,7	12,7	4,76	Faceta	0,04
027734	**SDHT 12 04AEEN-421**	**SP6564**				12,7	12,7	4,76	Faceta	0,04
017322	**SDHT 12 04AETN-42**	**MP91M**				12,7	12,7	4,76	Faceta	0,15
017728	**SDHT 12 04AETN-42**	**PFZ**				12,7	12,7	4,76	Faceta	0,15
027735	**SDHT 12 04AETN-42**	**SP6564**				12,7	12,7	4,76	Faceta	0,15
017729	**SDHT 12 04AETN-42**	**X500**	♦			12,7	12,7	4,76	Faceta	0,10
017324	**SDHW 12 04AETN**	**MP91M**				12,7	12,7	4,76	Faceta	0,15
015134	**SDHW 12 04AETN**	**PFZ**				12,7	12,7	4,76	Faceta	0,15
017730	**SDHW 12 04AETN**	**X500**				12,7	12,7	4,76	Faceta	0,15
029456	**SDKT 12 04AEEN-45**	**MP91M**		♦	♦	12,7	12,7	4,76	Faceta	0,05
029457	**SDKT 12 04AEEN-45**	**X500**		♦♦		12,7	12,7	4,76	Faceta	0,05
029455	**SDKT 12 04AEEN-45**	**SP6564**		♦♦	♦♦	12,7	12,7	4,76	Faceta	0,05
017326	**SDMT 12 0412EN-41**	**MP91M**	♦			12,7	12,7	4,76	1,2	0,05
015135	**SDMT 12 0412EN-41**	**PFZ**				12,7	12,7	4,76	1,2	0,05
014411	**SDMT 12 0412EN-41**	**X500**				12,7	12,7	4,76	1,2	0,05
027737	**SDMT 12 0412EN-41**	**SP6564**	♦♦			12,7	12,7	4,76	1,2	0,05
017328	**SDMW 12 0412TN**	**MP91M**	♦			12,7	12,7	4,76	1,2	0,15
015136	**SDMW 12 0412TN**	**PFZ**				12,7	12,7	4,76	1,2	0,15
015233	**SDMW 12 0412TN**	**X500**				12,7	12,7	4,76	1,2	0,12

h_m = espesor de la viruta

SDCT 12_



SDCW 12_



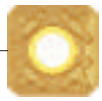
SDEX 12_ -701



SDHT 12_ -421



SDHT 12_ -42



SDHW 12_



SDKT 12_ -45



SDMT 12_ -41



SDMW 12_



Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Cartuchos de super-acabado 81 FS 00

Los cartuchos 81 FS 00 R-12 están destinados a las operaciones de super-acabado utilizándose conjuntamente con otros cartuchos como se puede observar en los dibujos de abajo. Estos cartuchos están dotados de un tornillo de regulación fina lo que permite levantarlos o bajarlos de nuevo hasta que se encuentre la posición deseada.

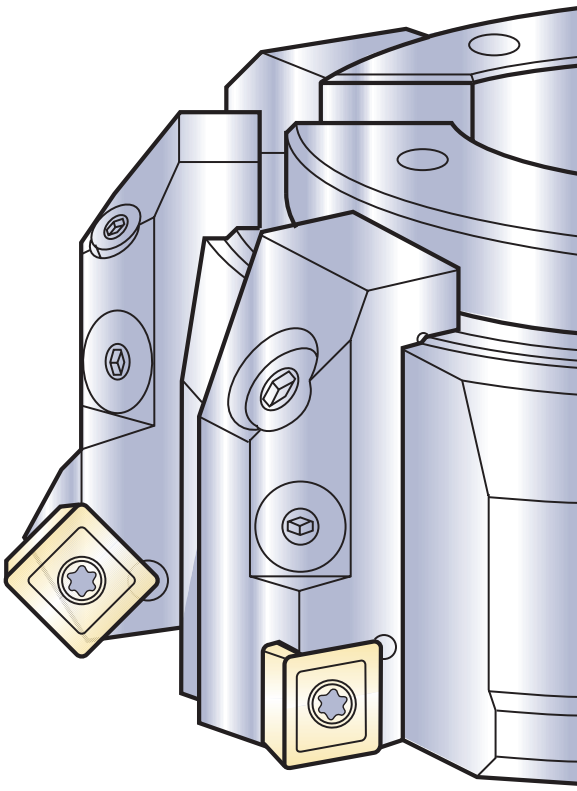
La profundidad de pasada en acabado debería ser a lo máximo de 1 mm. y preferiblemente de 0.5 mm. La placa de acabado debería de tener una pasada de máximo 0.03 mm debido a que es la placa principal para generar el acabado.

En las fresas de la gama 8000 V uno, dos o hasta tres cartuchos de desbaste pueden ser remplazados por cartuchos 81 FS 00 R-12. En las fresas 8100 V, los cartuchos de acabado se montan, uno en @ 125 y 160 mm o dos en @ 200 a 250 mm alojamientos adicionales e independientes.

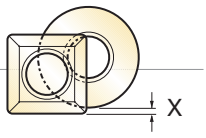
Para obtener un super-acabado, uno dos o hasta tres cartuchos de desbaste (dependiendo del diámetro) deben de ser remplazados por cartuchos de acabado 81 FS 00 R-12.

Estos cartuchos tienen un tornillo de ajuste fino para así poder regular la dimensión (sobrepaso axial) “X”.

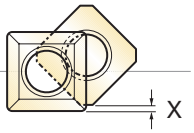
X = 0,03 – 0,05 mm
(X = 0,02 mm con plaquita prensada y radio de punta)



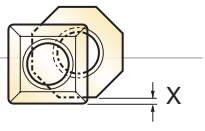
8000, 8100 VR 00

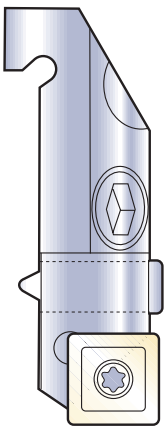


8000, 8100 VS/VSE 45



8000, 8100 VOD 45



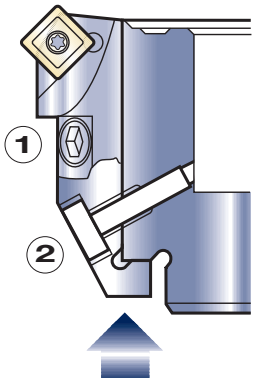


Recambios

Plaquita de acabado Referencia	Cartucho de acabado	Tornillo para cartucho	Tornillo de regulación	Cartucho protección	Tornillo plaquita	Destor-nillador
SPHX 12 M5 12-EN	81 FS 00 R-12	7065	72.602	70.951	D5013T	T20

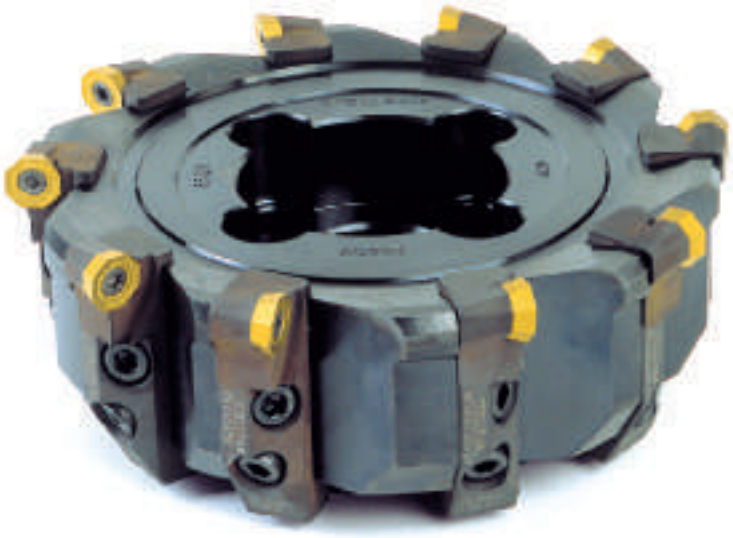
de regulación de los cartuchos

En la mayoría da la aplicaciones corrientes, las fresas a cartuchos 8000 V, 8010 V, 8100 V no tienen necesidad de ser reguladas. Los cartuchos se montan apoyados en su talón calibrado, contra una pista rectificada que se encuentra en el cuerpo de fresa (el batido axial máximo es de 0.05 mm con plaquitas con faceta de acabado rectificada) Sin embargo, si una mayor plenitud fuese requerida, pueden ser fácilmente reguladas individualmente con una precisión de 2 wm.



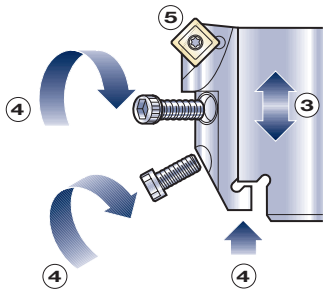
A MONTAJE DE LOS CARTUCHOS SIN REGULACION

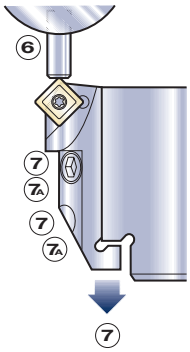
1. Engrasar los tornillos bajo cabeza y rosca (preferiblemente con pasta HSC).
2. Limpiar los cartuchos y sus alojamientos en la fresa.
3. Introducir el primer cartucho en su alojamiento y controlar que se mueve libremente.
4. Introducir el tornillo No. 1 y apretarlo moderadamente, apretando al mismo tiempo el cartucho contra su apoyo axial; montar así todos los demás cartuchos.
5. Introducir el tornillo No. 2 y apretarlo (par de apriete 10 Nm).
6. Apretar fuertemente el tornillo No. 1 con la llave larga, No. 70.901 (par de apriete 18 Nm).
7. Finalmente montar las plaquitas.

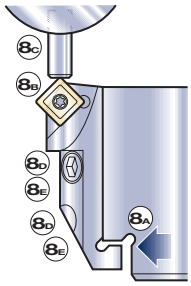


Instrucciones de montaje

de regulación de los cartuchos







B MONTAJE DE LOS CARTUCHOS CON REGULACION

Para la regulación de las fresas 8000 V con cartuchos intercambiables se utiliza el mismo aparato que para las fresas tipo 8100.

1. Engrasar los tornillos bajo cabeza y rosca (preferiblemente con la pasta HSC).
2. Limpiar los cartuchos y sus alojamientos en la fresa.
3. Introducir el primer cartucho en su alojamiento y controlar que se mueve libremente.
4. Introducir los tornillos No 1 y No 2, apretar moderadamente el tornillo No 2 apretando al mismo tiempo el cartucho contra su apoyo axial; apretar el tornillo No. 1.
5. Montar una plaquita rectificada periféricamente, la cual servirá como referencia.
6. Palpar la altura del primer cartucho montado, poner el comparador a cero (la posición del comparador debe de permitir a la aguja dar al máximo media vuelta en el cuadrante), bloquear el comparador. Girar el cuadrante del comparador hasta que la aguja se sitúe en +0,02 mm.
7. Aflojar ligeramente los dos tornillos et recular el cartucho hasta ponerlo apenas debajo del cero. Apretar de nuevo moderadamente el tornillo No 1. Accionar el tornillo No 2 para adelantar el cartucho hasta alcanzar el cero. Seguidamente distender el tornillo No 2.

MODO DE APRIETE

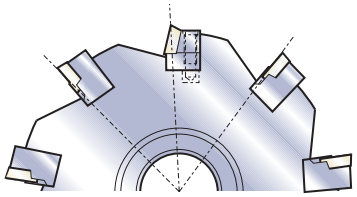
Después de haber alcanzado la altura cero:

- **A** Apretar fuertemente el tornillo No 1 con la llave alargada No 70.901 (par de apriete 14 Nm). En ese momento puede que el cartucho se venga hacia atrás.
- **B** Apretar de nuevo el tornillo No 2, lo bastante fuerte para devolver el cartucho a la posición cero si fuese necesario.

8. Para la regulación de los demás cartuchos, proceda como sigue:
   - **A** Montar el cartucho utilizando el tornillo No 1 y apretarlo moderadamente.
   - **B** Marcar la punta de una placa con un rotulador para utilizar siempre esta punta como referencia.
   - **C** Pasar el comparador por encima de la plaquita.
   - **D** Introducir el tornillo No 2 y avanzar el cartucho hasta la medida cero. Seguidamente distender el tornillo.
   - **E** En este punto seguir el modo de apriete descrito en los puntos **B** 7. **A** y **B.**
9. Cuando el montaje de los cartuchos haya concluido, montar las plaquitas.

Nota: Procediendo de este modo, los asientos de placa se encuentran todos en una tolerancia precisa (+-0,002 mm); solo la variación de las medidas de las plaquitas pueden influenciar en este momento el batido axial de la fresa.

C MONTAJE Y REGULACION DE LOS CARTUCHOS DE ACABADO

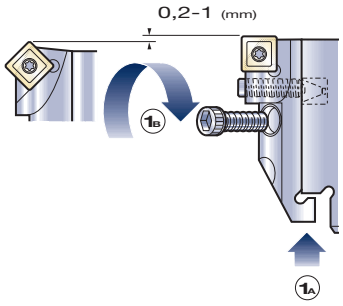


81 FS 00 R-12

Las fresas 8100V poseen para los diámetros de 125 y 160 mm poseen uno y para los diámetros de 200 y 250 mm dos alojamientos suplementarios e independientes, intercalados entre los alojamientos para los cartuchos de desbaste, estos alojamientos están marcados con la letra “F”. Tienen un taladro cónico diseñado para poder utilizar tornillos con micro regulación y así ajustar los cartuchos de acabado 81 FS 00 R-12.

IMPORTANTE!

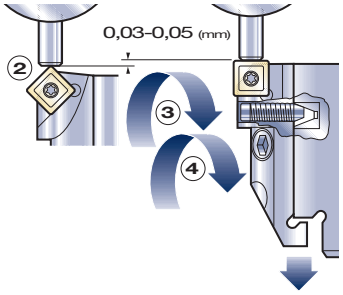
Cuando no se utilicen los cartuchos de acabado, esos alojamientos deben de ser equipados de los cartuchos de proteccion 70.951.



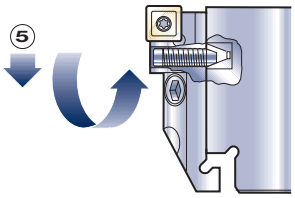
Las fresas 8000V y 8010V no están provistas de alojamientos particulares para los cartuchos de acabado. Por contra, es posible montar los cartuchos 81 FS 00 en los alojamientos marcados con una F, pudiendo montar uno o varios cartuchos dependiendo del diámetro.

NOTA: Cuando se utilizan uno o hasta tres cartuchos de acabado, se debe de asegurar que están bien subdivididos circunferencialmente y que el batido entre las aristas de las plaquitas montadas en ellos sea el mínimo posible.

MODO DE MONTAJE Y REGULACION



1. **A** Limpiar los cartuchos 81 FS 00 R-12 y sus alojamientos en la fresa.
   B Introducir el tornillo de amarre del cartucho y apretarlo suavemente apoyando el talón del cartucho sobre la pista prevista a ese efecto. De ese modo, la plaquita del cartucho de acabado sobrepasara la altura de corte de los cartuchos de desbaste de 0.2 a 1 mm, según el tipo de plaquita de desbaste.
2. Posicionar el aparato de regulación sobre la pista de control (montaje descrito en los puntos **A** y **B**) palpar todas las plaquitas de los cartuchos de desbaste de manera a encontrar la plaquita que se encuentra en la posición mas “alta” sobre la cual posicionaremos el comparador y lo pondremos a cero.
3. **A** Pasar el comparador sobre el centro de la arista de la plaquita de acabado.
   B Atornillando el tornillo cónico de regulación, recular el cartucho de acabado hasta que la aguja del comparador indique +0.03 a 0.05 mm. Si los cartucho de desbaste están equipados de plaquitas sin rectificar, este sobrepaso deberá de ser de +0.02.
   C Aflojar el tornillo de amarre para verificar, con un movimiento de va y ven del cartucho, la repetitividad de los valores regulados. En caso necesario, hacer la corrección que hiciese falta accionando el tornillo cónico de regulación.
4. Bloquear moderadamente el tornillo de amarre del cartucho.
5. Los cartuchos de acabado pueden ser reculados y de nuevo avanzados a discreción permitiendo los trabajos de desbaste o acabado como se indica en 3B y C. Para eso, se necesita solo aflojar el tornillo de amarre de media vuelta, de empujar el cartucho hacia atrás o a la posición de trabajo y apretar de nuevo el tornillo moderadamente.



Nota: No aconsejable para su utilización en las fresas tipo 8010 V.

Fresas Disco a Cartuchos

Fresas disco de dos y tres cortes



Las fresas disco de Stellram son ideales para ranuras profundas y para muchos fresados laterales.

El cuerpo de fresa es neutro, permitiendo dos, tres cortes y fresado lateral. Dos ranuras de chaveta permiten el posicionamiento de múltiples fresas en un eje para hacer diferentes ranuras simultáneamente.



Fresas Disco a Cartuchos Aplicaciones



Escuadrado



Ranurado



FRESAS DISCO CON CARTUCHOS AJUSTABLES

Las fresas **7200 VM**, **7200 VA** y **7220 VM** han sido diseñada para las operaciones de ranurado (tres cortes) y de fresado lateral (dos cortes) en todo tipo de materiales. Están equipadas de cartuchos intercambiables regulables en anchura, los cuales se amarran al cuerpo por medio de un eficiente sistema de amarre, el cual trabaja en la misma dirección que las fuerzas de corte. La amplitud de regulación es de 2 mm (para 7200 VM & 7220 VM, anchos de 10 – 20 mm) o de 3 mm (para 7200 VA, anchos de 20 – 26 mm).

La gama de cartuchos 72M de STELLRAM sobresale por su simplicidad, fiabilidad y precisión de posicionamiento. Las pequeñas dimensiones de los cartuchos permiten obtener un gran desahogo para la evacuación de la viruta – factor mas importante en el ranurado cuando la fresa se encuentra totalmente en contacto con el material. Por lo cual las fresas Stellram permiten el mecanizado de ranuras profundas sin ningún tipo de problema.

Los cuerpos de fresa son neutros y pueden ser adaptados a diferentes tipos de fresado. Pueden ser equipados sea con cartuchos a derechas y a izquierdas alternados (tres cortes) esencialmente para ranurado, o con cartuchos únicamente a izquierdas o a derechas (dos cortes) para un rendimiento máximo en fresado lateral.



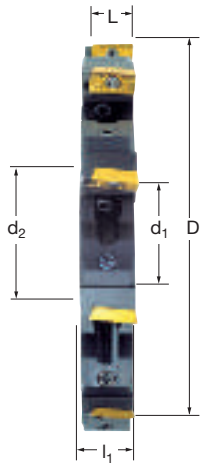
7200 VM



7200 VA



7220 VM





Fresas disco a cartuchos

Fresas 7200

EDP #	Referencia	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes
017536	**7200VA 16 -160R/N20/23BODY**	160	16	21	40	58	49	10
017537	**7200VA 16 -160R/N23/26BODY**	160	16	24	40	58	49	10
023051	**7200VA 16 -200R/N20/23BODY**	200	16	21	50	72	62	12
017539	**7200VA 16 -250R/N20/23BODY**	250	16	21	50	85	81	16
023051	**7200VA 16 -250R/N23/26BODY**	250	16	24	50	85	81	16
016676	**7200VM 04 -080R/N06/07BODY**	80	4,7	14	27	42	16	10
016677	**7200VM 04 -080R/N07/08BODY**	80	4,7	14	27	42	16	10
016678	**7200VM 04 -100R/N06/07BODY**	100	4,7	14	32	48	23	12
016679	**7200VM 04 -100R/N07/08BODY**	100	4,7	14	32	48	23	12
016680	**7200VM 04 -125R/N06/07BODY**	125	4,7	14	40	58	30	16
016681	**7200VM 04 -125R/N07/08BODY**	125	4,7	14	40	58	30	16
016682	**7200VM 06 -100R/N08/09BODY**	100	6,3	12	32	48	23	12
016683	**7200VM 06 -100R/N09/10BODY**	100	6,3	12	32	48	23	12
016684	**7200VM 06 -125R/N08/09BODY**	125	6,3	12	40	58	31	14
016685	**7200VM 06 -125R/N09/10BODY**	125	6,3	12	40	58	31	14
016686	**7200VM 08 -100R/N10/12BODY**	100	7,9	11	32	48	24	8
016687	**7200VM 08 -100R/N12/14BODY**	100	7,9	13	32	48	24	8
016688	**7200VM 08 -125R/N10/12BODY**	125	7,9	11	40	58	32	10
016689	**7200VM 08 -125R/N12/14BODY**	125	7,9	13	40	58	32	10
016690	**7200VM 08 -160R/N10/12BODY**	160	7,9	11	40	58	49	12
016691	**7200VM 08 -160R/N12/14BODY**	160	7,9	13	40	58	49	12
016692	**7200VM 11 -125R/N14/16BODY**	125	11,1	15	40	58	32	8
016693	**7200VM 11 -125R/N16/18BODY**	125	11,1	17	40	58	32	8
016694	**7200VM 11 -160R/N14/16BODY**	160	11,1	15	40	58	49	10
016695	**7200VM 11 -160R/N16/18BODY**	160	11,1	17	40	58	49	10
016696	**7200VM 11 -160R/N18/20BODY**	160	11,1	19	40	58	49	10
016697	**7200VM 11 -200R/N16/18BODY**	200	11,1	17	50	72	62	12
016698	**7200VM 11 -200R/N18/20BODY**	200	11,1	19	50	72	62	12
016699	**7200VM 11 -250R/N18/20BODY**	250	11,1	19	50	85	81	16

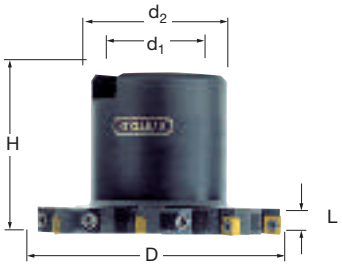
7200V Consejos técnicos

Ejemplo de pedido para cuerpo de fresa:
7200VM11 -125R/N14/16BODY



Fresas 7220

EDP #	Referencia	Dimensiones (mm) D	L	H	d_1	d_2	No. de dientes
016718	**7220VM 04 -063R/N06/07BODY**	63	4,7	40	22	35	8
016719	**7220VM 04 -063R/N07/08BODY**	63	4,7	40	22	35	8
016720	**7220VM 04 -080R/N06/07BODY**	80	4,7	45	27	45	10
016721	**7220VM 04 -080R/N07/08BODY**	80	4,7	45	27	45	10
016722	**7220VM 06 -100R/N08/09BODY**	100	6,3	50	32	48	12
016723	**7220VM 06 -100R/N09/10BODY**	100	6,3	50	23	48	12
016725	**7220VM 06 -125R/N09/10BODY**	125	6,3	55	40	48	14
016727	**7220VM 08 -125R/N10/12BODY**	125	7,9	55	40	62	10





Fresas disco a cartuchos



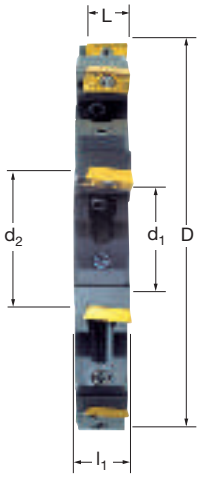


7200 VA 16_R Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
016621	**7200VA 16 -160R20/23**	160	16	21	40	58	49	10	016749	72VAR20/23	015262	D4010T	015240	T15
016622	**7200VA 16 -160R23/26**	160	16	24	40	58	49	10	016750	72VAR23/26	015262	D4010T	015240	T15
016623	**7200VA 16 -200R20/23**	200	16	21	50	72	62	12	016749	72VAR20/23	015262	D4010T	015240	T15
016624	**7200VA 16 -250R20/23**	250	16	21	50	85	81	16	016749	72VAR20/23	015262	D4010T	015240	T15
016625	**7200VA 16 -250R23/26**	250	16	24	50	85	81	16	016750	72VAR23/26	015262	D4010T	015240	T15

7200 VA 16_R Recambios

EDP #	Referencia cartucho	Accesorios EDP#		Tornillo de fijación EDP#		EDP#	
016749	**72VAR20/23**	016858	72.602	015257	72.694T	015273	T20TB
016750	**72VAR23/26**	016858	72.602	015257	72.694T	015273	T20TB





Fresa disco a cartuchos



7200 VA 16_R Consejos técnicos

Ejemplo de pedido de la fresa: **7200VA16-160R20/23**
Ejemplo de pedido de la plaquita: **APFW1604PDTR SFZ**
Para condiciones completas ver pagina: **A288**

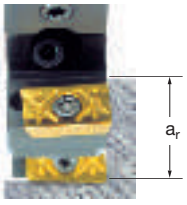
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

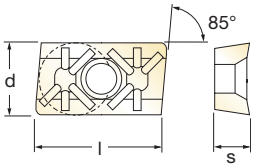
$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VA 16_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017623	**APEX 16 04PDFR-701**	**SFZ**				9,52	16,66	4,76	Faceta	0,02
014066	**APEX 16 04PDFR-701**	**GH1**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,02
017627	**APFW 16 04PDTR**	**X44**				9,52	16,66	4,76	Faceta	0,1
017628	**APFW 16 04PDTR**	**GH1**				9,52	16,66	4,76	Faceta	0,1
027883	**APFW 16 04PDTR**	**SC3025**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
017626	**APFW 16 04PDTR**	**SF30**				9,52	16,66	4,76	Faceta	0,1
017629	**APFW 16 04PDTR**	**SFZ**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
017293	**APHT 16 04PDTR-42**	**MP91M**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
017634	**APHT 16 04PDTR-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
027718	**APHT 16 04PDTR-42**	**SP6564**		◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
015155	**APHT 16 04PDTR-42**	**X500**	◆◆	◆	◆	9,52	16,66	4,76	Faceta	0,1

APEX 16_ -701



APFW 16_



APHT 16_ -42



Condiciones de corte recomendadas para AP_16

Material	Velocidad V_c (m/min)	Avance h_m (mm)
◆ Aceros no aleados	180 - 220	0,15 - 0,28
◆ Aceros aleados	70 - 110	0,14 - 0,25
◆ Aceros inoxidables	100 - 210	0,12 - 0,25
◆ Inoxidables PH	55 - 70	0,12 - 0,20
◆ Fundición	160 - 300	0,12 - 0,20
◆ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
◆ Aleaciones refractarias	25 - 35	0,12 - 0,20
◆ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

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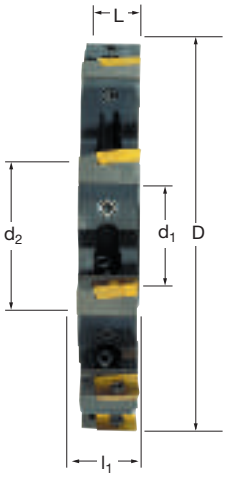


7200 VA 16_L Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
025470	**7200VA 16 -160L20/23**	160	16	21	40	58	49	10	016747	72VAL20/23	015262	D4010T	015240	T15
025471	**7200VA 16 -160L23/26**	160	16	24	40	58	49	10	016748	72VAL23/26	015262	D4010T	015240	T15
025472	**7200VA 16 -200L20/23**	200	16	21	50	72	62	12	016747	72VAL20/23	015262	D4010T	015240	T15
025473	**7200VA 16 -250L20/23**	250	16	21	50	85	81	16	016747	72VAL20/23	015262	D4010T	015240	T15
025474	**7200VA 16 -250L23/26**	250	16	24	50	85	81	16	016748	72VAL23/26	015262	D4010T	015240	T15

7200 VA 16_L Recambios cartuchos

EDP #	Referencia cartucho	Accesorios EDP#		Tornillo de fijación EDP#		EDP#	
016747	**72VAL20/23**	016858	72.602	015257	72.694T	015273	T20TB
016748	**72VAL23/26**	016858	72.602	015257	72.694T	015273	T20TB





Fresa disco a cartuchos

7200 VA 16_L Consejos técnicos



Ejemplo de pedido de la fresa: **7200VA16-250L23/26**
Ejemplo de pedido de la plaquita: **APFW1604PDTL SFZ**
Para condiciones completas ver pagina: **A288**

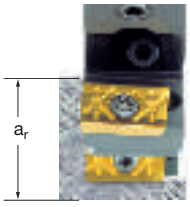
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

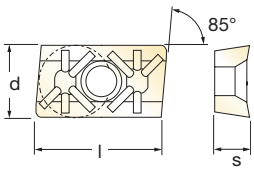
$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VA 16_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017624	**APEX 16 04PDFL-701**	**GH1**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,02
024922	**APFW 16 04PDTL**	**X44**				9,52	16,66	4,76	Faceta	0,1
017630	**APFW 16 04PDTL**	**GH1**				9,52	16,66	4,76	Faceta	0,1
024075	**APFW 16 04PDTL**	**SFZ**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
017292	**APHT 16 04PDTL-42**	**MP91M**	◆◆	◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
024088	**APHT 16 04PDTL-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
027910	**APHT 16 04PDTL-42**	**SP6564**		◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
017635	**APHT 16 04PDTL-42**	**X500**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1

APEX 16_ -701



APFW 16_



APHT 16_ -42



Condiciones de corte recomendadas para AP_16

Material	Velocidad V_c (m/min)	Avance h_m (mm)
◆ Aceros no aleados	180 - 220	0,15 - 0,28
◆ Aceros aleados	70 - 110	0,14 - 0,25
◆ Aceros inoxidables	100 - 210	0,12 - 0,25
◆ Inoxidables PH	55 - 70	0,12 - 0,20
◆ Fundición	140 - 280	0,12 - 0,20
◆ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
◆ Aleaciones refractarias	25 - 35	0,12 - 0,20
◆ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

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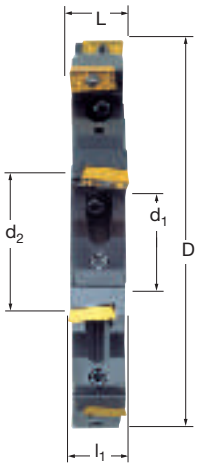


7200 VA 16_N Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L min-max.	l_1	d_1	d_2	a_r max.	No. de plaquitas	EDP#	Cartuchos	Recambios EDP#		EDP#	
016616	**7200VA 16 -160N20/23**	160	20-23	21	40	58	49	5R+5L	016749 016747	72VAR20/23 72VAL20/23	015262	D4010T	015240	T15
016617	**7200VA 16 -160N23/26**	160	20-26	24	40	58	49	5R+5L	016750 016748	72VAR23/26 72VAL23/26	015262	D4010T	015240	T15
016618	**7200VA 16 -200N20/23**	200	20-23	21	50	72	62	6R+6L	016749 016747	72VAR20/23 72VAL20/23	015262	D4010T	015240	T15
016619	**7200VA 16 -250N20/23**	250	20-23	21	50	85	81	8R+8L	016749 016747	72VAR20/23 72VAL20/23	015262	D4010T	015240	T15
016620	**7200VA 16 -250N23/26**	250	23-26	24	50	85	81	8R+8L	016750 016748	72VAR23/26 72VAL23/26	015262	D4010T	015240	T15

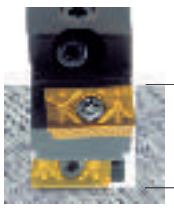
7200 VA 16_N Recambios cartuchos

EDP #	Referencia cartucho	Accesorios EDP#		Tornillo de fijación EDP#		EDP#	
016749	**72VAR20/23**	016858	72.602	015257	72.694T	015273	T20TB
016747	**72VAL20/23**	016858	72.602	015257	72.694T	015273	T20TB
016750	**72VAR23/26**	016858	72.602	015257	72.694T	015273	T20TB
016748	**72VAL23/26**	016858	72.602	015257	72.694T	015273	T20TB





Fresa disco a cartuchos



Profundidad de corte (a_r)



7200 VA 16_N Consejos técnicos

Ejemplo de pedido de la fresa: **7200VA16-200N20/23**
Ejemplo de pedido de la plaquita: **APFW1604PDTL SFZ / APFW1604PDTR SFZ**
Para condiciones completas ver pagina: **A288**



IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

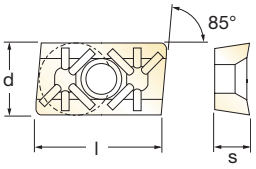
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo e la viruta

Plaquitas para 7200 VA 16_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
014066	**APEX 16 04PDFR-701**	**GH1**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,02
017624	**APEX 16 04PDFL-701**	**GH1**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,02
017627	**APFW 16 04PDTR**	**X44**				9,52	16,66	4,76	Faceta	0,1
024922	**APFW 16 04PDTL**	**X44**				9,52	16,66	4,76	Faceta	0,1
017628	**APFW 16 04PDTR**	**GH1**				9,52	16,66	4,76	Faceta	0,1
017630	**APFW 16 04PDTL**	**GH1**				9,52	16,66	4,76	Faceta	0,1
017629	**APFW 16 04PDTR**	**SFZ**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
024075	**APFW 16 04PDTL**	**SFZ**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
017293	**APHT 16 04PDTR-42**	**MP91M**	◆◆	◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
017292	**APHT 16 04PDTL-42**	**MP91M**	◆◆	◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
017634	**APHT 16 04PDTR-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
024088	**APHT 16 04PDTL-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
027718	**APHT 16 04PDTR-42**	**SP6564**		◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
027910	**APHT 16 04PDTL-42**	**SP6564**		◆◆	◆◆	9,52	16,66	4,76	Faceta	0,1
015155	**APHT 16 04PDTR-42**	**X500**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1
017635	**APHT 16 04PDTL-42**	**X500**	◆	◆	◆	9,52	16,66	4,76	Faceta	0,1

APEX 16_ -701



APFW 16_



APHT 16_ -42



Condiciones de corte recomendadas para AP_16

Material	Velocidad V_c (m/min)	Avance h_m (mm)
◆ Aceros no aleados	180 - 220	0,15 - 0,28
◆ Aceros aleados	70 - 110	0,14 - 0,25
◆ Aceros inoxidables	100 - 210	0,12 - 0,25
◆ Inoxidables PH	55 - 70	0,12 - 0,20
◆ Fundición	140 - 280	0,12 - 0,20
◆ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
◆ Aleaciones refractarias	25 - 35	0,12 - 0,20
◆ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

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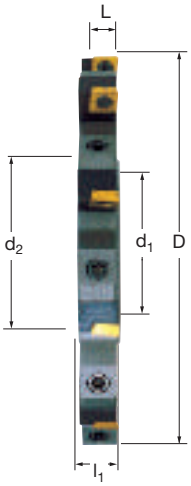


7200 VM 04_R Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#	F2004T	EDP#	T6
016652	**7200VM 04 -080R06/07**	80	4,7	14	27	42	16	10	016759	72VMR06/07	015059	F2004T	018487	T6
016653	**7200VM 04 -080R07/08**	80	4,7	14	27	42	16	10	016760	72VMR07/08	015059	F2004T	018487	T6
016650	**7200VM 04 -100R06/07**	100	4,7	14	32	48	23	12	016759	72VMR06/07	015059	F2004T	018487	T6
016651	**7200VM 04 -100R07/08**	100	4,7	14	32	48	23	12	016760	72VMR07/08	015059	F2004T	018487	T6
016654	**7200VM 04 -125R06/07**	125	4,7	14	40	58	30	16	016759	72VMR06/07	015059	F2004T	018487	T6
016655	**7200VM 04 -125R07/08**	125	4,7	14	40	58	30	16	016760	72VMR07/08	015059	F2004T	018487	T6

7200 VM 04 Recambios cartuchos

EDP #	Referencia cartucho	Cartuchos EDP#	Tornillo de fijación	EDP#	T9
016759	**72VMR06/07**	015259	72.698T	013214	T9
016760	**72VMR07/08**	015259	72.698T	013214	T9





Fresa disco a cartuchos



7200 VM 04_R Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM04-125R06/07**
Ejemplo de pedido de la plaquita: **MPHW0402PPTR X500**
Para condiciones completas ver pagina: **A288**

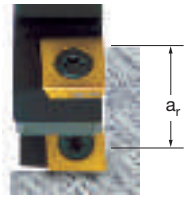
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

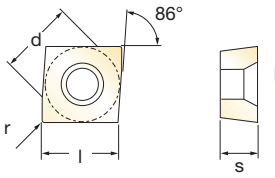
$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VM 04_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
017645	**MPFW 04 02PPTR**	**SF30**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**		◆◆	◆◆	4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**				4,76	4,76	2,38	Faceta	0,07
017666	**MPHW 04 02PPTR**	**X500**	◆			4,76	4,76	2,38	Faceta	0,07

MPFW 04_



MPHW 04_



Condiciones de corte recomendadas para MP_04

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,10
Aceros aleados	70 - 110	0,07 - 0,08
Aceros inoxidables	120 - 140	0,07 - 0,10
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,08
Aluminio y Aleaciones	-	-
Aleaciones refractarias	25 - 35	0,07 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

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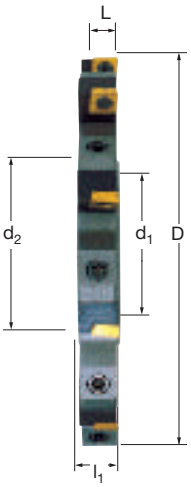


7200 VM 06_R Conjuntos Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
016656	**7200VM 06 -100R08/09**	100	6,3	12	32	48	23	12	016761	72VMR08/09	015060	F2505T	018488	T7
016657	**7200VM 06 -100R09/10**	100	6,3	12	32	48	23	12	016762	72VMR09/10	015060	F2505T	018488	T7
016658	**7200VM 06 -125R08/09**	125	6,3	12	40	58	31	14	016761	72VMR08/09	015060	F2505T	018488	T7
016659	**7200VM 06 -125R09/10**	125	6,3	12	40	58	31	14	016762	72VMR09/10	015060	F2505T	018488	T7

7200 VM 06_R Cartuchos Recambios

EDP #	Referencia cartucho	Cartuchos Tornillo de fijación EDP#		EDP#	
016761	**72VMR08/09**	015258	72.697T	015240	T15
016762	**72VMR09/10**	015258	72.697T	015240	T15





Fresa disco a cartuchos



7200 VM 06_R Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM06-100R08/09**
Ejemplo de pedido de la plaquita: **MPHW06020PPTR X500**
Para condiciones completas ver pagina: **A288**

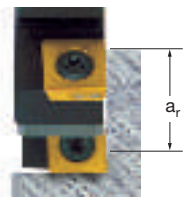
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

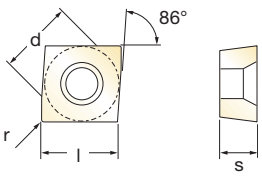
$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VM 06_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**		♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**				6,35	6,35	2,38	Faceta	0,07
017301	**MPHW 06 02PPTR**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
023253	**MPHW 06 02PPTR**	**PFZ**				6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07

MPEX 06_ -701



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas para MP_06

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,12
Aceros aleados	70 - 110	0,07 - 0,10
Aceros inoxidables	120 - 140	0,07 - 0,12
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,10
Aluminio y Aleaciones	275 - 450	0,04 - 0,12
Aleaciones refractarias	25 - 35	0,07 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ♦ Aceros no aleados	M ♦ Aceros inoxidables	K ♦ Fundición	S ♦ Aleaciones refractarias
P ♦ Aceros aleados	M ♦ Inoxidables PH	N ♦ Aluminio y Aleaciones	H ♦ Materiales duros

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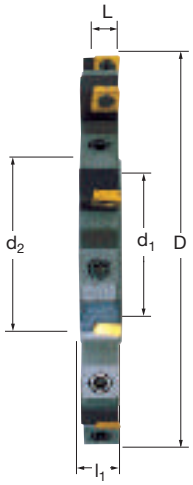


7200 VM 08_R Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#	F3008T	EDP#	T9
016660	**7200VM 08 -100R10/12**	100	7,9	11	32	48	24	8	016763	72VMR10/12	015063	F3008T	013214	T9
016661	**7200VM 08 -100R12/14**	100	7,9	13	32	48	24	8	016764	72VMR12/14	015063	F3008T	013214	T9
016662	**7200VM 08 -125R10/12**	125	7,9	11	40	58	32	10	016763	72VMR10/12	015063	F3008T	013214	T9
016663	**7200VM 08 -125R12/14**	125	7,9	13	40	58	32	10	016764	72VMR12/14	015063	F3008T	013214	T9
016664	**7200VM 08 -160R10/12**	160	7,9	11	40	58	49	12	016763	72VMR10/12	015063	F3008T	013214	T9
016665	**7200VM 08 -160R12/14**	160	7,9	13	40	58	49	12	016764	72VMR12/14	015063	F3008T	013214	T9

7200 VM 08_R Cartuchos Recambios

EDP #	Referencia cartucho	Cartuchos EDP#	Tornillo de fijación	EDP#	
016763	**72VMR10/12**	015256	72.693T	015273	T20TB
016764	**72VMR12/14**	015256	72.693T	015273	T20TB





Fresa disco a cartuchos



7200 VM 08_R Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM08-125R10/12**
Ejemplo de pedido de la plaquita: **MPFW0803PPTR SFZ**
Para condiciones completas ver pagina: **A288**

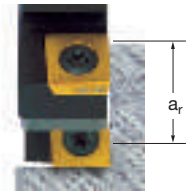
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

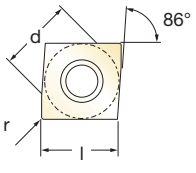
$$h_m = \sqrt{\frac{10}{200}} \times 0,5 = 0,223 \times 0,5 = 0,111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VM 08_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017640	**MPEX 08 03PPER-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017642	**MPEX 08 03PPFR-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017655	**MPFW 08 03PPTR**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**				7,94	7,94	3,18	Faceta	0,1
017664	**MPHT 08 03PPER**	**SFZ**				7,94	7,94	3,18	Faceta	0,04
017297	**MPHT 08 03PPTR-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTR-42**	**SP6564**		♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**	♦♦	♦	♦	7,94	7,94	3,18	Faceta	0,1

MPEX 08_ -701



MPFW 08_



MPHT 08_



MPHT 08_ -42



Condiciones de corte recomendadas para MP_08

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,10 - 0,14
♦ Aceros aleados	70 - 110	0,10 - 0,12
♦ Aceros inoxidables	120 - 140	0,10 - 0,12
♦ Inoxidables PH	55 - 70	0,12 - 0,20
♦ Fundición	140 - 280	0,10 - 0,12
♦ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
♦ Aleaciones refractarias	25 - 35	0,05 - 0,10
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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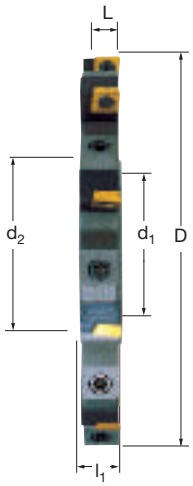


7200 VM 11_R Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
016668	**7200VM 11 -125R14/16**	125	11,1	15	40	58	32	8	016765	72VMR14/16	015262	D4010T	015240	T15
016669	**7200VM 11 -125R16/18**	125	11,1	17	40	58	32	8	016766	72VMR16/18	015262	D4010T	015240	T15
016670	**7200VM 11 -160R14/16**	160	11,1	15	40	58	49	10	016765	72VMR14/16	015262	D4010T	015240	T15
016671	**7200VM 11 -160R16/18**	160	11,1	17	40	58	49	10	016766	72VMR16/18	015262	D4010T	015240	T15
016672	**7200VM 11 -160R18/20**	160	11,1	19	40	58	49	10	015445	72VMR18/20	015262	D4010T	015240	T15
016673	**7200VM 11 -200R16/18**	200	11,1	17	50	72	62	12	016766	72VMR16/18	015262	D4010T	015240	T15
016674	**7200VM 11 -200R18/20**	200	11,1	19	50	72	62	12	015445	72VMR18/20	015262	D4010T	015240	T15
016675	**7200VM 11 -250R18/20**	250	11,1	19	50	85	81	16	015445	72VMR18/20	015262	D4010T	015240	T15

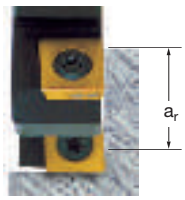
7200 VM 11_R Cartuchos Recambios

EDP #	Referencia cartucho	Accesorios EDP#		Tornillo de fijación EDP#		EDP#	
016765	**72VMR14/12**	016858	72.602	015257	72.694T	015273	T20TB
016766	**72VMR16/18**	016858	72.602	015257	72.694T	015273	T20TB
015445	**72VMR18/20**	016858	72.602	015257	72.694T	015273	T20TB





Fresa disco a cartuchos



Profundidad de corte (a_r)

7200 VM 11_R Consejos técnicos



Ejemplo de pedido de la fresa: **7200VM11-200R16/18**
Ejemplo de pedido de la plaquita: **MPFW1104PPTR SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

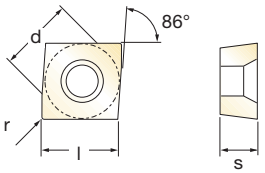
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0,5 = 0,223 \times 0,5 = 0,111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 11_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017643	**MPEX 11 04PPFR-701**	**GH1**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,02
017440	**MPFW 11 04PPTR**	**GH1**				11,11	11,11	4,76	Faceta	0,15
018182	**MPFW 11 04PPTR**	**SF30**				11,11	11,11	4,76	Faceta	0,15
017660	**MPFW 11 04PPTR**	**SFZ**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,15
017777	**MPFW 11 04PPTR**	**X44**				11,11	11,11	4,76	Faceta	0,15
017299	**MPHT 11 04PPTR-42**	**MP91M**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,1
027908	**MPHT 11 04PPTR-42**	**SP6564**		♦♦	♦♦	11,11	11,11	4,76	Faceta	0,1
015142	**MPHT 11 04PPTR-42**	**X500**	♦♦	♦	♦	11,11	11,11	4,76	Faceta	0,1

MPEX 11_ -701



MPFW_



MPHT 11_ -42



Condiciones de corte recomendadas para MP_11

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,15 - 0,40
♦ Aceros aleados	70 - 110	0,15 - 0,30
♦ Aceros inoxidables	120 - 140	0,12 - 0,30
♦ Inoxidables PH	55 - 70	0,12 - 0,20
♦ Fundición	140 - 280	0,12 - 0,30
♦ Aluminio y Aleaciones	275 - 450	0,06 - 0,28
♦ Aleaciones refractarias	25 - 35	0,05 - 0,15
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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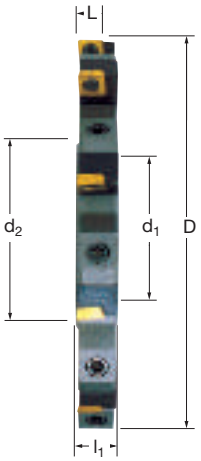


7200 VM 04_L Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
025475	**7200VM 04 -080L06/07**	80	4,7	14	27	42	16	10	016751	72VML06/07	015059	F2004T	018487	T6
025476	**7200VM 04 -080L07/08**	80	4,7	14	27	42	16	10	016752	72VML07/08	015059	F2004T	018487	T6
025477	**7200VM 04 -100L06/07**	100	4,7	14	32	48	23	12	016751	72VML06/07	015059	F2004T	018487	T6
025478	**7200VM 04 -100L07/08**	100	4,7	14	32	48	23	12	016752	72VML07/08	015059	F2004T	018487	T6
025479	**7200VM 04 -125L06/07**	125	4,7	14	40	58	30	16	016751	72VML06/07	015059	F2004T	018487	T6
025480	**7200VM 04 -125L07/08**	125	4,7	14	40	58	30	16	016752	72VML07/08	015059	F2004T	018487	T6

7200 VM 04_L Cartuchos Recambios

EDP #	Referencia cartucho	Cartuchos Tornillo de fijación EDP#		EDP#	
016751	**72VML06/07**	015259	72.698T	013214	T9
016752	**72VML07/08**	015259	72.698T	013214	T9





Fresa disco a cartuchos



7200 VM 04_L Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM04-125L06/07**
Ejemplo de pedido de la plaquita: **MPHW0402PPTL X500**
Para condiciones completas ver pagina: **A288**

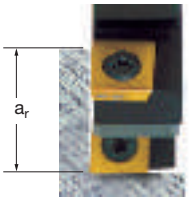
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

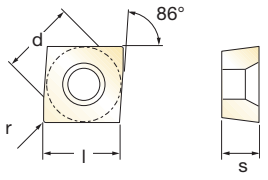
$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VM 04_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
025799	**MPFW 04 02PPTL**	**GH1**				4,76	4,76	2,38	Faceta	0,07
015157	**MPFW 04 02PPTL**	**SFZ**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
027903	**MPFW 04 02PPTL**	**SP6564**		◆◆	◆◆	4,76	4,76	2,38	Faceta	0,07
017426	**MPFW 04 02PPTL**	**X44**				4,76	4,76	2,38	Faceta	0,07
017667	**MPHW 04 02PPTL**	**X500**	◆			4,76	4,76	2,38	Faceta	0,07

MPFW 04_

MPHW 04_

Condiciones de corte recomendadas para MP_04

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,10
Aceros aleados	70 - 110	0,07 - 0,08
Aceros inoxidables	120 - 140	0,07 - 0,10
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,08
Aluminio y Aleaciones	-	-
Aleaciones refractarias	25 - 40	0,05 - 0,08
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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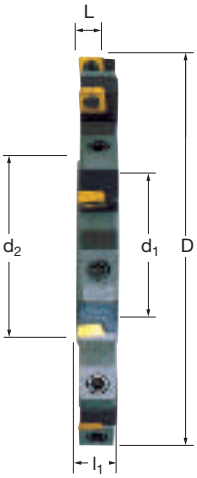


7200 VM 06_L Conjuntos Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartucho	Recambios EDP#		EDP#	
025481	**7200VM 06 -100L08/09**	100	6,3	12	32	48	23	12	016753	72VML08/09	015060	F2505T	018488	T7
025482	**7200VM 06 -100L09/10**	100	6,3	12	32	48	23	12	016754	72VML09/10	015060	F2505T	018488	T7
025483	**7200VM 06 -125L08/09**	125	6,3	12	40	58	31	14	016753	72VML08/09	015060	F2505T	018488	T7
025484	**7200VM 06 -125L09/10**	125	6,3	12	40	58	31	14	016754	72VML09/10	015060	F2505T	018488	T7

7200 VM 06_L Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartucho EDP#		Tornillo de fijación EDP#	
016753	**72VML08/09**	015258	72.697T	015240	T15
016754	**72VML09/10**	015258	72.697T	015240	T15





Fresa disco a cartuchos



7200 VM 06_L Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM06-100L08/09**
Ejemplo de pedido de la plaquita: **MPHW0602PPTL X500**
Para condiciones completas ver pagina: **A288**

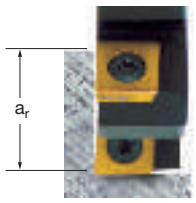
IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

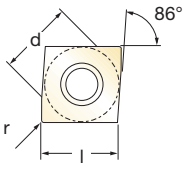
$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta



Profundidad de corte (a_r)

Plaquitas para 7200 VM 06_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024926	**MPEX 06 02PPFL-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
017639	**MPEX 06 02PPFL-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017652	**MPFW 06 02PPTL**	**GH1**				6,35	6,35	2,38	Faceta	0,07
015159	**MPFW 06 02PPTL**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
027905	**MPFW 06 02PPTL**	**SP6564**		♦	♦	6,35	6,35	2,38	Faceta	0,07
017300	**MPHW 06 02PPTL**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017669	**MPHW 06 02PPTL**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07

MPEX 06_ -701



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas MP_06

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,07 - 0,12
♦ Aceros aleados	70 - 110	0,07 - 0,10
♦ Aceros inoxidables	120 - 140	0,07 - 0,12
♦ Inoxidables PH	-	-
♦ Fundición	140 - 280	0,07 - 0,10
♦ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
♦ Aleaciones refractarias	25 - 40	0,05 - 0,08
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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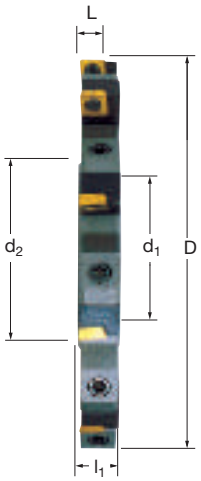


7200 VM 08_L Conjuntos Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartucho	Recambios EDP#		EDP#	
025485	**7200VM 08 -100L10/12**	100	7,9	11	32	48	24	8	016755	72VML10/12	015063	F3008T	013214	T9
025486	**7200VM 08 -100L12/14**	100	7,9	13	32	48	24	8	016756	72VML12/14	015063	F3008T	013214	T9
025487	**7200VM 08 -125L10/12**	125	7,9	11	40	58	32	10	016755	72VML10/12	015063	F3008T	013214	T9
025488	**7200VM 08 -125L12/14**	125	7,9	13	40	58	32	10	016756	72VML12/14	015063	F3008T	013214	T9
025489	**7200VM 08 -160L10/12**	160	7,9	11	40	58	49	12	016755	72VML10/12	015063	F3008T	013214	T9
025491	**7200VM 08 -160L12/14**	160	7,9	13	40	58	49	12	016756	72VML12/14	015063	F3008T	013214	T9

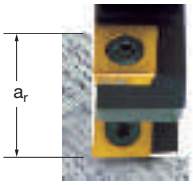
7200 VM 08_L Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartucho EDP#		Tornillo de fijación EDP#	
016755	**72VML10/12**	015256	72.693T	015273	T20TB
016756	**72VML12/14**	015256	72.693T	015273	T20TB





Fresa disco a cartuchos



Profundidad de corte (a_r)

7200 VM 08_L Consejos técnicos



Ejemplo de pedido de la fresa: **7200VM08-125L10/12**
Ejemplo de pedido de la plaquita: **MPFW0803PPTL SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

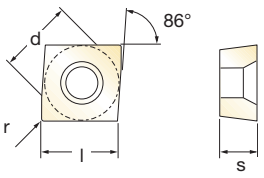
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0,5 = 0,223 \times 0,5 = 0,111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 08_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017641	**MPEX 08 03PPEL-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
024928	**MPEX 08 03PPFL-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
017490	**MPEX 08 03PPFL-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017658	**MPFW 08 03PPTL**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017656	**MPFW 08 03PPTL**	**SF30**				7,94	7,94	3,18	Faceta	0,1
017659	**MPFW 08 03PPTL**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017657	**MPFW 08 03PPTL**	**X44**				7,94	7,94	3,18	Faceta	0,1
017296	**MPHT 08 03PPTL-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
023249	**MPHT 08 03PPTL-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027907	**MPHT 08 03PPTL-42**	**SP6564**		♦	♦	7,94	7,94	3,18	Faceta	0,1
015138	**MPHT 08 03PPTL-42**	**X500**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1

MPEX 08_ -701



MPFW 08_



MPHT 08_ -42



Condiciones de corte recomendadas MP_08

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,10 - 0,14
Aceros aleados	70 - 110	0,10 - 0,12
Aceros inoxidables	120 - 140	0,10 - 0,12
Inoxidables PH	55 - 70	0,12 - 0,20
Fundición	140 - 280	0,10 - 0,12
Aluminio y Aleaciones	275 - 450	0,04 - 0,12
Aleaciones refractarias	25 - 40	0,05 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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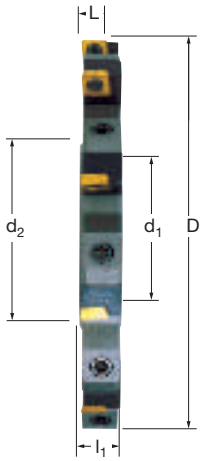


7200 VM 11_L Conjunto Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L	l_1	d_1	d_2	a_r max.	No. de dientes	EDP#	Cartucho	Recambios EDP#		EDP#	
025490	**7200VM 11 -125L14/16**	125	11,1	15	40	58	32	8	016757	72VML14/16	015262	D4010T	015240	T15
025492	**7200VM 11 -125L16/18**	125	11,1	17	40	58	32	8	016758	72VML16/18	015262	D4010T	015240	T15
025493	**7200VM 11 -160L14/16**	160	11,1	15	40	58	49	10	016757	72VML14/16	015262	D4010T	015240	T15
025494	**7200VM 11 -160L16/18**	160	11,1	17	40	58	49	10	016758	72VML16/18	015262	D4010T	015240	T15
025495	**7200VM 11 -160L18/20**	160	11,1	19	40	58	49	10	015444	72VML18/20	015262	D4010T	015240	T15
025496	**7200VM 11 -200L16/18**	200	11,1	17	50	72	62	12	016758	72VML16/18	015262	D4010T	015240	T15
025497	**7200VM 11 -200L18/20**	200	11,1	19	50	72	62	12	015444	72VML18/20	015262	D4010T	015240	T15
025498	**7200VM 11 -250L18/20**	250	11,1	19	50	85	81	16	015444	72VML18/20	015262	D4010T	015240	T15

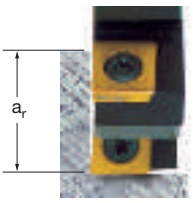
7200 VM 11_L Cartuchos Recambios

EDP #	Referencia Cartuchos	Regulación EDP#		Tornillo de fijación EDP#		EDP#	
016757	**72VML14/16**	016858	72.602	015257	72.694T	015273	T20TB
016758	**72VML16/18**	016858	72.602	015257	72.694T	015273	T20TB
015444	**72VML18/20**	016858	72.602	015257	72.694T	015273	T20TB





Fresa disco a cartuchos



Profundidad de corte (a_r)

7200 VM 11_L Consejos técnicos



Ejemplo de pedido de la fresa: **7200VM11-200L16/18**
Ejemplo de pedido de la plaquita: **MPFW1104PPTL SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

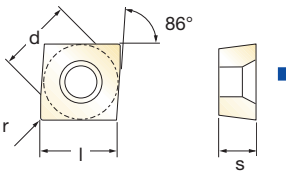
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 11_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017644	**MPEX 11 04PPFL-701**	**GH1**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,02
017439	**MPFW 11 04PPTL**	**GH1**				11,11	11,11	4,76	Faceta	0,15
018181	**MPFW 11 04PPTL**	**SF30**				11,11	11,11	4,76	Faceta	0,15
017662	**MPFW 11 04PPTL**	**SFZ**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,15
017336	**MPFW 11 04PPTL**	**X44**				11,11	11,11	4,76	Faceta	0,15
017298	**MPHT 11 04PPTL-42**	**MP91M**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,1
027909	**MPHT 11 04PPTL-42**	**SP6564**		♦	♦	11,11	11,11	4,76	Faceta	0,1
015141	**MPHT 11 04PPTL-42**	**X500**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,1

MPEX 11_ -701



MPFW 11_



MPHT 11_ -42



Condiciones de corte recomendadas MP_11

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,15 - 0,40
Aceros aleados	70 - 110	0,15 - 0,30
Aceros inoxidables	120 - 140	0,12 - 0,30
Inoxidables PH	55 - 70	0,12 - 0,20
Fundición	140 - 280	0,12 - 0,30
Aluminio y Aleaciones	275 - 450	0,06 - 0,28
Aleaciones refractarias	25 - 40	0,05 - 0,15
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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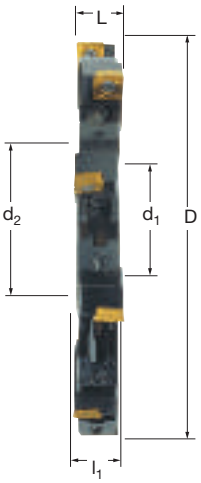


7200 VM 04_N Conjunto Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L min-max.	l_1	d_1	d_2	a_r max.	No. de plaquitas	EDP#	Cartucho	Recambios EDP#		EDP#	
016626	**7200VM 04 -080N06/07**	80	6-7	14	27	42	16	5R+5L	016759 016751	72VMR06/07 72VML06/07	015059	F2004T	018487	T6
016627	**7200VM 04 -080N07/08**	80	7-8	14	27	42	16	5R+5L	016760 016752	72VMR07/08 72VML07/08	015059	F2004T	018487	T6
016628	**7200VM 04 -100N06/07**	100	6-7	14	32	48	23	6R+6L	016759 016751	72VMR06/07 72VML06/07	015059	F2004T	018487	T6
016629	**7200VM 04 -100N07/08**	100	7-8	14	32	48	23	6R+6L	016760 016752	72VMR07/08 72VML07/08	015059	F2004T	018487	T6
016630	**7200VM 04 -125N06/07**	125	6-7	14	40	58	30	8R+8L	016759 016751	72VMR06/07 72VML06/07	015059	F2004T	018487	T6
016631	**7200VM 04 -125N07/08**	125	7-8	14	40	58	30	8R+8L	016760 016752	72VMR07/08 72VML07/08	015059	F2004T	018487	T6

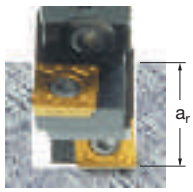
7200 VM 04_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartucho EDP#		Tornillo de fijación EDP#	
016759	**72VMR06/07**	015259	72.698T	013214	T9
016751	**72VML06/07**	015259	72.698T	013214	T9
016760	**72VMR07/08**	015259	72.698T	013214	T9
016752	**72VML07/08**	015259	72.698T	013214	T9





Fresa disco a cartuchos



Profundidad de corte (a_r)

7200 VM 04_N Consejos técnicos



Ejemplo de pedido de la fresa: **7200VM04-125N06/07**
Ejemplo de pedido de la plaquita: **MPFW0402PPTR X44 / MPFW0402PPTL X44**
Para condiciones completas ver pagina: **A288**



IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

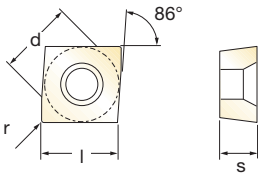
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 04_N



MPFW 04_

EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
025799	**MPFW 04 02PPTL**	**GH1**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
015157	**MPFW 04 02PPTL**	**SFZ**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**		◆	◆	4,76	4,76	2,38	Faceta	0,07
027903	**MPFW 04 02PPTL**	**SP6564**		◆	◆	4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**				4,76	4,76	2,38	Faceta	0,07
017426	**MPFW 04 02PPTL**	**X44**				4,76	4,76	2,38	Faceta	0,07

MPHW 04_

017666	**MPHW 04 02PPTR**	**X500**	◆	◆	◆	4,76	4,76	2,38	Faceta	0,07
017667	**MPHW 04 02PPTL**	**X500**	◆	◆	◆	4,76	4,76	2,38	Faceta	0,07

Condiciones de corte recomendadas MP_04

Material	Velocidad V_c (m/min)	Avance h_m (mm)
◆ Aceros no aleados	180 - 220	0,07 - 0,10
◆ Aceros aleados	70 - 110	0,07 - 0,08
◆ Aceros inoxidables	120 - 140	0,07 - 0,10
◆ Inoxidables PH	-	-
◆ Fundición	140 - 280	0,07 - 0,08
◆ Aluminio y Aleaciones	-	-
◆ Aleaciones refractarias	25 - 40	0,08 - 0,10
◆ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

Fresa disco 3 cortes 7200 VM 06_N

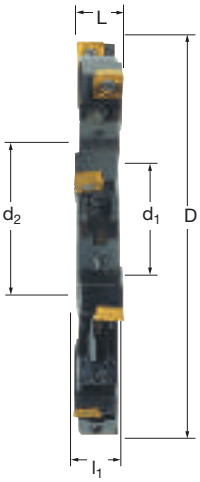


7200 VM 06_N Conjunto Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L min-max.	l_1	d_1	d_2	a_r max.	No. de plaquitas	EDP#	Cartucho	Recambios EDP#		EDP#	
016632	**7200VM 06 -100N08/09**	100	8-9	12	32	48	23	6R+6L	016761 016753	72VMR08/09 72VML08/09	015060	F2505T	018488	T7
016633	**7200VM 06 -100N09/10**	100	9-10	12	32	48	23	6R+6L	016762 016754	72VMR09/10 72VML09/10	015060	F2505T	018488	T7
016634	**7200VM 06 -125N08/09**	125	8-9	12	40	58	31	7R+7L	016761 016753	72VMR08/09 72VML08/09	015060	F2505T	018488	T7
016635	**7200VM 06 -125N09/10**	125	9-10	12	40	58	31	7R+7L	016762 016754	72VMR09/10 72VML09/10	015060	F2505T	018488	T7

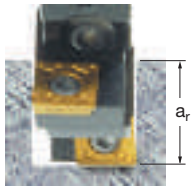
7200 VM 06_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartucho EDP#		Tornillo de fijación EDP#	
016761	**72VMR08/09**	015258	72.697T	015240	T15
016753	**72VML08/09**	015258	72.697T	015240	T15
016762	**72VMR09/10**	015258	72.697T	015240	T15
016754	**72VML09/10**	015258	72.697T	015240	T15





Fresa disco a cartuchos



Profundidad de corte (a_r)

7200 VM 06_N Consejos técnicos



Ejemplo de pedido de la fresa: **7200VM06-125N09/10**
Ejemplo de pedido de la plaquita: **MPHW0602PPTL X500 / MPHW0602PPTR X500**
Para condiciones completas ver pagina: **A288**



IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

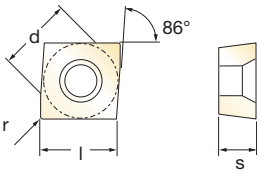
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 06_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
024926	**MPEX 06 02PPFL-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017639	**MPEX 06 02PPFL-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017652	**MPFW 06 02PPTL**	**GH1**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
015159	**MPFW 06 02PPTL**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**		♦	♦	6,35	6,35	2,38	Faceta	0,07
027905	**MPFW 06 02PPTL**	**SP6564**		♦	♦	6,35	6,35	2,38	Faceta	0,07
017301	**MPHW 06 02PPTR**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017300	**MPHW 06 02PPTL**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017669	**MPHW 06 02PPTL**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07

MPEX 06_ -701



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas MP_06

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,12
Aceros aleados	70 - 110	0,07 - 0,10
Aceros inoxidables	120 - 140	0,07 - 0,12
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,10
Aluminio y Aleaciones	275 - 450	0,04 - 0,12
Aleaciones refractarias	25 - 40	0,08 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Fresa disco 3 cortes 7200 VM 08_N

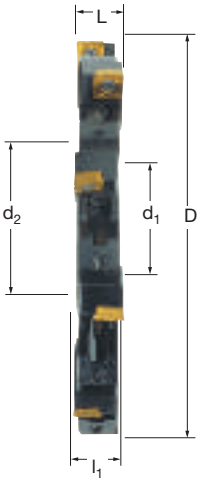


7200 VM 08_N Conjunto Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L min-max.	l_1	d_1	d_2	a_r max.	No. de plaquitas	EDP#	Cartucho	Recambios EDP#		EDP#	
016636	**7200VM 08 -100N10/12**	100	10-12	11	32	48	24	4R+4L	016763 016755	72VMR10/12 72VML10/12	015063	F3008T	013214	T9
016637	**7200VM 08 -100N12/14**	100	12-14	13	32	48	24	4R+4L	016764 016756	72VMR12/14 72VML12/14	015063	F3008T	013214	T9
016638	**7200VM 08 -125N10/12**	125	10-12	11	40	58	32	5R+5L	016763 016755	72VMR10/12 72VML10/12	015063	F3008T	013214	T9
016639	**7200VM 08 -125N12/14**	125	12-14	13	40	58	32	5R+5L	016764 016756	72VMR12/14 72VML12/14	015063	F3008T	013214	T9
016640	**7200VM 08 -160N10/12**	160	10-12	11	40	58	49	6R+6L	016763 016755	72VMR10/12 72VML10/12	015063	F3008T	013214	T9
016641	**7200VM 08 -160N12/14**	160	12-14	13	40	58	49	6R+6L	016764 016756	72VMR12/14 72VML12/14	015063	F3008T	013214	T9

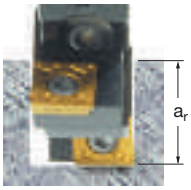
7200 VM 08_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartucho EDP#		Tornillo de fijación EDP#	
016763	**72VMR10/12**	015256	72.693T	015273	T20TB
016755	**72VML10/12**	015256	72.693T	015273	T20TB
016764	**72VMR12/14**	015256	72.693T	015273	T20TB
016756	**72VML12/14**	015256	72.693T	015273	T20TB





Fresa disco a cartuchos



Profundidad de corte (a_r)



7200 VM 08_N Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM08-100N10/12**
Ejemplo de pedido de la plaquita: **MPHT0803PPTR-42 MP91M / MPHT0803PPTL-42 MP91M**
Para condiciones completas ver pagina: **A288**



IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

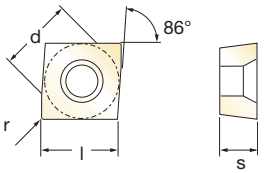
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 08_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
017640	**MPEX 08 03PPER-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017641	**MPEX 08 03PPEL-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017642	**MPEX 08 03PPFR-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
024928	**MPEX 08 03PPFL-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017490	**MPEX 08 03PPFL-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02

MPEX 08_ -701



017655	**MPFW 08 03PPTR**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017658	**MPFW 08 03PPTL**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**				7,94	7,94	3,18	Faceta	0,1
017656	**MPFW 08 03PPTL**	**SF30**				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017659	**MPFW 08 03PPTL**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**				7,94	7,94	3,18	Faceta	0,1
017657	**MPFW 08 03PPTL**	**X44**				7,94	7,94	3,18	Faceta	0,1

MPFW 08_



017297	**MPHT 08 03PPTR-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
017296	**MPHT 08 03PPTL-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
023249	**MPHT 08 03PPTL-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTR-42**	**SP6564**		♦	♦	7,94	7,94	3,18	Faceta	0,1
027907	**MPHT 08 03PPTL-42**	**SP6564**		♦	♦	7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
015138	**MPHT 08 03PPTL-42**	**X500**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1

MPHT 08_ -42



Condiciones de corte recomendadas MP_08

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,10 - 0,14
Aceros aleados	70 - 110	0,10 - 0,12
Aceros inoxidables	120 - 140	0,10 - 0,12
Inoxidables PH	55 - 70	0,12 - 0,20
Fundición	140 - 280	0,10 - 0,12
Aluminio y Aleaciones	275 - 450	0,04 - 0,12
Aleaciones refractarias	25 - 40	0,05 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

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Fresa disco 3 cortes 7200 VM 11_N

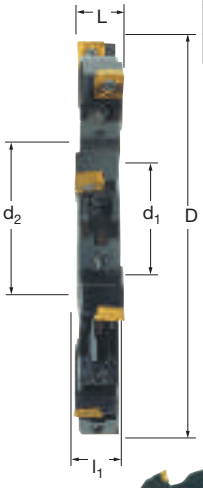


7200 VM 11_N Conjunto Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L min-max.	l_1	d_1	d_2	a_r max.	No. de plaquitas	EDP#	Cartucho	Recambios EDP#		EDP#	
016642	**7200VM11-125N14/16**	125	14-16	15	40	58	32	4R+4L	016765 016757	72VMR14/16 72VML14/16	015262	D4010T	015240	T15
016643	**7200VM11-125N16/18**	125	16-18	17	40	58	32	4R+4L	016766 016758	72VMR16/18 72VML16/18	015262	D4010T	015240	T15
016644	**7200VM11-160N14/16**	160	14-16	15	40	58	49	5R+5L	016765 016757	72VMR14/16 72VML14/16	015262	D4010T	015240	T15
016645	**7200VM11-160N16/18**	160	16-18	17	40	58	49	5R+5L	016766 016758	72VMR16/18 72VML16/18	015262	D4010T	015240	T15
016646	**7200VM11-160N18/20**	160	18-20	19	40	58	49	5R+5L	015445 015444	72VMR18/20 72VML18/20	015262	D4010T	015240	T15
016647	**7200VM11-200N16/18**	200	16-18	17	50	72	62	6R+6L	016766 016758	72VMR16/18 72VML16/18	015262	D4010T	015240	T15
016648	**7200VM11-200N18/20**	200	18-20	19	50	72	62	6R+6L	015445 015444	72VMR18/20 72VML18/20	015262	D4010T	015240	T15
016649	**7200VM11-250N18/20**	250	18-20	19	50	85	81	8R+8L	015445 015444	72VMR18/20 72VML18/20	015262	D4010T	015240	T15

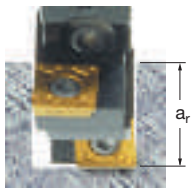
7200 VM 11_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Regulación EDP#		Tornillo de fijación EDP#		EDP#	
016765	**72VMR14/12**	016858	72.602	015257	72.694T	015273	T20TB
016757	**72VML14/12**	016858	72.602	015257	72.694T	015273	T20TB
016766	**72VMR16/18**	016858	72.602	015257	72.694T	015273	T20TB
016758	**72VML16/18**	016858	72.602	015257	72.694T	015273	T20TB
015445	**72VMR18/20**	016858	72.602	015257	72.694T	015273	T20TB
015444	**72VML18/20**	016858	72.602	015257	72.694T	015273	T20TB





Fresa disco a cartuchos



Profundidad de corte (a_r)



7200 VM 11_N Consejos técnicos

Ejemplo de pedido de la fresa: **7200VM11-250N18/20**
Ejemplo de pedido de la plaquita: **MPHT1104PPTR-42 MP91M / MPHT1104PPTL-42 MP91M**
Para condiciones completas ver pagina: **A288**



IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

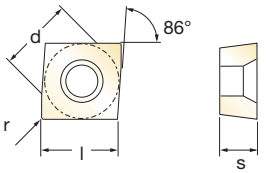
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7200 VM 11_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017643	**MPEX 11 04PPFR-701**	**GH1**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,02
017644	**MPEX 11 04PPFL-701**	**GH1**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,02

MPEX 11_ -701



017440	**MPFW 11 04PPTR**	**GH1**				11,11	11,11	4,76	Faceta	0,15
017439	**MPFW 11 04PPTL**	**GH1**				11,11	11,11	4,76	Faceta	0,15
018182	**MPFW 11 04PPTR**	**SF30**				11,11	11,11	4,76	Faceta	0,15
018181	**MPFW 11 04PPTL**	**SF30**				11,11	11,11	4,76	Faceta	0,15
017660	**MPFW 11 04PPTR**	**SFZ**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,15
017662	**MPFW 11 04PPTL**	**SFZ**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,15
017777	**MPFW 11 04PPTR**	**X44**				11,11	11,11	4,76	Faceta	0,15
017336	**MPFW 11 04PPTL**	**X44**				11,11	11,11	4,76	Faceta	0,15

MPFW 11_



017299	**MPHT 11 04PPTR-42**	**MP91M**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,1
017298	**MPHT 11 04PPTL-42**	**MP91M**	♦	♦	♦	11,11	11,11	4,76	Faceta	0,1
027908	**MPHT 11 04PPTR-42**	**X500**		♦	♦	11,11	11,11	4,76	Faceta	0,1
027909	**MPHT 11 04PPTL-42**	**X500**		♦	♦	11,11	11,11	4,76	Faceta	0,1
015142	**MPHT 11 04PPTR-42**	**X500**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,1
015141	**MPHT 11 04PPTL-42**	**X500**	♦♦	♦♦	♦♦	11,11	11,11	4,76	Faceta	0,1

MPHT 11_ -42



Condiciones de corte recomendadas MP_11

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,15 - 0,40
♦ Aceros aleados	70 - 110	0,15 - 0,30
♦ Aceros inoxidables	120 - 140	0,12 - 0,30
♦ Inoxidables PH	55 - 70	0,12 - 0,20
♦ Fundición	140 - 280	0,12 - 0,30
♦ Aluminio y Aleaciones	275 - 450	0,06 - 0,28
♦ Aleaciones refractarias	25 - 40	0,05 - 0,13
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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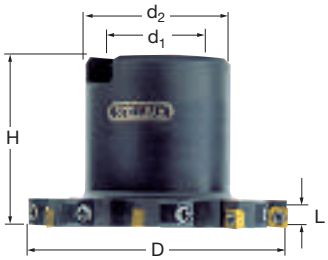


7220 VM 04_R Conjunto Fresa & Cartuchos

EDP #	Referencia Conjunto	Dimensiones (mm) D	L	H	d_1	d_2	No. de dientes	EDP#	Cartucho	Recambios EDP#		EDP#	
016709	**7220VM 04 -063R06/07R**	63	4,7	40	22	35	8	016759	72VMR06/07	015059	F2004T	018487	T6
016710	**7220VM 04 -063R07/08R**	63	4,7	40	22	35	8	016760	72VMR07/08	015059	F2004T	018487	T6
016711	**7220VM 04 -080R06/07R**	80	4,7	45	27	45	10	016759	72VMR06/07	015059	F2004T	018487	T6
016712	**7220VM 04 -080R07/08R**	80	4,7	45	27	45	10	016760	72VMR07/08	015059	F2004T	018487	T6

7220 VM 04_R Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartucho EDP#		Tornillo de fijación EDP#	
016759	**72VMR06/07**	015259	72.698T	013214	T9
016760	**72VMR07/08**	015259	72.698T	013214	T9





Fresa disco a cartuchos



7220 VM 04_R Consejos técnicos

Ejemplo de pedido de la fresa: **7220VM04-080R07/08R**
Ejemplo de pedido de la plaquita: **MPHW0402PPTR X500**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

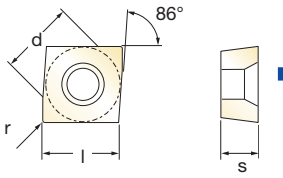
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 04_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
017645	**MPFW 04 02PPTR**	**SF30**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**		◆◆	◆◆	4,76	4,76	2,38	Faceta	0,07
017666	**MPHW 04 02PPTR**	**X500**	◆			4,76	4,76	2,38	Faceta	0,07

MPFW 04_

MPHW 04_

Condiciones de corte recomendadas MP_04

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,10
Aceros aleados	70 - 110	0,07 - 0,08
Aceros inoxidables	120 - 140	0,07 - 0,10
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,08
Aluminio y Aleaciones	-	-
Aleaciones refractarias	25 - 35	0,07 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

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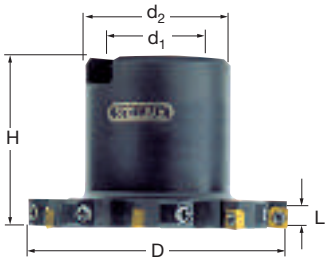


7220 VM 06_R Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	H	d_1	d_2	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
016713	**7220VM 06 -100R08/09R**	100	6,3	50	32	48	12	016761	72VMR08/09	015060	F2505T	018488	T7
016714	**7220VM 06 -100R09/10R**	100	6,3	50	32	48	12	016762	72VMR09/10	015060	F2505T	018488	T7
016715	**7220VM 06 -125R09/10R**	125	6,3	55	40	62	14	016762	72VMR09/10	015060	F2505T	018488	T7

7220 VM 06_R Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos EDP#		Tornillo de fijación EDP#	
016761	**72VMR08/09**	015258	72.697T	015240	T15
016762	**72VMR09/10**	015258	72.697T	015240	T15





Fresa disco a cartuchos



7220 VM 06_R Consejos técnicos

Ejemplo de pedido de la fresa: **7220VM06-100R08/09R**
Ejemplo de pedido de la plaquita: **MPFW0602PPTR SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

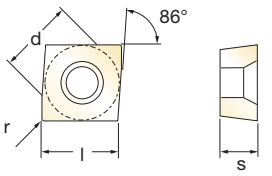
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0,5 = 0,223 \times 0,5 = 0,111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 06_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**		♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**				6,35	6,35	2,38	Faceta	0,07
017301	**MPHW 06 02PPTR**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
023253	**MPHW 06 02PPTR**	**PFZ**				6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07

MPEX 06_ -701



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas MP_06

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,12
Aceros aleados	70 - 110	0,07 - 0,10
Aceros inoxidables	120 - 140	0,07 - 0,12
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,10
Aluminio y Aleaciones	275 - 450	0,04 - 0,12
Aleaciones refractarias	25 - 35	0,07 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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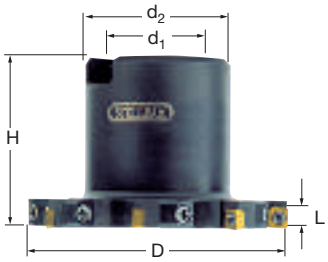


7220 VM 08_R Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	H	d_1	d_2	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
016716	**7220VM 08 -125R10/12R**	125	7,9	55	40	62	10	016763	72VMR10/12	015063	F3008T	013214	T9

7220 VM 08_R Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos EDP#		Tornillo de fijación EDP#	
016763	**72VMR10/12**	015256	72.693T	015273	T20TB





Fresa disco a cartuchos



7220 VM 08_R Consejos técnicos

Ejemplo de pedido de la fresa: **7220VM08-160R10/12R**
Ejemplo de pedido de la plaquita: **MPFW0803PPTR SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

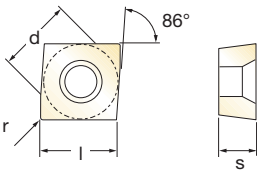
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 08_R



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017640	**MPEX 08 03PPER-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017642	**MPEX 08 03PPFR-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017655	**MPFW 08 03PPTR**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**				7,94	7,94	3,18	Faceta	0,1
017664	**MPHT 08 03PPER**	**SFZ**				7,94	7,94	3,18	Faceta	0,04
017297	**MPHT 08 03PPTR-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTR-42**	**SP6564**		♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**	♦♦	♦	♦	7,94	7,94	3,18	Faceta	0,1

MPEX 08_ -701



MPFW 08_



MPHT 08_



MPHT 08_ -42



Condiciones de corte recomendadas MP_08

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,10 - 0,14
♦ Aceros aleados	70 - 110	0,10 - 0,12
♦ Aceros inoxidables	120 - 140	0,10 - 0,12
♦ Inoxidables PH	55 - 70	0,12 - 0,20
♦ Fundición	140 - 280	0,10 - 0,12
♦ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
♦ Aleaciones refractarias	25 - 35	0,05 - 0,10
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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7220 VM 04_L Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	H	d_1	d_2	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
025499	**7220VM 04 -063R06/07L**	63	4,7	40	22	35	8	016751	72VML06/07	015059	F2004T	018487	T6
025500	**7220VM 04 -063R07/08L**	63	4,7	40	22	35	8	016752	72VML07/08	015059	F2004T	018487	T6
025501	**7220VM 04 -080R06/07L**	80	4,7	45	27	45	10	016751	72VML06/07	015059	F2004T	018487	T6
025502	**7220VM 04 -080R07/08L**	80	4,7	45	27	45	10	016752	72VML07/08	015059	F2004T	018487	T6

7220 VM 04_L Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos EDP#		Tornillo de fijación EDP#	
016751	**72VML06/07**	015259	72.698T	013214	T9
016752	**72VML07/08**	015259	72.698T	013214	T9





Fresa disco a cartuchos

7220 VM 04_L Consejos técnicos



Ejemplo de pedido de la fresa: **7220VM04-080R07/08L**
Ejemplo de pedido de la plaquita: **MPHW0402PPTL X500**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

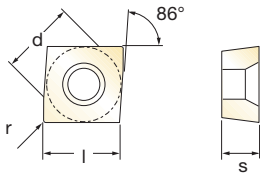
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 04_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
025799	**MPFW 04 02PPTL**	**GH1**				4,76	4,76	2,38	Faceta	0,07
015157	**MPFW 04 02PPTL**	**SFZ**	◆◆◆	◆◆◆	◆◆◆	4,76	4,76	2,38	Faceta	0,07
027903	**MPFW 04 02PPTL**	**SP6564**		◆◆	◆◆	4,76	4,76	2,38	Faceta	0,07
017426	**MPFW 04 02PPTL**	**X44**				4,76	4,76	2,38	Faceta	0,07
017667	**MPHW 04 02PPTL**	**X500**	◆			4,76	4,76	2,38	Faceta	0,07

MPFW 04_

MPHW 04_

Condiciones de corte recomendadas MP_04

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,10
Aceros aleados	70 - 110	0,07 - 0,08
Aceros inoxidables	120 - 140	0,07 - 0,10
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,08
Aluminio y Aleaciones	-	-
Aleaciones refractarias	25 - 40	0,05 - 0,08
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros



7220 VM 06_L Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L	H	d_1	d_2	No. de dientes	EDP#	Cartuchos	Recambios EDP#		EDP#	
025503	**7220VM 06 -100R08/09L**	100	6,3	50	32	48	12	016753	72VML08/09	015060	F2505T	018488	T7
025504	**7220VM 06 -100R09/10L**	100	6,3	50	32	48	12	016754	72VML09/10	015060	F2505T	018488	T7
025505	**7220VM 06 -125R09/10L**	125	6,3	55	40	62	14	016754	72VML09/10	015060	F2505T	018488	T7

7220 VM 06_L Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos EDP#		Tornillo de fijación EDP#	
016753	**72VML08/09**	015258	72.697T	015240	T15
016754	**72VML09/10**	015258	72.697T	015240	T15





Fresa disco a cartuchos

7220 VM 06_L Consejos técnicos



Ejemplo de pedido de la fresa: **7220VM06-100R08/09L**
Ejemplo de pedido de la plaquita: **MPFW0602PPTL SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

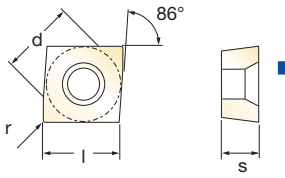
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0,5 = 0,223 \times 0,5 = 0,111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 06_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024926	**MPEX 06 02PPFL-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
017639	**MPEX 06 02PPFL-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017652	**MPFW 06 02PPTL**	**GH1**				6,35	6,35	2,38	Faceta	0,07
015159	**MPFW 06 02PPTL**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
027905	**MPFW 06 02PPTL**	**SP6564**		♦	♦	6,35	6,35	2,38	Faceta	0,07
017300	**MPHW 06 02PPTL**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017669	**MPHW 06 02PPTL**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07

MPEX 06_ -701



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas MP_06

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,07 - 0,12
♦ Aceros aleados	70 - 110	0,07 - 0,10
♦ Aceros inoxidables	120 - 140	0,07 - 0,12
♦ Inoxidables PH	-	-
♦ Fundición	140 - 280	0,07 - 0,10
♦ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
♦ Aleaciones refractarias	25 - 40	0,05 - 0,08
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	♦ Aceros no aleados	M	♦ Aceros inoxidables	K	♦ Fundición	S	♦ Aleaciones refractarias
P	♦ Aceros aleados	M	♦ Inoxidables PH	N	♦ Aluminio y Aleaciones	H	♦ Materiales duros

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7220 VM 08_L Conjuntos Fresa & Cartuchos

		Dimensiones (mm)								Recambios			
EDP #	**Referencia**	D	L	H	d_1	d_2	No. de dientes	EDP#	Cartuchos	EDP#		EDP#	
025506	**7220VM08-125R10/12L**	125	7,9	55	40	62	10	016755	72VML10/12	015063	F3008T	013214	T9

7220 VM 08_L Cartuchos Recambios

		Cartuchos		Tornillo de fijación	
EDP #	**Referencia Cartuchos**	EDP#		EDP#	
016755	**72VML10/12**	015256	72.693T	015273	T20TB





Fresa disco a cartuchos

7220 VM 08_L Consejos técnicos



Ejemplo de pedido de la fresa: **7220VM08-160R10/12L**
Ejemplo de pedido de la plaquita: **MPFW0803PPTL SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

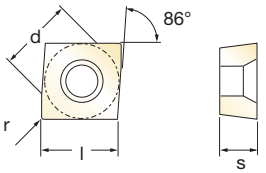
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 08_L



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
017641	**MPEX 08 03PPEL-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
024928	**MPEX 08 03PPFL-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
017490	**MPEX 08 03PPFL-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017658	**MPFW 08 03PPTL**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017656	**MPFW 08 03PPTL**	**SF30**				7,94	7,94	3,18	Faceta	0,1
017659	**MPFW 08 03PPTL**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017657	**MPFW 08 03PPTL**	**X44**				7,94	7,94	3,18	Faceta	0,1
017296	**MPHT 08 03PPTL-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
023249	**MPHT 08 03PPTL-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027907	**MPHT 08 03PPTL-42**	**SP6564**		♦	♦	7,94	7,94	3,18	Faceta	0,1
015138	**MPHT 08 03PPTL-42**	**X500**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1

MPEX 08_ -701



MPFW 08_



MPHT 08_ -42



Condiciones de corte recomendadas MP_08

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,10 - 0,14
♦ Aceros aleados	70 - 110	0,10 - 0,12
♦ Aceros inoxidables	120 - 140	0,10 - 0,12
♦ Inoxidables PH	55 - 70	0,12 - 0,20
♦ Fundición	140 - 280	0,10 - 0,12
♦ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
♦ Aleaciones refractarias	25 - 40	0,05 - 0,10
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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Fresa disco 3 cortes 7220 VM 04_N

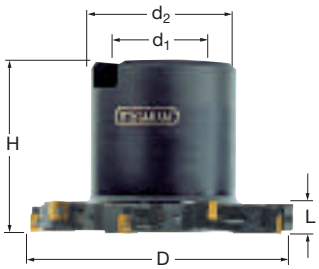


7220 VM 04_N Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L min-max.	H	d_1	d_2	No. de plaquitas	Cartuchos EDP#	Cartuchos	Recambios EDP#		EDP#	
016700	**7220VM 04 -063R06/07N**	63	6-7	40	22	35	4R+4L	016759 016751	72VMR06/07 72VML06/07	015059	F2004T	018487	T6
016701	**7220VM 04 -063R07/08N**	63	7-8	40	22	35	4R+4L	016760 016752	72VMR07/08 72VML07/08	015059	F2004T	018487	T6
016702	**7220VM 04 -080R06/07N**	80	6-7	45	27	45	5R+5L	016759 016751	72VMR06/07 72VML06/07	015059	F2004T	018487	T6
016703	**7220VM 04 -080R07/08N**	80	7-8	45	27	45	5R+5L	016760 016752	72VMR07/08 72VML07/08	015059	F2004T	018487	T6

7220 VM 04_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos Tornillo de fijación EDP#		EDP#	
016759	**72VMR06/07**	015259	72.698T	013214	T9
016751	**72VML06/07**	015259	72.698T	013214	T9
016760	**72VMR07/08**	015259	72.698T	013214	T9
016752	**72VML07/08**	015259	72.698T	013214	T9





Fresa disco a cartuchos



7220 VM 04_N Consejos técnicos

Ejemplo de pedido de la fresa: **7220VM04-063R06/07N**
Ejemplo de pedido de la plaquita: **MPFW0402PPTL SFZ / MPFW0402PPTR SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

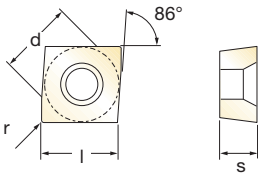
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 04_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
025799	**MPFW 04 02PPTL**	**GH1**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**	◆◆◆◆	◆◆◆◆	◆◆◆◆	4,76	4,76	2,38	Faceta	0,07
015157	**MPFW 04 02PPTL**	**SFZ**	◆◆◆◆	◆◆◆◆	◆◆◆◆	4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**		◆	◆	4,76	4,76	2,38	Faceta	0,07
027903	**MPFW 04 02PPTL**	**SP6564**		◆	◆	4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**				4,76	4,76	2,38	Faceta	0,07
017426	**MPFW 04 02PPTL**	**X44**				4,76	4,76	2,38	Faceta	0,07

MPFW 04_

017666	**MPHW 04 02PPTR**	**X500**	◆	◆	◆	4,76	4,76	2,38	Faceta	0,07
017667	**MPHW 04 02PPTL**	**X500**	◆	◆	◆	4,76	4,76	2,38	Faceta	0,07

MPHW 04_

Condiciones de corte recomendadas MP_04

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,07 - 0,10
Aceros aleados	70 - 110	0,07 - 0,08
Aceros inoxidables	120 - 140	0,07 - 0,10
Inoxidables PH	-	-
Fundición	140 - 280	0,07 - 0,08
Aluminio y Aleaciones	-	-
Aleaciones refractarias	25 - 40	0,08 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresa disco 3 cortes 7220 VM 06_N

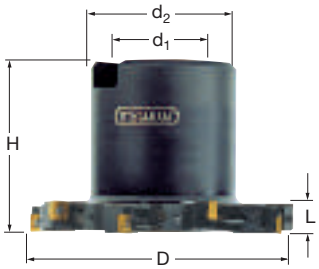


7220 VM 06_N Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L min-max.	H	d_1	d_2	No. de plaquitas	Cartuchos EDP#	Cartuchos	Recambios EDP#		EDP#	
016704	**7220VM 06 -100R08/09N**	100	8-9	50	32	48	6R+6L	016761 016753	72VMR08/09 72VML08/09	015060	F2505T	018488	T7
016705	**7220VM 06 -100R09/10N**	100	9-10	50	32	48	6R+6L	016762 016754	72VMR09/10 72VML09/10	015060	F2505T	018488	T7
016706	**7220VM 06 -125R09/10N**	125	9-10	55	40	62	7R+7L	016762 016754	72VMR09/10 72VML09/10	015060	F2505T	018488	T7

7220 VM 06_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos EDP#	Cartuchos	Tornillo de fijación EDP#	
016761	**72VMR08/09**	015258	72.697T	015240	T15
016753	**72VML08/09**	015258	72.697T	015240	T15
016762	**72VMR09/10**	015258	72.697T	015240	T15
016754	**72VML09/10**	015258	72.697T	015240	T15





Fresa disco a cartuchos



7220 VM 06_N Consejos técnicos

Ejemplo de pedido de la fresa: **7220VM06-100R08/09N**
Ejemplo de pedido de la plaquita: **MPHW0602PPTR MP91M / MPHW0602PPTL MP91M**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

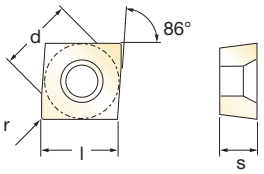
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 06_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
024926	**MPEX 06 02PPFL-701**	**GH1**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017639	**MPEX 06 02PPFL-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017652	**MPFW 06 02PPTL**	**GH1**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
015159	**MPFW 06 02PPTL**	**SFZ**	♦♦	♦♦	♦♦	6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**		♦	♦	6,35	6,35	2,38	Faceta	0,07
027905	**MPFW 06 02PPTL**	**SP6564**		♦	♦	6,35	6,35	2,38	Faceta	0,07
017301	**MPHW 06 02PPTR**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017300	**MPHW 06 02PPTL**	**MP91M**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017669	**MPHW 06 02PPTL**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	♦	♦	♦	6,35	6,35	2,38	Faceta	0,07

MPEX 06_ -701



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas MP_06

Material	Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	180 - 220	0,07 - 0,12
♦ Aceros aleados	70 - 110	0,07 - 0,10
♦ Aceros inoxidables	120 - 140	0,07 - 0,12
♦ Inoxidables PH	-	-
♦ Fundición	140 - 280	0,07 - 0,10
♦ Aluminio y Aleaciones	275 - 450	0,04 - 0,12
♦ Aleaciones refractarias	25 - 40	0,08 - 0,10
♦ Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa disco 3 cortes 7220 VM 08_N

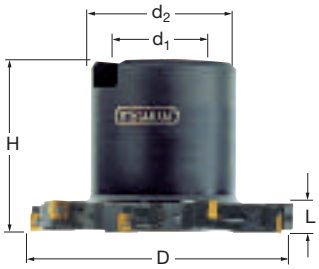


7220 VM 08_N Conjunto Fresa & Cartuchos

EDP #	Referencia conjunto	Dimensiones (mm) D	L min-max.	H	d_1	d_2	No. de plaquitas	EDP#	Cartuchos	Recambios EDP#		EDP#	
016707	**7220VM 08 -125R10/12N**	125	10-12	55	40	62	5R+5L	016763 016755	72VMR10/12 72VML10/12	015063	F3008T	013214	T9

7220 VM 08_N Cartuchos Recambios

EDP #	Referencia Cartuchos	Cartuchos EDP#		Tornillo de fijación EDP#	
016763	**72VMR10/12**	015256	72.693T	015273	T20TB
016755	**72VML10/12**	015256	72.693T	015273	T20TB





Fresa disco a cartuchos



7220 VM 08_N Consejos técnicos

Ejemplo de pedido de la fresa: **7220VM08-125R10/12N**
Ejemplo de pedido de la plaquita: **MPFW08030PPTR SFZ / MPFW08030PPTL SFZ**
Para condiciones completas ver pagina: **A288**

IMPORTANTE
Para un avance f_z (mm/diente) dado, el espesor de la viruta hm (avance efectivo por diente) disminuye con la profundidad de corte a_r. Es imperativo tener en cuenta este parámetro para determinar el avance afectivo, que se calcula con la fórmula descrita a continuación.

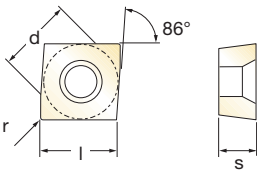
FORMULA
EJEMPLO

$$h_m = \sqrt{\frac{a_r}{D}} \times f_z$$

$$h_m = \sqrt{\frac{10}{200}} \times 0{,}5 = 0{,}223 \times 0{,}5 = 0{,}111 \text{ mm}$$

a_r = Profundidad de Corte (P.D.C.)
D = Diámetro de la fresa
f_z = Avance por diente
h_m = Espesor efectivo de la viruta

Plaquitas para 7220 VM 08_N



EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
017640	**MPEX 08 03PPER-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017641	**MPEX 08 03PPEL-701**	**PFZ**				7,94	7,94	3,18	Faceta	0,02
017642	**MPEX 08 03PPFR-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
024928	**MPEX 08 03PPFL-701**	**GH1**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017490	**MPEX 08 03PPFL-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02

MPEX 08_ -701



017655	**MPFW 08 03PPTR**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017658	**MPFW 08 03PPTL**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**				7,94	7,94	3,18	Faceta	0,1
017656	**MPFW 08 03PPTL**	**SF30**				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017659	**MPFW 08 03PPTL**	**SFZ**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**				7,94	7,94	3,18	Faceta	0,1
017657	**MPFW 08 03PPTL**	**X44**				7,94	7,94	3,18	Faceta	0,1

MPFW 08_



017297	**MPHT 08 03PPTR-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
017296	**MPHT 08 03PPTL-42**	**MP91M**	♦	♦	♦	7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
023249	**MPHT 08 03PPTL-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTR-42**	**SP6564**		♦	♦	7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTL-42**	**SP6564**		♦	♦	7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1
015138	**MPHT 08 03PPTL-42**	**X500**	♦♦	♦♦	♦♦	7,94	7,94	3,18	Faceta	0,1

MPHT 08_ -42



Condiciones de corte recomendadas MP_08

Material	Velocidad V_c (m/min)	Avance h_m (mm)
Aceros no aleados	180 - 220	0,10 - 0,14
Aceros aleados	70 - 110	0,10 - 0,12
Aceros inoxidables	120 - 140	0,10 - 0,12
Inoxidables PH	55 - 70	0,12 - 0,20
Fundición	140 - 280	0,10 - 0,12
Aluminio y Aleaciones	275 - 450	0,04 - 0,12
Aleaciones refractarias	25 - 40	0,05 - 0,10
Aceros duros (52-56 HRC)	-	-

h_m = espesor de la viruta

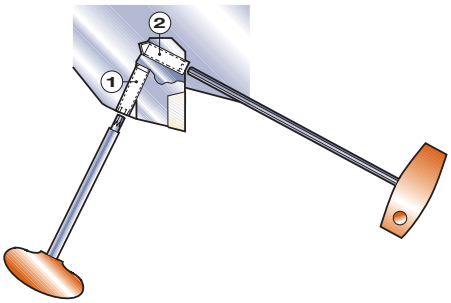
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ♦ Aceros no aleados	M ♦ Aceros inoxidables	K ♦ Fundición	S ♦ Aleaciones refractarias
P ♦ Aceros aleados	M ♦ Inoxidables PH	N ♦ Aluminio y Aleaciones	H ♦ Materiales duros

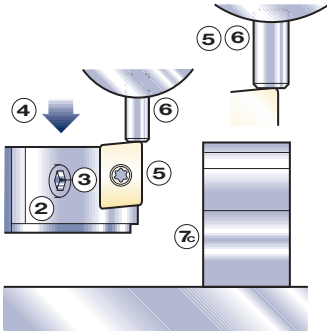
STELLRAM®

Montaje y regulación de los cartuchos



A REGULACION DE LAS FRESAS 7200 VM 11 Y 7200 VA 16 PROVISTAS DE TORNILLO DE REGULACION

1. Medir el espesor exacto de la parte central.
2. Montar y afianzar sin holgura la fresa sobre el aparato de regulación (sobre apoyo y con centrador).
3. Atrasar el tornillo No. 2 del primer cartucho “superior”.
4. Aflojar ligeramente el tornillo de bloqueo No. 1 y empujar este cartucho hacia abajo.
5. Montar una plaquita sobre el cartucho a regular.



IMPORTANTE

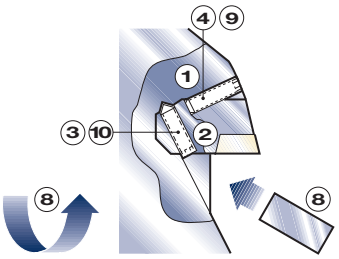
Asegurarse de montar una plaquita RH en un cartucho a derechas o una plaquita LH en un cartucho a izquierdas; para lo cual, basta con asegurarse de que el plano de acabado se encuentra lateralmente al exterior de la fresa.

6. Hacer girar el elemento de medición y dar el giro necesario a la fresa hasta conseguir que el palpador del comparador se encuentre centrado sobre el plano de acabado de la plaquita, a continuación bloquear el elemento de medición en esta posición.
7. Definir la posición de la puesta a cero del comparador, sea:
   - **A** Calcular la media entre el ancho de la ranura a fresar y el espesor del centro que medimos.

     Por ejemplo: $\frac{\text{Groove 22 mm + Hub 21 mm}}{2}$ = 21,5 mm

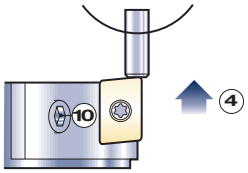
   - **B** Aumentar al espesor del apoyo = 10 mm.
   - **C** Preparar sobre la placa de base a proximidad de la fresa y del palpador del comparador un apilamiento de galgas de precisión de altura igual a la obtenida sumando los puntos A y B.
     (Por ejemplo: 21.5 + 10 = 31,5 mm).
8. Girar ligeramente la fresa de manera a poder colocar las galgas bajo el palpador del comparador, bloquear este ultimo haciendo atención a que la aguja del comparador no mas de media vuelta en la esfera. Girar la esfera de manera que la aguja indique el cero, alejar las galgas y volver a colocar la plaquita bajo el palpador del comparador.
9. Apretar sin bloquear el tornillo No. 1.

10. Accionar el tornillo de regulación No. 2 para hacer subir el cartucho, es decir el plano de acabado de la plaquita contra el palpador del comparador hasta que la aguja de éste alcance la cota cero correspondiente a la altura del apilado de galgas.



11. Bloquear el tornillo No. 1. El resultado será que el cartucho tendrá tendencia a desplazarse alrededor de 0.01 mm. hacia arriba o hacia abajo. Después de haber desbloqueado de nuevo el tornillo No. 1, repetir la operación de regulación según punto 10 pero esta vez teniendo en cuenta el valor y la dirección del desplazamiento constatado. Así el bloqueo final del cartucho llevara éste a la altura cero deseada.

12. Repetir las operaciones 3 y 4 sobre los otros cartuchos “superiores” retomando la misma arista de la misma plaquita para proceder a su regulación según los puntos 9 y 10, siempre teniendo en cuenta el desplazamiento constatado en el punto 11.



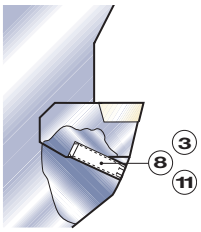
13. *Dar la vuelta a la fresa, proceder a las operaciones 3, 4 y, siempre con la misma arista de la misma plaquita, regular según los puntos 9,10 y 11.

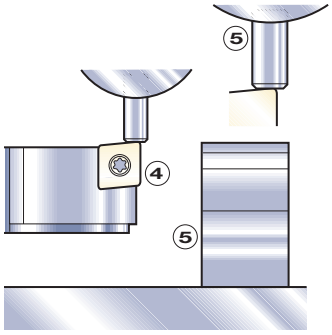
14. Proceder al control final, asegurándose sobre todo del bloqueo del tornillo No. 1 de todos los cartuchos.

15. Apretar ligeramente el tornillo de regulación No. 2 contra el fondo de su alojamiento .

***NOTA:** Las fresas de escuadrar, es decir a dientes no alternos, evidentemente solo se regulan de un solo lado.

Regulación cartuchos

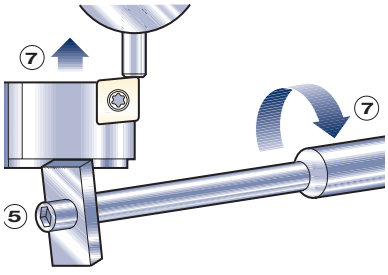


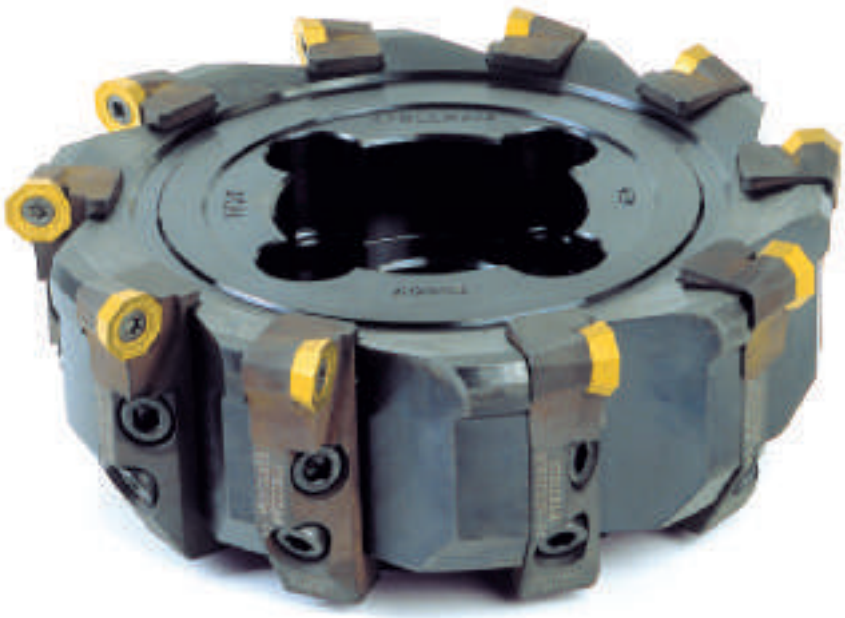


B REGULACION DE LAS FRESAS 7200 VM 04/06 & 08 DESPROVISTAS DE TORNILLO DE REGULACION.

1. Medir el espesor exacto del centro.
2. Montar y afianzar sin holgura sobre el aparato de regulación (sobre apoyo y centrador).
3. Aflojar ligeramente el tornillo de bloqueo del primer cartucho “superior” y empujar este ultimo hacia abajo.
4. Montar sobre el cartucho a regular la plaquita correspondiente.(Ver punto A 5)
5. Posicionar el aparato de control como explicado en A 6, centrar el palpador del comparador y proceder a su puesta a cero según puntos A7 y A8.
6. Introducir la extremidad (utilizando la arista mas larga para las fresas de anchuras comprendidas entre 10 y 14 mm.) de la palanca de regulación correctamente bajo el cartucho.
7. Girando la palanca de regulación, hacer subir el cartucho, es decir el plano de acabado de la plaquita, contra el palpador del comparador hasta que la aguja del comparador alcance la cota del cero predeterminado.
8. Apretar sin bloquear, el tornillo de fijación del cartucho verificando que la aguja del comparador se queda en el cero.
9. Repetir la operación 3 sobre los otros cartuchos “superiores” y utilizando la misma arista de la misma plaquita proceder a su regulación según los puntos 6,7 y 8.
10. *Dar la vuelta a la fresa y siempre con la misma arista de la misma plaquita proceder a las operaciones 3,4,6,7 y 8.
11. Proceder al control final asegurándose sobre todo de que el tornillo de fijación de todos los cartuchos se encuentra bien apretado.

***NOTA:** Las fresas de escuadrar, es decir a dientes no alternos, evidentemente solo se regulan de un solo lado.





Fresas de larga arista

Corte efectivo de los dientes Medio & Total



Esta fresa de alta productividad ha sido diseñada para arrancar grandes cantidades de material rápidamente, tanto en operaciones de escuadrado como de ranurado.

Estas fresas están fabricadas con acero de herramientas P – 20.



Fresas de larga arista - Aplicaciones


Fresado lateral


Fresado en escuadra con radio


Fresado en escuadra con radio


Ranurado


Ranurado


Ranurado



FRESAS DE LARGA ARISTA

Los dientes de la fresa **5210 VS** están colocados según un pronunciado ángulo de hélice a izquierdas. El ángulo elegido permite, en la mayoría de los casos, tener al menos dos dientes en contacto con el material contínuamente, permitiendo un ataque progresivo de este ultimo por las aristas de corte, disminuyendo así los golpes.

Una fresa con la hélice a izquierdas tiene la ventaja añadida de absorber las holguras en el cabezal reduciendo así las vibraciones. Al empezar cortando por la parte de arriba del diente esto disminuye la torsión en la fresa.

Las zonas de formación y desahogo de la viruta están ampliamente dimensionadas, teniendo así en cuenta la hélice negativa. Las plaquitas que equipan estas fresas son de gran espesor para incrementar su solidez y garantizar la protección del cuerpo de la fresa.

La fresa **5210 VM** constituye una extensión hacia los pequeños diámetros del programa **5210 VS**. Esta fresa esta equipada de plaquitas rómbicas tipo MP en vez de las cuadradas, están fabricadas con una hélice a derechas.

La fresa **5315VA12** es una extensión del versátil programa **7690 VA 12**. Esta fresa utiliza la gama de plaquitas de tipo A de 12.

La 5315VA16 es una extensión del versátil programa **7690VA16**. Esta fresa utiliza el tipo de plaquita estándar industrial AP 16.

Ambas familias ofrecen una totalidad de dientes efectivos para altos avances y un ángulo de la hélice a derechas. Son ideales para el fresado lateral y el ranurado.


5210 VS


5210 VM


5315 VA

Fresa de larga arista 5210 VM 04







Amarre Weldon

5210 VM 04 Amarre Weldon

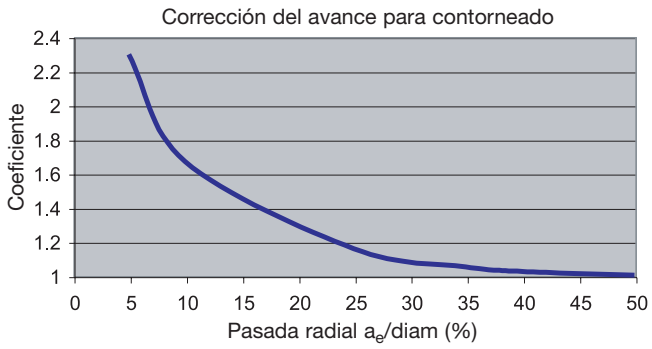
EDP #	Referencia	Dimensiones (mm) D	L	l_1	l_2	d_1	No. de dientes	No. de plaquitas	Recambios EDP#		EDP#	
018306	**5210VM 04 W016R22**	16	80	22	30	20	2	*a.* 6	015059	F2004T	018487	T6
								b. 1	015060	F2505T	018488	T7



5210 VM 04 Consejos técnicos

Ejemplo de pedido de la fresa: **5210VM04W016R22**
Ejemplo de pedido de la plaquita: **MPHW0402PPTR X500**
MPHW0602PPTR X500
Para condiciones completas ver pagina: **A288**

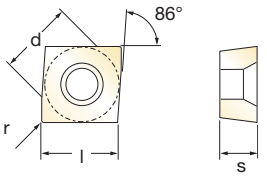
El gráfico que se muestra mas abajo indica el factor multiplicativo a utilizar en el avance, basado en el porcentaje de pasada radial en relación con el diámetro de la fresa.



Ejemplo: 5210VM04W016R22 mecanizando con una pasada lateral de 1.6mm (a_e) = 10% del diámetro de la fresa.

A 10% el coeficiente es de 1.6 (ver gráfico); por lo tanto debe de multiplicar el avance por 1.6 para corregir el avance en contorneado.

Plaquitas para 5210 VM 04



EDP #	Referencia	Calidad		Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**	*a.*				4,76	4,76	2,38	Faceta	0,07
017645	**MPFW 04 02PPTR**	**SF30**	*a.*				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**	*a.*	◆◆			4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**	*a.*	◆			4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**	*a.*				4,76	4,76	2,38	Faceta	0,07
017666	**MPHW 04 02PPTR**	**X500**	*a.*				4,76	4,76	2,38	Faceta	0,07
017649	**MPFW 06 02PPTR**	**GH1**	*b.*				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**	*b.*				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	*b.*	◆◆			6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SP6564**	*b.*	◆			6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**	*b.*				6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	*b.*				6,35	6,35	2,38	Faceta	0,07

MPFW 04_



MPHW 04_



MPFW 06_



MPHW 06_



Condiciones de corte recomendadas

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,10 - 0,16	22,0	-	-	-	-	-	-
◆ Aceros aleados	70 - 110	0,08 - 0,12	22,0	-	-	-	-	-	-
◆ Aceros inoxidables	-	-	-	-	-	-	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-	-
◆ Fundición	140 - 280	0,08 - 0,12	22,0	-	-	-	-	-	-
◆ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa de larga arista 5210 VM 06







Amarre Weldon

5210 VM 06 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1	l_2	d_1	No. de dientes	No. de plaquitas	Recambios EDP#		EDP#	
021650	**5210VM 06 W020R26**	20	92	26	36	25	2	*a.** 5	015060	F2505T	018488	T7
								*b.** 1	015063	F3008T	013214	T9
021651	**5210VM 06 W025R32**	25	108	32	48	32	3	*a.** 11	015060	F2505T	018488	T7
								*b.** 1	015063	F3008T	013214	T9

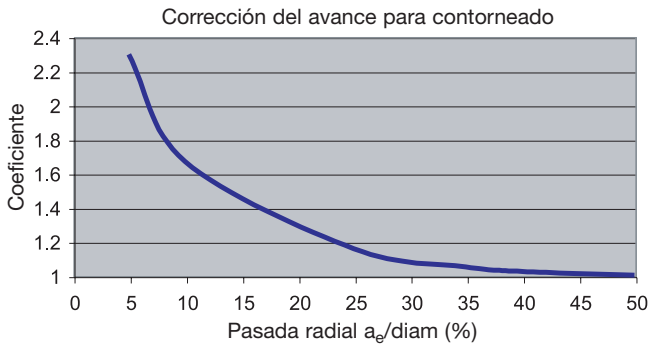
* Ambas plaquitas son necesarias para cada fresa.



5210 VM 06 Consejos técnicos

Ejemplo de pedido de la fresa: **5210VM06W020R26**
Ejemplo de pedido de la plaquita: **MPFW0602PPTR SFZ**
MPFW0803PPTR SFZ
Para condiciones completas ver pagina: **A288**

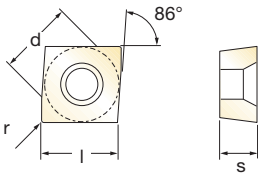
El gráfico que se muestra mas abajo indica el factor multiplicativo a utilizar en el avance, basado en el porcentaje de pasada radial en relación con el diámetro de la fresa.



Ejemplo: 5210M06W020R26 mecanizando con una pasada lateral de 2,0mm (a_e) = 10% del diámetro de la fresa.

A 10% el coeficiente es de 1.6 (ver gráfico); por lo tanto debe de multiplicar el avance por 1.6 para corregir el avance en contorneado.

Plaquitas para 5210 VM 06



MPFW 06_ 

MPFW 08_ 

EDP #	Referencia	Calidad		Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017649	**MPFW 06 02PPTR**	**GH1**	*a.*				6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**	*a.*				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	*a.*	◆◆			6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**	*a.*	◆			6,35	6,35	2,38	Faceta	0,07
017655	**MPFW 08 03PPTR**	**GH1**	*b.*				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**	*b.*				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	*b.*	◆◆			7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**	*b.*	◆			7,94	7,94	3,18	Faceta	0,1

* Para @ 25, ap max es 32 mm.
Para @ 20, ap max es 25 mm.

Condiciones de corte recomendadas

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,12 - 0,18	Ver l_1	-	-	-	-	-	-
◆ Aceros aleados	70 - 110	0,10 - 0,15	Ver l_1	-	-	-	-	-	-
◆ Aceros inoxidables	-	-	-	-	-	-	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-	-
◆ Fundición	140 - 280	0,10 - 0,15	Ver l_1	-	-	-	-	-	-
◆ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

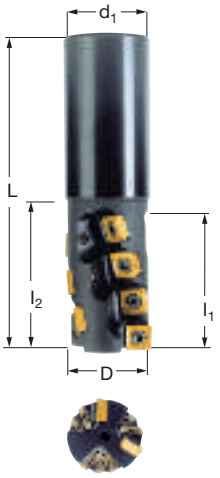


Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa de larga arista 5210 VS 09





Amarre Weldon

5210 VS 09 Amarre Weldon

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D	L	l_1	l_2	l_3	d_1	No. de dientes	No. de plaquitas	EDP#		EDP#	
015235	**5210VS 09 WA032R50**	32	119	50	57	-	32	3	11	015262	D4010T	015240	T15

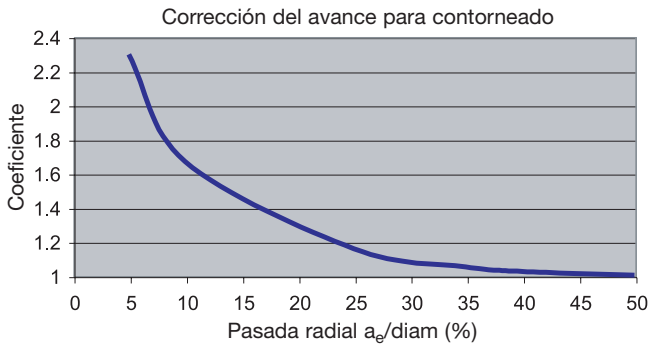


5210 VS 09 Consejos técnicos

Ejemplo de pedido de la fresa: **5210VS09WA032R50**
Ejemplo de pedido de la plaquita: **SCMT09 T308T SFZ**

Para condiciones completas ver pagina: **A288**

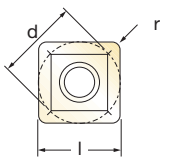
El gráfico que se muestra mas abajo indica el factor multiplicativo a utilizar en el avance, basado en el porcentaje de pasada radial en relación con el diámetro de la fresa.



Ejemplo: 5210VS09WA032R50 mecanizando con una pasada lateral de 3,2mm (a_e) = 10% del diámetro de la fresa.

A 10% el coeficiente es de 1.6 (ver gráfico); por lo tanto debe de multiplicar el avance por 1.6 para corregir el avance en contorneado.

Plaquitas para 5210 VS 09



SCMT 09_



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017703	**SCMT 09 T308E**	**SF30**				9,52	9,52	3,97	0,8	0,15
018188	**SCMT 09 T308E**	**SFZ**				9,52	9,52	3,97	0,8	0,15
015225	**SCMT 09 T308T**	**PFZ**	◆			9,52	9,52	3,97	0,8	0,15
017704	**SCMT 09 T308T**	**SF30**				9,52	9,52	3,97	0,8	0,15
017705	**SCMT 09 T308T**	**SFZ**	◆			9,52	9,52	3,97	0,8	0,15
027896	**SCMT 09 T308T**	**SP6564**	◆			9,52	9,52	3,97	0,8	0,15
015224	**SCMT 09 T308T**	**X44**				9,52	9,52	3,97	0,8	0,15

SCMT 09_ -41



024107	**SCMT 09 T308EN-41**	**PFZ**				9,52	9,52	3,97	0,8	0,04
015147	**SCMT 09 T308EN-41**	**X500**				9,52	9,52	3,97	0,8	0,04
027731	**SCMT 09 T308EN-41**	**SP6564**				9,52	9,52	3,97	0,8	0,04

Condiciones de corte recomendadas SC_09

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,25 - 0,40	Ver l_1	-	-	-	-	-	-
◆ Aceros aleados	70 - 110	0,20 - 0,35	Ver l_1	-	-	-	-	-	-
◆ Aceros inoxidables	-	-	-	-	-	-	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-	-
◆ Fundición	140 - 280	0,20 - 0,35	Ver l_1	-	-	-	-	-	-
◆ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

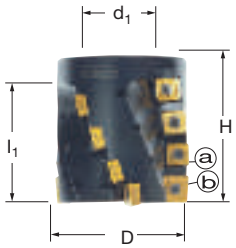


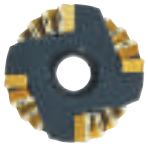
Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa de larga arista 5210 VS 12







Montaje en el eje

5210 VS 12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D	L/H	l_1	l_2	l_3	d_1	No. de dientes	No. de plaquitas	Recambios EDP#		EDP#	
021656	**5210VS 12 -080R68**	80	82	68	-	-	32	4	*a.** 14	015266	D5013T	015241	T20
									*b.** 2	015266	D5013T	015241	T20
021657	**5210VS 12 -100R77**	100	92	77	-	-	40	6	*a.** 27	015266	D5013T	015241	T20
									*b.** 2	015266	D5013T	015241	T20

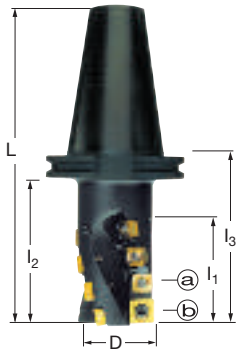
5210 VS 12 Amarre DIN 69871

021658	**5210VS 12 G050R76**	50	226	76	105	124,1	G50	3	*a.** 13	015266	D5013T	015241	T20
									*b.** 1	015266	D5013T	015241	T20

5210 VS 12 Consejos técnicos

021659	**5210VS 12 T050R76**	50	247	76	105	120,2	T50	3	*a.** 13	015266	D5013T	015241	T20
									*b.** 1	015266	D5013T	015241	T20

* Se requieren ambas plaquitas para cada fresa.





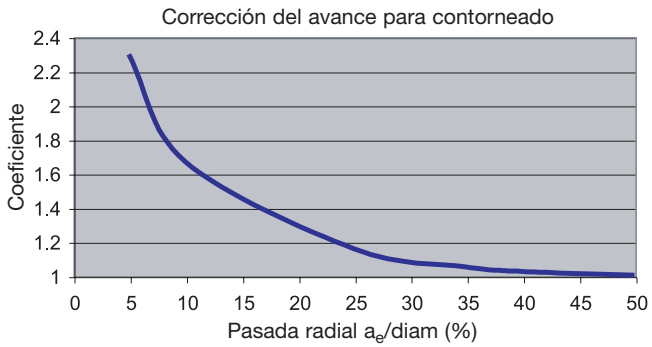
Amarre DIN 6987



5210 VS 12 Consejos técnicos

Ejemplo de pedido de la fresa: **5210VS12-080R68**
Ejemplo de pedido de la plaquita: **SOMT12M612SN-B PFZ**
SOMT15M612SN-B PFZ
Para condiciones completas ver pagina: **A288**

El gráfico que se muestra mas abajo indica el factor multiplicativo a utilizar en el avance, basado en el porcentaje de pasada radial en relación con el diámetro de la fresa.



Ejemplo: 5210VS12-100R77 mecanizando con una pasada lateral de 10,0mm (a_e) = 10% del diámetro de la fresa.

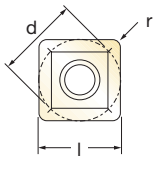
A 10% el coeficiente es de 1.6 (ver gráfico); por lo tanto debe de multiplicar el avance por 1.6 para corregir el avance en contorneado.





Amarre DIN 2080

Plaquitas para 5210 VS 12



SOMT 12_



SOMT 15_



EDP #	Referencia	Calidad		Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017329	**SOMT 12 M612SN-B**	**MP91M**	*a.*	♦			12,7	12,7	6,0	1,2	0,15
017733	**SOMT 12 M612SN-B**	**GH1**	*a.*				12,7	12,7	6,0	1,2	0,15
017734	**SOMT 12 M612SN-B**	**PFZ**	*a.*	♦			12,7	12,7	6,0	1,2	0,15
017732	**SOMT 12 M612SN-B**	**SF30**	*a.*				12,7	12,7	6,0	1,2	0,15
027899	**SOMT 12 M612SN-B**	**SP6564**	*a.*				12,7	12,7	6,0	1,2	0,15
015191	**SOMT 12 M612SN-B**	**X44**	*a.*				12,7	12,7	6,0	1,2	0,15
015190	**SOMT 12 M612SN-B**	**X500**	*a.*	♦			12,7	12,7	6,0	1,2	0,15
017330	**SOMT 15 M612SN-B**	**MP91M**	*b.*	♦			15,88	15,88	6,0	1,2	0,15
017737	**SOMT 15 M612SN-B**	**GH1**	*b.*				15,88	15,88	6,0	1,2	0,15
017738	**SOMT 15 M612SN-B**	**PFZ**	*b.*	♦			15,88	15,88	6,0	1,2	0,15
017736	**SOMT 15 M612SN-B**	**SF30**	*b.*				15,88	15,88	6,0	1,2	0,15
027900	**SOMT 15 M612SN-B**	**SP6564**	*b.*				15,88	15,88	6,0	1,2	0,15
015193	**SOMT 15 M612SN-B**	**X44**	*b.*				15,88	15,88	6,0	1,2	0,15
015192	**SOMT 15 M612SN-B**	**X500**	*b.*	♦			15,88	15,88	6,0	1,2	0,15

Condiciones de corte recomendadas

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	180 - 220	0,30 - 0,50	Ver l_1	180 - 220	0,50 - 0,90	Ver l_1	180 - 220	0,50 - 0,90	Ver l_1
♦ Aceros aleados	70 - 110	0,25 - 0,45	Ver l_1	70 - 110	0,40 - 0,70	Ver l_1	70 - 110	0,40 - 0,70	Ver l_1
♦ Aceros inoxidables	-	-	-	-	-	-	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	140 - 280	0,25 - 0,45	Ver l_1	140 - 280	0,40 - 0,70	Ver l_1	140 - 280	0,40 - 0,70	Ver l_1
♦ Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa de larga arista 5315 VA 12







Amarre Weldon

5315 VA 12 Amarre Weldon

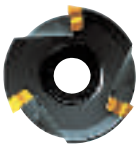
EDP #	Referencia	Dimensiones (mm) D	L/H	a_p max. Contorneado	a_p max. Ranurado	l_2	d_1	No. de dientes	No. de plaquitas	Recambios EDP #		EDP #	
029106	**5315VA12WA025R23**	25	96	23	15	40	25	2	4	*027860*	F3007T	*022157*	T8
029107	**5315VA12WA025R35**	25	106	35	7	50	25	2	6	*027860*	F3007T	*022157*	T8
029108	**5315VA12WA032R35**	32	110	35	20	50	32	3	9	*027860*	F3007T	*022157*	T8
029109	**5315VA12WA040R45**	40	130	45	20	60	40	3	12	*027860*	F3007T	*022157*	T8

5315 VA 12 Montaje en el eje

029110	**5315VA12-A040R34**	40	50	34	20	-	16	3	9	*027860*	F3007T	*022157*	T8

Tomen nota que el radio máximo de la plaquita permitido en las fresas 5315VA12 es de 0.8mm.
Plaquitas con radios superiores pueden ser montadas frontalmente si se modifica el cuerpo de la fresa.



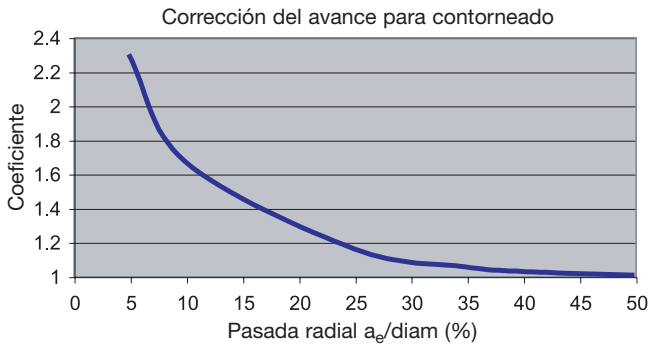


Montaje en el eje

5315 VA 12 Consejos técnicos

Ejemplo de pedido fresa: **5315VA12WA025R35**
Ejemplo de pedido plaquitas: **ADHT12T3PDER-46 X500**
Para condiciones de corte completas ver página: **A288**

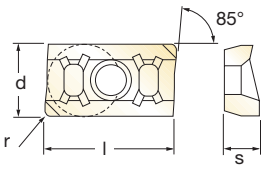
El gráfico que se muestra mas abajo indica el factor multiplicativo a utilizar en el avance, basado en el porcentaje de pasada radial en relación con el diámetro de la fresa.



Ejemplo: 5315VA12WA040R45 mecanizando con una pasada lateral de 4,0mm (a_e) = 10% del diámetro de la fresa.

A 10% el coeficiente es de 1.6 (ver gráfico); por lo tanto debe de multiplicar el avance por 1.6 para corregir el avance en contorneado.

Plaquitas para 5315 VA 12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
027914	**ADKT12T3PDER-45**	**SP6564**				7,87	12,70	3,76	Faceta	0,05
027913	**ADKT12T3PDER-45**	**X500**				7,87	12,70	3,76	Faceta	0,05
027915	**ADKT12T3PDER-45**	**MP91M**				7,87	12,70	3,76	Faceta	0,05
027916	**ADKT12T3PDER-45**	**SC3025**				7,87	12,70	3,76	Faceta	0,05
029098	**ADGT12T3PDFR-721**	**GH1**				7,96	12,90	3,76	Faceta	0,05
029326	**ADHT12T3PDER-46**	**SP6564**				8,00	12,90	3,76	Faceta	0,05
029327	**ADHT12T3PDER-46**	**X500**				8,00	12,90	3,76	Faceta	0,05
029328	**ADHT12T308R-46**	**SP6564**				8,00	12,90	3,76	0,8	0,05
029309	**ADHT12T308R-46**	**X500**				8,00	12,90	3,76	0,8	0,05

ADKT 12_ -45



ADGT 12_ -721



ADHT 12_ -46



Nota: Para este tipo de fresa, el radio de punta máximo es de 0,8mm.

Condiciones de corte recomendadas para AD_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	120 - 305	0,06 - 0,12	-	-	-	-	-	-	-
Aceros aleados	75 - 175	0,06 - 0,10	-	-	-	-	-	-	-
Aceros inoxidables	115 - 160	0,06 - 0,10	-	-	-	-	-	-	-
Inoxidables PH	95 - 150	0,06 - 0,10	-	-	-	-	-	-	-
Fundición	115 - 400	0,06 - 0,13	-	-	-	-	-	-	-
Aluminio y Aleaciones	200 - 800	0,04 - 0,20	-	-	-	-	-	-	-
Aleaciones refractarias	25 - 40	0,04 - 0,10	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Nota: Para los materiales de familia [M] (aceros inoxidables e inoxidables PH) y [S] (aleaciones refractarias) las plaquitas con geometría -46 deben de utilizarse solo para contorneado, no para ranurado.
Para P.D.P. sírvanse consultar ap max en página A156.

Estrella guía Llave para encontrar la herramienta idónea



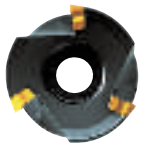
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa de larga arista 5315 VA 16







Montaje en el eje

5315 VA 16 Montaje en el ejea

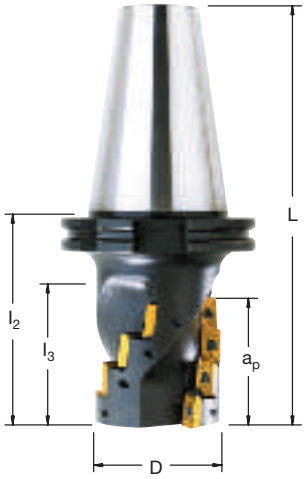
EDP #	Referencia	Dimensiones (mm) D	L/H	a_p max.	l_2	l_3	d_1	No. de dientes	No. de plaquitas	Recambios EDP#		EDP#	
025670	**5315VA 16 -A050Z3R31**	50	55	31	-	-	27	3	6	015262	D4010T	015240	T15
025671	**5315VA 16 -A050Z4R31**	50	55	31	-	-	27	4	8	015262	D4010T	015240	T15
025674	**5315VA 16 -A063Z4R31**	63	55	31	-	-	27	4	8	015262	D4010T	015240	T15
025675	**5315VA 16 -A063Z5R31**	63	55	31	-	-	27	5	10	015262	D4010T	015240	T15
025678	**5315VA 16 -A080Z4R31**	80	55	31	-	-	32	4	8	015262	D4010T	015240	T15
025679	**5315VA 16 -A080Z5R31**	80	55	31	-	-	32	5	10	015262	D4010T	015240	T15

5315 VA 16 Amarre BT

025668	**5315VA 16 BA50/050R61**	50	225,8	61	124	75	-	3	12	015262	D4010T	015240	T15
025672	**5315VA 16 BA50/063R61**	63	225,8	61	124	75	-	3	12	015262	D4010T	015240	T15
025676	**5315VA 16 BA50/080R91**	80	259,8	91	158	115	-	4	24	015262	D4010T	015240	T15

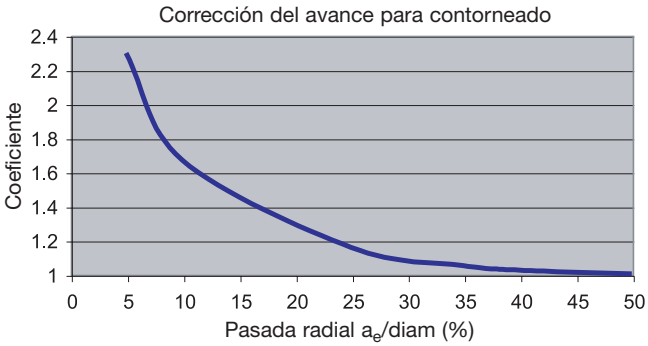
5315 VA 16 Amarre DIN 69871

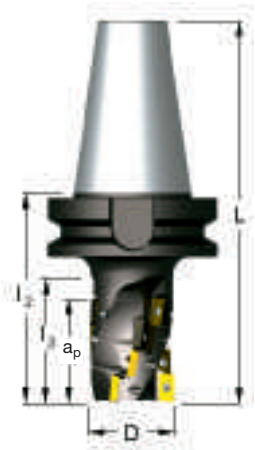
025669	**5315VA 16 GA50/050R61**	50	206,7	61	105	75	-	3	12	015262	D4010T	015240	T15
025673	**5315VA 16 GA50/063R61**	63	206,7	61	105	75	-	3	12	015262	D4010T	015240	T15
025677	**5315VA 16 GA50/080R91**	80	240,7	91	138	115	-	4	24	015262	D4010T	015240	T15



Amarre DIN 69871

El gráfico que se muestra mas abajo indica el factor multiplicativo a utilizar en el avance, basado en el porcentaje de pasada radial en relación con el diámetro de la fresa.





Amarre BT

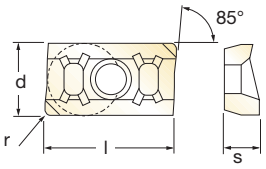
Ejemplo: 5315VA16A050Z4R31 mecanizando con una pasada lateral de 5,0mm (a_e) = 10% del diámetro de la fresa.

A 10% el coeficiente es de 1.6 (ver gráfico); por lo tanto debe de multiplicar el avance por 1.6 para corregir el avance en contorneado.

Condiciones de corte recomendadas para AP_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,20 - 0,38	Ver l_1	-	-	-	-	-	-
Aceros aleados	70 - 110	0,15 - 0,30	Ver l_1	-	-	-	-	-	-
Aceros inoxidables	120 - 140	0,12 - 0,25	Ver l_1	-	-	-	-	-	-
Inoxidables PH	55 - 70	0,10 - 0,18	Ver l_1	-	-	-	-	-	-
Fundición	140 - 280	0,15 - 0,30	Ver l_1	-	-	-	-	-	-
Aluminio y Aleaciones	275 - 450	0,05 - 0,12	Ver l_1	-	-	-	-	-	-
Aleaciones refractarias	25 - 40	0,10 - 0,18	Ver l_1	-	-	-	-	-	-
Aceros duros (52-56 HRC)	50 - 85	0,05 - 0,10	Ver l_1	-	-	-	-	-	-

Plaquitas para 5315 VA 16



EDP #	Referencia	Calidad	Operaciones & Material: Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
017621	**APEX 16 04PDER-701**	**PFZ**				9,52	16,66	4,76	Faceta	0,02
017623	**APEX 16 04PDFR-701**	**SFZ**				9,52	16,66	4,76	Faceta	0,02
014066	**APEX 16 04PDFR-701**	**GH1**	◆			9,52	16,66	4,76	Faceta	0,02
017291	**APFW 16 04PDER**	**MP91M**				9,52	16,66	4,76	Faceta	0,04
017627	**APFW 16 04PDTR**	**X44**				9,52	16,66	4,76	Faceta	0,1
017628	**APFW 16 04PDTR**	**GH1**				9,52	16,66	4,76	Faceta	0,1
018030	**APFW 16 04PDTR**	**CN35**	◆			9,52	16,66	4,76	Faceta	0,1
027883	**APFW 16 04PDTR**	**SC3025**				9,52	16,66	4,76	Faceta	0,1
017626	**APFW 16 04PDTR**	**SF30**				9,52	16,66	4,76	Faceta	0,1
017629	**APFW 16 04PDTR**	**SFZ**	◆			9,52	16,66	4,76	Faceta	0,1
017633	**APHT 16 04PDER**	**SFZ**				9,52	16,66	4,76	Faceta	0,05
015154	**APHT 16 04PDFR**	**GH1**				9,52	16,66	4,76	Faceta	0,02
017293	**APHT 16 04PDTR-42**	**MP91M**				9,52	16,66	4,76	Faceta	0,1
017634	**APHT 16 04PDTR-42**	**PFZ**				9,52	16,66	4,76	Faceta	0,1
015155	**APHT 16 04PDTR-42**	**X500**				9,52	16,66	4,76	Faceta	0,1
027718	**APHT 16 04PDTR-42**	**SP6564**				9,52	16,66	4,76	Faceta	0,1
027863	**APHT 16 0408ER-46**	**SP6564**				9,52	16,66	4,76	0,8	0,1
027869	**APHT 16 0408ER-46**	**X500**	◆			9,52	16,66	4,76	0,8	0,1
027864	**APHT 16 0416ER-46**	**SP6564**				9,52	16,66	4,76	1,6	0,1
027870	**APHT 16 0416ER-46**	**X500**	◆			9,52	16,66	4,76	1,6	0,1
027865	**APHT 16 0424ER-46**	**SP6564**				9,52	16,66	4,76	2,4	0,1
027871	**APHT 16 0424ER-46**	**X500**	◆			9,52	16,66	4,76	2,4	0,1
017294	**APKT 16 04PDER-43**	**MP91M**				9,52	16,66	4,76	Faceta	0,08
014067	**APKT 16 04PDER-43**	**PFZ**				9,52	16,66	4,76	Faceta	0,08
015156	**APKT 16 04PDER-43**	**X500**				9,52	16,66	4,76	Faceta	0,08
027887	**APKT 16 04PDER-43**	**SC3025**				9,52	16,66	4,76	Faceta	0,08
027720	**APKT 16 04PDER-43**	**SP6564**				9,52	16,66	4,76	Faceta	0,08
023115	**APKT 16 04PDER-45**	**X500**				9,52	16,66	4,76	Faceta	0,06
023114	**APKT 16 04PDER-45**	**MP91M**	◆			9,52	16,66	4,76	Faceta	0,06
027721	**APKT 16 04PDER-45**	**SP6564**	◆			9,52	16,66	4,76	Faceta	0,06
023102	**APET 16 0402TR-42**	**PFZ**				9,52	16,66	4,76	0,2	0,1
023103	**APET 16 0408TR-42**	**PFZ**				9,52	16,66	4,76	0,8	0,1
023104	**APET 16 0410TR-42**	**PFZ**				9,52	16,66	4,76	1,0	0,1
023105	**APET 16 0415TR-42**	**PFZ**				9,52	16,66	4,76	1,5	0,1
023106	**APET 16 0420TR-42**	**PFZ**				9,52	16,66	4,76	2,0	0,1
017618	**APET 16 0425TR-42**	**MP91M**				9,52	16,66	4,76	2,5	0,1
017619	**APET 16 0425TR-42**	**X500**				9,52	16,66	4,76	2,5	0,1
011488	**APKT 16 0408E-2C**	**MP91M**				9,52	16,66	4,76	0,8	0,10
010796	**APKT 16 0408E-2C**	**PFZ**				9,52	16,66	4,76	0,8	0,10
012468	**APKT 16 0408E-2C**	**SF30**				9,52	16,66	4,76	0,8	0,10
017228	**APMT 16 0412E-2C**	**MP91M**				9,52	16,66	4,76	1,2	0,1
013944	**APMT 16 0416E-2C**	**MP91M**				9,52	16,66	4,76	1,6	0,1
013945	**APMT 16 0424E-2C**	**MP91M**				9,52	16,66	4,76	2,4	0,1





















Nota: Para este tipo de fresa, el radio de punta máximo es de 2.5mm.

5315 VA 16 Consejos técnicos

Ejemplo de pedido fresa: **5315VA16-A063Z5R31**
Ejemplo de pedido plaquitas: **APFW1604PDER MP91M**
Para condiciones de corte completas ver página: **A288**



Estrella guía Llave para encontrar la herramienta idónea

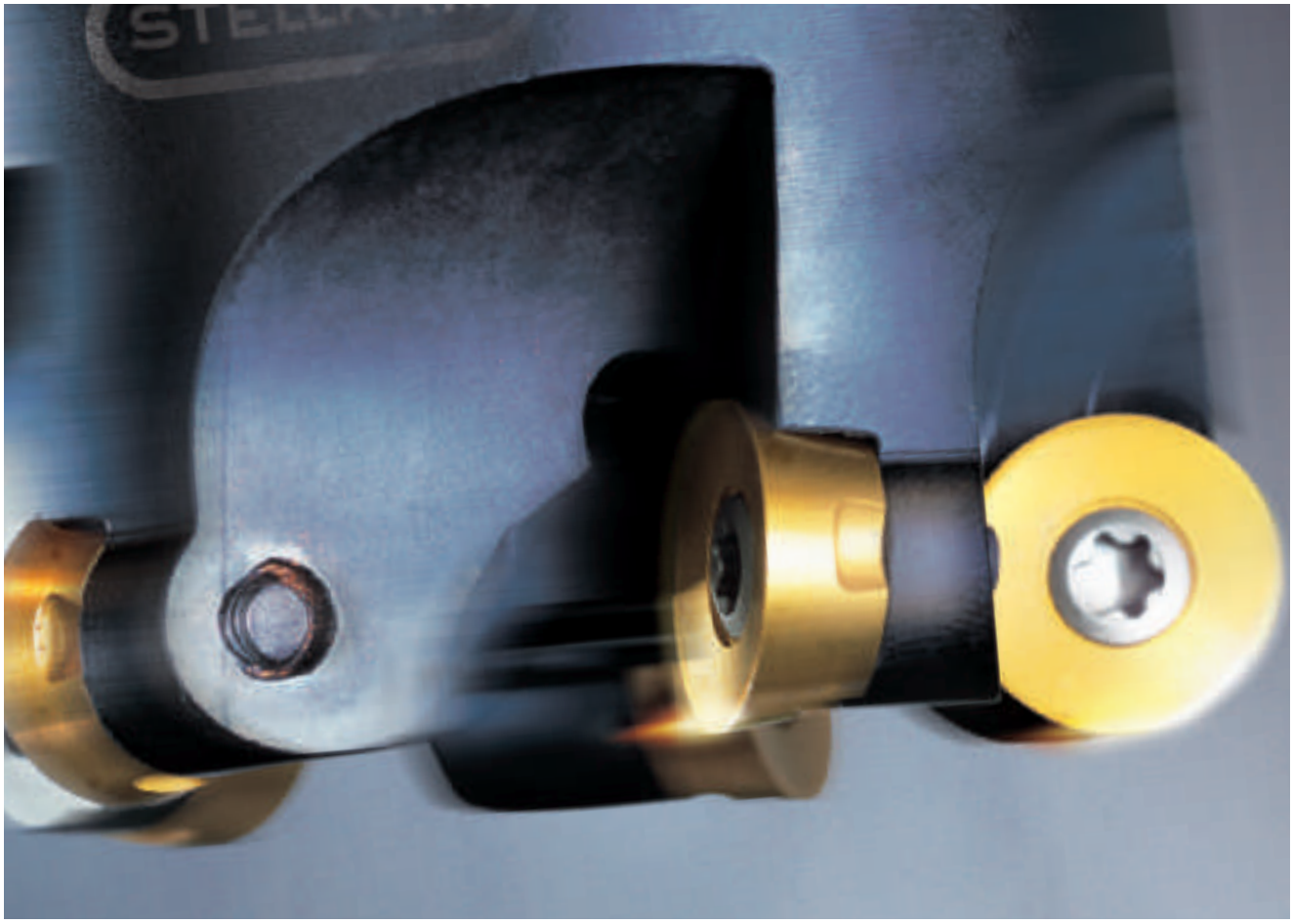


Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresas para perfilar

Acabado / Semi-acabado / Desbaste



Estas versátiles herramientas se utilizan para planear, escuadrar con radio, ranurar, vaciar, perfilar y taladrar por interpolación.

Todos los cuerpos de Fresas de Perfilado Stellram se fabrican con acero para herramientas P- 20. La refrigeración interna permite una mejor evacuación de la viruta y mayores avances. Pueden ser utilizadas en operaciones de desbaste y de acabado.



Fresas para perfilar – Aplicaciones



Planeado



Escuadrado con radio



Ranurado



Ranurado



Vaciado



Perfilado



Perfilado

Stellram ofrece una amplia gama para el fresado con placa redonda:

La fresa **5500 V** sirve para perfilar en operaciones de acabado. Un tornillo central y una V en la parte inferior de la plaquita proveen a esta herramienta de una gran precisión y repetitividad.

Las fresas **7700VR** son ideales para los materiales de alta resistencia. La nueva fresa **7710VR** (con plaquitas de 12mm de tamaño) tienen un patentado diseño que impide la rotación de la plaquita en su alojamiento durante las operaciones con grandes avances y con condiciones inestables. El diseño único del alojamiento asegura un preciso número de posicionamientos por plaquita.

Las fresas **7702 VRD** sirven para desbastar y acabar en la mecanización de moldes. El ángulo negativo de posicionamiento axial, reduce las vibraciones.

Fresas **7712VRD** (plaquitas con dimensiones de 12mm y 16mm) tienen un diseño patentado impidiendo la rotación de la plaquita durante operaciones con altos avances y condiciones inestables. El diseño único del alojamiento asegura un preciso número de posicionamientos por plaquita.



5500 V



7700 VR



7702 VRD



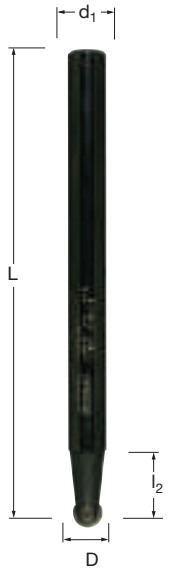
7710 VR



7712 VRD

Fresa para perfilar 5500 V 08





Amarre cilíndrico

5500 V 08 Amarre cilíndrico

EDP #	Referencia	Dimensiones (mm) D	L	l_2	d_1	a_p	No. de plaquitas	Recambios EDP#		EDP#	
021666	**5500V 08 CR**	8	160	20	12	4	1	022149	55.671	018487	T6

5500 V 08 Cabeza modular

EDP #	Referencia	Dimensiones (mm) D	L	M	d_1	a_p	No. de plaquitas	Recambios EDP#		EDP#	
029128	**5500V 08 SR25**	8	25	M8	8.5	4	1	022149	55.671	018487	T6

Amarres para cabezas modulares ver página A228 - A229.

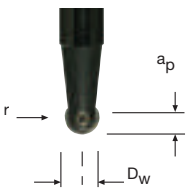


Cabeza modular



5500 V 08 Consejos técnicos

Ejemplo de pedido fresa: **5500V08CR**
Ejemplo de pedido plaquitas: **RG08S SP1064**
Para condiciones de corte completas ver página: **A288**

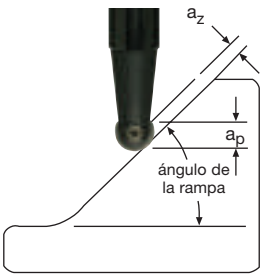


Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

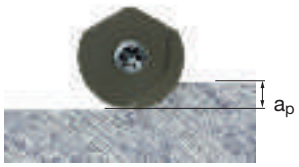
donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

Fresado en rampa



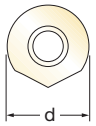
Datos de la rampa		
Diámetro de la fresa 8,00 mm		**ángulo de la rampa**
a_z (mm)	a_p (mm)	
3,0	3,9	15°
2,0	3,5	30°
1,2	2,8	45°
0,5	2,0	60°
0,14	1,1	75°
0,1	0,4	85°

Par máximo .31 Nm



Profundidad de corte (a_p)

Plaquitas para 5500 V 08



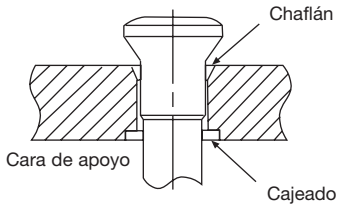


EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
027794	**RG 08S**	**SP1064**			◆◆◆◆◆◆◆	8,0	-	1,75	4,0	0,02

RG 08S_



Montaje de la plaquita RG



El agujero de la plaquita posee un chaflán en un lado y un cajeado en el otro.
Montaje según esquema con el fin de que la plaquita se aloje correctamente en su asiento.

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:

f_z	=	Avance por diente	a_e	=	Profundidad de pase radial
h_m	=	Espesor de la viruta	D_w	=	Diámetro de corte efectivo
D	=	Diámetro exterior de la fresa	a_p	=	Profundidad de corte axial

Condiciones de corte recomendadas para RG_08

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	-	-	-	180 - 360	0,10	< 1,0
◆ Aceros aleados	-	-	-	-	-	-	110 - 240	0,10	< 1,0
◆ Aceros inoxidables	-	-	-	-	-	-	140 - 240	0,10	< 1,0
◆ Inoxidables PH	-	-	-	-	-	-	120 - 190	0,08	< 1,0
◆ Fundición	-	-	-	-	-	-	100 - 160	0,08	< 1,0
◆ Aluminio y Aleaciones	-	-	-	-	-	-	400 - 1000	0,10	< 1,0
◆ Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,08	< 1,0
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,05	< 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

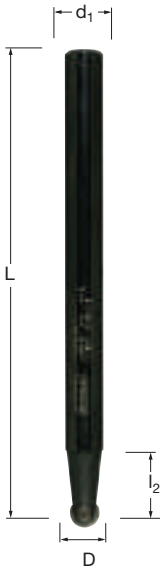


Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresa para perfilar 5500 V 10





Amarre cilíndrico

5500 V 10 Amarre cilíndrico

		Dimensiones (mm)						Recambios			
EDP #	Referencia	D	L	l_2	d_1	a_p	No. de plaquitas	EDP#		EDP#	
021667	**5500V 10 CR**	10	160	25	12	5	1	015250	55.672	018488	T7

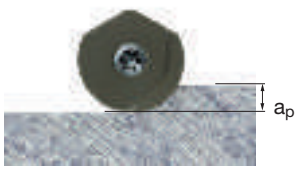
5500 V 10 Cabeza modular

		Dimensiones (mm)						Recambios			
EDP #	Referencia	D	L	M	d_1	a_p	No. de plaquitas	EDP#		EDP#	
029129	**5500V 10 SR25**	10	25	M8	8.5	5	1	015250	55.672	018488	T7

Amarres para cabezas modulares ver página A228 - A229.



Cabeza modular

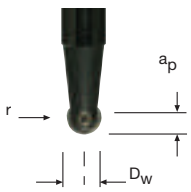


Profundidad de corte (a_p)



5500 V 10 Consejos técnicos

Ejemplo de pedido fresa: **5500V10CR**
Ejemplo de pedido plaquitas: **RG10S SP1064**
Para condiciones de corte completas ver página: **A288**

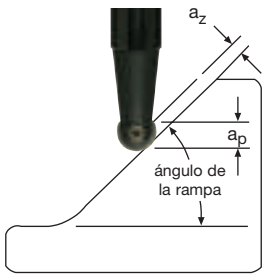


Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

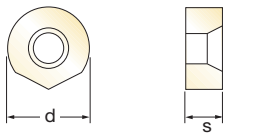
Fresado en rampa



Datos de la rampa		
Diámetro de la fresa 10,00 mm		**ángulo de la rampa**
a_z (mm)	a_p (mm)	
3,7	4,8	15°
2,5	4,4	30°
1,5	3,6	45°
0,7	2,6	60°
0,17	1,4	75°
0,1	0,5	85°

Par máximo .65 Nm

Plaquitas para 5500 V 10

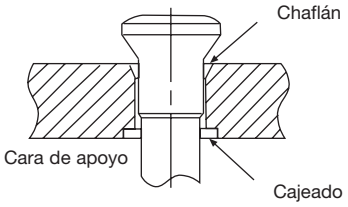


EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
027795	**RG 10S**	**SP1064**				10,0	-	2,0	5,0	0,02

RG 10S_



Montaje de la plaquita RG



El agujero de la plaquita posee un chaflán en un lado y un cajeado en el otro.
Montaje según esquema con el fin de que la plaquita se aloje correctamente en su asiento.

Intercambiabilidad de las plaquitas*

Métrico		Pulgadas	
Diámetro	Referencia plaquitas	Diámetro	Referencia plaquitas
10 mm	RG 10S	.375 in.	RG .375S

*La intercambiabilidad de las plaquitas permite el utilizar plaquitas métricas en una fresa en pulgadas, y viceversa.

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:

f_z	=	Avance por diente	a_e	=	Profundidad de pase radial
h_m	=	Espesor de la viruta	D_w	=	Diámetro de corte efectivo
D	=	Diámetro exterior de la fresa	a_p	=	Profundidad de corte axial

Condiciones de corte recomendadas para RG_10

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	-	-	-	180 - 360	0,10	< 1,0
Aceros aleados	-	-	-	-	-	-	110 - 240	0,10	< 1,0
Aceros inoxidables	-	-	-	-	-	-	140 - 240	0,10	< 1,0
Inoxidables PH	-	-	-	-	-	-	120 - 190	0,08	< 1,0
Fundición	-	-	-	-	-	-	100 - 160	0,08	< 1,0
Aluminio y Aleaciones	-	-	-	-	-	-	400 - 1000	0,10	< 1,0
Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,08	< 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,05	< 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



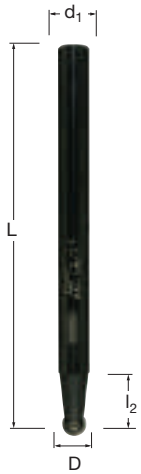
Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa para perfilar 5500 V 12





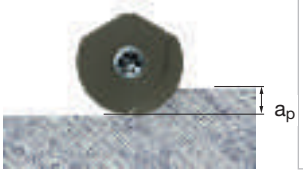
Amarre cilíndrico



Amarre Morse



Cabeza modular



Profundidad de corte (a_p)

5500 V 12 Amarre cilíndrico

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D	L	l_2	l_3	d_1	CM	a_p	No. de plaquitas	EDP#		EDP#	
021668	**5500V 12 CR**	12	180	30	-	12	-	6	1	015251	55.674	013215	T10

5500 V 12 Amarre Morse

021669	**5500V 12 MR**	12	124	55	60	-	CM2	6	1	015251	55.674	013215	T10

5500 V 12 Cabeza modular

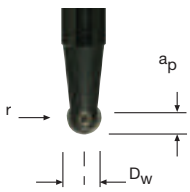
		Dimensiones (mm)						Recambios			
EDP #	Referencia	D	L	M	d_1	a_p	No. de plaquitas	EDP#		EDP#	
029130	**5500V 12 SR35**	12	35	M8	8,5	6	1	015251	55.674	03215	T10

Amarres para cabezas modulares ver página A228 - A229.



5500 V 12 Consejos técnicos

Ejemplo de pedido fresa: **5500V12CR**
Ejemplo de pedido plaquitas: **RG12S SP1064**
Para condiciones de corte completas ver página: **A288**

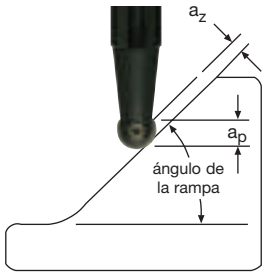


Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

Fresado en rampa

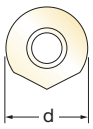


Datos de la rampa

Diámetro de la fresa 12,00 mm		**ángulo de la rampa**
a_z (mm)	a_p (mm)	
4,5	5,8	15°
3,0	5,2	30°
1,8	4,2	45°
0,8	3,0	60°
0,2	1,4	75°
0,1	0,6	85°

Par máximo 1.75 Nm

Plaquitas para 5500 V 12



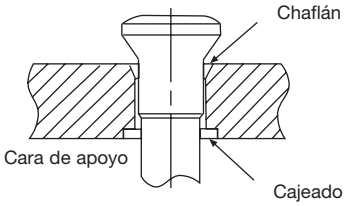


EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
027796	**RG 12S**	**SP1064**				12,0	-	2,5	6,0	0,02

RG 12S_



Montaje de la plaquita RG



El agujero de la plaquita posee un chaflán en un lado y un cajeado en el otro.
Montaje según esquema con el fin de que la plaquita se aloje correctamente en su asiento.

Intercambiabilidad de las plaquitas*

Métrico		Pulgadas	
Diámetro	Referencia plaquitas	Diámetro	Referencia plaquitas
12 mm	RG 12S	.500 in.	RG .500S

*La intercambiabilidad de las plaquitas permite el utilizar plaquitas métricas en una fresa en pulgadas, y viceversa.

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:

f_z	=	Avance por diente	a_e	=	Profundidad de pase radial
h_m	=	Espesor de la viruta	D_w	=	Diámetro de corte efectivo
D	=	Diámetro exterior de la fresa	a_p	=	Profundidad de corte axial

Condiciones de corte recomendadas para RG_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	-	-	-	180 - 360	0,10 - 0,15	< 1,0
Aceros aleados	-	-	-	-	-	-	110 - 240	0,10 - 0,15	< 1,0
Aceros inoxidables	-	-	-	-	-	-	140 - 240	0,10 - 0,15	< 1,0
Inoxidables PH	-	-	-	-	-	-	120 - 190	0,08 - 0,12	< 1,0
Fundición	-	-	-	-	-	-	100 - 160	0,08 - 0,12	< 1,0
Aluminio y Aleaciones	-	-	-	-	-	-	400 - 1000	0,10 - 0,15	< 1,0
Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,08 - 0,12	< 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	< 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

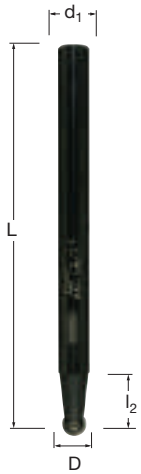


Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa para perfilar 5500 V 16





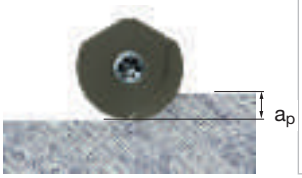
Amarre cilíndrico



Amarre Morse



Cabeza modular



Profundidad de corte (a_p)

5500 V 16 Amarre cilíndrico

EDP #	Referencia	Dimensiones (mm) D	L	l_2	l_3	d_1	CM	a_p	No. de plaquitas	Recambios EDP#		EDP#	
021670	**5500V 16 CR**	16	200	40	-	16	-	8	1	022150	55.675	015240	T15

5500 V 16 Amarre Morse

EDP #	Referencia	D	L	l_2	l_3	d_1	CM	a_p	No. de plaquitas	EDP#		EDP#	
021671	**5500V 16 MR**	16	139	70	75	-	CM2	8	1	022150	55.675	015240	T15

5500 V 16 Cabeza modular

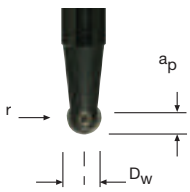
EDP #	Referencia	D	L	M	d_1	a_p	No. de plaquitas	EDP#		EDP#	
029131	**5500V 16 SR35**	16	35	M8	8,5	8	1	022150	55.675	015240	T15

Amarres para cabezas modulares ver página A228 - A229.



5500 V 16 Consejos técnicos

Ejemplo de pedido fresa: **5500V16CR**
Ejemplo de pedido plaquitas: **RG16S SP1064**
Para condiciones de corte completas ver página: **A288**

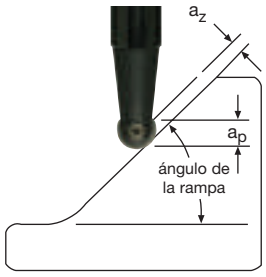


Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

Fresado en rampa

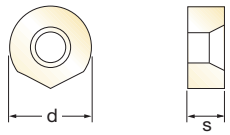


Datos de la rampa

Diámetro de la fresa 16,00 mm a_z (mm)	a_p (mm)	**ángulo de la rampa**
6,0	7,7	15°
4,0	6,9	30°
2,4	5,6	45°
1,1	4,0	60°
0,3	2,0	75°
0,1	0,7	85°

Par máximo 2.6 Nm

Plaquitas para 5500 V 16

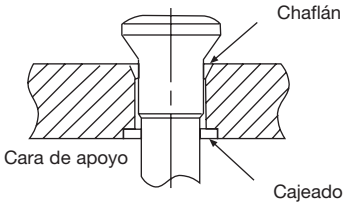


EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
027797	**RG 16S**	**SP1064**				16,0	-	3,0	8,0	0,02

RG 16S_



Montaje de la plaquita RG



El agujero de la plaquita posee un chaflán en un lado y un cajeado en el otro.
Montaje según esquema con el fin de que la plaquita se aloje correctamente en su asiento.

Intercambiabilidad de las plaquitas*

Métrico		Pulgadas	
Diámetro	Referencia plaquitas	Diámetro	Referencia plaquitas
16 mm	RG 16S	.625 in.	RG .625S

*La intercambiabilidad de las plaquitas permite el utilizar plaquitas métricas en una fresa en pulgadas, y viceversa.

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:

f_z	=	Avance por diente	a_e	=	Profundidad de pase radial
h_m	=	Espesor de la viruta	D_w	=	Diámetro de corte efectivo
D	=	Diámetro exterior de la fresa	a_p	=	Profundidad de corte axial

Condiciones de corte recomendadas para RG_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	-	-	-	180 - 360	0,10 - 0,15	< 1,0
Aceros aleados	-	-	-	-	-	-	110 - 240	0,10 - 0,15	< 1,0
Aceros inoxidables	-	-	-	-	-	-	140 - 240	0,10 - 0,15	< 1,0
Inoxidables PH	-	-	-	-	-	-	120 - 190	0,08 - 0,12	< 1,0
Fundición	-	-	-	-	-	-	100 - 160	0,08 - 0,12	< 1,0
Aluminio y Aleaciones	-	-	-	-	-	-	400 - 1000	0,10 - 0,15	< 1,0
Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,08 - 0,12	< 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	< 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

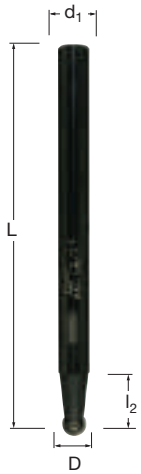


Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa para perfilar 5500 V 20





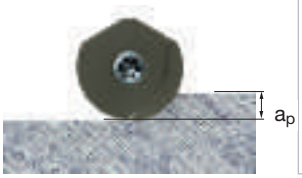
Amarre cilíndrico



Amarre Morse



Cabeza modular



Profundidad de corte (a_p)

5500 V 20 Amarre cilíndrico

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D	L	l_2	l_3	d_1	CM	a_p	No. de Plaquitas	EDP#		EDP#	
021672	**5500V 20 CR**	20	200	50	-	20	-	10	1	015252	55.676	015241	T20

5500 V 20 Amarre Morse

021673	**5500V 20 MR**	20	154	85	90	-	CM2	10	1	015252	55.676	015241	T20

5500 V 20 Cabeza modular

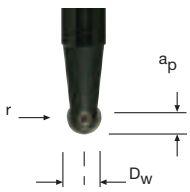
		Dimensiones (mm)						Recambios			
EDP #	Referencia	D	L	M	d_1	a_p	No. de Plaquitas	EDP#		EDP#	
029132	**5500V 20 SR35**	25	35	M10	10,5	10	1	015252	55.676	015241	T20

Amarres para cabezas modulares ver página A228 - A229.



5500 V 20 Consejos técnicos

Ejemplo de pedido fresa: **5500V20CR**
Ejemplo de pedido plaquitas: **RG20S SP1064**
Para condiciones de corte completas ver página: **A288**

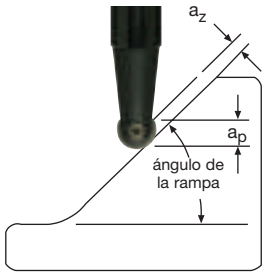


Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

Fresado en rampa

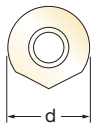


Datos de la rampa

Diámetro de la fresa 20,00 mm		
a_z (mm)	a_p (mm)	**ángulo de Angle**
7,4	9,6	15°
5,0	8,6	30°
3,0	7,1	45°
1,3	5,0	60°
0,35	2,9	75°
0,1	0,9	85°

Par máximo 5.1 Nm

Plaquitas para 5500 V 20



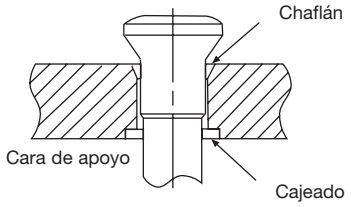


EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
027798	**RG 20S**	**SP1064**			◆◆◆◆◆◆◆	20,0	-	3,5	10,0	0,02

RG 20S_



Montaje de la plaquita RG



El agujero de la plaquita pover un chaflán en un lado y un cajeado en el otro.
Montaje según esquema con el fin de que la plaquita se aloje correctamente en su asiento.

Intercambiabilidad de las plaquitas*

Métrico		Pulgadas	
Diámetro	Referencia plaquitas	Diámetro	Referencia plaquitas
20 mm	RG 20S	.75 in.	RG .750S

*La intercambiabilidad de las plaquitas permite el utilizar plaquitas métricas en una fresa en pulgadas, y viceversa.

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:

f_z	=	Avance por diente	a_e	=	Profundidad de pase radial
h_m	=	Espesor de la viruta	D_w	=	Diámetro de corte efectivo
D	=	Diámetro exterior de la fresa	a_p	=	Profundidad de corte axial

Condiciones de corte recomendadas para RG_20

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	-	-	-	180 - 360	0,1 - 0,25	< 1,5
◆ Aceros aleados	-	-	-	-	-	-	110 - 240	0,1 - 0,25	< 1,5
◆ Aceros inoxidables	-	-	-	-	-	-	140 - 240	0,1 - 0,2	< 1,5
◆ Inoxidables PH	-	-	-	-	-	-	120 - 190	0,1 - 0,2	< 1,5
◆ Fundición	-	-	-	-	-	-	100 - 160	0,1 - 0,2	< 1,5
◆ Aluminio y Aleaciones	-	-	-	-	-	-	400 - 1000	0,1 - 0,25	< 1,5
◆ Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,1 - 0,2	< 1,5
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	< 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

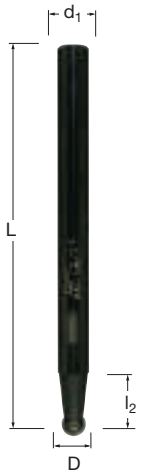


Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresa para perfilar 5500 V 25





Amarre cilíndrico

5500 V 25 Amarre cilíndrico

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D	L	l_2	l_3	d_1	CM	a_p	No. de Plaquitas	EDP#		EDP#	
021674	**5500V 25 CR**	25	200	50	-	25	-	12,5	1	015253	55.677	015241	T20

5500 V 25 Cabeza modular

		Dimensiones (mm)						Recambios			
EDP #	Referencia	D	L	M	d_1	a_p	No. de Plaquitas	EDP#		EDP#	
029133	**5500V 25 SR43**	25	43	M12	12,5	12,5	1	015253	55.677	015241	T20

Amarres para cabezas modulares ver página A228 - A229.

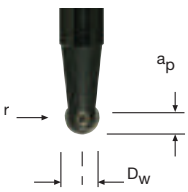


Cabeza modular



5500 V 25 Consejos técnicos

Ejemplo de pedido fresa: **5500V25CR**
Ejemplo de pedido plaquitas: **RG25S SP1064**
Para condiciones de corte completas ver página: **A288**

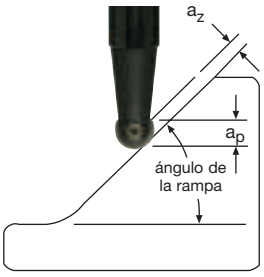


Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

Fresado en rampa



Datos de la rampa		
Diámetro de la fresa 25,00 mm		
a_z (mm)	a_p (mm)	**ángulo de la rampa**
9,3	12,1	15°
6,3	10,8	30°
3,7	8,8	45°
1,7	6,25	60°
0,4	3,2	75°
0,1	1,1	85°

Par máximo 5.1 Nm



Profundidad de corte (a_p)

Plaquitas para 5500 V 25

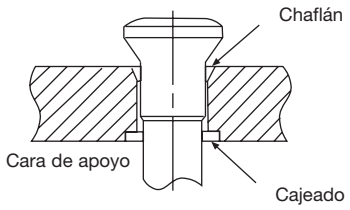




EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
027799	**RG 25S**	**SP1064**			◆◆◆◆◆◆◆	25,0	-	4,0	12,5	0,02

RG 25S_ 

Montaje de la plaquita RG



El agujero de la plaquita pover un chaflán en un lado y un cajeado en el otro.
Montaje según esquema con el fin de que la plaquita se aloje correctamente en su asiento.

Intercambiabilidad de las plaquitas*

Métrico		Pulgadas	
Diámetro	Referencia plaquitas	Diámetro	Referencia plaquitas
25 mm	RG 25S	1.000 in.	RG 1.00S

*La intercambiabilidad de las plaquitas permite el utilizar plaquitas métricas en una fresa en pulgadas, y viceversa.

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:

f_z	=	Avance por diente	a_e	=	Profundidad de pase radial
h_m	=	Espesor de la viruta	D_w	=	Diámetro de corte efectivo
D	=	Diámetro exterior de la fresa	a_p	=	Profundidad de corte axial

Condiciones de corte recomendadas para RG_2

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	-	-	-	180 - 360	0,1 - 0,3	< 1,5
◆ Aceros aleados	-	-	-	-	-	-	110 - 240	0,1 - 0,3	< 1,5
◆ Aceros inoxidables	-	-	-	-	-	-	140 - 240	0,1 - 0,2	< 1,5
◆ Inoxidables PH	-	-	-	-	-	-	120 - 190	0,1 - 0,2	< 1,5
◆ Fundición	-	-	-	-	-	-	100 - 160	0,1 - 0,2	< 1,5
◆ Aluminio y Aleaciones	-	-	-	-	-	-	400 - 1000	0,1 - 0,3	< 1,5
◆ Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,1 - 0,2	< 1,5
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	< 0,5

h_m = espesor de la viruta

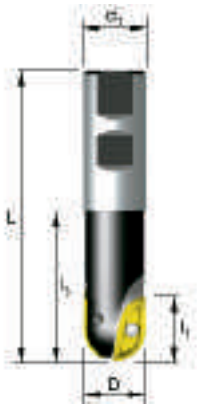
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresa de desbaste semiesférica 5505 VX 20



Amarre Weldon

5505 VX 20 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	d_1	Z	Plaquitas Tipo
029539	**5505VX20W020R50**	20	106	20	34	50	25	2	XPNT20

5505 VX 20 Amarre Morse

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	Cono Morse	Z	Plaquitas Tipo
029548	**5505VX20M020R70**	20	156	20	50	70	CM3	2	XPNT20

5505 VX 20 Recambios

Fresa Diámetro (mm)	Referencia	Recambios para fijación en alojamiento EDP#	Tornillo	EDP#	Destornillador	Recambios para tornillo de mantenimiento axial EDP#	Tornillo	EDP#	Destornillador
20.0	**5505VX20-------**	015063	F3008T	022157	T8	015063	F3008T	022157	T8



Amarre Morse

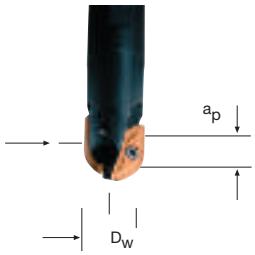




5505 VX 20 Consejos técnicos

Ejemplo de pedido fresa: **5505VX20W020R50**

Ejemplo de pedido plaquitas: **XPNT20/20T306 R-C X400**



Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:

D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

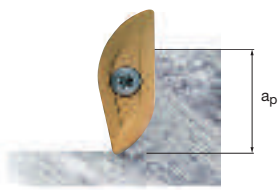
$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

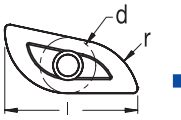
donde:

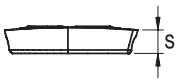
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial

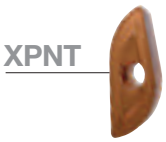


Profundidad de corte (a_p)

Plaquitas para 5505 VX 20







EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Dimensiones (mm) d	l	s centro	s arista de corte	r
029559	**XPNT20/20T306.R-C**	**SC3025**	◆	9,00	20,85	4,26	3,97	10,0
029560	**XPNT20/20T306.R-C**	**X400**	◆◆◆	9,00	20,85	4,26	3,97	10,0

Condiciones de corte recomendadas para XP_20

Material	▼ *Desbaste* (ø20mm) V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼ *Semi-acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼▼ *Acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)
Aceros no aleados	120 - 235	0,10 - 0,17	Ver l_1	-	-	-	-	-	-
Aceros aleados	70 - 150	0,10 - 0,15	Ver l_1	-	-	-	-	-	-
Aceros inoxidables	-	-	Ver l_1	-	-	-	-	-	-
Inoxidables PH	-	-	Ver l_1	-	-	-	-	-	-
Fundición	120 - 395	0,10 - 0,17	Ver l_1	-	-	-	-	-	-
Aluminio y Aleaciones	-	-	Ver l_1	-	-	-	-	-	-
Aleaciones refractarias	-	-	Ver l_1	-	-	-	-	-	-
Aceros duros (52-56 HRC)	35 - 100	0,10 - 0,12	Ver l_1	-	-	-	-	-	-

h_m = espesor de la viruta

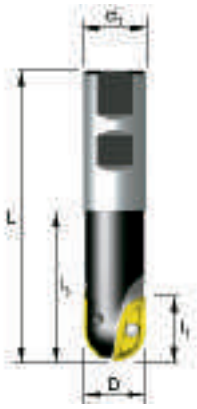
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa de desbaste semiesférica 5505 VX 25

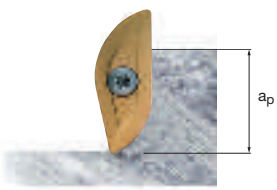


Amarre Weldon



Amarre Morse





Profundidad de corte (a_p)

5505 VX 25 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	d_1	Z	Plaquitas Tipo
029540	**5505VX25W025R60**	25	116	25	-	60	25	2	XPNT25
029541	**5505VX25W025R90**	25	150	25	70	90	32	2	XPNT25

5505 VX 25 Amarre Morse

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	Cono Morse	Z	Plaquitas Tipo
029549	**5505VX25M025R80**	25	161	25	-	80	CM3	2	XPNT25
029550	**5505VX25M025R100**	25	181	25	-	100	CM3	2	XPNT25

5505 VX 25 Recambios

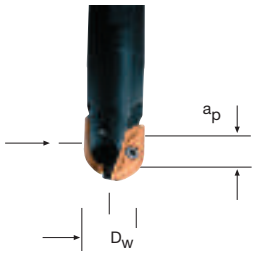
Fresa Diámetro (mm)	Referencia	Recambios para fijación en alojamiento EDP#	Tornillo	EDP#	Destornillador	Recambios para tornillo de mantenimiento axial EDP#	Tornillo	EDP#	Destornillador
25.0	**5505VX25-------**	015262	D4010T	015240	T15	022056	F3507T	015240	T15



5505 VX 25 Consejos técnicos

Ejemplo de pedido fresa: **5505VX25W025R60**

Ejemplo de pedido plaquitas: **XPNT25/250408.R-C X400**



Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
- D_w = Diámetro efectivo de corte
- r = Radio de la fresa
- a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

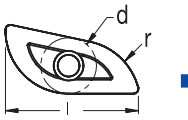
$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

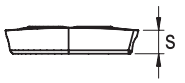
Espesor de la viruta:

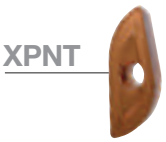
$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:
- f_z = Avance por diente
- h_m = Espesor de la viruta
- D = Diámetro exterior de la fresa
- a_e = Profundidad de pase radial
- D_w = Diámetro de corte efectivo
- a_p = Profundidad de corte axial

Plaquitas para 5505 VX 25







EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	Dimensiones (mm) d	l	s centro	s arista de corte	r
029561	**XPNT25/250408.R-C**	**SC3025**	♦	11,00	26,00	5,06	4,76	12,5
029562	**XPNT25/250408.R-C**	**X400**	♦♦♦	11,00	26,00	5,06	4,76	12,5

Condiciones de corte recomendadas para XP_25

Material	▼ *Desbaste* (ø25mm) V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼ *Semi-acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼▼ *Acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)
♦ Aceros no aleados	120 - 235	0,10 - 0,20	Ver l_1	-	-	-	-	-	-
♦ Aceros aleados	70 - 150	0,10 - 0,18	Ver l_1	-	-	-	-	-	-
♦ Aceros inoxidables	-	-	Ver l_1	-	-	-	-	-	-
♦ Inoxidables PH	-	-	Ver l_1	-	-	-	-	-	-
♦ Fundición	120 - 395	0,10 - 0,20	Ver l_1	-	-	-	-	-	-
♦ Aluminio y Aleaciones	-	-	Ver l_1	-	-	-	-	-	-
♦ Aleaciones refractarias	-	-	Ver l_1	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	35 - 100	0,10 - 0,15	Ver l_1	-	-	-	-	-	-

h_m = espesor de la viruta

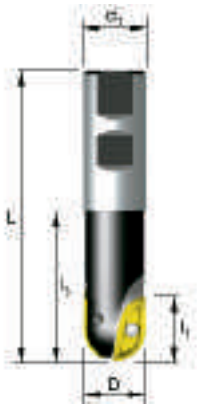
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa de desbaste semiesférica 5505 VX 32



Amarre Weldon



Amarre Morse

5505 VX 32 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	d_1	Z	Plaquitas Tipo
029542	**5505VX32W032R75**	32	130	32	-	75	32	2	XPNT32
029543	**5505VX32W032R100**	32	160	32	-	100	32	2	XPNT32

5505 VX 32 Amarre Morse

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	Cono Morse	Z	Plaquitas Tipo
029551	**5505VX32M032R90**	32	192.5	32	-	90	CM4	2	XPNT32
029552	**5505VX32M032R125**	32	227.5	32	-	125	CM4	2	XPNT32

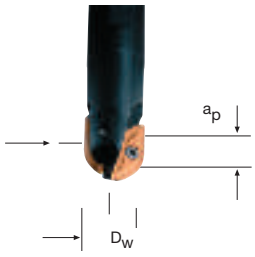
5505 VX 32 Recambios

Fresa Diámetro (mm)	Referencia	Recambios para fijación en alojamiento EDP#	Tornillo	EDP#	Destornillador	Recambios para tornillo de mantenimiento axial EDP#	Tornillo	EDP#	Destornillador
32.0	**5505VX32-------**	015266	D5013T	015241	T20	029639	F4007T	015241	T20



5505 VX 32 Consejos técnicos

Ejemplo de pedido fresa: **5505VX32W032R75**
Ejemplo de pedido plaquitas: **XPNT32/320612.R-C X400**



Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

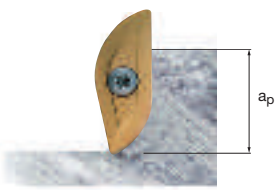
Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

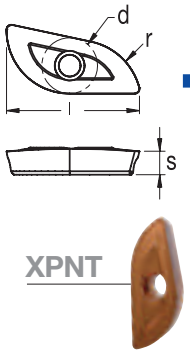
$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 5505 VX 32



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	Dimensiones (mm) d	l	s centro	s arista de corte	r
029563	**XPNT32/320612.R-C**	**SC3025**	◆	14,10	33,40	6,60	6,35	16,0
029564	**XPNT32/320612.R-C**	**X400**	◆◆◆	14,10	33,40	6,60	6,35	16,0

Condiciones de corte recomendadas para XP_32

Material	▼ *Desbaste* (ø32mm) V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼ *Semi-acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼▼ *Acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)
Aceros no aleados	120 - 235	0,10 - 0,22	Ver l_1	-	-	-	-	-	-
Aceros aleados	70 - 150	0,10 - 0,20	Ver l_1	-	-	-	-	-	-
Aceros inoxidables	-	-	Ver l_1	-	-	-	-	-	-
Inoxidables PH	-	-	Ver l_1	-	-	-	-	-	-
Fundición	120 - 395	0,10 - 0,22	Ver l_1	-	-	-	-	-	-
Aluminio y Aleaciones	-	-	Ver l_1	-	-	-	-	-	-
Aleaciones refractarias	-	-	Ver l_1	-	-	-	-	-	-
Aceros duros (52-56 HRC)	35 - 100	0,10 - 0,17	Ver l_1	-	-	-	-	-	-

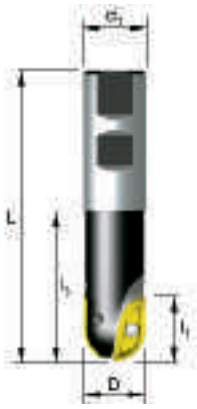
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa de desbaste semiesférica 5505 VX 40



Amarre Weldon



Amarre Morse

5505 VX 40 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	d_1	Z	Plaquitas Tipo
029544	**5505VX40W040R100**	40	170	40	-	100	40	2	XPNT40
029545	**5505VX40W040R150**	40	220	40	-	150	40	2	XPNT40

5505 VX 40 Amarre Morse

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	Cono Morse	Z	Plaquitas Tipo
029553	**5505VX40M040R100**	40	202.5	40	-	100	CM4	2	XPNT40
029554	**5505VX40M040R150**	40	252.5	40	-	150	CM4	2	XPNT40

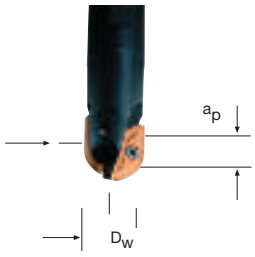
5505 VX 40 Recambios

Fresa Diámetro (mm)	Referencia	Recambios para fijación en alojamiento EDP#	Tornillo	EDP#	Destornillador	Recambios para tornillo de mantenimiento axial EDP#	Tornillo	EDP#	Destornillador
40.0	**5505VX40-------**	029640	D6014T	015241	T20	015270	F4011T	015241	T20



5505 VX 40 Consejos técnicos

Ejemplo de pedido fresa: **5505VX40W040R100**
Ejemplo de pedido plaquitas: **XPNT40/40T716.R-C X400**



Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

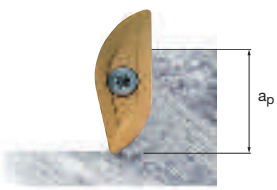
Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

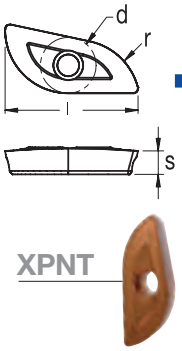
$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 5505 VX 40



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	Dimensiones (mm) d	l	s centro	s arista de corte	r
029567	**XPNT40/40T716.R-C**	**SC3025**	◆	18,00	41,84	8,25	7,95	20,0
029568	**XPNT40/40T716.R-C**	**X400**	◆◆◆	18,00	41,84	8,25	7,95	20,0

Condiciones de corte recomendadas para XP_40

Material	▼ *Desbaste* (ø40mm) V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼ *Semi-acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼▼ *Acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)
◆ Aceros no aleados	120 - 235	0,10 - 0,24	Ver l_1	-	-	-	-	-	-
◆ Aceros aleados	70 - 150	0,10 - 0,22	Ver l_1	-	-	-	-	-	-
◆ Aceros inoxidables	-	-	Ver l_1	-	-	-	-	-	-
◆ Inoxidables PH	-	-	Ver l_1	-	-	-	-	-	-
◆ Fundición	120 - 395	0,10 - 0,24	Ver l_1	-	-	-	-	-	-
◆ Aluminio y Aleaciones	-	-	Ver l_1	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	Ver l_1	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	35 - 100	0,10 - 0,19	Ver l_1	-	-	-	-	-	-

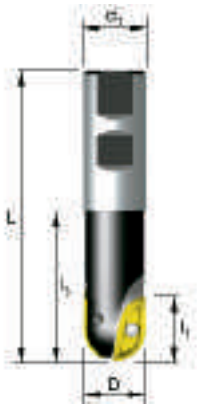
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa de desbaste semiesférica 5505 VX 50



Amarre Weldon



Amarre Morse

5505 VX 50 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	d_1	Z	Plaquitas Tipo
029546	**5505VX50W050R100**	50	170	50	-	100	40	2	XPNT50
029547	**5505VX50W050R150**	50	230	50	-	150	50	2	XPNT50

5505 VX 50 Amarre Morse

EDP #	Referencia	Dimensiones (mm) D	L	l_1 a_p max.	l_2	l_3	Cono Morse	Z	Plaquitas Tipo
029553	**5505VX50M050R100**	50	233	50	-	100	CM5	2	XPNT50
029554	**5505VX50M050R150**	50	283	50	-	150	CM5	2	XPNT50

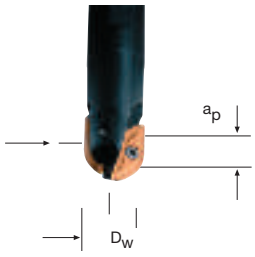
5505 VX 50 Recambios

Fresa Diámetro (mm)	Referencia	Recambios para fijación en alojamiento EDP#	Tornillo	EDP#	Destornillador	Recambios para tornillo de mantenimiento axial EDP#	Tornillo	EDP#	Destornillador
50.0	**5505VX50-------**	029641	F8017S	S2002050	SW5	018486	D6018S	S1066165	SW4



5505 VX 50 Consejos técnicos

Ejemplo de pedido fresa: **5505VX50W050R100**
Ejemplo de pedido plaquitas: **XPNT50/50T716.R-C X400**



Diámetro efectivo de corte:

$$D_w = 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
r = Radio de la fresa
a_p = Profundidad de corte axial

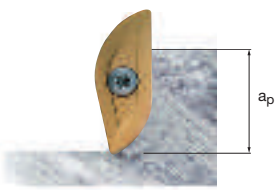
Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

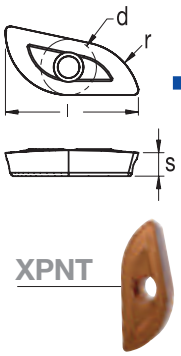
$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 5505 VX 50



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	Dimensiones (mm) d	l	s centro	s arista de corte	r
029569	**XPNT50/50T716.R-C**	**SC3025**	◆	22,25	52,86	8,25	7,95	25,0
029570	**XPNT50/50T716.R-C**	**X400**	◆◆◆	22,25	52,86	8,25	7,95	25,0

Condiciones de corte recomendadas para XP_50

Material	▼ *Desbaste* (ø50mm) V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼ *Semi-acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)	▼▼▼ *Acabado* V_c (m/min)	h_m (mm)	a_p max. (mm)
Aceros no aleados	120 - 235	0,10 - 0,27	Ver l_1	-	-	-	-	-	-
Aceros aleados	70 - 150	0,10 - 0,25	Ver l_1	-	-	-	-	-	-
Aceros inoxidables	-	-	Ver l_1	-	-	-	-	-	-
Inoxidables PH	-	-	Ver l_1	-	-	-	-	-	-
Fundición	120 - 395	0,10 - 0,27	Ver l_1	-	-	-	-	-	-
Aluminio y Aleaciones	-	-	Ver l_1	-	-	-	-	-	-
Aleaciones refractarias	-	-	Ver l_1	-	-	-	-	-	-
Aceros duros (52-56 HRC)	35 - 100	0,10 - 0,24	Ver l_1	-	-	-	-	-	-

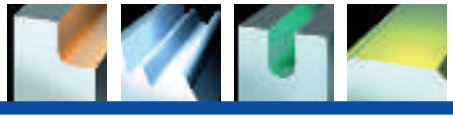
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Fresa para perfilar 7700 VR 06





Amarre Weldon

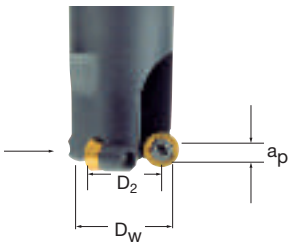
7700 VR 06 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D1	D2	L	l2	d1	ap max.	No. de dientes	EDP #	Recambios EDP #	
021727	**7700VR 06 WA016R067**	16	10	115	67	16	3	2	015060	F2505T	018488 T7
021728	**7700VR 06 WA016R102**	16	10	150	102	16	3	2	015060	F2505T	018488 T7
021729	**7700VR 06 WA020R060**	20	14	110	60	20	3	3	015060	F2505T	018488 T7
021730	**7700VR 06 WA020R090**	20	14	140	90	20	3	3	015060	F2505T	018488 T7
021731	**7700VR 06 WA020R120**	20	14	170	120	20	3	3	015060	F2505T	018488 T7



7700 VR 06 Consejos técnicos

Ejemplo de pedido fresa: **7700VR06WA016R067**
Ejemplo de pedido plaquitas: **RPEX0602M0F-701 SFZ**
Para condiciones de corte completas ver página: **A288**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
D_2 = Diámetro entre ejes de las plaquitas
r = Radio de la plaquita
a_p = Profundidad de corte axial

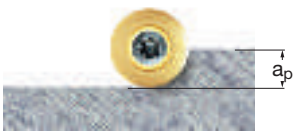
Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

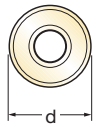
$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 7700 VR 06





EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024755	**RPEW 06 02M0T**	**X500**		♦♦		6,0	-	2,38	3,0	0,1
017686	**RPEX 06 02M0F-701**	**GH1**	♦	♦	♦	6,0	-	2,38	3,0	0,02
023312	**RPEX 06 02M0F-701**	**PFZ**				6,0	-	2,38	3,0	0,02
015212	**RPEX 06 02M0F-701**	**SFZ**		♦♦♦♦	♦♦♦♦	6,0	-	2,38	3,0	0,02
024104	**RPEX 06 02M0F-701**	**X44**			♦	6,0	-	2,38	3,0	0,02
023327	**RPMT 06 02M0E-41**	**MP91M**	♦			6,0	-	2,38	3,0	0,03
015219	**RPMT 06 02M0E-41**	**X500**				6,0	-	2,38	3,0	0,03

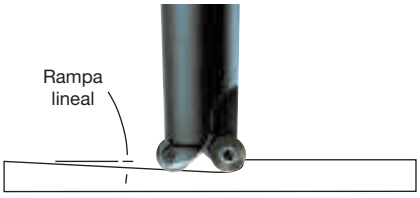
RPEW 06_

RPEX 06_ -701

RPMT 06_ -41

Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal a_p max.	Rampa lineal longitud
7700VR06WA016R067	10	16	6	9.3°	3	18.32
7700VR06WA016R102	10	16	6	9.3°	3	18.32
7700VR06WA020R060	14	20	6	5.4°	3	31.74
7700VR06WA020R090	14	20	6	5.4°	3	31.74
7700VR06WA020R120	14	20	6	5.4°	3	31.74



Condiciones de corte recomendadas para RP_06

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	180 - 220	0,12 - 0,18	1,5 - 3,0	220 - 260	0,10 - 0,14	0,5 - 1,5	220 - 300	0,08 - 0,12	0,1 - 0,5
♦ Aceros aleados	-	-	-	100 - 150	0,08 - 0,12	0,5 - 1,5	100 - 195	0,06 - 0,10	0,1 - 0,5
♦ Aceros inoxidables	-	-	-	140 - 180	0,06 - 0,10	0,5 - 1,5	180 - 230	0,05 - 0,08	0,1 - 0,5
♦ Inoxidables PH	-	-	-	70 - 85	0,06 - 0,10	0,5 - 1,5	80 - 100	0,05 - 0,08	0,1 - 0,5
♦ Fundición	-	-	-	180 - 300	0,08 - 0,12	0,5 - 1,5	200 - 350	0,06 - 0,10	0,1 - 0,5
♦ Aluminio y Aleaciones	275 - 450	0,05 - 0,08	1,5 - 3,0	400 - 750	0,04 - 0,06	0,5 - 1,5	700 - 1000	0,04 - 0,06	0,1 - 0,5
♦ Aleaciones refractarias	-	-	-	35 - 50	0,06 - 0,10	0,5 - 1,5	45 - 60	0,05 - 0,08	0,1 - 0,5
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,06	0,1 - 0,5

h_m = espesor de la viruta

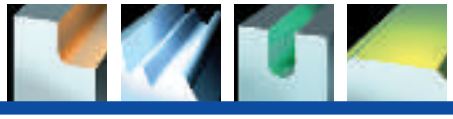
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa para perfilar 7700 VR 08





Amarre Weldon

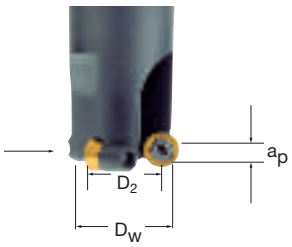
7700 VR 08 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D1	D2	L	l2	d1	ap max.	No. de dientes	EDP #	Recambios EDP #	
021732	**7700VR 08 WA025R070-M3**	25	17	126	70	25	4	3	015062	F3006T	013214 T9
021733	**7700VR 08 WA025R124-M3**	25	17	180	124	25	4	3	015062	F3006T	013214 T9
021734	**7700VR 08 WA025R154-M3**	25	17	210	154	25	4	3	015062	F3006T	013214 T9



7700 VR 08 Consejos técnicos

Ejemplo de pedido fresa: **7700VR 08 WA025R070-M3**
Ejemplo de pedido plaquitas: **RPEX0803M3F-701 SFZ**
Para condiciones de corte completas ver página: **A288**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
D_2 = Diámetro entre ejes de las plaquitas
r = Radio de la plaquita
a_p = Profundidad de corte axial

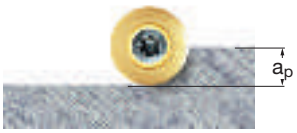
Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

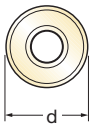
$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



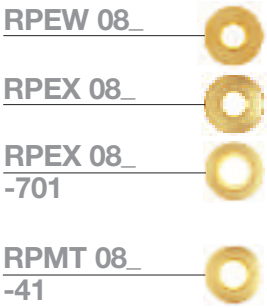
Profundidad de corte (a_p)

Plaquitas para 7700 VR 08



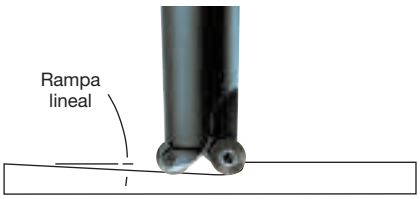


EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024756	**RPEW 08 03M3T**	**PFZ**		◆◆		8,0	-	3,18	4,0	0,1
024757	**RPEX 08 03M3E**	**X44**				8,0	-	3,18	3,0	0,02
015214	**RPEX 08 03M3E-701**	**PFZ**		◆◆	◆◆◆◆	8,0	-	3,18	4,0	0,02
023315	**RPEX 08 03M3F-701**	**GH1**	◆	◆	◆	8,0	-	3,18	4,0	0,02
015213	**RPEX 08 03M3F-701**	**SFZ**		◆	◆◆	8,0	-	3,18	4,0	0,02
017308	**RPMT 08 03M3E-41**	**MP91M**	◆◆			8,0	-	3,18	4,0	0,02
015220	**RPMT 08 03M3E-41**	**X500**				8,0	-	3,18	4,0	0,02
027728	**RPMT 08 03M3E-41**	**SP6564**	◆◆	◆	◆	8,0	-	3,18	4,0	0,02



Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal a_p max.	Rampa lineal longitud
7700VR08WA025R070-M3	17	25	8	7.85°	4	29.01
7700VR08WA025R124-M3	17	25	8	7.85°	4	29.01
7700VR08WA025R154-M3	17	25	8	7.85°	4	29.01



Condiciones de corte recomendadas para RP_08

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,14 - 0,24	2,0 - 4,0	220 - 260	0,12 - 0,18	0,8 - 2,0	220 - 300	0,10 - 0,16	0,1 - 0,8
◆ Aceros aleados	70 - 110	0,12 - 0,22	2,0 - 4,0	100 - 150	0,10 - 0,16	0,8 - 2,0	100 - 195	0,08 - 0,14	0,1 - 0,8
◆ Aceros inoxidables	120 - 140	0,10 - 0,15	2,0 - 4,0	140 - 180	0,08 - 0,12	0,8 - 2,0	180 - 230	0,08 - 0,10	0,1 - 0,8
◆ Inoxidables PH	-	-	-	70 - 85	0,08 - 0,10	0,8 - 2,0	80 - 100	0,08 - 0,10	0,1 - 0,8
◆ Fundición	140 - 280	0,12 - 0,22	2,0 - 4,0	180 - 300	0,10 - 0,16	0,8 - 2,0	200 - 350	0,08 - 0,14	0,1 - 0,8
◆ Aluminio y Aleaciones	275 - 450	0,05 - 0,10	2,0 - 4,0	400 - 750	0,04 - 0,08	0,8 - 2,0	700 - 1000	0,04 - 0,08	0,1 - 0,8
◆ Aleaciones refractarias	-	-	-	35 - 50	0,08 - 0,10	0,8 - 2,0	45 - 60	0,08 - 0,10	0,1 - 0,8
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,08 - 0,03	0,06 - 0,5

h_m = espesor de la viruta

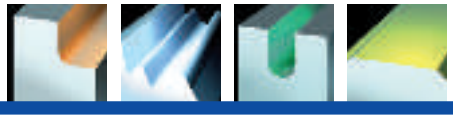
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

Fresa para perfilar 7700 VR 10







Amarre Weldon

7700 VR 10 Amarre Weldon

		Dimensiones (mm)								Recambios			
EDP #	Referencia	D_1	D_2	L/H	l_2	l_3	d_1	$a_{p\ max.}$	No. de dientes	EDP#		EDP#	
021737	**7700VR 10 WA032R070**	32	22	130	70	-	32	5	3	015260	D4008T	015240	T15
021738	**7700VR 10 WA032R140**	32	22	200	140	-	32	5	3	015260	D4008T	015240	T15
021739	**7700VR 10 WA032R190**	32	22	250	190	-	32	5	3	015260	D4008T	015240	T15

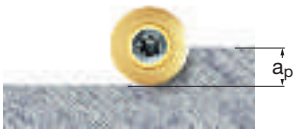
7700 VR 10 Amarre Morse

021735	**7700VR 10 M032R070**	32	22	179	70	76,5	CM4	5	3	015260	D4008T	015240	T15
021736	**7700VR 10 M032R140**	32	22	249	140	146,5	CM4	5	3	015260	D4008T	015240	T15





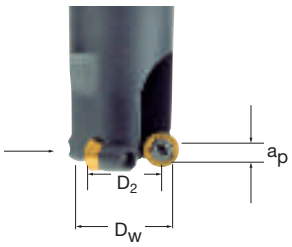
Amarre Morse



Profundidad de corte (a_p)

7700 VR 10 Consejos técnicos

Ejemplo de pedido fresa: **7700VR10M032R140**
Ejemplo de pedido plaquitas: **RPHT10T3M0E-421 X500**
Para condiciones de corte completas ver página: **A288**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:

- D_w = Diámetro efectivo de corte
- D_2 = Diámetro entre ejes de las plaquitas
- r = Radio de la plaquita
- a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

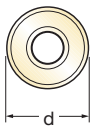
Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

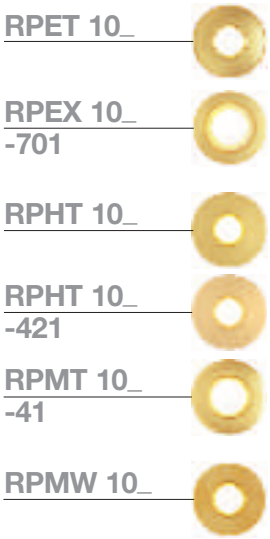
donde:

- f_z = Avance por diente
- h_m = Espesor de la viruta
- D = Diámetro exterior de la fresa
- a_e = Profundidad de pase radial
- D_w = Diámetro de corte efectivo
- a_p = Profundidad de corte axial

Plaquitas para 7700 VR 10

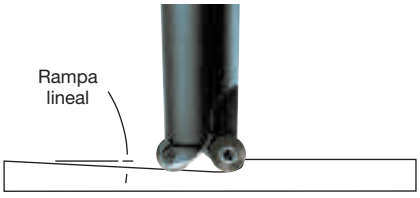


EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017679	**RPET 10 T3M0E**	**SFZ**			◆	10,0	-	3,97	5,0	0,03
017678	**RPET 10 T3M0E**	**X44**				10,0	-	3,97	5,0	0,03
015215	**RPEX 10 T3M0E-701**	**PFZ**				10,0	-	3,97	5,0	0,02
017688	**RPEX 10 T3M0F-701**	**GH1**	◆	◆	◆	10,0	-	3,97	5,0	0,02
023317	**RPEX 10 T3M0F-701**	**SFZ**				10,0	-	3,97	5,0	0,02
017690	**RPHT 10 T3M0T**	**X500**				10,0	-	3,97	5,0	0,075
027726	**RPHT 10 T3M0T**	**SP6564**		◆◆◆		10,0	-	3,97	5,0	0,075
015145	**RPHT 10 T3M0E-421**	**X500**		◆◆	◆◆	10,0	-	3,97	5,0	0,04
027725	**RPHT 10 T3M0E-421**	**SP6564**			◆◆◆	10,0	-	3,97	5,0	0,04
023329	**RPMT 10 T3M0E-41**	**MP91M**	◆◆	◆	◆	10,0	-	3,97	5,0	0,04
015221	**RPMT 10 T3M0E-41**	**X500**	◆◆			10,0	-	3,97	5,0	0,04
027729	**RPMT 10 T3M0E-41**	**SP6564**	◆◆			10,0	-	3,97	5,0	0,04
025839	**RPMW 10 T3M0T**	**X500**				10,0	-	3,97	5,0	0,13



Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal a_p max.	Rampa lineal longitud
7700VR10WA032R070	22	32	10	7.55°	5	37.72
7700VR10WA032R140	22	32	10	7.55°	5	37.72
7700VR10WA032R190	22	32	10	7.55°	5	37.72
7700VR10M032R070	22	32	10	7.55°	5	37.72
7700VR10M032R140	22	32	10	7.55°	5	37.72



Condiciones de corte recomendadas para RP_10

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,15 - 0,28	2,5 - 5,0	220 - 260	0,12 - 0,20	1,0 - 2,5	220 - 300	0,10 - 0,18	0,1 - 1,0
◆ Aceros aleados	70 - 110	0,12 - 0,24	2,5 - 4,0	100 - 150	0,10 - 0,18	1,0 - 2,5	100 - 195	0,08 - 0,14	0,1 - 1,0
◆ Aceros inoxidables	120 - 140	0,10 - 0,16	2,5 - 4,0	140 - 180	0,08 - 0,14	1,0 - 2,5	180 - 230	0,08 - 0,10	0,1 - 1,0
◆ Inoxidables PH	55 - 70	0,08 - 0,14	2,5 - 4,0	70 - 85	0,08 - 0,12	1,0 - 2,5	80 - 100	0,08 - 0,10	0,1 - 1,0
◆ Fundición	140 - 280	0,12 - 0,24	2,5 - 4,0	180 - 300	0,10 - 0,18	1,0 - 2,5	200 - 350	0,08 - 0,14	0,1 - 1,0
◆ Aluminio y Aleaciones	275 - 450	0,06 - 0,12	2,5 - 5,0	400 - 750	0,04 - 0,10	1,0 - 2,5	700 - 1000	0,04 - 0,08	0,1 - 1,0
◆ Aleaciones refractarias	25 - 40	0,08 - 0,14	2,5 - 4,0	35 - 50	0,08 - 0,12	1,0 - 2,5	45 - 60	0,08 - 0,10	0,1 - 1,0
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,08 - 0,03	0,1 - 0,5

h_m = espesor de la viruta

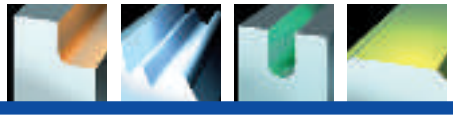
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa para perfilar 7700 VR 12

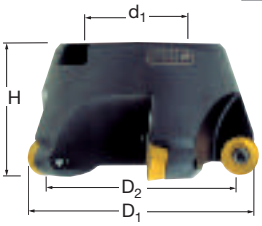


7700 VR 12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D_1	D_2	L/H	l_2	l_3	d_1	$a_{p\ max.}$	No. de dientes	Recambios EDP #		EDP #	
021740	**7700VR 12 -A040R**	52	40	32	-	-	16	6	4	015263	D4012T	015240	T15
021741	**7700VR 12 -A050R**	62	50	40	-	-	22	6	4	015263	D4012T	015240	T15
021742	**7700VR 12 -A063R**	75	63	40	-	-	22	6	5	015263	D4012T	015240	T15
021743	**7700VR 12 -A080R**	92	80	50	-	-	27	6	6	015263	D4012T	015240	T15
021744	**7700VR 12 -A100R**	112	100	50	-	-	32	6	7	015263	D4012T	015240	T15
021745	**7700VR 12 -A125R**	137	125	63	-	-	40	6	8	015263	D4012T	015240	T15

7700 VR 12 Amarre Morse

021746	**7700VR 12 M040R110**	40	28	219	110	116,5	CM4	6	4	015262	D4010T	015240	T15



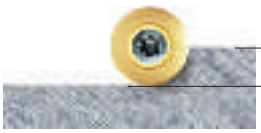


Montaje en el eje





Amarre Morse

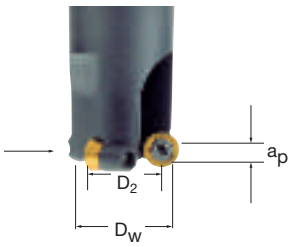


Profundidad de corte (a_p)

7700 VR 12 Consejos técnicos



Ejemplo de pedido de la fresa: **7700VR12-A080R**
Ejemplo de pedido de la plaquita: **RPHT1204M0E-421-X4 X500**
Para condiciones completas ver pagina: **A288**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
D_2 = Diámetro entre ejes de las plaquitas
r = Radio de la plaquita
a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

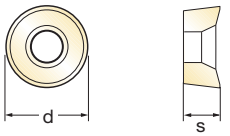
$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial

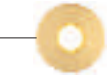
Plaquitas para 7700 VR 12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
029271	**RPET 12 04M0E-X4**	**SP4036**			◆	12,0	-	4,76	6,0	0,03
029279	**RPET 12 04M0E-X4**	**X44**				12,0	-	4,76	6,0	0,03
029280	**RPET 12 04M0E-X4**	**SFZ**		◆	◆	12,0	-	4,76	6,0	0,03
029282	**RPEX 12 04M0E-701-X4**	**X500**		◆	◆	12,0	-	4,76	6,0	0,02
029283	**RPEX 12 04M0F-701-X4**	**SFZ**			◆◆	12,0	-	4,76	6,0	0,02
029284	**RPEX 12 04M0F-701-X4**	**GH1**	◆	◆	◆	12,0	-	4,76	6,0	0,02
029286	**RPHT 12 04M0E-421-X4**	**X500**		◆◆		12,0	-	4,76	6,0	1,10
029287	**RPHT 12 04M0E-421-X4**	**MP91M**		◆	◆◆	12,0	-	4,76	6,0	1,10
029289	**RPHT 12 04M0T-X4**	**XP500**	◆◆	◆◆		12,0	-	4,76	6,0	0,04
029290	**RPHT 12 04M0T-X4**	**SP6564**	◆◆	◆◆		12,0	-	4,76	6,0	0,04
029272	**RPMT 12 04M0E-41-X4**	**X500**	◆	◆	◆	12,0	-	4,76	6,0	0,05
029291	**RPMT 12 04M0E-41-X4**	**MP91M**	◆◆	◆◆		12,0	-	4,76	6,0	0,05
029293	**RPMT 12 04M0E-41-X4**	**SP6564**	◆◆	◆◆		12,0	-	4,76	6,0	0,05
029294	**RPMW 12 04M0T-X4**	**MP91M**	◆◆			12,0	-	4,76	6,0	0,13
029295	**RPMW 12 04M0T-X4**	**X500**				12,0	-	4,76	6,0	0,13
029296	**RPMW 12 04M0T-X4**	**SP6564**	◆◆			12,0	-	4,76	6,0	0,13


RPET 12_


RPEX 12_ -701


RPHT 12_ -421

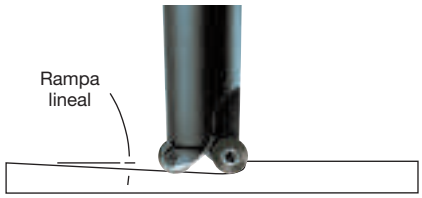

RPHT 12_


RPMT 12_ -41


RPMW 12_

Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal a_p max.	Rampa lineal longitud
7700VR12-A040R	40	52	12	4.15°	6	82.69
7700VR12-A050R	50	62	12	4.4°	6	77.98
7700VR12-A063R	63	75	12	3.5°	6	98.10
7700VR12-A080R	80	92	12	2.63°	6	130.62
7700VR12-A100R	100	112	12	2.15°	6	159.82
7700VR12-A125R	125	137	12	1.6°	6	214.80



Condiciones de corte recomendadas para RP_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,16 - 0,30	2,5 - 6,0	220 - 260	0,14 - 0,22	1,0 - 3,0	220 - 300	0,12 - 0,18	0,1 - 1,0
Aceros aleados	70 - 110	0,14 - 0,25	2,5 - 6,0	100 - 150	0,12 - 0,20	1,0 - 3,0	100 - 195	0,08 - 0,16	0,1 - 1,0
Aceros inoxidables	120 - 140	0,10 - 0,18	2,5 - 4,0	140 - 180	0,08 - 0,14	1,0 - 3,0	180 - 230	0,08 - 0,12	0,1 - 1,0
Inoxidables PH	-	-	-	70 - 85	0,08 - 0,12	1,0 - 3,0	80 - 100	0,08 - 0,10	0,1 - 1,0
Fundición	140 - 280	0,14 - 0,25	2,5 - 6,0	180 - 300	0,12 - 0,20	1,0 - 3,0	200 - 350	0,08 - 0,16	0,1 - 1,0
Aluminio y Aleaciones	275 - 450	0,06 - 0,12	2,5 - 6,0	400 - 750	0,06 - 0,10	1,0 - 3,0	700 - 1000	0,04 - 0,08	0,1 - 1,0
Aleaciones refractarias	-	-	-	35 - 50	0,08 - 0,12	1,0 - 3,0	45 - 60	0,08 - 0,10	0,1 - 1,0
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

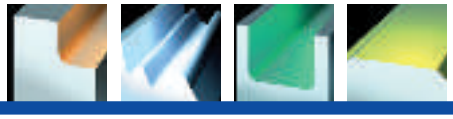
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Fresa para perfilar 7702 VRD 07





7702 VRD 07 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D1	D2	L	l1	d1	ap max.	No. de dientes	Angulo de rampa lineal	Recambios EDP #		EDP #	
025689	**7702VRD 07 WA012R50**	12	5	98	50	16	3,5	1	21,5º	015060	F2505T	018488	T7
025690	**7702VRD 07 WA012R100**	12	5	148	100	16	3,5	1	21,5º	015060	F2505T	018488	T7
025691	**7702VRD 07 WA016R50**	16	9	98	50	16	3,5	2	13,0º	015060	F2505T	018488	T7
025692	**7702VRD 07 WA016R100**	16	9	150	100	20	3,5	2	13,0º	015060	F2505T	018488	T7
025693	**7702VRD 07 WA020R50**	20	13	100	50	20	3,5	3	14,5º	015060	F2505T	018488	T7
025694	**7702VRD 07 WA020R100**	20	13	156	100	25	3,5	3	14,5º	015060	F2505T	018488	T7
025695	**7702VRD 07 WA025R50**	25	18	106	50	25	3,5	4	10,0º	015060	F2505T	018488	T7
025696	**7702VRD 07 WA025R100**	25	18	156	100	25	3,5	4	10,0º	015060	F2505T	018488	T7

7702 VRD 07 Cabeza modular

EDP #	Referencia	Dimensiones (mm) D1	D2	L	M	d1	ap max.	No. de dientes	Recambios EDP #		EDP #	
029111	**7702VRD 07 S015R25**	15	8	25	M8	8,5	3,5	2	015060	F2505T	018488	T7
029112	**7702VRD 07 S020R25**	20	13	25	M10	10,5	3,5	4	015060	F2505T	018488	T7
029113	**7702VRD 07 S025R35**	25	18	35	M12	12,5	3,5	5	015060	F2505T	018488	T7
029114	**7702VRD 07 S030R35**	30	23	35	M16	17,0	3,5	5	015060	F2505T	018488	T7
029234	**7702VRD 07 S035R35**	35	23	35	M16	17,0	3,5	6	015060	F2505T	018488	T7

Amarres para cabezas modulares ver página A228 - A229.



Amarre Weldon



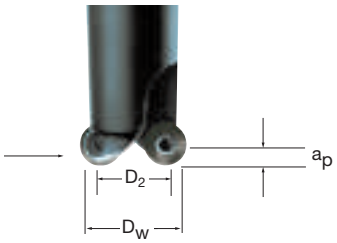
Cabeza modular



7702 VRD 07 Consejos técnicos

Ejemplo de pedido de la fresa: **7702VRD07WA025R100**
Ejemplo de pedido de la plaquita: **RDET0702M0E-701 SP4036**
Para condiciones completas ver pagina: **A288**

Para herramientas con mucho voladizo, ap es 10% del diámetro de la fresa.



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
- D_w = Diámetro efectivo de corte
- D_2 = Diámetro entre ejes de las plaquitas
- r = Radio de la plaquita
- a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

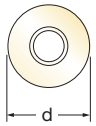
$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
- f_z = Avance por diente
- h_m = Espesor de la viruta
- D = Diámetro exterior de la fresa
- a_e = Profundidad de pase radial
- D_w = Diámetro de corte efectivo
- a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 7702 VRD 07





EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
025739	**RDET 07 02M0E-701**	**SP4036**		◆◆◆	◆◆◆◆◆◆◆	7,0	-	2,38	3,5	0,03
025737	**RDHW 07 02M0T**	**SP4036**		◆◆◆		7,0	-	2,38	3,5	0,08

RDET 07_ -701

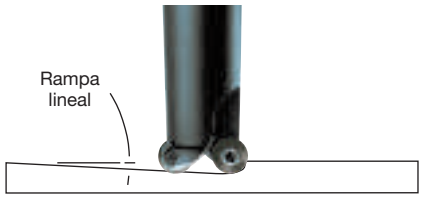


RDHW 07_



Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal	
					a_p max.	longitud
7702VRD07WA012R50	5	12	7	21.5°	3.5	8.89
7702VRD07WA012R100	5	12	7	21.5°	3.5	8.89
7702VRD07WA016R50	9	16	7	13°	3.5	15.16
7702VRD07WA016R100	9	16	7	13°	3.5	15.16
7702VRD07WA020R50	13	20	7	14.5°	3.5	13.53
7702VRD07WA020R100	13	20	7	14.5°	3.5	13.53
7702VRD07WA025R50	18	25	7	10°	3.5	19.85
7702VRD07WA025R100	18	25	7	10°	3.5	19.85



Condiciones de corte recomendadas para RD_07

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	-	-	-	220 - 260	0,06 - 0,12	0,5 - 0,12	220 - 300	0,05 - 0,10	0,1 - 0,5
◆ Aceros aleados	-	-	-	100 - 150	0,06 - 0,10	0,5 - 0,10	100 - 195	0,05 - 0,10	0,1 - 0,5
◆ Aceros inoxidables	-	-	-	140 - 180	0,05 - 0,10	0,5 - 0,10	180 - 230	0,05 - 0,08	0,1 - 0,5
◆ Inoxidables PH	-	-	-	70 - 85	0,05 - 0,08	0,5 - 0,8	80 - 100	0,05 - 0,08	0,1 - 0,5
◆ Fundición	-	-	-	180 - 300	0,06 - 0,10	0,5 - 0,10	200 - 350	0,05 - 0,10	0,1 - 0,5
◆ Aluminio y Aleaciones	-	-	-	400 - 750	0,05 - 0,10	0,5 - 0,10	700 - 1000	0,05 - 0,10	0,1 - 0,5
◆ Aleaciones refractarias	-	-	-	35 - 50	0,05 - 0,08	0,5 - 0,8	45 - 60	0,05 - 0,08	0,1 - 0,5
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	50 - 100	0,03 - 0,04	0,1 - 0,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

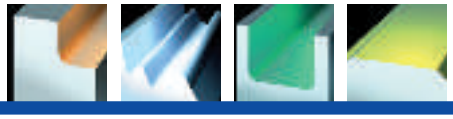


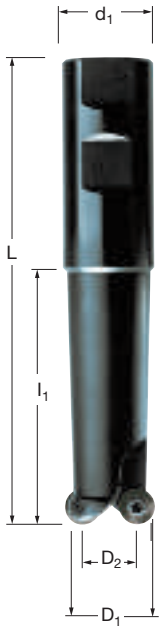
Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa para perfilar 7702 VRD 10







Amarre Weldon

7702 VRD 10 Amarre Weldon

EDP #	Referencia	Dimensiones (mm) D_1	D_2	L	l_1	d_1	$a_{p\,max.}$	No. de dientes	Angulo de rampa lineal	Recambios EDP #		EDP #	
025697	**7702VRD 10 WA020R70**	20	10	120	70	20	5	2	17,5º	022056	F3507T	015240	T15
025698	**7702VRD 10 WA020R120**	20	10	176	120	25	5	2	17,5º	022056	F3507T	015240	T15
025699	**7702VRD 10 WA025R70**	25	15	126	70	25	5	2	10,7º	015269	F3508T	015240	T15
025700	**7702VRD 10 WA025R120**	25	15	176	120	25	5	2	10,7º	015269	F3508T	015240	T15
025701	**7702VRD 10 WA032R70**	32	22	130	70	32	5	3	14,0º	015269	F3508T	015240	T15
025702	**7702VRD 10 WA032R120**	32	22	180	120	32	5	3	14,0º	015269	F3508T	015240	T15

7702 VRD 10 Cabeza modular

EDP #	Referencia	Dimensiones (mm) D_1	D_2	L	M	d_1	$a_{p\,max.}$	No. de dientes	Recambios EDP #		EDP #	
029116	**7702VRD 10 S020R30**	20	10	30	M10	10,5	5	2	022056	F3507T	015240	T15
029117	**7702VRD 10 S025R35**	25	15	35	M12	12,5	5	3	022056	F3507T	015240	T15
029118	**7702VRD 10 S030R35**	30	20	35	M16	17,0	5	4	022056	F3507T	015240	T15
029120	**7702VRD 10 S035R35**	35	25	35	M16	17,0	5	5	022056	F3507T	015240	T15

Amarres para cabezas modulares ver página A228 - A229.

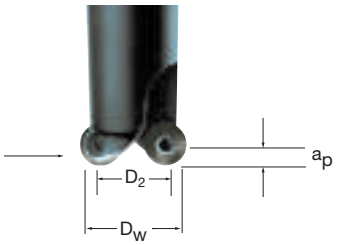


Cabeza modular

7702 VRD 10 Consejos técnicos

Ejemplo de pedido de la fresa: **7702VRD10WA025R120**
Ejemplo de pedido de la plaquita: **RDHW1003M0T SP4036**
Para condiciones completas ver pagina: **A288**

Para herramientas con mucho voladizo, ap es 10% del diámetro de la fresa.



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
D_2 = Diámetro entre ejes de las plaquitas
r = Radio de la plaquita
a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

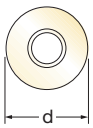
$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 7702 VRD 10





EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
025743	**RDET 10 03M0E-701**	**SP4036**	◆	◆◆◆	◆◆◆◆◆◆◆	10,0	-	3,18	5,0	0,05
025741	**RDHW 10 03M0T**	**SP4036**	◆◆◆	◆◆◆◆◆	◆	10,0	-	3,18	5,0	0,15

RDET 10_ -701

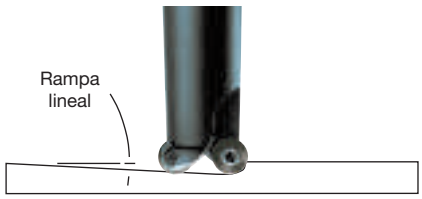


RDHW 10_



Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal a_p max.	Rampa lineal longitud
7702VRD10WA020R70	10	20	10	17.5°	5	15.86
7702VRD10WA020R120	10	20	10	17.5°	5	15.86
7702VRD10WA025R70	15	25	10	10.7°	5	26.46
7702VRD10WA025R120	15	25	10	10.7°	5	26.46
7702VRD10WA032R70	22	32	10	14°	5	20.05
7702VRD10WA032R120	22	32	10	14°	5	20.05



Condiciones de corte recomendadas para RD_10

Material	▼ *Desbaste* Velocidad V_c (m/min)	▼ *Desbaste* Avance h_m (mm)	▼ *Desbaste* P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	▼▼ *Semi-acabado* Avance h_m (mm)	▼▼ *Semi-acabado* P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	▼▼▼ *Acabado* Avance h_m (mm)	▼▼▼ *Acabado* P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,12 - 0,25	2,5 - 5,0	220 - 260	0,10 - 0,20	0,8 - 2,5	220 - 300	0,05 - 0,14	0,1 - 0,8
◆ Aceros aleados	70 - 110	0,10 - 0,22	2,5 - 4,0	100 - 150	0,08 - 0,18	0,8 - 2,5	100 - 195	0,05 - 0,12	0,1 - 0,8
◆ Aceros inoxidables	-	-	-	140 - 180	0,08 - 0,14	0,8 - 2,5	180 - 230	0,05 - 0,12	0,1 - 0,8
◆ Inoxidables PH	-	-	-	70 - 85	0,08 - 0,10	0,8 - 2,5	80 - 100	0,05 - 0,10	0,1 - 0,8
◆ Fundición	140 - 280	1,10 - 0,22	2,5 - 4,0	180 - 300	0,08 - 0,18	0,8 - 2,5	200 - 350	0,05 - 0,12	0,1 - 0,8
◆ Aluminio y Aleaciones	275 - 450	0,05 - 0,12	2,5 - 5,0	400 - 750	0,05 - 0,12	0,8 - 2,5	700 - 1000	0,05 - 0,12	0,1 - 0,8
◆ Aleaciones refractarias	-	-	-	35 - 50	0,08 - 0,10	0,8 - 2,5	45 - 60	0,05 - 0,10	0,1 - 0,8
◆ Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,05 - 0,08	0,5 - 1,0	50 - 100	0,03 - 0,05	0,1 - 0,5

h_m = espesor de la viruta

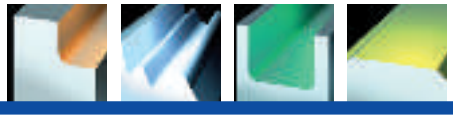
Estrella guía Llave para encontrar la herramienta idónea

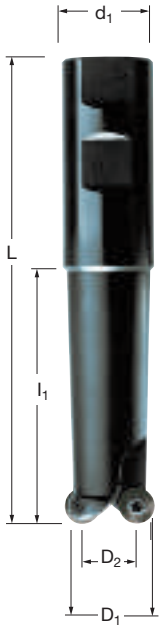


Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Fresa para perfilar 7702 VRD 12







Amarre Weldon

7702 VRD 12 Amarre Weldon

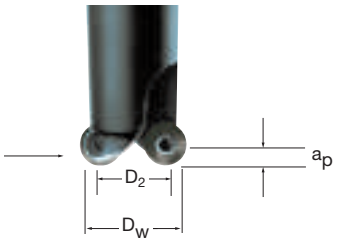
EDP #	Referencia	Dimensiones (mm) D_1	D_2	L	l_1	d_1	$a_{p\,max.}$	No. de dientes	Angulo de rampa lineal	Recambios EDP #		EDP #	
025703	**7702VRD 12 WA025R70**	25	13	126	70	25	6	2	16,5º	*015269*	F3508T	*015240*	T15
025704	**7702VRD 12 WA025R120**	25	13	180	120	25	6	2	16,5º	*015269*	F3508T	*015240*	T15
025705	**7702VRD 12 WA032R70**	32	20	130	70	32	6	3	12,0º	*015269*	F3508T	*015240*	T15
025706	**7702VRD 12 WA032R120**	32	20	180	120	32	6	3	12,0º	*015269*	F3508T	*015240*	T15
025707	**7702VRD 12 WA040R70**	40	28	140	70	40	6	3	13,0º	*015269*	F3508T	*015240*	T15
025708	**7702VRD 12 WA040R120**	40	28	190	120	40	6	3	13,0º	*015269*	F3508T	*015240*	T15



7702 VRD 12 Consejos técnicos

Ejemplo de pedido de la fresa: **7702VRD12WA040R120**
Ejemplo de pedido de la plaquita: **RDHW12T3M0T-X6 SP4036**
Para condiciones completas ver pagina: **A288**

Para herramientas con mucho voladizo, ap es 10% del diámetro de la fresa.



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
- D_w = Diámetro efectivo de corte
- D_2 = Diámetro entre ejes de las plaquitas
- r = Radio de la plaquita
- a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

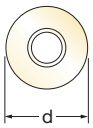
$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
- f_z = Avance por diente
- h_m = Espesor de la viruta
- D = Diámetro exterior de la fresa
- a_e = Profundidad de pase radial
- D_w = Diámetro de corte efectivo
- a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 7702 VRD 12





EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
029297	**RDET 12 T3M0E-701-X6**	**SP4036**	◆	◆	◆◆◆◆◆◆	12,0	-	3,97	6,0	0,05
029299	**RDHW 12 T3M0T-20-X6**	**SP4036**	◆			12,0	-	3,97	6,0	0,20
029301	**RDHW 12 T3M0T-20-X6**	**SP5464**	◆			12,0	-	3,97	6,0	0,20
029302	**RDHW 12 T3M0T-X6**	**SP4036**	◆◆	◆◆		12,0	-	3,97	6,0	0,15
029303	**RDHW 12 T3M0T-X6**	**SP5464**		◆◆		12,0	-	3,97	6,0	0,15
029313	**RDHW 12 T3M0T-20-X6**	**SP5464**	◆◆			12,0	-	3,97	6,0	0,20
029314	**RDHW 12 T3M0T-X6**	**SP5464**		◆◆		12,0	-	3,97	6,0	0,15

RDET 12_ -701



RDHW 12_

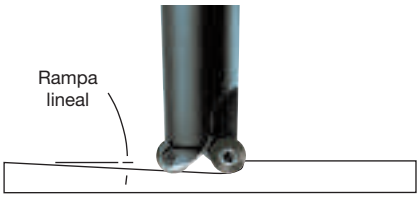


RDMW 12_



Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal a_p max.	Rampa lineal longitud
7702VRD12WA025R70	13	25	12	16.5°	6	20.26
7702VRD12WA025R120	13	25	12	16.5°	6	20.26
7702VRD12WA032R70	20	32	12	12°	6	28.23
7702VRD12WA032R120	20	32	12	12°	6	28.23
7702VRD12WA040R70	28	40	12	13°	6	25.99
7702VRD12WA040R120	28	40	12	13°	6	25.99



Condiciones de corte recomendadas para RD_12

Material	▼ *Desbaste* Velocidad V_c (m/min)	▼ *Desbaste* Avance h_m (mm)	▼ *Desbaste* P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	▼▼ *Semi-acabado* Avance h_m (mm)	▼▼ *Semi-acabado* P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	▼▼▼ *Acabado* Avance h_m (mm)	▼▼▼ *Acabado* P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,25 - 0,40	3,0 - 6,0	220 - 260	0,22 - 0,32	0,8 - 3,0	220 - 300	0,10 - 0,18	0,1 - 0,8
◆ Aceros aleados	70 - 110	0,22 - 0,35	3,0 - 6,0	100 - 150	0,20 - 0,30	0,8 - 3,0	100 - 195	0,10 - 0,16	0,1 - 0,8
◆ Aceros inoxidables	-	-	-	140 - 180	0,08 - 0,16	0,8 - 3,0	180 - 230	0,08 - 0,12	0,1 - 0,8
◆ Inoxidables PH	-	-	-	70 - 85	0,08 - 0,14	0,8 - 3,0	80 - 100	0,08 - 0,12	0,1 - 0,8
◆ Fundición	140 - 280	0,22 - 0,35	3,0 - 6,0	180 - 300	0,20 - 0,30	0,8 - 3,0	200 - 350	0,10 - 0,16	0,1 - 0,8
◆ Aluminio y Aleaciones	275 - 450	0,06 - 0,12	3,0 - 6,0	400 - 750	0,06 - 0,12	0,8 - 3,0	700 - 1000	0,06 - 0,12	0,1 - 0,8
◆ Aleaciones refractarias	-	-	-	35 - 50	0,08 - 0,14	0,8 - 3,0	45 - 60	0,08 - 0,12	0,1 - 0,8
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

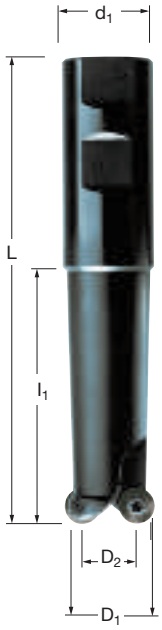


Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

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Fresa para perfilar 7702 VRD 16







Amarre Weldon

7702 VRD 16 Amarre Weldon

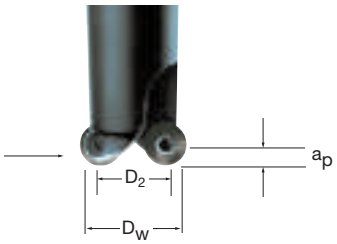
EDP #	Referencia	Dimensiones (mm) D_1	D_2	L	l_1	d_1	$a_{p\,max.}$	No. de dientes	Angulo de rampa lineal	Recambios EDP #		EDP #	
025709	**7702VRD 16 WA032R70**	32	16	130	70	32	8	2	17,5°	*015270*	F4011T	*015241*	T20
025710	**7702VRD 16 WA032R120**	32	16	180	120	32	8	2	17,5°	*015270*	F4011T	*015241*	T20
025712	**7702VRD 16 WA040R120**	40	24	190	120	40	8	2	13,0°	*015270*	F4011T	*015241*	T20
025711	**7702VRD 16 WA040R70**	40	24	140	70	40	8	2	13,0°	*015270*	F4011T	*015241*	T20



7702 VRD 16 Consejos técnicos

Ejemplo de pedido de la fresa: **7702VRD16WA040R120**
Ejemplo de pedido de la plaquita: **RDHW1604M0T-X8 SP4036**
Para condiciones completas ver pagina: **A288**

Para herramientas con mucho voladizo, ap es 10% del diámetro de la fresa.



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
- D_w = Diámetro efectivo de corte
- D_2 = Diámetro entre ejes de las plaquitas
- r = Radio de la plaquita
- a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

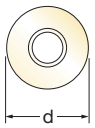
$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
- f_z = Avance por diente
- h_m = Espesor de la viruta
- D = Diámetro exterior de la fresa
- a_e = Profundidad de pase radial
- D_w = Diámetro de corte efectivo
- a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 7702 VRD 16





EDP #	Referencia	Calidad	Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	d	l	s	r	h_m min
029298	**RDET 16 04M0E-701-X8**	**SP4036**				16,0	-	4,76	8,0	0,05

RDET 16_ -701



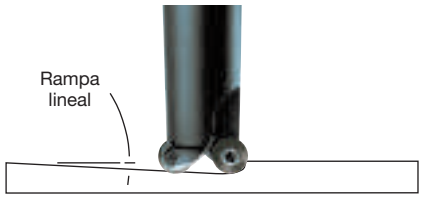
029306	**RDHW 16 04M0T-30-X8**	**SP4036**				16,0	-	4,76	8,0	0,15
029304	**RDHW 16 04M0T-X8**	**SP4036**				16,0	-	4,76	8,0	0,15
029308	**RDHW 16 04M0T-30-X8**	**SP5464**				16,0	-	4,76	8,0	0,15
029305	**RDHW 16 04M0T-X8**	**SP5464**				16,0	-	4,76	8,0	0,15

RDHW 16_



Rampa lineal

Descripción	Diámetro y eje	Diámetro exterior	Plaquita diámetro	Angulo de rampa	Rampa lineal	
					a_p max.	longitud
7702VRD16WA032R70	16	32	16	17.5°	8	25.37
7702VRD16WA032R120	16	32	16	17.5°	8	25.37
7702VRD16WA040R70	24	40	16	13°	8	34.65
7702VRD16WA040R120	24	40	16	13°	8	34.65



Condiciones de corte recomendadas para RD_16

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,33 - 0,55	4,0 - 8,0	220 - 260	0,25 - 0,35	0,8 - 4,0	220 - 300	0,10 - 0,18	0,1 - 0,8
Aceros aleados	70 - 110	0,30 - 0,45	4,0 - 8,0	100 - 150	0,22 - 0,33	0,8 - 4,0	100 - 195	0,10 - 0,16	0,1 - 0,8
Aceros inoxidables	-	-	-	140 - 180	0,15 - 0,18	0,8 - 4,0	180 - 230	0,08 - 0,12	0,1 - 0,8
Inoxidables PH	-	-	-	70 - 85	0,08 - 0,14	0,8 - 4,0	80 - 100	0,08 - 0,12	0,1 - 0,8
Fundición	140 - 280	0,30 - 0,40	4,0 - 8,0	180 - 300	0,22 - 0,33	0,8 - 4,0	200 - 350	0,10 - 0,16	0,1 - 0,8
Aluminio y Aleaciones	275 - 450	0,06 - 0,12	4,0 - 8,0	400 - 750	0,06 - 0,12	0,8 - 4,0	700 - 1000	0,06 - 0,12	0,1 - 0,8
Aleaciones refractarias	-	-	-	35 - 50	0,08 - 0,14	0,8 - 4,0	45 - 60	0,08 - 0,12	0,1 - 0,8
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,05 - 0,10	0,5 - 1,5	50 - 100	0,03 - 0,06	0,1 - 0,5

h_m = espesor de la viruta

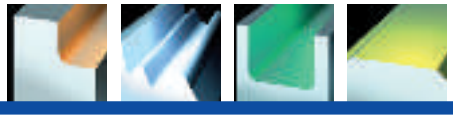
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Fresa para perfilar 7710 VR 12





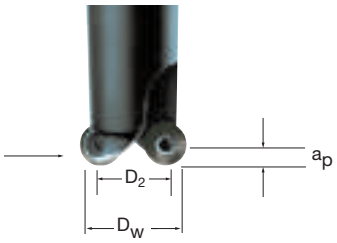
Montaje en el eje

7710VR12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D_1	D_2	H	d_1	a_p max.	No. de dientes	Recambios EDP#		EDP#		Ajuste del tornillo Nm
029051	**7710VR12-A040R**	40	28	40	16	6	4	015262	D4010T	015240	T15	3,10
029635	**7710VR12-A040Z05R**	40	28	40	16	6	5	015262	D4010T	015240	T15	3,10
029052	**7710VR12-A052R**	52	40	40	22	6	5	015262	D4010T	015240	T15	3,10
029636	**7710VR12-A052Z06R**	52	40	40	22	6	6	015262	D4010T	015240	T15	3,10
029053	**7710VR12-A066R**	66	54	50	27	6	6	015262	D4010T	015240	T15	3,10

7710 VR 12 Consejos técnicos

Ejemplo de pedido de la fresa: **7710VRD12-A040R**
Ejemplo de pedido de la plaquita: **RPEX 1204M0E-701-X4 X500**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
D_2 = Diámetro entre ejes de las plaquitas
r = Radio de la plaquita
a_p = Profundidad de corte axial

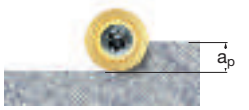
Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

Espesor de la viruta:

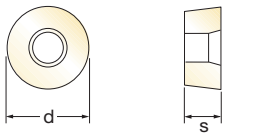
$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial



Profundidad de corte (a_p)

Plaquitas para 7710 VR 12



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
029271	**RPET1204M0E-X4**	**SP4036**				12,0	-	4,76	6,0	0,05
029278	**RPET1204M0E-X4**	**SF30**				12,0	-	4,76	6,0	0,05
029279	**RPET1204M0E-X4**	**X44**				12,0	-	4,76	6,0	0,05
029280	**RPET1204M0E-X4**	**SFZ**				12,0	-	4,76	6,0	0,05
029281	**RPEX1204M0E-701-X4**	**PFZ**				12,0	-	4,76	6,0	0,02
029282	**RPEX1204M0E-701-X4**	**X500**	♦♦	♦♦		12,0	-	4,76	6,0	0,02
029283	**RPEX1204M0F-701-X4**	**SFZ**			♦	12,0	-	4,76	6,0	0,02
029284	**RPEX1204M0F-701-X4**	**GH1**	♦	♦	♦	12,0	-	4,76	6,0	0,02
029285	**RPHT1204M0E-421-X4**	**PFZ**				12,0	-	4,76	6,0	0,05
029286	**RPHT1204M0E-421-X4**	**X500**			♦	12,0	-	4,76	6,0	0,05
029287	**RPHT1204M0E-421-X4**	**MP91M**				12,0	-	4,76	6,0	0,05
029034	**RPHT1204M0T-X4**	**X500**	♦♦	♦♦		12,0	-	4,76	6,0	0,10
029035	**RPHT1204M0T-X4**	**SP6564**	♦			12,0	-	4,76	6,0	0,10
029288	**RPHT1204M0T-X4**	**PFZ**				12,0	-	4,76	6,0	0,10
029290	**RPHT1204M0T-X4**	**SP6564**			♦	12,0	-	4,76	6,0	0,10
029272	**RPMT1204M0E-421-X4**	**X500**				12,0	-	4,76	6,0	0,08
029291	**RPMT1204M0E-421-X4**	**MP91M**	♦	♦		12,0	-	4,76	6,0	0,08
029292	**RPMT1204M0E-421-X4**	**PFZ**	♦	♦		12,0	-	4,76	6,0	0,08
029293	**RPMT1204M0E-421-X4**	**SP6564**				12,0	-	4,76	6,0	0,08
029294	**RPMW1204M0T-X4**	**MP91M**	♦	♦		12,0	-	4,76	6,0	0,10
029295	**RPMW1204M0T-X4**	**X500**			♦	12,0	-	4,76	6,0	0,10
029296	**RPMW1204M0T-X4**	**SP6564**				12,0	-	4,76	6,0	0,10

RPET 12_



RPEX 12_ -701



RPHT 12_ -421



RPHT 12_



RPMT 12_ -421



RPMW 12_



Condiciones de corte recomendadas para RP_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	180 - 220	0,16 - 0,30	2,5 - 6,0	220 - 260	0,14 - 0,22	1,0 - 3,0	220 - 300	0,12 - 0,18	0,1 - 1,0
♦ Aceros aleados	70 - 110	0,14 - 0,25	2,5 - 6,0	100 - 150	0,12 - 0,20	1,0 - 3,0	100 - 195	0,08 - 0,16	0,1 - 1,0
♦ Aceros inoxidables	120 - 140	0,10 - 0,18	2,5 - 4,0	140 - 180	0,08 - 0,14	1,0 - 3,0	180 - 230	0,08 - 0,12	0,1 - 1,0
♦ Inoxidables PH	-	-	-	70 - 85	0,08 - 0,12	1,0 - 3,0	80 - 100	0,08 - 0,10	0,1 - 1,0
♦ Fundición	140 - 280	0,14 - 0,25	2,5 - 6,0	180 - 300	0,12 - 0,20	1,0 - 3,0	200 - 350	0,08 - 0,16	0,1 - 1,0
♦ Aluminio y Aleaciones	275 - 450	0,06 - 0,12	2,5 - 6,0	400 - 750	0,06 - 0,10	1,0 - 3,0	700 - 1000	0,04 - 0,08	0,1 - 1,0
♦ Aleaciones refractarias	-	-	-	35 - 50	0,08 - 0,12	1,0 - 3,0	45 - 60	0,08 - 0,10	0,1 - 1,0
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

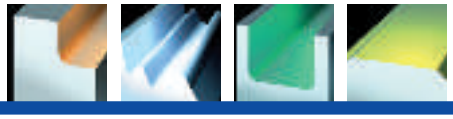


Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa para perfilar 7712 VRD 12





7712VRD12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D1	D2	L/H	d1	ap max.	No. de dientes	Plaquitas	Recambios EDP #		EDP #	
029054	**7712VRD12-A052R**	52	40	52	22	6	5	RD..12T3..-X6	015269	F3508T	015240	T15
029055	**7712VRD12-A066R**	66	54	52	27	6	6	RD..12T3..-X6	015269	F3508T	015240	T15
029056	**7712VRD12-A080R**	80	68	52	27	6	7	RD..12T3..-X6	015269	F3508T	015240	T15

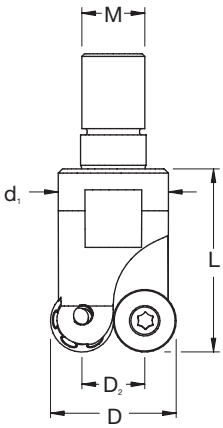
7712VRD12 Cabeza modular

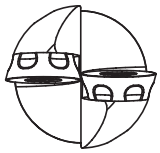
EDP #	Referencia	Dimensiones (mm) D	D2	L/H	M	d1	No. de dientes	Plaquitas	Recambios EDP #		EDP #	
029121	**7712VRD12S024R35**	24	12	35	M12	12,5	2	RD...12...	022056	F3507T	015240	T15
029124	**7712VRD12S035R35**	35	23	35	M16	17,0	3	RD...12...	022056	F3507T	015240	T15
029125	**7712VRD12S042R43**	42	30	43	M16	17,0	4	RD...12...	022056	F3507T	015240	T15

Amarres para cabezas modulares ver página A228 - A229.

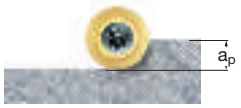


Montaje en el eje





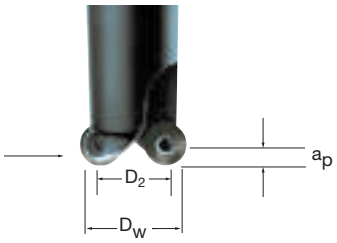
Cabeza modular



Profundidad de corte (a_p)

7712 VRD 12 Consejos técnicos

Ejemplo de pedido de la fresa: **7712VRD12-A052R**
Ejemplo de pedido de la plaquita: **RDET 12T3M0E-701-X6 SP4036**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:
D_w = Diámetro efectivo de corte
D_2 = Diámetro entre ejes de las plaquitas
r = Radio de la plaquita
a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

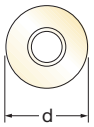
$$f_z = \frac{h_m}{\frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}}$$

Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2-(r-a_e)^2}}{r} \times \frac{\sqrt{r^2-(r-a_p)^2}}{r}$$

donde:
f_z = Avance por diente
h_m = Espesor de la viruta
D = Diámetro exterior de la fresa
a_e = Profundidad de pase radial
D_w = Diámetro de corte efectivo
a_p = Profundidad de corte axial

Ø12mm Plaquitas para 7712 VRD





EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
029297	**RDET 12T3M0E-701-X6**	**SP4036**	◆	◆	◆◆◆◆◆◆	12,0	-	3,97	6,0	0,05
029299	**RDHW 12T3M0T-20-X6**	**SP4036**	◆	◇		12,0	-	3,97	6,0	0,20
029301	**RDHW 12T3M0T-20-X6**	**SP5464**	◆			12,0	-	3,97	6,0	0,20
029302	**RDHW 12T3M0T-X6**	**SP4036**	◆◆	◆◆		12,0	-	3,97	6,0	0,15
029303	**RDHW 12T3M0T-X6**	**SP5464**		◆◆		12,0	-	3,97	6,0	0,15
029313	**RDMW12T3M0T-20-X6**	**SP5464**	◆◆			12,0	-	3,97	6,0	0,20
029314	**RDMW12T3M0T-X6**	**SP5464**		◆◆		12,0	-	3,97	6,0	0,15







Interpolación de rampa

Referencia	Diámetro (mm)	Agujero Diam. max. (mm)	Agujero Diam. min (mm)	Angulo de penetración
7712VRD12-A052R	52	102	82	3.9°
7712VRD12-A066R	66	130	110	3.1°
7712VRD12-A080R	80	158	138	2.5°

Ángulo de rampa

Referencia	Diámetro	Angulo de la rampa recomendado	a_p max	Longitud
7712VRD12-A052R	52	5°	6,0	68,58
7712VRD12-A066R	66	3.7°	6,0	104,05
7712VRD12-A080R	80	2.8°	6,0	157,38

Condiciones de corte recomendadas para RD_12

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,25 - 0,60	1,5 - 4,0	220 - 260	0,17 - 0,45	1,0 - 3,5	220 - 300	0,10 - 0,18	0,1 - 1,0
Aceros aleados	70 - 110	0,22 - 0,50	1,5 - 4,0	100 - 150	0,17 - 0,40	1,0 - 3,5	100 - 195	0,10 - 0,16	0,1 - 1,0
Aceros inoxidables	120 - 140	0,22 - 0,35	1,5 - 3,0	140 - 180	0,17 - 0,30	1,0 - 2,5	180 - 230	0,08 - 0,12	0,1 - 1,0
Inoxidables PH	-	-	-	-	-	-	80 - 100	0,08 - 0,12	0,1 - 1,0
Fundición	140 - 280	0,22 - 0,50	1,5 - 4,0	180 - 300	0,17 - 0,40	1,0 - 3,5	200 - 350	0,10 - 0,16	0,1 - 1,0
Aluminio y Aleaciones	275 - 450	0,06 - 0,12	1,5 - 4,0	400 - 750	0,06 - 0,12	1,0 - 3,5	700 - 1000	0,06 - 0,12	0,1 - 1,0
Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,08 - 0,12	0,1 - 1,0
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,05 - 0,10	0,5 - 1,0	50 - 100	0,03 - 0,06	0,1 - 1,0

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

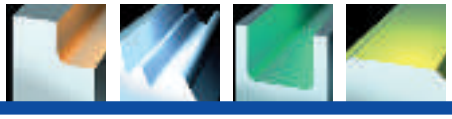


Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa para perfilar 7712 VRD 16





7712VRD16 Montaje en el eje

EDP #	Referencia	Dimensions mm D_1	D_2	L/H	d_1	a_p max.	No. de dientes	Plaquitas	Recambios EDP #		EDP #	
029057	**7712VRD16-A052R**	52	36	52	22	8	4	RD..1604..-X8	015270	F4011T	015241	T20
029058	**7712VRD16-A066R**	66	50	52	27	8	5	RD..1604..-X8	015270	F4011T	015241	T20
029059	**7712VRD16-A080R**	80	64	52	27	8	6	RD..1604..-X8	015270	F4011T	015241	T20
029060	**7712VRD16-A100R**	100	84	52	32	8	7	RD..1604..-X8	015270	F4011T	015241	T20
029061	**7712VRD16-A125R**	125	109	52	40	8	8	RD..1604..-X8	015270	F4011T	015241	T20

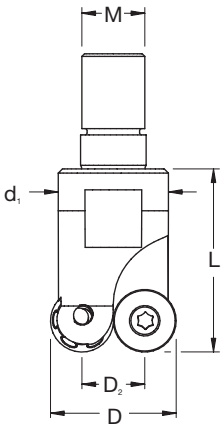


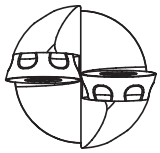
Montaje en el eje

7712VRD16 Cabeza modular

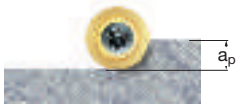
EDP #	Referencia	Dimensiones (mm) D	D_2	L/H	M	d_1	No. de dientes	Plaquitas	Recambios EDP #		EDP #	
029126	**7712VRD16S030R43**	30	14	43	M16	17,0	2	RD...16...	015270	F4011T	023256	T20
029127	**7712VRD16S032R43**	32	16	43	M16	17,0	2	RD...16...	015270	F4011T	023256	T20

Amarres para cabezas modulares ver página A228 - A229.





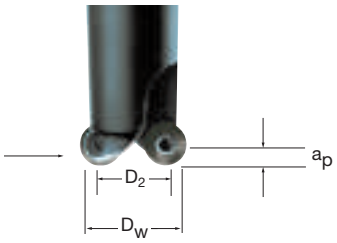
Cabeza modular



Profundidad de corte (a_p)

7712 VRD 16 Consejos técnicos

Ejemplo de pedido de la fresa: **7712VRD16-A052R**
Ejemplo de pedido de la plaquita: **RDET 1604M0E-701-X8 SP4036**



Diámetro efectivo de corte:

$$D_w = D_2 + 2 \times \sqrt{r^2 - (r - a_p)^2}$$

donde:

- D_w = Diámetro efectivo de corte
- D_2 = Diámetro entre ejes de las plaquitas
- r = Radio de la plaquita
- a_p = Profundidad de corte axial

Para encontrar el avance a pprogramar:

$$f_z = \frac{h_m}{\frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}}$$

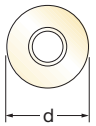
Espesor de la viruta:

$$h_m = f_z \times \frac{\sqrt{r^2 - (r - a_e)^2}}{r} \times \frac{\sqrt{r^2 - (r - a_p)^2}}{r}$$

donde:

- f_z = Avance por diente
- h_m = Espesor de la viruta
- D = Diámetro exterior de la fresa
- a_e = Profundidad de pase radial
- D_w = Diámetro de corte efectivo
- a_p = Profundidad de corte axial

Ø16mm Plaquitas para 7712 VRD



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
029298	**RDET 1604M0E-701-X8**	**SP4036**	◆	◆	◆◆◆◆◆◆	16,0	-	4,76	8,0	0,02
029304	**RDHW 1604M0T-X8**	**SP4036**		◆◆		16,0	-	4,76	8,0	0,15
029305	**RDHW 1604M0T-X8**	**SP5464**	◆	◆◆		16,0	-	4,76	8,0	0,15
029306	**RDHW 1604M0T-30-X8**	**SP4036**	◆◆	◆◆		16,0	-	4,76	8,0	0,30
029308	**RDHW 1604M0T-30-X8**	**SP5464**		◆◆		16,0	-	4,76	8,0	0,30
029311	**RDMW 1604M0T-X8**	**SP5464**		◆◆		16,0	-	6,35	8,0	0,15
029312	**RDMW 1604M0T-30-X8**	**SP5464**	◆◆			16,0	-	6,35	8,0	0,30

RDET 16_ -701



RDHW 16_



RDMW 16_



Interpolación de rampa

Referencia	Diámetro (mm)	Agujero Diam. max. (mm)	Agujero Diam. min (mm)	Angulo de penetración
7712VRD16-A052R	52	102	74	5.2°
7712VRD16-A066R	66	130	102	4.1°
7712VRD16-A080R	80	158	130	3.35°
7712VRD16-A100R	100	198	170	2.65°
7712VRD16-A125R	125	248	220	2.1°

Ángulo de rampa

Referencia	Diámetro	Angulo de la rampa recomendado	a_p max	Longitud
7712VRD16-A052R	52	11.5°	8,0	39,32
7712VRD16-A066R	66	7.5°	8,0	60,77
7712VRD16-A080R	80	6°	8,0	76,11
7712VRD16-A100R	100	4°	8,0	114,40
7712VRD16-A125R	125	3°	8,0	152,65

Condiciones de corte recomendadas para RD_16

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,32 - 0,80	1,5 - 5,3	220 - 260	0,17 - 0,50	1,0 - 4,5	220 - 300	0,10 - 0,18	0,1 - 1,5
Aceros aleados	70 - 110	0,32 - 0,60	1,5 - 5,3	100 - 150	0,17 - 0,45	1,0 - 4,5	100 - 195	0,10 - 0,16	0,1 - 1,5
Aceros inoxidables	120 - 140	0,32 - 0,40	1,5 - 4,0	140 - 180	0,17 - 0,35	1,0 - 3,5	180 - 230	0,08 - 0,12	0,1 - 1,5
Inoxidables PH	-	-	-	-	-	-	80 - 100	0,08 - 0,12	0,1 - 1,5
Fundición	140 - 280	0,32 - 0,60	1,5 - 5,3	180 - 300	0,17 - 0,45	1,0 - 4,5	200 - 350	0,10 - 0,16	0,1 - 1,5
Aluminio y Aleaciones	275 - 450	0,06 - 0,16	1,5 - 5,3	400 - 750	0,06 - 0,14	1,0 - 4,5	700 - 1000	0,06 - 0,12	0,1 - 1,5
Aleaciones refractarias	-	-	-	-	-	-	45 - 60	0,08 - 0,12	0,1 - 1,5
Aceros duros (52-56 HRC)	-	-	-	50 - 85	0,05 - 0,10	0,5 - 1,5	50 - 100	0,03 - 0,06	0,1 - 1,5

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

FRESAS PARA CONTORNEAR Y VACIAR



Estas fresas han sido especialmente concebidas para el mecanizado de alveolas y el contorneado en piezas en aleaciones ligeras. Están igualmente capacitadas para realizar operaciones de contorneado acabado en materiales composites, fundición y aleaciones de titanio.

Todas las fresas pocketing de Stellram están fabricadas en acero para herramientas y nitruradas. La refrigeración interna permite mejor evacuación de la viruta y mayores avances.



APLICACIONES – FRESAS POCKETING


Perfilado


Vaciado


Escuadrado


Escuadrado


Escuadrado con radio



FRESAS POCKETING

Las fresas **5182VZ**, o fresas **Aerostell®**, son de una concepción única, destinada a las operaciones de mecanizado de alveolas con un gran rendimiento, tanto en aluminio como en aleaciones ligeras. Fueron concebidas en asociación con uno de los lideres de la industria aerospacial, para superar los problemas encontrados en el fresado del aluminio.

Las plaquitas **Aerostell®** tienen un ángulo de corte muy positivo para reducir los esfuerzos de corte, el riesgo de adherencias y la potencia necesaria en la maquina, en comparación con las fresas a placa soldada. Por ejemplo para mecanizar A-U4G, es necesario 18w/cm3. Su geometría disminuye igualmente los riesgos de deformación en las piezas delgadas hasta 1 mm de pared.

Las plaquitas, en metal duro micrograno, se montan en sus alojamientos por medio de dos tornillos, para un posicionamiento mas preciso. Están rectificadas con tolerancias muy apretadas, procurando así un excelente acabado a las piezas mecanizadas y no necesitan reafilados, como es necesario con otro tipo de herramientas.

Se dispone de plaquitas para profundidades de corte de 32mm, 33 mm o 53 mm. Cada fresa ha sido concebida para aceptar las plaquitas propuestas en una gran variedad de radios.

Es posible fresar en rampa con un ángulo de 15 grados.

La fresa **5702VZ** tiene un diseño novedoso para un alto arranque de metal en aplicaciones con aluminio.

Esta herramienta está diseñada, fabricada y controlada en acuerdo a la norma ISO 15641:2001 para asegurar un máximo de estabilidad en aplicaciones a altas velocidades. Estas herramientas pueden girar hasta 43.000 RPM.

Las plaquitas de 14mm permiten mecanizar paredes delgadas debido a su baja presión de corte. Se disponen de radios estándar desde 2mm hasta 4mm.


5182 VZ


5702 VZ







Amarre DIN 69871

5182 VZ 32 DIN 69871 Amarre*

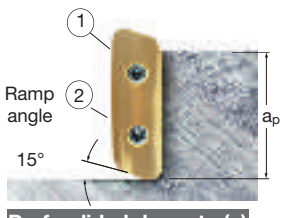
		Dimensiones (mm)							Recambios			
EDP #	**Referencia**	D	L	l_2	l_3	$R_{max.}$	a_p	No. de plaquitas	*EDP#*		*EDP#*	
023039	**5182VZ 32 GA032R075-4**	32	162,5	75	94,1	4	32	*a.* 2	*023144*	D4008A	*015240*	T15
021643	**5182VZ 32 GA032R075-8**	32	162,5	75	94,1	8	32	*b.* 2	*023144*	D4008A	*015240*	T15

* Cono 40.

Nota: Puesto que la longitud de la plaquita disminuye cuando el radio de punta aumenta, las dimensiones L, l_2, l_3 varían en función del valor del radio.

Las dimensiones indicadas corresponden a las de una plaquita con radio 4 mm

Cuando la referencia de la fresa termina por –4, esto indica que admite plaquitas con un radio de punta máximo de 4,0 mm.
Cuando la referencia de la fresa se termina por –8, esto indica que se pueden utilizar solo plaquitas con radios comprendidos entre 5 y 8 mm.



Profundidad de corte (a)

5182 VZ 32 Consejos técnicos

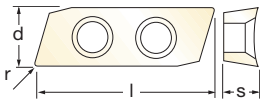
Ejemplo de pedido fresa: **5182VZ32GA032R075-4**
Ejemplo de pedido plaquitas: **ZECX32T330ER-701 SFZ**
Para condiciones de corte completas ver página: **A288**

Numero máximo de vueltas con equilibrado = 18.000 r/min.
Angulo de rampa máximo = 15

Apriete de los tornillos :
1) Apretar ligeramente los tornillos 1 y 2
2) Apretar el tornillo numero 1 a 3.5-4.0 Nm
3) Apretar el tornillo numero 2 a 3.5-4.0 Nm



Plaquitas para 5182 VZ 32



EDP #	Referencia	Calidad		Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
025787	**ZECX32T302ER-701**	**GH2**	*a.*	♦	♦	♦	11,9	37,0	3,97	0,2	0,03
029643	**ZECX32T325ER-701**	**GH2**	*a.*	♦	♦	♦	11,9	37,0	3,97	2,5	0,03
017485	**ZECX32T330ER-701**	**GH2**	*a.*	♦	♦	♦	11,9	37,0	3,97	3,0	0,03
025788	**ZECX32T340ER-701**	**GH2**	*a.*	♦	♦	♦	11,9	37,0	3,97	4,0	0,03
029644	**ZECX32T350ER-701**	**GH2**	*b.*	♦	♦	♦	11,9	37,0	3,97	5,0	0,03

ZECX 32_ -701



* En los materiales indicados, esta fresa se puede utilizar para el contorneado de acabado con una profundidad de pasada radial de máxima 1 mm.

Condiciones de corte recomendadas para ZE_32

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	-	-	-	-	-	-
♦ Aceros aleados	-	-	-	-	-	-	-	-	-
♦ Aceros inoxidables	-	-	-	-	-	-	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	-	-	-	-	-	-
♦ Aluminio y Aleaciones	500 - 1800	0,10 - 0,25	0,10 - 32,0	500 - 1800	0,10 - 0,25	0,10 - 32,0	500 - 1800	0,05 - 0,20	0,1 - 15,0
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®







Amarre DIN 69871

5182 VZ 33 DIN 69871 Amarre*

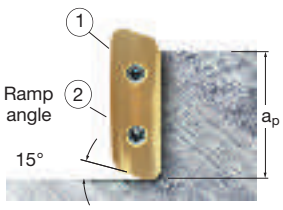
		Dimensiones (mm)							Recambios			
EDP #	**Referencia**	D	L	l_2	l_3	$R_{max.}$	a_p	No. de plaquitas	*EDP#*		*EDP#*	
021644	**5182VZ 33 GA040R095-4**	40	182,5	95	114,1	4	33	*a.* 2	*015261*	D4010A	*015240*	T15
021645	**5182VZ 33 GA040R095-8**	40	182,5	95	114,1	8	33	*b.* 2	*015261*	D4010A	*015240*	T15

* 40 taper.

Nota: Puesto que la longitud de la plaquita disminuye cuando el radio de punta aumenta, las dimensiones L, l_2, l_3 varían en función del valor del radio.

Las dimensiones indicadas corresponden a las de una plaquita con radio 4 mm

Cuando la referencia de la fresa termina por –4, esto indica que admite plaquitas con un radio de punta máximo de 4,0 mm.
Cuando la referencia de la fresa se termina por –8, esto indica que se pueden utilizar solo plaquitas con radios comprendidos entre 5 y 8 mm.



Profundidad de corte (a)

5182 VZ 33 Consejos técnicos

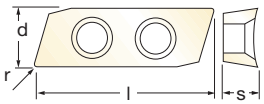
Ejemplo de pedido fresa: **5182VZ33GA040R095-4**
Ejemplo de pedido plaquitas: **ZDCX330430ER-701 SFZ**
Para condiciones de corte completas ver página: **A288**

Numero máximo de vueltas con equilibrado = 18.000 r/min.
Angulo de rampa máximo = 15

Apriete de los tornillos :
1) Apretar ligeramente los tornillos 1 y 2
2) Apretar el tornillo numero 1 a 3.5-4.0 Nm
3) Apretar el tornillo numero 2 a 3.5-4.0 Nm



Plaquitas para 5182 VZ 33



EDP #	Referencia	Calidad		Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
025785	**ZDCX330402ER-701**	**GH2**	*a.*	◆	◆	◆	13,5	37,0	4,76	0,2	0,03
023734	**ZDCX330425ER-701**	**GH2**	*a.*	◆	◆	◆	13,5	37,0	4,76	2,5	0,03
025786	**ZDCX330440ER-701**	**GH2**	*a.*	◆	◆	◆	13,5	37,0	4,76	4,0	0,03

ZDCX 33_ -701



* En los materiales indicados, esta fresa se puede utilizar para el contorneado de acabado con una profundidad de pasada radial de máxima 1 mm.

Condiciones de corte recomendadas para ZE_33

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	-	-	-	-	-	-
Aceros aleados	-	-	-	-	-	-	-	-	-
Aceros inoxidables	-	-	-	-	-	-	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	-	-	-	-	-	-	-	-	-
Aluminio y Aleaciones	500 - 2200	0,10 - 0,25	0,10 - 53,0	500 - 2200	0,10 - 0,25	0,10 - 53,0	500 - 2200	0,05 - 0,20	0,1 - 15,0
Aleaciones refractarias	-	-	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

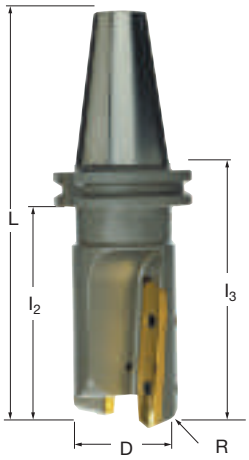
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®







Amarre DIN 69871

5182 VZ 53 DIN 69871 Amarre**

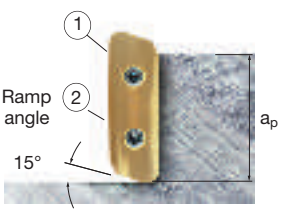
		Dimensiones (mm)							Recambios			
EDP #	**Referencia**	D	L	l_2	l_3	$R_{max.}$	a_p	No. de plaquitas	*EDP#*		*EDP#*	
021646	**5182VZ 53 GA050R100-4**	50	187,5	100	119,1	4	53	*a.* 2	*015264*	D5010A	*015240*	T15
021648	**5182VZ 53 GA063R125-4**	63	245,85	125	144,1	4	53	*a.* 2	*015264*	D5010A	*015240*	T15
021647	**5182VZ 53 GA050R100-8**	50	187,5	100	119,1	8	53	*b.* 2	*015264*	D5010A	*015240*	T15

**∅ 50 = 40 taper, ∅ 63 = 50 taper.

Nota: Puesto que la longitud de la plaquita disminuye cuando el radio de punta aumenta, las dimensiones L, l_2, l_3 varían en función de la valor del radio.

Las dimensiones indicadas corresponden a las de una plaquita con radio 4 mm.

Cuando la referencia de la fresa termina por –4, esto indica que admite plaquitas con un radio de punta máximo de 4,0 mm.
Cuando la referencia de la fresa se termina por –8, esto indica que se pueden utilizar solo plaquitas con radios comprendidos entre 5 y 8 mm.



Profundidad de corte (a)

5182 VZ 53 Consejos técnicos

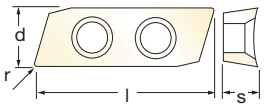
Ejemplo de pedido fresa: **5182VZ53GA050R100-4**
Ejemplo de pedido plaquitas: **ZDCX530430ER-701 SFZ**
Para condiciones de corte completas ver página: **A288**

Numero máximo de vueltas con equilibrado = 16.000 r/min. para D 50 mm.
Numero máximo de vueltas con equilibrado = 12.000 r/min. para D 63 mm.
Angulo de rampa máximo = 15

Apriete de los tornillos :
1) Apretar ligeramente los tornillos 1 y 2
2) Apretar el tornillo numero 1 a 3.5-4.0 Nm
3) Apretar el tornillo numero 2 a 3.5-4.0 Nm



Plaquitas para 5182 VZ 53



EDP #	Referencia	Calidad		Operaciones & Material Desbaste ▼	Semi-acabado ▼▼	Acabado ▼▼▼	Dimensiones (mm) d	l	s	r	h_m min
025770	**ZDCX530402ER-701**	**GH2**	*a.*	♦	♦	♦	14,8	64,0	4,76	0,2	0,03
017479	**ZDCX530430ER-701**	**GH2**	*a.*	♦	♦	♦	14,8	64,0	4,76	3,0	0,03
025769	**ZDCX530440ER-701**	**GH2**	*a.*	♦	♦	♦	14,8	64,0	4,76	4,0	0,03
027195	**ZDCX530460ER-701**	**GH2**	*b.*	♦	♦	♦	14,8	64,0	4,76	6,0	0,03

ZDCX 53_ -701



* En los materiales indicados, esta fresa se puede utilizar para el contorneado de acabado con una profundidad de pasada radial de máxima 1 mm.
** Ver numero maximo de revoluciones

Condiciones de corte recomendadas para ZD_53

Material	▼ *Desbaste* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ *Semi-acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ *Acabado* Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
♦ Aceros no aleados	-	-	-	-	-	-	-	-	-
♦ Aceros aleados	-	-	-	-	-	-	-	-	-
♦ Aceros inoxidables	-	-	-	-	-	-	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-	-
♦ Fundición	-	-	-	-	-	-	-	-	-
♦ Aluminio y Aleaciones	500 - 2200	0,1 - 0,25	0,1 - 53,0	500 - 2200	0,1 - 0,25	0,1 - 53,0	500 - 2200	0,05 -0,20	0,1 - 15,0
♦ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

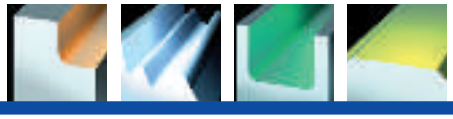


Código ISO de materiales

P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

STELLRAM®

Fresa de achaflanar 5702 VZD 14



5702 VZD14 Montaje en el ejea

EDP #	Referencia	Dimensiones (mm) D	L	l_2	l_3	d_1 g4	a_p max.	No. de dientes	Inserte la gama del radio	Max. RPM	Recambios EDP #		EDP #		Ajuste del tornillo Nm
028998	**5702VZD14CA020R58-2**	20	108	58	-	20	12	2	Faceta - 2,0	**43,000**	*015060*	F2505T	*018488*	T7	0,8
028999	**5702VZD14CA020R58-4**	20	108	58	-	20	12	2	2,0 - 4,0	**43,000**	*015060*	F2505T	*018488*	T7	0,8



Montaje en el eje

*Remplazar siempre el tornillo cuando se cambia de plaquita. Pasada radial = 0,2mm hasta el diámetro de la fresa.
Estas herramientas han sido diseñadas, fabricadas y controladas en acuerdo con EN ISO estándar 15641 y almacenadas equilibradas a G = 2,5 a 30.000 RPM.

5702VZ Consejos técnicos

Ejemplo de pedido fresa: **5702VZD14CA020R58-2**
Ejemplo de pedido plaquitas: **ZDCX1403PDFR-701 GH1**

Angulo de rampa

	Radios (mm)				
Fresa Ø	**Faceta**	**2,0**	**2,5**	**3,0**	**4,0**
20	11,0°	9,8°	9,0°	8,0°	6,3°

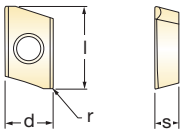
El gráfico a continuación muestra la capacidad de arranque de viruta (basado en 24.000 RPM) y RPM máximo por diámetro. Todas las herramientas están equilibradas según ISO estándar 1940.1:986. El máximo de RPM se encuentra grabado en el cuerpo de la fresa.

Arranque de viruta

Fresa Ø	Max RPM	Qmax – cm^3/min
20	43,000	720

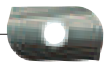
***Tornillo de fijación**
Es importante cambiar el tornillo cada vez que se cambia la plaquita para garantizar una mayor seguridad. Una llave dinamométrica y el buen valor de par son importantes. La información del par correcto se muestra con las dimensiones de la herramienta.

Plaquitas para 5702 VZD



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
029027	**ZDCX1403PDFR-701**	**GH1**	◆	◆	◆	7,59	16,83	3,18	Faceta	0,02
029028	**ZDCX140320FR-701**	**GH1**	◆	◆	◆	7,59	16,83	3,18	2,0	0,02
026019	**ZDCX140325FR-701**	**GH1**	◆	◆	◆	7,59	16,83	3,18	2,5	0,02
029029	**ZDCX140330FR-701**	**GH1**	◆	◆	◆	7,59	16,83	3,18	3,0	0,02
026020	**ZDCX140340FR-701**	**GH1**	◆	◆	◆	7,59	16,83	3,18	4,0	0,02

ZDCX 14_ -701



Condiciones de corte recomendadas para ZD_14

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	-	-	-	-	-	-
Aceros aleados	-	-	-	-	-	-	-	-	-
Aceros inoxidables	-	-	-	-	-	-	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	-	-	-	-	-	-	-	-	-
Aluminio y Aleaciones	400 - *	0,02 - 0,25	0,2 - 11	400 - *	0,02 - 0,25	0,2 - 11	400 - *	0,02 -0,25	0,2 - 11
Aleaciones refractarias	-	-	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

*La velocidad de corte máxima (v_c m/min) está relacionada con el diámetro de la herramienta.

Estrella guía Llave para encontrar la herramienta idónea

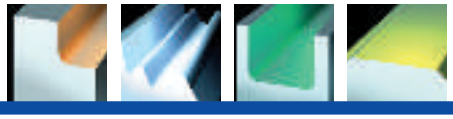


Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Fresa de achaflanar 5702 VZP 14



5702 VZP14 Montaje en el ejea

EDP #	Referencia	Dimensiones (mm) D	L	l_2	l_3	d_1 g4	a_p max.	No. de dientes	Inserte la gama del radio	Max. RPM	Recambios EDP #		EDP #		Ajuste del tornillo Nm
029000	**5702VZP14CA025R73-2**	25	129	73	-	25	12	2	Faceta - 2,0	**41,000**	*018481*	D4006T	*015240*	T15	3,1
029001	**5702VZP14CA025R73-4**	25	129	73	-	25	12	2	2,0 - 4,0	**41,000**	*018481*	D4006T	*015240*	T15	3,1

5702 VZP14 HSK-63A

029002	**5702VZP14HA025R75-2**	25	133	75	101	-	12	2	Faceta - 2,0	**41,000**	*018481*	D4006T	*015240*	T15	3,1
029003	**5702VZP14HA025R75-4**	25	133	75	101	-	12	2	2,0 - 4,0	**41,000**	*018481*	D4006T	*015240*	T15	3,1
029004	**5702VZP14HA032R75-2**	32	133	75	101	-	12	2	Faceta - 2,0	**37,000**	*015260*	D4008T	*015240*	T15	3,1
029005	**5702VZP14HA032R75-4**	32	133	75	101	-	12	2	2,0 - 4,0	**37,000**	*015260*	D4008T	*015240*	T15	3,1
029006	**5702VZP14HA040R095-2**	40	153	95	121	-	12	2	Faceta - 2,0	**32,000**	*015260*	D4008T	*015240*	T15	3,1
029007	**5702VZP14HA040R095-4**	40	153	95	121	-	12	2	2,0 - 4,0	**32,000**	*015260*	D4008T	*015240*	T15	3,1

*Remplazar siempre el tornillo cuando se cambia de plaquita. Pasada radial = 0,2mm hasta el diámetro de la fresa.
Estas herramientas han sido diseñadas, fabricadas y controladas en acuerdo con EN ISO estándar 15641 y almacenadas equilibradas a G = 2,5 a 30.000 RPM.





Montaje en el eje





HSK

5702VZ Consejos técnicos

Ejemplo de pedido fresa: **5702VZP14CA025R73-2**
Ejemplo de pedido plaquitas: **ZPCX1404PDFR-701 GH1**

Angulo de rampa

Fresa Ø	Radios (mm) Faceta	2,0	2,5	3,0	4,0
25	11,0°	10,5°	9,9°	9,3°	8,0°
32	7,2°	6,8°	6,4°	5,9°	4,9°
40	5,1°	4,8°	4,4°	4,0°	3,3°

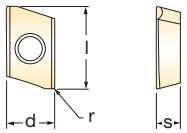
El gráfico a continuación muestra la capacidad de arranque de viruta (basado en 24.000 RPM) y RPM máximo por diámetro. Todas las herramientas están equilibradas según ISO estándar 1940.1:986. El máximo de RPM se encuentra grabado en el cuerpo de la fresa.

Arranque de viruta

Fresa Ø	Max RPM	Qmax – cm^3/min
25	41,000	960
32	37,000	3400
40	32,000	4200

***Tornillo de fijación**
Es importante cambiar el tornillo cada vez que se cambia la plaquita para garantizar una mayor seguridad. Una llave dinamométrica y el buen valor de par son importantes. La información del par correcto se muestra con las dimensiones de la herramienta.

Plaquitas para 5702 VZP



ZPCX 14_



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
025771	**ZPCX1404PDFR-701**	**GH1**	♦	♦	♦	9,52	16,83	4,76	Faceta	0,02
029030	**ZPCX140420FR-701**	**GH1**	♦	♦	♦	9,52	16,83	4,76	2,0	0,02
026021	**ZPCX140425FR-701**	**GH1**	♦	♦	♦	9,52	16,83	4,76	2,5	0,02
029031	**ZPCX140430FR-701**	**GH1**	♦	♦	♦	9,52	16,83	4,76	3,0	0,02
026022	**ZPCX140440FR-701**	**GH1**	♦	♦	♦	9,52	16,83	4,76	4,0	0,02

Condiciones de corte recomendadas para ZP_14

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	-	-	-	-	-	-	-	-	-
Aceros aleados	-	-	-	-	-	-	-	-	-
Aceros inoxidables	-	-	-	-	-	-	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	-	-	-	-	-	-	-	-	-
Aluminio y Aleaciones	400 - *	0,02 - 0,25	0,2 - 11	400 - *	0,02 - 0,25	0,2 - 11	400 - *	0,02 -0,25	0,2 - 11
Aleaciones refractarias	-	-	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

*La velocidad de corte máxima (v_c m/min) está relacionada con el diámetro de la herramienta.

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Grupo de aleaciones	Designación de aleaciones	LIMITE DE COMPOSICIONES QUIMICAS (WT%)												Tratamiento térmico	Rm (Mpa)	Mecanización Formación de la viruta	Mecanización Abrasión	Aplicaciones típicas	v_c m/min min-max		f_z mm/Z max
		Cu	Si	Fe	Mn	Mg	Zn	Cr	Ti	Pb	Bi	Al	Otros								
Al	1050	0.05	0.25	0.4	0.5	0.05	0.05	-	-	-	-	99.50min	-	H14	105	D	A	Hojas de metal para equipamientos químico y fabricación de tubos.	600	3000	0,2
	1100	0.05~0.20	Si+Fe1.0max		0.05	-	0.1	-	-	-	-	99.00min	-	H14	90	D	A				
Al-Cu	2011	50.~60.	0.4	0.7	-	-	0.3	-	-	0.2	0.6	restante	-	T3	310	A	A	Tornillos para máquinas. Chasis de camiones. Estructuras de aviones. Palas de reactores, Cabezas de cilindros para motores de aviones.	400	2500	0,25
	2014	3.9~5.0	0.5~1.2	0.7	0.4~1.2	0.2~0.8	0.25	0.1	0.15	-	-	restante	-	T6	430	B	A				
	2017	3.5~4.5	0.2~0.8	0.7	0.4~1.0	0.4~0.8	0.25	0.1	0.15	-	-	restante	-	T4	390	B	A				
	2024	3.8~4.9	0.5	0.5	0.3~0.9	1.2~1.8	0.25	0.1	0.15	-	-	restante	-	T4	465	B	A				
	2218	3.5~4.5	0.9	1	0.2	1.2~1.8	0.25	0.1	-	-	-	restante	Ni1.7~2.3	T72	331	B	B				
	2224	3.8~4.4	0.12	0.15	0.30~0.9	1.2~1.8	0.25	0.1	0.15	-	-	restante	-			A	A				
Al-Mn	3003	0.05~0.20	0.6	0.7	1.0~1.5	-	0.1	-	-	-	-	restante	-	H14	140	D	B	Utensilios de cocina. Equipamientos químicos.	200	2500	0,2
Al-Si	4032	0.5~1.3	11.0~13.5	1	-	0.8~1.3	0.25	0.1	-	-	-	restante	Ni0.5~1.3	T6	379	B	D	Pistones.	200	1000	0,18
Al-Mg	5052	0.1	0.25	0.4	0.1	2.2~2.8	0.1	0.15~0.35	-	-	-	restante	- H34	H14	260	C	A	Estructuras arquitectónicas. Cables trenzados. Vasijas de presión soldadas para buques. Tubos hidráulicos. Equipamiento de transporte.	400	3000	0,25
	5056	0.1	0.3	0.4	0.05~0.20	4.5~5.6	0.1	0.05~0.20	-	-	-	restante	- H32	H12	300	C	A				
	5083	0.1	0.4	0.4	0.4~1.0	4.0~4.9	0.25	0.05~0.25	0.15	-	-	restante	-	H112	335	C	A				
	5086	0.1	0.4	0.5	0.20~0.7	3.5~4.5	0.25	0.05~0.25	0.15	-	-	restante	- H116	H32	300	C	A				
Al-Mg-Si	6061	0.15~0.40	0.4~0.8	0.7	0.15	0.8~1.2	0.25	0.04~0.35	0.15	-	-	restante	-	T6	300	C	B	Estructuras pesadas. Mobiliario. Estructuras arquitectónicas. Estructuras pesadas soldadas. Oleoductos.	400	2500	0,2
	6063	0.1	0.2~0.6	0.35	0.1	0.45~0.9	0.1	0.1	0.1	-	-	restante	-	T5	200	C	B				
	6070	0.15~0.40	1.0~1.7	0.5	0.40~1.0	0.50~1.2	0.25	0.1	0.15	-	-	restante	-	T6	379	C	C				
	6151	0.35	0.6~1.2	1	0.2	0.45~0.8	0.25	0.15~0.35	0.15	-	-	restante	-	T6		C	C				
	6262	0.15~0.40	0.4~0.8	0.7	0.15	0.8~1.2	0.25	0.04~0.14	0.15	0.40	0.7	restante	-	T9	400	B	B				
	6351	0.1	0.7~1.3	0.5	0.4~0.8	0.40~0.8	0.2	-	0.2	-	-	restante	-	T6	310	D	C				
	6463	0.2	0.20~0.6	0.15	0.05	0.45~0.9	0.05	-	-	-	-	restante	-	T6	241	C	B				
Al-Zn	7001	1.6~2.6	0.35	0.4	0.2	2.6~3.4	6.8~8.0	0.18~0.35	0.2	-	-	restante	-	O		B	A	Estructuras altas resistentes a la flexión. Estructuras de aeronaves. Construcción.	400	3000	0,25
	7003	0.2	0.3	0.35	0.3	0.50~1.0	5.0~6.5	0.2	0.2	-	-	restante	Zr0.05~0.25	T5	400	B	A				
	7050	2.0~2.6	0.12	0.15	0.1	1.9~2.6	5.7~6.7	0.04	0.06	-	-	restante	Zr0.08~0.15	T73	530	B	A				
	7075	1.2~2.0	0.4	0.5	0.3	2.1~2.9	5.1~6.1	0.18~0.28	0.2	-	-	restante	-	T6	570	B	A				
	7178	1.6~2.4	0.4	0.5	0.3	2.4~3.1	6.3~7.3	0.18~0.35	0.2	-	-	restante	-	T6	600	B	A				
	7475	1.2~1.9	0.1	0.12	0.06	1.9~2.6	5.2~6.2	0.18~0.25	0.06	-	-	restante	-	T61	565	B	A				

Mecanización

A EXCELENTE

B BUENA A EXCELENTE

C BUENA

D MALA

$V_C = \pi \times D \times n / 1000$ m/min = mm x RPM

D: Diámetro de la herramienta, N: RPM, V_c: Velocidad de corte

Escoger la velocidad de corte en la gama de valores, compatible con la velocidad de rotación máxima (gravada en la fresa) y la estabilidad del cabezal.

Recomendaciones para el mecanizado a alta velocidad

- Controlar las condiciones del cabezal: Excentricidad
  Equilibrado
  Sujeción en tracción del amarre
  Marcas y suciedad

- Controlar si la herramienta es la adecuada para ese trabajo.

- Las plaquitas deben de ser posicionadas adecuadamente en el alojamiento y fijadas utilizando el destornillador torx proporcionado. El tornillo debe de ser apretado a su justo valor como indicado en nuestro gráfico. Por seguridad utilizar un nuevo tornillo cada vez.

- Controlar el equilibrado con la – fresa montada – cuerpo, plaquitas y amarre.

- Antes de empezar, anotar las máximas RPM gravadas en la fresa en sus documentos técnicos. Las máximas RPM son vinculantes para un preciso equilibrado.

- Asegurarse de que el campo de aplicación de la herramienta aparece en su documentación técnica y que los parámetros tecnológicos son respetados:

a_e (mm)	ancho de pasada, profundidad lateral (radial)
a_p (mm)	Profundidad de corte axial
f_z (mm/diente)	Avance por diente
n (rpm)	RPM

Stellram no aceptará responsabilidad alguna en caso de uso indebido de este producto:

- El no respeto de las instrucciones indicadas anteriormente.

- Máquina sin carenado.

- Amarre incorrecto de la pieza.

- Falta de material de seguridad en máquina

- Cualquier uso indebido o amarre incorrecto

La rotación máxima debe de ser determinada por las condiciones del cabezal. El cabezal debe de ser rígido para rotar a esas altas RPMs.

Bajo ninguna circunstancia se debe de intentar reparar esta herramienta. El único mantenimiento permitido es el de posicionar y cambiar las plaquitas. Utilizar un nuevo tornillo para cada cambio de plaquita.

Cuando la fijación de la fresa se hace con un amarre a presión, el voladizo no debe sobrepasar el 10% de la longitud útil.

El código de nomenclatura de las fresas sigue la clave siguiente:
Ejemplo: 5702VZP14CA025R73-2

5702	=	Familia de productos Stellram
V	=	Fijación por tornillo
Z	=	Forma de la plaquita (paralelogramo)
P	=	Desprendimiento ISO de las plaquitas (P 11° , D = 15º)
14	=	Longitud de la arista de corte (mm)
C	=	Amarre cilíndrico (sin planos)
A	=	Refrigeración por el centro
025	=	Diámetro de corte (mm)
R	=	Herramienta a derechas
73	=	Longitud útil en mm
-2	=	Radio máximo de la plaquita indicado en 1/10 de mm

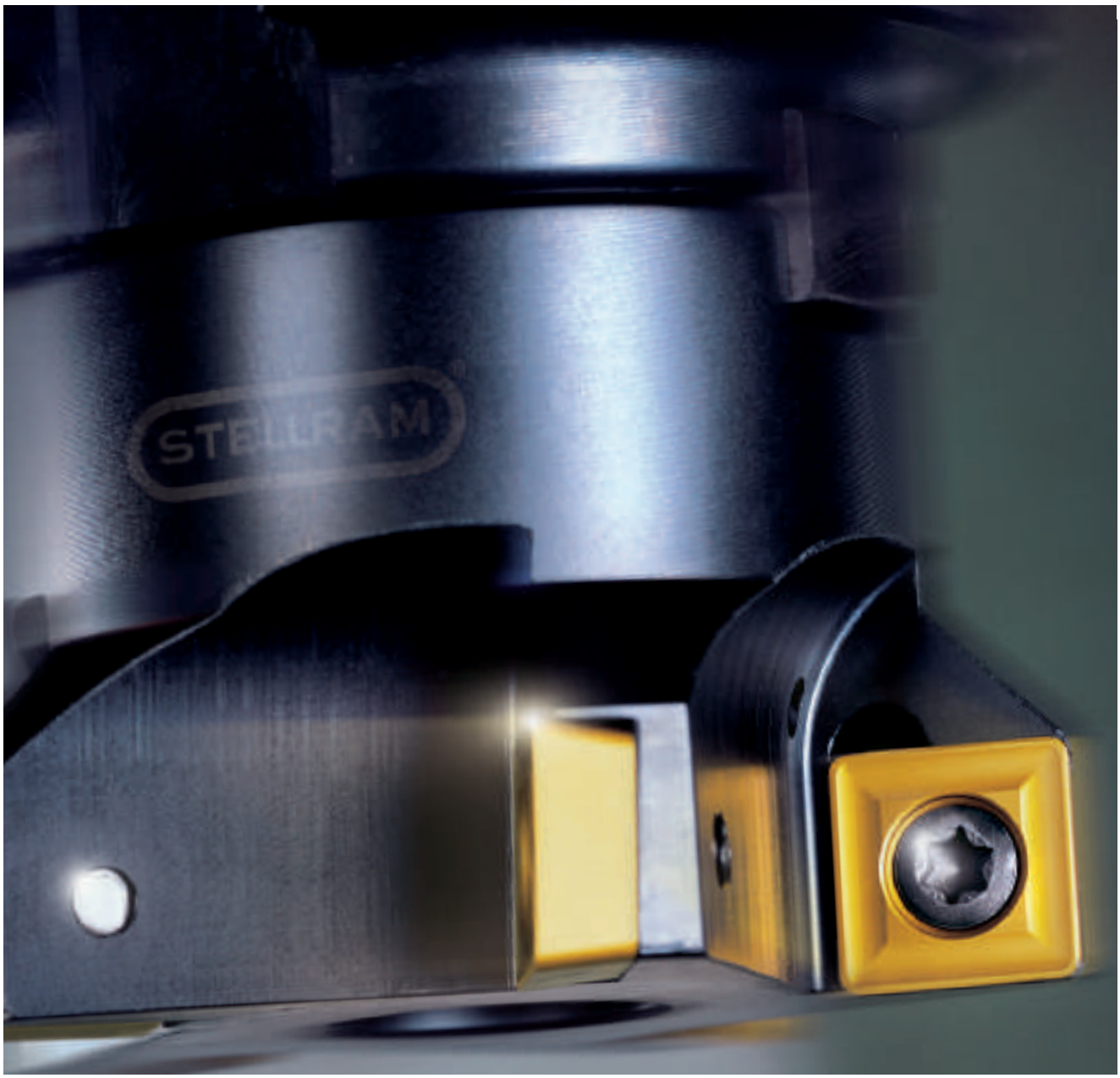
Esta herramienta debe de utilizarse solo para las operaciones siguientes: Planeado, escuadrado, ranurado y vaciado.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

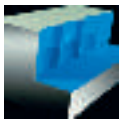
Fresa en picado

Desbaste



Diseñadas para un gran arranque de viruta, particularmente en desbaste, una amplia gama de plaquitas intercambiables de norma en Stellram se montan en estas fresas. Designadas 7791VS, son ideales para mecanizar una amplia variedad de metales, desde aceros inoxidables de todos los tipos, hasta aceros, fundición, aluminio y sus aleaciones y aleaciones refractarias.

Fresa en picado


Perfilado


Vaciado


Ranurado

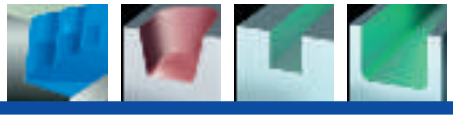

Ranurado

Utilizar la técnica del fresado en picado puede incrementar la productividad entre 3 y 10 veces sobre el contorneado tradicional.

La familia 7791VS de Stellram emplea una fijación en el eje, utilizando plaquitas con 4 aristas de corte alrededor de la periferia, se puede obtener una profundidad de pasada radial de 8mm o 11mm fresando paredes verticales de la pieza, relativamente verticales, haciendo bocados o contorneando. Las plaquitas más pequeñas se utilizan en fresas desde 20mm a 50mm de diámetro mientras que las plaquitas más grandes son utilizadas en fresas desde 63mm a 125mm de diámetro.



7791 VS 09 Fresa en picado







Montaje en el eje



Cabeza modular

7791 VS09 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D	d_1	H	No. de plaquitas	a_e	Recambios EDP#		EDP#	
029092	**7791VS09-A040R**	40	16	32	4	8	015262	D4010T	015240	T15
029101	**7791VS09-A050R**	50	22	40	5	8	015262	D4010T	015240	T15

7791 VS09 Cabeza modular

EDP #	Referencia	Dimensiones (mm) D	d_1	L	No. de plaquitas	M	Recambios EDP#		EDP#	
029137	**7791VS09S025R35**	25	12,5	35	2	M12	015260	D4008T	015240	T15
029138	**7791VS09S032R43**	32	17,0	43	3	M16	015262	D4010T	015240	T15

Amarres para cabezas modulares ver página A228 - A229.

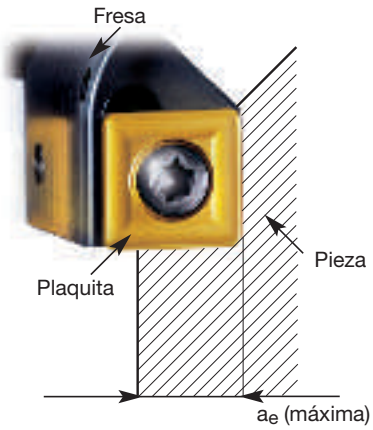


7791 VS 09 Consejos técnicos

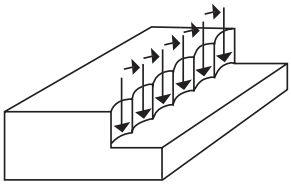
Ejemplo de pedido fresa: **7791VS09-A040R**
Ejemplo de pedido plaquitas: **SCMT09T308EN-41 SP6564**

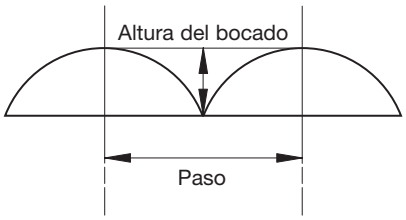
Definición de la herramienta Altura del bocado y paso

	Definición de la herramienta (mm)			
Diámetro	25	32	40	50
Dimensión de la plaquita	9	9	9	9
a_e max	6,0	6,0	8,0	8,0
Altura del bocado	Paso (mm)			
0,25	4,97	5,63	6,30	7,05
0,50	7,00	7,94	8,89	9,95
0,75	8,53	9,68	10,85	12,16
1	9,80	11,14	12,49	14,00
2	13,56	15,49	17,44	19,60
3	16,25	18,65	21,07	23,75
4	18,33	21,17	24,00	27,13
5	20,00	23,24	26,46	30,00
6	21,35	24,98	28,57	32,50
7			30,40	34,70
8			32,00	36,66
9				
10				



La altura del bocado está calculada con relación al paso.



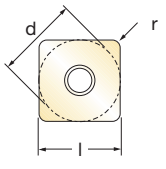


La pasada lateral máxima está directamente relacionada con la longitud de la arista de corte de la plaquita.

Para plaquitas tipo: **XD...09 el a_e, max es 8mm.**

La arista de corte no debería de continuar en contacto con el material tras el mecanizado para mantener la calidad de dicha arista.

Plaquitas para 7791 VS 09



SCMT 09_



SCMT 09_ -41



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
018186	**SCMT09T308E**	**GH1**	♦	♦	♦	9,52	9,52	3,97	0,8	0,12
017315	**SCMT09T308EN-41**	**MP91M**	♦♦			9,52	9,52	3,97	0,8	0,04
024107	**SCMT09T308EN-41**	**PFZ**	♦			9,52	9,52	3,97	0,8	0,04
015147	**SCMT09T308EN-41**	**X500**	♦♦			9,52	9,52	3,97	0,8	0,04
027731	**SCMT09T308EN-41**	**SP6564**	♦♦♦			9,52	9,52	3,97	0,8	0,04

Condiciones de corte recomendadas

	▼ Desbaste Velocidad V_c (m/min)	Avance SCMT12 h_m (mm)	P.D.C. Avance SCMT12 a_p (mm)		▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)
♦ Aceros no aleados	130 - 300	0,12 - 0,30	-	-	-	-	-	-
♦ Aceros aleados	105 - 200	0,12 - 0,25	-	-	-	-	-	-
♦ Aceros inoxidables	115 - 240	0,12 - 0,25	-	-	-	-	-	-
♦ Inoxidables PH	-	-	-	-	-	-	-	-
♦ Fundición	105 - 365	0,12 - 0,30	-	-	-	-	-	-
♦ Aluminio y Aleaciones	400 - 1000	0,12 - 0,24	-	-	-	-	-	-
♦ Aleaciones refractarias	30 - 85	0,05 - 0,12	-	-	-	-	-	-
♦ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

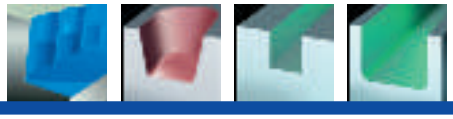
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P ♦	Aceros no aleados	M ♦	Aceros inoxidables	K ♦	Fundición	S ♦	Aleaciones refractarias
P ♦	Aceros aleados	M ♦	Inoxidables PH	N ♦	Aluminio y Aleaciones	H ♦	Materiales duros

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7791 VS 12 Fresa en picado







Montaje en el eje

7791 VS 12 Montaje en el eje

EDP #	Referencia	Dimensiones (mm) D	d_1	H	No. de dientes	a_e	Recamblos EDP#		EDP#	
029102	**7791VS12-A063R**	63	22	40	5	11	015270	F4011T	015240	T15
029103	**7791VS12-A080R**	80	27	50	6	11	015270	F4011T	015240	T15
029104	**7791VS12-A100R**	100	32	50	8	11	015270	F4011T	015240	T15
029105	**7791VS12-A125R**	125	40	63	9	11	015270	F4011T	015240	T15

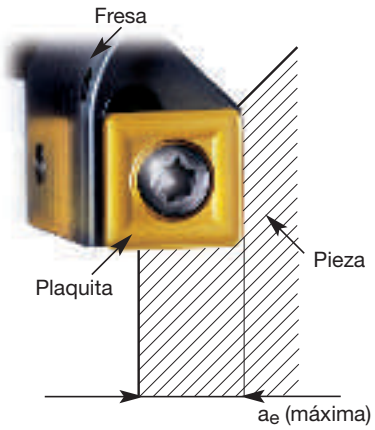


7791 VS 12 Consejos técnicos

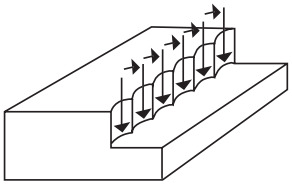
Ejemplo de pedido fresa: **7791VS12-A063R**
Ejemplo de pedido plaquitas: **SCMT12M512E X500**

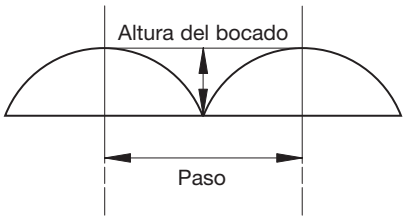
Definición de la herramienta Altura del bocado y paso

	Definición de la herramienta (mm)			
Diámetro	63	80	100	125
Dimensión de la plaquita	12	12	12	12
a_e max	11	11	11	11
Altura del bocado	Paso (mm)			
0,25	7,92	8,93	9,99	11,17
0,50	11,18	12,61	14,11	15,78
0,75	13,67	15,42	17,26	19,31
1	15,75	17,78	19,90	22,27
2	22,09	24,98	28,00	31,37
3	26,83	30,40	34,12	38,26
4	30,72	34,87	39,19	44,00
5	34,06	38,73	43,59	48,99
6	36,99	42,14	47,50	53,44
7	39,60	45,21	51,03	57,48
8	41,95	48,00	54,26	61,19
9	44,09	50,56	57,24	64,62
10	46,04	52,92	60,00	67,82



La altura del bocado está calculada con relación al paso.



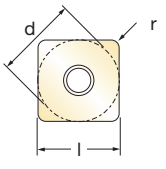


La pasada lateral máxima está directamente relacionada con la longitud de la arista de corte de la plaquita.

Para plaquitas tipo: **SC...12 the a_e, max is 11 mm.**

La arista de corte no debería de continuar en contacto con el material tras el mecanizado para mantener la calidad de dicha arista.

Plaquitas para 7791 VS 12



SCMT 12_



SCMT 12_ -41



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
018192	**SCMT12M508E**	**GH1**	◆			12,7	12,7	5,00	0,8	0,12
017709	**SCMT12M512E**	**GH1**	◆			12,7	12,7	5,00	1,2	0,12
017316	**SCMT12M512E**	**MP91M**	◆◆			12,7	12,7	5,00	1,2	0,12
015227	**SCMT12M512E**	**PFZ**	◆			12,7	12,7	5,00	1,2	0,12
017710	**SCMT12M512E**	**SFZ**	◆◆			12,7	12,7	5,00	1,2	0,12
024129	**SCMT12M512E**	**X500**	◆			12,7	12,7	5,00	1,2	0,12
017317	**SCMT12M512EN-41**	**MP91M**	◆◆			12,7	12,7	5,00	1,2	0,05
024108	**SCMT12M512EN-41**	**PFZ**	◆			12,7	12,7	5,00	1,2	0,05
015226	**SCMT12M512EN-41**	**X500**	◆◆			12,7	12,7	5,00	1,2	0,05
027732	**SCMT12M512EN-41**	**SP6564**	◆◆◆			12,7	12,7	5,00	1,2	0,05

Condiciones de corte recomendadas

	▼ Desbaste Velocidad V_c (m/min)	Avance SCMT12 h_m (mm)	P.D.C. Avance SCMT12 a_p (mm)		▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)
◆ Aceros no aleados	130 - 300	0,12 - 0,30	0,12 - 0,24	-	-	-	-	-
◆ Aceros aleados	105 - 200	0,12 - 0,25	0,12 - 0,20	-	-	-	-	-
◆ Aceros inoxidables	115 - 240	0,12 - 0,25	0,12 - 0,18	-	-	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-
◆ Fundición	105 - 365	0,12 - 0,30	0,12 - 0,25	-	-	-	-	-
◆ Aluminio y Aleaciones	400 - 1000	0,12 - 0,24	0,12 - 0,20	-	-	-	-	-
◆ Aleaciones refractarias	30 - 85	0,05 - 0,12	0,05 - 0,08	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

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Herramientas Modulares



Las cabezas de las herramientas modulares han sido diseñadas para facilitar la búsqueda, Realizadas con un acoplamiento estándar industrial y con amarre cilíndrico y Morse. Una completa gama de técnicas de mecanizado son posibles.

Aplicaciones – Herramientas Modulares



Escuadrado con radio



Ranurado



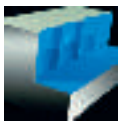
Ranurado



Ranurado



Vaciado



Perfilado



Contor-neado



Contor-neado



Escuadrado

La fresas **5500 V** sirven para realizar operaciones de copiado y acabado. Un tornillo situado centralmente in una base de la plaquita en forma de V proporciona un posicionamiento seguro en el cuerpo de la herramienta.

Las fresas **7690 VA** se encuentran disponibles en versiones de 12mm de profundidad de corte. Se disponen de una amplia variedad de geometrías y calidades para todas alas aplicaciones.

Las fresas **7702 VRD** sirven para operaciones de desbaste y acabado en el mecanizado de moldes. El ángulo axial negativo reduce las vibraciones. Fresas 7712 (plaquitas de dimensiones 12mm y 16mm) tienen un diseño patentado impidiendo la rotación de la plaquita durante operaciones con altos avances y condiciones inestables. El diseño único del alojamiento asegura un preciso número de posicionamientos por plaquita.
La familia **7791** emplea un amarre de fijación por el eje, utilizando plaquitas con cuatro aristas de corte, realiza una profundidad de pasada radial de máximo 8mm, picando hacia abajo en la pared de la pieza, de preferencia vertical, realizando bocados laterales.

Las fresas de gran avance **7792 VXD** están capacitadas para un gran arranque de viruta en operaciones de planeado, picado y ranurado. La plaquita patentada ofrece mejores rendimientos que las fresas a plaquita redonda.

Amarre – Cilíndrico



Mango cilíndrico en aleación de alta densidad

EDP #	Referencia	Dimensiones (mm)					
		L	L_1	D_2	D	D_1	M
029099	**M-13-M8-C16-090**	90	40	16	13	8,5	M8
029139	**M-13-M8-C16-110**	110	60	16	13	8,5	M8
029140	**M-13-M8-C16-130**	130	80	16	13	8,5	M8
029141	**M-13-M8-C16-170**	170	120	16	13	8,5	M8
029142	**M-18-M10-C20-110**	110	60	20	18	10,5	M10
029143	**M-18-M10-C20-130**	130	80	20	18	10,5	M10
029144	**M-18-M10-C20-170**	170	120	20	18	10,5	M10
029145	**M-18-M10-C20-190**	190	140	20	18	10,5	M10
029146	**M-21-M12-C25-131**	131	75	25	21	12,5	M12
029147	**M-21-M12-C25-156**	156	100	25	21	12,5	M12
029148	**M-21-M12-C25-181**	181	125	25	21	12,5	M12
029149	**M-21-M12-C25-206**	206	150	25	21	12,5	M12
029150	**M-21-M12-C25-231**	231	175	25	21	12,5	M12
029151	**M-29-M16-C32-160**	160	100	32	29	17,0	M16
029152	**M-29-M16-C32-210**	210	150	32	29	17,0	M16
029153	**M-29-M16-C32-260**	260	200	32	29	17,0	M16
029154	**M-29-M16-C32-310**	310	250	32	29	17,0	M16

Ejemplo con amarre cilíndrico: M-13-M8-C16-090

Consejos técnicos

M:	Amarre modular
13:	Diámetro tras rosca en la cabeza modular
M8:	Rosca métrica (M)
C16:	Diámetro del mango cilíndrico 16mm
090:	Longitud total de la herramienta

Amarre cono Morse en acero para herramientas

EDP #	Referencia	Dimensiones (mm)					
		L	L_1	CM	D	D_1	M
029100	**M-13-M8-M2-020**	84	20	CM2	13	8,5	M8
029155	**M-13-M8-M2-040**	104	40	CM2	13	8,5	M8
029156	**M-13-M8-M2-060**	124	60	CM2	13	8,5	M8
029157	**M-13-M8-M3-080**	159	80	CM3	13	8,5	M8
029158	**M-13-M8-M3-100**	179	100	CM3	13	8,5	M8
029159	**M-18-M10-M2-020**	84	20	CM2	18	10,5	M10
029160	**M-18-M10-M2-040**	104	40	CM2	18	10,5	M10
029161	**M-18-M10-M2-060**	124	60	CM2	18	10,5	M10
029162	**M-18-M10-M3-080**	159	80	CM3	18	10,5	M10
029163	**M-18-M10-M3-100**	179	100	CM3	18	10,5	M10
029164	**M-21-M12-M3-030**	109	30	CM3	21	12,5	M12
029165	**M-21-M12-M3-045**	124	45	CM3	21	12,5	M12
029166	**M-21-M12-M3-060**	139	60	CM3	21	12,5	M12
029167	**M-21-M12-M3-075**	154	75	CM3	21	12,5	M12
029168	**M-21-M12-M3-085**	164	85	CM3	21	12,5	M12
029169	**M-21-M12-M3-095**	174	95	CM3	21	12,5	M12
029170	**M-21-M12-M4-120**	220	120	CM4	21	12,5	M12
029171	**M-29-M16-M4-035**	134	35	CM4	29	17,0	M16
029172	**M-29-M16-M4-065**	165	65	CM4	29	17,0	M16
029173	**M-29-M16-M4-095**	195	95	CM4	29	17,0	M16
029174	**M-29-M16-M5-120**	249.50	120	CM5	29	17,0	M16
029175	**M-29-M16-M5-150**	279.50	150	CM5	29	17,0	M16
029176	**M-29-M16-M5-180**	309.50	180	CM5	29	17,0	M16



Ejemplo con amarre cono Morse: M-13-M8-M2-020

Consejos técnicos

M: Amarre modular
13: Diámetro tras rosca en la cabeza modular (D)
M8: Rosca métrica (M)
M2: Cono Morse 2
020: Longitud útil de la herramienta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Cabezas modulares



5500 V

5500V

EDP #	Referencia	Dimensiones (mm) D_1	D_2	L	M	d_1	No. de plaquitas	plaquitas	Recamblos EDP#		EDP#	
029128	**5500V08SR25**	8	-	25	M8	8,5	1	RG08S	*022149*	55.671	*018487*	T6
029129	**5500V10SR25**	10	-	25	M8	8,5	1	RG10S	*015250*	55.672	*018488*	T7
029130	**5500V12SR35**	12	-	35	M8	8,5	1	RG12S	*015251*	55.674	*013215*	T10
029131	**5500V16SR35**	16	-	35	M8	8,5	1	RG16S	*022150*	55.675	*015240*	T15
029132	**5500V20SR35**	20	-	35	M10	10.5	1	RG20S	*015252*	55.676	*023256*	T20
029133	**5500V25SR43**	25	-	43	M12	12.5	1	RG25S	*015253*	55.677	*023256*	T20

Para plaquitas y datos de corte referirse a páginas A162 - A173.



7702 VRD

7702VRD

029111	**7702VRD07S015R25**	15	8	25	M8	8,5	2	RD...07...	*015060*	F2505T	*018488*	T7
029112	**7702VRD07S020R25**	20	13	25	M10	10,5	4	RD...07...	*015060*	F2505T	*018488*	T7
029113	**7702VRD07S025R35**	25	18	35	M12	12,5	5	RD...07...	*015060*	F2505T	*018488*	T7
029114	**7702VRD07S030R35**	30	23	35	M16	17,0	5	RD...07...	*015060*	F2505T	*018488*	T7
029234	**7702VRD07S035R35**	35	28	35	M16	17,0	6	RD...07...	*015060*	F2505T	*018488*	T7
029116	**7702VRD10S020R30**	20	10	30	M10	10,5	2	RD...10...	*022056*	F3507T	*015240*	T15
029117	**7702VRD10S025R35**	25	15	35	M12	12,5	3	RD...10...	*022056*	F3507T	*015240*	T15
029118	**7702VRD10S030R35**	30	20	35	M16	17,0	4	RD...10...	*022056*	F3507T	*015240*	T15
029120	**7702VRD10S035R35**	35	25	35	M16	17,0	5	RD...10...	*022056*	F3507T	*015240*	T15

Para plaquitas y datos de corte referirse a páginas A192 - A195.



7712 VRD

7712VRD

029121	**7712VRD12S024R35**	24	12	35	M12	12,5	2	RD...12...	*022056*	F3507T	*015240*	T15
029124	**7712VRD12S035R35**	35	23	35	M16	17,0	3	RD...12...	*022056*	F3507T	*015240*	T15
029125	**7712VRD12S042R43**	42	30	43	M16	17,0	4	RD...12...	*022056*	F3507T	*015240*	T15
029126	**7712VRD16S030R43**	30	14	43	M16	17,0	2	RD...16...	*015270*	F4011T	*023256*	T20
029127	**7712VRD16S032R43**	32	16	43	M16	17,0	2	RD...16...	*015270*	F4011T	*023256*	T20

Para plaquitas y datos de corte referirse a páginas A202 - A205.

7690VA12

EDP #	Referencia	Dimensiones (mm) D	L	M	D_1	No. de plaquitas	plaquitas	Recamblos EDP#	F3007T	EDP#	T8
029134	**7690VA12S020R35**	20	35	M10	10,5	2	AD...12...	027860	F3007T	022157	T8
029135	**7690VA12S025R35**	25	35	M12	12,5	3	AD...12...	027860	F3007T	022157	T8
029136	**7690VA12S032R43**	32	43	M16	17,0	4	AD...12...	027860	F3007T	022157	T8

Para plaquitas y datos de corte referirse a páginas A22 - A23.



7690 VA12

7791VS09

029137	**7791VS09S025R35**	25	35	M12	12,5	2	SC...09...	015260	F4008T	015240	T15
029135	**7791VS09S032R43**	32	43	M16	17,0	3	SC...09...	015262	F4010T	015240	T15

Para plaquitas y datos de corte referirse a páginas A222 - A223.



7791 VS09

7792VXD09

EDP #	Referencia	Dimensiones (mm) D	L/H	l_2	d_1	a_p max.	No. de plaquitas	Recamblos EDP#	F3508T	EDP#	T15
029465	**7792VXD09S025Z3R43**	25	43	M12	29	1,5	3	015069	F3508T	015240	T15
029466	**7792VXD09S032Z3R43**	32	43	M16	29	1,5	3	015064	F3510T	015240	T15

Para plaquitas y datos de corte referirse a páginas A62 - A63.



7792 VXD09

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Fresas Para Ranuras T



Estas fresas permiten hacer ranuras en forma de T tras haber mecanizado con antelación el cuello de la ranura. Se caracterizan por su construcción particularmente compacta y rígida, puesta a punto y patentada por Stellram, permitiendo velocidades de corte y avances mayores que las demás fresas de este tipo.

Todas las fresas para ranuras T de Stellram son de acero para herramientas y nitruradas.



Ranurar T



FRESAS PARA RANURAS T

La fresa **5400 VM** esta concebida específicamente para realizar ranuras en forma de T, tras haber fresado con antelación el cuello de la ranura. Esta fresa patentada es de dientes alternos, dos plaquitas mecanizan la parte superior de la ranura mientras que las otras dos mecanizan la parte inferior.

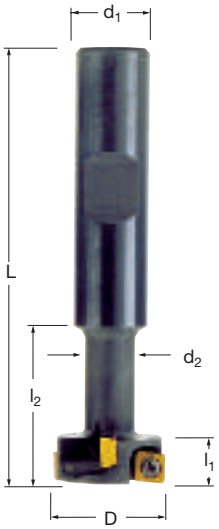
Gracias a los desahogos de particular diseño, las paredes residuales de la fresa son mas gruesas que sobre las herramientas de la competencia, lo que asegura un mayor soporte a las plaquitas y reduciendo el riesgo de vibraciones.

En la medida de lo posible, el fondo de la ranura mecanizada con anterioridad no debería situarse a mas de 1 mm mas abajo que la parte superior de la ranura T; así, las virutas se evacuan por un solo lado, por la ranura que acaba de realizarse con la fresa T.



5400 VM







Amarre Weldon

5400 VM 04 Amarre Weldon

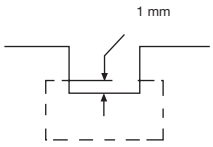
EDP #	Referencia	Dimensiones (mm) D	L	l_1	l_2	d_1	d_2	No. de plaquitas	Recamblos EDP#		EDP#	
021662	**5400VM 04 WA018R**	18	70	8	25	12	8	2R + 2L	015059	F2004T	018487	T6
021663	**5400VM 04 WA021R**	21	75	9	30	12	10	2R + 2L	015059	F2004T	018487	T6



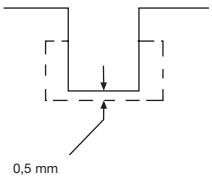
5400 VM 04 Consejos técnicos

Ejemplo de pedido fresa: **5400VM04WA021R**
Ejemplo de pedido plaquitas: **MPFW0402PPTR X44**
MPFW0402PPTL X44
Para condiciones de corte completas ver página: **A288**

a)

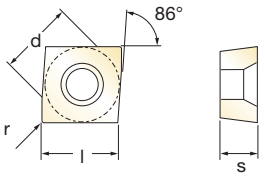


b)



Cuando sea posible, Stellram recomienda el fresado según el método a). Es indispensable utilizar un fuerte chorro de aire comprimido o una refrigeración abundante para asegurarse de la adecuada evacuación de la viruta.

Plaquitas para 5400 VM 04



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
024148	**MPFW 04 02PPTR**	**GH1**				4,76	4,76	2,38	Faceta	0,07
025799	**MPFW 04 02PPTL**	**GH1**				4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**				4,76	4,76	2,38	Faceta	0,07
015157	**MPFW 04 02PPTL**	**SFZ**				4,76	4,76	2,38	Faceta	0,07
027902	**MPFW 04 02PPTR**	**SP6564**				4,76	4,76	2,38	Faceta	0,07
027903	**MPFW 04 02PPTL**	**SP6564**				4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**				4,76	4,76	2,38	Faceta	0,07
017426	**MPFW 04 02PPTL**	**X44**				4,76	4,76	2,38	Faceta	0,07

MPFW 04_

017666	**MPHW 04 02PPTR**	**X500**				4,76	4,76	2,38	Faceta	0,07
017667	**MPHW 04 02PPTL**	**X500**				4,76	4,76	2,38	Faceta	0,07

MPHW 04_

Condiciones de corte recomendadas para VM_04

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,08 - 0,12	-	-	-	-	-	-	-
Aceros aleados	70 - 110	0,07 - 0,10	-	-	-	-	-	-	-
Aceros inoxidables	-	-	-	-	-	-	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	140 - 280	0,07 - 0,10	-	-	-	-	-	-	-
Aluminio y Aleaciones	-	-	-	-	-	-	-	-	-
Aleaciones refractarias	-	-	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

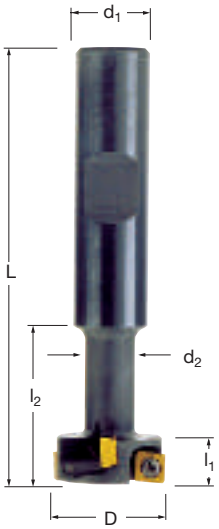
h_m = espesor de la viruta

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Amarre Weldon

5400 VM 06 Amarre Weldon

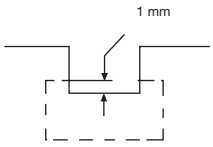
EDP #	Referencia	Dimensiones (mm) D	L	l_1	l_2	d_1	d_2	No. de plaquitas	Recamblos EDP#		EDP#	
021664	**5400VM 06 WA025R**	25	83	11	35	16	12	2R + 2L	015060	F2505T	018488	T7



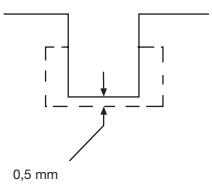
5400 VM 04 Consejos técnicos

Ejemplo de pedido fresa: **5400VM06WA025R**
Ejemplo de pedido plaquitas: **MPHW0602PPTR MP91M**
MPHW0602PPTL MP91M
Para condiciones de corte completas ver página: **A288**

a)

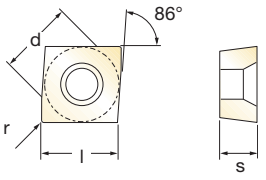


b)



Cuando sea posible, Stellram recomienda el fresado según el método a). Es indispensable utilizar un fuerte chorro de aire comprimido o una refrigeración abundante para asegurarse de la adecuada evacuación de la viruta.

Plaquitas para 5400 VM 06



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	◆			6,35	6,35	2,38	Faceta	0,02
024926	**MPEX 06 02PPFL-701**	**GH1**	◆			6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017639	**MPEX 06 02PPFL-701**	**SFZ**				6,35	6,35	2,38	Faceta	0,02
017649	**MPFW 06 02PPTR**	**GH1**				6,35	6,35	2,38	Faceta	0,07
017652	**MPFW 06 02PPTL**	**GH1**				6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	◆			6,35	6,35	2,38	Faceta	0,07
015159	**MPFW 06 02PPTL**	**SFZ**	◆			6,35	6,35	2,38	Faceta	0,07
027904	**MPFW 06 02PPTR**	**SFZ**	◆			6,35	6,35	2,38	Faceta	0,07
027905	**MPFW 06 02PPTL**	**SFZ**	◆			6,35	6,35	2,38	Faceta	0,07
017301	**MPHW 06 02PPTR**	**MP91M**				6,35	6,35	2,38	Faceta	0,07
017300	**MPHW 06 02PPTL**	**MP91M**				6,35	6,35	2,38	Faceta	0,07
017669	**MPHW 06 02PPTL**	**X500**				6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**				6,35	6,35	2,38	Faceta	0,07
015180	**MPMT 06 0204EN-43**	**X500**				6,35	6,35	2,38	0,4	0,04

MPEX 06_ -701



MPFW 06_



MPHW 06_



MPMT 06_ -43



Condiciones de corte recomendadas para VM_06

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
Aceros no aleados	180 - 220	0,10 - 0,15	-	-	-	-	-	-	-
Aceros aleados	70 - 110	0,08 - 0,12	-	-	-	-	-	-	-
Aceros inoxidables	-	-	-	-	-	-	-	-	-
Inoxidables PH	-	-	-	-	-	-	-	-	-
Fundición	140 - 280	0,08 - 0,12	-	-	-	-	-	-	-
Aluminio y Aleaciones	275 - 450	0,06 - 0,10	-	-	-	-	-	-	-
Aleaciones refractarias	-	-	-	-	-	-	-	-	-
Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

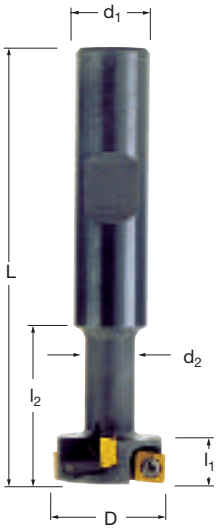
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

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Amarre Weldon

5400 VM 08 Amarre Weldon

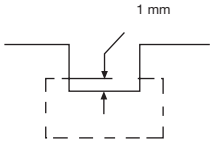
EDP #	Referencia	Dimensiones (mm) D	L	l_1	l_2	d_1	d_2	No. de plaquitas	Recamblos EDP#		EDP#	
018313	**5400VM 08 WA032R**	32	91	14	43	16	15	2R + 2L	015063	F3008T	013214	T9



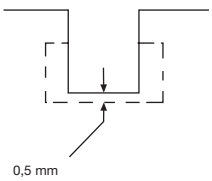
5400 VM 08 Consejos técnicos

Ejemplo de pedido fresa: **5400VM08WA032R**
Ejemplo de pedido plaquitas: **MPFW0803PPTR SFZ**
MPFW0803PPTL SFZ
Para condiciones de corte completas ver página: **A288**

a)

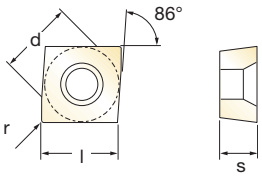


b)



Cuando sea posible, Stellram recomienda el fresado según el método a). Es indispensable utilizar un fuerte chorro de aire comprimido o una refrigeración abundante para asegurarse de la adecuada evacuación de la viruta.

Plaquitas para 5400 VM 08



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017642	**MPEX 08 03PPFR-701**	**GH1**	◆			7,94	7,94	3,18	Faceta	0,02
024928	**MPEX 08 03PPFL-701**	**GH1**	◆			7,94	7,94	3,18	Faceta	0,02
017640	**MPEX 08 03PPER-701**	**PFZ.**				7,94	7,94	3,18	Faceta	0,02
017641	**MPEX 08 03PPEL-701**	**PFZ.**				7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017490	**MPEX 08 03PPFL-701**	**SFZ**				7,94	7,94	3,18	Faceta	0,02
017655	**MPFW 08 03PPTR**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017658	**MPFW 08 03PPTL**	**GH1**				7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**				7,94	7,94	3,18	Faceta	0,1
017656	**MPFW 08 03PPTL**	**SF30**				7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	◆◆			7,94	7,94	3,18	Faceta	0,1
017659	**MPFW 08 03PPTL**	**SFZ**	◆◆			7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**				7,94	7,94	3,18	Faceta	0,1
017657	**MPFW 08 03PPTL**	**X44**				7,94	7,94	3,18	Faceta	0,1
017297	**MPHT 08 03PPTR-42**	**MP91M**				7,94	7,94	3,18	Faceta	0,1
017296	**MPHT 08 03PPTL-42**	**MP91M**				7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
023249	**MPHT 08 03PPTL-42**	**PFZ**				7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTR-42**	**SP6564**	◆			7,94	7,94	3,18	Faceta	0,1
027907	**MPHT 08 03PPTL-42**	**SP6564**	◆			7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**				7,94	7,94	3,18	Faceta	0,1
015138	**MPHT 08 03PPTL-42**	**X500**				7,94	7,94	3,18	Faceta	0,1
017670	**MPMW 08 0304TN**	**SF30**				7,94	7,94	3,18	0,4	0,1

MPEX 08_ -701



MPFW 08_



MPHT 08_ -42



MPMW 08_



Condiciones de corte recomendadas para VM_08

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Aceros no aleados	180 - 220	0,12 - 0,18	-	-	-	-	-	-	-
◆ Aceros aleados	70 - 110	0,10 - 0,15	-	-	-	-	-	-	-
◆ Aceros inoxidables	-	-	-	-	-	-	-	-	-
◆ Inoxidables PH	-	-	-	-	-	-	-	-	-
◆ Fundición	140 - 280	0,10 - 0,15	-	-	-	-	-	-	-
◆ Aluminio y Aleaciones	275 - 450	0,06 - 0,10	-	-	-	-	-	-	-
◆ Aleaciones refractarias	-	-	-	-	-	-	-	-	-
◆ Aceros duros (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = espesor de la viruta

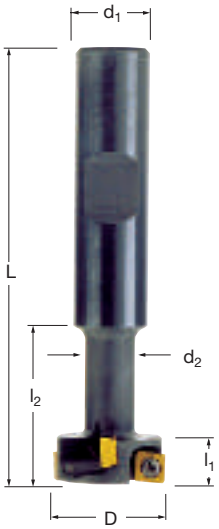
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros







Amarre Weldon

5400 VM 11 Amarre Weldon

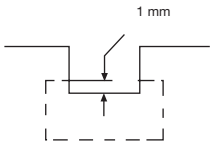
EDP #	Referencia	Dimensiones (mm) D	L	l_1	l_2	d_1	d_2	No. de plaquitas	Recamblos EDP#		EDP#	
021665	**5400VM 11 WA040R**	40	106	18	50	25	19	2R + 2L	015062	D4010T	015240	T15

5400 VM 11 Consejos técnicos

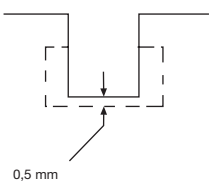


Ejemplo de pedido fresa: **5400VM11WA040R**
Ejemplo de pedido plaquitas: **MPFW1104PPTR X44**
MPFW1104PPTL X44
Para condiciones de corte completas ver página: **A288**

a)

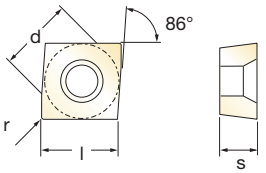


b)



Cuando sea posible, Stellram recomienda el fresado según el método a). Es indispensable utilizar un fuerte chorro de aire comprimido o una refrigeración abundante para asegurarse de la adecuada evacuación de la viruta.

Plaquitas para 5400 VM 11



EDP #	Referencia	Calidad	Operaciones & Material ▼ Desbaste	▼▼ Semi-acabado	▼▼▼ Acabado	Dimensiones (mm) d	l	s	r	h_m min
017643	**MPEX 11 04PPFR-701**	**GH1**	◆			11,11	11,11	4,76	Faceta	0,02
017644	**MPEX 11 04PPFL-701**	**GH1**	◆			11,11	11,11	4,76	Faceta	0,02
017440	**MPFW 11 04PPTR**	**GH1**				11,11	11,11	4,76	Faceta	0,15
017439	**MPFW 11 04PPTL**	**GH1**				11,11	11,11	4,76	Faceta	0,15
018182	**MPFW 11 04PPTR**	**SF30**				11,11	11,11	4,76	Faceta	0,15
018181	**MPFW 11 04PPTL**	**SF30**				11,11	11,11	4,76	Faceta	0,15
017660	**MPFW 11 04PPTR**	**SFZ**	◆◆			11,11	11,11	4,76	Faceta	0,15
017662	**MPFW 11 04PPTL**	**SFZ**	◆◆			11,11	11,11	4,76	Faceta	0,15
017777	**MPFW 11 04PPTR**	**X44**				11,11	11,11	4,76	Faceta	0,15
017336	**MPFW 11 04PPTL**	**X44**				11,11	11,11	4,76	Faceta	0,15
017299	**MPHT 11 04PPTR-42**	**MP91M**				11,11	11,11	4,76	Faceta	0,1
017298	**MPHT 11 04PPTL-42**	**MP91M**				11,11	11,11	4,76	Faceta	0,1
027908	**MPHT 11 04PPTR-42**	**SP6564**	◆			11,11	11,11	4,76	Faceta	0,1
027909	**MPHT 11 04PPTL-42**	**SP6564**	◆			11,11	11,11	4,76	Faceta	0,1
015142	**MPHT 11 04PPTR-42**	**X500**				11,11	11,11	4,76	Faceta	0,1
015141	**MPHT 11 04PPTL-42**	**X500**				11,11	11,11	4,76	Faceta	0,1

MPEX 11_ -701



MPFW 11_



MPHT 11_ -42



Condiciones de corte recomendadas para VM_11

Material	▼ Desbaste Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼ Semi-acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)	▼▼▼ Acabado Velocidad V_c (m/min)	Avance h_m (mm)	P.D.C. a_p (mm)
◆ Unalloyed Steels	180 - 220	0,12 - 0,20	-	-	-	-	-	-	-
◆ Alloyed Steels	70 - 110	0,10 - 0,18	-	-	-	-	-	-	-
◆ Stainless Steels	-	-	-	-	-	-	-	-	-
◆ PH Stainless	-	-	-	-	-	-	-	-	-
◆ Cast Irons	140 - 280	0,10 - 0,18	-	-	-	-	-	-	-
◆ Aluminium & Alloys	275 - 450	0,06 - 0,10	-	-	-	-	-	-	-
◆ High Temp. Alloys	-	-	-	-	-	-	-	-	-
◆ Hard Steels (52-56 HRC)	-	-	-	-	-	-	-	-	-

h_m = average chip thickness

Estrella guía Llave para encontrar la herramienta idónea

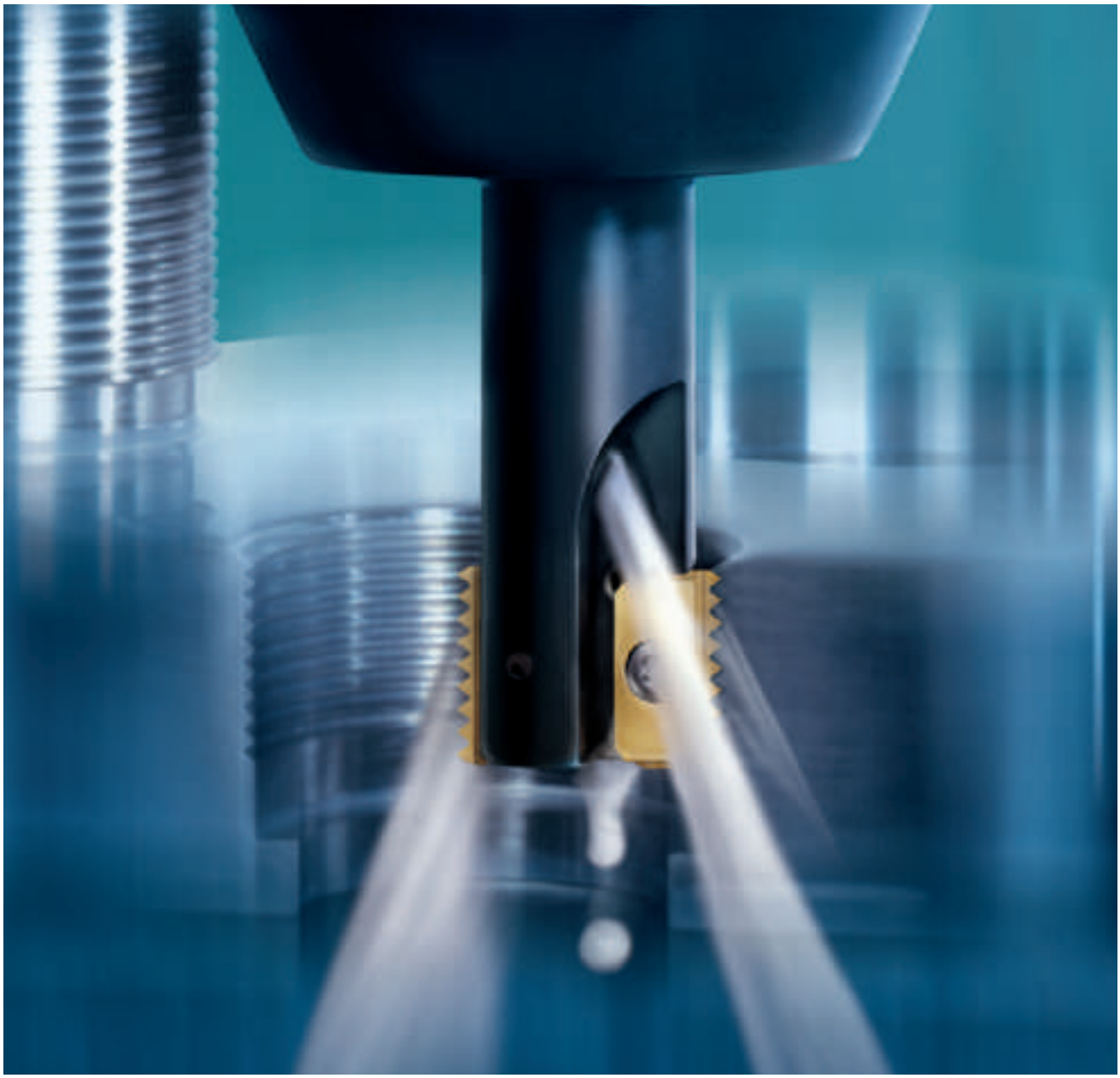


Código ISO de materiales

P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

STELLRAM®

Roscado por Fresado



La aparición de los centros de mecanizado modernos ha permitido la mecanización con varios ejes simultáneamente. Las operaciones de roscado por fresado pueden así realizarse muy fácilmente, utilizando los programas de interpolación helicoidal, de manera económica con herramientas y métodos modernos.

La gama de Stellram incluye herramientas en metal duro integral capaces de realizar roscas tales como M6 o 1/4" UNC, y el sistema patentado con plaquitas intercambiables, con una, dos o cuatro plaquitas para un amplio abanico de operaciones de roscado.

La gama de roscado por fresado de Stellram es 100% de perfil completo tanto en las plaquitas intercambiables como las fresa de metal duro integral.



1. Todas las fresas para roscar Stellram son de perfil completo
2. La rosca realizable se encuentra dentro del límite de 1 hilo del fondo de agujeros ciegos o topes.
3. No hace falta hacer desahogos en la pieza a mecanizar, así hacen falta menos herramientas.
4. Realiza roscas de todas las dimensiones y tolerancias.
5. Las roscas obtenidas son fiables y constantes
6. Roscas a izquierdas y a derechas pueden ser hechascon la misma herramienta.
7. Ejecuta una rosca con una sola regulación de maquina
8. Las herramientas con las formas NPT, NPTF, BSPT, BSW realizan indiferentemente roscas interiores o exteriores, a derechas o a izquierdas.
9. La viruta es fácil de evacuar
10. Menos potencia necesaria
11. El corte intermitente o la sobrecarga en piezas fundidas no son problemas.
12. Excelente acabado con lo cual se evita la operación de desbarbado
13. Las roscas con varias entradas son fáciles de realizar.
14. Nada de machos rotos a extraer



GRATUITO Software de Roscado por Fresado
Disponga de nuestro software pidiéndolo simplemente

Características

- Concebido con un menú de opciones para las formas, las dimensiones de la rosca y los materiales a mecanizar.
- Recomienda los mejores porta herramientas y plaquitas.
- Calcula automáticamente los avances y las velocidades de corte
- Genera programas para los controles numéricos de la mayoría de las maquinas CNC



Roscado por Fresado



Exterior a derechas



Exterior a izquierdas



Interior a derechas



Interior a izquierdas

Trayectoria de la fresa

Como para la mayoría de las operaciones de fresado, POR TREPADO cada vez que esto sea posible. Sin embargo hay dos factores a considerar en el momento de escoger la trayectoria de la herramienta para el roscado por fresado:

1. **Mejor manera de trabajar para la herramienta**
2. **Las reacciones de la viruta en el agujero**

Virutas que vuelven pueden ser la causa de una disminución de la vida de la herramienta y de una deterioración de la rosca. Por consiguiente, en la medida de lo posible, empezar todas las operaciones de roscado interior desde el fondo del agujero mecanizando hacia el exterior, utilizando la buena interpolación para darle a la rosca la buena dirección de los hilos.

Introducción de la fresa

La fresa para roscar debe de introducirse y extraerse con un ángulo de hélice idéntico al de la rosca realizada, por interpolación helicoidal. Ventajas:

1. **Un ataque suave sobre la arista de corte en toda la profundidad de la rosca.**
2. **Una rosca conforme y precisa sin deformación del perfil.**

Importante

Los avances demasiado elevados pueden provocar:

1. **Un mal acabado**
2. **Una flexión de la herramienta**
3. **Una reducción de la vida**

Los avances demasiado bajos pueden provocar:

1. **Vibraciones**
2. **Deformación de la rosca**
3. **Desgaste demasiado rápido**

Compensación del avance

Los controles numéricos controlan el avance al centro de la herramienta. Cuando se realizan roscas interiores el diámetro de interpolación en el centro de la fresa es mas pequeño que el del diámetro a mecanizar. El avance debe por lo tanto disminuirse. En el caso de roscas exteriores, tenemos el fenómeno inverso (diámetro de interpolación en el centro de la fresa mas grande que el de la rosca a realizar), por lo cual hay que incrementar el avance.

Las tablas y formulas a continuación indican los cálculos de la compensación tanto para las roscas interiores como exteriores.



Amarre de la herramienta

Stellram recomienda que todas las fresas a plaquita intercambiable con amarre Weldon, así como las fresas para roscar en metal duro integral se monten únicamente en porta fresas a fijación lateral o con apriete hidráulico. Estos métodos de fijación aportan una mayor precisión de concentricidad e incrementa la rigidez.

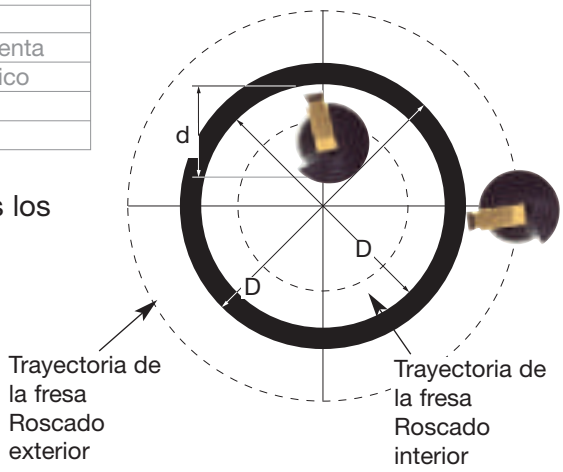
Programa de calculo del avance

Interior		
F	=	RPM x fz
D	=	Diámetro de la rosca
d	=	Diámetro de la herramienta
fz	=	Avance por diente teórico
Pf	=	Avance a programar
Avance		Pf = F - ((F x d) / D)

Exterior		
F	=	RPM x fz
D	=	Diámetro de la rosca
d	=	Diámetro de la herramienta
fz	=	Avance por diente teórico
Pf	=	Avance a programar
Avance		Pf = F + ((F x d) / D)

Stellram provee gratuitamente un software que calcula todos los parámetros del recorrido.

Trayectoria de la fresa



Software de Roscado por Fresado



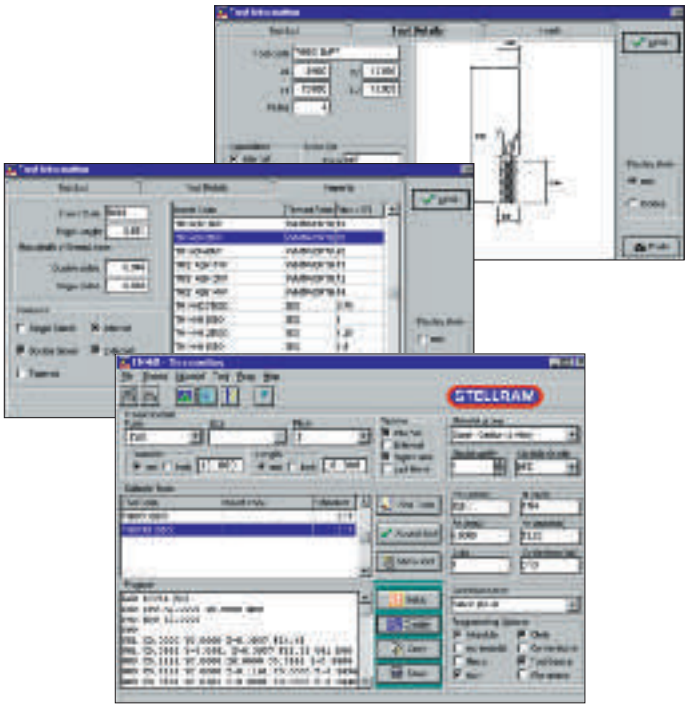
Stellram pone a su disposición gratuitamente un software para M.S.DOS/Microsoft Windows que permite al usuario seleccionar la herramienta adaptada a su especifica aplicación.

Características

- Concebido con un menú de opciones para formas, dimensiones de la rosca y materiales a mecanizar.
- Recomienda la mejor herramienta
- Limites de seguridad en el valor de los avances
- Limites de seguridad para reducir los riesgos de deformación
- Calculo automático de la compensación del valor de los avances
- Programas parciales para los controles numéricos de la mayoría de las maquinas CNC

Ventajas

- Detalle y dimensiones de las roscas
- Detalle y dimensiones de la fresa
- Foto de la herramienta
- Valores de corte adaptados
- Avance en función de la herramienta y del material
- Programación parcial sin problemas



Programación manual y ejemplos

Stellram preconiza la utilización de su software, disponible gratuitamente con solo pedirlo. Sin embargo cada cual es libre de generar sus programas manualmente, el método y los ejemplos a continuación pueden servir de ayuda.

Si desea mas amplias informaciones sobre la programación, contacte con nuestro equipo técnico.



Programa Heidenhain para roscas NPT 1/2"	
0	BEGIN PGM 069 MM
1	FN4 Q99 = +25,4DIV+(TPI (i.e.14))
2	FN0 Q1 = +0,0 (ÁNGULO DE ATAQUE)
3	FN0 Q2 = +2,0 (ÁNGULO DE INCREMENTACIÓN)
4	FN0 Q3 = +0,056 (CONO)
5	FN0 Q5 = +(RADIO DE ATAQUE)
6	(PROBAR 1.5 MM Y ADAPTAR)
7	FN4 Q6 = +Q3 DIV+180,0 (AUMENTAR RADIO 2 GRADOS)
8	FN4 Q7 = +Q99 DIV +180,0 (AUMENTAR RADIO 2 GRADOS)
9	FN0 Q3 = +0,0 (ATAQUE Z)
10	L X0,0 Y0,0 Z+15,0 R F9999 M13
11	L Z0,0 R F500 M
12	L X+Q5 Y0,0 R0 F(VALOR DE AVANCE) M
13	LBL 1
14	FN6 Q10 = SIN +Q1
15	FN7 Q11 = COS +Q1
16	FN3 Q10 = +Q10 X +Q5
17	FN3 Q11 = Q11 X + Q5
18	L X+Q11 Y+Q10 Z+Q8 R F M90 (ALTER LAG TO 1)
19	FN1 Q1 = +Q1+ + Q2 (ÁNGULO DE INCREMENTACIÓN)
20	FN1 Q8 = +Q8+ +Q7 (INCREMENTACIÓN AXR Z)
21	FN1 Q5+ +Q5+ +Q6 (INCREMENTACIÓN EJES X Y Y)
22	FN12 IF + Q1 LT + Q9 GO TO LBL1
23	LBL 0
24	LX0,0 Y0,0 R F1000 M
25	Z+15,0 R0 F9999 M
26	END PGM 069 MM
LAG =	Parámetro 60 = 1 en sistemas 2500 e inferiores, en superiores a 2500, con parámetros usuario.

Control Heidenhain valido para todos los niveles de control	
Ejemplo:	M36 X 4 mm PASO
Utilizar:	5900V30W029R
Plaquita:	TM30N4ISO SFZ
Por lo tanto:	R = 18-14,5 = 3,5 mm, R/2 = 1,75 mm
L	X0 Y0
LZ	- (HACIA EL FONDO DEL HILO)
CC	IY+0,00 IX + (R/2) F--
CP	IPA + 180,0 IZ + (1/8 PASO) DR+
LP	R(R/2) PA0
CC	IX-R IY0,0
CP	IPA +360,0 IZ + (PASO) DR+
CC	IX-(R/2) IY0,0
CP	IPA+180,0 IZ + (1/8 PASO) DR+

Control Fanuc	
R = Radio de la trayectoria de la herramienta	
Comienzo en el fondo de la rosca en el centro del agujero.Rosca a derechas – fresado por trepado (avance con el eje Z subiendo) Las medidas entre paréntesis deberán ser sustituidas por las correctas de la rosca a mecanizar Stellram recomienda que todos los programas de roscado por fresado se hagan con cotas en valores absolutos, con transferencia de datos entre los agujeros. Eso permite eliminar los posibles errores de posicionamiento.	
G90	G00 X0 Y0 Z0
G01	Z-(PROFUNDIDAD) F1000
G01	G41 X(R/2) Y-(R/2) F-- D-- OR H--
G03	X(R) Y0 R(R/2) Z(1/8 PASO)
G03	X(R) Y0 I - (R) J0,0 Z (PASO)
G03	X(R/2) Y(R/2) R(R/2) Z(1/8 PASO)
G01	G40 X(0) Y-(0)
G00	Z0

Programa para Fanuc NPT 1/2"	
S----	M13
G00	X0 Y0 Z0
G01	X0 Y0 Z-16,57 F----
G41	X0,784 Y-0,784 (D OR H WORD)
G03	X1,569 Y0 Z-16,343 I0 J0,784 F--- (COMPENSADO)
G03	X0 Y1,583 Z-15,889 I-1,583 J0
G03	X-1,597 Y0 Z-15,436 I0 J-1,597
G03	X0 Y-1,612 Z-14,982 I1,612 J0
G03	X1,626 Y0 Z-14,528 I0 J1,626
G03	X0,813 Y0,813 Z-14,302 I-0,813 J0
G01	G40 X0 Y0
G00	Z-5,684
G01	G41 X0,954 Y-0,954 (D OR H WORD) F---
G03	X1,909 Y0 Z-5,457 I0 J0,954
G03	X0 Y1,923 Z-5,003 I-1,923 J0
G03	X-1,938 Y0 Z-4,550 I0 J-1,938
G03	X0 Y-1,952 Z-4,096 I1,952 J0
G03	X1,966 Y0 Z-3,643 I0 J1,966
G03	X0,983 Y0,983 Z-3,416 I-0,983 J0
G01	G40 X0 Y0
G00	X0 Y0 Z0

Fresas para Roscar en Metal duro Integral



Las fresas para roscar de Stellram en metal duro integral, se fabrican en maquinas de control numérico de ultima tecnología, cada fresa es controlada rigurosamente con el fin de asegurar que le sean entregadas en un perfecto estado.



Se utilizan habitualmente para mecanizar roscas interiores, donde las ventajas de los dientes múltiples y del metal duro integral son incontestables:

- **Corte equilibrado**
- **Rigidez**
- **Mayor avance**

Aplicaciones – Roscado con Fresas en Metal duro Integral


ISO


Unificado


Whitworth









La gama de fresas stellram para roscar de Stellram en metal duro integral ha sido concebida para roscas cuya relación longitud/diámetro sea de 1.5 : 1 para asegurar una rigidez máxima.

Estas herramientas han sido desarrolladas para su utilización en maquinas con control numérico capaces de trabajar con 3 ejes simultáneamente.

Todas las fresas para roscar tienen ranuras helicoidales y son 100 % a perfil completo. Estas fresas harán una rosca perfecta cada vez y de una sola pasada.

La calidad DFZ de Stellram es la calidad única para todo tipo de aplicaciones. Se utiliza sobre todos los materiales, tanto que sean aleaciones refractarias para la industria aeronáutica, aceros inoxidables, o metales ferrosos y no ferrosos.

CALIDAD DFZ

Se dispone de esta calidad para todas las fresas para roscar en metal duro integral.

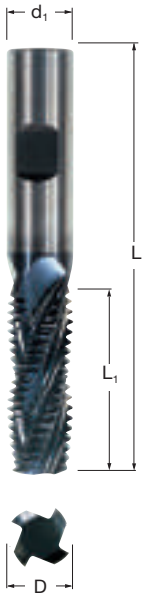
La base es un metal duro micrograno al cual se le pone un revestimiento Al TiN PVD, que aporta :

Una gran estabilidad a altas temperaturas
Un bajo coeficiente de fricción

Conviene pues para todos los materiales y todas las aplicaciones de roscado por fresado con herramientas de metal duro integral.


Cilíndrica


Cónica



TMSCN Cilíndrica

ISO 60° TMSCN Cilíndrica

EDP #	Referencia	Dimensiones (mm) D	d1	L	L1	Grade	No. de dientes	No. de hilos	Paso mm	Norm	Paso fino
023491	**TMSCN0.7ISO**	2,8	6	60	8,4	DFZ	3	12	0,70	M4	-
023492	**TMSCN0.8ISO**	3,5	6	60	10,4	DFZ	3	13	0,80	M5	-
021587	**TMSCN1.0ISO**	4,1	6	60	11,0	DFZ	3	11	1,00	M6	-
021588	**TMSCN1.25ISO**	5,6	6	60	17,5	DFZ	3	14	1,25	M8	M10, M12
018302	**TMSCN1.5ISO**	7,1	8	60	16,5	DFZ	3	11	1,50	M10	M14
021589	**TMSCN1.75ISO**	8,6	10	70	21,0	DFZ	3	12	1,75	M12	-
018303	**TMSCN2.0ISO**	11,9	12	83	26,0	DFZ	3	13	2,00	M16	-
021590	**TMSCN2.5ISO**	15,0	16	100	35,0	DFZ	4	14	2,50	M20	-
021591	**TMSCN3.0ISO**	18,2	20	120	42,0	DFZ	4	14	3,00	M24	-
021592	**TMSCN3.5ISO**	19,9	20	120	52,5	DFZ	4	15	3,50	M30	-
021593	**TMSCN4.0ISO**	19,9	20	120	52,0	DFZ	4	13	4,00	M36	-
023493	**TMSCN1.5ISO16MM**	15,9	16	100	42,0	DFZ	4	28	1,50	-	-
023495	**TMSCN2.0ISO16MM**	15,9	16	100	46,0	DFZ	4	23	2,00	-	-
023496	**TMSCN2.0ISO20MM**	19,9	20	120	56,0	DFZ	5	28	2,00	-	-

UNC 60° TMSCN Cilíndrica

EDP #	Referencia	Dimensions (mm) D	d1	L	L1	Calidad	No. de dientes	No. de hilos	TPI	Rosca	
021577	**TMSCN20UNC**	4,1	6	60	10,16	DFZ	3	8	20	1/4"	UNC
021578	**TMSCN18UNC**	5,3	6	60	12,70	DFZ	3	9	18	5/16"	UNC
021579	**TMSCN16UNC**	6,5	8	60	14,29	DFZ	3	9	16	3/8"	UNC
018301	**TMSCN14UNC**	7,7	8	60	18,49	DFZ	3	10	14	7/16"	UNC
021581	**TMSCN13UNC**	8,9	10	70	21,49	DFZ	3	11	13	1/2"	UNC
021580	**TMSCN12UNC**	9,9	10	70	23,28	DFZ	3	11	12	9/16"	UNC
021582	**TMSCN11UNC**	11,4	12	83	27,70	DFZ	3	11	11	5/8"	UNC
018566	**TMSCN10UNC**	14,4	16	100	30,48	DFZ	4	12	10	3/4"	UNC
021583	**TMSCN9UNC**	15,9	16	100	39,51	DFZ	4	14	9	7/8"	UNC
021584	**TMSCN8UNC**	19,2	20	120	38,10	DFZ	4	12	8	1"	UNC
021585	**TMSCN7UNC**	19,9	20	120	43,54	DFZ	4	12	7	1 1/8" - 1 1/4"	
021586	**TMSCN6UNC**	19,9	20	120	59,27	DFZ	4	14	6	1 3/8" - 1 1/2"	

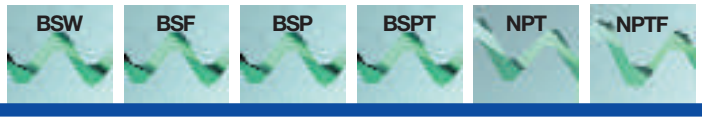
UNF 60° TMSCN Cilíndrica

017022	**TMSCN28UNF**	4,5	6	60	9,98	DFZ	3	11	28	1/4"	UNF
017023	**TMSCN24UNF**	5,8	6	60	14,82	DFZ	3	14	24	5/16" - 3/8"	UNF
017024	**TMSCN20UNF**	8,5	10	70	20,32	DFZ	3	16	20	7/16" - 1/2"	UNF
017025	**TMSCN18UNF**	11,3	12	83	25,40	DFZ	4	18	18	9/16" - 5/8"	UNF
017026	**TMSCN16UNF**	15,6	16	100	36,51	DFZ	4	23	16	3/4"	UNF
017027	**TMSCN14UNF**	15,9	16	100	39,91	DFZ	4	22	14	7/8"	UNF
023494	**TMSCN12UNF**	15,9	16	100	38,10	DFZ	4	18	12	1" - 1 1/2"	UNF

TMSC Consejos técnicos

Ejemplo de pedido de fresa para roscar: **TMSCN14UNF**
Para condiciones de corte completas ver pagina: **A288**





BSW 55° TMSCEN Cilíndrica

EDP #	Referencia	Dimensions (mm) D	d_1	L	L_1	Grade	No. de Flutes	No. de Pitches	TPI	Thread	
023487	**TMSCEN14BSW**	7,67	8	60	18,14	DFZ	3	10	14	7/16"	BSW
021597	**TMSCEN12BSW**	8,6	10	70	19,05	DFZ	3	9	12	1/2", 9/16"	BSW
021598	**TMSCEN11BSW**	11,2	12	85	25,4	DFZ	3	11	11	3/8", 11/16"	BSW
021599	**TMSCEN10BSW/BSF**	13,8	16	100	20,32	DFZ	4	13	10	3/4"	BSW

BSF 55° TMSCEN Cilíndrica

021603	**TMSCEN22BSF**	5,5	8	60	12,70	DFZ	3	11	22	5/16"	BSF
021604	**TMSCEN20BSF**	6,8	8	60	13,97	DFZ	3	11	20	3/8"	BSF
021605	**TMSCEN18BSF**	7,9	8	60	15,52	DFZ	3	11	18	7/16"	BSF
021606	**TMSCEN16BSF**	9,3	10	70	17,46	DFZ	3	11	16	1/2" - 9/16"	BSF
021607	**TMSCEN14BSF**	9,3	10	70	19,96	DFZ	3	11	14	5/8" - 11/16"	BSF
021608	**TMSCEN12BSF**	14,5	16	100	33,87	DFZ	4	16	12	3/4" - 13/16"	BSF
021609	**TMSCEN11BSF**	15,9	16	100	39,25	DFZ	4	17	11	7/8"	BSF
021599	**TMSCEN10BSW/BSF**	13,8	16	100	33,02	DFZ	4	13	10	1"	BSF

BSP 55° TMSCEN Cilíndrica

021619	**TMSCEN28BSP**	7,6	8	60	15,42	DFZ	3	17	28	1/8"	BSP
021620	**TMSCEN19BSP**	9,9	10	70	21,39	DFZ	3	16	19	1/4" - 3/8"	BSP
021621	**TMSCEN14BSP**	15,9	16	100	38,10	DFZ	4	21	14	1/2" - 7/8"	BSP
021622	**TMSCEN11BSP**	19,9	20	120	39,25	DFZ	4	17	11	1" - 4"	BSP

BSPT 55° TMSCEN Cónica

021627	**TMSCEN28BSPT**	7,6	8	60	9,9`8	DFZ	4	11	28	1/8"	BSPT
017754	**TMSCEN19BSPT**	9,9	10	70	14,70	DFZ	4	11	19	1/4" - 3/8"	BSPT
021628	**TMSCEN14BSPT**	15,9	16	100	21,77	DFZ	4	12	14	1/2" - 7/8"	BSPT
021629	**TMSCEN11BSPT**	19,9	20	120	41,56	DFZ	4	18	11	1" - 4"	BSPT

NPT 60° TMSCEN Cónica

021633	**TMSCEN27NPT**	7,6	8	60	9,41	DFZ	4	10	27	1/8"	NPT
023489	**TMSCEN18NPT**	9,9	10	70	14,10	DFZ	4	10	18	1/4" - 3/8"	NPT
021634	**TMSCEN14NPT**	15,9	16	100	19,96	DFZ	4	11	14	1/2" - 3/4"	NPT
021635	**TMSCEN11.5NPT**	15,9	16	100	26,50	DFZ	4	14	11,5	1" - 2 1/2"	NPT
021636	**TMSCEN8NPT**	19,9	20	120	44,45	DFZ	4	11	8	2 1/2" - 4"	NPT

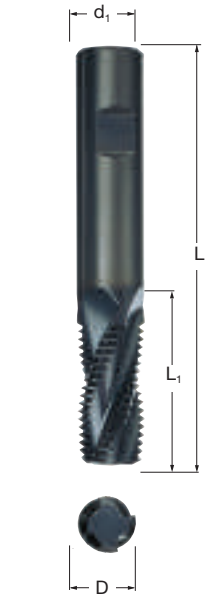
NPTF 60° TMSCEN Cónica

023490	**TMSCEN27NPTF**	7,6	8	60	9,4	DFZ	4	10	27	1/8"	NPTF
023488	**TMSCEN14NPTF**	15,9	16	100	16,32	DFZ	4	9	14	1/2" - 3/4"	NPT
023486	**TMSCEN11.5NPTF**	15,9	16	100	22,10	DFZ	4	10	11,5	1" - 2 1/2"	NPT

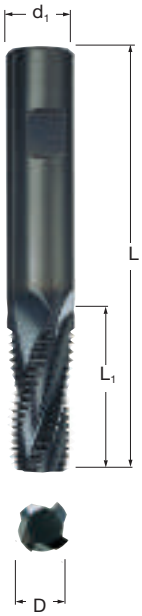
TMSCN = Interior
TMSCE = Exterior
TMSCEN = Interior/Exterior

Fresas de roscar con diente cónico en espiral patentado #US 6,345,941.B1

* Los acanalados de estas herramientas son rectos.



TMSCEN Cilíndrica



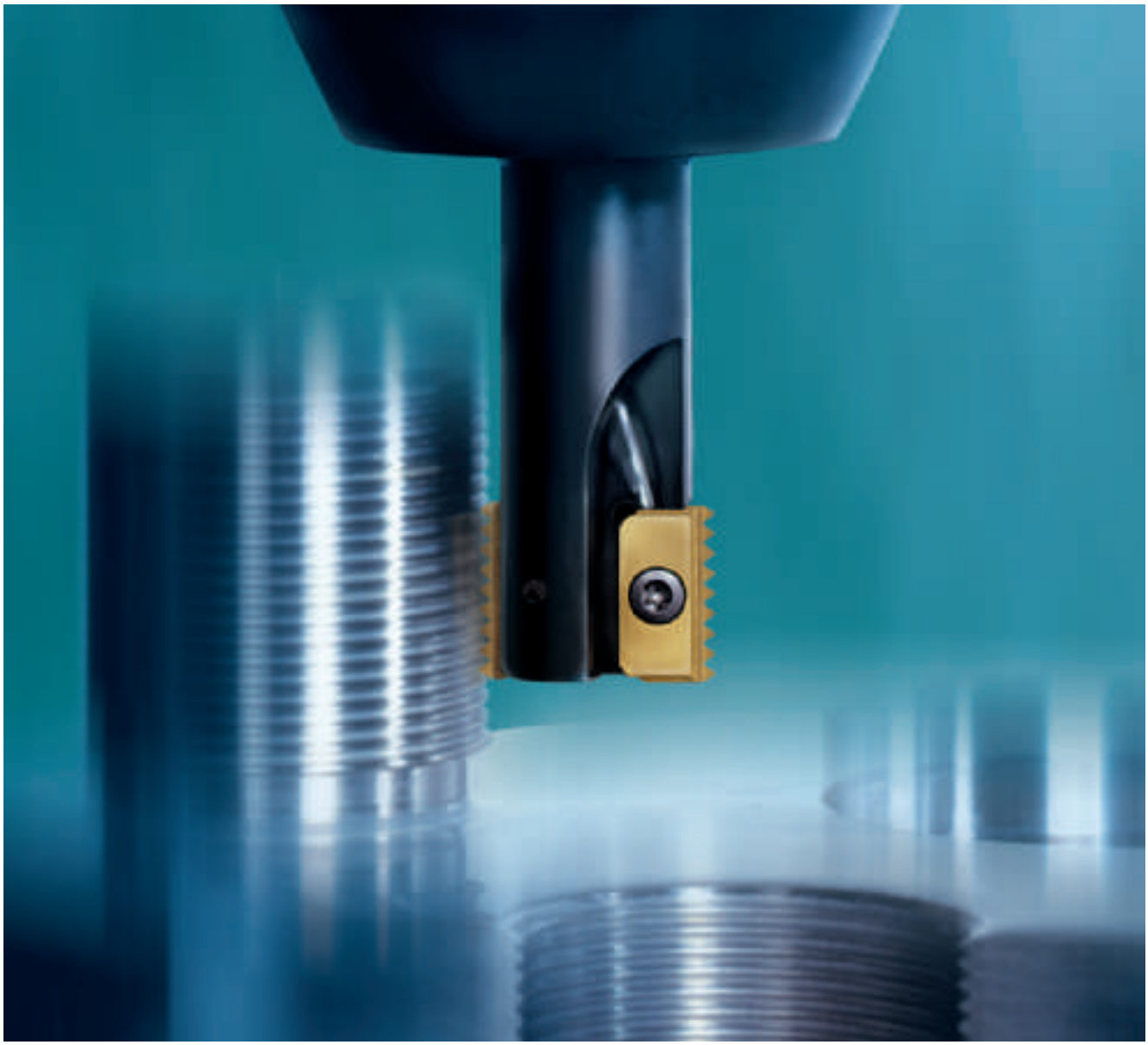
TMSCEN Cónica

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Fresas para Roscar con Plaquita



Stellram ha ideado fresas para hacer roscas interiores y exteriores sobre maquinas de control numérico modernas.

Las fresas para roscar de Stellram están fabricadas con acero para herramientas de alta calidad. Un tratamiento apropiado les asegura una gran robustez a todos los niveles.



Aplicaciones – Fresas para Roscar con Plaquita


ISO


Unified


UNJ


Whitworth


BSPT


NPT


NPTF



FRESAS Y PLAQUITAS

Las herramientas de roscar por fresado de Stellram están disponibles en diámetros desde 9 a 100 mm, con una, dos o 4 plaquitas, ofreciendo un gran abanico de soluciones.

Los taladros de refrigeración interna de la herramienta, dirigen los aceites de refrigeración directamente sobre la arista de corte, para así evacuar el calor y lubricar.

Todas las plaquitas de roscar por fresado de Stellram son a perfil completo.

Todas las plaquitas tienen dos aristas, salvo algunas a paso grande y ciertas formas cónicas que solo tienen una.

CALIDAD SFZ

Esta es la calidad disponible para todas las plaquitas.

La base es un metal duro micrograno, al cual se pone un revestimiento PVD TiN, que aporta:

- **Una buena resistencia a la temperatura**
- **Un bajo coeficiente de fricción**
- **Una protección contra las adherencias**

La calidad SFZ conviene pues para velocidades de corte medias y bajas para todos los materiales y todas las aplicaciones de roscado con fresa a plaquita.



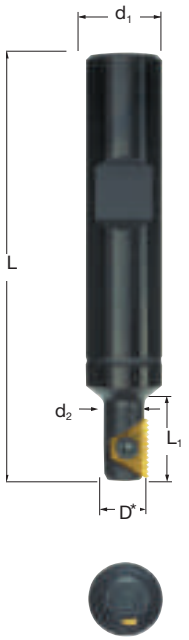
Intercambiable



Cónica

TMM Fresas para Roscar con Plaquita

ISO Unified Whitworth



TMM

TMM

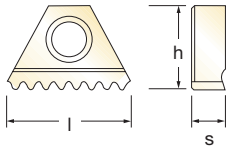
EDP #	Referencia	Dimensiones (mm) D*	d_1	d_2	L	L_1	No. de plaquitas	Recamblos EDP#		EDP#	
021557	**TMM126**	9	12	6,8	69	12	1	015564	S8T	015068	T6F
021558	**TMM206**	9	20	6,8	84	17	1	015564	S8T	015068	T6F

* El agujero mínimo debería ser 1/3 mas grande que D.



TMM Consejos técnicos

Ejemplo de pedido de fresa: **TMM206**
Ejemplo de pedido de plaquitas: **TM6EN24W SFZ**
Para condiciones de corte completas ver pagina: **A288**



EDP #	Referencia	Calidad	Material a mecanizar	Dimensiones (mm) l	h	s
014754	**TM6N0.5ISO**	**SFZ**		10,4	6,2	2,6
014755	**TM6N0.75ISO**	**SFZ**		10,4	6,2	2,6
014756	**TM6N1.0ISO**	**SFZ**		10,4	6,2	2,6
021315	**TM6N1.25ISO**	**SFZ**		10,4	6,2	2,6
021316	**TM6N1.5ISO**	**SFZ**		10,4	6,2	2,6

TM6_ ISO
Interior

017385	**TM6N40UN**	**SFZ**		10,4	6,2	2,6
014762	**TM6N32UN**	**SFZ**		10,4	6,2	2,6
014761	**TM6N28UN**	**SFZ**		10,4	6,2	2,6
014760	**TM6N24UN**	**SFZ**		10,4	6,2	2,6
014759	**TM6N20UN**	**SFZ**		10,4	6,2	2,6
023461	**TM6N18UN**	**SFZ**		10,4	6,2	2,6
014757	**TM6N16UN**	**SFZ**		10,4	6,2	2,6

TM6_UNIFIED
Interior

023460	**TM6E28UN**	**SFZ**		10,4	6,2	2,6
014758	**TM6E18UN**	**SFZ**		10,4	6,2	2,6

TM6_UNIFIED
Exterior

021323	**TM6EN40W**	**SFZ**		10,4	6,2	2,6
021322	**TM6EN32W**	**SFZ**		10,4	6,2	2,6
021321	**TM6EN28W**	**SFZ**		10,4	6,2	2,6
021320	**TM6EN26W**	**SFZ**		10,4	6,2	2,6
021319	**TM6EN24W**	**SFZ**		10,4	6,2	2,6
021318	**TM6EN20W**	**SFZ**		10,4	6,2	2,6
021317	**TM6EN19W**	**SFZ**		10,4	6,2	2,6

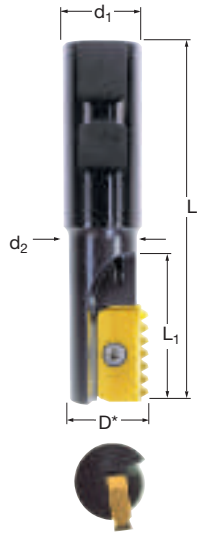
TM6_WHITWORTH
Interior y Exterior

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

5900 V14 Fresa de roscar con plaquita

ISO Unified UNJ



Fresa a una plaquita amarre Weldon

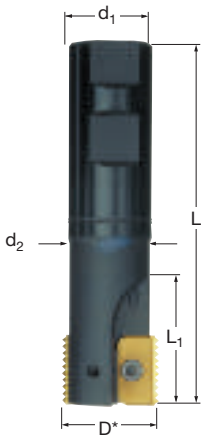
5900 V Fresa a una plaquita amarre Weldon

EDP #	Referencia	Dimensiones (mm) D*	d_1	d_2	L	L_1	No. de plaquitas	Recamblos EDP#		EDP#	
021559	**5900V14W012R**	12	20	8,65	75	25	1	023047	60F2506T	001569	T7F
021560	**5900V14WA017R**	17	20	12,8	85	30	1	023047	60F2506T	001569	T7F

5900 V Fresa a dos plaquitas amarre Weldon

021564	**5900V14WA020R**	20	20	16	93	41	2	023047	60F2506T	015690	T7F

* El agujero mínimo debería ser 1/3 mas grande que D.



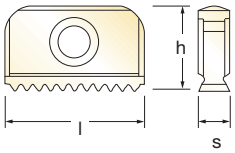
Fresa a dos plaquitas amarre Weldon

5900V14 Consejos técnicos

jemplo de pedido de fresa: **5900V14WA020R**
Ejemplo de pedido de plaquitas: **TM14N1ISO SFZ**
Para condiciones de corte completas ver pagina: **A288**



Plaquitas para 5900 V14



EDP #	Referencia	Calidad	Material a mecanizar	Dimensiones (mm) l	h	s
014763	TM14N0.5ISO	SFZ		14	7,6	3,10
014764	TM14N0.75ISO	SFZ		14	7,6	3,10
014765	TM14N1.0ISO	SFZ		14	7,6	3,10
021324	TM14N1.25ISO	SFZ		14	7,6	3,10
014766	TM14N1.5ISO	SFZ		14	7,6	3,10
021325	TM14N1.75ISO	SFZ		14	7,6	3,10
023415	TM14N2.0ISO	SFZ		14	7,6	3,10
014768	TMS14N2.5ISO	SFZ		14	7,6	3,10

TM14_ISO
Interior



022611	TM14N40UN	SFZ		14	7,6	3,10
023416	TM14N32UN	SFZ		14	7,6	3,10
017365	TM14N24UN	SFZ		14	7,6	3,10
014772	TM14N20UN	SFZ		14	7,6	3,10
014771	TM14N18UN	SFZ		14	7,6	3,10
014770	TM14N16UN	SFZ		14	7,6	3,10
014769	TM14N14UN	SFZ		14	7,6	3,10
014773	TMS14N12UN	SFZ		14	7,6	3,10
023465	TMS14N11UN	SFZ		14	7,6	3,10
017946	TMS14N10UN	SFZ		14	7,6	3,10

TM14_UNIFIED
Interior



023399	TM14E0.5ISO	SFZ		14	7,6	3,10
023404	TM14E1.0ISO	SFZ		14	7,6	3,10
023400	TM14E1.25ISO	SFZ		14	7,6	3,10
023401	TM14E1.5ISO	SFZ		14	7,6	3,10
023463	TMS14E2.0ISO	SFZ		14	7,6	3,10

TM14_ISO
Exterior



027154	TM14E28UN	SFZ		14	7,6	3,10
023405	TM14E20UN	SFZ		14	7,6	3,10
023402	TM14E16UN	SFZ		14	7,6	3,10
017433	TM14E12UN	SFZ		14	7,6	3,10

TM14_UNIFIED
Exterior



023406	TM14E20UNJ	SFZ		14	7,6	3,10

TM14_UNJ
Exterior



021328	TM14EN40W	SFZ		14	7,6	3,10
023412	TM14EN32W	SFZ		14	7,6	3,10
021327	TM14EN26W	SFZ		14	7,6	3,10
023411	TM14EN24W	SFZ		14	7,6	3,10
023410	TM14EN20W	SFZ		14	7,6	3,10
021326	TM14EN19W	SFZ		14	7,6	3,10
023409	TM14EN14W	SFZ		14	7,6	3,10
021331	TMS14EN14W	SFZ		14	7,6	3,10
021330	TMS14EN12W	SFZ		14	7,6	3,10
021329	TMS14EN11W	SFZ		14	7,6	3,10

TM14_WHITWORTH
Interior y Exterior



021333	TMT14 EN 19 BSPT	SFZ		14	7,6	3,10
021332	TMT14 EN 14 BSPT	SFZ		14	7,6	3,10

TM14_BSPT
Interior y Exterior



017367	TMT14 EN 18 NPT	SFZ		14	7,6	3,10
017366	TMT14 EN 14 NPT	SFZ		14	7,6	3,10

TM14_NPT
Interior y Exterior



017368	TMT14 EN 14 NPTF	SFZ		14	7,6	3,10

TM14_NPTF
Interior y Exterior



TM = Reversible
TMS = No reversible
TMT = No reversible forma cónica

Estrella guía Llave para encontrar la herramienta idónea

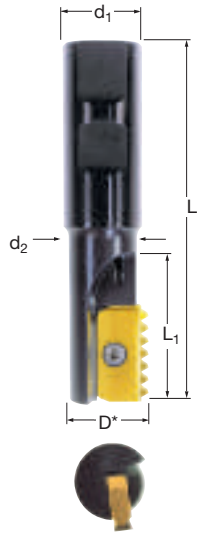


Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

5900 V21 Fresa de roscar con plaquita

ISO Unified UNJ



Fresa a una plaquita amarre Weldon

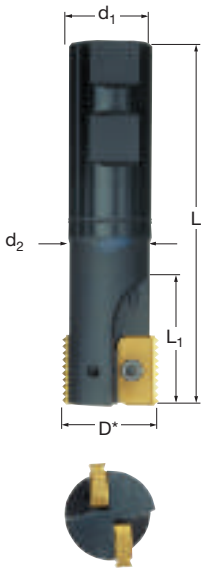
5900 V Fresa a una plaquita amarre Weldon

EDP #	Referencia	Dimensions (mm) D*	d_1	d_2	L	L_1	No. de dientes	Recambios EDP#		EDP#	
021561	**5900V21WA021R**	21	20	15,5	89	40	1	023048	60F4010T	015241	T20

5900 V Fresa a dos plaquitas amarre Weldon

021565	**5900V21WA030R**	30	25	24	108	52	2	023048	60F4010T	015241	T20

* El agujero mínimo debería ser 1/3 mas grande que D.



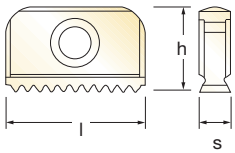
Fresa a dos plaquitas amarre Weldon

5900V21 Consejos técnicos

Ejemplo de pedido de fresa: **5900V21WA030R**
Ejemplo de pedido de plaquitas: **TM21N1.0ISO SFZ**
Para condiciones de corte completas ver pagina: **A288**



Plaquitas para 5900 V21



EDP #	Referencia	Calidad	Material a mecanizar	Dimensiones (mm) l	h	s
023432	**TM21N0.5ISO**	**SFZ**		21	12	4,70
021334	**TM21N1.0ISO**	**SFZ**		21	12	4,70
023434	**TM21N1.25ISO**	**SFZ**		21	12	4,70
014774	**TM21N1.5ISO**	**SFZ**		21	12	4,70
027138	**TM21N1.75ISO**	**SFZ**		21	12	4,70
014776	**TM21N2.0ISO**	**SFZ.**		21	12	4,70
021335	**TM21N2.5ISO**	**SFZ**		21	12	4,70
014777	**TM21N3.0ISO**	**SFZ**		21	12	4,70
027144	**TM21N3.5ISO**	**SFZ**		21	12	4,70
023467	**TM21N4.0ISO**	**SFZ.**		21	12	4,70

TM21_ISO
Interior



023437	**TM21N28UN**	**SFZ**		21	12	4,70
017435	**TM21N20UN**	**SFZ**		21	12	4,70
018483	**TM21N18UN**	**SFZ**		21	12	4,70
014782	**TM21N16UN**	**SFZ**		21	12	4,70
014781	**TM21N14UN**	**SFZ**		21	12	4,70
014780	**TM21N12UN**	**SFZ**		21	12	4,70
023435	**TM21N10UN**	**SFZ**		21	12	4,70
017363	**TM21N8UN**	**SFZ**		21	12	4,70
022214	**TMS21N7UN**	**SFZ**		21	12	4,70

TM21_UNIFIED
Interior



023424	**TM21E1.0ISO**	**SFZ**		21	12	4,70
027137	**TM21E1.5ISO**	**SFZ**		21	12	4,70
014775	**TM21E2.0ISO**	**SFZ**		21	12	4,70
027143	**TM21E3.0ISO**	**SFZ**		21	12	4,70

TM21_ISO
Exterior



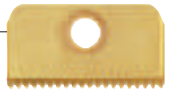
017434	**TM21E20UN**	**SFZ**		21	12	4,70
023423	**TM21E18UN**	**SFZ**		21	12	4,70
027164	**TM21E16UN**	**SFZ**		21	12	4,70
027168	**TM21E14UN**	**SFZ**		21	12	4,70
014779	**TM21E12UN**	**SFZ**		21	12	4,70
023419	**TM21E10UN**	**SFZ**		21	12	4,70

TM21_UNIFIED
Exterior



023420	**TM21E14UNJ**	**SFZ**		21	12	4,70

TM21_UNJ
Exterior



023430	**TM21EN26W**	**SFZ**		21	12	4,70
021342	**TM21EN20W**	**SFZ**		21	12	4,70
021341	**TM21EN19W**	**SFZ**		21	12	4,70
021340	**TM21EN18W**	**SFZ**		21	12	4,70
021339	**TM21EN16W**	**SFZ**		21	12	4,70
021338	**TM21EN14W**	**SFZ**		21	12	4,70
023428	**TM21EN12W**	**SFZ**		21	12	4,70
021337	**TM21EN11W**	**SFZ**		21	12	4,70
023426	**TM21EN10W**	**SFZ**		21	12	4,70
021343	**TMS21EN8W**	**SFZ**		21	12	4,70

TM21_WHITWORTH
Interior y Exterior



021345	**TMT21EN14BSPT**	**SFZ**		21	12	4,70
021344	**TMT21EN11BSPT**	**SFZ**		21	12	4,70

TM21_BSPT
Interior y Exterior



014784	**TMT21EN14NPT**	**SFZ**		21	12	4,70
014783	**TMT21EN11.5NPT**	**SFZ**		21	12	4,70

TM21_NPT
Interior y Exterior



017369	**TMT21EN14NPTF**	**SFZ**		21	12	4,70
017370	**TMT21EN11.5NPTF**	**SFZ**		21	12	4,70

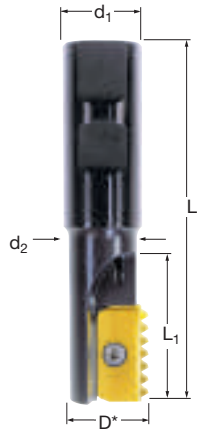
TM21_NPTF
Interior y Exterior



TM = Reversible
TMS = No reversible
TMT = No reversible forma cónica

5900 V30 Fresa de roscar con plaquita

ISO Unified UNJ





Fresa a una plaquita amarre Weldon

5900 V Fresa a una plaquita amarre Weldon

EDP #	Referencia	Dimensions (mm) D*	d_1	d_2	L	L_1	No. de dientes	Spares EDP#		EDP#	
021562	**5900V30WA029R**	29	25	21,7	110	50	1	023049	60F5012T	015241	T20

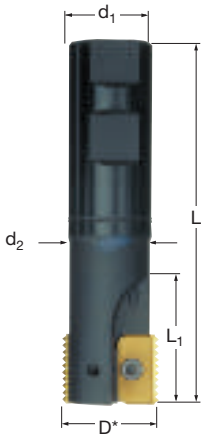
5900 V Fresa a dos plaquitas amarre Weldon

021566	**5900V30WA040R**	40	32	30	130	70	2	023049	60F5012T	015241	T20

5900 V Fresa a 4 plaquitas amarre Weldon

021568	**5900V30-A063R**	63	22	-	50	-	4	023049	60F5012T	015241	T20
021569	**5900V30-A080R**	80	27	-	55	-	4	023049	60F5012T	015241	T20
021570	**5900V30-A100R**	100	32	-	60	-	4	023049	60F5012T	015241	T20

* El agujero mínimo debería ser 1/3 mas grande que D.





Fresa a dos plaquitas amarre Weldon





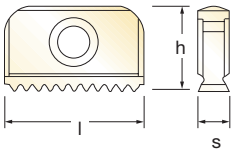
Fresa a 4 plaquitas amarre Weldon

5900V30 Consejos técnicos

Ejemplo de pedido de fresa: **5900V30-A063R**
Ejemplo de pedido de plaquitas: **TM30N1.0ISO SFZ**
Para condiciones de corte completas ver pagina: **A288**



Plaquitas para 5900 V30



EDP #	Referencia	Calidad	Material a mecanizar	Dimensiones (mm) l	h	s
023447	TM30N1.0ISO	SFZ		30	16	5,50
014785	TM30N1.5ISO	SFZ		30	16	5,50
023448	TM30N2.0ISO	SFZ		30	16	5,50
024775	TM30N2.5ISO	SFZ		30	16	5,50
021346	TM30N3.0ISO	SFZ		30	16	5,50
021347	TM30N4.0ISO	SFZ		30	16	5,50
021348	TM30N4.5ISO	SFZ		30	16	5,50
021349	TMS30N5.0ISO	SFZ		30	16	5,50
023471	TMS30N6.0ISO	SFZ		30	16	5,50

TM30_ISO
Interior



027157	TM30N20UN	SFZ		30	16	5,50
014790	TM30N16UN	SFZ		30	16	5,50
023446	TM30N14UN	SFZ		30	16	5,50
014789	TM30N12UN	SFZ		30	16	5,50
014788	TM30N10UN	SFZ		30	16	5,50
017364	TM30N8UN	SFZ		30	16	5,50
017395	TM30N6UN	SFZ		30	16	5,50
021350	TMS30N5UN	SFZ		30	16	5,50
023469	TMS30N4.5UN	SFZ		30	16	5,50

TM30_UNIFIED
Interior



023441	TM30E1.0ISO	SFZ		30	16	5,50
023442	TM30E1.5ISO	SFZ		30	16	5,50

TM30_ISO
Exterior



023443	TM30E12UN	SFZ		30	16	5,50
014787	TM30E10UN	SFZ		30	16	5,50
027176	TM30E9UN	SFZ		30	16	5,50
022618	TM30E8UN	SFZ		30	16	5,50

TM30_UNIFIED
Exterior



027185	TM30E12UNJ	SFZ		30	16	5,50

TM30_UNJ
Exterior



021354	TM30EN16W	SFZ		30	16	5,50
021353	TM30EN14W	SFZ		30	16	5,50
023445	TM30EN12W	SFZ		30	16	5,50
021352	TM30EN11W	SFZ		30	16	5,50
021351	TM30EN8W	SFZ		30	16	5,50
023468	TM30EN6W	SFZ		30	16	5,50

TM30_WHITWORTH
Interior y Exterior



021355	TMT30EN11BSPT	SFZ		30	16	5,50

TM30_BSPT
Interior y Exterior



014792	TMT30EN11.5NPT	SFZ		30	16	5,50
014791	TMT30EN8NPT	SFZ		30	16	5,50

TM30_NPT
Interior y Exterior



023500	TMT30EN8NPTF	SFZ		30	16	5,50

TM30_NPTF
Interior y Exterior



TM = Reversible
TMS = No reversible
TMT = No reversible forma cónica

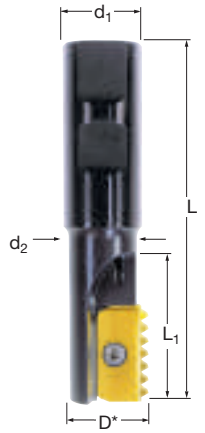
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

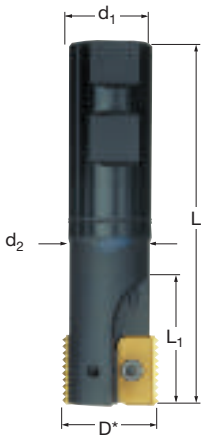
5900 V40 Fresa de roscar con plaquita

ISO Unified Whitworth





Fresa a una plaquita amarre Weldon





Fresa a dos plaquitas amarre Weldon





Fresa a 4 plaquitas montaje en el eje

5900 V Fresa a una plaquita amarre Weldon

EDP #	Referencia	Dimensions (mm) D*	d_1	d_2	L	L_1	No. de dientes	Spares EDP#		EDP#	
021563	**5900V40WA048R**	48	40	35	153	78	1	023049	60F5012T	015241	T20

5900 V Fresa a dos plaquitas amarre Weldon

021567	**5900V40WA050R**	50	40	38	153	78	2	023049	60F5012T	015241	T20

5900 V Fresa a 4 plaquitas montaje en el eje

021571	**5900V40-A080R**	80	27	-	65	-	4	023049	60F5012T	015241	T20
021572	**5900V40-A100R**	100	32	-	70	-	4	023049	60F5012T	015241	T20

* El agujero mínimo debería ser 1/3 mas grande que D.

5900V14 Consejos técnicos

Ejemplo de pedido de fresa: **5900V40-A080R**
Ejemplo de pedido de plaquitas: **TM40N1.0ISO SFZ**
Para condiciones de corte completas ver pagina: **A288**

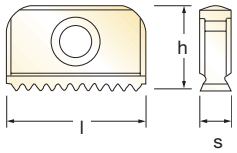








Plaquitas para 5900 V40



EDP #	Referencia	Calidad	Material a mecanizar	Dimensiones (mm) l	h	s
023454	**TM40N0.751ISO**	**SFZ**		40	20	6,30
024778	**TM40N1.0ISO**	**SFZ**		40	20	6,30
023455	**TM40N1.5ISO**	**SFZ**		40	20	6,30
024779	**TM40N2.0ISO**	**SFZ**		40	20	6,30
014793	**TM40N3.0ISO**	**SFZ**		40	20	6,30
014794	**TM40N4.0ISO**	**SFZ**		40	20	6,30
023457	**TM40N5.0ISO**	**SFZ**		40	20	6,30
023458	**TM40N6.0ISO**	**SFZ**		40	20	6,30
023472	**TMS40N8.0ISO**	**SFZ**		40	20	6,30

TM40_ISO
Interior



014796	**TM40N20UN**	**SFZ**		40	20	6,30
014795	**TM40N12UN**	**SFZ**		40	20	6,30
017350	**TM40N8UN**	**SFZ**		40	20	6,30

TM40_UNIFIED
Interior



023451	**TM40E6.0ISO**	**SFZ**		40	20	6,30

TM40_ISO
Exterior



023450	**TM40E12UN**	**SFZ**		40	20	6,30

TM40_UNIFIED
Exterior



023453	**TM40EN16W**	**SFZ**		40	20	6,30
021358	**TM40EN11W**	**SFZ**		40	20	6,30
021357	**TM40EN8W**	**SFZ**		40	20	6,30
021356	**TM40EN6W**	**SFZ**		40	20	6,30
021359	**TMS40EN4W**	**SFZ**		40	20	6,30

TM40_ WHITWORTH
Interior y Exterior



021360	**TMT40EN11BSPT**	**SFZ**		40	20	6,30

TM40_BSPT
Interior y Exterior



014798	**TMT40EN11.5NPT**	**SFZ**		40	20	6,30
014797	**TMT40EN8NPT**	**SFZ**		40	20	6,30

TM40_NPT
Interior y Exterior



027193	**TMT40EN11.5NPTF**	**SFZ**		40	20	6,30

TM40_NPTF
Interior y Exterior



TM = Reversible
TMS = No reversible
TMT = No reversible forma cónica

Estrella guía Llave para encontrar la herramienta idónea



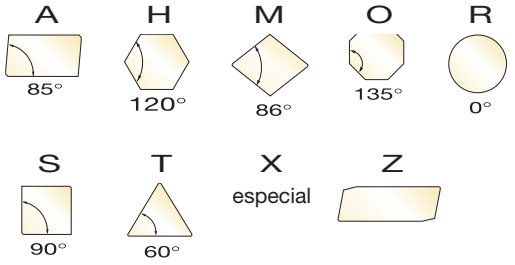
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

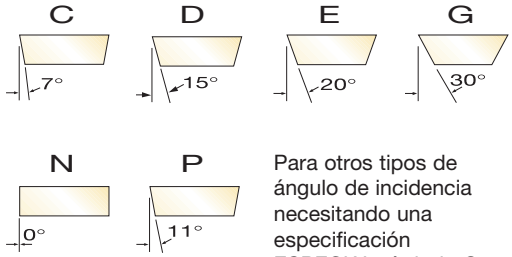
Designación de las plaquitas

A	P	F	W	16
1	2	3	4	5

1 Forma

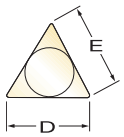


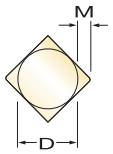
2 Angulo de incidencia

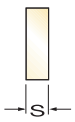


Para otros tipos de ángulo de incidencia necesitando una especificación ESPECIAL símbolo O.

3 Tolerancia



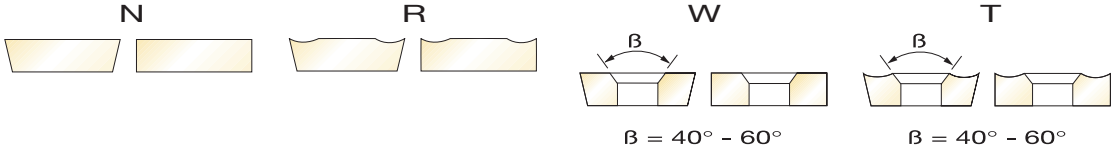




Class		D	M	S
A(1)	mm	±0,025	±0,005	±0,025
C(1)	mm	±0,025	±0,013	±0,025
E(1)	mm	±0,025	±0,025	±0,025
F(1)	mm	±0,013	±0,005	±0,025
G	mm	±0,025	±0,025	±0,130
H(1)	mm	±0,013	±0,013	±0,025
J(1)	mm	desde ±0,050 a ±0,150	±0,005	±0,025
K(1)	mm	desde ±0,050 a ±0,150	±0,013	±0,025
L(1)	mm	desde ±0,050 a ±0,150	±0,025	±0,025
M	mm	desde ±0,050 a ±0,150	desde ±0,080 a ±0,200	±0,13
N	mm	desde ±0,050 a ±0,150	desde ±0,080 a ±0,200	±0,025
U	mm	desde ±0,080 a ±0,250	desde ±0,130 a ±0,380	±0,13

(1) Plaquitas con faceta de acabado rectificada. (2 Depende de las dimensiones de la plaquita (ver Norma ISO 1832).

4 Tipo



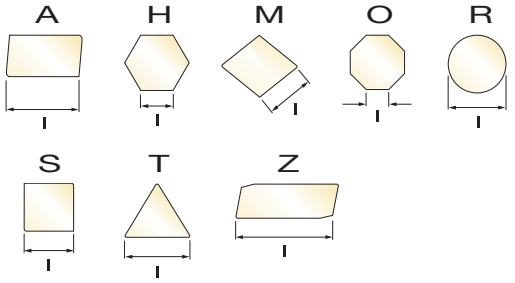
ß = 40° - 60°

ß = 40° - 60°

Con dimensiones o detalles exigiendo especificaciones complementarias.

04	PD	T	R	-
6	7	8	9	10

5 Tamaño



7 Punta de corte



Plaquitas con radios en las puntas

Indicación del radio en 1/10 de mm

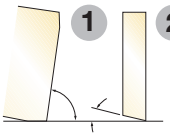
Nota : Para puntas a arista viva
Símbolo = **00**



Plaquitas redondas

Símbolo = **00**
Para D convertidos a partir de valores en pulgadas.

Símbolo = **M0**
Para diámetros métricos.



Plaquitas con faceta de acabado.

Se indican con dos letras

1 **Angulo χ_r de dirección de la arista**

A = 45°
D = 60°
E = 75°
F = 85°
P = 90°

2 **Angulo de incidencia de la faceta**

A = 3°
B = 5°
C = 7°
D = 15°
E = 20°
F = 25°
G = 30°
N = 0°
P = 11°

Z = Otros ángulos de incidencia de la faceta.

10 Facultativo

Símbolo facultativo propio del fabricante, formado por cifras o letras. Debe de estar separado de la designación normalizada por un guión (-).

SÍMBOLO FACULTATIVO

6 Espesor



02 = 2,38 mm
03 = 3,18 mm



T3 = 3,97 mm
04 = 4,76 mm



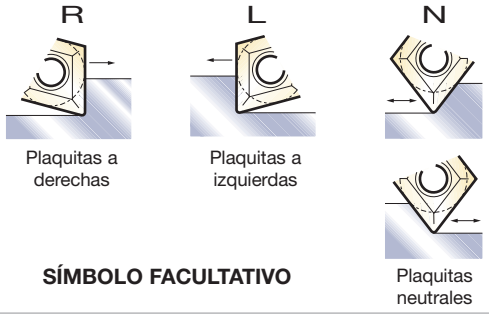
M5 = 5,0 mm
05 = 5,56 mm
06 = 6,35 mm

8 Protección de la arista



SÍMBOLO FACULTATIVO

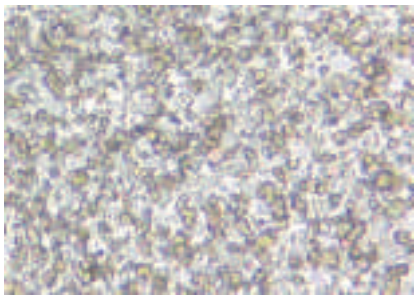
9 Dirección de corte



SÍMBOLO FACULTATIVO

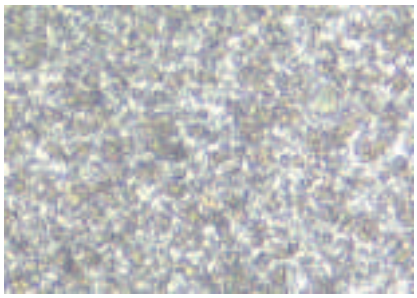
Calidades no revestidas





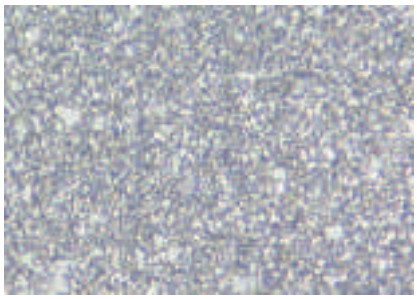
CALIDAD SF30

Una calidad tenaz destinada al mecanizado de los aceros, aceros aleados y aceros inoxidables. Se obtienen buenos resultados mecanizando a seco o con refrigeración.



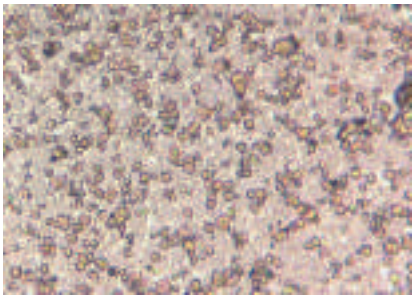
CALIDAD X44

Calidad conteniendo rutenio, para su utilización en aceros aleados. La calidad X44 es recomendada cuando la tenacidad es mas importante que la resistencia al desgaste. Campo de aplicación : aceros aleados.



CALIDAD GH1

Calidad micrograno destinada al mecanizado de la fundición y aceros templados, así como el bronce, aluminio y el kevlar, etc. Se obtienen buenos resultados con o sin refrigeración. Se recomienda la refrigeración en el caso de mecanización de aceros templados.

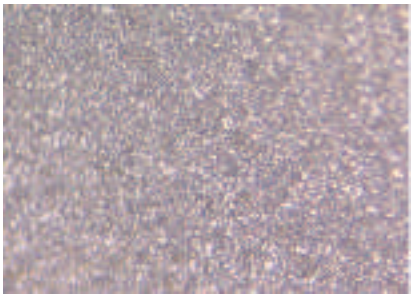


CALIDAD SU5400

Una resistente calidad P40 para aceros aleados y no aleados

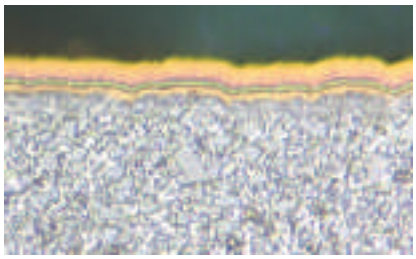
CN25 CERMET

Destinada al mecanizado con corte intermitente limitado. Excelente acabado. Gran resistencia al desgaste y a la deformación plástica. Para planeado en acabado de los aceros, fundición, aluminio, etc., y el super acabado con las plaquitas SPHX12M512EN.



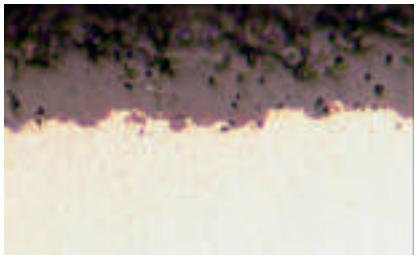
Calidades revestidas





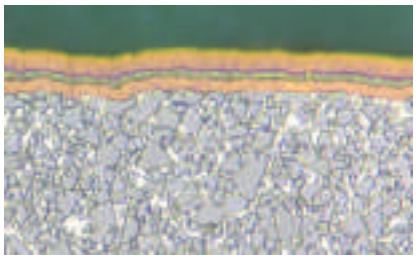
CALIDAD PFZ

Revestida CVD TiN-TiC-TiN
Espesor del revestimiento 3-5 milésimas. Para el mecanizado de aceros, aceros aleados y aceros inoxidables, con o sin refrigeración. Con refrigeración, la calidad PFZ da buenos resultados en el mecanizado de aleaciones a base de titanio o de níquel, así como la fundición dúctil.



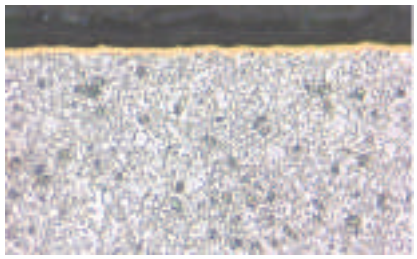
CALIDAD X400

Recubierta PVD TiAlN
Una calidad de alto rendimiento con un alto nivel de tenacidad y de resistencia al desgaste, capa fina de recubrimiento PVD, para su utilización en condiciones que demandan un gran arranque de viruta con corte interrumpido. Esta calidad diseñada especialmente (patente pendiente) permite altos niveles de presión de corte y ofrece una seguridad incrementada a la arista de corte. Para su utilización en aceros con nivel bajo o medio de carbono, acero para herramientas y aceros endurecidos.



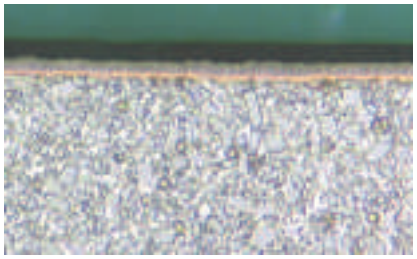
CALIDAD X500

Una calidad de metal duro de alto rendimiento con un gran nivel de tenacidad y especialmente desarrollada con recubrimiento CVD para operaciones de fresado exigentes. Esta calidad única trabaja a velocidades bajas y medias y es capaz de un gran arranque de viruta mientras mantiene una segura arista de corte. Para su utilización en aceros aleados, aceros inoxidables y aleaciones refractarias.



CALIDAD SFZ

Metal duro micrograno con un revestimiento PVD TiN. Para las operaciones que necesitan una arista viva.

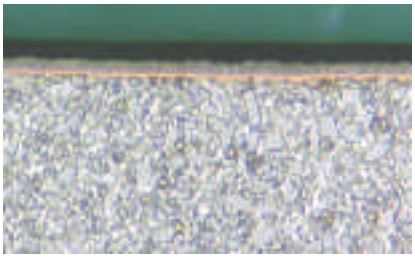


CALIDAD MP91M

CVD TiN-MT TiCN – Al_O_ . Espesor del revestimiento 4 – 7 milésimas.
Para el mecanizado de los aceros, aceros aleados y fundición. Gracias a su revestimiento de oxido de aluminio, la calidad MP91M es recomendada cada vez que las características de resistencia al desgaste sean mas importantes que la tenacidad.

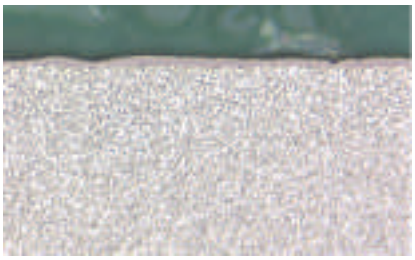
CALIDAD SC3025

Recubierta CVD con TiN – TiCN – Al_2O_3
Una nueva calidad de alto rendimiento para el fresado de la fundición. Calidad SC3025 es un recubrimiento CVD multi-capas diseñado para ofrecer una gran resistencia al desgaste y a la abrasión en estos materiales.



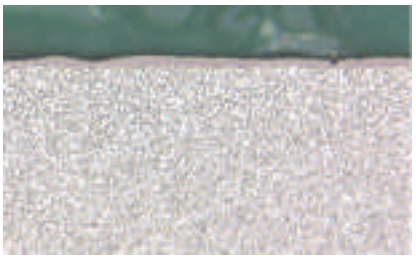
CALIDAD SP4036

Metal duro micro grano con recubrimiento PVD multi-capas TiAlN. Con un bajo coeficiente de fricción y bajo esfuerzo de corte durante el acabado. La arista viva reduce el problema de las adherencias y da a la pieza mecanizada un excelente acabado de superficie. Recomendada para aceros aleados y fundiciones gris, esferoidal, nodular, maleable y a grafito compactado a altas velocidades.



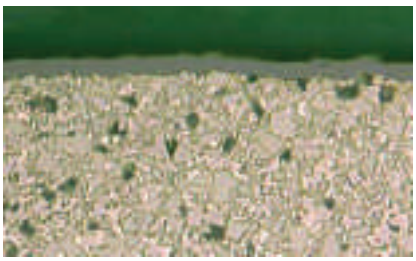
CALIDAD SP5464

PVD con TiAlN
Una calidad recubierta resistente para aceros y fundiciones.



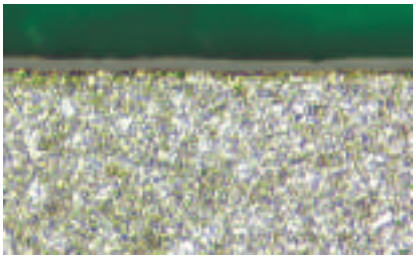
CALIDAD SP6564

Metal duro revestido PVD TiAlN con capa autolubricante. Esta calidad tiene un bajo coeficiente de fricción traduciéndose por bajos esfuerzos de corte durante el acabado. La arista viva reduce el riesgo de adherencias y procura un excelente acabado. Se recomienda para el mecanizado de los aceros inoxidables, para aplicaciones con velocidades de corte mas bien altas o sin refrigeración.



CALIDAD SP1064

Metal duro micrograno con revestimiento PVD TiAlN y capa autolubricante. Para las aplicaciones de semiacabado. Ideal para las fresas hemisféricas trabajando a velocidades de corte elevadas o para una gran resistencia al desgaste.

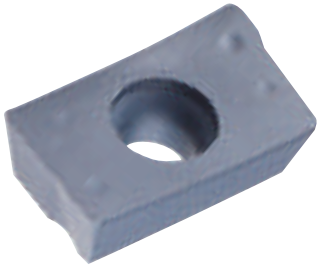


Geometrías de corte



-2C

La geometría –2C tiene un rompe virutas abierto que reduce la presión de corte manteniendo la robustez de la plaquita. Esta geometría es ideal para la mecanización de aceros bajos en carbono.



-3M

Esta geometría tiene la tenacidad de una plaquita “W” sin rompe virutas, pero con arista helicoidal que ayuda a disminuir la potencia necesaria de la maquina.



-41

-41 es una geometría de uso general a utilizar principalmente en aplicaciones donde se gastan plaquitas rectificadas. Esta geometría económica se encuentra a disposición en un gran número de plaquitas para mecanizar todo tipo de ángulos. La geometría -41 tiene una fuerte arista de corte con un ángulo de incisión muy positivo y debe de ser utilizada con bajos avances.



-42

La geometría 42 es universal y puede ser utilizada en la mayoría de los materiales. La combinación del ángulo de corte positivo con el chaflán T crea una arista de corte muy sólida. En fresado a 90, la geometría –42 es la primera elección para las aplicaciones difíciles. Se dispone de esta geometría en las plaquitas rectificadas, tales como la gama AP, SDHT, TPHT y MPHT en gran parte de las calidades revestidas. Permite grandes avances en las aplicaciones de fresado a 90, 60 y 45.

-421

La geometría -421 es para operaciones de acabado medio en aleaciones refractarias, titanio, aceros inoxidables y materiales difíciles de mecanizar. El altamente positivo ángulo de incisión previene las adherencias en ese tipo de materiales. Las plaquitas RPHT y SDHT se encuentran disponibles en la geometría -425 para operaciones de fresado de 45º y 0º. La -421 es para acabado y para aleaciones refractarias requiriendo una arista viva de corte.



-43

-43 es una geometría de utilización general diseñada para soportar materiales resistentes y pegajosos tales como aceros inoxidables y aleaciones refractarias. Se aplica a plaquitas rectificadas con plano de acabado rectificado para una excelente terminación de superficie y disminuir la excentricidad de la fresa. ADKT, APKT y MOMT se encuentran disponibles con la geometría -43 para su utilización en fresas Stellram a 90º.



-44

La geometría –44 se aplica a las plaquitas rectificadas periféricamente y con faceta también rectificada, esto permite la obtención de mejores acabados en la mayoría de los materiales, reduciendo al mismo tiempo la presión de corte y la potencia necesaria.



Geometrías de corte



-441

La geometría 441 se aplica a las plaquitas rectificadas periféricamente con una arista viva para la mecanización de las aleaciones de aluminio, aleaciones de titanio, el cobre y el latón. Esta geometría procura un corte mas franco en las aplicaciones de prensado a 90 y 45, y disminuye el efecto de aspiración asociado a las geometrías con ángulo de hélice superiores.



-45

La geometría –45 se destina a las operaciones de desbaste y de semi-acabado. Está disponible en varias calidades, y conviene al mecanizado de una gran gama de materiales. Se aplica a las plaquitas rectificadas periféricamente con faceta para un mejor acabado. La geometría –45 procura un corte mas suave en las operaciones de fresado a 90 y 45, y disminuye el efecto de aspiración asociado a las geometrías con ángulo de hélice superiores.



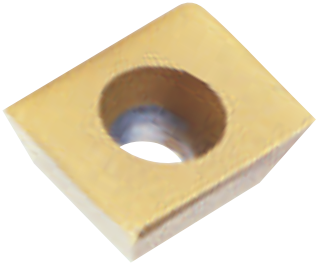
-46

La geometría 46 es una geometría con rectificación periférica total para incrementar la precisión, disponible en tipo – A con radio. Estas plaquitas tienen una faceta rectificada para un mejor acabado en la cara planeada. La rectificación periférica origina una arista de corte consistente y una precisa forma del radio.



-47

La geometría –47 tiene aplicaciones similares a las de la geometría –45, con una presión de corte ligeramente inferior. Da buenos resultados en las aleaciones refractarias.



-J

La especificación –J se da a la plaquita AOHW 09, sin rompe virutas y rectificada periféricamente, la razón es su ángulo de incidencia evolutivo. Se dispone de esta placa en varios radios.

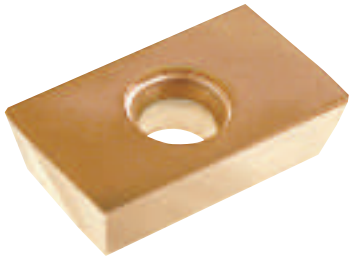
-M

La geometría –M tiene un mini rompe virutas permitiendo bajos avances por diente en las operaciones de achaflanado.



...W

Las plaquitas W son sin rompe virutas, se fabrican en diferentes formas y se destinan a aplicaciones múltiples en una amplia gama de materiales. Las plaquitas sin rompe virutas son la mejor elección al nivel tenacidad en las operaciones de fresado a 90, 45 y de planeado.



-701/-702

La geometría –701 conviene particularmente a las operaciones de acabado en una amplia gama de materiales, a bajos avances. Un ángulo de corte muy positivo permite un corte mas franco, sobre todo en el aluminio. El acabado en el titanio puede ser realizado cuando la geometría –701 se asocia a la calidad SFZ. Se dispone de esta geometría en las plaquitas Stellram totalmente rectificadas. Todas las plaquitas que equipan el famoso programa de fresas Aerostell tienen la geometría –701 de particular rendimiento en el mecanizado de piezas con paredes delgadas. La geometría –702 tiene una preparación de arista evolutiva que permite la mecanización de materiales mas duros.



-721

-721 es una geometría disponible para las plaquitas ADGT12 para el fresado del aluminio. El ángulo de posicionamiento muy positivo y la arista viva permite suave acción de corte y reduce las adherencias.



-N

La especificación –N se da a las plaquitas AOCW 35.. sin rompe virutas, AOCX35.. a rompe virutas rectificado de las geometrías –701 y –702, y se refiere a su ángulo de incidencia evolutivo. Estas plaquitas se destinan al mecanizado de la fundición, de aceros, del titanio y del aluminio con las fresas 7690VAZ.



Geometrías de corte



-P

La especificación –P se da a las plaquitas SCMT 09 utilizadas en las fresas tipo erizo 5210VS y se refiere a su espesor de reforzamiento de la base. Esta plaquita esta pues destinada a las operaciones de fuerte desbaste.



-RA

La geometría –RA se encuentra disponible en las plaquitas de precisión ODEW para el fresado de la fundición. La ampliada faceta de esta geometría permite un 50% más de avance para una mayor productividad. Se dispone de esta geometría en la calidad SC3025, nuestra mejor calidad para el fresado de la fundición.



RG..S

La plaquita RG..S se utiliza igualmente en las fresas 5500V para el mecanizado de acabado de moldes en 3 dimensiones. Tan precisa y procurando una duración tan importante como la plaquita RG.., da sin embargo mejores resultados cuando se mecanizan paredes laterales próximas a los 90.



SN

La protección de arista –SN es la mas fuerte de esta gama, es ideal para las condiciones de corte difíciles, grandes voladizos y fuertes avances.

...T

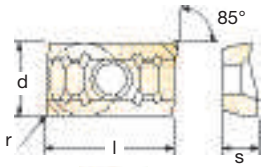


Las plaquitas ….T, sin indicación complementaria relativa a su geometría, poseen un rompe virutas estándar que conviene a las aplicaciones generales, sobre todo a las aplicaciones de fresado a 45, y disponibles en numerosas formas dentro de la gama de plaquitas Stellram. Tienen una tenacidad cercana al de las plaquitas sin rompe virutas mientras garantizan una excelente fragmentación de la viruta.

TN



Esta protección de arista reduce algo la potencia absorbida por la plaquita en comparación con la protección S.



Plaquitas de fresado forma A



ADET_-42

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADET_-44

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADET_-441

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADGT_-721

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADHT_-46

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADKT_-43

Faceta de acabado rectificada ϰ 90° rompe virutas prensado en una sola cara.



ADKT_-45

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADKT_-47

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



ADLT_-47

Rectificada periféricamente ϰ 90° rompe virutas prensado en una sola cara.



AOCW_-N

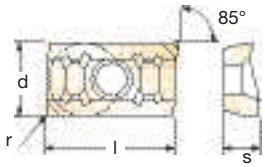
Rectificada periféricamente ϰ 90° sin rompe virutas.



AOCX_-N702 -N701

Totalmente rectificada ϰ 90° cara de corte cóncava.

			Dimensiones (mm)				
EDP #	**Referencia**	**Calidad**	d	l	s	r	h_m min
024912	**ADET 09 0310SR-42**	**MP91M**	6,35	9,2	3,18	1,0	0,1
024913	**ADET 09 0310SR-42**	**X500**	6,35	9,2	3,18	1,0	0,1
024914	**ADET 09 03PDER-44**	**MP91M**	6,35	9,2	3,18	Faceta	0,04
024915	**ADET 09 03PDER-44**	**PFZ**	6,35	9,2	3,18	Faceta	0,04
024916	**ADET 09 03PDER-441**	**GH1**	6,35	9,2	3,18	Faceta	0,03
029098	**ADGT 12T 3PDFR-721**	**GH1**	7,87	12,7	3,76	Faceta	0,05
029326	**ADHT 12T 3PDER-46**	**MP91M**	7,87	12,7	3,76	Faceta	0,05
029327	**ADHT 12T 3PDER-46**	**SP3025**	7,87	12,7	3,76	Faceta	0,05
029328	**ADHT 12T 308ER-46**	**SP6564**	7,87	12,7	3,76	0,8	0,05
029329	**ADHT 12T 308ER-46**	**X500**	7,87	12,7	3,76	0,8	0,05
029330	**ADHT 12T 316ER-46**	**MP91M**	7,87	12,7	3,76	1,6	0,05
029331	**ADHT 12T 316ER-46**	**X500**	7,87	12,7	3,76	1,6	0,05
029336	**ADHT 12T 320ER-46**	**SP6564**	7,87	12,7	3,76	2,0	0,05
029337	**ADHT 12T 320ER-46**	**X500**	7,87	12,7	3,76	2,0	0,05
029332	**ADHT 12T 324ER-46**	**SP6564**	7,87	12,7	3,76	2,4	0,05
029333	**ADHT 12T 324ER-46**	**X500**	7,87	12,7	3,76	2,4	0,05
029338	**ADHT 12T 330ER-46**	**SP6564**	7,87	12,7	3,76	3,0	0,05
029339	**ADHT 12T 330ER-46**	**X500**	7,87	12,7	3,76	3,0	0,05
029337	**ADHT 12T 332ER-46**	**SP6564**	7,87	12,7	3,76	3,2	0,05
029336	**ADHT 12T 332ER-46**	**X500**	7,87	12,7	3,76	3,2	0,05
029334	**ADHT 12T 340ER-46**	**SP6564**	7,87	12,7	3,76	4,0	0,05
029335	**ADHT 12T 340ER-46**	**X500**	7,87	12,7	3,76	4,0	0,05
017286	**ADKT 09 03PDER-43**	**MP91M**	6,35	9,2	3,5	Faceta	0,05
024917	**ADKT 09 03PDER-43**	**PFZ**	6,35	9,2	3,5	Faceta	0,05
027888	**ADKT 09 03PDER-43**	**SC3025**	6,35	9,2	3,5	Faceta	0,05
015150	**ADKT 09 03PDER-43**	**X500**	6,35	9,2	3,5	Faceta	0,05
027715	**ADKT 09 03PDER-43**	**SP6564**	6,35	9,2	3,5	Faceta	0,05
024138	**ADKT 09 0310ER-43**	**X500**	6,35	9,2	3,5	1,0	0,05
027915	**ADKT 12T 3PDER-45**	**MP91M**	7,87	12,7	3,76	Faceta	0,05
027916	**ADKT 12T 3PDER-45**	**SP3025**	7,87	12,7	3,76	Faceta	0,05
027914	**ADKT 12T 3PDER-45**	**SP6564**	7,87	12,7	3,76	Faceta	0,05
027913	**ADKT 12T 3PDER-45**	**X500**	7,87	12,7	3,76	Faceta	0,05
023082	**ADKT 15 05PDER-45**	**MP91M**	9,65	16,05	5,56	Faceta	0,06
023083	**ADKT 15 05PDER-45**	**X500**	9,65	16,05	5,56	Faceta	0,06
027716	**ADKT 15 05PDER-45**	**SP6564**	9,65	16,05	5,56	Faceta	0,06
022226	**ADKT 15 05PDER-47**	**MP91M**	9,65	16,05	5,56	Faceta	0,06
022227	**ADKT 15 05PDER-47**	**PFZ**	9,65	16,05	5,56	Faceta	0,06
022889	**ADKT 15 05PDER-47**	**SP6564**	9,65	16,05	5,56	Faceta	0,06
026108	**ADKT 15 05PDER-47**	**X500**	9,65	16,05	5,56	Faceta	0,06
026098	**ADLT 15 0516ER-47**	**MP91M**	9,65	16,05	5,56	1,6	0,06
026103	**ADLT 15 0516ER-47**	**SP6564**	9,65	16,05	5,56	1,6	0,06
026099	**ADLT 15 0524ER-47**	**MP91M**	9,65	16,05	5,56	2,4	0,06
026104	**ADLT 15 0524ER-47**	**SP6564**	9,65	16,05	5,56	2,4	0,06
026100	**ADLT 15 0532ER-47**	**MP91M**	9,65	16,05	5,56	3,2	0,06
026105	**ADLT 15 0532ER-47**	**SP6564**	9,65	16,05	5,56	3,2	0,06
026101	**ADLT 15 0550ER-47**	**MP91M**	9,65	16,05	5,56	5,0	0,06
026106	**ADLT 15 0550ER-47**	**SP6564**	9,65	16,05	5,56	5,0	0,06
026102	**ADLT 15 0564ER-47**	**MP91M**	9,65	16,05	5,56	6,4	0,06
026107	**ADLT 15 0564ER-47**	**SP6564**	9,65	16,05	5,56	6,4	0,06
015204	**AOCW 35 04PZTR-N**	**PFZ**	11,86	35,8	4,76	Faceta	0,10
015151	**AOCX 35 04PZER-N702**	**SFZ**	11,86	35,8	4,76	Faceta	0,04
015152	**AOCX 35 04PZFR-N701**	**PFZ**	11,86	35,8	4,76	Faceta	0,02



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
024918	**AOHW 09 0302ER-J**	**PFZ**	6,9	9,2	3,18	0,2	0,04
023084	**AOHW 09 0302ER-J**	**SFZ**	6,9	9,2	3,18	0,2	0,04
025813	**AOHW 09 0302FR-J**	**SP4036**	6,9	9,2	3,18	0,2	0,04
017287	**AOHW 09 0304ER-J**	**MP91M**	6,9	9,2	3,18	0,4	0,04
023086	**AOHW 09 0304ER-J**	**PFZ**	6,9	9,2	3,18	0,4	0,04
017617	**AOHW 09 0304ER-J**	**SFZ**	6,9	9,2	3,18	0,4	0,04
017288	**AOHW 09 0308ER-J**	**MP91M**	6,9	9,2	3,18	0,8	0,04
023087	**AOHW 09 0308ER-J**	**PFZ**	6,9	9,2	3,18	0,8	0,04
024919	**AOHW 09 0310ER-J**	**PFZ**	6,9	9,2	3,18	1,0	0,04
023088	**AOHW 09 0312ER-J**	**PFZ**	6,9	9,2	3,18	1,2	0,04
024111	**AOHW 09 0315ER-J**	**PFZ**	6,9	9,2	3,18	1,5	0,04
023093	**AOHW 09 0320ER-J**	**PFZ**	6,9	9,2	3,18	2,0	0,04
023095	**AOHW 09 0330ER-J**	**PFZ**	6,9	9,2	3,18	3,0	0,04
015205	**AOHW 09 03PFFR-J**	**SFZ**	6,9	9,2	3,18	Faceta	0,03
023097	**AOHW 09 03PFTR-J**	**PFZ**	6,9	9,2	3,18	Faceta	0,10
015206	**AOHW 09 03PFTR-J**	**X500**	6,9	9,2	3,18	Faceta	0,10
017289	**AOHW 09 03PFTR-J**	**MP91M**	6,9	9,2	3,18	Faceta	0,10
027717	**AOHW 09 03PFTR-J**	**SP6564**	6,9	9,2	3,18	Faceta	0,10
023102	**APET 16 0402TR-42**	**PFZ**	9,52	16,66	4,76	0,2	0,1
023103	**APET 16 0408TR-42**	**PFZ**	9,52	16,66	4,76	0,8	0,1
023104	**APET 16 0410TR-42**	**PFZ**	9,52	16,66	4,76	1,0	0,1
023105	**APET 16 0415TR-42**	**PFZ**	9,52	16,66	4,76	1,5	0,1
023106	**APET 16 0420TR-42**	**PFZ**	9,52	16,66	4,76	2,0	0,1
017619	**APET 16 0425TR-42**	**X500**	9,52	16,66	4,76	2,5	0,1
024949	**APET 16 0425TR-42**	**PFZ**	9,52	16,66	4,76	2,5	0,1
023107	**APET 16 0430TR-42**	**PFZ**	9,52	16,66	4,76	3,0	0,1
017290	**APET 16 0440TR-42**	**MP91M**	9,52	16,66	4,76	4,0	0,1
024921	**APET 16 0440TR-42**	**PFZ**	9,52	16,66	4,76	4,0	0,1
017620	**APET 16 0440TR-42**	**X500**	9,52	16,66	4,76	4,0	0,1
025804	**APET 16 0460TR-42**	**PFZ**	9,52	16,66	4,76	6,0	0,1
017621	**APEX 16 04PDER-701**	**PFZ**	9,52	16,66	4,76	Faceta	0,02
017622	**APEX 16 04PDEL-701**	**PFZ**	9,52	16,66	4,76	Faceta	0,02
017623	**APEX 16 04PDFR-701**	**SFZ**	9,52	16,66	4,76	Faceta	0,02
014066	**APEX 16 04PDFR-701**	**GH1**	9,52	16,66	4,76	Faceta	0,02
017624	**APEX 16 04PDFL-701**	**GH1**	9,52	16,66	4,76	Faceta	0,02
017291	**APFW 16 04PDER**	**MP91M**	9,52	16,66	4,76	Faceta	0,04
017627	**APFW 16 04PDTR**	**X44**	9,52	16,66	4,76	Faceta	0,1
024922	**APFW 16 04PDTL**	**X44**	9,52	16,66	4,76	Faceta	0,1
017628	**APFW 16 04PDTR**	**GH1**	9,52	16,66	4,76	Faceta	0,1
017630	**APFW 16 04PDTL**	**GH1**	9,52	16,66	4,76	Faceta	0,1
027883	**APFW 16 04PDTR**	**SC3025**	9,52	16,66	4,76	Faceta	0,1
017626	**APFW 16 04PDTR**	**SF30**	9,52	16,66	4,76	Faceta	0,1
017629	**APFW 16 04PDTR**	**SFZ**	9,52	16,66	4,76	Faceta	0,1
024075	**APFW 16 04PDTL**	**SFZ**	9,52	16,66	4,76	Faceta	0,1
017632	**APFW 16 04PDER**	**SF30**	9,52	16,66	4,76	Faceta	0,05
017633	**APHT 16 04PDER**	**SFZ**	9,52	16,66	4,76	Faceta	0,05
015154	**APHT 16 04PDFR**	**GH1**	9,52	16,66	4,76	Faceta	0,02
017293	**APHT 16 04PDTR-42**	**MP91M**	9,52	16,66	4,76	Faceta	0,1
017292	**APHT 16 04PDTL-42**	**MP91M**	9,52	16,66	4,76	Faceta	0,1
017634	**APHT 16 04PDTR-42**	**PFZ**	9,52	16,66	4,76	Faceta	0,1
024088	**APHT 16 04PDTL-42**	**PFZ**	9,52	16,66	4,76	Faceta	0,1
015155	**APHT 16 04PDTR-42**	**X500**	9,52	16,66	4,76	Faceta	0,1
017635	**APHT 16 04PDTL-42**	**X500**	9,52	16,66	4,76	Faceta	0,1
027718	**APHT 16 04PDTR-42**	**SP6564**	9,52	16,66	4,76	Faceta	0,1
027910	**APHT 16 04PDTR-42**	**SP6564**	9,52	16,66	4,76	Faceta	0,1
017636	**APHW 16 0440TR**	**X44**	9,52	16,66	4,76	4,0	0,1

AOHW_-J

Rectificada periféricamente
⟡ 90° sin rompe virutas.



AOHW_-J

Rectificada periféricamente
⟡ 90° sin rompe virutas.



APET_-42

Rectificada periféricamente ⟡ 90° rompe virutas prensado en una sola cara.



APEX_-701

Totalmente rectificada ⟡ 90°
cara de corte cóncava.



APFW_

Rectificada periféricamente
⟡ 90° sin rompe virutas.



APHT_

Rectificada periféricamente ⟡ 90° rompe virutas prensado en una sola cara.



APHT_-42

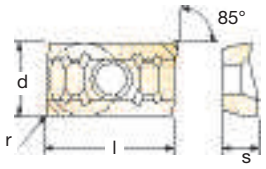
Rectificada periféricamente ⟡ 90° rompe virutas prensado en una sola cara.



APHW_

Rectificada periféricamente
⟡ 90° sin rompe virutas.





Plaquitas de fresado forma A, H



APHT_-46

Rectificada periféricamente χ 90° rompe virutas prensado en una sola cara.

EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
027869	APHT 16 04 08ER-46	X500	9,52	16,66	4,76	0,8	0,1
027863	APHT 16 04 08ER-46	SP6564	9,52	16,66	4,76	0,8	0,1
027870	APHT 16 04 16ER-46	X500	9,52	16,66	4,76	1,6	0,1
027864	APHT 16 04 16ER-46	SP6564	9,52	16,66	4,76	1,6	0,1
027871	APHT 16 04 24ER-46	X500	9,52	16,66	4,76	2,4	0,1
027865	APHT 16 04 24ER-46	SP6564	9,52	16,66	4,76	2,4	0,1
027872	APHT 16 04 32ER-46	X500	9,52	16,66	4,76	3,2	0,1
027862	APHT 16 04 32ER-46	SP6564	9,52	16,66	4,76	3,2	0,1
027873	APHT 16 04 40ER-46	X500	9,52	16,66	4,76	4,0	0,1
027866	APHT 16 04 40ER-46	SP6564	9,52	16,66	4,76	4,0	0,1
027874	APHT 16 04 50ER-46	X500	9,52	16,66	4,76	5,0	0,1
027867	APHT 16 04 50ER-46	SP6564	9,52	16,66	4,76	5,0	0,1
027875	APHT 16 04 64ER-46	X500	9,52	16,66	4,76	6,4	0,1
027868	APHT 16 04 64ER-46	SP6564	9,52	16,66	4,76	6,4	0,1



APKT_-2C

Faceta de acabado rectificada χ 90° rompe virutas prensado en una sola cara.

011488	APKT 16 0408E-2C	MP91M	9,52	16,66	4,76	0,8	0,10
010796	APKT 16 0408E-2C	PFZ	9,52	16,66	4,76	0,8	0,10



APKT_-3M

Rectificada periféricamente χ 90° rompe virutas prensado en una sola cara.

011676	APKT 10 03PDER-3M	MP91M	6,68	10,5	3,47	Faceta	0,05
017861	APKT 10 03PDFR-3M	GH1	6,68	10,5	3,47	Faceta	0,05
011649	APKT 16 04PDER-3M	MP91M	9,52	16,66	4,76	Faceta	0,1



APKT_-43

Rectificada periféricamente χ 90° rompe virutas prensado en una sola cara.

017294	APKT 16 04PDER-43	MP91M	9,52	16,66	4,76	Faceta	0,08
014067	APKT 16 04PDER-43	PFZ	9,52	16,66	4,76	Faceta	0,08
027887	APKT 16 04PDER-43	SC3025	9,52	16,66	4,76	Faceta	0,08
015156	APKT 16 04PDER-43	X500	9,52	16,66	4,76	Faceta	0,08
027720	APKT 16 04PDER-43	SP6564	9,52	16,66	4,76	Faceta	0,08



APKT_-45

Rectificada periféricamente χ 90° rompe virutas prensado en una sola cara.

024135	APKT 16 04PDER-45	X44	9,52	16,66	4,76	Faceta	0,06
023115	APKT 16 04PDER-45	X500	9,52	16,66	4,76	Faceta	0,06
023114	APKT 16 04PDER-45	MP91M	9,52	16,66	4,76	Faceta	0,06
027721	APKT 16 04PDER-45	SP6564	9,52	16,66	4,76	Faceta	0,06



APKT_-45

Rectificada periféricamente χ 90° rompe virutas prensado en una sola cara.

023112	APKT 10 03PDER-45	MP91M	6,68	10,5	3,47	Faceta	0,05
023113	APKT 10 03PDER-45	X500	6,68	10,5	3,47	Faceta	0,05
027719	APKT 10 03PDER-45	SP6564	6,68	10,5	3,47	Faceta	0,05



APKT_-47

Rectificada periféricamente χ 90° rompe virutas prensado en una sola cara.

026579	APKT 10 03PDER-47	MP91M	6,68	10,5	3,47	Faceta	0,05
027890	APKT 10 03PDER-47	SP6564	6,68	10,5	3,47	Faceta	0,05
026580	APKT 10 03PDER-47	X500	6,68	10,5	3,47	Faceta	0,05



APMT_-2C

Bruta de sinterizado rompe virutas en una sola cara.

017228	APMT 16 0412E-2C	MP91M	9,52	16,66	4,76	1,2	0,1
013944	APMT 16 0416E-2C	MP91M	9,52	16,66	4,76	1,6	0,1
013945	APMT 16 0424E-2C	MP91M	9,52	16,66	4,76	2,4	0,1
013946	APMT 16 0432E-2C	MP91M	9,52	16,66	4,76	3,2	0,1
017229	APMT 16 0440E-2C	MP91M	9,52	16,66	4,76	4,0	0,1
017230	APMT 16 0448E-2C	MP91M	9,52	16,66	4,76	4,8	0,1
013947	APMT 16 0464E-2C	MP91M	9,52	16,66	4,76	6,4	0,1



HPCT_

Rectificada periféricamente χ 45° rompe virutas prensado en una sola cara.

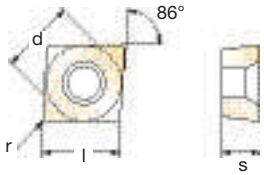
017236	HPCT 09 04ADTR	GH1	15,88	9,2	4,76	Faceta	0,18
017637	HPCT 09 04ADTR	SF30	15,88	9,2	4,73	Faceta	0,18
024065	HPCT 09 04ADTR	X44	15,88	9,2	4,76	Faceta	0,18



HPHT_

Rectificada periféricamente χ 45° rompe virutas prensado en una sola cara.

017295	HPHT 09 04ADTR	MP91M	15,88	9,2	4,76	Faceta	0,18
024925	HPHT 09 04ADTR	PFZ	15,88	9,2	4,73	Faceta	0,18



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
024927	**MPEX 06 02PPFR-701**	**GH1**	6,35	6,35	2,38	Faceta	0,02
024926	**MPEX 06 02PPFL-701**	**GH1**	6,35	6,35	2,38	Faceta	0,02
017638	**MPEX 06 02PPFR-701**	**SFZ**	6,35	6,35	2,38	Faceta	0,02
017639	**MPEX 06 02PPFL-701**	**SFZ**	6,35	6,35	2,38	Faceta	0,02
017640	**MPEX 08 03PPER-701**	**PFZ**	7,94	7,94	3,18	Faceta	0,02
017641	**MPEX 08 03PPEL-701**	**PFZ**	7,94	7,94	3,18	Faceta	0,02
017642	**MPEX 08 03PPFR-701**	**GH1**	7,94	7,94	3,18	Faceta	0,02
024928	**MPEX 08 03PPFL-701**	**GH1**	7,94	7,94	3,18	Faceta	0,02
017489	**MPEX 08 03PPFR-701**	**SFZ**	7,94	7,94	3,18	Faceta	0,02
017490	**MPEX 08 03PPFL-701**	**SFZ**	7,94	7,94	3,18	Faceta	0,02
017643	**MPEX 11 04PPFR-701**	**GH1**	11,11	11,11	4,76	Faceta	0,02
017644	**MPEX 11 04PPFL-701**	**GH1**	11,11	11,11	4,76	Faceta	0,02

MPEX_-701



Totalmente rectificada ϰ 90°
cara de corte cóncava.

024148	**MPFW 04 02PPTR**	**GH1**	4,76	4,76	2,38	Faceta	0,07
025799	**MPFW 04 02PPTL**	**GH1**	4,76	4,76	2,38	Faceta	0,07
017645	**MPFW 04 02PPTR**	**SF30**	4,76	4,76	2,38	Faceta	0,07
015158	**MPFW 04 02PPTR**	**SFZ**	4,76	4,76	2,38	Faceta	0,07
015157	**MPFW 04 02PPTL**	**SFZ**	4,76	4,76	2,38	Faceta	0,07
017427	**MPFW 04 02PPTR**	**X44**	4,76	4,76	2,38	Faceta	0,07
017426	**MPFW 04 02PPTL**	**X44**	4,76	4,76	2,38	Faceta	0,07
017649	**MPFW 06 02PPTR**	**GH1**	6,35	6,35	2,38	Faceta	0,07
017652	**MPFW 06 02PPTL**	**GH1**	6,35	6,35	2,38	Faceta	0,07
017647	**MPFW 06 02PPTR**	**SF30**	6,35	6,35	2,38	Faceta	0,07
014400	**MPFW 06 02PPTR**	**SFZ**	6,35	6,35	2,38	Faceta	0,07
015159	**MPFW 06 02PPTL**	**SFZ**	6,35	6,35	2,38	Faceta	0,07
017648	**MPFW 06 02PPTR**	**X44**	6,35	6,35	2,38	Faceta	0,07
017655	**MPFW 08 03PPTR**	**GH1**	7,94	7,94	3,18	Faceta	0,1
017658	**MPFW 08 03PPTL**	**GH1**	7,94	7,94	3,18	Faceta	0,1
017653	**MPFW 08 03PPTR**	**SF30**	7,94	7,94	3,18	Faceta	0,1
017656	**MPFW 08 03PPTL**	**SF30**	7,94	7,94	3,18	Faceta	0,1
014401	**MPFW 08 03PPTR**	**SFZ**	7,94	7,94	3,18	Faceta	0,1
017659	**MPFW 08 03PPTL**	**SFZ**	7,94	7,94	3,18	Faceta	0,1
017654	**MPFW 08 03PPTR**	**X44**	7,94	7,94	3,18	Faceta	0,1
017657	**MPFW 08 03PPTL**	**X44**	7,94	7,94	3,18	Faceta	0,1
017440	**MPFW 11 04PPTR**	**GH1**	11,11	11,11	4,76	Faceta	0,15
017439	**MPFW 11 04PPTL**	**GH1**	11,11	11,11	4,76	Faceta	0,15
018182	**MPFW 11 04PPTR**	**SF30**	11,11	11,11	4,76	Faceta	0,15
018181	**MPFW 11 04PPTL**	**SF30**	11,11	11,11	4,76	Faceta	0,15
017660	**MPFW 11 04PPTR**	**SFZ**	11,11	11,11	4,76	Faceta	0,15
017662	**MPFW 11 04PPTL**	**SFZ**	11,11	11,11	4,76	Faceta	0,15
017777	**MPFW 11 04PPTR**	**X44**	11,11	11,11	4,76	Faceta	0,15
017336	**MPFW 11 04PPTL**	**X44**	11,11	11,11	4,76	Faceta	0,15

MPFW_



Rectificada periféricamente
ϰ 90° sin rompe virutas.

017664	**MPHT 08 03PPER**	**SFZ**	7,94	7,94	3,18	Faceta	0,04

MPHT_



Rectificada periféricamente ϰ 90° rompe
virutas prensado en una sola cara.

017297	**MPHT 08 03PPTR-42**	**MP91M**	7,94	7,94	3,18	Faceta	0,1
017296	**MPHT 08 03PPTL-42**	**MP91M**	7,94	7,94	3,18	Faceta	0,1
023250	**MPHT 08 03PPTR-42**	**PFZ**	7,94	7,94	3,18	Faceta	0,1
023249	**MPHT 08 03PPTL-42**	**PFZ**	7,94	7,94	3,18	Faceta	0,1
027906	**MPHT 08 03PPTL-42**	**SP6564**	7,94	7,94	3,18	Faceta	0,1
015140	**MPHT 08 03PPTR-42**	**X500**	7,94	7,94	3,18	Faceta	0,1
015138	**MPHT 08 03PPTL-42**	**X500**	7,94	7,94	3,18	Faceta	0,1
017299	**MPHT 11 04PPTR-42**	**MP91M**	11,11	11,11	4,76	Faceta	0,1
017298	**MPHT 11 04PPTL-42**	**MP91M**	11,11	11,11	4,76	Faceta	0,1
027908	**MPHT 11 04PPTL-42**	**SP6564**	11,11	11,11	4,76	Faceta	0,1
015142	**MPHT 11 04PPTR-42**	**X500**	11,11	11,11	4,76	Faceta	0,1
015141	**MPHT 11 04PPTL-42**	**X500**	11,11	11,11	4,76	Faceta	0,1

MPHT_-42



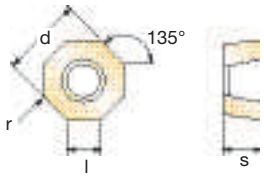
Rectificada periféricamente ϰ 90° rompe
virutas prensado en una sola cara.

017666	**MPHW 04 02PPTR**	**X500**	4,76	4,76	2,38	Faceta	0,07
017667	**MPHW 04 02PPTL**	**X500**	4,76	4,76	2,38	Faceta	0,07
017301	**MPHW 06 02PPTR**	**MP91M**	6,35	6,35	2,38	Faceta	0,07
017300	**MPHW 06 02PPTL**	**MP91M**	6,35	6,35	2,38	Faceta	0,07
023253	**MPHW 06 02PPTR**	**PFZ**	6,35	6,35	2,38	Faceta	0,07
017669	**MPHW 06 02PPTL**	**X500**	6,35	6,35	2,38	Faceta	0,07
017668	**MPHW 06 02PPTR**	**X500**	6,35	6,35	2,38	Faceta	0,07

MPHW_



Rectificada periféricamente
ϰ 90° sin rompe virutas.



Plaquitas de fresado forma M, O & R

MPMT_-43

Bruta de sinterizado ϰ 90° rompe virutas en una sola cara.



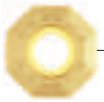
MPMW_

Bruta de sinterizado ϰ 90° sin rompe virutas.



ODET_-44

Rectificada periféricamente ϰ 45° rompe virutas prensado en una sola cara.



ODET_-441

Rectificada periféricamente ϰ 45° rompe virutas prensado en una sola cara.



ODEW_-RA

Rectificada periféricamente ϰ 90° sin rompe virutas.



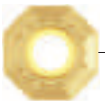
ODET_-41

Bruta de sinterizado ϰ 45° rompe virutas en una sola cara.



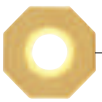
ODMT_-41

Bruta de sinterizado ϰ 45° rompe virutas en una sola cara.



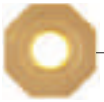
ODMW_-SN

Bruta de sinterizado ϰ 45° sin rompe virutas.



ODMW_-TN

Bruta de sinterizado ϰ 45° sin rompe virutas.



RDET_-701

Rectificada periféricamente ϰ 45° rompe virutas prensado en una sola cara.



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
015180	**MPMT 06 0204EN-43**	**X500**	6,35	6,35	2,38	0,4	0,04
017670	**MPMW 08 0304TN**	**SFZ**	7,94	7,94	3,18	0,4	0,1
022199	**ODET 04 04APEN-44**	**MP91M**	12,7	4,0	4,76	Faceta	0,04
022198	**ODET 04 04APEN-44**	**X500**	12,7	4,0	4,76	Faceta	0,04
027722	**ODET 04 04APEN-44**	**SP6564**	12,7	4,0	4,76	Faceta	0,04
026591	**ODET 06 05APEN-44**	**MP91M**	16,0	6,0	5,55	Faceta	0,04
026598	**ODET 06 05APEN-44**	**SP4036**	16,0	6,0	5,55	Faceta	0,04
027891	**ODET 06 05APEN-44**	**SP6564**	16,0	6,0	5,55	Faceta	0,04
026592	**ODET 06 05APEN-44**	**X500**	16,0	6,0	5,55	Faceta	0,04
024911	**ODET 04 04APFN-441**	**GH1**	12,7	4,0	4,76	Faceta	0,02
026588	**ODET 06 05APEN-441**	**X500**	16,0	6,0	5,55	Faceta	0,02
027884	**ODEW 04 04APTR-RA**	**SC3025**	12,7	4,0	4,76	Faceta	0,19
027885	**ODEW 06 05APTR-RA**	**SC3025**	16,0	6,0	5,55	Faceta	0,19
017775	**ODET 04 04APEN-41**	**MP91M**	12,7	4,0	4,76	Faceta	0,04
022061	**ODET 04 04APEN-41**	**X500**	12,7	4,0	4,76	Faceta	0,04
027724	**ODET 04 04APEN-41**	**SP6564**	12,7	4,0	4,76	Faceta	0,04
026589	**ODET 06 05APEN-41**	**MP91M**	16,0	6,0	5,55	Faceta	0,04
026597	**ODET 06 05APEN-41**	**SP4036**	16,0	6,0	5,55	Faceta	0,04
026590	**ODET 06 05APEN-41**	**X500**	16,0	6,0	5,55	Faceta	0,04
017303	**ODMT 04 0408EN-41**	**MP91M**	12,7	4,0	4,76	0,8	0,04
015143	**ODMT 04 0408EN-41**	**X500**	12,7	4,0	4,76	0,8	0,04
027723	**ODMT 04 0408EN-41**	**SP6564**	12,7	4,0	4,76	0,8	0,04
017304	**ODMW 04 0408SN**	**MP91M**	12,7	4,0	4,76	0,8	0,27
015143	**ODMW 04 0408SN**	**PFZ**	12,7	4,0	4,76	0,8	0,27
029096	**ODMW 04 0408SN**	**SC3025**	12,7	4,0	4,76	0,8	0,27
024115	**ODMW 04 0408SN**	**X44**	12,7	4,0	4,76	0,8	0,27
017672	**ODMW 04 0408SN**	**X500**	12,7	4,0	4,76	0,8	0,27
027197	**ODMW 04 0408SN**	**SP6564**	12,7	4,0	4,76	0,8	0,27
025836	**ODMW 06 0512SN**	**MP91M**	16,0	6,0	5,55	1,2	0,27
029097	**ODMW 06 0512SN**	**SC3025**	16,0	6,0	5,55	1,2	0,27
025837	**ODMW 06 0512SN**	**SF30**	16,0	6,0	5,55	1,2	0,27
025838	**ODMW 06 0512SN**	**X500**	16,0	6,0	5,55	1,2	0,27
027743	**ODMW 06 0512SN**	**SP6564**	16,0	6,0	5,55	1,2	0,27
026595	**ODMW 06 0512TN**	**MP91M**	16,0	6,0	5,55	1,2	0,17
026599	**ODMW 06 0512TN**	**SP4036**	16,0	6,0	5,55	1,2	0,17
027893	**ODMW 06 0512TN**	**SP6564**	16,0	6,0	5,55	1,2	0,17
026596	**ODMW 06 0512TN**	**X500**	16,0	6,0	5,55	1,2	0,17
025739	**RDET 07 02M0E-701**	**SP4036**	7,0	-	2,38	3,5	0,03
025743	**RDET 10 03M0E-701**	**SP4036**	10,0	-	3,18	5,0	0,05
029297	**RDET 12 T3M0E-701-X6**	**SP4036**	12,0	-	3,97	6,0	0,05
029298	**RDET 16 04M0E-701-X6**	**SP4036**	16,0	-	4,76	8,0	0,05



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
025737	**RDHW 07 02M0T**	**SP4036**	7,0	-	2,38	3,5	0,075
025741	**RDHW 10 03M0T**	**SP4036**	10,0	-	3,18	5,0	0,15
029299	**RDHW 12 T3M0T-20-X6**	**SP4036**	12,0	-	3,97	6,0	0,20
029301	**RDHW 12 T3M0T-20-X6**	**SP5464**	12,0	-	3,97	6,0	0,20
029302	**RDHW 12 T3M0T-X6**	**SP4036**	12,0	-	3,97	6,0	0,15
029303	**RDHW 12 T3M0T-X6**	**SP5464**	12,0	-	3,97	6,0	0,15
029306	**RDHW 16 04M0T-30-X8**	**SP4036**	16,0	-	4,76	8,0	0,30
027478	**RDHW 16 04M0T-30-X8**	**SP5464**	16,0	-	4,76	8,0	0,30
029304	**RDHW 16 04M0T-X8**	**SP4036**	16,0	-	4,76	8,0	0,15
025749	**RDHW 16 04M0T-X8**	**SP5464**	16,0	-	4,76	8,0	0,15

RDHW_
Rectificada periféricamente sin rompe virutas.



029313	**RDMW 12 T3M0T-20-X6**	**SP5464**	12,0	-	3,97	6,0	0,20
029314	**RDMW 12 T3M0T-X6**	**SP5464**	12,0	-	3,97	6,0	0,15
029312	**RDMW 16 04M0T-30-X8**	**SP5464**	16,0	-	4,76	8,0	0,30
029311	**RDMW 16 04M0T-X8**	**SP5464**	16,0	-	4,76	8,0	0,15
017673	**RDMW 16 06M0S**	**SF30**	16,0	-	6,35	8,0	0,30
027816	**RDMW 16 06M0S**	**SU5400**	16,0	-	6,35	8,0	0,30
015183	**RDMW 16 06M0S**	**X500**	16,0	-	6,35	8,0	0,30

RDMW_
Bruta de sinterizado sin rompe virutas.



027795	**RG 10S**	**SP1064**	10,0	-	2,0	5,0	0,02
027796	**RG 12S**	**SP1064**	12,0	-	2,5	6,0	0,02
027797	**RG 16S**	**SP1064**	16,0	-	3,0	8,0	0,02
027798	**RG 20S**	**SP1064**	20,0	-	3,5	10,0	0,02
027799	**RG 25S**	**SP1064**	25,0	-	4,0	12,5	0,02

RG..S_
Totalmente rectificada.



017679	**RPET 10 T3M0E**	**SFZ**	10,0	-	3,97	5,0	0,03
017678	**RPET 10 T3M0E**	**X44**	10,0	-	3,97	5,0	0,03
029279	**RPET 12 04M0E-X4**	**X44**	12,0	-	4,76	6,0	0,03
029280	**RPET 12 04M0E-X4**	**SFZ**	12,0	-	4,76	6,0	0,03
029271	**RPET 12 04M0E-X4**	**SP4036**	12,0	-	4,76	6,0	0,03

RPET_
Rectificada periféricamente rompe virutas prensado en una sola cara.



024755	**RPEW 06 02M0T**	**X500**	6,0	-	2,38	3,0	0,1
024756	**RPEW 08 03M3T**	**PFZ**	8,0	-	3,18	4,0	0,1

RPEW_
Rectificada periféricamente sin rompe virutas.



024757	**RPEX 08 03M3E**	**X44**	8,0	-	3,18	3,0	0,02

RPEX_
Totalmente rectificada cara de corte cóncava.



023312	**RPEX 06 02M0E-701**	**PFZ**	6,0	-	2,38	3,0	0,02
017686	**RPEX 06 02M0F-701**	**GH1**	6,0	-	2,38	3,0	0,02
015212	**RPEX 06 02M0F-701**	**SFZ**	6,0	-	2,38	3,0	0,02
024104	**RPEX 06 02M0F-701**	**X44**	6,0	-	2,38	3,0	0,02
015214	**RPEX 08 03M3E-701**	**PFZ**	8,0	-	3,18	4,0	0,02
023315	**RPEX 08 03M3F-701**	**GH1**	8,0	-	3,18	4,0	0,02
015213	**RPEX 08 03M3F-701**	**SFZ**	8,0	-	3,18	4,0	0,02
015215	**RPEX 10 T3M0E-701**	**PFZ**	10,0	-	3,97	5,0	0,02
017688	**RPEX 10 T3M0F-701**	**GH1**	10,0	-	3,97	5,0	0,02
023317	**RPEX 10 T3M0F-701**	**SFZ**	10,0	-	3,97	5,0	0,02
029284	**RPEX 12 04M0E-701-X4**	**GH1**	12,0	-	4,76	6,0	0,02
029283	**RPEX 12 04M0F-701-X4**	**SFZ**	12,0	-	4,76	6,0	0,02
029282	**RPEX 12 04M0F-701-X4**	**X500**	12,0	-	4,76	6,0	0,02

RPEX_-701
Totalmente rectificada cara de corte cóncava.



024082	**RPHT 10 T3M0T**	**PFZ**	10,0	-	3,97	5,0	0,075
017690	**RPHT 10 T3M0T**	**X500**	10,0	-	3,97	5,0	0,075
027726	**RPHT 10 T3M0T**	**SP6564**	10,0	-	3,97	5,0	0,075
029289	**RPHT 12 04M0T-X4**	**X500**	12,0	-	4,76	6,0	0,1
029290	**RPHT 12 04M0T-X4**	**SP6564**	12,0	-	4,76	6,0	0,1
015132	**RPHT 16 06M0T**	**PFZ**	16,0	-	6,35	8,0	0,1
017692	**RPHT 16 06M0T**	**X500**	16,0	-	6,35	8,0	0,1

RPHT_
Rectificada periféricamente rompe virutas prensado en una sola cara.



Plaquitas de fresado forma R & S







RPHT_-421

Rectificada periféricamente
rompe virutas prensado
en una sola cara.



RPMT_-41

Bruta de sinterizado
rompe virutas en una sola cara.



RPMW_

Bruta de sinterizado
sin rompe virutas.



SCCT_

Rectificada periféricamente ϒ 45°
rompe virutas prensado
en una sola cara



SCHT_

Rectificada periféricamente ϒ 45°
rompe virutas prensado
en una sola cara.



SCKT_-41

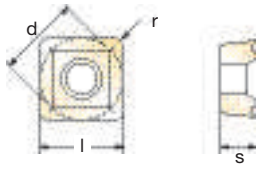
Faceta de acabado rectificada ϒ 45°
rompe virutas prensado
en una sola cara.



SCMT_

Bruta de sinterizado
rompe virutas en una sola cara.

			Dimensiones (mm)				
EDP #	**Referencia**	**Calidad**	d	l	s	r	h_m min
015145	**RPHT 10 T3M0E-421**	**X500**	10,0	-	3,97	5,0	0,04
027725	**RPHT 10 T3M0E-421**	**SP6564**	10,0	-	3,97	5,0	0,04
029287	**RPHT 12 04M0E-421-X4**	**MP91M**	12,0	-	4,76	6,0	0,04
029286	**RPHT 12 04M0E-421-X4**	**X500**	12,0	-	4,76	6,0	0,04
015131	**RPHT 16 06M0E-421**	**PFZ**	16,0	-	6,35	8,0	0,04
024151	**RPHT 16 06M0E-421**	**X500**	16,0	-	6,35	8,0	0,04
023327	**RPMT 06 02M0E-41**	**MP91M**	6,0	-	2,38	3,0	0,03
015219	**RPMT 06 02M0E-41**	**X500**	6,0	-	2,38	3,0	0,03
017308	**RPMT 08 03M3E-41**	**MP91M**	8,0	-	3,18	4,0	0,04
015220	**RPMT 08 03M3E-41**	**X500**	8,0	-	3,18	4,0	0,04
027728	**RPMT 08 03M3E-41**	**SP6564**	8,0	-	3,18	4,0	0,04
023329	**RPMT 10 T3M0E-41**	**MP91M**	10,0	-	3,97	5,0	0,04
015221	**RPMT 10 T3M0E-41**	**X500**	10,0	-	3,97	5,0	0,04
029291	**RPMT 12 04M0E-41-X4**	**MP91M**	12,0	-	4,76	6,0	0,05
029272	**RPMT 12 04M0E-41-X4**	**X500**	12,0	-	4,76	6,0	0,05
029293	**RPMT 12 04M0E-41-X4**	**SP6564**	12,0	-	4,76	6,0	0,05
015223	**RPMT 16 06M0E-41**	**X500**	16,0	-	6,35	8,0	0,05
025839	**RPMW 10 T3M0T**	**X500**	10,0	-	3,97	5,0	0,13
029294	**RPMW 12 04M0T-X4**	**MP91M**	12,0	-	4,76	6,0	0,13
029295	**RPMW 12 04M0T-X4**	**X500**	12,0	-	4,76	6,0	0,13
029296	**RPMW 12 04M0T-X4**	**SP6564**	12,0	-	4,76	6,0	0,13
017312	**SCCT 12 M5ACER**	**MP91M**	12,7	12,7	5,0	Faceta	0,03
025811	**SCCT 12 M5ACTR**	**SP4036**	12,7	12,7	5,0	Faceta	0,15
017695	**SCCT 12 M5ACTR**	**GH1**	12,7	12,7	5,0	Faceta	0,15
017693	**SCCT 12 M5ACTR**	**SF30**	12,7	12,7	5,0	Faceta	0,15
017696	**SCCT 12 M5ACTR**	**SFZ**	12,7	12,7	5,0	Faceta	0,15
017694	**SCCT 12 M5ACTR**	**X44**	12,7	12,7	5,0	Faceta	0,15
017697	**SCHT 12 M5ACTN**	**PFZ**	12,7	12,7	5,0	Faceta	0,15
027894	**SCHT 12 M5ACTN**	**SP6564**	12,7	12,7	5,0	Faceta	0,15
017698	**SCHT 12 M5ACTN**	**X500**	12,7	12,7	5,0	Faceta	0,15
017313	**SCHT 12 M5ACTN**	**MP91M**	12,7	12,7	5,0	Faceta	0,15
015144	**SCKT 12 M5ACSN-41**	**X500**	12,7	12,7	5,0	Faceta	0,12
017314	**SCKT 12 M5ACSN-41**	**MP91M**	12,7	12,7	5,0	Faceta	0,12
017699	**SCKT 12 M5ACSN-41**	**PFZ**	12,7	12,7	5,0	Faceta	0,12
027895	**SCKT 12 M5ACSN-41**	**SP6564**	12,7	12,7	5,0	Faceta	0,12
017703	**SCMT 09 T308E**	**SF30**	9,52	9,52	3,97	0,8	0,15
018188	**SCMT 09 T308E**	**SFZ**	9,52	9,52	3,97	0,8	0,15
025852	**SCMT 09 T304T**	**SF30**	9,52	9,52	3,97	0,4	0,15
015225	**SCMT 09 T308T**	**PFZ**	9,52	9,52	3,97	0,8	0,15
017704	**SCMT 09 T308T**	**SF30**	9,52	9,52	3,97	0,8	0,15
017705	**SCMT 09 T308T**	**SFZ**	9,52	9,52	3,97	0,8	0,15
027896	**SCMT 09 T308T**	**SP6564**	9,52	9,52	3,97	0,8	0,15
015224	**SCMT 09 T308T**	**X44**	9,52	9,52	3,97	0,8	0,15
017706	**SCMT 12 M508E**	**SF30**	9,52	9,52	3,97	0,8	0,15
024944	**SCMT 12 M508E**	**X44**	12,7	12,7	5,0	0,8	0,15
025832	**SCMT 12 M508T**	**PFZ**	12,7	12,7	5,0	0,8	0,15
017707	**SCMT 12 M512E**	**SF30**	12,7	12,7	5,0	1,2	0,15
017709	**SCMT 12 M512T**	**GH1**	12,7	12,7	5,0	1,2	0,15
017316	**SCMT 12 M512T**	**MP91M**	12,7	12,7	5,0	1,2	0,15
015227	**SCMT 12 M512T**	**PFZ**	12,7	12,7	5,0	1,2	0,15
017708	**SCMT 12 M512T**	**SF30**	12,7	12,7	5,0	1,2	0,15
017710	**SCMT 12 M512T**	**SFZ**	12,7	12,7	5,0	1,2	0,15
015228	**SCMT 12 M512T**	**X44**	12,7	12,7	5,0	1,2	0,15
024129	**SCMT 12 M512T**	**X500**	12,7	12,7	5,0	1,2	0,12



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
017700	**SCMT 09 M512SN-P**	**SF30**	9,52	9,52	5,0	1,2	0,15
017702	**SCMT 09 M512SN-P**	**SFZ**	9,52	9,52	5,0	1,2	0,15
027897	**SCMT 09 M512SN-P**	**SP6564**	9,52	9,52	5,0	1,2	0,15
017430	**SCMT 09 M512SN-P**	**X44**	9,52	9,52	5,0	1,2	0,15
017701	**SCMT 09 M512SN-P**	**X500**	9,52	9,52	5,0	1,2	0,15
023343	**SCMT 09 M512SN-P**	**PFZ**	9,52	9,52	5,0	1,2	0,15

SCMT_-P
Bruta de sinterizado
rompe virutas en una sola cara.



017315	**SCMT 09 T308EN-41**	**MP91M**	9,52	9,52	3,97	0,8	0,04
024107	**SCMT 09 T308EN-41**	**PFZ**	9,52	9,52	3,97	0,8	0,04
015147	**SCMT 09 T308EN-41**	**X500**	9,52	9,52	3,97	0,8	0,04
027731	**SCMT 09 T308EN-41**	**SP6564**	9,52	9,52	3,97	0,8	0,04
017317	**SCMT 12 M512EN-41**	**MP91M**	12,7	12,7	5,0	1,2	0,05
024108	**SCMT 12 M512EN-41**	**PFZ**	12,7	12,7	5,0	1,2	0,05
015226	**SCMT 12 M512EN-41**	**X500**	12,7	12,7	5,0	1,2	0,05
027732	**SCMT 12 M512EN-41**	**SP6564**	12,7	12,7	5,0	1,2	0,05

SCMT_-41
Bruta de sinterizado
rompe virutas en una sola cara.



018198	**SCMW 09 T304E**	**GH1**	9,52	9,52	3,97	0,4	0,03
018199	**SCMW 09 T308E**	**GH1**	9,52	9,52	3,97	0,8	0,03

SCMW_
Bruta de sinterizado
sin rompe virutas.



017714	**SDCT 09 T3AEEN**	**SF30**	9,52	9,52	3,97	Faceta	0,04
025842	**SDCT 09 T3AEEN**	**SP4036**	9,52	9,52	3,97	Faceta	0,03
017242	**SDCT 09 T3AEFN**	**GH1**	9,52	9,52	3,97	Faceta	0,02
018203	**SDCT 12 04AEEN**	**SF30**	12,7	12,7	4,76	Faceta	0,04
017243	**SDCT 12 04AEFN**	**GH1**	12,7	12,7	4,76	Faceta	0,02

SDCT_
Rectificada periféricamente ϰ 45° rompe
virutas prensado en una sola cara.



017715	**SDCW 09 T3AEFN**	**SFZ**	9,52	9,52	3,97	Faceta	0,02
018204	**SDCW 09 T3AETN**	**CN35**	9,52	9,52	3,97	Faceta	0,12
017716	**SDCW 09 T3AETN**	**SF30**	9,52	9,52	3,97	Faceta	0,15
017717	**SDCW 09 T3AETN**	**X44**	9,52	9,52	3,97	Faceta	0,15
027718	**SDCW 09 T3AETN**	**SFZ**	9,52	9,52	3,97	Faceta	0,10
025843	**SDCW 09 T3EEFR**	**GH1**	9,52	9,52	3,97	Faceta	0,02
017318	**SDCW 12 04AEEN**	**MP91M**	12,7	12,7	4,76	Faceta	0,03
017722	**SDCW 12 04AETN**	**GH1**	12,7	12,7	4,76	Faceta	0,15
018205	**SDCW 12 04AETN**	**CN35**	12,7	12,7	4,76	Faceta	0,17
017720	**SDCW 12 04AETN**	**SF30**	12,7	12,7	4,76	Faceta	0,15
017723	**SDCW 12 04AETN**	**SFZ**	12,7	12,7	4,76	Faceta	0,10
017721	**SDCW 12 04AETN**	**X44**	12,7	12,7	4,76	Faceta	0,15

SDCW_
Rectificada periféricamente
ϰ 45° sin rompe virutas.



017319	**SDET 09 T308EN**	**MP91M**	9,52	9,52	3,97	0,8	0,03
017724	**SDET 09 T308EN**	**PFZ**	9,52	9,52	3,97	0,8	0,03
017725	**SDET 09 T308FN**	**GH1**	9,52	9,52	3,97	0,8	0,02

SDET_
Rectificada periféricamente ϰ 45° rompe
virutas prensado en una sola cara.



017726	**SDEX 09 T3AEEN-701**	**PFZ**	9,52	9,52	3,97	Faceta	0,03
015148	**SDEX 09 T3AEFN-701**	**GH1**	9,52	9,52	3,97	Faceta	0,02
015229	**SDEX 09 T3AEFN-701**	**SFZ**	9,52	9,52	3,97	Faceta	0,02
017727	**SDEX 12 04AEEN-701**	**PFZ**	12,7	12,7	4,76	Faceta	0,03
015149	**SDEX 12 04AEEN-701**	**GH1**	12,7	12,7	4,76	Faceta	0,02
015230	**SDEX 12 04AEEN-701**	**SFZ**	12,7	12,7	4,76	Faceta	0,02

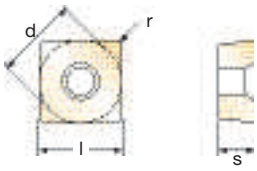
SDEX_-701
Totalmente rectificada ϰ 45°
cara de corte cóncava.



017322	**SDHT 12 04AETN-42**	**MP91M**	12,7	12,7	4,76	Faceta	0,15
017728	**SDHT 12 04AETN-42**	**PFZ**	12,7	12,7	4,76	Faceta	0,15
027735	**SDHT 12 04AETN-42**	**SP6564**	12,7	12,7	4,76	Faceta	0,15
017729	**SDHT 12 04AETN-42**	**X500**	12,7	12,7	4,76	Faceta	0,10

SDHT_-42
Rectificada periféricamente ϰ 45° rompe
virutas prensado en una sola cara.





Plaquitas de fresado forma S



SDHT_-421

Rectificada periféricamente ϰ 45° rompe virutas prensado en una sola cara.

			Dimensiones (mm)				
EDP #	Referencia	Calidad	d	l	s	r	h_m min
017320	SDHT 09 T3AEEN-421	MP91M	9,52	9,52	3,97	Faceta	0,03
023356	SDHT 09 T3AEEN-421	PFZ	9,52	9,52	3,97	Faceta	0,03
015186	SDHT 09 T3AEEN-421	X500	9,52	9,52	3,97	Faceta	0,03
027733	SDHT 09 T3AEEN-421	SP6564	9,52	9,52	3,97	Faceta	0,03
017321	SDHT 12 04AEEN-421	MP91M	12,7	12,7	4,76	8,0	0,04
015133	SDHT 12 04AEEN-421	PFZ	12,7	12,7	4,76	8,0	0,04
015187	SDHT 12 04AEEN-421	X500	12,7	12,7	4,76	8,0	0,04
027734	SDHT 12 04AEEN-421	SP6564	12,7	12,7	4,76	8,0	0,04



SDHW_

Rectificada periféricamente ϰ 45° sin rompe virutas.

017323	SDHW 09 T3AETN	MP91M	9,52	9,52	3,97	Faceta	0,10
023358	SDHW 09 T3AETN	PFZ	9,52	9,52	3,97	Faceta	0,10
015231	SDHW 09 T3AETN	X500	9,52	9,52	3,97	Faceta	0,10
017324	SDHW 12 04AETN	MP91M	12,7	12,7	4,76	Faceta	0,15
015134	SDHW 12 04AETN	PFZ	12,7	12,7	4,76	Faceta	0,15
017730	SDHW 12 04AETN	X500	12,7	12,7	4,76	Faceta	0,15
017731	SDHW 15 05AETN	X500	15,88	15,88	5,56	Faceta	0,15



SDKT_-45

Bruta de sinterizado faceta de acabado rectificada rompe virutas prensado en una sola cara.

026600	SDKT 09 T3AEEN-45	MP91M	9,52	9,52	3,97	Faceta	0,05
026602	SDKT 09 T3AEEN-45	X500	9,52	9,52	3,97	Faceta	0,05
027738	SDKT 09 T3AEEN-45	SP6564	9,52	9,52	3,97	Faceta	0,05
029456	SDKT 12 04AEEN-45	MP91M	12,7	12,7	4,76	Faceta	0,05
029457	SDKT 12 04AEEN-45	X500	12,7	12,7	4,76	Faceta	0,05
029455	SDKT 12 04AEEN-45	SP6564	12,7	12,7	4,76	Faceta	0,05



SDMT_-41

Bruta de sinterizado rompe virutas prensado en una sola cara.

017325	SDMT 09 T308EN-41	MP91M	9,52	9,52	3,97	0,8	0,04
023362	SDMT 09 T308EN-41	PFZ	9,52	9,52	3,97	0,8	0,04
014410	SDMT 09 T308EN-41	X500	9,52	9,52	3,97	0,8	0,04
027736	SDMT 09 T308EN-41	SP6564	9,52	9,52	3,97	0,8	0,04
017326	SDMT 12 0412EN-41	MP91M	12,7	12,7	4,76	1,2	0,05
015135	SDMT 12 0412EN-41	PFZ	12,7	12,7	4,76	1,2	0,05
014411	SDMT 12 0412EN-41	X500	12,7	12,7	4,76	1,2	0,05
027737	SDMT 12 0412EN-41	SP6564	12,7	12,7	4,76	1,2	0,05



SDMW_

Bruta de sinterizado sin rompe virutas.

017327	SDMW 09 T308TN	MP91M	9,52	9,52	3,97	0,8	0,15
027742	SDMW 09 T308TN	SP6564	9,52	9,52	3,97	0,8	0,15
023363	SDMW 09 T308TN	PFZ	9,52	9,52	3,97	0,8	0,15
015232	SDMW 09 T308TN	X500	9,52	9,52	3,97	0,8	0,12
017328	SDMW 12 0412TN	MP91M	12,7	12,7	4,76	1,2	0,15
015136	SDMW 12 0412TN	PFZ	12,7	12,7	4,76	1,2	0,15
015233	SDMW 12 0412TN	X500	12,7	12,7	4,76	1,2	0,12



SEHT_

Rectificada periféricamente ϰ 45° rompe virutas prensado en una sola cara.

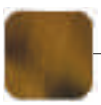
012470	SEHT 12 04AF4B	MP91M	12,7	12,7	4,76	Faceta	0,12
012469	SEHT 12 04AFER	PFZ	12,7	12,7	4,76	Faceta	0,12



SEHW_

Rectificada periféricamente ϰ 45° sin rompe virutas.

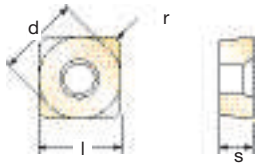
012990	SEHW 12 04AF4B	MP91M	12,7	12,7	4,76	Faceta	0,12



SEKN_

Rectificada periféricamente ϰ 45° sin rompe virutas.

010832	SEKN 12 03AFEN	MP91M	12,7	12,7	3,18	Faceta	0,12
009252	SEKN 12 03AFEN	PFZ	12,7	12,7	3,18	Faceta	0,12
009247	SEKN 12 03AFEN	SF30	12,7	12,7	3,18	Faceta	0,12
017862	SEKN 12 03AFFN	GH1	12,7	12,7	3,18	Faceta	0,12
010834	SEKN 12 04AFEN	MP91M	12,7	12,7	4,76	Faceta	0,12
009253	SEKN 12 04AFEN	PFZ	12,7	12,7	4,76	Faceta	0,12
011344	SEKN 15 04AFEN	MP91M	15,88	15,88	4,76	Faceta	0,12
009254	SEKN 15 04AFEN	PFZ	15,88	15,88	4,76	Faceta	0,12



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	h_m min
010833	**SEKR 12 03AFEN**	**MP91M**	12,7	12,7	3,18	Faceta	0,12
009781	**SEKR 12 03AFEN**	**PFZ**	12,7	12,7	3,18	Faceta	0,12
017863	**SEKR 12 03AFFN**	**GH1**	12,7	12,7	3,18	Faceta	0,12
011546	**SEKR 12 04AFEN**	**MP91M**	12,7	12,7	4,76	Faceta	0,12
027898	**SEKR 12 03AFTR**	**SP6564**	12,7	12,7	4,76	Faceta	0,12
017223	**SEKR 12 04AFEN**	**PFZ**	12,7	12,7	4,76	Faceta	0,12
011345	**SEKR 15 04AFEN**	**MP91M**	15,88	15,88	4,76	Faceta	0,12
010309	**SEKR 15 04AFEN**	**PFZ**	15,88	15,88	4,76	Faceta	0,12

SEKR_-

Rectificada periféricamente ϰ 45° rompe virutas prensado en una sola cara.



022114	**SEKT 12 04AFER-45**	**MP91M**	12,7	12,7	4,76	Faceta	0,05
022113	**SEKT 12 04AFER-45**	**X500**	12,7	12,7	4,76	Faceta	0,05

SEKT_-45

Bruta de sinterizado faceta de acabado rectificada ϰ 45° rompe virutas prensado en una sola cara.



017329	**SOMT 12 M612SN-B**	**MP91M**	12,7	12,7	6,0	1,2	0,15
017733	**SOMT 12 M612SN-B**	**GH1**	12,7	12,7	6,0	1,2	0,15
017734	**SOMT 12 M612SN-B**	**PFZ**	12,7	12,7	6,0	1,2	0,15
017732	**SOMT 12 M612SN-B**	**SF30**	12,7	12,7	6,0	1,2	0,15
017735	**SOMT 12 M612SN-B**	**SFZ**	12,7	12,7	6,0	1,2	0,15
025808	**SOMT 12 M612SN-B**	**SP4036**	12,7	12,7	6,0	1,2	0,15
027899	**SOMT 12 M612SN-B**	**SP6564**	12,7	12,7	6,0	1,2	0,15
015191	**SOMT 12 M612SN-B**	**X44**	12,7	12,7	6,0	1,2	0,15
015190	**SOMT 12 M612SN-B**	**X500**	12,7	12,7	6,0	1,2	0,15
017330	**SOMT 15 M612SN-B**	**MP91M**	15,88	15,88	6,0	1,2	0,15
017737	**SOMT 15 M612SN-B**	**GH1**	15,88	15,88	6,0	1,2	0,15
017738	**SOMT 15 M612SN-B**	**PFZ**	15,88	15,88	6,0	1,2	0,15
017736	**SOMT 15 M612SN-B**	**SF30**	15,88	15,88	6,0	1,2	0,15
027900	**SOMT 15 M612SN-B**	**SP6564**	15,88	15,88	6,0	1,2	0,15
015193	**SOMT 15 M612SN-B**	**X44**	15,88	15,88	6,0	1,2	0,15
015193	**SOMT 15 M612SN-B**	**X500**	15,88	15,88	6,0	1,2	0,15

SOMT_

Bruta de sinterizado rompe virutas prensado en una sola cara.



014413	**SPEW 06 0304SN**	**X500**	6,35	6,35	3,18	0,4	0,15

SPEW_

Rectificada periféricamente sin rompe virutas.



015234	**SPHX 12 M512EN**	**CN25**	12,7	12,7	5,0	1,2	0,02
017237	**SPHX 12 M512EN**	**GH1**	12,7	12,7	5,0	1,2	0,02

SPHX_

Rectificada periféricamente con rompe virutas rectificado – plaquita especial de acabado.



000477	**SPKN 12 03EDKR**	**SF30**	12,7	12,7	3,18	Faceta	0,2
012476	**SPKN 12 03EDKR**	**MP91M**	12,7	12,7	3,18	Faceta	0,2
012476	**SPKN 12 03EDTR**	**MP91M**	12,7	12,7	3,18	Faceta	0,15
012476	**SPKN 12 03EDTR**	**PFZ**	12,7	12,7	3,18	Faceta	0,15
012476	**SPKN 12 03EDTR**	**X44**	12,7	12,7	3,18	Faceta	0,15
012476	**SPKN 12 03EDTR**	**PFZ**	12,7	12,7	3,18	Faceta	0,15

SPKN_

Bruta de sinterizado ϰ 45° con faceta de acabado rectificad y sin rompe virutas



023382	**TCEW 16 T304F**	**GH1**	9,52	16,5	3,97	0,4	0,02

TCEW_

Rectificada periféricamente sin rompe virutas.



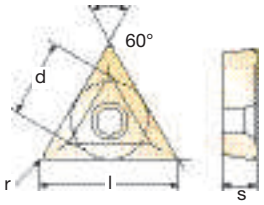
024139	**TCMT 16 T308E**	**MP91M**	9,52	16,5	3,97	0,8	0,05
023388	**TCMT 16 T308E**	**PFZ**	9,52	16,5	3,97	0,8	0,05
017743	**TCMT 16 T308E**	**SF30**	9,52	16,5	3,97	0,8	0,05
027901	**TCMT 16 T308E**	**SP6564**	9,52	16,5	3,97	0,8	0,05
014852	**TCMT 16 T308E**	**X44**	9,52	16,5	3,97	0,8	0,07
024140	**TCMT 16 T308E**	**X500**	9,52	16,5	3,97	0,8	0,05
014399	**TCMT 16 T308T**	**PFZ**	9,52	16,5	3,97	0,8	0,15
017745	**TCMT 16 T308T**	**SF30**	9,52	16,5	3,97	0,8	0,15
017746	**TCMT 16 T308T**	**X44**	9,52	16,5	3,97	0,8	0,15
025801	**TCMT 16 T308T**	**SFZ**	9,52	16,5	3,97	0,8	0,15

TCMT_

Bruta de sinterizado rompe virutas prensado en una sola cara.



Plaquitas de fresado forma T & X



TCMW_



Bruta de sinterizado sin rompe virutas.

EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	R	h_m min
010833	**TCMW 16 T308E**	**MP91M**	12,7	16,5	3,97	0,8	-	0,15

TCMX_



Angulo de incidencia rectificado ϒ 45° únicamente para 7745VT 16 WA020R.

023395	**TCMX 16 T308E-ZR**	**SFZ**	9,52	16,5	3,97	0,8	-	0,05

TNEF_



Rectificada periféricamente ϒ 45° rompe virutas prensado por ambas caras.

022354	**TNEF 12 04ANEN26**	**MP91M**	12,7	12,0	4,76	Faceta	-	0,05

TNCT_



Rectificada periféricamente rompe virutas prensado en una sola cara.

017284	**TNCT 22 04DDTR**	**GH1**	12,7	22,0	4,76	Faceta	-	0,15
017285	**TNCT 22 04DDTR**	**SF30**	12,7	22,0	4,76	Faceta	-	0,15

TNEN_



Rectificada periféricamente ϒ 45° sin rompe virutas.

026962	**TNEN12 04ANEN**	**MP91M**	12,7	12,0	4,76	Faceta	-	0,05
027886	**TNEN12 04ANTN**	**SC3025**	12,7	12,0	4,76	Faceta	-	0,05

TNHT_



Rectificada periféricamente rompe virutas prensado en una sola cara.

024084	**TNHT 22 04DDTR**	**PFZ**	12,7	22,0	4,76	Faceta	-	0,15

TPHT_-42



Rectificada periféricamente ϒ 60° rompe virutas prensado en una sola cara.

015137	**TPHT 22 04DETN-42**	**PFZ**	12,7	22,0	4,76	Faceta	-	0,1

TPMT_-M



Rectificada periféricamente ϒ 45° a ϒ 60° rompe virutas prensado en una sola cara.

024948	**TPMT 11 0204E-M**	**GH1**	6,35	11,0	2,38	0,4	-	0,03
023503	**TPMT 11 0204E-M**	**SFZ**	6,35	11,0	2,38	0,4	-	0,03
023504	**TPMT 11 0204E-M**	**X44**	6,35	11,0	2,38	0,4	-	0,03
024947	**TPMT 11 0204E-M**	**X500**	6,35	11,0	2,38	0,4	-	0,03

XDEW_-B



Rectificada periféricamente sin rompe virutas.

015195	**XDEW 11 /32T308SN-B**	**X500**	9,0	11,0	3,97	0,8	16	0,12
017749	**XDEW 12 /40T312SN-B**	**X500**	9,52	12,0	3,97	1,2	20	0,2
017748	**XDEW 12 /40T312SN-B**	**X44**	9,52	12,0	3,97	1,2	20	0,2
014414	**XDEW 13 /50T312SN-B**	**X44**	9,52	13,0	3,97	1,2	25	0,2
014416	**XDEW 13 /50T312SN-B**	**X500**	9,52	13,0	3,97	1,2	25	0,2
014417	**XDEW 16 /400512SN-B**	**X44**	12,7	16,0	5,56	1,2	20	0,2
014415	**XDEW 16 /400512SN-B**	**X500**	12,7	16,0	5,56	1,2	20	0,2
015177	**XDEW 16 /500512SN-B**	**X44**	12,7	16,0	5,56	1,2	25	0,2
015176	**XDEW 16 /500512SN-B**	**X500**	12,7	16,0	5,56	1,2	25	0,2

XDLT



Rectificada periféricamente rompe virutas prensado en una sola cara.

029637	**XDLT090408ER-D721**	**GH2**	9,52	9,52	4,76	0,8	-	-
029685	**XDLT090408ER-D41**	**X500**	9,52	9,52	4,76	0,8	-	-
029686	**XDLT090408ER-D41**	**SP6564**	9,52	9,52	4,76	0,8	-	-
029638	**XDLT120508ER-D721**	**GH2**	12,7	12,7	5,56	0,8	-	-
029682	**XDLT120508ER-D41**	**X500**	12,7	12,7	5,56	0,8	-	-
029683	**XDLT120508ER-D41**	**SP6564**	12,7	12,7	5,56	0,8	-	-

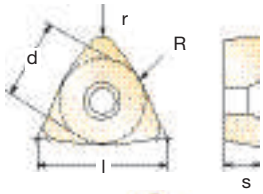
XDLW_D



Rectificada periféricamente sin rompe virutas.

029485	**XDLW090408SR-D**	**X500**	9,52	9,52	4,76	0,8	-	-
029486	**XDLW090408SR-D**	**SC3025**	9,52	9,52	4,76	0,8	-	-
029487	**XDLW090408SR-D**	**X400**	9,52	9,52	4,76	0,8	-	-
029488	**XDLW120508SR-D**	**X500**	12,7	12,7	5,56	0,8	-	-
029489	**XDLW120508SR-D**	**SC3025**	12,7	12,7	5,56	0,8	-	-
029490	**XDLW120508SR-D**	**X400**	12,7	12,7	5,56	0,8	-	-

Plaquitas de fresado forma X & Z



EDP #	Referencia	Calidad	Dimensiones (mm) d	l	s	r	R	h_m min
015171	**XDMT 12 /40T312EN-B41**	**X500**	9,52	12,0	3,97	1,2	20	0,06
015178	**XDMT 13 /50T312EN-B41**	**X500**	9,52	13,0	3,97	1,2	25	0,06
015174	**XDMT 16 /400512EN-B41**	**X500**	12,7	16,0	5,56	1,2	20	0,06
015162	**XDMT 16 /500512EN-B41**	**X500**	12,7	16,0	5,56	1,2	25	0,06

XDMT_B41



Bruta de sinterizado rompe virutas prensado en una sola cara.

014419	**XPEW 08 /250308SN-B**	**X500**	6,35	8,0	3,18	0,8	12,5	0,12

XPEW_B



Rectificada periféricamente sin rompe virutas.

029557	**XPNT06/062.51.5R-C**	**SC3025**	8,53	19,89	4,52	-	10,0	0,15
029486	**XPNT06/062.51.5R-C**	**X400**	8,53	19,89	4,52	-	10,0	0,15
029561	**XPNT25/250408.R-C**	**SC3025**	11,0	26,0	5,31	-	12,5	0,18
029562	**XPNT25/250408.R-C**	**X400**	11,0	26,0	5,31	-	12,5	0,18
029563	**XPNT32/320612.R-C**	**SC3025**	14,1	33,4	6,6	-	16,0	0,20
029564	**XPNT32/320612.R-C**	**X400**	14,1	33,4	6,6	-	16,0	0,20
029567	**XPNT40/40T716.R-C**	**SC3025**	17,0	40,0	8,56	-	20,0	0,22
029568	**XPNT40/40T716.R-C**	**X400**	17,0	40,0	8,56	-	20,0	0,22
029569	**XPNT50/50T716.R-C**	**SC3025**	22,25	52,86	8,53	-	25,4	0,25
029570	**XPNT50/50T716.R-C**	**X400**	22,25	52,86	8,53	-	25,4	0,25

XPNT_C



Bruta de sinterizado rompe virutas prensado en una sola cara.

029027	**ZDCX1403PDFR-701**	**GH1**	7,59	16,83	3,13	Faceta	-	0,02
029028	**ZDCX140320PDFR-701**	**GH1**	7,59	16,83	3,13	2,0	-	0,02
026019	**ZDCX140325PDFR-701**	**GH1**	7,59	16,83	3,13	2,5	-	0,02
029029	**ZDCX140330PDFR-701**	**GH1**	7,59	16,83	3,13	3,0	-	0,02
026020	**ZDCX140340PDFR-701**	**GH1**	7,59	16,83	3,13	4,0	-	0,02

ZDCX 14_ -701



Totalmente rectificada χ 90° cara de corte cóncava.

017471	**ZDCX330402ER-701**	**GH2**	13,5	37,0	4,76	0,2	-	0,03
017472	**ZDCX330425ER-701**	**GH2**	13,5	37,0	4,76	2,5	-	0,03
029566	**ZDCX330430ER-701**	**GH2**	13,5	37,0	4,76	3,0	-	0,03
017474	**ZDCX330440ER-701**	**GH2**	13,5	37,0	4,76	4,0	-	0,03
024147	**ZDCX330450ER-701**	**GH2**	13,5	37,0	4,76	5,0	-	0,03
017475	**ZDCX330460ER-701**	**GH2**	13,5	37,0	4,76	6,0	-	0,03
017476	**ZDCX330480ER-701**	**GH2**	13,5	37,0	4,76	8,0	-	0,03
017477	**ZDCX530402ER-701**	**GH2**	14,8	64,0	4,76	0,2	-	0,03
017478	**ZDCX530425ER-701**	**GH2**	14,8	64,0	4,76	2,5	-	0,03
017576	**ZDCX530430ER-701**	**GH2**	14,8	64,0	4,76	3,0	-	0,03
017480	**ZDCX530440ER-701**	**GH2**	14,8	64,0	4,76	4,0	-	0,03
022228	**ZDCX530450ER-701**	**GH2**	14,8	64,0	4,76	5,0	-	0,03
017481	**ZDCX530460ER-701**	**GH2**	14,8	64,0	4,76	6,0	-	0,03
017482	**ZDCX530480ER-701**	**GH2**	14,8	64,0	4,76	8,0	-	0,03

ZDCX_-701



Totalmente rectificada χ 90° cara de corte cóncava.

017467	**ZECX32T302ER-701**	**GH2**	11,9	37,0	3,97	0,2	-	0,03
017484	**ZECX32T325ER-701**	**GH2**	11,9	37,0	3,97	2,5	-	0,03
022215	**ZECX32T330ER-701**	**GH2**	11,9	37,0	3,97	3,0	-	0,03
017486	**ZECX32T340ER-701**	**GH2**	11,9	37,0	3,97	4,0	-	0,03
024146	**ZECX32T350ER-701**	**GH2**	11,9	37,0	3,97	5,0	-	0,03
017487	**ZECX32T360ER-701**	**GH2**	11,9	37,0	3,97	6,0	-	0,03
017488	**ZECX32T380ER-701**	**GH2**	11,9	37,0	3,97	8,0	-	0,03

ZECX_-701



Totalmente rectificada χ 90° cara de corte cóncava.

025771	**ZPCX1404PDFR-701**	**GH1**	9,52	16,83	4,76	Faceta	-	0,02
029030	**ZPCX140420FR-701**	**GH1**	9,52	16,83	4,76	2,0	-	0,02
026021	**ZPCX140425FR-701**	**GH1**	9,52	16,83	4,76	2,5	-	0,02
029031	**ZPCX140430FR-701**	**GH1**	9,52	16,83	4,76	3,0	-	0,02
026022	**ZPCX140440FR-701**	**GH1**	9,52	16,83	4,76	4,0	-	0,02
029032	**ZPCX140450FR-701**	**GH1**	9,52	16,83	4,76	5,0	-	0,02
029033	**ZPCX140460FR-701**	**GH1**	9,52	16,83	4,76	6,0	-	0,02

ZPCX_-701



Totalmente rectificada χ 90° cara de corte cóncava.

Condiciones de Corte Ampliadas

ISO	Material	Resistencia Material	Calidades revestidas CVD				Calidades revestidas PVD			
			SC3025	X500	MP91M	PFZ	SP1064	SP4036	SP5464	SP6564
			Velocidad de corte (m/min)*							
P	Aceros no aleados	<600 N/mm²			350 - 140	275 - 135		280 - 150	207 - 117	260 - 130
		<600 N/mm²			350 - 120	240 - 120		250 - 130	183 - 104	230 - 115
	Aceros aleados	700-950 N/mm²		210 - 100	270 - 105	210 - 105	295 - 175	240 - 115	161 - 91	220 - 100
		950 - 1200 N/mm²		160 - 75	200 - 80	160 - 80	225 - 135	190 - 90	122 - 69	175 - 80
		1200 - 1400 N/mm²		100 - 50		100 - 50	145 - 85		78 - 44	110 - 50
M	Aceros inoxidables	Austeníticos + Ferríticos		240 - 115	200 - 120	240 - 120		280 - 130		265 - 115
		Martensíticos		215 - 100	180 - 110	220 - 110		250 - 115		235 - 105
	Inoxidables PH	Refractory P.H.		100 - 50		105 - 50		115 - 55		110 - 50
K	Fundición	Gris GG-Ft	395 - 150		365 - 145		400 - 240	295 - 145		
		Esferoidal-dúctiles GGG-FGS	335 - 120	220 - 105	285 - 115	225 - 110	315 - 185	235 - 115		
		Maleables GTS – MN/MP	275 - 105	200 - 100	260 - 105	205 - 100	285 - 170	215 - 105		
N	Aluminio y aleaciones de aluminio	< 16% Silicio					1000 - 400			
		> 16% Silicio					475 - 275			
S	Aleaciones refractarias	Base hierro		85 - 40	70 - 45	85 - 45		90 - 45		85 - 40
		Base cobalto		45 - 20	40 - 25	45 - 25		50 - 25		45 - 25
		Base níquel		50 - 25	40 - 25	45 - 25		55 - 25		50 - 25
		Base titanio		60 -30	50 - 30	60 - 30		65 - 30		60 - 30
H	Materiales duros	48 - 52 HRC					60 - 140	60 - 140	73 - 41	
		52 - 56 HRC					50 - 100	50 - 100	61 - 35	
		56 - 58 HRC					20 - 40	20 - 40		
	Fundición dúctil bainitica	46 - 50 HRC			65 - 40					

* **Velocidad de corte (m/min)**

$$\text{Velocidad de corte} = \frac{3{,}142 \times \text{diámetro de la fresa} \times \text{R.P.M.}}{1000}$$

$$\text{R.P.M.} = \frac{1000 \times \text{Velocidad de corte}}{3{,}142 \times \text{Diámetro de la fresa}}$$

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Condiciones de Corte Ampliadas

ISO	Material	Resistencia Material	Calidades revestidas CVD		Calidades Cermet	Calidades no revestidas			
			SFZ	X400	CN25	SF30	SU5400	X44	GH1
			Velocidad de corte (m/min)*						
P	Aceros no aleados	<600 N/mm²	240 - 135	260 - 125	345 - 245	205 - 125	185 - 115		
		<950 N/mm²	215 - 120	230 - 105	305 - 215	180 - 110	170 - 98		
	Aceros aleados	700-950 N/mm²	190 - 105	205 - 95	270 - 190	160 - 100	150 - 90	135 - 80	
		950 - 1200 N/mm²	140 - 80	155 - 70	205 - 145	120 - 75	110 - 70	100 - 60	
		1200 - 1400 N/mm²		100 - 45	130 - 90		70 - 45	65 - 40	
M	Aceros inoxidables	Austeníticos + Ferríticos	215 - 120		240 - 115	200 - 120			
		Martensíticos	195 - 110		215 - 100	180 - 110	220 - 110		
	Inoxidables PH	Refractarios P.H.	90 - 50						
K	Fundición	Gris GG-Ft	255 - 140		365 - 255				275 - 215
		Esferoidal-dúctiles GGG-FGS			285 - 200				
		Maleables GTS – MN/MP			260 - 180				
N	Aluminio y aleaciones de aluminio	< 16% Silicio	855 - 400						1000 - 400
		> 16% Silicio	430 - 275						475 - 275
S	Aleaciones refractarias	Base hierro	75 - 40						
		Base cobalto	40 - 25						
		Base níquel	45 - 25						
		Base titanio	50 - 30						65 - 50
H	Materiales duros	48 - 52 HRC	60 - 110	100 - 45					
		52 - 56 HRC	50 - 85	95 - 45					
		56 - 58 HRC	20 - 40	75 - 35					
	Fundición dúctil bainitica	46 - 50 HRC		75 - 35					

*** Velocidad de corte (m/min)**

$$\text{Velocidad de corte} = \frac{3{,}142 \times \text{diámetro de la fresa} \times \text{R.P.M.}}{1000}$$

$$\text{R.P.M.} = \frac{1000 \times \text{Velocidad de corte}}{3{,}142 \times \text{Diámetro de la fresa}}$$

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

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Clasificacion de Calidades

MATERIALES A MECANIZAR	CÓDIGO		No Revestidas			Micrograno sin revestir	Revestimiento CVD				Revestimiento PVD					
	C	ISO	SF30	X44	SU5400	GH1	MP91M	PFZ	X500	SC3025	SP4036	SP6564	SP1064	SP5464	SFZ	X400
Aceros aleados y no aleados	C8 C7 C6 C5	P01 P05 P10 P15 P20 P25 P30 P35 P40 P45 P50	SF30	X44	SU5400		MP91M	PFZ	X500		SP4036	SP6564	SP1064	SP5464	SFZ	X400
Aceros inoxidables		M05 M10 M15 M20 M30 M35 M40				GH1	MP91M	PFZ	X500		SP4036	SP6564	SP1064		SFZ	
Fundición	C4 C3 C2 C1	K01 K05 K10 K15 K20 K25 K30 K35 K40				GH1	MP91M		X500	SC3025	SP4036	SP6564	SP1064	SP5464	SFZ	
Materiales no ferrosos		N01 N05 N10 N15 N20 N25 N30				GH1									SFZ	
Aleaciones refractarias		S01 S05 S10 S15 S20 S25 S30	SF30					PFZ	X500			SP6564			SFZ	
Materiales duros: Aceros endurecidos, fundiciones endurecidas, fundición dúctil bainitica		H01 H05 H10 H15 H20 H25 H30					MP91M				SP4036				SFZ	X400

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros


STELLRAM
Ste X500

Taladrado



Unidrill®

Estrella Guía . . . . . .B2 – B3

Herramientas y gama de plaquitas:

Ø9,9mm – Ø11,7mm . . . . . .B4 – B5
Ø11,9mm – Ø13,2mm . . . . . .B6 – B7
Ø13,5mm – Ø16,3mm . . . . . .B8 – B9
Ø15,0mm – Ø16,3mm . . . . . .B10 – B11
Ø16,5mm – Ø18,7mm . . . . . .B12 – B13
Ø19,0mm – Ø22,2mm . . . . . .B14 – B15
Ø22,5mm – Ø25,4mm . . . . . .B16 – B17
Ø25,0mm – Ø29,5mm . . . . . .B18 – B19
Ø30,0mm – Ø35,7mm . . . . . .B20 – B21
Ø36,0mm – Ø45,0mm . . . . . .B22 – B23
Ø46,0mm – Ø55,6mm . . . . . .B24 – B25
Ø56,0mm – Ø65,1mm . . . . . .B26 – B27
Ø66,0mm – Ø79,4mm . . . . . .B28 – B29
Ø80,0mm – Ø90,0mm . . . . . .B30 – B31
Ø92,0mm – Ø114,0mm . . . . . .B32 – B33

Geometrías y calidades . . . . . .B34 – B35

Información técnica . . . . . .B36 – B37

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Directrices de requisitos de potencia . . . . . .B44 – B47

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Contenido



Posidrill Plus™

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Herramientas y plaquitas . . . . . B50 – B51

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Gráfico de solución de problemas . . . B54

Geometría / Calidad B55

Información sobre avances B56

Directrices de corte B57

Estrella Guía

Utilizando la Estrella Guía a lo largo de las próximas páginas, le permitirá seleccionar el producto apropiado, así como sugerencias de valores de partida para velocidades y avances, simplemente seleccionando el material a mecanizar.

Primera elección

La punta de la Estrella le indicará la plaquita recomendada para cada material la Estrella Guía de Stellram le permitirá encontrar la plaquita indicada para sus requisitos de mecanizado.

1. **Seleccione el material.**
2. **Seleccione el diámetro de la plaquita correcto para el taladro a realizar.**
3. **Seleccione el cuerpo de herramienta basándose en la profundidad del taladro.**
4. **4 Consulte velocidades y avances.**

Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018789	Corto	P6100W095R	90,0	**20,0**	47,0	50,0	40,0	20,0	-	9,8	2,5	-	F2004T	T6
018800	Largo	P6300W095R	115,0	**45,0**	72,0	75,0	40,0	20,0	-	9,8	2,5	-	F2004T	T6
018812	X Largo	P6500W095R	154,0	**84,0**	111,0	114,0	40,0	20,0	-	9,8	2,5	-	F2004T	T6
Amarre cono Morse														
018819	Corto	P6100M095R	125,0	**20,0**	45,0	50,0	75,0	-	2	9,8	2,5	-	F2004T	T6
015380	Largo	P6300M095R	150,0	**45,0**	70,0	75,0	75,0	-	2	9,8	2,5	-	F2004T	T6
015381	X Largo	P6500M095R	186,0	**84,0**	106,0	111,0	75,0	-	2	9,8	2,5	-	F2004T	T6

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,03 - 0,08	70 - 118	0,03 - 0,08	40 - 68	0,08 - 0,15
		Acero <280 HBN	-		60 - 97	0,03 - 0,08	60 - 97	0,03 - 0,08	35 - 63	0,08 - 0,13
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,03 - 0,08	60 - 90	0,03 - 0,08	30 - 58	0,08 - 0,13
		280-355 HBN	-	-	50 - 71	0,03 - 0,05	50 - 71	0,03 - 0,05	25 - 42	0,06 - 0,10
		355-415 HBN	-	-	40 - 58	0,03 - 0,05	40 - 58	0,03 - 0,05	25 - 36	0,06 - 0,10
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,03 - 0,05	60 - 69	0,03 - 0,05	10 - 27	0,08 - 0,13
		Martensítico series 400	-	-	55 - 58	0,03 - 0,05	55 - 58	0,03 - 0,05	10 - 31	0,08 - 0,13
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,03 - 0,08	70 - 109	0,03 - 0,08	30 - 58	0,08 - 0,15
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,03 - 0,08	55 - 96	0,03 - 0,08	30 - 53	0,08 - 0,12
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,03 - 0,08	50 - 69	0,03 - 0,08	20 - 44	0,08 - 0,12
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,05 - 0,10	200 - 411	0,05 - 0,10	-	-	90 - 275	0,12 - 0,20
		Alumino con silicio	90 - 137	0,03 - 0,08	90 - 220	0,03 - 0,08	-	-	90 - 220	0,10 - 0,15
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,02 - 0,05	-	-	5 - 10	0,02 - 0,05
		Aleaciones base cobalto	-	-	30 - 44	0,02 - 0,05	-	-	5 - 8	0,02 - 0,05
		Aleaciones base níquel	-	-	30 - 44	0,02 - 0,05	-	-	5 - 8	0,02 - 0,05
		Aleaciones base titanio	40 - 55	0,03 - 0,05	45 - 58	0,03 - 0,05	-	-	5 - 14	0,03 - 0,07
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-		-	-	15 - 36	0,02 - 0,05	-	-

2

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
9,9	023822	UC099HR	SP4036	-	
10,0	018690	UC100PR	H22	-	
	023507	UC100HR	SP4036	-	
	023508	UC100SR	SP4036	-	
	027301	US100CR	-	SP9336	
10,2	023509	UC102HR	SP4036	-	
	023510	UC102SR	SP4036	-	
	023663	US102CR	-	SP9336	
10,3	023826	UC103SR	SP4036	-	
	027302	US103CR	-	SP9336	
10,5	018365	UC105PR	H22	-	
	023511	UC105HR	SP4036	-	
	023512	UC105SR	SP4036	-	
	027303	US105CR	-	SP9336	
10,7	023513	UC107HR	SP4036	-	
	023514	UC107SR	SP4036	-	
10,8	023831	UC108SR	SP4036	-	
	027304	US108CR	-	SP9336	
11,0	018691	UC11PR	H22	-	
	023515	UC110HR	SP4036	-	
	023516	UC110SR	SP4036	-	
	027305	US110CR	-	SP9336	
11,1	023985	UC111HR	SP4036	-	
	027306	US111CR	-	SP9336	
11,2	023517	UC112HR	SP4036	-	
	023518	UC112SR	SP4036	-	
11,5	015070	UC115PR	H22	-	
	023519	UC115HR	SP4036	-	
	023520	UC115SR	SP4036	-	
	027307	US115CR	-	SP9336	
11,7	023521	UC117HR	SP4036	-	
	023522	UC117SR	SP4036	-	
	027310	US117CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

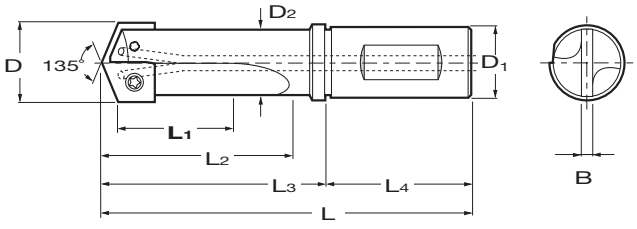
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

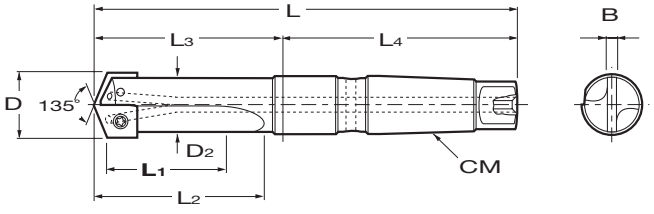
STELLRAM®

Broca para plaquitas desde ø9,9mm – ø11,7mm

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018789	Corto	P6100W095R	90,0	**20,0**	47,0	50,0	40,0	20,0	-	9,8	2,5	-	F2004T	T6
018800	Largo	P6300W095R	115,0	**45,0**	72,0	75,0	40,0	20,0	-	9,8	2,5	-	F2004T	T6
018812	X Largo	P6500W095R	154,0	**84,0**	111,0	114,0	40,0	20,0	-	9,8	2,5	-	F2004T	T6
Amarre cono Morse														
018819	Corto	P6100M095R	125,0	**20,0**	45,0	50,0	75,0	-	2	9,8	2,5	-	F2004T	T6
015380	Largo	P6300M095R	150,0	**45,0**	70,0	75,0	75,0	-	2	9,8	2,5	-	F2004T	T6
015381	X Largo	P6500M095R	186,0	**84,0**	106,0	111,0	75,0	-	2	9,8	2,5	-	F2004T	T6

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,03 - 0,08	70 - 118	0,03 - 0,08	40 - 68	0,08 - 0,15
		Acero <280 HBN	-	-	60 - 97	0,03 - 0,08	60 - 97	0,03 - 0,08	35 - 63	0,08 - 0,13
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,03 - 0,08	60 - 90	0,03 - 0,08	30 - 58	0,08 - 0,13
		280-355 HBN	-	-	50 - 71	0,03 - 0,05	50 - 71	0,03 - 0,05	25 - 42	0,06 - 0,10
		355-415 HBN	-	-	40 - 58	0,03 - 0,05	40 - 58	0,03 - 0,05	25 - 36	0,06 - 0,10
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,03 - 0,05	60 - 69	0,03 - 0,05	10 - 27	0,08 - 0,13
		Martensítico series 400	-	-	55 - 58	0,03 - 0,05	55 - 58	0,03 - 0,05	10 - 31	0,08 - 0,13
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,03 - 0,08	70 - 109	0,03 - 0,08	30 - 58	0,08 - 0,15
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,03 - 0,08	55 - 96	0,03 - 0,08	30 - 53	0,08 - 0,12
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,03 - 0,08	50 - 69	0,03 - 0,08	20 - 44	0,08 - 0,12
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,05 - 0,10	200 - 411	0,05 - 0,10	-	-	90 - 275	0,12 - 0,20
		Alumino con silicio	90 - 137	0,03 - 0,08	90 - 220	0,03 - 0,08	-	-	90 - 220	0,10 - 0,15
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,02 - 0,05	-	-	5 - 10	0,02 - 0,05
		Aleaciones base cobalto	-	-	30 - 44	0,02 - 0,05	-	-	5 - 8	0,02 - 0,05
		Aleaciones base níquel	-	-	30 - 44	0,02 - 0,05	-	-	5 - 8	0,02 - 0,05
		Aleaciones base titanio	40 - 55	0,03 - 0,05	45 - 58	0,03 - 0,05	-	-	5 - 14	0,03 - 0,07
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,02 - 0,05	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
9,9	023822	UC099HR	SP4036	-	
10,0	018690	UC100PR	H22	-	
	023507	UC100HR	SP4036	-	
	023508	UC100SR	SP4036	-	
	027301	US100CR	-	SP9336	
10,2	023509	UC102HR	SP4036	-	
	023510	UC102SR	SP4036	-	
	023663	US102CR	-	SP9336	
10,3	023826	UC103SR	SP4036	-	
	027302	US103CR	-	SP9336	
10,5	018365	UC105PR	H22	-	
	023511	UC105HR	SP4036	-	
	023512	UC105SR	SP4036	-	
	027303	US105CR	-	SP9336	
10,7	023513	UC107HR	SP4036	-	
	023514	UC107SR	SP4036	-	
10,8	023831	UC108SR	SP4036	-	
	027304	US108CR	-	SP9336	
11,0	018691	UC11PR	H22	-	
	023515	UC110HR	SP4036	-	
	023516	UC110SR	SP4036	-	
	027305	US110CR	-	SP9336	
11,1	023985	UC111HR	SP4036	-	
	027306	US111CR	-	SP9336	
11,2	023517	UC112HR	SP4036	-	
	023518	UC112SR	SP4036	-	
11,5	015070	UC115PR	H22	-	
	023519	UC115HR	SP4036	-	
	023520	UC115SR	SP4036	-	
	027307	US115CR	-	SP9336	
11,7	023521	UC117HR	SP4036	-	
	023522	UC117SR	SP4036	-	
	027310	US117CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

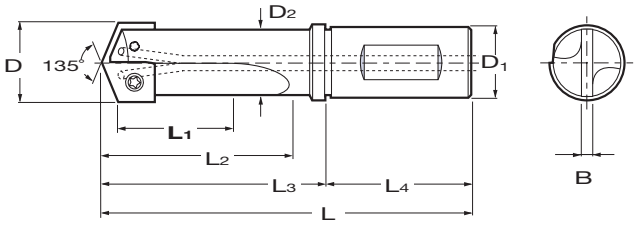


Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

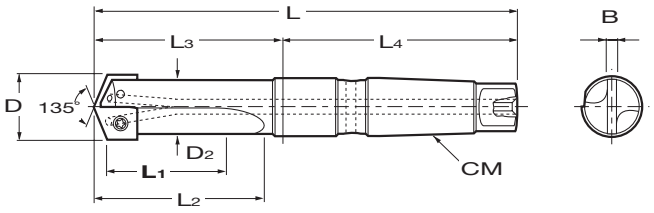
STELLRAM®

Broca para plaquitas desde ø11,9mm – ø13,2mm

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018790	Corto	P6100W115R	90,0	**20,0**	47,0	50,0	40,0	20,0	-	11,5	2,5	-	F2004T	T6
018801	Largo	P6300W115R	115,0	**45,0**	72,0	75,0	40,0	20,0	-	11,5	2,5	-	F2004T	T6
018813	X Largo	P6500W115R	159,0	**89,0**	116,0	119,0	40,0	20,0	-	11,5	2,5	-	F2004T	T6
Amarre cono Morse														
018465	Corto	P6100M115R	125,0	**20,0**	45,0	50,0	75,0	-	2	11,5	2,5	-	F2004T	T6
014157	Largo	P6300M115R	150,0	**45,0**	70,0	75,0	75,0	-	2	11,5	2,5	-	F2004T	T6
015382	X Largo	P6500M115R	191,0	**89,0**	111,0	116,0	75,0	-	2	11,5	2,5	-	F2004T	T6

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,04 - 0,10	70 - 118	0,04 - 0,09	40 - 68	0,09 - 0,17
		Acero <280 HBN	-		60 - 97	0,04 - 0,09	60 - 97	0,04 - 0,09	35 - 63	0,09 - 0,15
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,04 - 0,10	60 - 90	0,04 - 0,09	30 - 58	0,09 - 0,15
		280-355 HBN	-	-	50 - 71	0,04 - 0,07	50 - 71	0,04 - 0,06	25 - 42	0,07 - 0,11
		355-415 HBN	-	-	40 - 58	0,04 - 0,06	40 - 58	0,04 - 0,06	25 - 36	0,07 - 0,11
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,04 - 0,07	60 - 69	0,04 - 0,06	10 - 27	0,09 - 0,14
		Martensítico series 400	-	-	55 - 58	0,04 - 0,07	55 - 58	0,04 - 0,06	10 - 31	0,09 - 0,14
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,04 - 0,10	70 - 109	0,04 - 0,10	30 - 58	0,09 - 0,17
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,04 - 0,10	55 - 96	0,04 - 0,09	30 - 53	0,09 - 0,13
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,04 - 0,09	50 - 69	0,04 - 0,09	20 - 44	0,09 - 0,13
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,06 - 0,12	200 - 411	0,06 - 0,12	-	-	90 - 275	0,13 - 0,21
		Alumino con silicio	90 - 137	0,04 - 0,10	90 - 220	0,04 - 0,10	-	-	90 - 220	0,11 - 0,17
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,03 - 0,06	-	-	5 - 10	0,02 - 0,06
		Aleaciones base cobalto	-	-	30 - 44	0,03 - 0,06	-	-	5 - 8	0,02 - 0,06
		Aleaciones base níquel	-	-	30 - 44	0,03 - 0,06	-	-	5 - 8	0,02 - 0,06
		Aleaciones base titanio	40 - 55	0,04 - 0,06	45 - 58	0,04 - 0,06	-	-	5 - 14	0,04 - 0,08
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,03 - 0,06	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
11,9	023840	UC119SR	SP4036	-	
	027308	US119CR	-	SP9336	
12,0	023524	UC120SR	SP4036	-	
	023523	UC120HR	SP4036	-	
	018692	UC120PR	H22	-	
	027309	US120CR	-	SP9336	
12,2	023527	UC122SR	SP4036	-	
	023525	UC122HR	SP4036	-	
12,3	023844	UC123SR	SP4036	-	
	027311	US123CR	-	SP9336	
12,5	023529	UC125SR	SP4036	-	
	023528	UC125HR	SP4036	-	
	015071	UC125PR	H22	-	
	027312	US125CR	-	SP9336	
12,7	023531	UC127SR	SP4036	-	
	023530	UC127HR	SP4036	-	
	015072	UC127PR	H22	-	
	027313	US127CR	-	SP9336	
13,0	023533	UC130SR	SP4036	-	
	023532	UC130HR	SP4036	-	
	018693	UC130PR	H22	-	
	027314	US130CR	-	SP9336	
13,1	027316	US131CR	-	SP9336	
13,2	023535	UC132SR	SP4036	-	
	023534	UC132HR	SP4036	-	
	027317	US132CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

Controle la lista de precios local para disponibilidad.

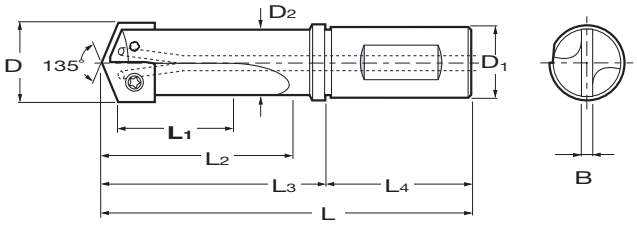
Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

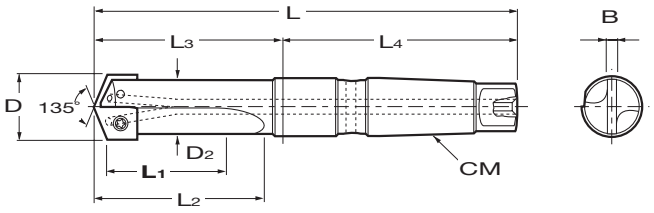
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Broca para plaquitas desde ø13,5mm – ø16,3mm

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018791	Corto	P6100W130R	95,0	**25,0**	53,0	55,0	40,0	20,0	-	13,0	3,5	-	F2505T	T7
018802	Largo	P6300W130R	125,0	**55,0**	83,0	85,0	40,0	20,0	-	13,0	3,5	-	F2505T	T7
018814	X Largo	P6500W130R	178,5	**108,0**	136,5	138,5	40,0	20,0	-	13,0	3,5	-	F2505T	T7
Amarre cono Morse														
018820	Corto	P6100M130R	130,0	**25,0**	50,0	55,0	75,0	-	2	13,0	3,5	-	F2505T	T7
014158	Largo	P6300M130R	160,0	**55,0**	80,0	85,0	75,0	-	2	13,0	3,5	-	F2505T	T7
015383	X Largo	P6500M130R	209,5	**108,0**	129,5	134,5	75,0	-	2	13,0	3,5	-	F2505T	T7

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,05 - 0,11	70 - 118	0,05 - 0,11	40 - 68	0,11 - 0,19
		Acero <280 HBN	-		60 - 97	0,05 - 0,11	60 - 97	0,05 - 0,11	35 - 63	0,11 - 0,17
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,05 - 0,11	60 - 90	0,05 - 0,11	30 - 58	0,11 - 0,17
		280-355 HBN	-	-	50 - 71	0,05 - 0,08	50 - 71	0,05 - 0,08	25 - 42	0,08 - 0,13
		355-415 HBN	-	-	40 - 58	0,05 - 0,08	40 - 58	0,05 - 0,07	25 - 36	0,08 - 0,13
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,05 - 0,08	60 - 69	0,05 - 0,08	10 - 27	0,11 - 0,16
		Martensítico series 400	-	-	55 - 58	0,05 - 0,08	55 - 58	0,05 - 0,08	10 - 31	0,10 - 0,16
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,05 - 0,13	70 - 109	0,06 - 0,13	30 - 58	0,11 - 0,19
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,05 - 0,11	55 - 96	0,05 - 0,11	30 - 53	0,11 - 0,16
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,05 - 0,11	50 - 69	0,05 - 0,10	20 - 44	0,11 - 0,15
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,07 - 0,15	200 - 411	0,07 - 0,15	-	-	90 - 275	0,15 - 0,24
		Alumino con silicio	90 - 137	0,05 - 0,12	90 - 220	0,05 - 0,12	-	-	90 - 220	0,13 - 0,19
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,03 - 0,07	-	-	5 - 10	0,03 - 0,07
		Aleaciones base cobalto	-	-	30 - 44	0,03 - 0,07	-	-	5 - 8	0,03 - 0,07
		Aleaciones base níquel	-	-	30 - 44	0,03 - 0,07	-	-	5 - 8	0,03 - 0,07
		Aleaciones base titanio	40 - 55	0,05 - 0,08	45 - 58	0,05 - 0,08	-	-	5 - 14	0,04 - 0,09
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,04 - 0,07	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
13,5	023537	UC135SR	SP4036	-	
	023536	UC135HR	SP4036	-	
	015073	UC135PR	H22	-	
	027318	US135CR	-	SP9336	
13,7	023539	UC137SR	SP4036	-	
	023538	UC137HR	SP4036	-	
	018694	UC137PR	H22	-	
13,9	027319	US139CR	-	SP9336	
14,0	023542	UC140SR	SP4036	-	
	023540	UC140HR	SP4036	-	
	018695	UC140PR	H22	-	
	027320	US140CR	-	SP9336	
14,2	023544	UC142SR	SP4036	-	
	023543	UC142HR	SP4036	-	
14,3	023861	UC143SR	SP4036	-	
	023860	UC143HR	SP4036	-	
	027321	US143CR	-	SP9336	
14,5	023546	UC145SR	SP4036	-	
	023545	UC145HR	SP4036	-	
	015074	UC145PR	H22	-	
	027322	US145CR	-	SP9336	
14,7	023548	UC147SR	SP4036	-	
	023547	UC147HR	SP4036	-	
	018696	UC147PR	H22	-	
	027323	US147CR	-	SP9336	
15,0	023550	UC150SR	SP4036	-	
	023549	UC150HR	SP4036	-	
	015075	UC150PR	H22	-	
	027324	US150CR	-	SP9336	
15,1	027325	US151CR	-	SP9336	
15,2	023552	UC152SR	SP4036	-	
	023551	UC152HR	SP4036	-	
	023670	US152CR	-	SP9336	
15,5	023554	UC155SR	SP4036	-	
	023553	UC155HR	SP4036	-	
	015076	UC155PR	H22	-	
	027326	US155CR	-	SP9336	
15,7	023556	UC157SR	SP4036	-	
	023555	UC157HR	SP4036	-	
	027327	US157CR	-	SP9336	
15,9	023875	UC159SR	SP4036	-	
	023874	UC159HR	SP4036	-	
	027328	US159CR	-	SP9336	
16,0	023558	UC160SR	SP4036	-	
	023557	UC160HR	SP4036	-	
	018697	UC160PR	H22	-	
	027329	US160CR	-	SP9336	
16,2	023560	UC162SR	SP4036	-	
	023559	UC162HR	SP4036	-	
	018698	UC162PR	H22	-	
	027330	US162CR	-	SP9336	
16,3	027331	US163CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

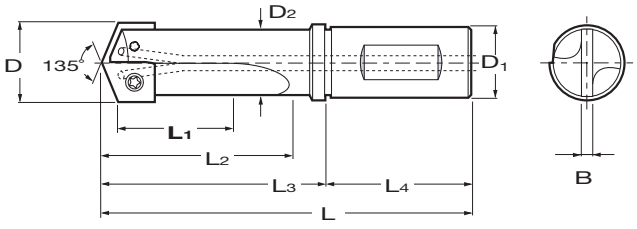


Código ISO de materiales

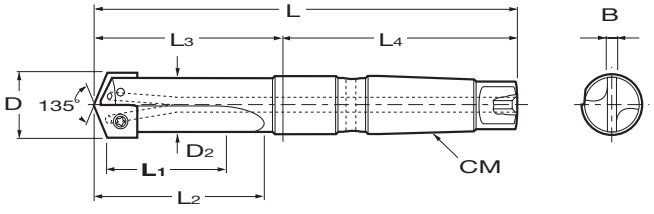
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018803	Largo	P6300W145R	125,0	**55,0**	83,0	85,0	40,0	20,0	-	14,5	3,5	-	F2505T	T7
018815	X Largo	P6500W145R	178,5	**108,0**	136,5	138,5	40,0	20,0	-	14,5	3,5	-	F2505T	T7
Amarre cono Morse														
014159	Largo	P6300M145R	160,0	**55,0**	90,0	85,0	75,0	-	2	14,5	3,5	-	F2505T	T7
015384	X Largo	P6500M145R	209,5	**108,0**	129,5	134,5	75,0	-	2	14,5	3,5	-	F2505T	T7

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,06 - 0,12	70 - 118	0,06 - 0,12	40 - 68	0,11 - 0,19
		Acero <280 HBN	-		60 - 97	0,06 - 0,12	60 - 97	0,06 - 0,11	35 - 63	0,11 - 0,17
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,06 - 0,12	60 - 90	0,06 - 0,12	30 - 58	0,11 - 0,17
		280-355 HBN	-	-	50 - 71	0,06 - 0,09	50 - 71	0,06 - 0,09	25 - 42	0,08 - 0,13
		355-415 HBN	-	-	40 - 58	0,06 - 0,08	40 - 58	0,06 - 0,08	25 - 36	0,08 - 0,13
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,06 - 0,09	60 - 69	0,06 - 0,09	10 - 27	0,11 - 0,16
		Martensítico series 400	-	-	55 - 58	0,06 - 0,09	55 - 58	0,06 - 0,09	10 - 31	0,10 - 0,16
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,07 - 0,14	70 - 109	0,07 - 0,14	30 - 58	0,11 - 0,19
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,06 - 0,12	55 - 96	0,06 - 0,12	30 - 53	0,11 - 0,16
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,06 - 0,11	50 - 69	0,06 - 0,11	20 - 44	0,11 - 0,15
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,08 - 0,16	200 - 411	0,08 - 0,16	-	-	90 - 275	0,15 - 0,24
		Alumino con silicio	90 - 137	0,05 - 0,13	90 - 220	0,05 - 0,13	-	-	90 - 220	0,13 - 0,19
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,03 - 0,08	-	-	5 - 10	0,03 - 0,07
		Aleaciones base cobalto	-	-	30 - 44	0,03 - 0,08	-	-	5 - 8	0,03 - 0,07
		Aleaciones base níquel	-	-	30 - 44	0,03 - 0,08	-	-	5 - 8	0,03 - 0,07
		Aleaciones base titanio	40 - 55	0,05 - 0,08	45 - 58	0,05 - 0,08	-	-	5 - 14	0,04 - 0,09
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,04 - 0,08	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
15,0	023550	UC150SR	SP4036	-	
	023549	UC150HR	SP4036	-	
	015075	UC150PR	H22	-	
	027324	US150CR	-	SP9336	
15,1	027325	US151CR	-	SP9336	
15,2	023552	UC152SR	SP4036	-	
	023551	UC152HR	SP4036	-	
	023670	US152CR	-	SP9336	
15,5	023554	UC155SR	SP4036	-	
	023553	UC155HR	SP4036	-	
	015076	UC155PR	H22	-	
	027326	US155CR	-	SP9336	
15,7	023556	UC157SR	SP4036	-	
	023555	UC157HR	SP4036	-	
	027327	US157CR	-	SP9336	
15,9	023875	UC159SR	SP4036	-	
	023874	UC159HR	SP4036	-	
	027328	US159CR	-	SP9336	
16,0	023558	UC160SR	SP4036	-	
	023557	UC160HR	SP4036	-	
	018697	UC160PR	H22	-	
	027329	US160CR	-	SP9336	
16,2	023560	UC162SR	SP4036	-	
	023559	UC162HR	SP4036	-	
	018698	UC162PR	H22	-	
	027330	US162CR	-	SP9336	
16,3	027331	US163CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

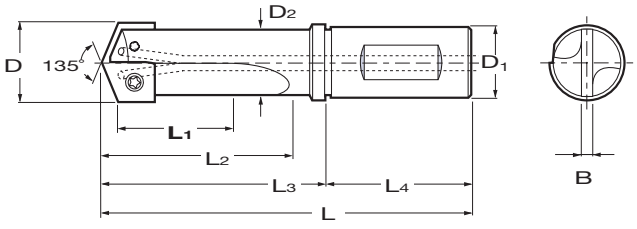
Estrella guía Llave para encontrar la herramienta idónea



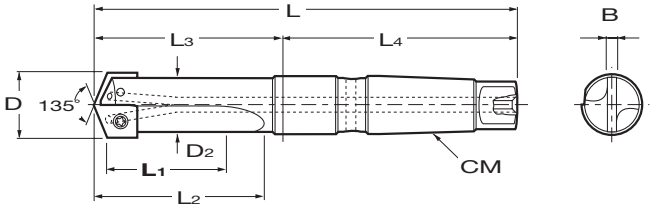
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018792	Corto	P6100W160R	95,0	**25,0**	54,0	55,0	40,0	20,0	-	16,0	3,5	-	F2507T	T7
018804	Largo	P6300W160R	135,0	**65,0**	94,0	95,0	40,0	20,0	-	16,0	3,5	-	F2507T	T7
015385	X Largo	P6500W160R	186,5	**116,0**	145,5	146,5	40,0	20,0	-	16,0	3,5	-	F2507T	T7
027800	XX Largo	P6700W170R	353,0	**270,0**	305,0	313,0	40,0	20,0	-	17,0	3,5	-	F2507T	T7
Amarre cono Morse														
018821	Corto	P6100M160R	130,0	**25,0**	50,0	55,0	75,0	-	2	16,0	3,5	-	F2507T	T7
014160	Largo	P6300M160R	170,0	**65,0**	90,0	95,0	75,0	-	2	16,0	3,5	-	F2507T	T7
015385	X Largo	P6500M160R	217,5	**116,0**	137,5	142,5	75,0	-	2	16,0	3,5	-	F2507T	T7

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,08 - 0,14	70 - 118	0,07 - 0,14	40 - 68	0,12 - 0,20
		Acero <280 HBN	-		60 - 97	0,08 - 0,14	60 - 97	0,07 - 0,13	35 - 63	0,12 - 0,18
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,08 - 0,14	60 - 90	0,07 - 0,14	30 - 58	0,12 - 0,18
		280-355 HBN	-	-	50 - 71	0,08 - 0,11	50 - 71	0,07 - 0,12	25 - 42	0,10 - 0,14
		355-415 HBN	-	-	40 - 58	0,08 - 0,10	40 - 58	0,07 - 0,10	25 - 36	0,09 - 0,14
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,08 - 0,11	60 - 69	0,08 - 0,11	10 - 27	0,11 - 0,17
		Martensítico series 400	-	-	55 - 58	0,08 - 0,11	55 - 58	0,08 - 0,11	10 - 31	0,11 - 0,17
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,09 - 0,19	70 - 109	0,09 - 0,18	30 - 58	0,12 - 0,21
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,08 - 0,14	55 - 96	0,08 - 0,14	30 - 53	0,12 - 0,17
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,08 - 0,13	50 - 69	0,08 - 0,13	20 - 44	0,12 - 0,17
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,09 - 0,20	200 - 411	0,09 - 0,20	-	-	90 - 275	0,17 - 0,26
		Alumino con silicio	90 - 137	0,06 - 0,16	90 - 220	0,06 - 0,16	-	-	90 - 220	0,14 - 0,20
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,04 - 0,10	-	-	5 - 10	0,03 - 0,08
		Aleaciones base cobalto	-	-	30 - 44	0,04 - 0,10	-	-	5 - 8	0,03 - 0,08
		Aleaciones base níquel	-	-	30 - 44	0,04 - 0,10	-	-	5 - 8	0,03 - 0,08
		Aleaciones base titanio	40 - 55	0,07 - 0,10	45 - 58	0,07 - 0,10	-	-	5 - 14	0,05 - 0,10
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,06 - 0,09	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
16,5	023562	UC165SR	SP4036	-	
	023879	UC165HR	SP4036	-	
	018490	UC165PR	H22	-	
	027332	US165CR	-	SP9336	
16,7	023564	UC167SR	SP4036	-	
	023563	UC167HR	SP4036	-	
	027333	US167CR	-	SP9336	
17,0	023566	UC170SR	SP4036	-	
	023565	UC170HR	SP4036	-	
	018699	UC170PR	H22	-	
	027334	US170CR	-	SP9336	
17,2	023568	UC172SR	SP4036	-	
	023567	UC172HR	SP4036	-	
	023671	US172CR	-	SP9336	
17,4	023888	UC174SR	SP4036	-	
	023887	UC174HR	SP4036	-	
	027335	US174CR	-	SP9336	
17,5	023570	UC175SR	SP4036	-	
	023569	UC175HR	SP4036	-	
	017392	UC175PR	H22	-	
	027336	US175CR	-	SP9336	
17,9	027337	US179CR	-	SP9336	
18,0	023572	UC180SR	SP4036	-	
	023571	UC180HR	SP4036	-	
	018700	UC180PR	H22	-	
	027338	US180CR	-	SP9336	
18,2	023574	UC182SR	SP4036	-	
	023573	UC182HR	SP4036	-	
	027339	US182CR	-	SP9336	
18,5	023576	UC185SR	SP4036	-	
	023575	UC185HR	SP4036	-	
	018701	UC185PR	H22	-	
	027340	US185CR	-	SP9336	
18,6	027341	US186CR	-	SP9336	
18,7	023578	UC187SR	SP4036	-	
	023577	UC187HR	SP4036	-	
	027342	US187CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

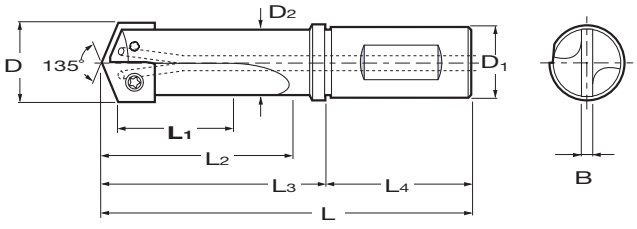
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

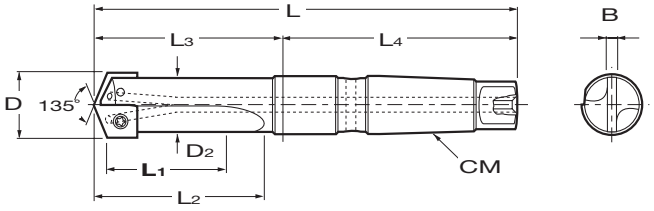
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
017391	Corto	P6100W185R	105,0	**30,0**	63,0	65,0	40,0	20,0	-	18,5	4,0	-	F3006T	T9
018805	Largo	P6300W185R	145,0	**70,0**	103,0	105,0	40,0	20,0	-	18,5	4,0	-	F3006T	T9
018817	X Largo	P6500W185R	204,0	**129,0**	162,0	164,0	40,0	20,0	-	18,5	4,0	-	F3006T	T9
027801	XX Largo	P6700W185R	369,0	**285,0**	305,0	313,0	40,0	20,0	-	18,5	4,0	-	F3006T	T9
Amarre cono Morse														
018822	Corto	P6100M185R	160,0	**30,0**	61,0	66,0	94,0	-	3	18,5	4,0	-	F3006T	T9
014161	Largo	P6300M185R	200,0	**70,0**	101,0	106,0	94,0	-	3	18,5	4,0	-	F3006T	T9
015386	X Largo	P6500M185R	258,0	**129,0**	159,0	164,0	94,0	-	3	18,5	4,0	-	F3006T	T9

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,10 - 0,18	70 - 118	0,10 - 0,16	40 - 68	0,14 - 0,22
		Acero <280 HBN	-		60 - 97	0,11 - 0,16	60 - 97	0,10 - 0,15	35 - 63	0,14 - 0,20
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,11 - 0,18	60 - 90	0,10 - 0,16	30 - 58	0,14 - 0,20
		280-355 HBN	-	-	50 - 71	0,11 - 0,15	50 - 71	0,10 - 0,14	25 - 42	0,11 - 0,16
		355-415 HBN	-	-	40 - 58	0,11 - 0,13	40 - 58	0,10 - 0,12	25 - 36	0,10 - 0,16
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,11 - 0,15	60 - 69	0,11 - 0,14	10 - 27	0,13 - 0,19
		Martensítico series 400	-	-	55 - 58	0,11 - 0,15	55 - 58	0,11 - 0,14	10 - 31	0,13 - 0,19
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,14 - 0,25	70 - 109	0,14 - 0,23	30 - 58	0,14 - 0,22
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,11 - 0,18	55 - 96	0,11 - 0,16	30 - 53	0,14 - 0,19
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,11 - 0,16	50 - 69	0,11 - 0,15	20 - 44	0,13 - 0,18
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,11 - 0,26	200 - 411	0,11 - 0,26	-	-	90 - 275	0,18 - 0,31
		Alumino con silicio	90 - 137	0,09 - 0,21	90 - 220	0,08 - 0,21	-	-	90 - 220	0,15 - 0,22
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,06 - 0,12	-	-	5 - 10	0,04 - 0,08
		Aleaciones base cobalto	-	-	30 - 44	0,06 - 0,12	-	-	5 - 8	0,04 - 0,08
		Aleaciones base níquel	-	-	30 - 44	0,06 - 0,12	-	-	5 - 8	0,04 - 0,08
		Aleaciones base titanio	40 - 55	0,09 - 0,13	45 - 58	0,09 - 0,13	-	-	5 - 14	0,05 - 0,12
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,08 - 0,11	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
19,0	023580	UC190SR	SP4036	-	
	023579	UC190HR	SP4036	-	
	015077	UC190PR	H22	-	
	027343	US190CR	-	SP9336	
19,2	023582	UC192SR	SP4036	-	
	023581	UC192HR	SP4036	-	
19,5	023584	UC195SR	SP4036	-	
	023583	UC195HR	SP4036	-	
	017393	UC195PR	H22	-	
	027344	US195CR	-	SP9336	
19,7	023586	UC197SR	SP4036	-	
	023585	UC197HR	SP4036	-	
	023673	US197CR	-	SP9336	
19,8	023906	UC198SR	SP4036	-	
	027345	US198CR	-	SP9336	
20,0	023588	UC200SR	SP4036	-	
	023587	UC200HR	SP4036	-	
	018702	UC200PR	H22	-	
	027346	US200CR	-	SP9336	
20,2	023590	UC202SR	SP4036	-	
	023589	UC202HR	SP4036	-	
	023674	US202CR	-	SP9336	
20,5	023592	UC205SR	SP4036	-	
	023591	UC205HR	SP4036	-	
	018703	UC205PR	H22	-	
	027347	US205CR	-	SP9336	
20,6	023914	UC206SR	SP4036	-	
	023913	UC206HR	SP4036	-	
	027348	US206CR	-	SP9336	
20,7	023594	UC207SR	SP4036	-	
	023593	UC207HR	SP4036	-	
21,0	023596	UC210SR	SP4036	-	
	023595	UC210HR	SP4036	-	
	017394	UC210PR	H22	-	
	027349	US210CR	-	SP9336	
21,2	023598	UC212SR	SP4036	-	
	023597	UC212HR	SP4036	-	
	023676	US212CR	-	SP9336	
21,4	023986	UC214SR	SP4036	-	
	027350	US214CR	-	SP9336	
21,5	023600	UC215SR	SP4036	-	
	023599	UC215HR	SP4036	-	
	018704	UC215PR	H22	-	
	027351	US215CR	-	SP9336	
21,7	023602	UC217SR	SP4036	-	
	023601	UC217HR	SP4036	-	
22,0	023604	UC220SR	SP4036	-	
	023603	UC220HR	SP4036	-	
	018705	UC220PR	H22	-	
	027352	US220CR	-	SP9336	
22,2	023606	UC222SR	SP4036	-	
	023605	UC222HR	SP4036	-	
	027353	US222CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

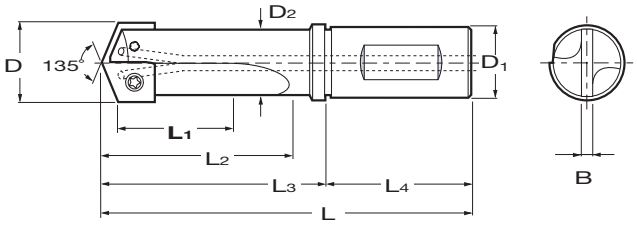


Código ISO de materiales

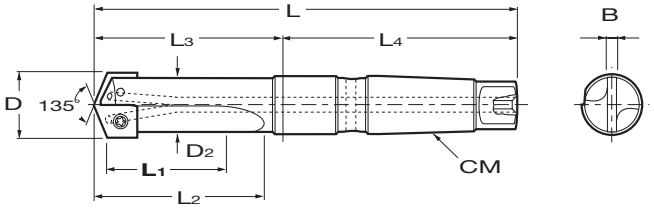
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018794	Corto	P6100W220R	115,0	**40,0**	73,0	75,0	40,0	20,0	-	22,0	4,0	-	F3008T	T9
018806	Largo	P6300W220R	155,0	**80,0**	113,0	115,0	40,0	20,0	-	22,0	4,0	-	F3008T	T9
018818	X Largo	P6500W220R	212,0	**137,0**	170,0	172,0	40,0	20,0	-	22,0	4,0	-	F3008T	T9
027802	XX Largo	P6700W220R	369,0	**285,0**	320,0	329,0	40,0	20,0	-	22,0	4,0	-	F3008T	T9
Amarre cono Morse														
018823	Corto	P6100M220R	170,0	**40,0**	71,0	76,0	94,0	-	3	22,0	4,0	-	F3008T	T9
014162	Largo	P6300M220R	210,0	**80,0**	111,0	116,0	94,0	-	3	22,0	4,0	-	F3008T	T9
015387	X Largo	P6500M220R	266,0	**137,0**	167,0	172,0	94,0	-	3	22,0	4,0	-	F3008T	T9

Cuerpo de herramienta

ISO	Material	Dureza	PR H22		HR SP4036		SR SP4036		CR SP9336	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	-	-	70 - 118	0,13 - 0,20	70 - 118	0,12 - 0,18	40 - 68	0,17 - 0,26
		Acero <280 HBN	-		60 - 97	0,13 - 0,18	60 - 97	0,12 - 0,17	35 - 63	0,16 - 0,23
P	Aceros aleados	200-280 HBN	-	-	60 - 90	0,13 - 0,20	60 - 90	0,12 - 0,18	30 - 58	0,16 - 0,23
		280-355 HBN	-	-	50 - 71	0,13 - 0,18	50 - 71	0,12 - 0,17	25 - 42	0,13 - 0,18
		355-415 HBN	-	-	40 - 58	0,13 - 0,15	40 - 58	0,12 - 0,14	25 - 36	0,12 - 0,18
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	-	-	60 - 69	0,13 - 0,18	60 - 69	0,13 - 0,17	10 - 27	0,15 - 0,22
		Martensítico series 400	-	-	55 - 58	0,13 - 0,18	55 - 58	0,13 - 0,17	10 - 31	0,15 - 0,22
		Refractario	-	-	-	-	-	-	-	-
K	Fundición	Gris (GG) (FT)	-	-	70 - 109	0,18 - 0,30	70 - 109	0,18 - 0,28	30 - 58	0,17 - 0,26
		Esferoidal (GGG) (FGS)	-	-	55 - 96	0,13 - 0,20	55 - 96	0,13 - 0,18	30 - 53	0,16 - 0,22
		Maleable (GTS) (MNMP)	-	-	50 - 69	0,13 - 0,18	50 - 69	0,13 - 0,16	20 - 44	0,16 - 0,21
N	Aluminio y aleaciones	Aluminio y aleaciones	180 - 330	0,13 - 0,30	200 - 411	0,13 - 0,30	-	-	90 - 275	0,20 - 0,31
		Alumino con silicio	90 - 137	0,10 - 0,24	90 - 220	0,10 - 0,24	-	-	90 - 220	0,18 - 0,24
S	Aleaciones refractarias	Aleaciones base hierro	-	-	30 - 44	0,07 - 0,14	-	-	5 - 10	0,05 - 0,10
		Aleaciones base cobalto	-	-	30 - 44	0,07 - 0,14	-	-	5 - 8	0,05 - 0,10
		Aleaciones base níquel	-	-	30 - 44	0,07 - 0,14	-	-	5 - 8	0,05 - 0,10
		Aleaciones base titanio	40 - 55	0,11 - 0,15	45 - 58	0,11 - 0,15	-	-	5 - 14	0,07 - 0,13
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-	-	-	15 - 36	0,10 - 0,13	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
22,5	023608	UC225SR	SP4036	-	
	023607	UC225HR	SP4036	-	
	018706	UC225PR	H22	-	
	027354	US225CR	-	SP9336	
22,7	023610	UC227SR	SP4036	-	
	023609	UC227HR	SP4036	-	
23,0	023612	UC230SR	SP4036	-	
	023611	UC230HR	SP4036	-	
	017976	UC230PR	H22	-	
	027355	US230CR	-	SP9336	
23,2	023614	UC232SR	SP4036	-	
	023613	UC232HR	SP4036	-	
23,4	027356	US234CR	-	SP9336	
23,5	023616	UC235SR	SP4036	-	
	023615	UC235HR	SP4036	-	
	018707	UC235PR	H22	-	
23,7	023618	UC237SR	SP4036	-	
	023617	UC237HR	SP4036	-	
23,8	023940	UC238SR	SP4036	-	
	027357	US238CR	-	SP9336	
24,0	023620	UC240SR	SP4036	-	
	023619	UC240HR	SP4036	-	
	018708	UC240PR	H22	-	
	027358	US240CR	-	SP9336	
24,2	023622	UC242SR	SP4036	-	
	023621	UC242HR	SP4036	-	
24,5	023624	UC245SR	SP4036	-	
	023623	UC245HR	SP4036	-	
	018709	UC245PR	H22	-	
	027359	US245CR	-	SP9336	
24,6	023947	UC246SR	SP4036	-	
	023987	UC246HR	SP4036	-	
	027360	US246CR	-	SP9336	
24,7	023626	UC247SR	SP4036	-	
	023625	UC247HR	SP4036	-	
25,0	023628	UC250SR	SP4036	-	
	023627	UC250HR	SP4036	-	
	018710	UC250PR	H22	-	
	027361	US250CR	-	SP9336	
25,2	023630	UC252SR	SP4036	-	
	023629	UC252HR	SP4036	-	
25,4	023632	UC254SR	SP4036	-	
	023631	UC254HR	SP4036	-	
	027362	US254CR	-	SP9336	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

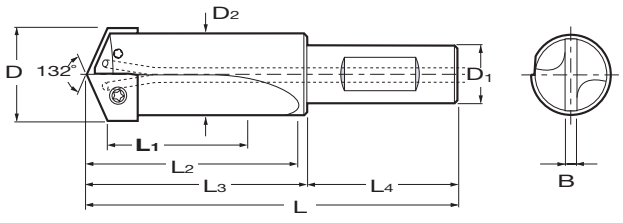
Estrella guía Llave para encontrar la herramienta idónea



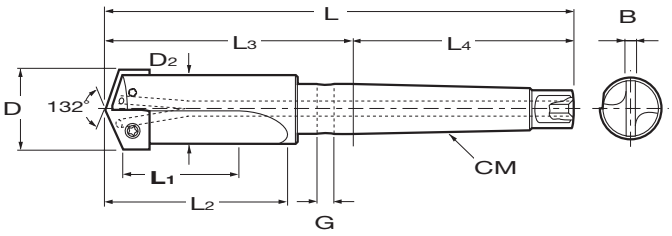
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018795	Corto	S6100W230R	173,0	**75,0**	105,0	113,0	60,0	32,0	-	23,0	5,0	-	F3510T	T15
018807	Largo	S6300W230R	273,0	**170,0**	205,0	213,0	60,0	32,0	-	23,0	5,0	-	F3510T	T15
027803	XX Largo	S6700W250R	396,0	**290,0**	327,0	336,0	60,0	32,0	-	25,0	5,0	-	F3510T	T15
Amarre cono Morse														
014163	Corto	S6100M230R	279,0	**80,0**	110,0	161,5	117,5	-	4	23,0	5,0	1/4"	F3510T	T15
014172	Largo	S6300M230R	379,0	**175,0**	210,0	261,5	117,5	-	4	23,0	5,0	1/4"	F3510T	T15

Cuerpo de herramienta

ISO	Material	Dureza	SR SP4036		CR SP9530	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	70 - 118	0,12 - 0,18	40 - 63	0,17 - 0,26
		Acero <280 HBN	60 - 97	0,12 - 0,17	35 - 50	0,16 - 0,23
P	Aceros aleados	200-280 HBN	60 - 90	0,12 - 0,18	30 - 36	0,16 - 0,23
		280-355 HBN	50 - 71	0,12 - 0,16	25 - 31	0,13 - 0,18
		355-415 HBN	40 - 58	0,12 - 0,14	20 - 27	0,12 - 0,18
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	60 - 69	0,13 - 0,16	10 - 19	0,15 - 0,22
		Martensítico series 400	55 - 58	0,13 - 0,16	10 - 19	0,15 - 0,22
		Refractario	-	-	-	-
K	Fundición	Gris (GG) (FT)	70 - 109	0,18 - 0,28	30 - 50	0,17 - 0,26
		Esferoidal (GGG) (FGS)	55 - 96	0,13 - 0,18	25 - 44	0,16 - 0,22
		Maleable (GTS) (MNMP)	50 - 69	0,13 - 0,16	25 - 36	0,16 - 0,21
N	Aluminio y aleaciones	Aluminio y aleaciones	-	-	90 - 252	0,20 - 0,35
		Alumino con silicio	-	-	90 - 206	0,20 - 0,30
S	Aleaciones refractarias	Aleaciones base hierro	-	-	-	-
		Aleaciones base cobalto	-	-	-	-
		Aleaciones base níquel	-	-	-	-
		Aleaciones base titanio	-	-	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	15 - 36	0,10 - 0,13	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
25,0	023648	UH250SR	SP4036	-	
	027263	UD250CR	-	SP9530	
25,4	015078	UH254PR	H22	-	
	027264	UD254CR	-	SP9530	
25,8	027265	UD258CR	-	SP9530	
26,0	023649	UH260SR	SP4036	-	
	027266	UD260CR	-	SP9530	
26,2	027268	UD262CR	-	SP9530	
26,5	027269	UD265CR	-	SP9530	
27,0	023650	UH270SR	SP4036	-	
	027270	UD270CR	-	SP9530	
27,5	027271	UD275CR	-	SP9530	
27,8	027272	UD278CR	-	SP9530	
28,0	023651	UH280SR	SP4036	-	
	027273	UD280CR	-	SP9530	
28,5	027274	UD285CR	-	SP9530	
28,6	027275	UD286CR	-	SP9530	
29,0	023652	UH290SR	SP4036	-	
	027276	UD290CR	-	SP9530	
29,4	027277	UD294CR	-	SP9530	
29,5	027278	UD295CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

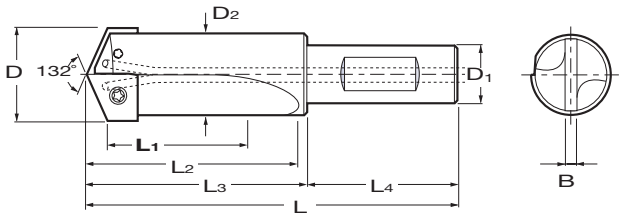
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

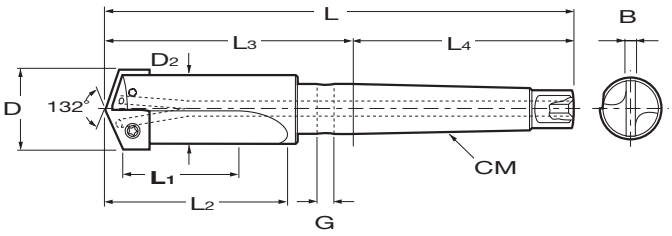
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018796	Corto	S6100W280R	173,0	**75,0**	105,0	113,0	60,0	32,0	-	28,0	5,0	-	F3510T	T15
018808	Largo	S6300W280R	273,0	**170,0**	205,0	213,0	60,0	32,0	-	28,0	5,0	-	F3510T	T15
027804	XX Largo	S6700W280R	396,0	**290,0**	327,0	336,0	60,0	32,0	-	28,0	5,0	-	F3510T	T15
Amarre cono Morse														
014164	Corto	S6100M280R	279,0	**80,0**	110,0	161,5	117,5	-	4	28,0	5,0	1/4"	F3510T	T15
014173	Largo	S6300M280R	379,0	**175,0**	210,0	261,5	117,5	-	4	28,0	5,0	1/4"	F3510T	T15

Cuerpo de herramienta

ISO	Material	Dureza	SR SP4036		CR SP9530	
			Velocidad (V_c)	Avance (f_n)	Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	70 - 118	0,16 - 0,22	40 - 63	0,19 - 0,28
		Acero <280 HBN	60 - 97	0,16 - 0,19	35 - 50	0,18 - 0,25
P	Aceros aleados	200-280 HBN	60 - 90	0,16 - 0,22	30 - 36	0,18 - 0,25
		280-355 HBN	50 - 71	0,16 - 0,21	25 - 31	0,15 - 0,21
		355-415 HBN	40 - 58	0,16 - 0,17	20 - 27	0,15 - 0,21
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	60 - 69	0,17 - 0,21	10 - 19	0,17 - 0,24
		Martensítico series 400	55 - 58	0,17 - 0,21	10 - 19	0,16 - 0,23
		Refractario	-	-	-	-
K	Fundición	Gris (GG) (FT)	70 - 109	0,26 - 0,35	30 - 50	0,19 - 0,28
		Esferoidal (GGG) (FGS)	55 - 96	0,17 - 0,22	25 - 44	0,18 - 0,24
		Maleable (GTS) (MNMP)	50 - 69	0,17 - 0,19	25 - 36	0,18 - 0,24
N	Aluminio y aleaciones	Aluminio y aleaciones	-	-	90 - 252	0,20 - 0,35
		Alumino con silicio	-	-	90 - 206	0,20 - 0,30
S	Aleaciones refractarias	Aleaciones base hierro	-	-	-	-
		Aleaciones base cobalto	-	-	-	-
		Aleaciones base níquel	-	-	-	-
		Aleaciones base titanio	-	-	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	15 - 36	0,14 - 0,15	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
30,0	023653	UH300SR	SP4036	-	
	027279	UD300CR	-	SP9530	
30,1	027280	UD301CR	-	SP9530	
30,9	027281	UD309CR	-	SP9530	
31,0	023654	UH310SR	SP4036	-	
	027282	UD310CR	-	SP9530	
31,7	027283	UD317CR	-	SP9530	
32,0	023655	UH320SR	SP4036	-	
	027284	UD320CR	-	SP9530	
32,5	027285	UD325CR	-	SP9530	
32,6	027286	UD326CR	-	SP9530	
33,0	023656	UH330SR	SP4036	-	
	027287	UD330CR	-	SP9530	
33,3	027288	UD333CR	-	SP9530	
34,0	023657	UH340SR	SP4036	-	
	027289	UD340CR	-	SP9530	
34,1	027290	UD341CR	-	SP9530	
35,0	023658	UH350SR	SP4036	-	
	027291	UD350CR	-	SP9530	
35,7	027363	UD357CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

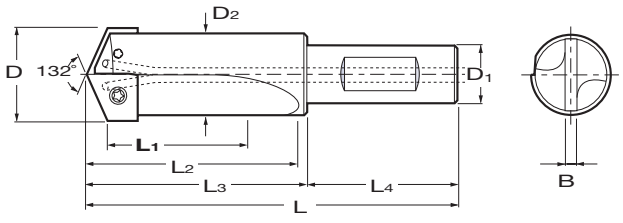
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

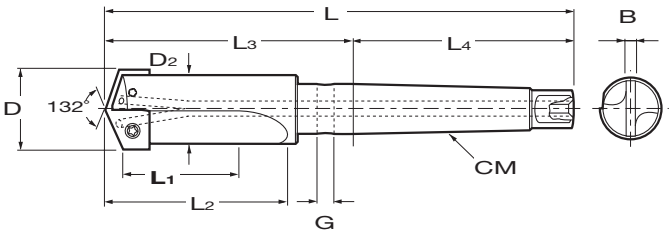
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018797	Corto	S6100W340R	217,0	**110,0**	149,0	157,0	60,0	32,0	-	34,0	7,0	-	F4015T	T20
018809	Largo	S6300W340R	322,0	**215,0**	254,0	262,0	60,0	32,0	-	34,0	7,0	-	F4015T	T20
Amarre cono Morse														
014165	Corto	S6100M340R	324,0	**115,0**	155,0	206,5	117,5	-	4	34,0	7,0	1/4"	F4015T	T20
014174	Largo	S6300M340R	429,0	**220,0**	260,0	311,5	117,5	-	4	34,0	7,0	1/4"	F4015T	T20

Cuerpo de herramienta

ISO	Material	Dureza	CR SP9530	
			Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	40 - 63	0,24 - 0,34
		Acero <280 HBN	35 - 50	0,23 - 0,30
P	Aceros aleados	200-280 HBN	30 - 36	0,23 - 0,30
		280-355 HBN	25 - 31	0,19 - 0,25
		355-415 HBN	20 - 27	0,18 - 0,24
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	10 - 19	0,20 - 0,28
		Martensítico series 400	10 -19	0,19 - 0,26
		Refractario	-	-
K	Fundición	Gris (GG) (FT)	30 - 50	0,24 - 0,34
		Esferoidal (GGG) (FGS)	25 - 44	0,23 - 0,29
		Maleable (GTS) (MNMP)	25 - 36	0,22 - 0,28
N	Aluminio y aleaciones	Aluminio y aleaciones	90 - 252	0,30 - 0,45
		Alumino con silicio	90 - 206	0,25 - 0,35
S	Aleaciones refractarias	Aleaciones base hierro	-	-
		Aleaciones base cobalto	-	-
		Aleaciones base níquel	-	-
		Aleaciones base titanio	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
36,0	027364	UD360CR	-	SP9530	
36,5	027365	UD365CR	-	SP9530	
37,0	027366	UD370CR	-	SP9530	
37,3	027367	UD373CR	-	SP9530	
38,0	027368	UD380CR	-	SP9530	
38,1	027369	UD381CR	-	SP9530	
38,9	027370	UD389CR	-	SP9530	
39,0	027371	UD390CR	-	SP9530	
39,7	027372	UD397CR	-	SP9530	
40,0	027373	UD400CR	-	SP9530	
40,5	027374	UD405CR	-	SP9530	
41,0	027375	UD410CR	-	SP9530	
41,3	027376	UD413CR	-	SP9530	
42,0	027377	UD420CR	-	SP9530	
42,8	027378	UD428CR	-	SP9530	
42,9	027379	UD429CR	-	SP9530	
43,0	027380	UD430CR	-	SP9530	
43,7	027381	UD437CR	-	SP9530	
44,0	027382	UD440CR	-	SP9530	
44,4	027383	UD444CR	-	SP9530	
45,0	027384	UD450CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

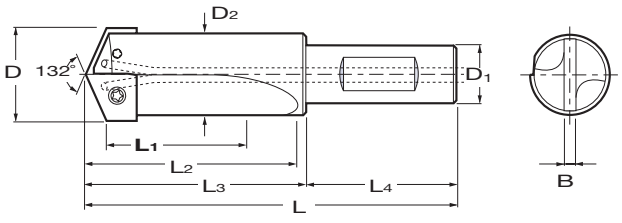
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

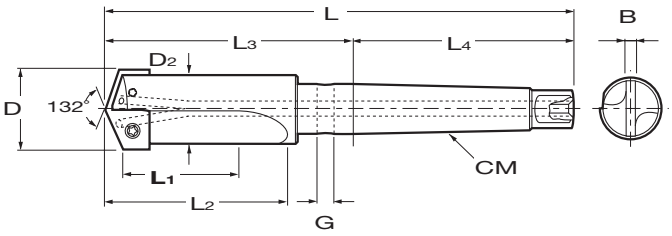
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018798	Corto	S6100W440R	227,0	**110,0**	149,0	157,0	70,0	40,0	-	44,0	7,0	-	F4015T	T20
018810	Largo	S6300W440R	332,0	**215,0**	254,0	262,0	70,0	40,0	-	44,0	7,0	-	F4015T	T20
Amarre cono Morse														
014166	Corto	S6100M440R	324,0	**115,0**	155,0	206,5	117,5	-	4	44,0	7,0	1/4"	F4015T	T20
014175	Largo	S6300M440R	429,0	**220,0**	260,0	311,5	117,5	-	4	44,0	7,0	1/4"	F4015T	T20

Cuerpo de herramienta

ISO	Material	Dureza	CR SP9530	
			Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	40 - 63	0,29 - 0,28
		Acero <280 HBN	35 - 50	0,27 - 0,34
P	Aceros aleados	200-280 HBN	30 - 36	0,27 - 0,34
		280-355 HBN	25 - 31	0,23 - 0,29
		355-415 HBN	20 - 27	0,21 - 0,28
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	10 - 19	0,23 - 0,32
		Martensítico series 400	10 -19	0,22 - 0,30
		Refractario	-	-
K	Fundición	Gris (GG) (FT)	30 - 50	0,29 - 0,38
		Esferoidal (GGG) (FGS)	25 - 44	0,27 - 0,34
		Maleable (GTS) (MNMP)	25 - 36	0,26 - 0,33
N	Aluminio y aleaciones	Aluminio y aleaciones	90 - 252	0,30 - 0,45
		Alumino con silicio	90 - 206	0,25 - 0,35
S	Aleaciones refractarias	Aleaciones base hierro	-	-
		Aleaciones base cobalto	-	-
		Aleaciones base níquel	-	-
		Aleaciones base titanio	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
46,0	027385	UD460CR	-	SP9530	
47,0	027386	UD470CR	-	SP9530	
47,6	027387	UD476CR	-	SP9530	
48,0	027388	UD480CR	-	SP9530	
49,0	027389	UD490CR	-	SP9530	
50,0	027390	UD500CR	-	SP9530	
50,8	027391	UD508CR	-	SP9530	
51,0	027392	UD510CR	-	SP9530	
51,6	027393	UD516CR	-	SP9530	
52,0	027394	UD520CR	-	SP9530	
52,4	027395	UD524CR	-	SP9530	
53,0	027396	UD530CR	-	SP9530	
53,2	027397	UD532CR	-	SP9530	
54,0	027398	UD540CR	-	SP9530	
54,8	027399	UD548CR	-	SP9530	
55,0	027400	UD550CR	-	SP9530	
55,6	027401	UD556CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

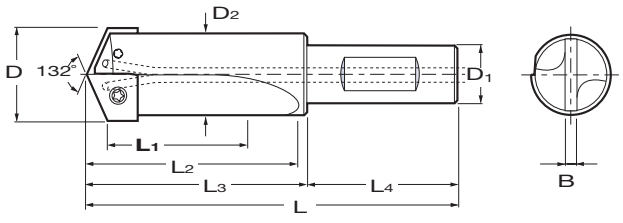
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

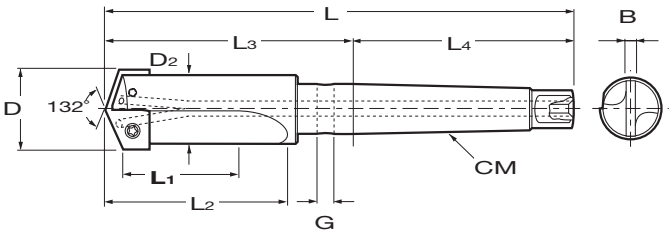
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre Weldon



Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre Weldon														
018799	Corto	S6100W540R	227,0	**110,0**	149,0	157,0	70,0	40,0	-	54,0	7,0	-	F4015T	T20
018811	Largo	S6300W540R	332,0	**215,0**	254,0	262,0	70,0	40,0	-	54,0	7,0	-	F4015T	T20
Amarre cono Morse														
014167	Corto	S6100M540R	324,0	**115,0**	155,0	206,5	117,5	-	4	54,0	7,0	1/4"	F4015T	T20
014168	Corto	S6100M5540R	371,0	**115,0**	155,0	221,5	149,5	-	5	54,0	7,0	1/2"	F4015T	T20
014176	Largo	S6300M540R	429,0	**220,0**	260,0	311,5	117,5	-	4	54,0	7,0	1/4"	F4015T	T20
014177	Largo	S6300M5540R	476,0	**220,0**	260,0	326,5	149,5	-	5	54,0	7,0	1/2"	F4015T	T20

Cuerpo de herramienta

ISO	Material	Dureza	CR SP9530	
			Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	40 - 63	0,34 - 0,42
		Acero <280 HBN	35 - 50	0,31 - 0,38
P	Aceros aleados	200-280 HBN	30 - 36	0,31 - 0,38
		280-355 HBN	25 - 31	0,26 - 0,33
		355-415 HBN	20 - 27	0,24 - 0,31
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	10 - 19	0,26 - 0,35
		Martensítico series 400	10 -19	0,25 - 0,32
		Refractario	-	-
K	Fundición	Gris (GG) (FT)	30 - 50	0,34 - 0,42
		Esferoidal (GGG) (FGS)	25 - 44	0,31 - 0,38
		Maleable (GTS) (MNMP)	25 - 36	0,30 - 0,36
N	Aluminio y aleaciones	Aluminio y aleaciones	90 - 252	0,30 - 0,45
		Alumino con silicio	90 - 206	0,25 - 0,35
S	Aleaciones refractarias	Aleaciones base hierro	-	-
		Aleaciones base cobalto	-	-
		Aleaciones base níquel	-	-
		Aleaciones base titanio	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Grade		Primera opción
			Metal duro	HSS	
56,0	027402	UD560CR	-	SP9530	
57,0	027403	UD570CR	-	SP9530	
57,1	027404	UD571CR	-	SP9530	
58,0	027405	UD580CR	-	SP9530	
58,7	027406	UD587CR	-	SP9530	
59,0	027407	UD590CR	-	SP9530	
60,0	027408	UD600CR	-	SP9530	
60,3	027409	UD603CR	-	SP9530	
61,0	027410	UD610CR	-	SP9530	
61,9	027411	UD619CR	-	SP9530	
62,0	027412	UD620CR	-	SP9530	
63,0	027413	UD630CR	-	SP9530	
63,5	027414	UD635CR	-	SP9530	
64,0	027415	UD640CR	-	SP9530	
65,0	027416	UD650CR	-	SP9530	
65,1	027417	UD651CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

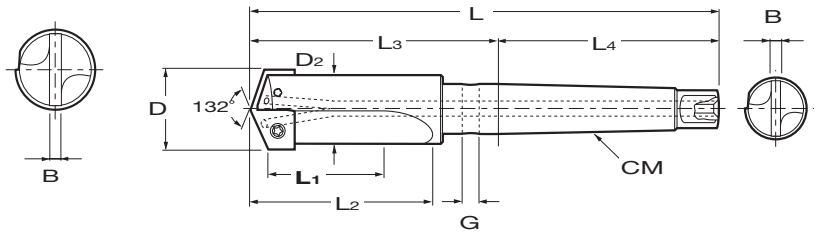
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre cono Morse														
014169	Corto	S6100M630R	436,0	**170,0**	220,0	286,5	149,5	-	5	63,0	9,0	1/2"	F5020T	T20
014178	Largo	S6300M630R	536,0	**270,0**	320,0	386,5	149,5	-	5	63,0	9,0	1/2"	F5020T	T20

Cuerpo de herramienta

ISO	Material	Dureza	CR SP9530	
			Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	40 - 63	0,40 - 0,48
		Acero <280 HBN	35 - 50	0,36 - 0,44
P	Aceros aleados	200-280 HBN	30 - 36	0,36 - 0,44
		280-355 HBN	25 - 31	0,31 - 0,38
		355-415 HBN	20 - 27	0,29 - 0,36
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	10 - 19	0,30 - 0,39
		Martensítico series 400	10 -19	0,29 - 0,36
		Refractario	-	-
K	Fundición	Gris (GG) (FT)	30 - 50	0,40 - 0,48
		Esferoidal (GGG) (FGS)	25 - 44	0,36 - 0,44
		Maleable (GTS) (MNMP)	25 - 36	0,35 - 0,42
N	Aluminio y aleaciones	Aluminio y aleaciones	90 - 252	0,40 - 0,50
		Alumino con silicio	90 - 206	0,35 - 0,45
S	Aleaciones refractarias	Aleaciones base hierro	-	-
		Aleaciones base cobalto	-	-
		Aleaciones base níquel	-	-
		Aleaciones base titanio	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
66,0	027418	UD660CR	-	SP9530	
66,6	027419	UD666CR	-	SP9530	
67,0	027420	UD670CR	-	SP9530	
68,0	027421	UD680CR	-	SP9530	
69,0	027422	UD690CR	-	SP9530	
69,8	027423	UD698CR	-	SP9530	
70,0	027424	UD700CR	-	SP9530	
72,0	027425	UD720CR	-	SP9530	
73,0	027426	UD730CR	-	SP9530	
74,0	027427	UD740CR	-	SP9530	
75,0	027428	UD750CR	-	SP9530	
76,0	027429	UD760CR	-	SP9530	
76,2	027430	UD762CR	-	SP9530	
77,8	027431	UD778CR	-	SP9530	
78,0	027432	UD780CR	-	SP9530	
79,0	027433	UD790CR	-	SP9530	
79,4	027434	UD794CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

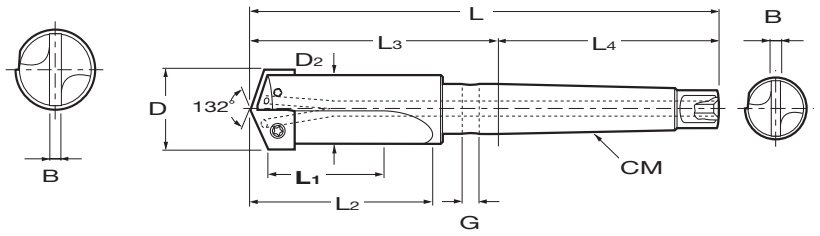
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre cono Morse														
014170	Corto	S6100M770R	436,0	**170,0**	220,0	286,5	149,5	-	5	77,0	9,0	1/2"	F5020T	T20
014179	Largo	S6300M770R	536,0	**270,0**	320,0	386,5	149,5	-	5	77,0	9,0	1/2"	F5020T	T20

Cuerpo de herramienta

ISO	Material	Dureza	CR SP9530	
			Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	40 - 63	0,46 - 0,54
		Acero <280 HBN	35 - 50	0,42 - 0,49
P	Aceros aleados	200-280 HBN	30 - 36	0,42 - 0,49
		280-355 HBN	25 - 31	0,36 - 0,43
		355-415 HBN	20 - 27	0,33 - 0,40
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	10 - 19	0,34 - 0,44
		Martensítico series 400	10 -19	0,33 - 0,40
		Refractario	-	-
K	Fundición	Gris (GG) (FT)	30 - 50	046 - 0,54
		Esferoidal (GGG) (FGS)	25 - 44	0,42 - 0,49
		Maleable (GTS) (MNMP)	25 - 36	0,40 - 0,47
N	Aluminio y aleaciones	Aluminio y aleaciones	90 - 252	0,40 - 0,50
		Alumino con silicio	90 - 206	0,35 - 0,45
S	Aleaciones refractarias	Aleaciones base hierro	-	-
		Aleaciones base cobalto	-	-
		Aleaciones base níquel	-	-
		Aleaciones base titanio	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
80,0	027435	UD800CR	-	SP9530	
82,5	027436	UD825CR	-	SP9530	
83,0	023634	UD830CR	-	SP9530	
84,0	027437	UD840CR	-	SP9530	
85,0	027438	UD850CR	-	SP9530	
85,7	027439	UD857CR	-	SP9530	
86,0	027440	UD860CR	-	SP9530	
87,3	027441	UD873CR	-	SP9530	
88,0	027442	UD880CR	-	SP9530	
88,9	027443	UD889CR	-	SP9530	
89,0	027444	UD890CR	-	SP9530	
90,0	027445	UD900CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

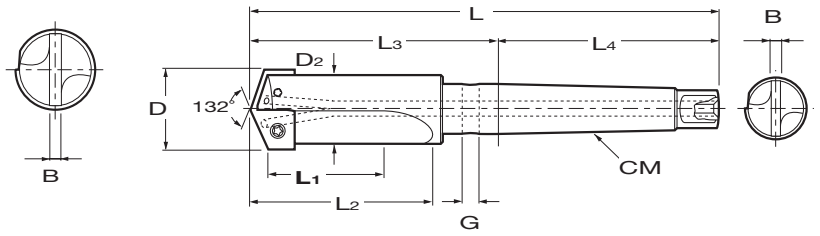
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Amarre cono Morse



Cuerpo de herramienta

EDP #		Referencia	L	L_1	L_2	L_3	L_4	D_1	CM	D_2	B	Tornillo BSP	Tornillo	Destornillador
Amarre cono Morse														
014171	Corto	S6100M890R	436,0	**170,0**	220,0	286,5	149,5	-	5	89,0	9,0	1/2"	F5020T	T20
014180	Largo	S6300M890R	536,0	**270,0**	320,0	386,5	149,5	-	5	89,0	9,0	1/2"	F5020T	T20

Cuerpo de herramienta

ISO	Material	Dureza	CR SP9530	
			Velocidad (V_c)	Avance (f_n)
P	Aceros no aleados	Acero <180 HBN	40 - 63	0,56 - 0,62
		Acero <280 HBN	35 - 50	0,50 - 0,56
P	Aceros aleados	200-280 HBN	30 - 36	0,50 - 0,56
		280-355 HBN	25 - 31	0,45 - 0,50
		355-415 HBN	20 - 27	0,40 - 0,47
M	Aceros inoxidables	Austenítico/Ferrítico Series 300	10 - 19	0,40 - 0,50
		Martensítico series 400	10 -19	0,38 - 0,45
		Refractario	-	-
K	Fundición	Gris (GG) (FT)	30 - 50	0,56 - 0,62
		Esferoidal (GGG) (FGS)	25 - 44	0,50 - 0,57
		Maleable (GTS) (MNMP)	25 - 36	0,48 - 0,55
N	Aluminio y aleaciones	Aluminio y aleaciones	90 - 252	0,50 - 0,65
		Alumino con silicio	90 - 206	0,45 - 0,55
S	Aleaciones refractarias	Aleaciones base hierro	-	-
		Aleaciones base cobalto	-	-
		Aleaciones base níquel	-	-
		Aleaciones base titanio	-	-
H	Materiales de alta dureza (52-56 HRC)	Materiales de alta dureza (52-56 HRC)	-	-

Gama de plaquitas

Diámetro (mm)	EDP #	Referencia	Calidad		Primera opción
			Metal duro	HSS	
92,0	027446	UD920CR	-	SP9530	
95,2	027447	UD952CR	-	SP9530	
99,0	023635	UD990CR	-	SP9530	
100,0	023633	UD1000CR	-	SP9530	
101,6	027448	UD1016CR	-	SP9530	
103,2	027449	UD1032CR	-	SP9530	
108,0	027450	UD1080CR	-	SP9530	
114,0	027451	UD1140CR	-	SP9530	

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos

Controle la lista de precios local para disponibilidad.

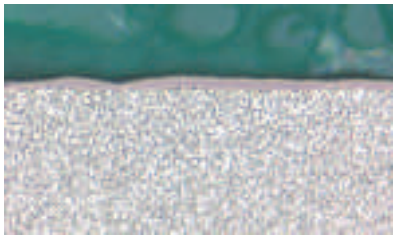
Nota: Tamaños intermedios disponibles según demanda

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros



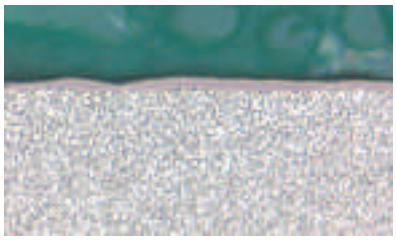




GEOMETRÍA SR *Calidad SP4036*

Geometría SR (Metal duro microgramo con recubrimiento TiAlN PVD)
Primera elección para el mecanizado de acero, fundición y fundición nodular, esta geometría tiene rompe virutas rectificados, guías laterales y chaflán de protección en las esquinas.
Gama de diámetros 10,0mm - 35,0mm





GEOMETRÍA HR *Calidad SP4036*

Geometría HR (Metal duro microgramo con recubrimiento TiAlN PVD)
Primera elección para la mecanización de aceros de baja dureza < 750 N/mm^2 (HB 230) y aceros inoxidables. Esta geometría tiene un afilado helicoidal, una arista de corte reforzada guías laterales que permiten un excelente auto centrado y grande capacidad de penetración.
Gama de diámetros 9,9mm – 25,4mm

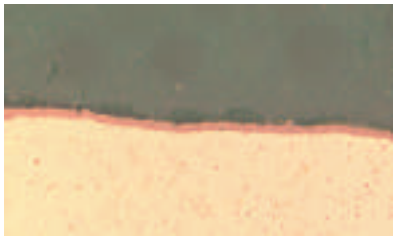




GEOMETRÍA PR *Calidad H22*

Geometría PR (Metal duro microgramo)
Primera elección para la mecanización de aluminio y otras aleaciones no ferrosas. Esta geometría tiene rompe virutas anchos y rectificados, aristas vivas, ranuras para fracturar la viruta y sin guías laterales. Esto permite una gran capacidad de penetración y una suave evacuación de la viruta.
Gama de diámetros 10,0mm – 25,4mm.





GEOMETRÍA CR *Calidad SP9336*

Geometría CR (T15 acero rápido recubierto TiAlN PVD)
Para la mecanización de acero, fundición (incluyendo la nodular) y materiales no ferrosos. Rompe virutas rectificados, guías laterales, ranuras para fracturar la viruta y radio de protección en las esquinas.
Gama de diámetros 10,0mm – 25,4mm





GEOMETRÍA CR *Calidad SP9530*

Geometría CR (M4 acero rápido con recubrimiento TiN PVD)
Para la mecanización de acero, fundición (incluyendo la nodular) y materiales no ferrosos. Esta geometría tiene rompe virutas rectificados, guías laterales, ranuras para fracturar la viruta y radio de protección en las esquinas.
Gama de diámetros 25,0mm – 114,0mm

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

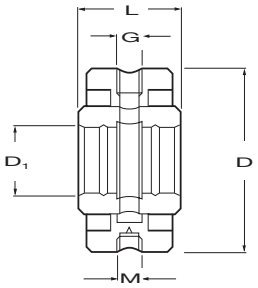
STELLRAM®



Junta rotatoria

Referencia	Dimensiones (mm)					
	C.M.	D	D_1	L	M	G
S9010 X00 317	4	80	31,75	45	M10	1/4 BSP
S9010 X00 635	5	127	63,50	60	M12	1/2 BSP

Para su utilización en el amarre Unidrill tipo S cono Morse.



Recomendaciones de utilización

- No hacer taladros de mayor profundidad que la dimensión L_1, máxima profundidad de taladrado.
- Utilizar siempre la broca mas corta posible para un máximo de rigidez.
- Asegurarse de la rigidez del cabezal y del buen amarre de la pieza antes de empezar.
- La refrigeración interna es altamente recomendada cuando la profundidad del taladro sobrepasa 1 x el diámetro.
- Unidrill puede ser utilizado de cualquiera de las dos maneras (fijo en la torreta como en un torno) o de modo dinámico (rotando como en un centro de mecanizado). Cuando se taladra material de viruta larga, tenga cuidado en la elección de la geometría correcta. Para esos materiales está fuertemente recomendado hacer micro paradas en el ciclo de taladrado para así poder evacuar la viruta. Esto es particularmente importante en caso de taladrado vertical. Se recomienda un pretaladro o un punto de centro con el mismo ángulo de punta cuándo se taladra con las brocas de mayor longitud.

Notas importante

Cuando el taladro es superior a 5 veces el diámetro, es importante asegurarse que todas las condiciones son respetadas. Algunos o todos los procesos siguientes deben de ser utilizados:

1. La cara a mecanizar debe de ser plana y estar a escuadra.
2. Una broca de puntear con un ángulo de 135º o incluso superior puede ser utilizada. El diámetro del punteado debe de ser como máximo 50% del diámetro del taladro.
3. En algunos casos es aconsejable utilizar una broca corta y taladrar hasta su capacidad máxima y luego llegar a la profundidad deseada con otra broca más larga.
4. Disminuir el avance de mitad hasta que la punta de la plaquita no haya penetrado.

Cuando hay problemas de taladrado por culpa de la viruta, se aconseja utilizar las plaquitas en HSS en vez de las de metal duro.

La información técnica proporcionada depende del entorno y condiciones de la operación, tales como la máquina, refrigeración y resultado deseado del mecanizado: éstas están basadas en condiciones adecuadas, y de acuerdo con los límites del cabezal.

Equipamiento de seguridad debería ser proporcionado al personal para protegerlos de la viruta.
Para asegurar una productividad máxima, las plaquitas deben de ser cambiadas regularmente.

PROBLEMA	CAUSA	SOLUCION
Plaquita astillada o rota	La velocidad demasiado alta causa vibraciones	Reducir velocidad
	Velocidad demasiado baja	Ver el gráfico de velocidades y ajustar
	Velocidad demasiado alta	Ver el gráfico de velocidades y ajustar
	Viruta apelmazada	Aumentar la velocidad y/o cambiar la geometría
	Viruta apelmazada	En algunos caso el ciclo con micro para es necesario
Desgaste prematuro de la plaquita	Velocidad demasiado alta	Reducir velocidad
	Calidad errónea	Comprobar las recomendaciones sobre calidades y ajustar
	Geometría errónea	Comprobar las recomendaciones sobre geometrías y ajustar
	Presión del refrigerante demasiado baja	Incrementar la presión y comprobar fallos en la alimentación
	Calidad del refrigerante	Comprobar la emulsión. Podría ser que la mezcla supere las recomendaciones del proveedor.
	C/n torreta descentrada	Comprobar y ajustar
Sobre medida en taladro	C/n torreta descentrada	Comprobar y ajustar

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Velocidad de corte (V_C) metros/minuto



Velocidad de corte (V_C) metros/minuto			Recubiertas PVD						No recubiertas	
ISO	Material	Rm y Dureza	SP9336 Max - min		SP9530 Max - min		SP4036 Max - min		H22 Max - min	
P	Aceros no aleados	<600 N/mm² <180HBN	68	40	63	40	118	70	-	-
		<950 N/mm² <280HBN	63	37	50	37	97	59	-	-
	Aceros aleados	700 - 950 N/mm² 200 - 280 HBN	58	30	36	30	90	61	-	-
		950 - 1200 N/mm² 280 - 355 HBN	42	24	31	24	71	49	-	-
		1200 - 1400 N/mm² 355 - 415 HBN	36	24	27	21	58	41	-	-
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	27	9	19	9	69	59	-	-
		Martensítico Series 400	31	9	19	9	58	55	-	-
		Refractario P.H.	-	-	-	-	-	-	-	-
K	Fundición	Gris GG-Ft	58	30	50	30	109	70	-	-
		Esferoidal-Dúctil GGG-FGS	53	29	44	27	96	55	-	-
		Maleable GTS - MN/MP	44	27	36	21	69	52	-	-
N	Aluminio y aleaciones	< 16% Si 116HBN	300	91	275	91	411	201	330	180
		> 16% Si 92HBN	220	91	206	91	220	91	137	91
S	Aleaciones refractarias	Base hierro	10	5	-	-	44	30	-	-
		Base cobalto	8	5	-	-	44	30	-	-
		Base níquel	8	5	-	-	44	30	-	-
		Base titanio	14	5	-	-	58	43	55	40
H	Aceros de alta dureza	>1400 N/mm² >415 HBN	-	-	-	-	36	15	-	-
	Fundición dúctil	1400 N/mm² 400 HBN	-	-	-	-	-	-	-	-

Avance por tipo de diámetro: Geometría PR calidad H22

ISO	Material	Rm y Dureza	Fn = Avance por vuelta mm/rev: min y max Diámetros de las plaquitas (mm) 10	12	14	15	16	18	20	22	25
P	Aceros no aleados	<600 N/mm² <180HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
		<950 N/mm² <280HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
	Aceros aleados	700-950 N/mm² 200-280 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
		950-1200 N/mm² 280-355 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
		1200-1400 N/mm² 355-415 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Martensítico Series 400	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Refractario P.H.	- -	- -	- -	- -	- -	- -	- -	- -	- -
K	Fundición	Gris GG-Ft	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Esferoidal-Dúctil GGG-FGS	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Maleable GTS - MN/MP	- -	- -	- -	- -	- -	- -	- -	- -	- -
N	Aluminio y aleaciones	< 16% Si 116HBN	0,050 0,100	0,060 0,124	0,070 0,150	0,075 0,163	0,080 0,176	0,090 0,202	0,100 0,230	0,110 0,258	0,125 0,300
		> 16% Si 92HBN	0,030 0,080	0,038 0,100	0,046 0,120	0,051 0,130	0,055 0,141	0,064 0,162	0,074 0,184	0,084 0,206	0,099 0,240
S	Aleaciones refractarias	Base hierro	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Base cobalto	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Base níquel	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Base titanio	0,030 0,050	0,039 0,062	0,048 0,075	0,053 0,081	0,058 0,088	0,068 0,101	0,079 0,115	0,090 0,129	0,108 0,150
H	Aceros de alta dureza	>1400 N/mm² >415 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
	Fundición dúctil	1400 N/mm² 400 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales

P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®



ISO	Material	Rm y Dureza	Fn = Avance por vuelta mm/rev: min y max								
			Diámetros de las plaquitas (mm)								
			10	12	14	15	16	18	20	22	25
P	Aceros no aleados	<600 N/mm² <180HBN	0,030 0,080	0,040 0,096	0,051 0,112	0,056 0,120	0,062 0,128	0,075 0,144	0,088 0,160	0,103 0,176	0,125 0,200
		<950 N/mm² <280HBN	0,030 0,080	0,040 0,094	0,051 0,108	0,057 0,115	0,064 0,122	0,077 0,136	0,091 0,149	0,106 0,163	0,130 0,182
	Aceros aleados	700-950 N/mm² 200-280 HBN	0,030 0,080	0,040 0,096	0,051 0,112	0,057 0,120	0,064 0,128	0,077 0,144	0,091 0,160	0,106 0,176	0,130 0,200
		950-1200 N/mm² 280-355 HBN	0,030 0,050	0,040 0,065	0,051 0,080	0,057 0,088	0,064 0,097	0,077 0,114	0,091 0,132	0,106 0,151	0,130 0,180
		1200-1400 N/mm² 355-415 HBN	0,030 0,050	0,040 0,062	0,051 0,075	0,057 0,081	0,064 0,088	0,077 0,101	0,091 0,115	0,106 0,129	0,130 0,150
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	0,030 0,050	0,040 0,065	0,051 0,080	0,057 0,088	0,064 0,097	0,077 0,114	0,091 0,132	0,106 0,151	0,130 0,180
		Martensítico Series 400	0,030 0,050	0,040 0,065	0,051 0,080	0,057 0,088	0,064 0,097	0,077 0,114	0,091 0,132	0,106 0,151	0,130 0,180
		Refractario P.H.	- -	- -	- -	- -	- -	- -	- -	- -	- -
K	Fundición	Gris GG-Ft	0,030 0,080	0,043 0,104	0,058 0,130	0,066 0,144	0,075 0,158	0,094 0,188	0,116 0,219	0,140 0,251	0,179 0,302
		Esferoidal-Dúctil GGG-FGS	0,030 0,080	0,040 0,096	0,051 0,112	0,057 0,120	0,064 0,128	0,077 0,144	0,091 0,160	0,106 0,176	0,130 0,200
		Maleable GTS - MN/MP	0,030 0,080	0,040 0,094	0,051 0,108	0,057 0,114	0,064 0,121	0,077 0,134	0,091 0,147	0,106 0,160	0,130 0,179
N	Aluminio y aleaciones	< 16% Si 116HBN	0,050 0,100	0,060 0,124	0,070 0,150	0,075 0,163	0,080 0,176	0,090 0,202	0,100 0,230	0,110 0,258	0,125 0,300
		> 16% Si 92HBN	0,030 0,080	0,038 0,100	0,046 0,120	0,051 0,130	0,055 0,141	0,064 0,162	0,074 0,184	0,084 0,206	0,099 0,240
S	Aleaciones refractarias	Base hierro	0,020 0,050	0.025 0.061	0,031 0,072	0,034 0,078	0,037 0,084	0,043 0,095	0,049 0,107	0,056 0,119	0,066 0,137
		Base cobalto	0,020 0,050	0,025 0,061	0,031 0,072	0,034 0,078	0,037 0,084	0,043 0,095	0,049 0,107	0,056 0,119	0,066 0,137
		Base níquel	0,020 0,050	0,025 0,061	0,031 0,072	0,034 0,078	0,037 0,084	0,043 0,095	0,049 0,107	0,056 0,119	0,066 0,137
		Base titanio	0,030 0,050	0,039 0,062	0,048 0,075	0,053 0,081	0,058 0,088	0,068 0,101	0,079 0,115	0,090 0,129	0,108 0,150
H	Aceros de alta dureza	>1400 N/mm² >415 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -
	Fundición dúctil	1400 N/mm² 400 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -

Avance por tipo de diámetro: Geometría SR calidad SP4036

ISO	Material	Rm y Dureza	Fn = Avance por vuelta mm/rev: min y max Diámetros de las plaquitas (mm)										
			10	12	14	15	16	18	20	22	25	30	35
P	Aceros no aleados	<600 N/mm² <180HBN	0,030 0,080	0,039 0,094	0,050 0,108	0,055 0,115	0,061 0,122	0,072 0,136	0,085 0,149	0,098 0,163	0,119 0,182	0,156 0,215	0,196 0,247
		<950 N/mm² <280HBN	0,030 0,080	0,039 0,093	0,050 0,105	0,055 0,111	0,061 0,117	0,072 0,128	0,085 0,139	0,098 0,150	0,119 0,167	0,156 0,193	0,196 0,218
	Aceros aleados	700-950 N/mm² 200-280 HBN	0,030 0,080	0,039 0,094	0,050 0,108	0,055 0,115	0,061 0,122	0,072 0,136	0,085 0,149	0,098 0,163	0,119 0,182	0,156 0,215	0,196 0,247
		950-1200 N/mm² 280-355 HBN	0,030 0,050	0,039 0,063	0,050 0,077	0,055 0,085	0,061 0,092	0,072 0,107	0,085 0,123	0,098 0,139	0,119 0,165	0,156 0,209	0,196 0,255
		1200-1400 N/mm² 355-415 HBN	0,030 0,050	0,039 0,061	0,050 0,072	0,055 0,078	0,061 0,084	0,072 0,095	0,085 0,107	0,098 0,119	0,119 0,137	0,156 0,167	0,196 0,198
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	0,030 0,050	0,040 0,063	0,051 0,077	0,057 0,085	0,064 0,092	0,077 0,107	0,091 0,123	0,106 0,139	0,130 0,165	0,174 0,209	0,223 0,255
		Martensítico Series 400	0,030 0,050	0,040 0,063	0,051 0,077	0,057 0,085	0,064 0,092	0,077 0,107	0,091 0,123	0,106 0,139	0,130 0,165	0,174 0,209	0,223 0,255
		Refractario P.H.	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
K	Fundición	Gris GG-Ft	0,030 0,080	0,043 0,102	0,058 0,126	0,066 0,138	0,075 0,151	0,094 0,177	0,116 0,204	0,140 0,232	0,179 0,276	0,256 0,353	0,345 0,434
		Esferoidal-Dúctil GGG-FGS	0,030 0,080	0,040 0,094	0,051 0,108	0,057 0,115	0,064 0,122	0,077 0,136	0,091 0,149	0,106 0,163	0,130 0,182	0,174 0,215	0,223 0,247
		Maleable GTS - MN/MP	0,030 0,080	0,040 0,092	0,051 0,104	0,057 0,110	0,064 0,115	0,077 0,127	0,091 0,137	0,106 0,148	0,130 0,163	0,174 0,188	0,223 0,213
N	Aluminio y aleaciones	< 16% Si 116HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
		> 16% Si 92HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
S	Aleaciones refractarias	Base hierro	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Base cobalto	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Base níquel	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
		Base titanio	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
H	Aceros de alta dureza	>1400 N/mm² >415 HBN	0,020 0,050	0,028 0,060	0,037 0,070	0,041 0,075	0,047 0,080	0,058 0,090	0,070 0,100	0,083 0,110	0,104 0,125	0,144 0,150	0,191 0,175
	Fundición dúctil	1400 N/mm² 400 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales

P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

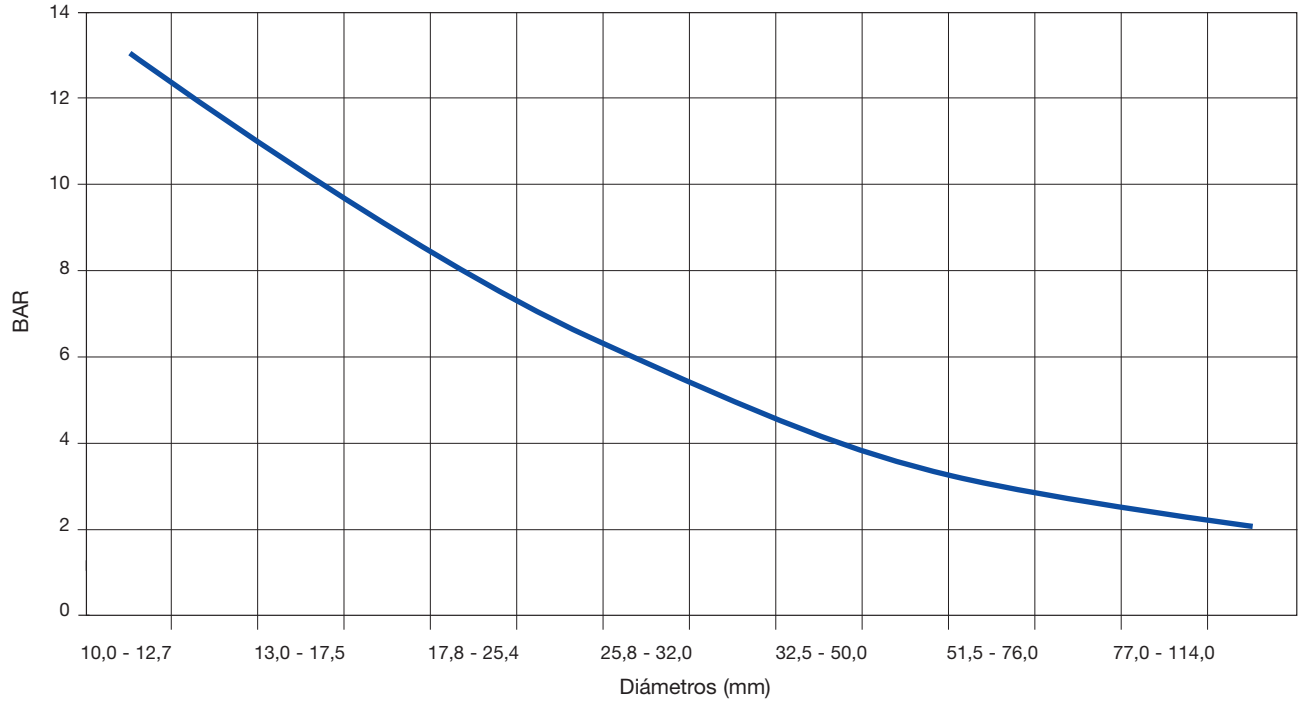
STELLRAM®



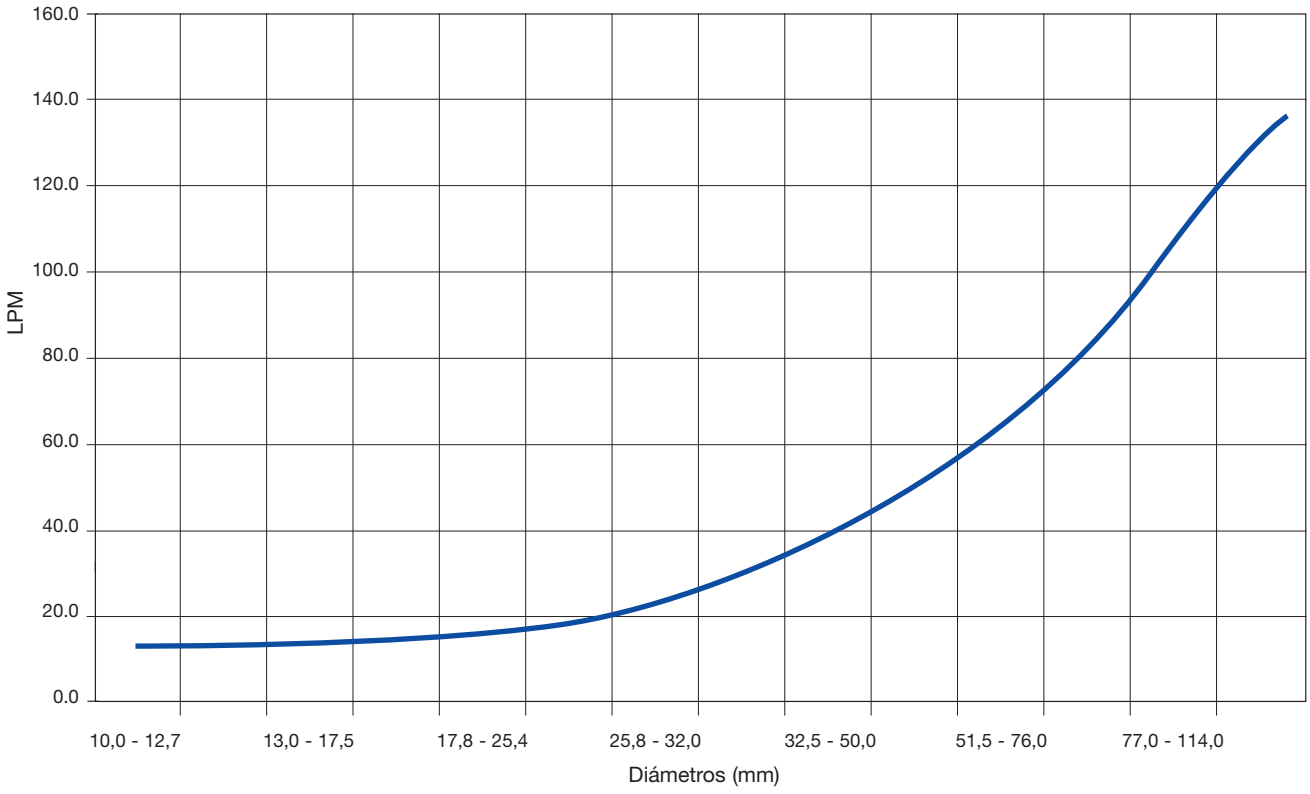
ISO	Material	Rm y Dureza	Fn = Avance por vuelta mm/rev: min y max Diámetros de las plaquitas (mm)											
			10	12	15	20	25	30	40	50	60	75	90	115
P	Aceros no aleados	<600 N/mm² <180HBN	0,080 0,150	0,093 0,167	0,111 0,190	0,139 0,224	0,167 0,255	0,193 0,284	0,243 0,335	0,290 0,381	0,335 0,424	0,401 0,483	0,464 0,536	0,564 0,618
		<950 N/mm² <280HBN	0,080 0,130	0,092 0,145	0,108 0,166	0,135 0,197	0,159 0,225	0,182 0,251	0,226 0,299	0,267 0,341	0,307 0,381	0,363 0,435	0,416 0,486	0,500 0,563
	Aceros aleados	700-950 N/mm² 200-280 HBN	0,080 0,130	0,092 0,145	0,108 0,166	0,135 0,197	0,159 0,225	0,182 0,251	0,226 0,299	0,267 0,341	0,307 0,381	0,363 0,435	0,416 0,486	0,500 0,563
		950-1200 N/mm² 280-355 HBN	0,060 0,100	0,070 0,113	0,084 0,131	0,106 0,158	0,127 0,183	0,148 0,206	0,187 0,250	0,225 0,289	0,261 0,326	0,313 0,378	0,364 0,426	0,445 0,501
		1200-1400 N/mm² 355-415 HBN	0,060 0,100	0,069 0,112	0,082 0,129	0,103 0,155	0,123 0,178	0,141 0,200	0,177 0,239	0,211 0,276	0,243 0,309	0,289 0,356	0,333 0,399	0,403 0,466
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	0,080 0,130	0,090 0,144	0,105 0,162	0,126 0,190	0,146 0,215	0,165 0,238	0,200 0,279	0,231 0,315	0,261 0,348	0,302 0,394	0,341 0,435	0,401 0,498
		Martensítico Series 400	0,080 0,130	0,090 0,143	0,104 0,160	0,125 0,185	0,144 0,207	0,162 0,228	0,194 0,264	0,224 0,295	0,252 0,324	0,290 0,363	0,326 0,399	0,382 0,452
		Refractario P.H.	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
K	Fundición	Gris GG-Ft	0,080 0,150	0,093 0,167	0,111 0,190	0,139 0,224	0,167 0,255	0,193 0,284	0,243 0,335	0,290 0,381	0,335 0,424	0,401 0,483	0,464 0,536	0,564 0,618
		Esferoidal-Dúctil GGG-FGS	0,080 0,120	0,092 0,135	0,108 0,156	0,135 0,187	0,159 0,216	0,182 0,242	0,226 0,291	0,267 0,336	0,307 0,378	0,363 0,436	0,416 0,490	0,500 0,573
		Maleable GTS - MN/MP	0,080 0,120	0,091 0,134	0,108 0,154	0,133 0,184	0,156 0,212	0,178 0,237	0,220 0,283	0,259 0,325	0,296 0,364	0,348 0,419	0,398 0,469	0,476 0,546
N	Aluminio y aleaciones	< 16% Si 116HBN	0,120 0,200	0,133 0,217	0,152 0,241	0,179 0,275	0,204 0,305	0,227 0,332	0,268 0,378	0,305 0,419	0,339 0,456	0,386 0,505	0,429 0,550	0,495 0,615
		> 16% Si 92HBN	0,100 0,150	0,112 0,165	0,129 0,186	0,154 0,217	0,176 0,244	0,198 0,269	0,236 0,313	0,271 0,352	0,304 0,388	0,349 0,436	0,391 0,481	0,455 0,547
S	Aleaciones refractarias	Base hierro	0,020 0,050	0,024 0,057	0,029 0,067	0,039 0,084	0,048 0,099	0,057 0,113	0,075 0,139	0,092 0,165	0,110 0,188	0,136 0,222	0,161 0,254	0,204 0,305
		Base cobalto	0,020 0,050	0,024 0,057	0,029 0,067	0,039 0,084	0,048 0,099	0,057 0,113	0,075 0,139	0,092 0,165	0,110 0,188	0,136 0,222	0,161 0,254	0,204 0,305
		Base níquel	0,020 0,050	0,024 0,057	0,029 0,067	0,039 0,084	0,048 0,099	0,057 0,113	0,075 0,139	0,092 0,165	0,110 0,188	0,136 0,222	0,161 0,254	0,204 0,305
		Base titanio	0,030 0,070	0,035 0,080	0,043 0,093	0,054 0,115	0,066 0,134	0,077 0,153	0,099 0,187	0,120 0,219	0,140 0,250	0,170 0,293	0,199 0,333	0,245 0,396
H	Aceros de alta dureza	>1400 N/mm² >415 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	Fundición dúctil	1400 N/mm² 400 HBN	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Recomendaciones para el flujo y presión del refrigerante

Presión del refrigerante – Kg/cm² (BAR) por diámetro



Flujo del refrigerante – Litros por minuto (LPM) por diámetro



Estrella guía Llave para encontrar la herramienta idónea

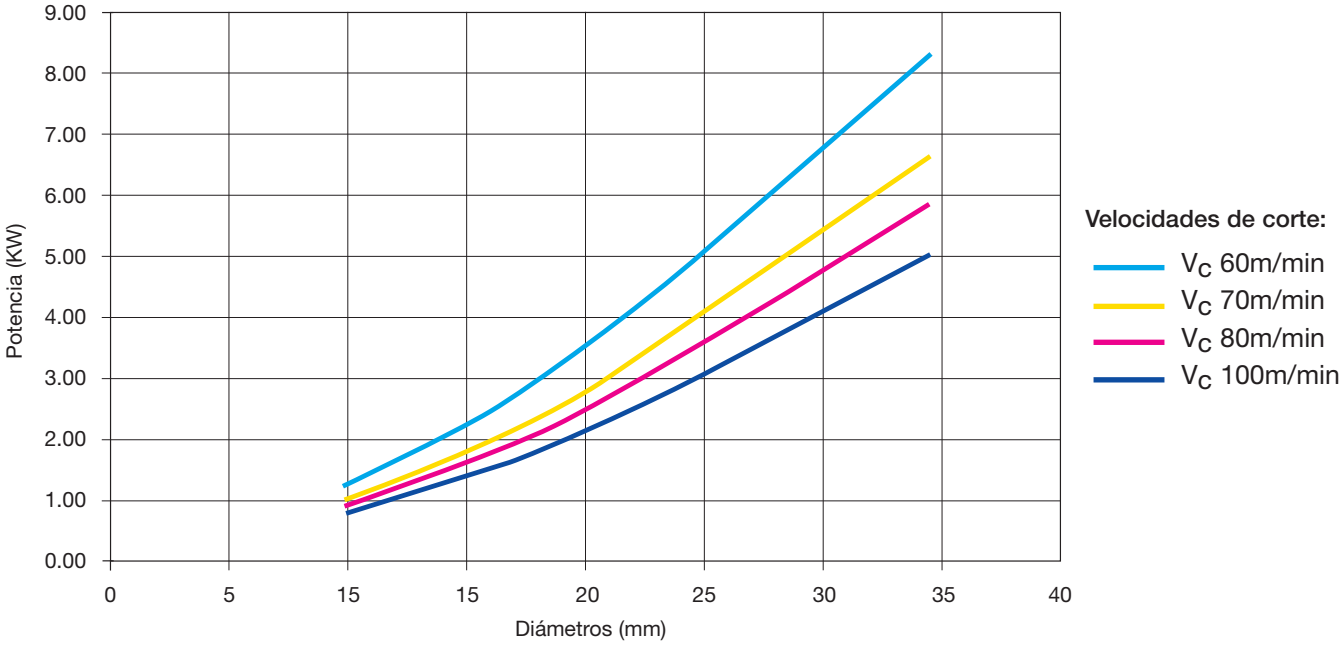
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

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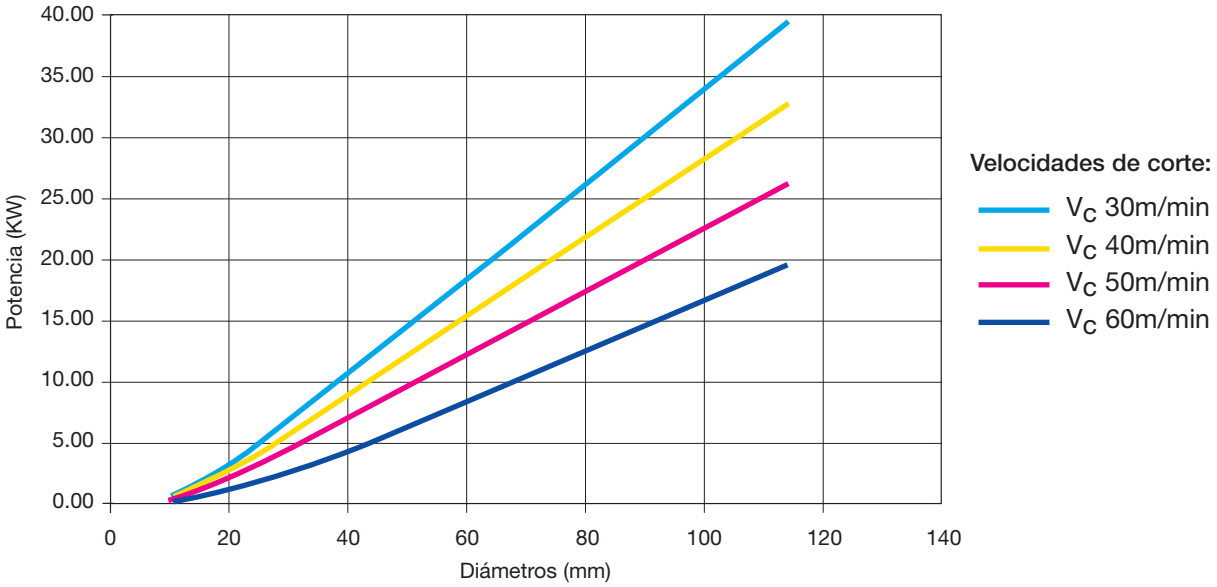
Directrices para potencia necesaria



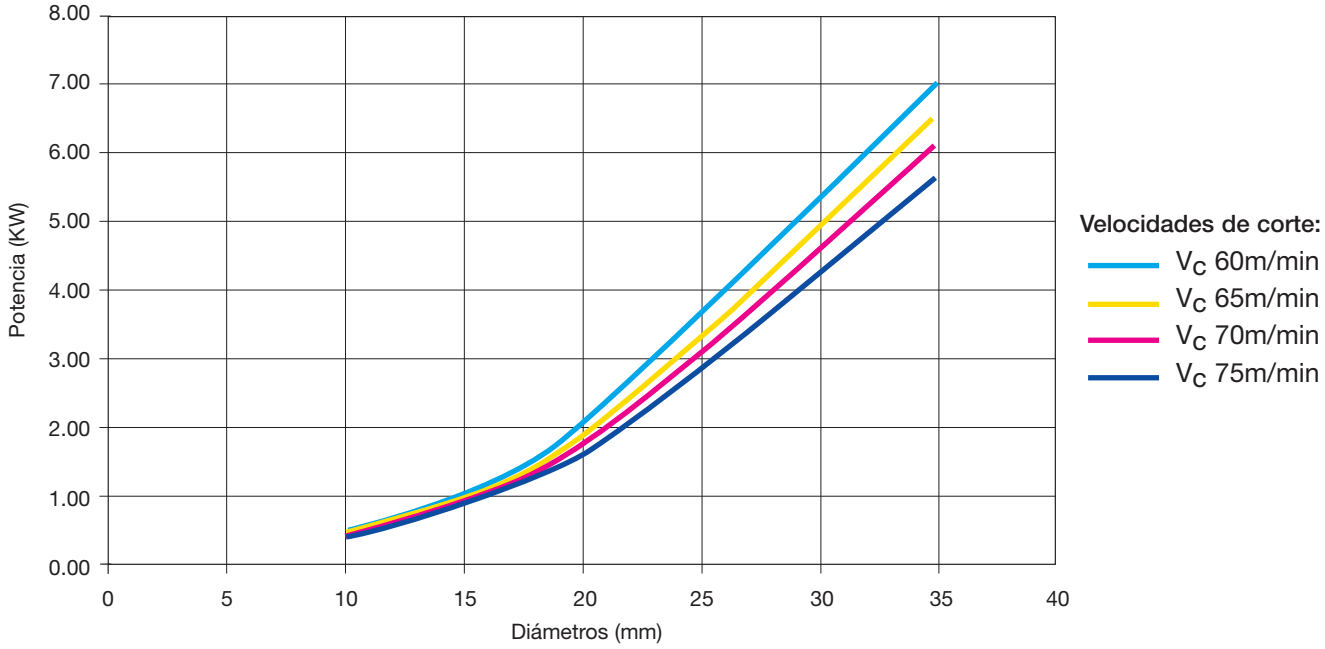
Metal duro: Potencia necesaria para aceros aleados 700-950 N/mm²



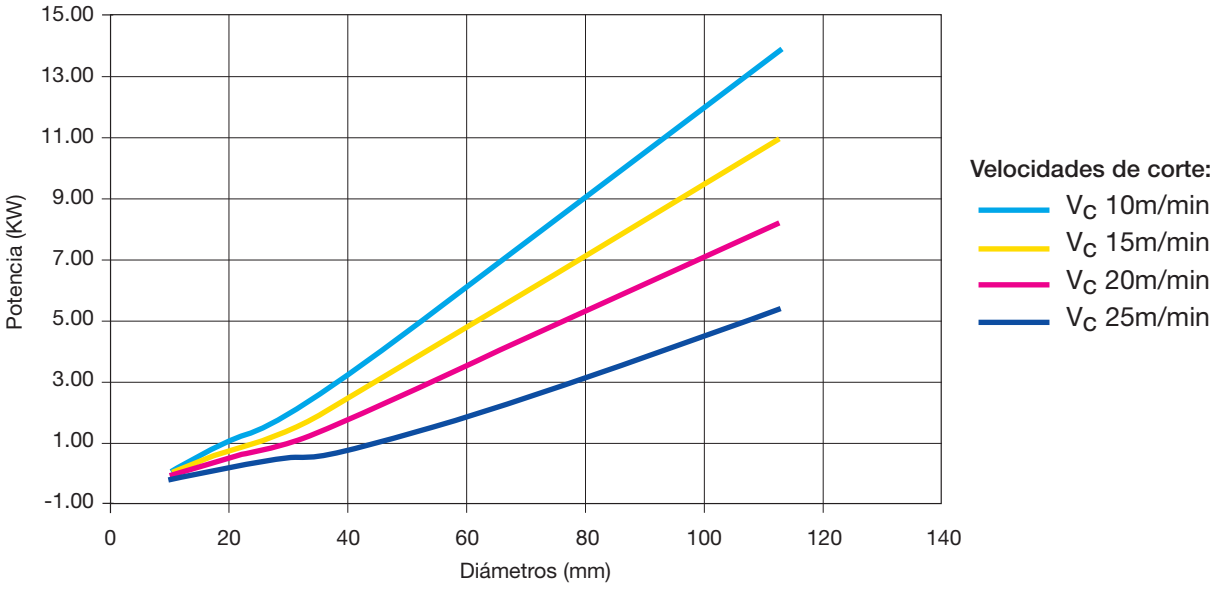
HSS: Potencia necesaria para aceros aleados 700-950 N/mm²



Metal duro: Potencia necesaria para aceros inoxidables



HSS: Potencia necesaria para aceros inoxidables



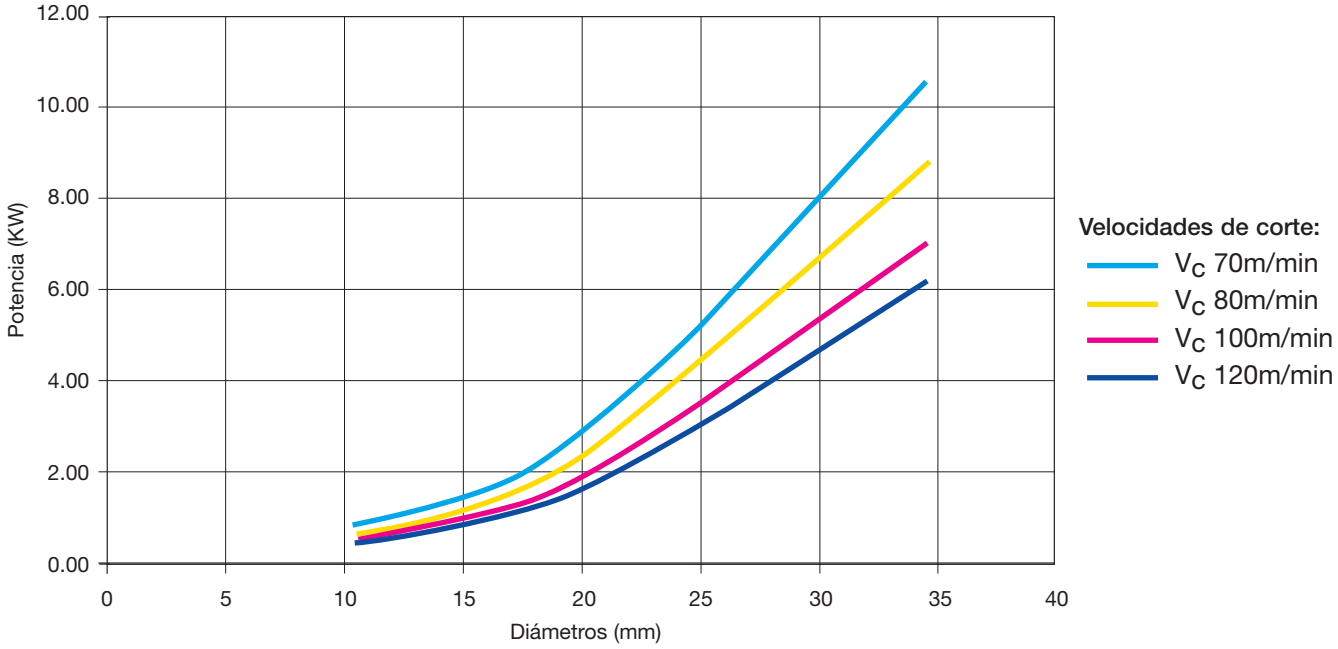
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

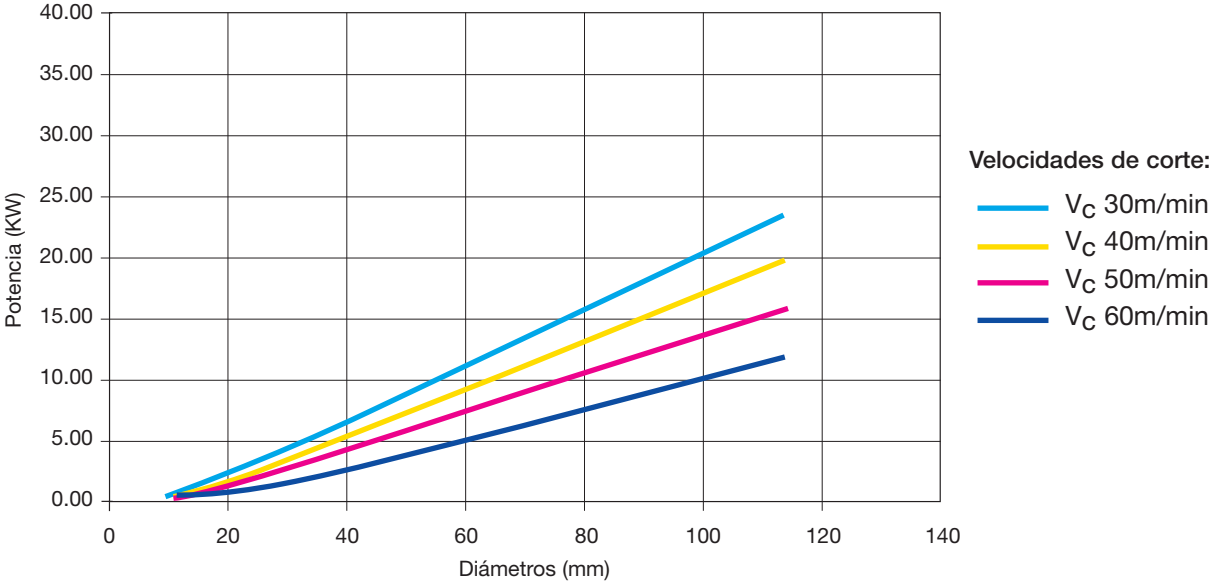
Directrices para potencia necesaria



Metal duro: Potencia necesaria para fundición gris

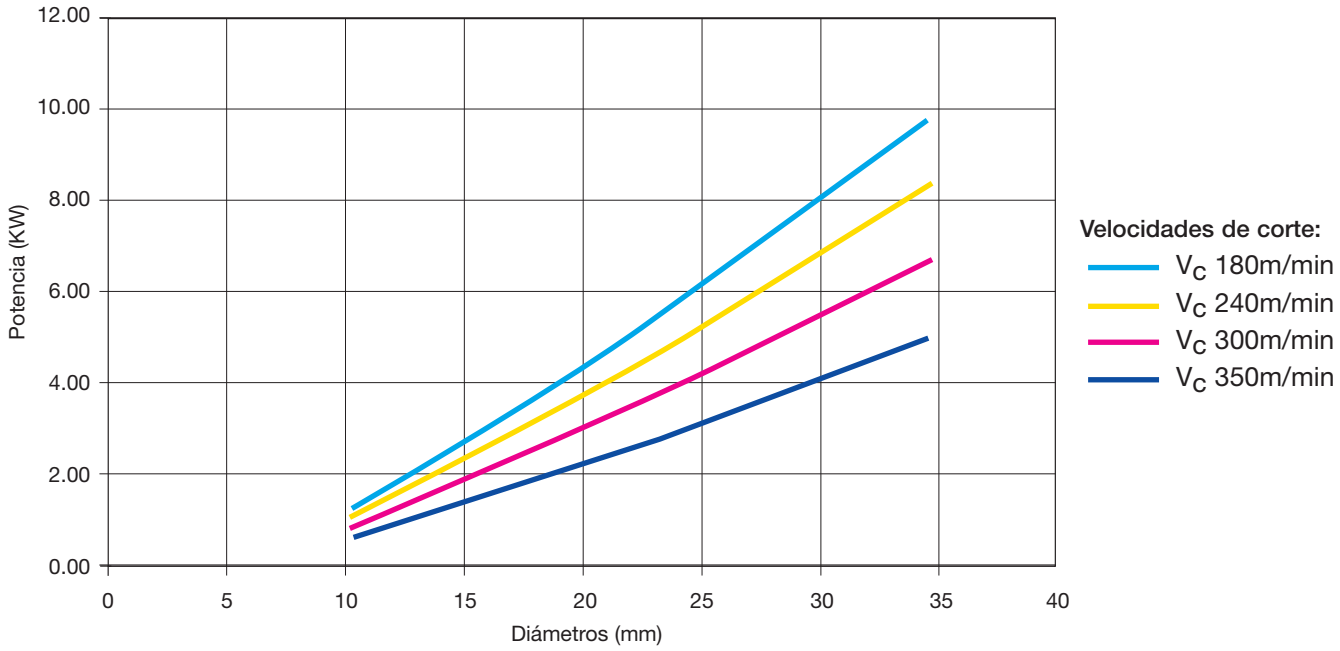


HSS: Potencia necesaria para fundición gris

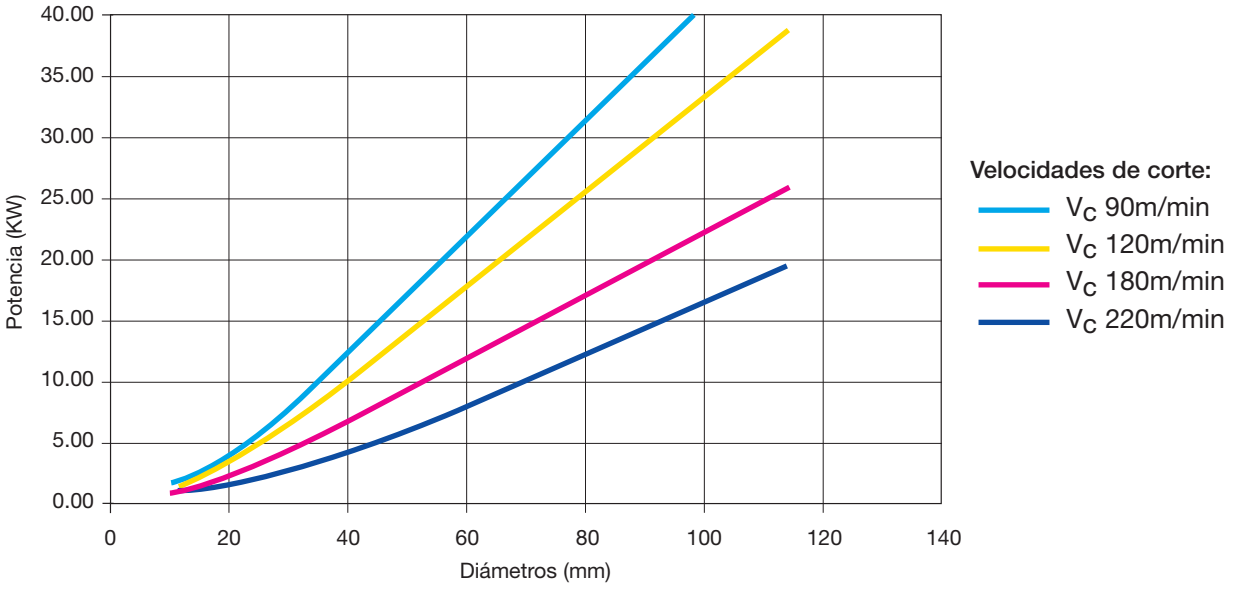


Directrices para potencia necesaria

Metal duro: Potencia necesaria para aleaciones de aluminio



HSS: Potencia necesaria para aleaciones de aluminio



Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros


STELLRAM

La nueva broca Posidrill Plus de Stellram ofrece un excelente rendimiento en el taladrado de agujeros cortos. La combinación del cuerpo y la plaquita ofrecen una insuperable combinación para taladrar agujeros cortos de hasta 3x el diámetro.

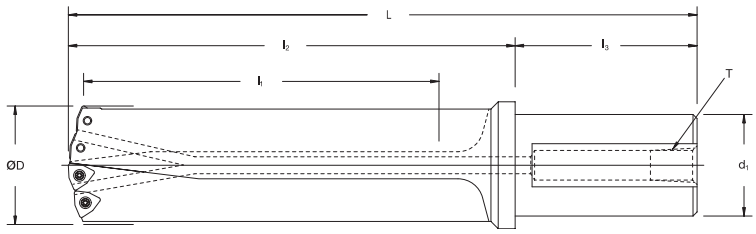
El cuerpo ofrece:

- Un diseño único de la acanaladura previniendo el apelmazamiento a la salida de los taladros. Esto permite que chapas apiladas o soldadas puedan ser taladradas.
- Varias plaquitas en cada diente permiten dividir la sección a cortar en varias más pequeñas. Estas secciones más pequeñas crean virutas más manejables para una mejor evacuación.
- Se puede utilizar en aplicaciones en estático o rotatorias.
- Longitud estándar 3x el diámetro.

La plaquita ofrece:

- Una calidad y geometría validas para la mayoría de los materiales.
- Una geometría de la plaquita especialmente diseñada para un excelente control de la viruta en aceros inoxidables y aceros pegajosos.
- Reduce el consumo de potencia gracias al diseño del cuerpo y la plaquita.

Se pueden disponer de proporciones especiales longitud-diámetro de hasta 4x el diámetro, bajo demanda. Amarres especiales ABS, HSK y otros se encuentran también disponibles bajo demanda.



Cuerpo de herramienta

		Dimensiones (mm)								
EDP	**Referencia**	**ØD**	**d_1**	**L**	**l_1**	**l_2**	**l_3**	**T**	**No de plaquitas**	**Tamaño WCMX**
029571	**P69003WNX1350W040**	13,5	20,0	109,3	40,5	57,5	50,0	1/8" NPT	2	030204E-60
*029572	**P69003WNX1400W042**	14,0	20,0	110,9	42,0	59,0	50,0	1/8" NPT	2	030204E-60
*029573	**P69003WNX1450W043**	14,5	20,0	112,5	43,5	60,5	50,0	1/8" NPT	2	030204E-60
029574	**P69003WNX1500W045**	15,0	20,0	114,1	45,0	62,0	50,0	1/8" NPT	2	030204E-60
*029575	**P69003WNX1550W046**	15,5	20,0	115,7	46,5	63,5	50,0	1/8" NPT	2	030204E-60
029576	**P69003WNX1600W048**	16,0	20,0	117,2	48,0	65,0	50,0	1/8" NPT	2	030204E-60
*029577	**P69003WNX1650W049**	16,5	20,0	118,8	49,5	66,5	50,0	1/8" NPT	2	030204E-60
029578	**P69003WNX1700W051**	17,0	20,0	120,4	51,0	68,0	50,0	1/8" NPT	2	030204E-60
029579	**P69004WNX1750W052**	17,5	20,0	124,8	52,5	72,5	50,0	1/8" NPT	2	040204E-60
029580	**P69004WNX1800W053**	18,0	20,0	126,3	54,0	74,0	50,0	1/8" NPT	2	040204E-60
029581	**P69004WNX1850W055**	18,5	20,0	127,9	55,5	75,5	50,0	1/8" NPT	2	040204E-60
029582	**P69004WNX1900W057**	19,0	20,0	129,6	57,0	77,0	50,0	1/8" NPT	2	040204E-60
029583	**P69004WNX1950W058**	19,5	20,0	131,1	58,5	78,5	50,0	1/8" NPT	2	040204E-60
029584	**P69004WNX2000W060**	20,0	20,0	132,7	60,0	80,0	50,0	1/8" NPT	2	040204E-60
029585	**P69004WNX2050W061**	20,5	20,0	134,3	61,5	81,5	50,0	1/8" NPT	2	040204E-60
029586	**P69004WNX2100W063**	21,0	20,0	135,8	63,0	83,0	50,0	1/8" NPT	2	040204E-60
029587	**P69004WNX2150W064**	21,5	20,0	137,4	64,5	84,5	50,0	1/8" NPT	2	040204E-60
029588	**P69005WNX2200W066**	22,0	25,0	145,3	66,0	86,0	56,0	1/8" NPT	2	050308E-60
029589	**P69005WNX2250W067**	22,5	25,0	146,9	67,5	87,5	56,0	1/8" NPT	2	050308E-60
029590	**P69005WNX2300W069**	23,0	25,0	148,4	69,0	89,0	56,0	1/8" NPT	2	050308E-60
029591	**P69005WNX2350W070**	23,5	25,0	150.0	70,5	90,5	56,0	1/8" NPT	2	050308E-60
029592	**P69005WNX2400W072**	24,0	25,0	151,6	72,0	92,0	56,0	1/8" NPT	2	050308E-60
029593	**P69005WNX2450W073**	24,5	25,0	153,1	73,5	93,5	56,0	1/8" NPT	2	050308E-60
029594	**P69005WNX2500W075**	25,0	25,0	154,7	75,0	95,0	56,0	1/8" NPT	2	050308E-60
029595	**P69005WNX2550W076**	25,5	25,0	156,2	76,5	96,5	56,0	1/8" NPT	2	050308E-60
029596	**P69005WNX2600W078**	26,0	25,0	157,8	78,0	98,0	56,0	1/8" NPT	2	050308E-60
029597	**P69005WNX2650W079**	26,5	25,0	159,4	79,5	99,5	56,0	1/8" NPT	2	050308E-60
029598	**P69005WNX2700W081**	27,0	25,0	160,9	81,0	101,0	56,0	1/8" NPT	2	050308E-60
029599	**P69005WNX2800W084**	28,0	25,0	164,1	84,0	104,0	56,0	1/8" NPT	2	050308E-60
029600	**P69005WNX2900W087**	29,0	25,0	167,2	87,0	107,0	56,0	1/8" NPT	2	050308E-60
029601	**P69006WNX3000W090**	30,0	32,0	174,3	90,0	110,0	60,0	1/4" NPT	2	06T308E-60
029602	**P69006WNX3100W093**	31,0	32,0	177,4	93,0	113,0	60,0	1/4" NPT	2	06T308E-60
029603	**P69006WNX3200W096**	32,0	32,0	180,6	96,0	116,0	60,0	1/4" NPT	2	06T308E-60
029604	**P69006WNX3300W099**	33,0	32,0	183,7	99,0	119,0	60,0	1/4" NPT	2	06T308E-60
029605	**P69006WNX3400W102**	34,0	32,0	186,8	102,0	122,0	60,0	1/4" NPT	2	06T308E-60
029606	**P69006WNX3500W105**	35,0	32,0	189,9	105,0	125,0	60,0	1/4" NPT	2	06T308E-60
029607	**P69006WNX3600W108**	36,0	32,0	193,1	108,0	128,0	60,0	1/4" NPT	2	06T308E-60
029608	**P69006WNX3700W111**	37,0	32,0	196,1	111,0	131,0	60,0	1/4" NPT	2	06T308E-60
029609	**P69006WNX3800W114**	38,0	32,0	199,2	114,0	134,0	60,0	1/4" NPT	2	06T308E-60
029610	**P69006WNX3900W117**	39,0	32,0	207,3	117,0	142,0	60,0	1/4" NPT	2	06T308E-60

Cuerpo de herramienta

		Dimensiones (mm)								
EDP	**Referencia**	**ØD**	**d_1**	**L**	**l_1**	**l_2**	**l_3**	**T**	**No de plaquitas**	**Tamaño WCMX**
029611	**P69005WNX4000W120**	40,0	40,0	220,3	120,0	145,0	70,0	1/4" NPT	3	050308E-60
*029612	**P69005WNX4100W123**	41,0	40,0	223,4	123,0	148,0	70,0	1/4" NPT	3	050308E-60
*029613	**P69005WNX4200W126**	42,0	40,0	226,5	126,0	151,0	70,0	1/4" NPT	3	050308E-60
*029614	**P69005WNX4300W129**	43,0	40,0	229,6	129,0	154,0	70,0	1/4" NPT	3	050308E-60
*029615	**P69005WNX4400W132**	44,0	40,0	237,7	132,0	162,0	70,0	1/4" NPT	4	050308E-60
029616	**P69005WNX4500W135**	45,0	40,0	240,9	135,0	165,0	70,0	1/4" NPT	4	050308E-60
*029617	**P69005WNX4600W138**	46,0	40,0	243,8	138,0	168,0	70,0	1/4" NPT	4	050308E-60
*029618	**P69005WNX4700W141**	47,0	40,0	246,9	141,0	171,0	70,0	1/4" NPT	4	050308E-60
*029619	**P69005WNX4800W144**	48,0	40,0	250,2	144,0	174,0	70,0	1/4" NPT	4	050308E-60
*029620	**P69005WNX4900W147**	49,0	40,0	253,6	147,0	177,0	70,0	1/4" NPT	4	050308E-60
029621	**P69005WNX5000W150**	50,0	40,0	256,6	150,0	180,0	70,0	1/4" NPT	4	050308E-60
*029622	**P69005WNX5100W153**	51,0	50,0	269,8	153,0	183,0	80,0	1/4" NPT	4	050308E-60
*029623	**P69006WNX5200W156**	52,0	50,0	274,6	156,0	188,0	80,0	1/4" NPT	4	06T308E-60
*029624	**P69006WNX5300W159**	53,0	50,0	277,8	159,0	191,0	80,0	1/4" NPT	4	06T308E-60
*029625	**P69006WNX5400W162**	54,0	50,0	280,8	162,0	194,0	80,0	1/4" NPT	4	06T308E-60
*029626	**P69006WNX5500W165**	55,0	50,0	283,9	165,0	197,0	80,0	1/4" NPT	4	06T308E-60
*029627	**P69006WNX5600W168**	56,0	50,0	287,2	168,0	200,0	80,0	1/4" NPT	4	06T308E-60
*029628	**P69006WNX5700W171**	57,0	50,0	290,1	171,0	203,0	80,0	1/4" NPT	4	06T308E-60
*029629	**P69006WNX5800W174**	58,0	50,0	293,2	174,0	206,0	80,0	1/4" NPT	4	06T308E-60
*029630	**P69006WNX5900W177**	59,0	50,0	296,4	177,0	209,0	80,0	1/4" NPT	4	06T308E-60
*029631	**P69006WNX6000W180**	60,0	50,0	302,7	180,0	215,0	80,0	1/4" NPT	4	06T308E-60
*029632	**P69006WNX6100W183**	61,0	50,0	305,7	183,0	218,0	80,0	1/4" NPT	4	06T308E-60
*029633	**P69006WNX6200W186**	62,0	50,0	308,9	186,0	221,0	80,0	1/4" NPT	4	06T308E-60
*029634	**P69006WNX6300W189**	63,0	50,0	311,9	189,0	224,0	80,0	1/4" NPT	4	06T308E-60

EDP# = Número interno de producto: Les rogamos indique este número en sus pedidos
* Plazo 4 - 6 semanas y pedido minimo 2 piezas.
Controle la lista de precios local para disponibilidad.

Nota: Tamaños intermedios disponibles según demanda

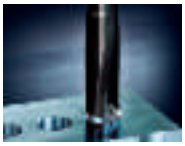
Se pueden disponer de longitudes especiales de hasta 4 x el diámetro, bajo pedido. Amarres especiales tales como ABS, HSK y otros también disponibles bajo pedido.

Plaquitas

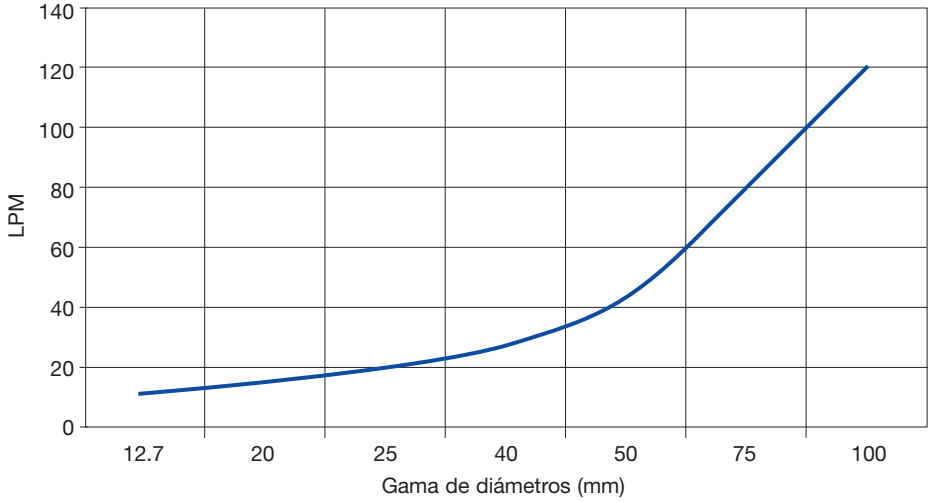
EDP	Description	Calidad	EDP	Tornillo	EDP	Destornillador
029354	WCMX 030204E - 60	SP4034	029341	F2004TP	018487	T6
029355	WCMX 040204E - 60	SP4034	015061	F2507T	018488	T7
029356	WCMX 050308E - 60	SP4034	015063	F3008T	013214	T9
029357	WCMX 06T308E - 60	SP4034	029460	D3509T	013215	T10

Estrella guía Llave para encontrar la herramienta idónea

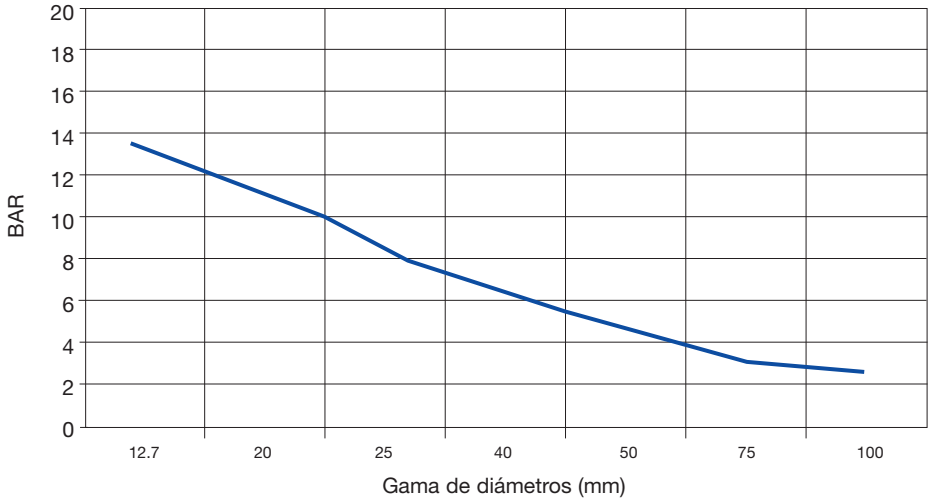
Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros



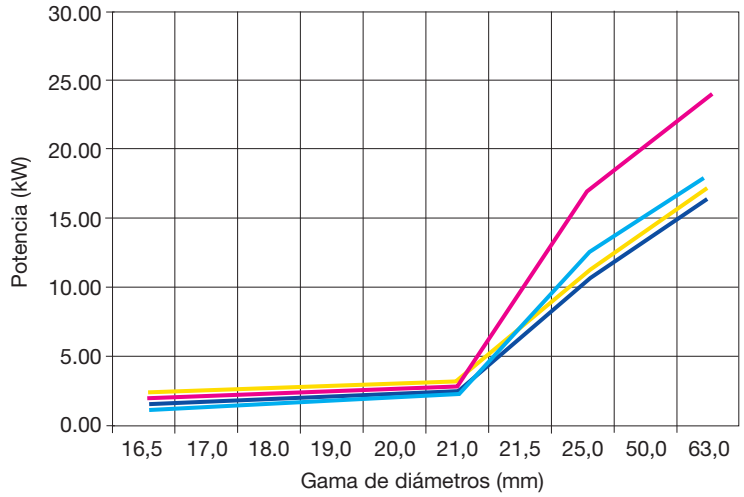
Flujo de refrigerante – Litros por minuto (LPM) según diámetro LPM



Presión de refrigerante – kg/cm² (BAR) según diámetro

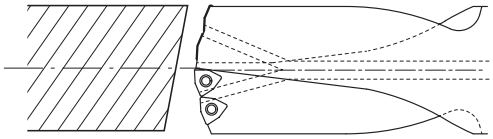


Directrices de potencia consumida

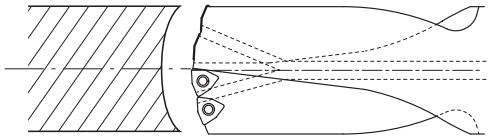


Velocidades de corte:

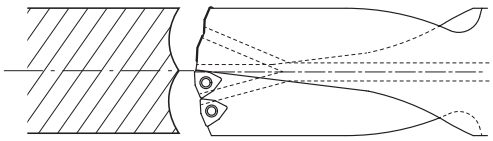
- Acero Vc 150 m/min
- Fundición Vc 210 m/min
- Acero inoxidable Vc 135 m/min
- Aluminio Vc 300 m/min



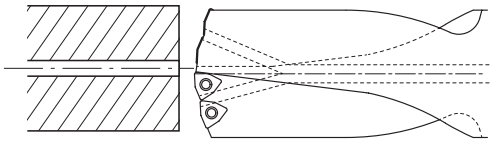
La cara a taladrar deberá de se plana a ser posible. Si el ángulo de dicha cara excede 2º, reducir el avance de 1/3.



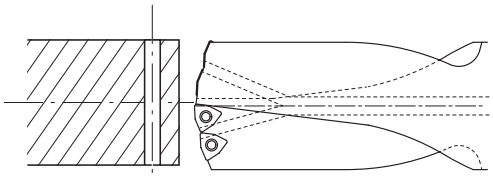
Reducir de 1/3 el avance cuando se taladran superficies cóncavas.



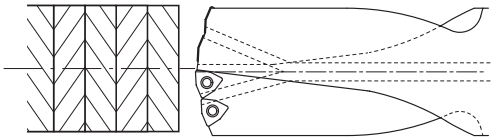
Reducir el avance cuando la superficie a taladrar es irregular, para así prevenir el desportillado. Este podría también ser el caso cuando hay roturas a la salida del taladro.



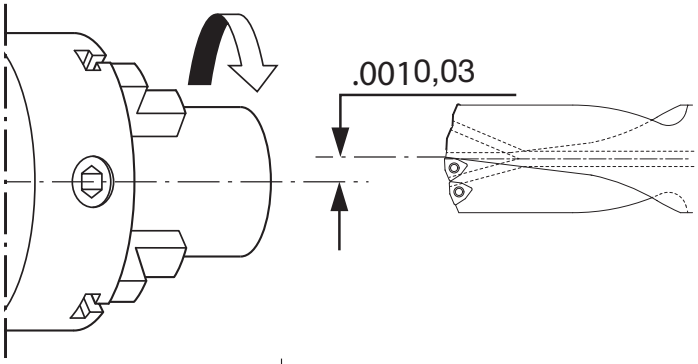
Puede haber una flexión de la herramienta cuando existe un pretaladro de un diámetro superior a 1/4 del diámetro final.



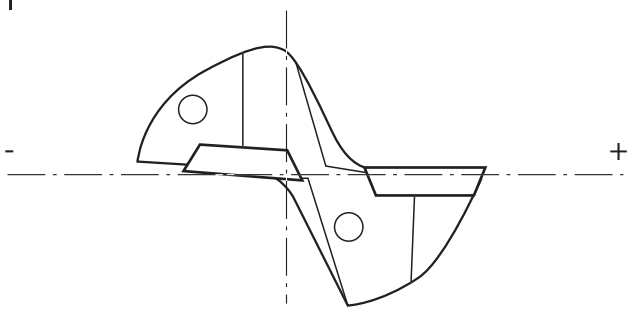
Reducir el avance cuando se tiene que atravesar un taladro transversal de más de 1/4 el diámetro de la broca.



Chapas apiladas y pilas de chapas soldadas pueden ser taladrados con Posidrill Plus™.

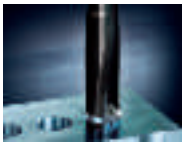


Para obtener los mejores resultados, la excentricidad entre la pieza a taladrar y la broca no debería exceder de 0.03 mm.



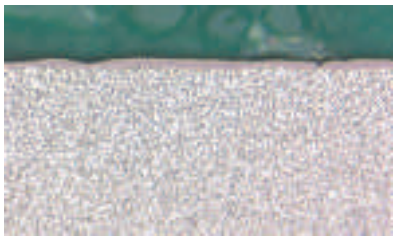
La plaquita exterior debería de estar paralela al eje transversal de la máquina en el momento de montar la broca.

Posidrill Plus™ Cuadro de solución de problemas



PROBLEMA	Virutas largas e incontrolables	La viruta se atasca en el taladro	Desgaste excesivo en la plaquita exterior	Plaquita exterior desportillada	Plaquita interior desportillada	Taladro demasiado grande	Taladro demasiado pequeño	El cuerpo de la broca frota en el taladro	Mal acabado	La broca corta en la salida	SOLUCION
	SINTOMAS										
Condiciones de corte incorrectas	■		■	■	■				■	■	Controlar la velocidad y el avance recomendado y ajustar en consecuencia.
Insuficiente presión del refrigerante	■	■	■						■		Controlar si hay fugas en la tubería. Incrementar la presión de la bomba.
Refrigerante de mala calidad			■						■		Controlar el refrigerante; una mezcla mas fuerte puede estar recomendada por el proveedor. No utilizar refrigerantes sintéticos cuando se taladra acero inoxidable.
Broca descentrada			■	■	■	■	■	■	■	■	Controlar el alineamiento, la tolerancia máxima permitida con la broca en estático es +/- 0.03 mm por 25 mm en los ejes X e Y. La tolerancia máxima con broca en rotación es de 0.13 mm de excentricidad.
Flexión				■				■	■	■	Reducir el avance. Controlar alineamiento.
Vibraciones			■	■	■				■		Controlar la rigidez de la pieza a mecanizar. Reducir la velocidad. Incrementar el avance.
La viruta vuelve				■	■				■		Aumentar la presión del refrigerante.
Avance demasiado alto		■		■	■					■	Controlar la velocidad y el avance.
Avance demasiado bajo	■	■									Reducir avance.
Velocidad demasiado alta			■								Reducir velocidad.
Broca montada incorrectamente			■	■	■	■	■	■	■	■	Controlar daños en amarre y herramienta, limpiar minuciosamente y remplazar.
Plaquita montada incorrectamente			■	■	■	■	■	■	■	■	Controlar daños en alojamientos y tornillos, limpiar minuciosamente y remplazar.





Geometría 60 *Calidad SP4034*

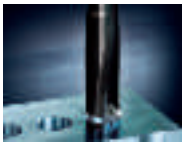
Metal duro micro grano con recubrimiento PVD TiAlN de capa lubricante.
SP4034 ofrece una gran resistencia al desgaste debido a la base micro grano. Su capa lubricante ofrece un bajo coeficiente de fricción, especialmente en materiales pegajosos. La geometría 60 ofrece un excelente control de la viruta en dichos materiales pegajosos.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Avance por diámetro



ISO	Materiales	Rm y Dureza	Fn = Avance por vuelta mm/rev: min. & max.					
			Diámetros de las plaquitas (mm)					
			13,5 - 17,0	17,5 - 21,5	22,0 - 29.0	30.0 - 40,0	41,0 - 51,0	52,0 - 63,0
P	Aceros no aleados	<600 N/mm² <180HBN	0,038 - 0,051	0,064 - 0,076	0,064 - 0,089	0,064 - 0,102	0,064 - 0,089	0,064 - 0,102
		<950 N/mm² <280HBN	0,038 - 0,051	0,064 - 0,076	0,064 - 0,089	0,064 - 0,102	0,064 - 0,089	0,064 - 0,102
	Aceros aleados	700-950 N/mm² 200-280 HBN	0,051 - 0,076	0,051 - 0,127	0,076 - 0,152	0,102 - 0,178	0,076 - 0,152	0,102 - 0,178
		950-1200 N/mm² 280-355 HBN	0,038 - 0,064	0,038 - 0,102	0,064 - 0,127	0,076 - 0,152	0,064 - 0,127	0,076 - 0,152
		1200-1400 N/mm² 355-415 HBN	0,025 - 0,051	0,051 - 0,076	0,051 - 0,102	0,064 - 0,127	0,051 - 0,102	0,064 - 0,127
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	0,038 - 0,064	0,051 - 0,102	0,076 - 0,102	0,089 - 0,127	0,076 - 0,102	0,089 - 0,127
		Martensítico Series 400	0,038 - 0,056	0,051 - 0,089	0,076 - 0,089	0,089 - 0,114	0,076 - 0,089	0,089 - 0,114
		Refractario P.H.	-	-	-	-	-	-
K	Aluminio y sus aleaciones	Gris GG-Ft	0,038 - 0,089	0,064 - 0,152	0,076 - 0,178	0,076 - 0,203	0,076 - 0,178	0,076 - 0,203
		Esferoidal-Dúctil GGG-FGS	0,038 - 0,076	0,051 - 0,152	0,076 - 0,178	0,076 - 0,191	0,076 - 0,178	0,076 - 0,191
		Maleable GTS - MN/MP	0,038 - 0,064	0,051 - 0,127	0,076 - 0,152	0,076 - 0,152	0,076 - 0,152	0,076 - 0,152
N	Aluminio y sus aleaciones	< 16% Si 116HBN	0,051 - 0,102	0,076 - 0,152	0,076 - 0,191	0,076 - 0,229	0,076 - 0,191	0,076 - 0,229
		> 16% Si 92HBN	0,051 - 0,076	0,076 - 0,127	0,076 - 0,152	0,076 - 0,178	0,076 - 0,152	0,076 - 0,178
S	Aleaciones refractarias	Base hierro	-	-	-	-	-	-
		Base cobalto	-	-	-	-	-	-
		Base níquel	-	-	-	-	-	-
		Base titanio	0,051 - 0,089	0,064 - 0,102	0,051 - 0,114	0,064 - 0,127	0,051 - 0,114	0,064 - 0,127
H	Aceros de alta dureza	>1400 N/mm² >415 HBN	-	-	-	-	-	-
	Fundición dúctil	1400 N/mm² 400 HBN	-	-	-	-	-	-

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Velocidad de corte (V_c) metros/minuto

			SP4034
ISO	Materiales	Rm y Dureza	Velocidad (V_c) m/min max – min
P	Aceros no aleados	<600 N/mm² <180HBN	180 - 290
		<950 N/mm² <280HBN	180 - 275
	Aceros aleados	700-950 N/mm² 200-280 HBN	120 - 245
		950-1200 N/mm² 280-355 HBN	105 - 200
		1200-1400 N/mm² 355-415 HBN	65 - 135
M	Aceros inoxidables	Austenítico + Ferrítico Series 300	120 - 215
		Martensítico Series 400	125 - 220
		Refractario P.H.	-
K	Aluminio y sus aleaciones	Gris GG-Ft	120 - 335
		Esferoidal-Dúctil GGG-FGS	120 - 275
		Maleable GTS - MN/MP	105 - 180
N	Aluminio y sus aleaciones	< 16% Si 116HBN	245 - 520
		> 16% Si 92HBN	150 - 305
S	Aleaciones refractarias	Base hierro	-
		Base cobalto	-
		Base níquel	-
		Base titanio	20 - 45
H	Materiales de gran dureza	(52-56 HRC)	-

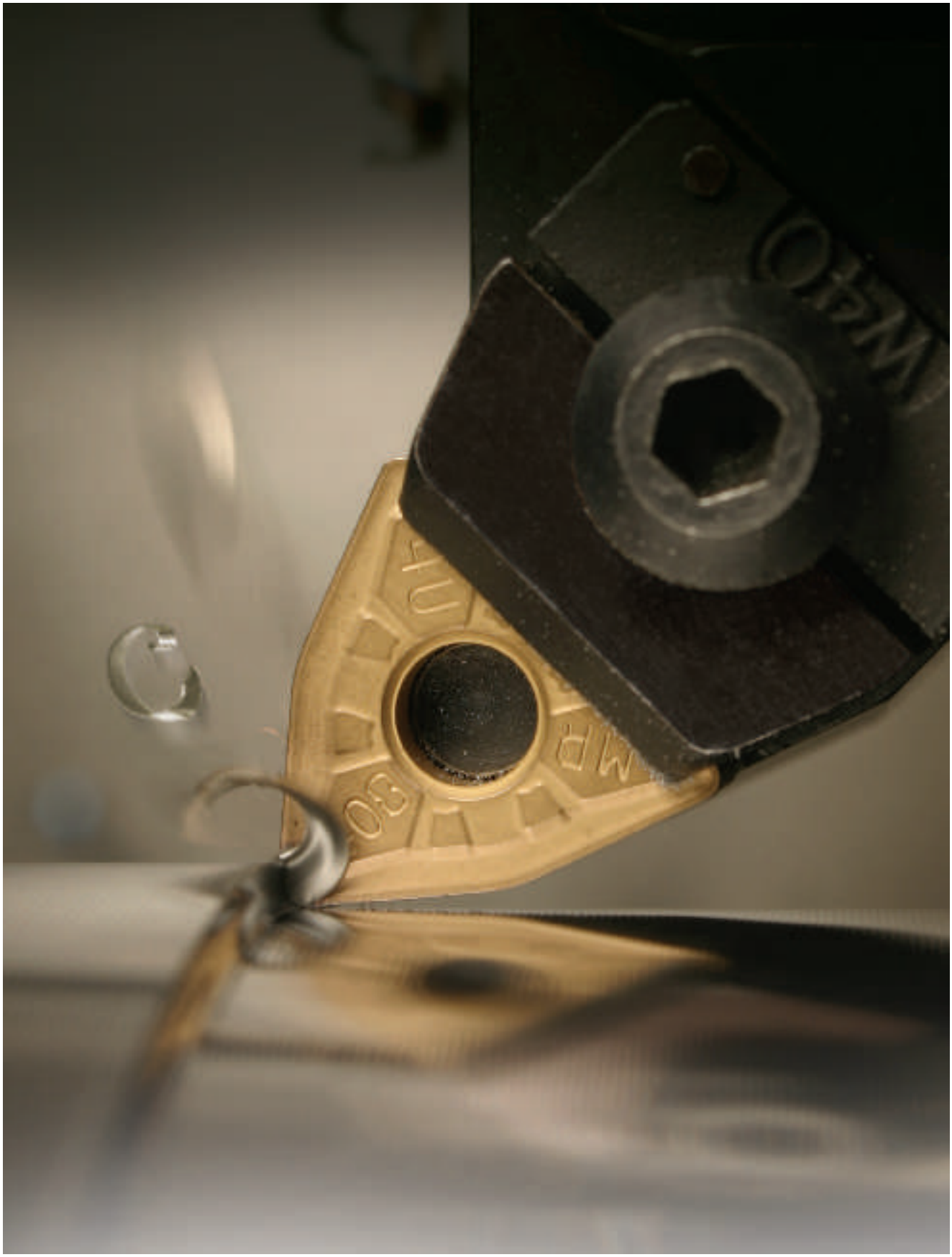
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Torneado





- Los programas de Stellram Posicut™ y Negacut™ se presentan con una completa gama de calidades PVD y CVD con opciones de recubrimientos para una máxima productividad.
- Las calidades y geometrías de Stellam, combinadas con tecnología de recubrimientos patentada, están disponibles para una completa gama de materiales desde aceros y fundiciones hasta aleaciones refractarias y aleaciones de aluminio.
- Una completa gama de plaquitas para aplicaciones desde acabado hasta desbaste pesado están disponibles para la industria aeroespacial, automoción, de generación de energía, mecanizado en general y de precisión.
- Una línea completa de portaherramientas esta disponible para aplicaciones exteriores e interiores. Portaherramientas de metal duro integral y con Tugsteno tambien están disponibles para operaciones interiores pesadas.
- El programa de Stellram Posimatic™ está compuesto por una línea completa de herramientas intercambiables para aplicaciones para Tornos Automáticos multi husillos, mecanizado de precisión y fabricación de relojes, con plaquitas de radios pequeños hasta de 0.00. Ultra mini herramientas de mandrinado se encuentran a disposición con diámetros mínimos de hasta 2.80 mm.

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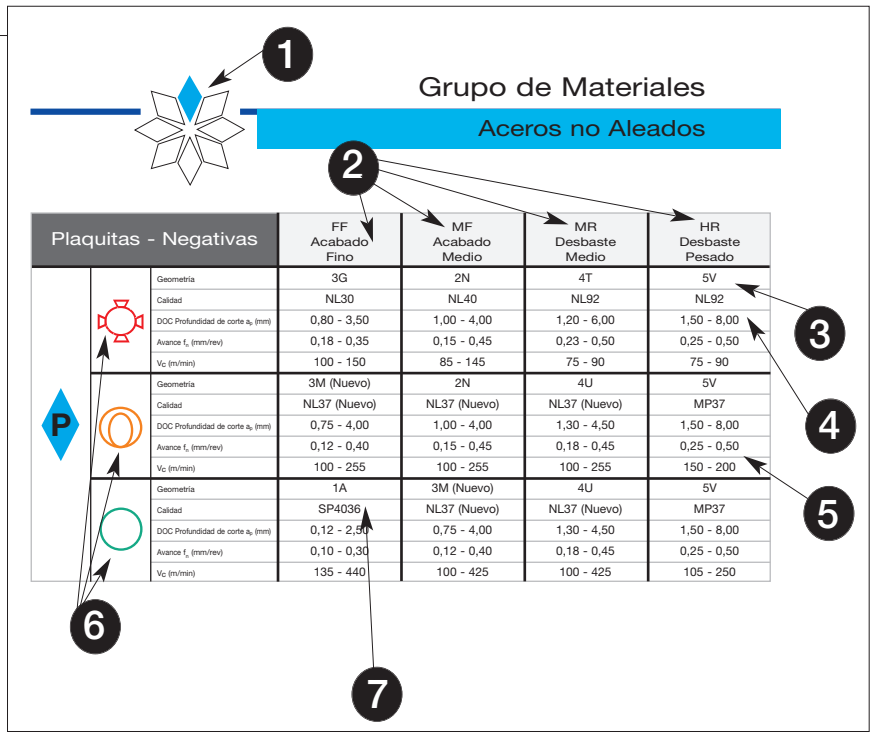
Información Técnica . . . . .C182 – C195

Estrella Guía™

Las siguientes páginas de la Estrella Guía™ le permiten seleccionar la geometría y grado adecuados, así como sugerencias de valores de partida para avances y velocidades mediante la selección del material a mecanizar y tipo de operación.

1ª elección

La punta de la Estrella indica la plaquita que se recomienda para cada material. La Estrella Guía™ le asiste en la selección de la plaquita adecuada para sus requerimientos de mecanizado.



Plaquitas - Negativas		FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
P	Geometría	3G	2N	4T	5V
	Calidad	NL30	NL40	NL92	NL92
	DOC Profundidad de corte a_p (mm)	0,80 - 3,50	1,00 - 4,00	1,20 - 6,00	1,50 - 8,00
	Avance f_n (mm/rev)	0,18 - 0,35	0,15 - 0,45	0,23 - 0,50	0,25 - 0,50
	V_C (m/min)	100 - 150	85 - 145	75 - 90	75 - 90
	Geometría	3M (Nuevo)	2N	4U	5V
	Calidad	NL37 (Nuevo)	NL37 (Nuevo)	NL37 (Nuevo)	MP37
	DOC Profundidad de corte a_p (mm)	0,75 - 4,00	1,00 - 4,00	1,30 - 4,50	1,50 - 8,00
	Avance f_n (mm/rev)	0,12 - 0,40	0,15 - 0,45	0,18 - 0,45	0,25 - 0,50
	V_C (m/min)	100 - 255	100 - 255	100 - 255	150 - 200
	Geometría	1A	3M (Nuevo)	4U	5V
	Calidad	SP4036	NL37 (Nuevo)	NL37 (Nuevo)	MP37
	DOC Profundidad de corte a_p (mm)	0,12 - 2,50	0,75 - 4,00	1,30 - 4,50	1,50 - 8,00
	Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,40	0,18 - 0,45	0,25 - 0,50
	V_C (m/min)	135 - 440	100 - 425	100 - 425	105 - 250

1. **Seleccione el material.**
2. **Seleccione la operación de mecanizado desde acabado fino hasta desbaste pesado.**
3. **Indica la geometría recomendada para dicha operación.**
4. **Indica la profundidad de corte mínima y máxima para esta geometría.**
5. **Indica el avance mínimo y máximo para esta geometría.**
6. **Seleccione las condiciones de mecanizado a continuación:**

   Corte Interrumpido

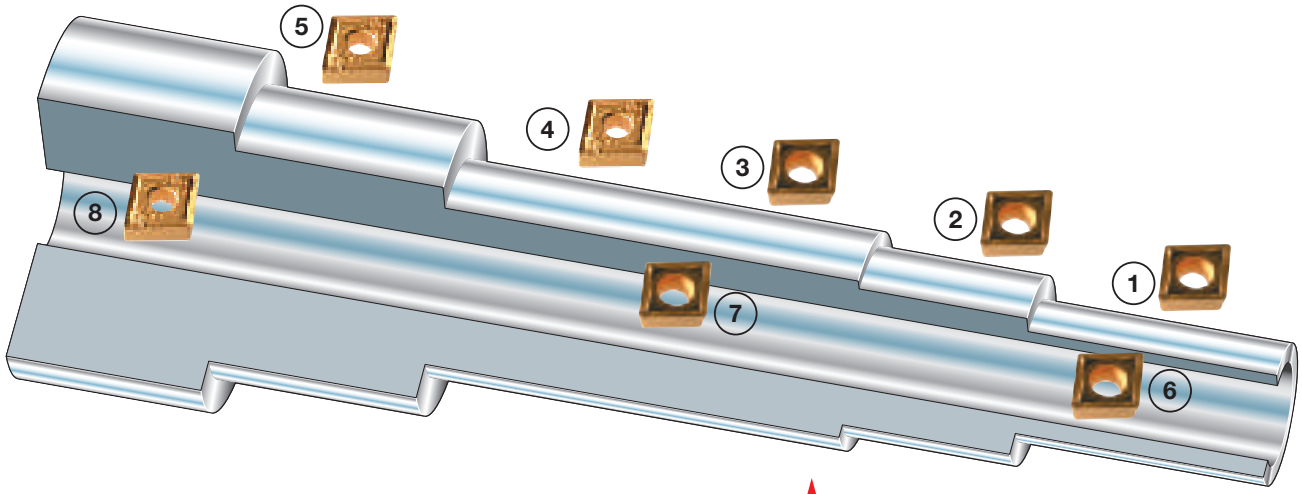
   Profundidad de corte variable

   Buenas condiciones

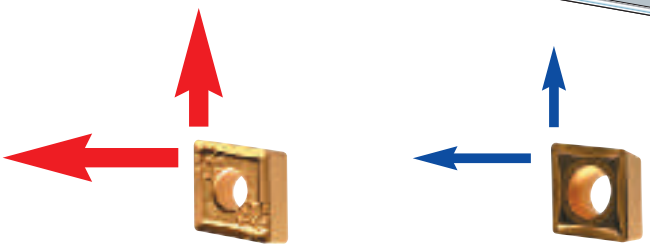
7. **Indica la calidad ecomendada y las velocidades de corte para estas condiciones de corte.**

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros



Dadas las mismas condiciones de mecanizado, una de las diferencias más importantes entre positivo y negativo son los esfuerzos de corte generados



Fuerzas del negativo - Fuerzas del positivo

Mecanizado Exterior e Interior

Mecanizado Exterior			
	Aplicaciones	Recomendaciones	Tipos de plaquita
1	Pieza larga y delgada (riesgo de deformación y vibración), mecanizado inestable (riesgo de vibración)	Plaquitas positivas 7°,11°	C,D,E,S,T,W
2, 3	Pieza larga e inestable (riesgo de vibración).	Plaquitas positivas 7°	C,D,E,S,T,W
4, 5	Piezas de mediana o alta estabilidad	Plaquita negativa	C,D,R,S,T,V,W

Otras consideraciones

Acabado fino: Cuando se mecaniza a pequeñas profundidades de corte para obtener buen acabado superficial o tolerancias muy precisas, se recomienda plaquitas positivas

Mecanizado Interior			
La incidencia de Los plaquitas positivas permite el mecanizado de diámetros pequeños			
	Aplicación	Recomendaciones	Tipos de plaquita
6	Para diámetros interiores pequeños con gran voladizo (8mm - 32mm)	Plaquitas positivas 11°	E, T
7	Para diámetros interiores de pequeños a medianos con gran voladizo (16mm - 60mm)	Plaquitas positivas 7°	C,D,E,S,T,W
8	8 Para diámetros grandes en condiciones estables	Plaquitas negativas	C,D,R,S,T,V,W

Grupo de Materiales

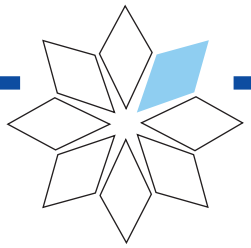
Aceros no Aleados

Plaquitas - Negativas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
P		Geometría	3G	2N	4T	5V
		Calidad	NL30	NL40	NL92	NL92
		DOC Profundidad de corte a_p (mm)	0,80 - 3,50	1,00 - 4,00	1,20 - 6,00	1,50 - 8,00
		Avance f_n (mm/rev)	0,18 - 0,35	0,15 - 0,45	0,23 - 0,50	0,25 - 0,50
		V_c (m/min)	100 - 150	85 - 145	75 - 90	75 - 90
		Geometría	3M (Nuevo)	2N	4U	5V
		Calidad	NL37 (Nuevo)	NL37 (Nuevo)	NL37 (Nuevo)	MP37
		DOC Profundidad de corte a_p (mm)	0,75 - 4,00	1,00 - 4,00	1,30 - 4,50	1,50 - 8,00
		Avance f_n (mm/rev)	0,12 - 0,40	0,15 - 0,45	0,18 - 0,45	0,25 - 0,50
		V_c (m/min)	100 - 255	100 - 255	100 - 255	150 - 200
		Geometría	1A	3M (Nuevo)	4U	5V
		Calidad	SP4036	NL37 (Nuevo)	NL37 (Nuevo)	MP37
		DOC Profundidad de corte a_p (mm)	0,12 - 2,50	0,75 - 4,00	1,30 - 4,50	1,50 - 8,00
		Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,40	0,18 - 0,45	0,25 - 0,50
		V_c (m/min)	135 - 440	100 - 425	100 - 425	105 - 250

Plaquitas - Positivas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
P		Geometría	62	73	3G
		Calidad	SP4036	NL30	NL92
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,50 - 5,00
		Avance f_n (mm/rev))	0,025 - 0,25	0,07 - 0,50	0,15 - 0,50
		V_c (m/min)	135 - 250	100 - 150	75 - 90
		Geometría	62	73	3G
		Calidad	SP4036	NL30	NL30
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,50 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,15 - 0,50
		V_c (m/min)	135 - 350	100 - 230	100 - 230
		Geometría	62	73	3G
		Calidad	SP4036	NL25	NL25
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,50 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,15 - 0,50
		V_c (m/min)	135 - 440	105 - 405	105 - 405

STELLRAM®

Clave					
	Corte Interrumpido		Profundidad de corte variable		Buenas condiciones



Grupo de Materiales

Aceros aleados

Plaquitas - Negativas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
P		Geometría	2N	2N	4T	5V
		Calidad	NL37 (Nuevo)	NL92	NL92	NL92
		DOC Profundidad de corte a_p (mm)	0,80 - 4,00	0,80 - 4,00	1,20 - 6,00	1,50 - 8,00
		Avance f_n (mm/rev)	0,12 - 0,40	0,12 - 0,40	0,23 - 0,50	0,30 - 0,50
		V_c (m/min)	60 - 100	45 - 55	45 - 55	45 - 55
		Geometría	3M (Nuevo)	2N	4T	5V
		Calidad	NL37 (Nuevo)	NL30	NL40	NL92
		DOC Profundidad de corte a_p (mm)	0,75 - 4,00	0,80 - 4,00	1,20 - 6,00	1,50 - 8,00
		Avance f_n (mm/rev)	0,12 - 0,40	0,12 - 0,40	0,23 - 0,50	0,30 - 0,50
		V_c (m/min)	60 - 150	60 - 140	50 - 130	45 - 95
		Geometría	1A	3M (Nuevo)	4U	5V
		Calidad	SP3036	NL37 (Nuevo)	NL37 (Nuevo)	NL92
		DOC Profundidad de corte a_p (mm)	0,12 - 2,50	0,75 - 4,00	1,30 - 4,50	1,50 - 8,00
		Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,40	0,18 - 0,45	0,30 - 0,50
		V_c (m/min)	75 - 255	60 - 250	60 - 250	45 - 13

Plaquitas - Positivas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
P		Geometría	62	73	3G
		Calidad	SP4036	NL40	NL92
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,50 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,15 - 0,50
		V_c (m/min)	125 - 160	60 - 100	60 - 95
		Geometría	62	73	3G
		Calidad	SP4036	NL30	NL30
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,50 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,15 - 0,50
		V_c (m/min)	125 - 200	60 - 140	60 - 140
		Geometría	62	73	3G
		Calidad	SP4036	NL25	NL25
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,50 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,15 - 0,50
		V_c (m/min)	125 - 265	60 - 240	60 - 240

Note que los datos de corte, geometrías y calidades sugeridas son solo una guía. Para mayor y más detallada información consulte las páginas C12 - C31 (información técnica sobre calidades y geometrías).

Grupo de Materiales

Aceros Inoxidables 300 - 400

Plaquitas - Negativas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
M		Geometría	1A	3J	2N	4T
		Calidad	NL30	NL40	NL92	NL92
		DOC Profundidad de corte a_p (mm)	0,80 - 2,50	1,20 - 2,50	1,00 - 4,00	1,20 - 5,00
		Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,35	0,12 - 0,40	0,23 - 0,50
		V_c (m/min)	100 - 125	90 - 105	80 - 100	40 - 55
		Geometría	1A	3J	2N	4T
		Calidad	NL25	NL30	NL30	NL40
		DOC Profundidad de corte a_p (mm)	0,80 - 2,50	1,20 - 2,50	1,00 - 4,00	1,20 - 5,00
		Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,35	0,12 - 0,40	0,23 - 0,50
		V_c (m/min)	110 - 170	110 - 140	110 - 140	130 - 160
		Geometría	1A	3J	2N	4T
		Calidad	SP4036	SP3036	NL25	NL30
		DOC Profundidad de corte a_p (mm)	0,80 - 2,50	1,20 - 2,50	1,00 - 4,00	1,20 - 5,00
		Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,35	0,12 - 0,40	0,23 - 0,50
		V_c (m/min)	135 - 300	135 - 300	110 - 285	110 - 240

Plaquitas - Positivas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
M		Geometría	62	73	-
		Calidad	SP4036	NL30	-
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	-
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	-
		V_c (m/min)	135 - 180	100 - 125	-
		Geometría	62	73	73
		Calidad	SP4036	NL30	NL30
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,40 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,07 - 0,50
		V_c (m/min)	135 - 240	110 - 140	110 - 140
		Geometría	62	73	73
		Calidad	SP4036	NL25	NL25
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,40 - 5,00	0,40 - 5,00
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	0,07 - 0,50
		V_c (m/min)	135 - 300	110 - 285	110 - 285

Clave: Corte Interrumpido | Profundidad de corte variable | Buenas condiciones

Grupo de Materiales

Aceros Inoxidables Endurecidos PH

Plaquitas - Negativas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
M		Geometría	2N	3J	2N	4M
		Calidad	NL30	NL40	NL40	NL92
		DOC Profundidad de corte a_p (mm)	1,00 - 4,00	1,20 - 2,50	1,00 - 4,00	1,20 - 7,20
		Avance f_n (mm/rev)	0,12 - 0,40	0,12 - 0,35	0,12 - 0,40	0,30 - 0,50
		V_c (m/min)	55 - 65	50 - 60	50 - 60	40 - 50
		Geometría	3F	91	2N	4M
		Calidad	SP3064	SP3064	NL30	NL30
		DOC Profundidad de corte a_p (mm)	1,00 - 3,00	1,30 - 5,80	1,00 - 4,00	1,20 - 7,20
		Avance f_n (mm/rev)	0,20 - 0,35	0,18 - 0,45	0,12 - 0,40	0,30 - 0,50
		V_c (m/min)	75 - 95	75 - 100	60 - 75	60 - 75
		Geometría	3F	91	2N	4M
		Calidad	SP4064	SP0864	SP0864	NL25
		DOC Profundidad de corte a_p (mm)	1,00 - 3,00	1,30 - 5,80	1,00 - 4,00	1,20 - 7,20
		Avance f_n (mm/rev)	0,20 - 0,35	0,18 - 0,45	0,12 - 0,40	0,30 - 0,50
		V_c (m/min)	75 - 160	75 - 165	75 - 165	75 - 145

Plaquitas - Positivas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
M		Geometría	62	73	-
		Calidad	SP4036	NL92	-
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,50 - 5,00	-
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	-
		V_c (m/min)	75 - 85	40 - 70	-
		Geometría	62	73	-
		Calidad	SP4036	SFZ	-
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,50 - 5,00	-
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	-
		V_c (m/min)	75 - 95	50 - 85	-
		Geometría	62	73	-
		Calidad	SP4036	NL25	-
		DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,50 - 5,00	-
		Avance f_n (mm/rev)	0,025 - 0,25	0,07 - 0,50	-
		V_c (m/min)	75 - 160	60 - 145	-

Note que los datos de corte, geometrías y calidades sugeridas son solo una guía. Para mayor y más detallada información consulte las páginas C12 - C31 (información técnica sobre calidades y geometrías).

Grupo de Materiales

Fundiciones

Plaquitas - Negativas		FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
K	Geometría	4U	4U	4T	FLAT
	Calidad	SC1519	SC1519	MP37	MP37
	DOC Profundidad de corte a_p (mm)	0,50 - 4,00	0,50 - 4,00	1,20 - 6,50	1,30 - 6,00
	Avance f_n (mm/rev)	0,10 - 0,40	0,10 - 0,40	0,23 - 0,50	0,30 - 0,60
	V_c (m/min)	125 - 195	125 - 195	150 - 180	150 - 180
	Geometría	4U	4U	4T	FLAT
	Calidad	SC1519	SC1519	MP37	SC1519
	DOC Profundidad de corte a_p (mm)	0,50 - 4,00	0,50 - 4,00	1,20 - 6,50	1,30 - 6,00
	Avance f_n (mm/rev)	0,10 - 0,40	0,10 - 0,40	0,23 - 0,50	0,30 - 0,60
	V_c (m/min)	125 - 295	125 - 295	90 - 200	125 - 295
	Geometría	4U	4U	4T	FLAT
	Calidad	SC1519	SC1519	NL25	SC1519
	DOC Profundidad de corte a_p (mm)	0,50 - 4,00	0,50 - 4,00	1,20 - 6,50	1,30 - 6,00
	Avance f_n (mm/rev)	0,10 - 0,40	0,10 - 0,40	0,23 - 0,50	0,30 - 0,60
	V_c (m/min)	125 - 490	125 - 490	90 - 335	125 - 490

Plaquitas - Positivas		FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
K	Geometría	-	-	-
	Calidad	-	-	-
	DOC Profundidad de corte a_p (mm)	-	-	-
	Avance f_n (mm/rev)	-	-	-
	V_c (m/min)	-	-	-
	Geometría	62	T	3G
	Calidad	GH2	GH1	MP37
	DOC Profundidad de corte a_p (mm)	0,25 - 3,00	1,00 - 6,00	0,50 - 4,00
	Avance f_n (mm/rev)	0,025 - 0,25	0,20 - 0,50	0,10 - 0,35
	V_c (m/min)	95 - 125	70 - 160	70 - 160
	Geometría	62	T	3G
	Calidad	GH2	GH1	MP37
	DOC Profundidad de corte a_p (mm)	0,25 - 3,00	1,00 - 6,00	0,50 - 4,00
	Avance f_n (mm/rev)	0,025 - 0,25	0,20 - 0,50	0,10 - 0,35
	V_c (m/min)	95 - 175	70 - 225	70 - 225

Clave: Corte Interrumpido | Profundidad de corte variable | Buenas condiciones

Grupo de Materiales

Aluminio y sus Aleaciones

Plaquitas - Negativas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
N		Geometría	-	-	-	-
		Calidad	-	-	-	-
		DOC Profundidad de corte a_p (mm)	-	-	-	-
		Avance f_n (mm/rev)	-	-	-	-
		V_c (m/min)	-	-	-	-
		Geometría	-	3F	3F	-
		Calidad	-	SP0864	SP0864	-
		DOC Profundidad de corte a_p (mm)	-	1,00 - 3,00	1,00 - 3,00	-
		Avance f_n (mm/rev)	-	0,20 - 0,35	0,20 - 0,35	-
		V_c (m/min)	-	365 - 585	365 - 585	-
		Geometría	-	3F	3F	-
		Calidad	-	SP0864	SP0864	-
		DOC Profundidad de corte a_p (mm)	-	1,00 - 3,00	1,00 - 3,00	-
		Avance f_n (mm/rev)	-	0,20 - 0,35	0,20 - 0,35	-
		V_c (m/min)	-	365 - 1065	365 - 1065	-

Plaquitas - Positivas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
N		Geometría	-	64	64
		Calidad	-	GH1	GH1
		DOC Profundidad de corte a_p (mm)	-	2,00 - 6,00	2,00 - 6,00
		Avance f_n (mm/rev)	-	0,35 - 0,60	0,35 - 0,60
		V_c (m/min)	-	185 - 335	185 - 335
		Geometría	15	64	64
		Calidad	GH1	GH1	GH1
		DOC Profundidad de corte a_p (mm)	0,80 - 2,00	2,00 - 6,00	2,00 - 6,00
		Avance f_n (mm/rev)	0,05 - 0,20	0,35 - 0,60	0,35 - 0,60
		V_c (m/min)	185 - 490	185 - 490	185 - 490
		Geometría	15	64	64
		Calidad	GH1	GH1	GH1
		DOC Profundidad de corte a_p (mm)	0,80 - 2,00	2,00 - 6,00	2,00 - 6,00
		Avance f_n (mm/rev)	0,05 - 0,20	0,35 - 0,60	0,35 - 0,60
		V_c (m/min)	185 - 820	185 - 820	185 - 820

Note que los datos de corte, geometrías y calidades sugeridas son solo una guía. Para mayor y más detallada información consulte las páginas C12 - C31 (información técnica sobre calidades y geometrías).

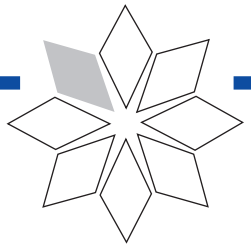
Grupo de Materiales

Aleaciones Refractarias

Plaquitas - Negativas		FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
S	Geometría	2N	91	2N	4M
	Calidad	SP0864	SP3064	NL92	NL30
	DOC Profundidad de corte a_p (mm)	0,80 - 4,00	1,30 - 5,80	0,80 - 4,00	1,00 - 5,00
	Avance f_n (mm/rev)	0,12 - 0,40	0,18 - 0,45	0,12 - 0,40	0,30 - 0,50
	V_c (m/min)	25 - 35	25 - 35	15 - 30	15 - 30
	Geometría	3F	91	2N	4M
	Calidad	SP3064	SP3064	SP0864	NL30
	DOC Profundidad de corte a_p (mm)	1,00 - 3,00	1,30 - 5,80	0,80 - 4,00	1,00 - 5,00
	Avance f_n (mm/rev)	0,12 - 0,35	0,18 - 0,45	0,12 - 0,40	0,30 - 0,50
	V_c (m/min)	25 - 40	25 - 50	25 - 55	15 - 50
	Geometría	1A	3F	2N	4M
	Calidad	SP4036	SP0864	SP0864	NL30
	DOC Profundidad de corte a_p (mm)	0,80 - 2,50	1,00 - 3,00	0,80 - 4,00	1,00 - 5,00
	Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,35	0,12 - 0,40	0,30 - 0,50
	V_c (m/min)	25 - 90	25 - 90	25 - 90	20 - 70

Plaquitas - Positivas		FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
S	Geometría	62	-	-
	Calidad	GH2		
	DOC Profundidad de corte a_p (mm)	0,25 - 3,00	-	-
	Avance f_n (mm/rev)	0,025 - 0,25	-	-
	V_c (m/min)	15 - 30	-	-
	Geometría	62	m	73
	Calidad	SP4036	GH1	SFZ
	DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,50 - 4,00	0,50 - 5,00
	Avance f_n (mm/rev)	0,025 - 0,25	0,10 - 0,20	0,07 - 0,50
	V_c (m/min)	25 - 60	20 - 40	15 - 35
	Geometría	62	m	73
	Calidad	SP4036	GH1	SFZ
	DOC Profundidad de corte a_p (mm)	0,25 - 3,00	0,50 - 4,00	0,50 - 5,00
	Avance f_n (mm/rev)	0,025 - 0,25	0,10 - 0,20	0,07 - 0,50
	V_c (m/min)	25 - 90	20 - 80	15 - 55

Clave: Corte Interrumpido | Profundidad de corte variable | Buenas condiciones



Grupo de Materiales

Materiales duros

Plaquitas - Negativas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio	HR Desbaste Pesado
H		Geometría	4U	4T	4T	-
		Calidad	NL37	NL37	NL37	-
		DOC Profundidad de corte a_p (mm)	1,30 - 4,50	1,20 - 6,00	1,20 - 6,00	-
		Avance f_n (mm/rev)	0,18 - 0,45	0,23 - 0,50	0,23 - 0,50	-
		V_c (m/min)	45 - 50	45 - 50	45 - 50	-
		Geometría	2N	4U	4U	-
		Calidad	NL37	NL37	NL37	
		DOC Profundidad de corte a_p (mm)	0,80 - 4,00	1,30 - 4,50	1,30 - 4,50	-
		Avance f_n (mm/rev)	0,12 - 0,40	0,18 - 0,45	0,18 - 0,45	-
		V_c (m/min)	45 - 55	45 - 55	45 - 55	-
		Geometría	1A	2N	2N	-
		Calidad	SP4036	SP0864	SP0864	
		DOC Profundidad de corte a_p (mm)	0,12 - 2,50	0,80 - 4,00	0,80 - 4,00	-
		Avance f_n (mm/rev)	0,10 - 0,30	0,12 - 0,40	0,12 - 0,40	-
		V_c (m/min)	45 - 65	45 - 65	45 - 65	-

Plaquitas - Positivas			FF Acabado Fino	MF Acabado Medio	MR Desbaste Medio
H		Geometría	-	-	-
		Calidad	-	-	-
		DOC Profundidad de corte a_p (mm)	-	-	-
		Avance f_n (mm/rev)	-	-	-
		V_c (m/min)	-	-	-
		Geometría		-	
		Calidad	*SA7402	*SA7402	
		DOC Profundidad de corte a_p (mm)	-	-	-
		Avance f_n (mm/rev)	-	-	-
		V_c (m/min)	20 - 90	20 - 80	-
		Geometría			-
		Calidad	*SA7402	*SA7402	
		DOC Profundidad de corte a_p (mm)	-	-	-
		Avance f_n (mm/rev)	-	-	-
		V_c (m/min)	20 - 90	20 - 80	-

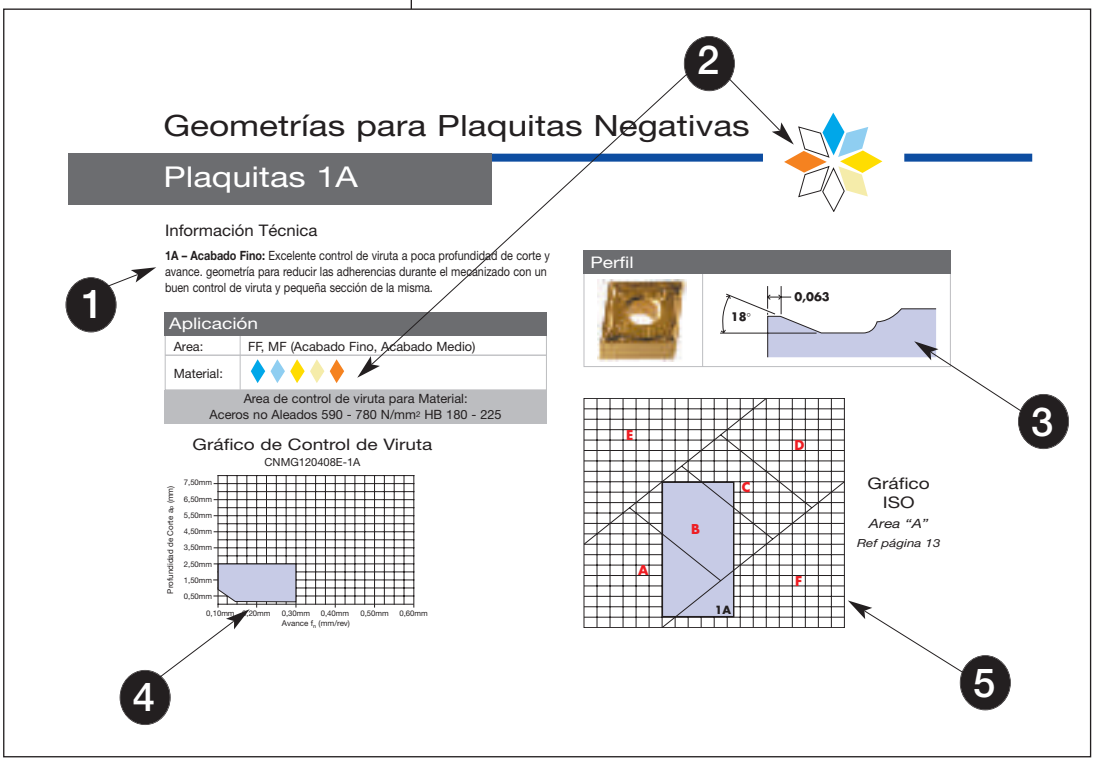
* Si desea más información sobre las calidades SA, la podrá encontrar en el catalogo de Cerámica.

Note que los datos de corte, geometrías y calidades sugeridas son solo una guía. Para mayor y más detallada información consulte las páginas C12 - C31 (información técnica sobre calidades y geometrías).

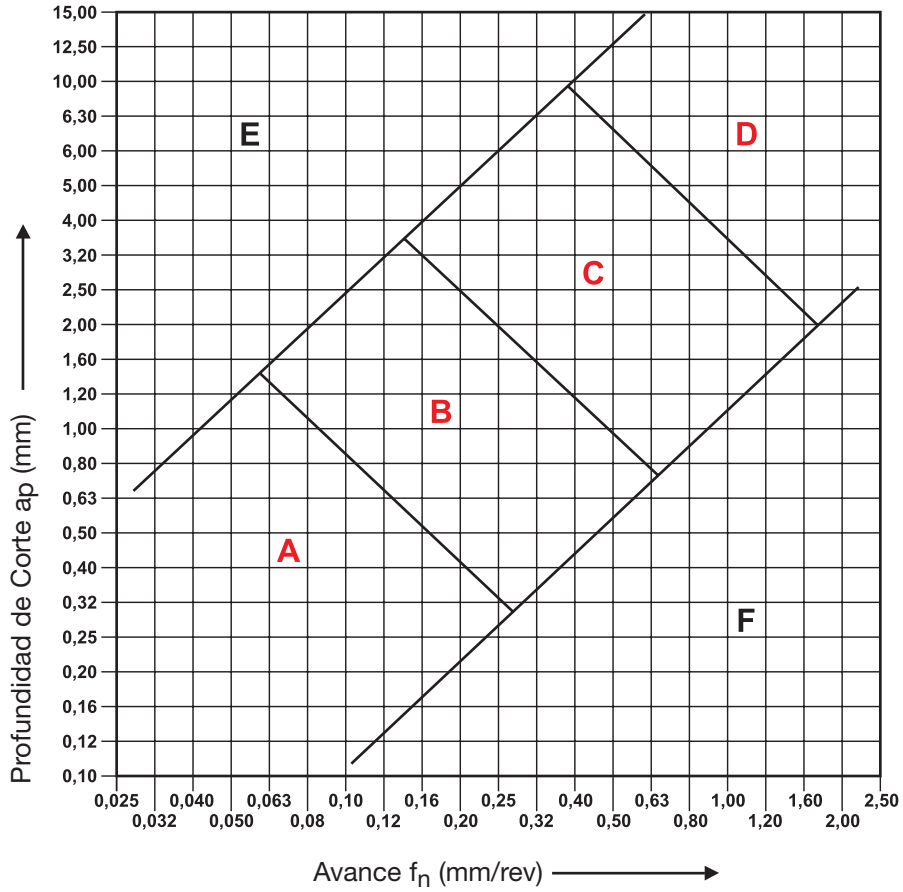
Guía sobre geometrías

1a Elección

La punta de la estrella indica la plaquita que se recomienda para cada material. La Estrella Guía™ le asiste en la selección de la plaquita adecuada para sus requerimientos de mecanizado.

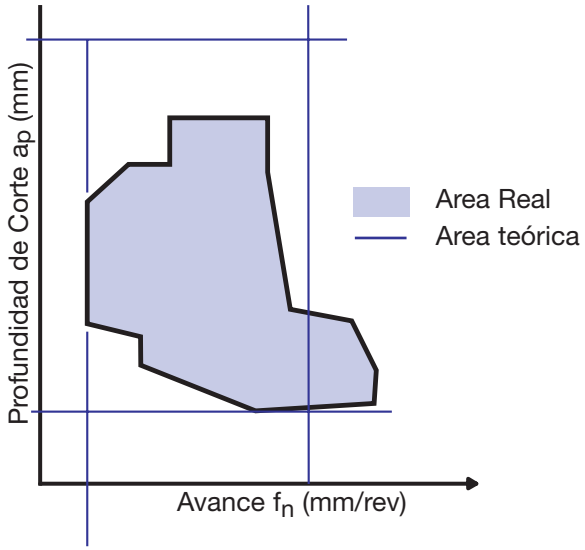


1. **información sobre la Aplicación**
2. **información Estrella Guía™ - Los puntos de la estrella indican los materiales recomendados en relación a la geometría.**
3. **Detalle del perfil de la geometría.**
4. **Indica la profundidad de corte (D.O.C) y avance aplicable a la geometría.**
5. **Grafico de estándares de geometrías ISO/DIN.**



Las siguientes páginas muestran el gráfico dibujado arriba en relación con las geometrías de Stellram. Los gráficos muestran la posición de referencia estándar ISO/DIN en relación a cada geometría con el uso de una letra para cada zona – A. B. C. D. E. y F. Estas zonas están representadas por un rango de profundidad de corte (ap mm) y una velocidad de corte f/n (mm/rev). Cada geometría tiene su propio rango de operación representada por la area de control de viruta o huella. Estas zonas representan el area de aplicación de una geometría dada.

Ejemplo del area de control de viruta o huella.



Esta es la clasificación de Stellram para cada zona de ISO/DIN 10910:

A	Acabado Fino
A/B	Acabado
B	Acabado Medio
B/C	Desbaste Ligero
C	Desbaste Medio
C/D	Desbaste Pesado

Geometrías de Plaquitas Negativas

Plaquitas 1A

Información Técnica

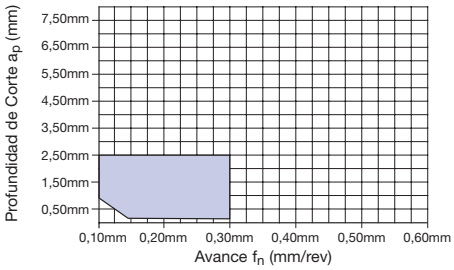
1A – Acabado Fino: Excelente control de viruta a poca profundidad de corte y avance. geometría para reducir las adherencias durante el mecanizado con un buen control de viruta y pequeña sección de la misma.

Aplicación	
Area:	FF, MF (Acabado Fino, Acabado Medio)
Material:	

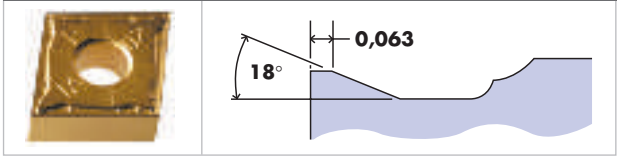
Area de control de viruta para Material:
Aceros no Aleados 590 - 780 N/mm² HBN 180 - 225

Gráfico de Control de Viruta

CNMG120408E-1A



Perfil



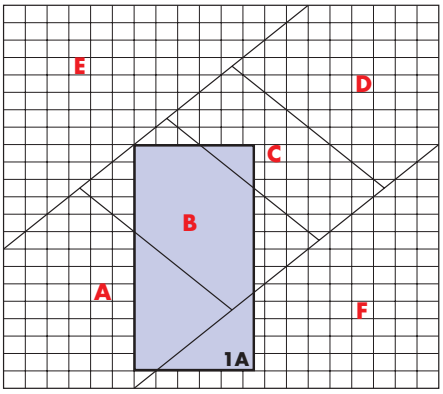


Gráfico ISO
Area "A-B"
Ref página C13

Plaquitas 2B

Información Técnica

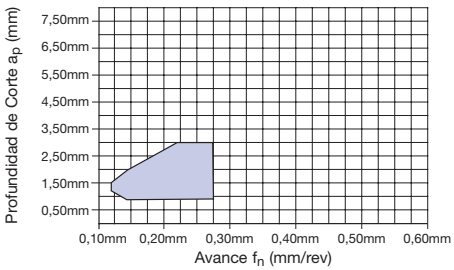
2B – Acabado: Acción de corte positiva para profundidades y avances ligeros. El corte positivo produce fuerzas de corte menores, incrementando la vida de la herramienta.

Aplicación	
Area:	MF (Acabado Medio)
Material:	

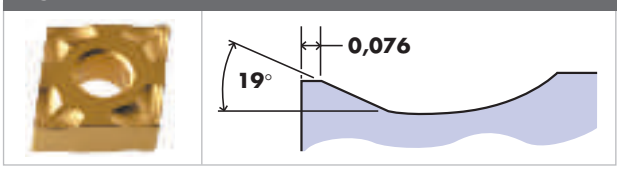
Area de control de viruta para Material:
Aceros aleados 800 - 1200 N/mm² HBN 230 - 340

Gráfico de Control de Viruta

CNMG120408E-2B



Perfil



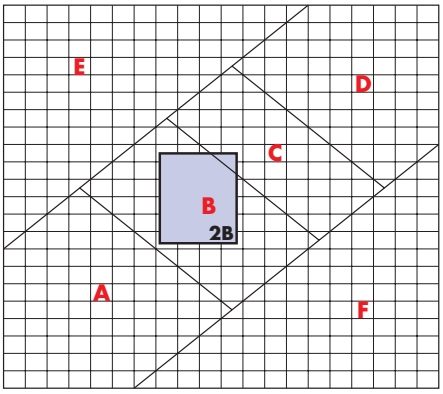


Gráfico ISO
Area "B"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Geometrías de Plaquitas Negativas

Plaquitas 2N

Información Técnica

2N – Desbaste de ligero a medio: El ángulo de incisión positivo proporciona una acción positiva de corte y reduce la presión de corte, esto hace de la geometría 2N una buena geometría de comienzo, ya que se puede utilizar en una amplia gama de aplicaciones y materiales.

Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	
Area de control de viruta para Material: Aceros aleados 900 - 1200 N/mm² HBN 260 - 340	

Perfil

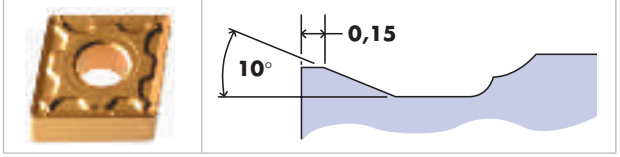
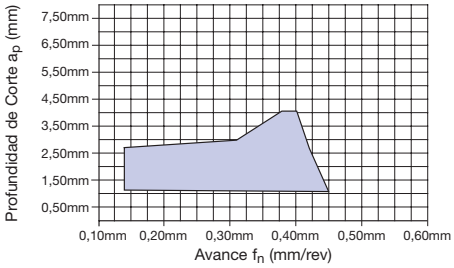


Gráfico de Control de Viruta

CNMG120408E-2N



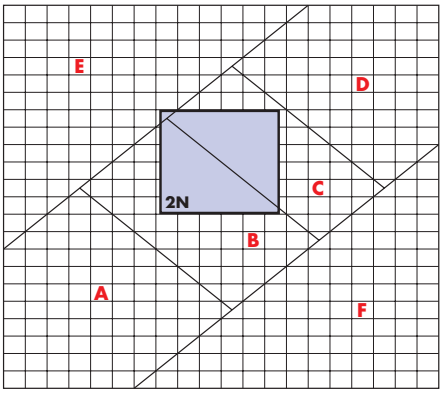


Gráfico ISO
Area "B-C"
Ref página C13

Plaquitas 3F

Información Técnica

3F – Acabado a Desbaste Ligero: La geometría 3F tiene la periferia y las aristas rectificadas para mantener perfiles precisos y continuidad al cambio de arista.

Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	
Area de control de viruta para Material: Aceros Inoxidables 450 - 700 N/mm² HBN 120 - 180	

Perfil

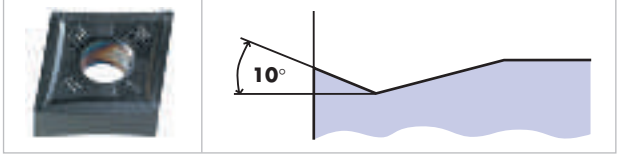
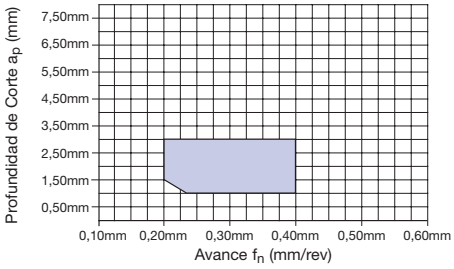


Gráfico de Control de Viruta

CNGG120408E-3F



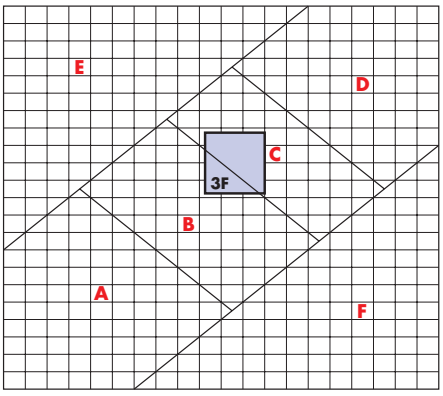


Gráfico ISO
Area "B-C"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Geometrías de Plaquitas Negativas

Plaquitas 3G

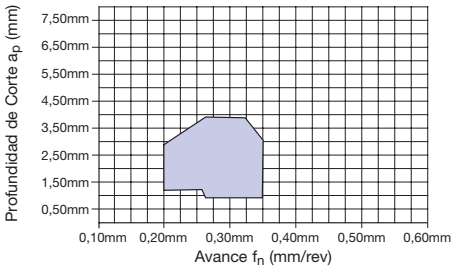
Información Técnica

3G – De acabado medio a desbaste ligero: Versátil es la geometría que se propone generalmente, utilizada a ligeras profundidades de pasada y avances no crea ningún problema de mecanizado.

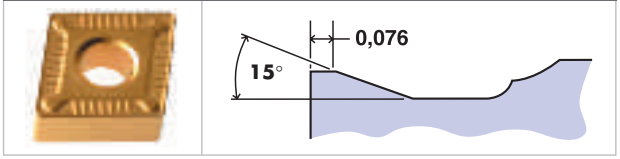
Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	◆◆◆
Area de control de viruta para Material: Aceros aleados 800 - 1200 N/mm² HBN 230 - 340	

Gráfico de Control de Viruta

CNMG120408E-3G



Perfil



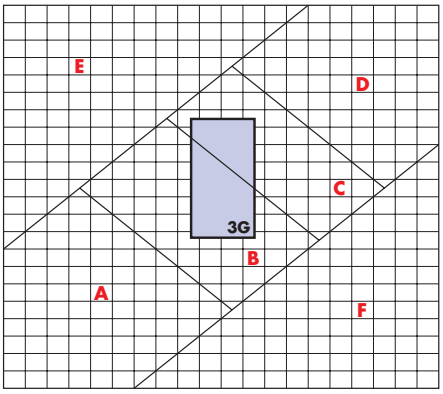


Gráfico ISO

Area "B-C"

Ref página C13

Plaquitas 3J

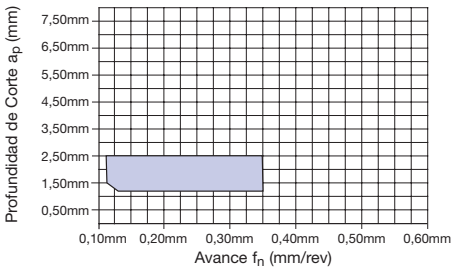
Información Técnica

3J – Acabado medio - Desbaste Ligero: El corte suave de 3J reduce las fuerzas de corte, mejora el acabado superficial e incrementa la vida de la herramienta.

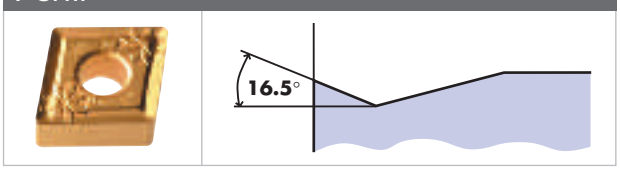
Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	◆◆◆◆
Area de control de viruta para Material: Aceros Inoxidables 450 - 700 N/mm² HBN 120 - 180	

Gráfico de Control de Viruta

CNMG120408E-3J



Perfil



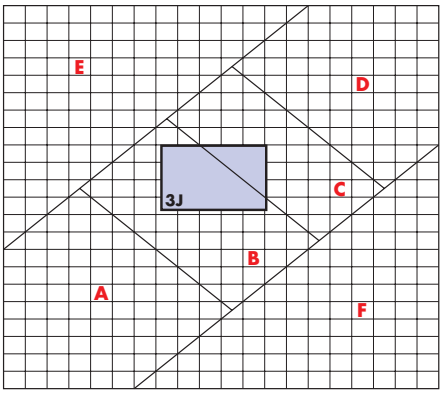


Gráfico ISO

Area "B-C"

Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

Geometrías de Plaquitas Negativas

Plaquitas 3M

Información Técnica

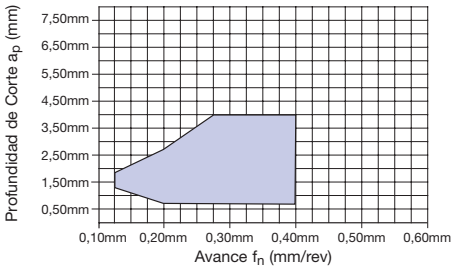
3M – Semi Acabado a desbaste ligero: Geometría de utilización general, adecuada para el torneado de piezas forjadas o fundidas, ofreciendo un excelente control de la viruta a diferentes profundidades de corte.

Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	

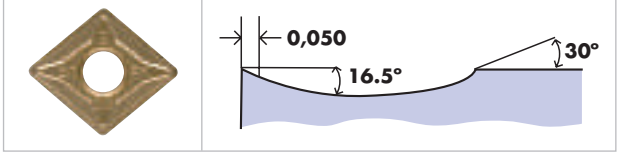
Area de control de viruta para Material:
Acero 4140 267HBN

Gráfico de Control de Viruta

CNMG120408E-3M



Perfil



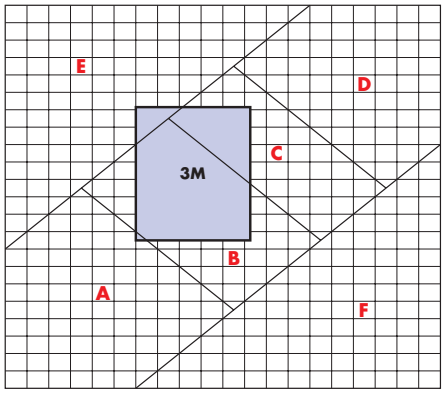


Gráfico ISO
Area "B-C"
Ref página C13

Plaquitas 4M

Información Técnica

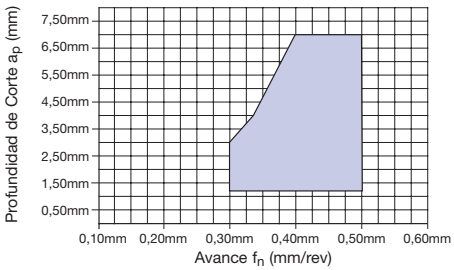
4M – Desbaste Medio a Pesado: Plaquitas de una cara para proporcionar resistencia a la vez de una acción de corte suave, lo que permite grandes avances.

Aplicación	
Area:	MR, HR (Desbaste Medio y Pesado)
Material:	

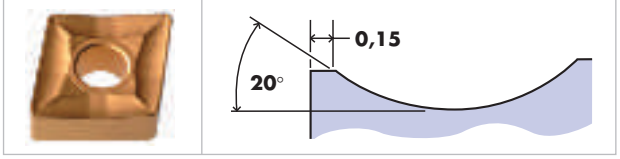
Area de control de viruta para Material:
Aceros aleados 800 - 1200 N/mm² HBN 230 - 340

Gráfico de Control de Viruta

CNMM120408E-4M



Perfil



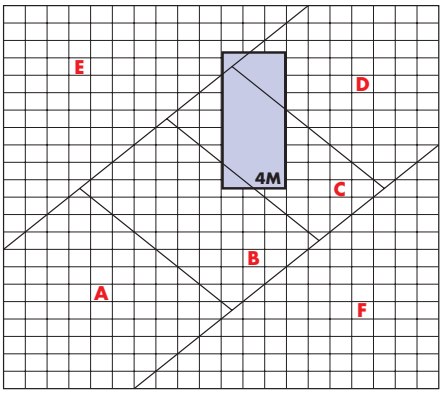


Gráfico ISO
Area "C-D"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Geometrías de Plaquitas Negativas

Plaquitas 4T

Información Técnica

4T – Utilización general en desbaste: El nuevo diseño de la actual versión 4T mejora la superficie de contacto, una buena geometría negativa para desbaste para una amplia gama de aplicaciones.

Aplicación	
Area:	MF, MR, HR (Acabado Medio, Desbaste Medio, Desbaste Pesado)
Material:	
Area de control de viruta para Material: Aceros aleados 800 - 1200 N/mm² HBN 230 - 340	

Perfil

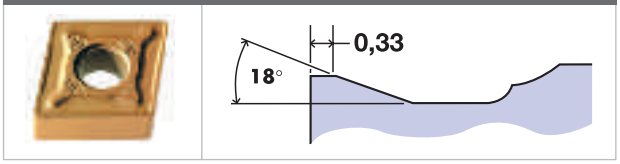
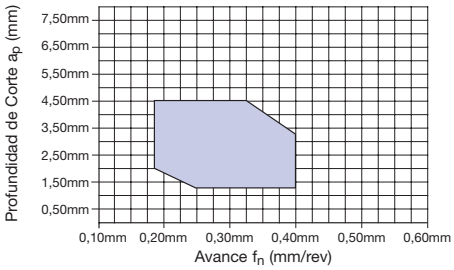


Gráfico de Control de Viruta

CNMG120408E-4T



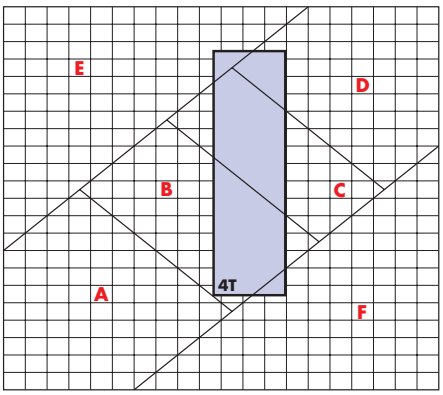


Gráfico ISO
Area "B-C"
Ref página C13

Plaquitas 4U

Información Técnica

4U – Medio y desbaste: Esta geometría es ideal para las aplicaciones de desbaste, excelente control de la viruta con bajas presiones de corte para una excelente durabilidad en aceros aleados y fundición esferoidal.

Aplicación	
Area:	FF, MF, MR (Acabado fino, Acabado medio, Desbaste medio)
Material:	
Area de control de viruta para Material: Ductile Iron HBN 170	

Perfil

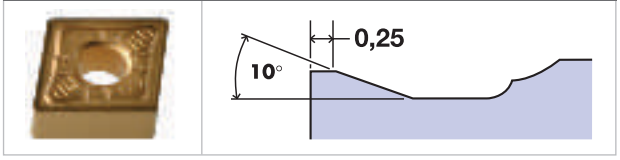
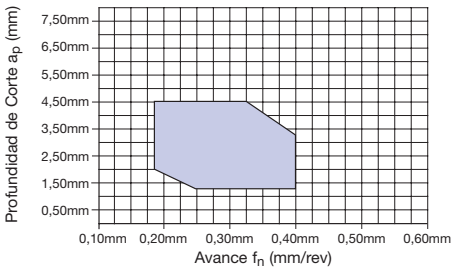


Gráfico de Control de Viruta

CNMG120408E-4U



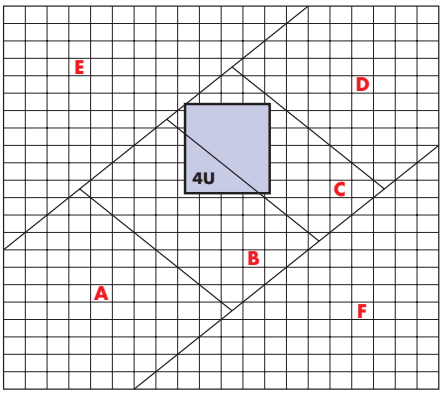


Gráfico ISO
Area "A-B-C"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Geometrías de Plaquitas Negativas

Plaquitas 5V

Información Técnica

5V – Desbaste Pesado: Acción de corte negativa con un soporte de arista extra para un soberbio desbaste con grandes avances y profundidades de corte.

Aplicación	
Area:	MR, HR (Desbaste Medio y Pesado)
Material:	◆◆
Area de control de viruta para Material: Aceros aleados 900 - 1200 N/mm² HBN 260 - 340	

Perfil

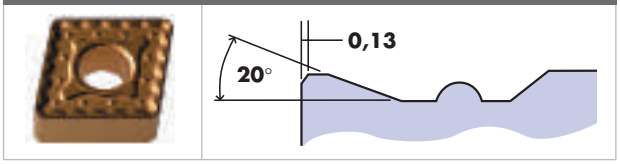
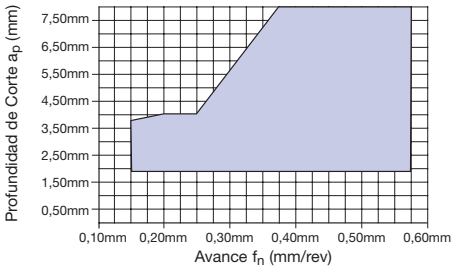


Gráfico de Control de Viruta

CNMG120408E-5V



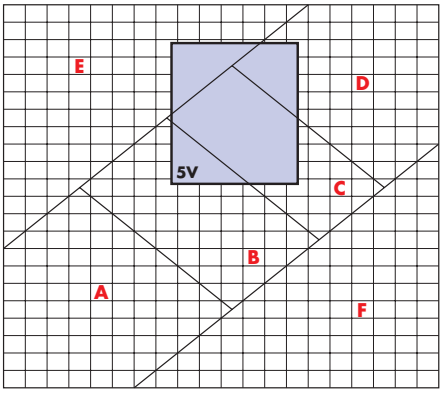


Gráfico ISO
Area "C-D"
Ref página C13

Plaquitas 91

Información Técnica

91 – De acabado a desbaste ligero: Una geometría positiva abierta produce un excelente control de la viruta con bajas fuerzas de corte en aleaciones refractarias, tales como titanio e inconel.

Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	◆◆
Area de control de viruta para Material: Titanio Ti-6Al-4V	

Perfil

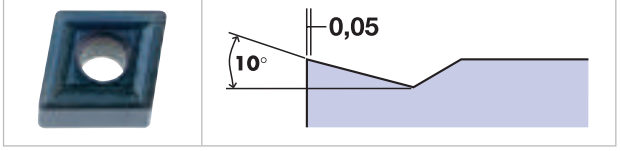
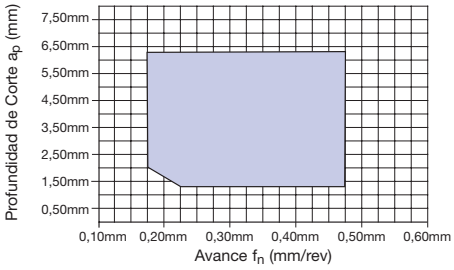


Gráfico de Control de Viruta

CNMG120408E-3M



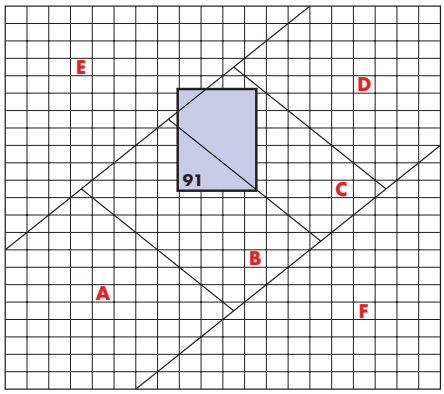


Gráfico ISO
Area "B-C"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

Geometrías de Plaquitas Positivas

Plaquitas 15

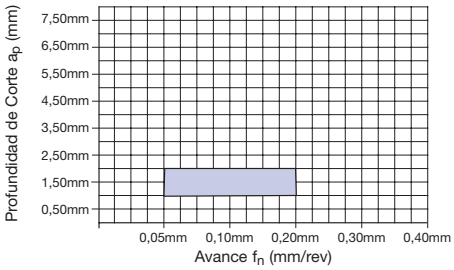
Información Técnica

15 – Acabado Medio: Filo agudo y geometría rectificada para mecanizado de acabado con profundidades de corte y avances ligeros. Diseñada para reducir las vibraciones.

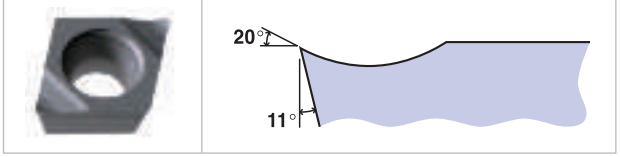
Aplicación	
Area:	FF, MF (Acabado Fino, Acabado Medio)
Material:	◆
Area de control de viruta para Material: Aluminio <16% Si HBN 116	

Gráfico de Control de Viruta

EPEX040404F-15



Perfil



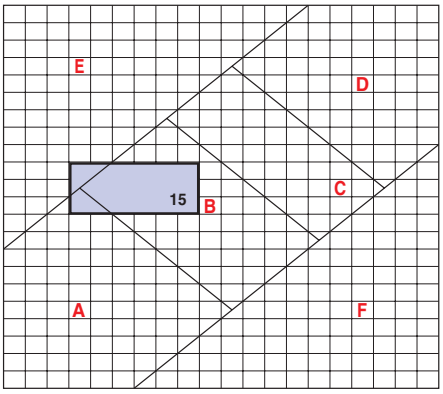


Gráfico ISO
Area "B"
Ref página C13

Plaquitas 61

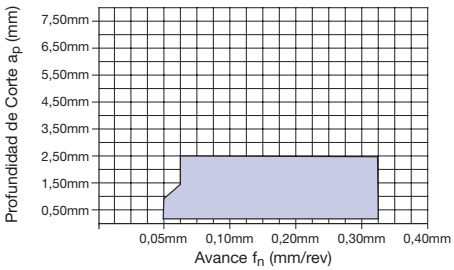
Información Técnica

61 – Acabado: Plaquitas sinterizadas con rompe virutas que provee con un control optimo de viruta y acabado superficial.

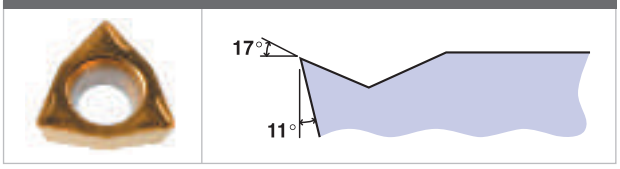
Aplicación	
Area:	FF, MF, MR (Acabado Fino, Medio y Desbaste Medio)
Material:	◆◆◆◆
Area de control de viruta para Material: Aceros no Aleados 750 - 950 N/mm² HBN 220 - 270	

Gráfico de Control de Viruta

WPMT050304E-61



Perfil



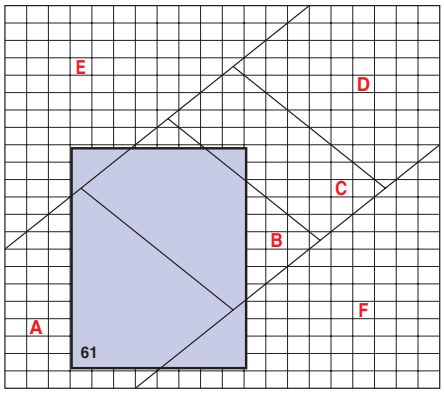


Gráfico ISO
Area "A-B"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

Geometrías de Plaquitas Positivas

Plaquitas 62

Información Técnica

62 – Acabado: Una geometría con periferia rectificada con un rompe virutas optimizado para tolerancias y acabados muy precisos.

Aplicación	
Area:	FF, MF, MR (Acabado Fino, Medio y Desbaste Medio)
Material:	
Area de control de viruta para Material: Aceros no Aleados 750 - 950 N/mm² HBN 220 - 270	

Perfil

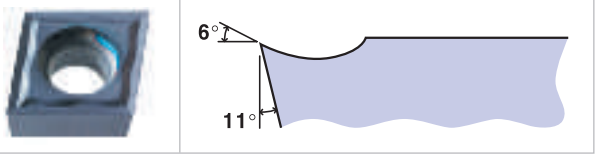
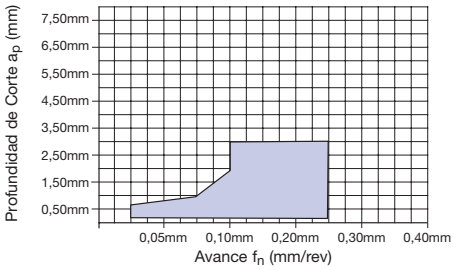


Gráfico de Control de Viruta

EPGT060204E-62



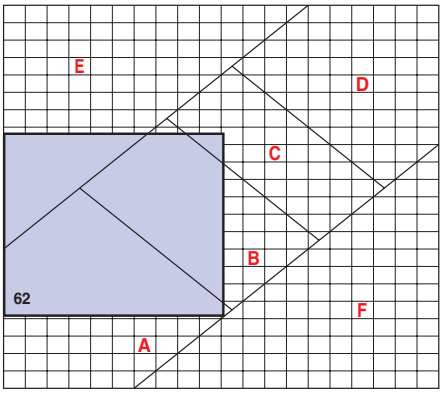


Gráfico ISO

Area "A-B-E"

Ref página C13

Plaquitas 64

Información Técnica

64 – Desbaste Medio: Una geometría rectificada altamente positiva con la cara superior pulida para mecanizado de aluminio.

Aplicación	
Area:	MR (Desbaste Medio)
Material:	
Area de control de viruta para Material: Aluminio <16% Si HBN 116	

Perfil

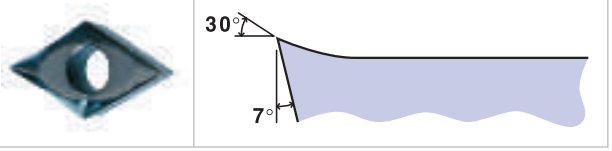
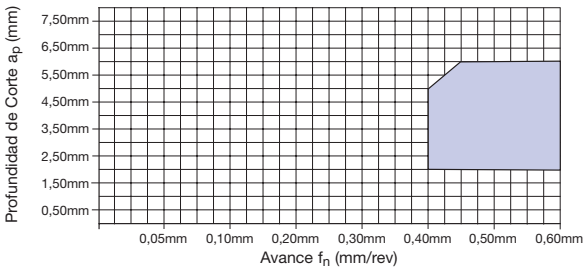


Gráfico de Control de Viruta

DCGT11T308F-64



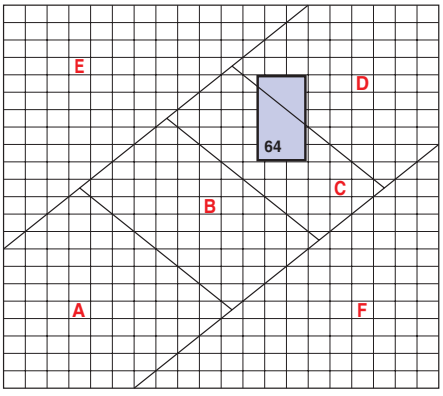


Gráfico ISO

Area "C-D"

Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

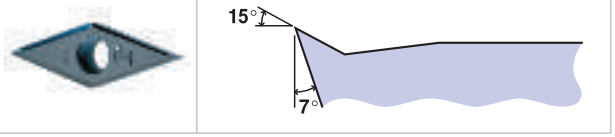
Geometrías de Plaquitas Positivas

Plaquitas 66

Información Técnica

66 – Acabado Medio: Una geometría rectificada con rompe virutas prensado y arista de corte aguda, ideal para un control de viruta fino.

Perfil



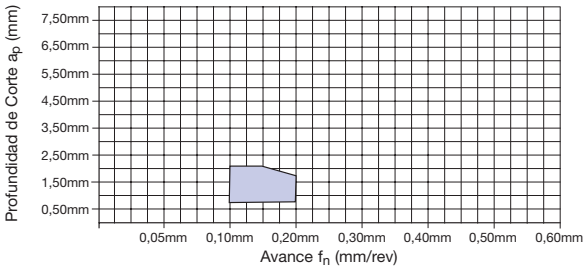
Aplicación

Area:	MF (Acabado Medio)
Material:	

Area de control de viruta para Material:
Aceros Inoxidables 450 - 700 N/mm² HBN 120 - 180

Gráfico de Control de Viruta

VCGT130304-66



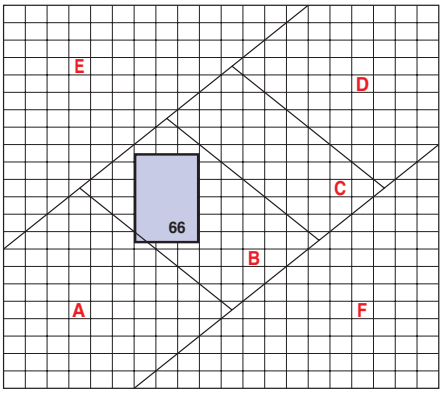


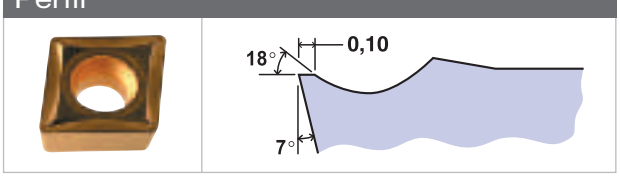
Gráfico ISO
Area "B"
Ref página C13

Plaquitas 73

Información Técnica

73 – Acabado Medio a Desbaste Medio: geometría sinterizada que cubre un amplio abanico de aplicaciones y materiales. Es una geometría ideal como punto de partida para la mayoría de las aplicaciones.

Perfil



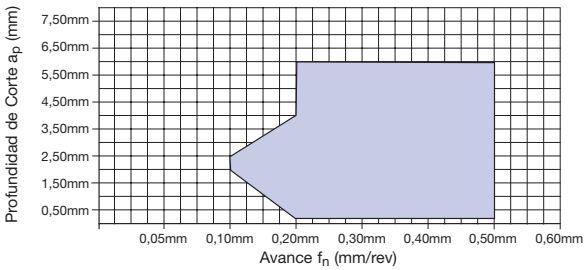
Aplicación

Area:	FF, MF, MR (Acabado Fino, Acabado Medio, Desbaste Medio)
Material:	

Area de control de viruta para Material:
Aceros aleados 900 - 1200 N/mm² HBN 260 - 340

Gráfico de Control de Viruta

CCMT120408E-73



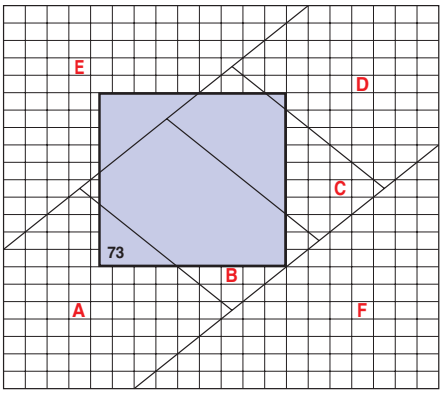


Gráfico ISO
Area "B-C"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Geometrías de Plaquitas Positivas

Plaquitas 3G

Información Técnica

3G Acabado Medio a Desbaste Ligero: Versátil geometría de uso general para profundidades de corte y avances ligeros para materiales de fácil mecanizado.

Aplicación	
Area:	FF, MF (Acabado Fino, Acabado Medio)
Material:	
Area de control de viruta para Material: Aceros no Aleados 750 - 950 N/mm² HBN 220 - 270	

Perfil

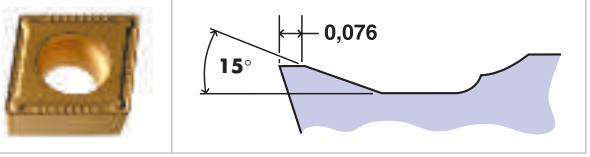
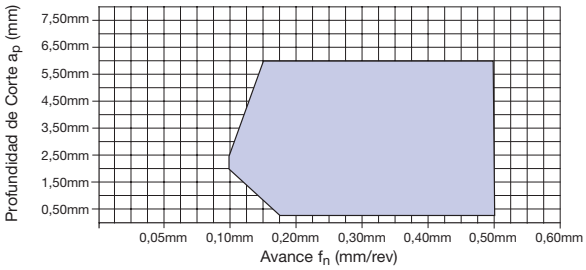


Gráfico de Control de Viruta

CCMT120408E-3G



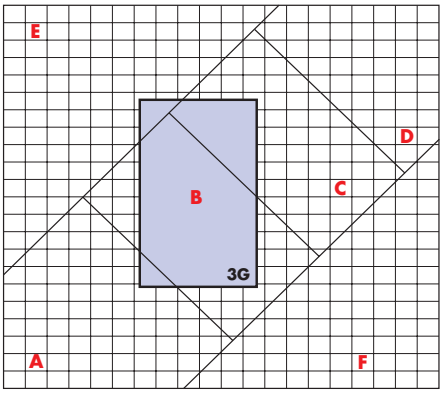


Gráfico ISO
Area "B-C"
Ref página C13

Plaquitas M

Información Técnica

M – Acabado Medio: Una plaquita sinterizada con un mini rompe virutas que ofrece un corte suave y un buen control de viruta.

Aplicación	
Area:	FF, MF, MR (Acabado Fino y Medio, Desbaste Medio)
Material:	
Area de control de viruta para Material: Aceros no Aleados 750 - 950 N/mm² HBN 220 - 270	

Perfil

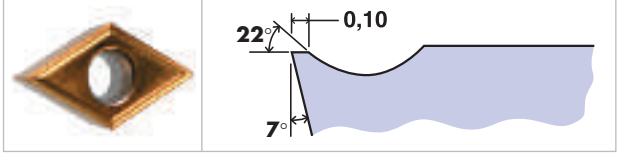
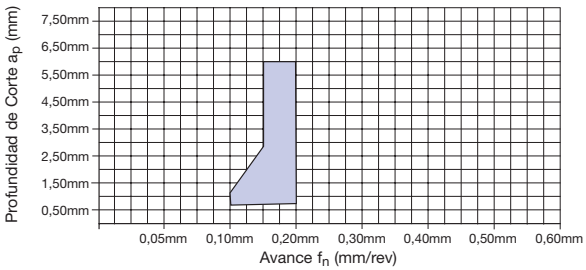


Gráfico de Control de Viruta

VCMT160408E-M



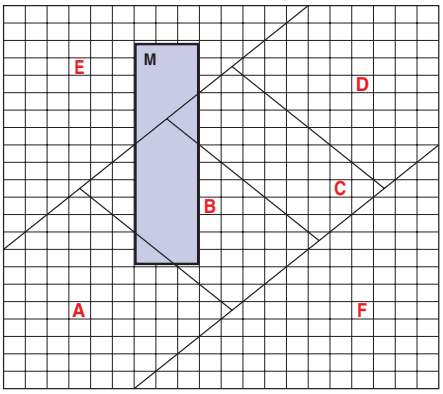


Gráfico ISO
Area "B-E"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Geometrías de Plaquitas Positivas

Plaquitas T

Información Técnica

T – Acabado Medio a Desbaste Medio: geometría de utilitaria dando unas condiciones de corte estables en la mayoría de los casos.

Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	

Area de control de viruta para Material:
Aceros no Aleados 750 - 950 N/mm² HBN 220 - 270

Perfil

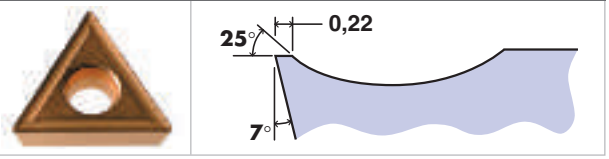
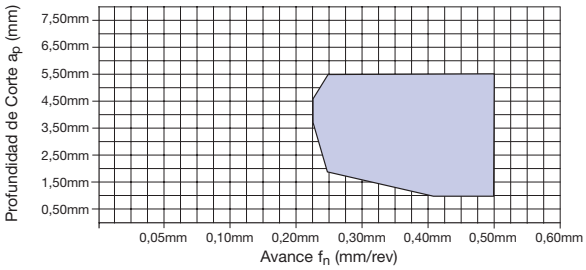


Gráfico de Control de Viruta

TCMT16T308



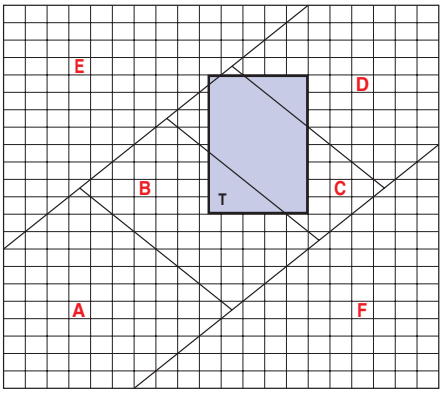


Gráfico ISO
Area "B-C"
Ref página C13

Plaquitas X

Información Técnica

X - Acabado Medio a Desbaste Medio: Rompe virutas paralelo rectificado, disponible en plaquitas rectificadas totalmente en la periferia o sinterizadas, con arista viva o redondeada. Esta geometría puede mecanizar una gran variedad de materiales en operaciones con riesgo de vibraciones.

Aplicación	
Area:	MF, MR (Acabado Medio, Desbaste Medio)
Material:	

Area de control de viruta para Material:
Aluminio <16% Si HBN 116

Perfil

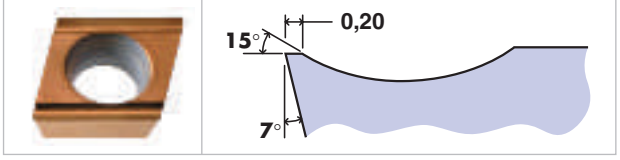
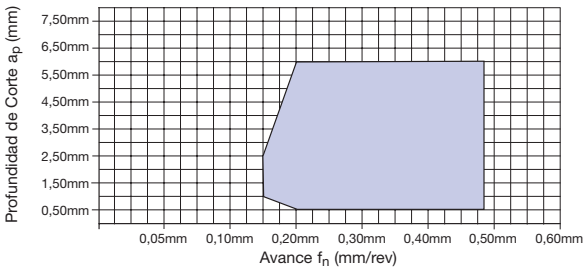


Gráfico de Control de Viruta

ECMX12T308EL-25



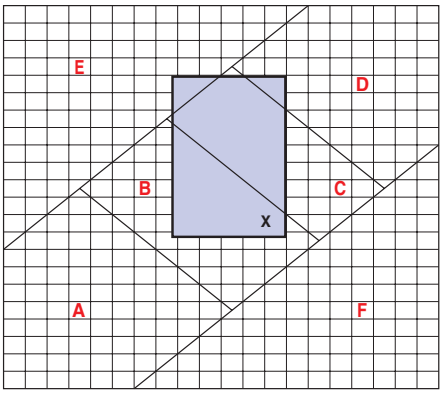


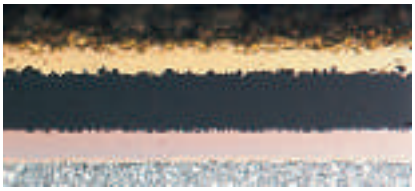
Gráfico ISO
Area "B-C"
Ref página C13

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros



Descripciones de Calidades



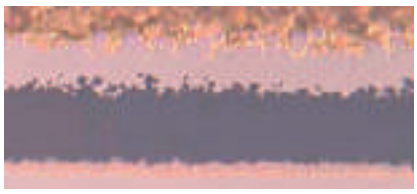
Calidad NL25 (HC)

Calidad con gran resistencia al desgaste para acabado y semiacabado en aceros, aceros inoxidables y fundiciones.
Estructura del recubrimiento - CVD TiN - TiCN - Al_2O_3 - TiN.



Calidad NL30 (HC)

Calidad con substrato rico en Cobalto, para desbaste medio y pesado, aceros inoxidables y fundiciones.
Estructura del recubrimiento - CVD TiN - TiCN - Al_2O_3 - TiN.



Calidad NL37 (HC) NUEVA

Calidad recubierta TiN-MT TiCN-Al_2O_3-MT TiCN-TiN por CVD.

Principalmente para mecanizar aceros y aceros aleados. Esta calidad tiene una excelente resistencia al desgaste.



Calidad NL40 (HC)

Calidad con substrato rico en Cobalto, para desbaste medio y pesado, principalmente para aceros inoxidables y aleaciones exóticas.
Estructura del recubrimiento - CVD TiN - TiCN - Al_2O_3 - TiN.



Calidad NL92 (HC)

Calidad tenaz con un alto grado de seguridad en las aristas para aceros y aceros inoxidables.
Estructura del recubrimiento - CVD TiN - TiCN - Al_2O_3 - TiN.



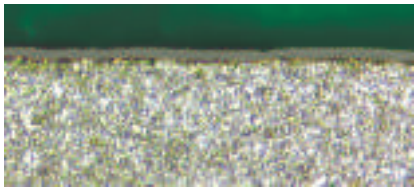
Calidad SC1519 (HC)

Primera opción en calidad resistente al desgaste para mecanizado medio y acabado de fundiciones.
Estructura del recubrimiento - CVD TiN - TiCN - Al_2O_3 - TiN.



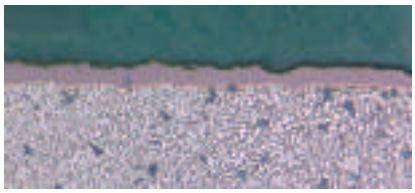
Calidad MP37 (HC)

Calidad con alta resistencia al desgaste para el mecanizado de aceros, aceros inoxidables y fundiciones.
Estructura del recubrimiento - CVD TiN - MT - TiCN - Al_2O_3.



Calidad SP0864 (HC)

Una calidad resistente al desgaste con un substrato micro grano.
Principalmente para acabado en titanio y aleaciones exóticas.
Estructura del recubrimiento – PVD TiAlN.



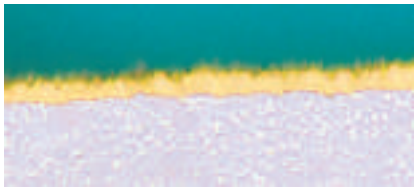
Calidad SP3036/SP3064 (HC)

Calidad dura para desbaste ligero y operaciones de acabado a altas velocidades. Principalmente se aplica a aleaciones exóticas
Estructura del recubrimiento - PVD TiAlN.



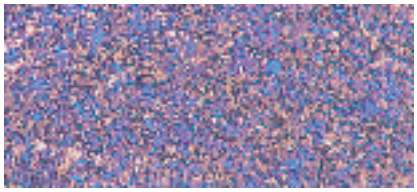
Calidad SP4036/SP4064 (HC)

Calidad dura para operaciones de desbaste ligero y acabado con viruta corta. Se aplica principalmente a aceros inoxidables, aleaciones exóticas y fundiciones.
Estructura del recubrimiento - PVD TiAlN.



Calidad SFZ (HC)

Calidad utilitaria con substrato micrograno. Para operaciones que requieren aristas muy agudas.
Estructura del recubrimiento - PVD TiN.



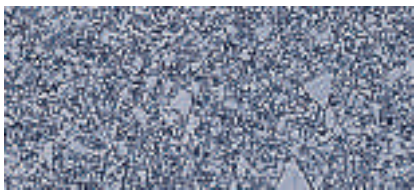
Calidad GH1 (HF) – Sin recubrir

Micrograno sin recubrir para fundiciones, aceros endurecidos hasta 60 HRC y aleaciones no ferrosas. Fuerzas de corte bajas a altas velocidades debido a las aristas de corte agudas.



Calidad GH2 (HF) – Sin recubrir

Micrograno sin recubrir para fundiciones, aceros inoxidables y aleaciones exóticas. Esta calidad es tenaz y capaz de soportar grandes presiones, vibraciones y golpes.



Calidad H21 (HW) – Sin recubrir

Calidad sin recubrir principalmente para fundiciones, aceros inoxidables, aleaciones refractarias y aleaciones de aluminio. Para uso en cortes interrumpidos o corteza.

Velocidad de Corte (V_c) metros/minuto

Velocidad de Corte (V_c) m/min			Recubrimiento CVD													
ISO	Material	Rm y Dureza	NL25 Max - min		NL30 Max - min		NL37 Max - min		NL40 Max - min		NL92 Max - min		SC1519 Max - min		MP37 Max - min	
			HC Max - Min		HC Max - Min		HC Max - Min		HC Max - Min		HC Max - Min		HC Max - Min		HC Max - min	
P	Aceros no Aleados	<600 N/mm² <180HBN	405	165	380	160	425	160	360	135	225	115	-	-	490	275
		<950 N/mm² <280HBN	265	105	245	100	275	100	235	90	145	75	-	-	335	150
	Aceros Aleados	700-950 N/mm² 200-280 HBN	240	95	230	95	250	95	215	80	135	70	-	-	215	125
		950 - 1200 N/mm² 280 - 355 HBN	220	90	200	85	215	85	195	75	125	65	-	-	-	-
		1200 - 1400 N/mm² 355 - 415 HBN	150	60	135	60	120	60	135	50	85	45	-	-	-	-
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	275	110	230	105	-	-	245	90	150	80	-	-	185	130
		Martensitic Series 400	285	115	240	110	-	-	255	95	160	80	-	-	200	125
		Refractario P.H.	145	60	120	60	-	-	130	50	80	40	-	-	150	100
K	Fundiciones	Gris GG-Ft	400	160	335	-	-	-	-	-	225	115	490	215	185	150
		Dúctil-Esferoidal GGG-FGS	350	140	290	135	-	-	-	-	195	100	425	185	275	170
		Malleable GTS - MN/MP	235	95	195	90	-	-	-	-	130	70	285	125	-	-
N	Aluminio y Aleaciones	< 16% Si 116HBN	475	190	-	-	-	-	-	-	-	-	-	-	-	-
		> 16% Si 92HBN	295	115	-	-	-	-	-	-	-	-	-	-	-	-
S	Aleaciones Refractarias	Base Hierro	60	25	50	25	-	-	50	20	35	15	-	-	-	-
		Base Cobalto	50	20	40	20	-	-	40	15	25	15	-	-	-	-
		Base Niquel	50	20	45	20	-	-	45	15	30	15	-	-	-	-
		Base Titanio	80	30	65	30	-	-	70	30	45	25	-	-	-	-
H	Aceros Templados	>1400 N/mm² >415 HBN	-	-	-	-	65	45	-	-	-	-	-	-	-	-
	Fundición Dúctil Bainítica	1400 N/mm² 400 HBN	-	-	-	-	60	45	-	-	-	-	-	-	-	-

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Velocidad de Corte (V_c) metros/minuto

Velocidad de Corte (V_c) m/min			Recubrimiento PVD								No recubierto					
ISO	Material	Rm y Dureza	SP0864 Max - min		SP4036 SP4064 Max - min		SP3036 SP3064 Max - min		SFZ Max - min		H21 Max - min		GH1 Micrograno Max - min		GH2 Micrograno Max - min	
			HC Max - Min		HC Max - Min		HC Max - Min		HC Max - Min		HW Max - Min		HF Max - Min		HF Max - Min	
P	Aceros no Aleados	<600 N/mm² <180HBN	-	-	440	210	430	205	270	135	-	-	-	-	-	-
		<950 N/mm² <280HBN	-	-	285	135	280	130	-	-	-	-	-	-	-	-
	Aceros Aleados	700 - 950 N/mm² 200 - 280 HBN	-	-	265	125	255	120	-	-	-	-	-	-	-	-
		950 - 1200 N/mm² 280 - 355 HBN	-	-	-	-	235	110	-	-	-	-	-	-	-	-
		1200 - 1400 N/mm² 355 - 415 HBN	-	-	-	-	160	75	-	-	-	-	-	-	-	-
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	305	145	300	140	290	135	-	-	135	80	150	80	140	75
		Martensitic Series 400	315	150	310	145	300	145	-	-	-	-	160	80	-	-
		Refractario P.H.	165	75	160	75	155	75	100	50	75	40	80	40	75	40
K	Fundiciones	Gris GG-Ft	450	210	440	205	425	200	-	-	200	115	225	115	-	-
		Dúctil-Esferoidal GGG-FGS	385	180	380	180	365	175	-	-	175	100	195	100	175	100
		Malleable GTS - MN/MP	260	120	255	120	250	115	-	-	115	70	130	70	-	-
N	Aluminio y Aleaciones	< 16% Si 116HBN	1065	365	975	365	960	365	915	365	460	305	825	335	-	-
		> 16% Si 92HBN	-	-	-	-	-	-	610	245	215	150	550	185	-	-
S	Aleaciones Refractarias	Base Hierro	65	30	65	30	60	30	40	20	30	20	35	15	30	15
		Base Cobalto	55	25	50	25	50	25	30	15	25	15	25	15	25	15
		Base Niquel	57	30	55	25	55	25	35	15	25	15	30	15	25	15
		Base Titanio	90	40	90	40	85	40	55	30	40	25	45	25	40	20
H	Aceros Templados	>1400 N/mm² >415 HBN	135	65	-	-	125	60	-	-	-	-	-	-	-	-
	Fundición Dúctil Bainítica	1400 N/mm² 400 HBN	130	60	-	-	115	50	-	-	-	-	-	-	-	-

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Gráfico de clasificación de Calidades - Torneado

Óptimo rendimiento de la Calidad

Materiales	Código C	Código ISO	Recubrimiento CVD – Calidad HC NL25	HC NL30	HC NL37	HC NL40	HC NL92	HC MP37	HC SC1519
Aceros no aleados y aleados P	C8	P01							
		P05	◆		◆			◆	
		P10	◆		◆			◆	
	C7	P15	◆	◆	◆			◆	
		P20	◆	◆		◆			
		P25	◆	◆		◆	◆		
	C6	P30		◆		◆	◆		
		P35				◆	◆		
	C5	P40				◆	◆		
		P45							
		P50							
Aceros Inoxidables M		M05							
		M10	◆			◆		◆	
		M15	◆	◆		◆		◆	
		M20	◆	◆		◆	◆		
		M25	◆	◆		◆	◆		
		M30		◆		◆	◆		
		M35					◆		
		M40					◆		
Fundiciones K	C4	K01							
		K05	◆					◆	◆
	C3	K10	◆	◆				◆	◆
		K15	◆	◆					
	C2	K20	◆	◆					
		K25		◆					
	C1	K30		◆			◆		
		K35					◆		
		K40					◆		
Aluminio y Aleaciones N		N01							
		N05							
		N10	◆						
		N15	◆						
		N20							
		N25							
		N30							
Aleaciones Refractarias S		S01							
		S05	◆						
		S10	◆			◆			
		S15	◆	◆		◆			
		S20		◆		◆			
		S25		◆			◆		
		S30					◆		
Materiales duros H		H01							
		H05							
		H10			◆				
		H15			◆				
		H20			◆				
		H25							
		H30							

Mayor resistencia al desgaste – Mayor Velocidad de corte

Mayor – resistencia al choque – Mayor - avance

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Gráfico de clasificación de Calidades - Torneado

Óptimo rendimiento de la Calidad

Materiales	Código C	Código ISO	Recubrimiento PVD: Calidad HC SFZ	HC SP0864	HC SP3036 SP3064	HC SP4036 SP4064	No recubierto: Calidad HW H21	HF GH1	HF GH2
Aceros no aleados y aleados P	C8	P01							
		P05							
		P10							
	C7	P15							
		P20							
		P25							
	C6	P30							
		P35							
	C5	P40							
		P45							
		P50							
Aceros Inoxidables M		M05							
		M10							
		M15							
		M20							
		M25							
		M30							
		M35							
		M40							
Fundiciones K	C4	K01							
		K05							
	C3	K10							
		K15							
	C2	K20							
		K25							
	C1	K30							
		K35							
		K40							
Aluminio y Aleaciones N		N01							
		N05							
		N10							
		N15							
		N20							
		N25							
		N30							
Aleaciones Refractarias S		S01							
		S05							
		S10							
		S15							
		S20							
		S25							
		S30							
Materiales duros H		H01							
		H05							
		H10							
		H15							
		H20							
		H25							
		H30							

Mayor resistencia al desgaste – Mayor Velocidad de corte

Mayor – resistencia al choque – Mayor - avance

Estrella guía Llave para encontrar la herramienta idónea

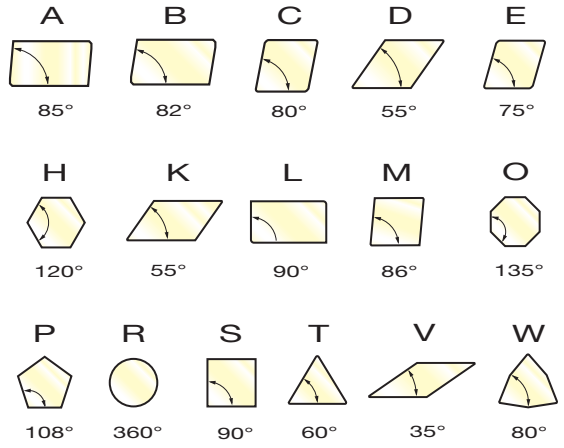
Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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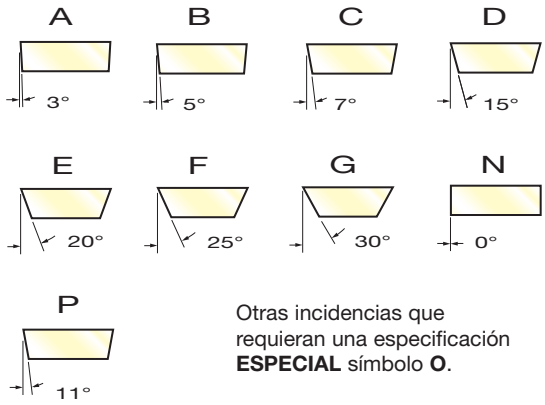
Designación ISO de las plaquitas

S	N	M	G	12
1	2	3	4	5

1 Forma

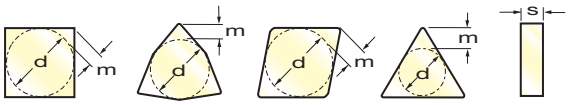


2 Incidencia



Otras incidencias que requieran una especificación **ESPECIAL** símbolo **O**.

3 Tolerancia



Clase		d	m	s
A	mm	±0,025	±0,005	±0,025
C	mm	±0,025	±0,013	±0,025
E	mm	±0,025	±0,025	±0,025
F	mm	±0,013	±0,005	±0,025
G	mm	±0,025	±0,025	±0,13
H	mm	±0,013	±0,013	±0,025
J	mm	*	±0,005	±0,025
K	mm	*	±0,013	±0,025
L	mm	*	±0,025	±0,025
M	mm	*	*	±0,127
U	mm	*	*	±0,127
N	mm	*	*	±0,025

* Vea las tablas abajo.

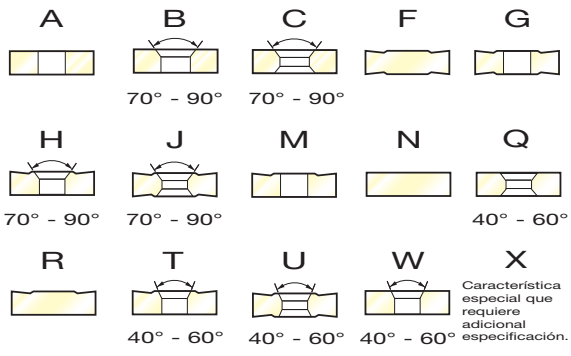
Válida para formas:
C, E, H, M, O, P, S, T, R, W

IC	d		m	
	J, K, L, M, N	**U**	**M, N**	**U**
4,76	±0,05	±0,08	±0,08	±0,13
5,56	±0,05	±0,08	±0,08	±0,13
6	±0,05	±0,08	±0,08	±0,13
6,35	±0,05	±0,08	±0,08	±0,13
7,94	±0,05	±0,08	±0,08	±0,13
8	±0,05	±0,08	±0,08	±0,13
9,525	±0,05	±0,08	±0,08	±0,13
10	±0,05	±0,08	±0,08	±0,13
12	±0,08	±0,13	±0,13	±0,2
12,7	±0,08	±0,13	±0,13	±0,2
15,875	±0,1	±0,18	±0,15	±0,27
16	±0,1	±0,18	±0,15	±0,27
19,05	±0,1	±0,18	±0,15	±0,27
20	±0,1	±0,18	±0,15	±0,27
25	±0,13	±0,25	±0,18	±0,38
25,4	±0,13	±0,25	±0,18	±0,38
31,75	±0,15	±0,25	±0,2	±0,38
32	±0,15	±0,25	±0,2	±0,38

Válido solo para forma D (Tolerancia **M** y **N**)

IC	d	m
5,56	±0,05	±0,11
6,35	±0,05	±0,11
7,94	±0,05	±0,11
9,525	±0,05	±0,11
12,7	±0,08	±0,15
15,875	±0,10	±0,18
19,05	±0,10	±0,18

4 Tipo



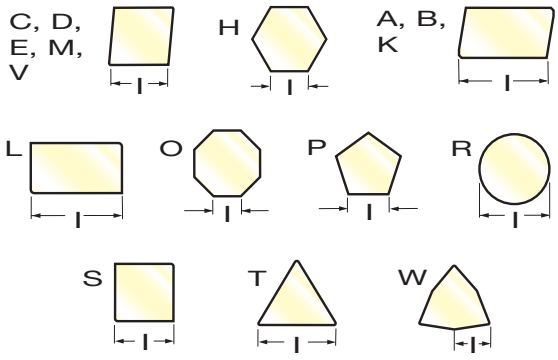
Designación ISO de las plaquitas

04 **08** **E** **-** **4T**

6 7 8 9

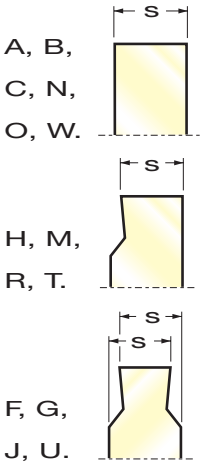
5 Tamaño

Enteros de una sola cifra son precedidos por un **0** (cero) Se omiten los decimales. e.g. 9,525 = **09.**



6 Espesor

Enteros de una sola cifra son precedidos por un 0 (cero) o la letra T. Se omiten los decimales.



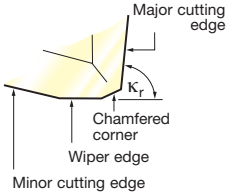
Ejemplos:

01	=	1,588
T1	=	1,984
02	=	2,381
03	=	3,175
T3	=	3,969
04	=	4,763
05	=	5,556
06	=	6,350
07	=	7,938
09	=	9,525
11	=	11,113
12	=	12,700
14	=	14,288
15	=	15,875

7 Punta de corte

Insertos con faceta de acabado

Ángulo de direccion (κ_r) 1° letra:			Ángulo de incidencia de la faceta 2° letral: (α_n)		
A	=	45°	**A**	=	3°
D	=	60°	**B**	=	5°
E	=	75°	**C**	=	7°
F	=	85°	**D**	=	15°
G	=	87°	**E**	=	20°
P	=	90°	**F**	=	25°
Z	=	CUALQUIER OTRO	**G**	=	30°
			N	=	0°
			P	=	11°
			Z	=	CUALQUIER OTRO

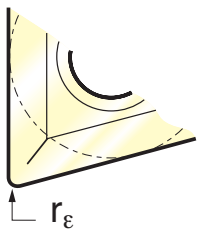


7 Punta de corte *continuación*

Plaquitas con radio. El radio es indicado en 0.1 mm. Enteros de una sola cifra son precedidos por un 0 (cero). Si la punta es aguda, se designa el símbolo 00 (cero, cero).

Ejemplos:

00	=	ESQUINAS AGUDAS	**24**	=	2,4
01	=	0,1	**28**	=	2,8
02	=	0,2	**32**	=	3,2
04	=	0,4	**40**	=	4,0
08	=	0,8	**48**	=	4,8
12	=	1,2	**56**	=	5,6
16	=	1,6	**64**	=	6,4
20	=	2,0	**X**	=	CUALQUIER OTRO

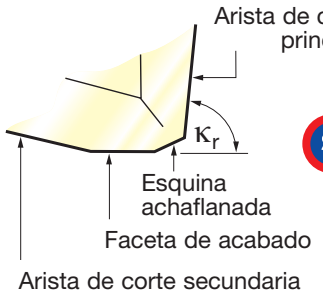


8 Tratamiento de la arista

	Símbolo
Viva	**F**
Redondeada (Radiada)	**E**
Achaflanada (Faceta negativa)	**T**
Achaflanada + Redondeada	**S**

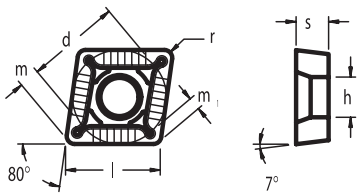
9 Designación de la geometría

1A, 2B, 2N, 3F, 3G, 3J, 3M, 4M, 4T, 4U, 5V, 91, 15, 61, 62, 64, 66, 73, 3G, M



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CCGT



Dimensiones para CCGT y CCMT							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
060200	6,35	6,45	2,38	0,00	1,75	0,12	2,80
060201	6,35	6,45	2,38	0,10	1,71	0,21	2,80
060202	6,35	6,45	2,38	0,20	1,65	0,30	2,80
060204	6,35	6,45	2,38	0,40	1,54	0,48	2,80
060208	6,35	6,45	2,38	0,80	1,32	0,72	2,80
09T300	9,52	9,57	3,97	0,00	2,63	1,45	4,40
09T301	9,52	9,57	3,97	0,10	2,59	1,42	4,40
09T302	9,52	9,57	3,97	0,20	2,53	1,39	4,40
09T304	9,52	9,57	3,97	0,40	2,42	1,33	4,40
09T308	9,52	9,57	3,97	0,80	2,20	1,21	4,40
120404	12,70	12,90	4,76	0,40	3,31	1,31	5,50
120408	12,70	12,90	4,76	0,80	3,08	1,69	5,50

Geometría 62

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CCGT060200E-62																
CCGT060201E-62											◊					
CCGT060202E-62											◊					
CCGT060204E-62											◊					
CCGT09T300E-62																
CCGT09T301E-62																
CCGT09T302E-62											◊					
CCGT09T304E-62											◊					
CCGT09T308E-62											◊					
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 73

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CCMT060202E-73		◊														
CCMT060204E-73	◊	◊		◊	◊											
CCMT060208E-73		◊			◊											
CCMT09T304E-73	◊	◊		◊	◊											
CCMT09T308E-73	◊	◊			◊											
CCMT120404E-73		◊			◊											
CCMT120408E-73	◊	◊			◊											



Geometría 3G

CCMT060202E-3G							◊									
CCMT060204E-3G				◊			◊									
CCMT060208E-3G					◊		◊									
CCMT09T302E-3G							◊									
CCMT09T304E-3G				◊	◊		◊									
CCMT09T308E-3G			◊	◊	◊		◊									
CCMT120408E-3G					◊		◊									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

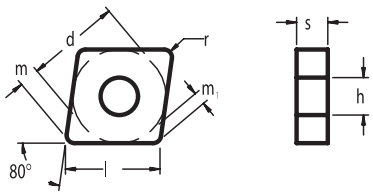


◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

CNGG



Dimensiones para CNGG, CNMA, CNMG y CNMM							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
090308	9,52	9,57	3,18	0,80	2,20	1,21	3,81
120401	12,70	12,90	4,76	0,10	3,47	1,91	5,16
120402	12,70	12,90	4,76	0,20	3,42	1,88	5,16
120404	12,70	12,90	4,76	0,40	3,30	1,81	5,16
120408	12,70	12,90	4,76	0,80	3,08	1,69	5,16
120412	12,70	12,90	4,76	1,20	2,86	1,57	5,16
120416	12,70	12,90	4,76	1,60	2,64	1,45	5,16
160608	15,88	16,10	6,35	0,80	3,97	2,18	6,35
160612	15,88	16,10	6,35	1,20	3,74	2,06	6,35
160616	15,88	16,10	6,35	1,60	3,52	1,94	6,35
160632	15,88	16,10	6,35	3,20	2,65	1,45	6,35
190608	19,05	19,40	6,35	0,80	4,85	2,66	7,92
190612	19,05	19,40	6,35	1,20	4,63	2,54	7,92
190616	19,05	19,40	6,35	1,60	4,41	2,42	7,92
190632	19,05	19,40	6,35	3,20	3,53	1,94	7,92

Geometría 3F



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CNGG120401F-3F								◊		◊						
CNGG120402F-3F								◊		◊						
CNGG120404F-3F								◊		◊		◊				
CNGG120408F-3F								◊		◊		◊				
CNGG120412F-3F								◊								
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

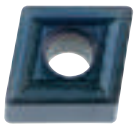
CNMA, CNMG

Sin rompe virutas



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CNMA120404E						♦										
CNMA120408E						♦	♦									
CNMA120412E						♦	♦									
CNMA120416E						♦										
CNMA160612E						♦	♦									
CNMA160632E						♦										
CNMA190612E						♦										
CNMA190616E						♦										
CNMA190632E						♦										

Geometría 91



CNMG120404E-91								◊		◊						
CNMG120408E-91								◊		◊						
CNMG120412E-91								◊		◊						

Geometría 1A



CNMG120402E-1A									◊							
CNMG120404E-1A	◊								◊		◊					
CNMG120408E-1A	◊										◊					
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◆ Aceros no aleados	M ◆ Aceros inoxidables	K ◆ Fundición	S ◆ Aleaciones refractarias
P ◆ Aceros aleados	M ◆ Inoxidables PH	N ◆ Aluminio y Aleaciones	H ◆ Materiales duros

STELLRAM®

CNMG

Geometría 2B



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CNMG120404E-2B		◆					◆									
CNMG120408E-2B	◆◆	◆					◆									
CNMG190612E-2B		◆														

Geometría 2N



CNMG090308E-2N	◆◆◆															
CNMG120404E-2N	◆◆◆	◆◆◆			◆◆◆			◆◆								
CNMG120408E-2N	◆◆◆	◆◆◆	◆◆		◆◆◆			◆◆						◆◆		
CNMG120412E-2N	◆◆◆	◆◆◆			◆◆◆			◆◆								
CNMG160608E-2N					◆◆◆											
CNMG160612E-2N		◆◆◆			◆◆◆											
CNMG190612E-2N		◆◆◆			◆◆◆											
CNMG190616E-2N					◆◆◆											

Geometría 3G



CNMG120404E-3G	◆◆	◆◆			◆◆		◆◆◆									
CNMG120408E-3G	◆◆	◆◆	◆◆◆	◆◆	◆◆		◆◆◆									
CNMG120412E-3G		◆◆	◆◆◆		◆◆		◆◆◆									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros

Geometría 3G *continuación*

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 CNMG160608E-3G		◊					◊									
CNMG160612E-3G	◊						◊									

Geometría 3J

CNMG120404E-3J		◊		◊					◊		◊					
CNMG120408E-3J		◊		◊					◊		◊					
CNMG120412E-3J				◊					◊		◊					
 CNMG120416E-3J				◊							◊					
CNMG160608E-3J									◊							
CNMG160612E-3J				◊					◊							
CNMG190612E-3J				◊												
CNMG190616E-3J				◊												

Geometría 3M

 CNMG120408E-3M			◊													
CNMG120412E-3M			◊													
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

CNMG

Geometría 4T

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CNMG120404E-4T		◊			◊		◊									
CNMG120408E-4T	◊	◊	◊	◊	◊		◊							◊		
CNMG120412E-4T	◊	◊	◊	◊	◊		◊									
CNMG120416E-4T	◊	◊		◊			◊									
CNMG160608E-4T		◊		◊			◊									
CNMG160612E-4T	◊	◊		◊	◊		◊							◊		
CNMG160616E-4T	◊	◊			◊											
CNMG190608E-4T	◊	◊		◊	◊		◊									
CNMG190612E-4T	◊	◊		◊	◊		◊							◊		
CNMG190616E-4T	◊	◊			◊									◊		



Geometría 4U

CNMG120408E-4U			◊			◊										
CNMG120412E-4U			◊			◊										
CNMG120416E-4U						◊										
CNMG160612E-4U						◊										
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 5V



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CNMG120408E-5V							◊									
CNMG120412E-5V					◊		◊									
CNMG160616E-5V																
CNMG190612E-5V					◊		◊									
CNMG190616E-5V					◊											

Geometría 4M



CNMM120408E-4M		◊														
CNMM190612E-4M	◊	◊														
CNMM190616E-4M		◊														
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

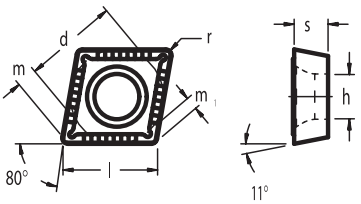
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

CPMT



Dimensiones para CPMT							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
060204	6,35	6,40	2,38	0,40	1,54	0,85	2,80

Geometría 73

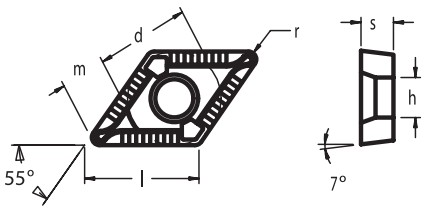
Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
CPMT060204E-73	◊				◊											



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros



Dimensiones para DCGT, DCMT y DCMW							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
070200	6,35	7,70	2,38	0,00	3,67	-	2,79
070201	6,35	7,70	2,38	0,10	3,58	-	2,79
070202	6,35	7,70	2,38	0,20	3,46	-	2,79
070204	6,35	7,70	2,38	0,40	3,24	-	2,79
070208	6,35	7,70	2,38	0,80	2,78	-	2,79
11T301	9,52	11,60	3,97	0,10	5,43	-	4,39
11T302	9,52	11,60	3,97	0,20	5,33	-	4,39
11T304	9,52	11,60	3,97	0,40	5,09	-	4,39
11T308	9,52	11,60	3,97	0,80	4,62	-	4,39
11T312	9,52	11,60	3,97	1,20	4,16	-	4,39
150404	12,70	15,50	4,76	0,40	6,93	-	5,45
150408	12,70	15,50	4,76	0,80	6,47	-	5,45

Geometría 62

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DCGT070200E-62											◊					
DCGT070201E-62											◊					
DCGT070202E-62											◊					
DCGT070204E-62											◊					◊
DCGT11T301E-62											◊					
DCGT11T302E-62											◊					
DCGT11T304E-62											◊					
DCGT11T308E-62											◊					
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

DCGT, DCMT

Geometría 64

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DCGT11T304F-64															◊	
DCGT11T308F-64															◊	

Geometría M

DCMT11T304E-M				◊									◊			◊
DCMT150404E-M				◊												
DCMT150408E-M				◊												

Geometría 3G

DCMT070202E-3G																
DCMT070204E-3G			◊		◊		◊									
DCMT070208E-3G					◊		◊									
DCMT11T302E-3G							◊									
DCMT11T304E-3G			◊				◊									
DCMT11T308E-3G			◊		◊		◊									
DCMT11T312E-3G							◊									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 73

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DCMT070202E-73	◊	◊													◊	
DCMT070204E-73	◊	◊			◊										◊	
DCMT11T304E-73	◊	◊		◊	◊								◊			
DCMT11T308E-73	◊	◊		◊	◊								◊			
DCMT150408E-73				◊												



Sin rompe virutas



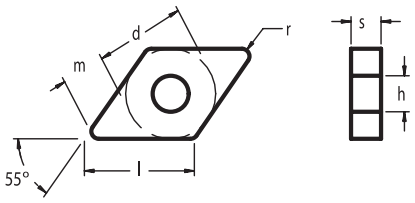
DCMW11T304E															◊	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P ◊ Aceros no aleados	M ◊ Aceros inoxidables	K ◊ Fundición	S ◊ Aleaciones refractarias
P ◊ Aceros aleados	M ◊ Inoxidables PH	N ◊ Aluminio y Aleaciones	H ◊ Materiales duros

DNGG



Dimensiones para DNGG, DNMA y DNMG							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
110404	9,52	11,00	4,76	0,40	5,08	-	4,39
110408	9,52	11,00	4,76	0,80	4,62	-	4,39
150401	12,70	15,50	4,76	0,10	7,29	-	5,16
150402	12,70	15,50	4,76	0,20	7,17	-	5,16
150404	12,70	15,50	4,76	0,40	6,93	-	5,16
150408	12,70	15,50	4,76	0,80	6,47	-	5,16
150412	12,70	15,50	4,76	1,20	6,01	-	5,16
150601	12,70	15,50	6,35	0,10	7,29	-	5,16
150602	12,70	15,50	6,35	0,20	7,17	-	5,16
150604	12,70	15,50	6,35	0,40	6,93	-	5,16
150608	12,70	15,50	6,35	0,80	6,47	-	5,16
150612	12,70	15,50	6,35	1,20	6,01	-	5,16
190608	15,88	19,40	6,35	0,80	8,32	-	6,35
190612	15,88	19,40	6,35	1,20	7,86	-	6,35

Geometría 3F

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DNGG150401F-3F								◊								
DNGG150402F-3F								◊								
DNGG150404F-3F								◊								
DNGG150408F-3F																
DNGG150601F-3F								◊								
DNGG150602F-3F								◊								
DNGG150604F-3F								◊								
DNGG150608F-3F										◊						



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Sin rompe virutas



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DNMA150608E						◆										

Geometría 1A



DNMG110404E-1A										◆						
DNMG150402E-1A									◆							
DNMG150404E-1A										◆						
DNMG150604E-1A										◆						
DNMG150608E-1A										◆						
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

DNMG

Geometría 2B



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DNMG150404E-2B	◆◆						◆									
DNMG150408E-2B	◆◆	◆◆					◆									
DNMG150412E-2B							◆									
DNMG150608E-2B							◆									

Geometría 2N



DNMG110404E-2N	◆◆◆				◆◆◆											
DNMG110408E-2N					◆◆◆											
DNMG150404E-2N		◆◆◆			◆◆◆			◆◆◆								
DNMG150408E-2N	◆◆◆	◆◆◆			◆◆◆			◆◆◆								
DNMG150412E-2N		◆◆◆														
DNMG150608E-2N	◆◆◆	◆◆◆	◆◆		◆◆◆											
DNMG150612E-2N		◆◆◆	◆◆													
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 3G



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DNMG150404E-3G	◊	◊	◊				◊									
DNMG150408E-3G	◊	◊	◊		◊		◊									
DNMG150412E-3G			◊				◊									
DNMG150604E-3G	◊	◊					◊									
DNMG150608E-3G	◊	◊					◊									
DNMG150612E-3G	◊															

Geometría 3J



DNMG110404E-3J											◊					
DNMG150404E-3J											◊					
DNMG150408E-3J				◊					◊		◊					
DNMG150412E-3J		◊														
DNMG150604E-3J				◊					◊		◊					
DNMG150608E-3J				◊					◊		◊					
DNMG150612E-3J				◊												
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

DNMG

Geometría 4T



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
DNMG150404E-4T		◊			◊											
DNMG150408E-4T	◊	◊		◊	◊		◊							◊		
DNMG150412E-4T		◊			◊		◊									
DNMG150604E-4T	◊															
DNMG150608E-4T	◊	◊		◊	◊		◊									
DNMG150612E-4T	◊															
DNMG190608E-4T	◊	◊					◊									
DNMG190612E-4T	◊	◊			◊		◊									

Geometría 4U

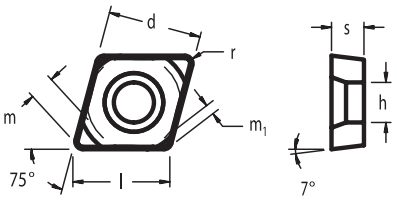


DNMG150408E-4U					◊											
DNMG150412E-4U					◊											
DNMG150608E-4U					◊											
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros



Dimensiones para ECMT y ECMW							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
09T304	9,52	9,85	3,97	0,40	2,80	1,13	4,40
09T308	9,52	9,85	3,97	0,80	2,55	1,03	4,40
12T304	12,00	12,40	3,97	0,40	3,60	1,45	5,40
12T308	12,00	12,40	3,97	0,80	3,34	1,35	5,40
12T312	12,00	12,40	3,97	1,20	3,08	1,25	5,40
16M608	15,88	16,40	6,00	0,80	4,59	1,86	6,40
16M612	15,88	16,40	6,00	1,20	4,33	1,75	6,40

Geometría G

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
ECMT12T304E-G																◊
ECMT12T308E-G				◊											◊	
ECMT16M608E-G																◊



Geometría 73

ECMT09T304E-73					◊											
ECMT09T308E-73				◊	◊								◊			
ECMT12T304E-73	◊	◊			◊								◊			
ECMT12T308E-73	◊	◊		◊	◊								◊			◊
ECMT12T312E-73					◊											
ECMT16M608E-73		◊		◊	◊											
ECMT16M612E-73		◊		◊	◊											
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

ECMW

Geometría W

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
ECMW12T304E															◊	
ECMW12T308E															◊	

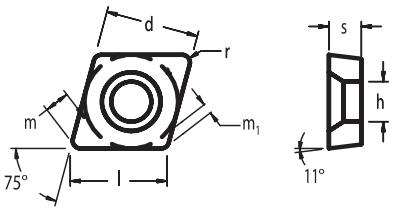


◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

EPEW



Dimensiones para EPEW, EPEX, EPGT, EPMT, EPMW y EPMX							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
040202	4,76	4,93	2,38	0,20	1,40	0,56	2,30
040204	4,76	4,93	2,38	0,40	1,27	0,51	2,30
060202	6,35	6,54	2,38	0,20	1,91	0,77	2,80
060204	6,35	6,54	2,38	0,40	1,78	0,72	2,80
08M300	8,00	8,20	3,00	0,00	2,57	1,04	4,20
08M301	8,00	8,20	3,00	0,10	2,50	1,02	4,20
08M302	8,00	8,20	3,00	0,20	2,43	0,98	4,20
08M304	8,00	8,20	3,00	0,40	2,30	0,93	4,20
08M308	8,00	8,20	3,00	0,80	2,04	0,83	4,20

Sin rompe virutas



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
EPEW040202F															♦	
EPEW040204F															♦	
EPEW060202F															♦	
EPEW060204F															♦	
EPEW08M300F															♦	
EPEW08M302F															♦	
EPEW08M304F															♦	
EPEW08M308F															♦	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

EPEX

Geometría X

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
EPEX060202FR															◆	
EPEX060202FL															◆	
EPEX060202FR															◆	
EPEX060204FL															◆	
EPEX060204FR															◆	
EPEX08M300FL													◆			
EPEX08M300FR													◆			
EPEX08M301FL													◆			
EPEX08M301FR													◆			
EPEX08M302FL															◆	
EPEX08M302FR													◆		◆	
EPEX08M304FL													◆		◆	
EPEX08M304FR															◆	
EPEX08M308FL															◆	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		



Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 15



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
EPEX040202F-15															◊	

Geometría 62



EPGT040202E-62	◊										◊		◊		◊	
EPGT040204E-62											◊					
EPGT060202E-62	◊										◊		◊			
EPGT060204E-62											◊		◊			
EPGT08M300E-62											◊					
EPGT08M301E-62											◊					
EPGT08M302E-62	◊										◊		◊			
EPGT08M304E-62	◊										◊		◊			
EPGT08M308E-62											◊					
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

EPMT, EPMW

Geometría T

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
EPMT060202E	◊	◊			◊								◊		◊	
EPMT060204E	◊	◊		◊	◊								◊		◊	
EPMT08M302E	◊				◊								◊		◊	◊
EPMT08M304E	◊			◊	◊								◊		◊	◊
EPMT08M308E	◊												◊		◊	

Geometría 73

EPMT08M302E-73	◊	◊			◊								◊			◊
EPMT08M304E-73	◊	◊		◊	◊								◊			
EPMT08M308E-73	◊	◊		◊	◊								◊			◊

Sin rompe virutas

EPMW040202E															◊	
EPMW040204E													◊		◊	
EPMW08M302E															◊	
EPMW08M304E				◊											◊	
EPMW08M308E				◊											◊	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría X

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
EPMX08M302EL					◊											
EPMX08M302ER					◊											
EPMX08M302FL															◊	
EPMX08M304FL															◊	
EPMX08M302FR															◊	
EPMX08M304FR													◊		◊	



Geometría 15



EPMX040202F-15															◊	
EPMX040204F-15															◊	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

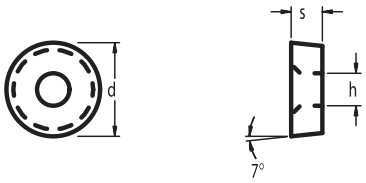
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

RCEW, RCMT



Dimensiones para RCEW y RCMT							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
0602M0	6,00	-	2,38	-	-	-	2,79
09T300	9,53	-	3,97	-	-	-	3,40
10T3M0	10,00	-	3,97	-	-	-	4,39
1204M0	12,00	-	4,76	-	-	-	5,50
120400	12,70	-	4,76	-	-	-	4,39
1606M0	16,00	-	6,35	-	-	-	5,51
190600	19,05	-	6,35	-	-	-	6,50
2006M0	20,00	-	6,35	-	-	-	6,50

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
RCEW0602M0F															♦	

Geometría T



RCMT0602M0E	◊				◊											
RCMT10T3M0E	◊				◊											
RCMT1204M0E	◊				◊											
RCMT1606M0E					◊											
RCMT2006M0E	◊				◊											

Geometría 2N



RCMT190600E-2N	◊				◊											
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

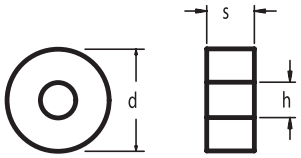
Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ◊	Aceros no aleados	M ◊	Aceros inoxidables	K ◊	Fundición	S ◊	Aleaciones refractarias
P ◊	Aceros aleados	M ◊	Inoxidables PH	N ◊	Aluminio y Aleaciones	H ◊	Materiales duros

Geometría 3G

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 RCMT09T300E-3G							◊									
RCMT10T3M0E-3G							◊									
RCMT120400E-3G							◊									

◊ Indica existencia en almacén y gama de aplicaciones.



Dimensiones para RNMG							
Tamaño	d mm	l mm	s mm	r mm	m mm	m1 mm	h mm
250900	25,40	-	9,52	-	-	-	9,12

Geometría 4T

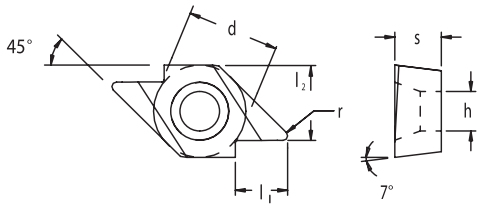
Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 RNMG250900E-4T		◊														

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

SBET



Dimensiones para SBET						
Tamaño	d mm	l_1 mm	l_2 mm	r mm	s mm	h mm
090305R	6,50	7,95	5,01	0,05	4,00	3,40
090315R	6,50	7,95	4,86	0,15	4,00	3,40
090340R	6,50	7,95	4,50	0,40	4,00	3,40

Torneado en retroceso

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia																
SBET090305R											◊					◊
SBET090315R											◊					
SBET090340R											◊					

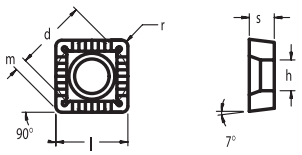


NOTA: Las referencias para estas plaquitas son específicas de Stellram ya que ISO 1832 no prevé este tipo de plaquita.

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros



Dimensiones para SCMT, SCMW y SCMX							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
09T304	9,53	9,53	3,97	0,40	1,81	-	4,40
09T308	9,53	9,53	3,97	0,80	1,64	-	4,40
12M504	12,70	12,70	5,00	0,40	2,47	-	5,50
12M508	12,70	12,70	5,00	0,80	2,30	-	5,50
12M512	12,70	12,70	5,00	1,20	2,14	-	5,50
120404	12,70	12,70	4,76	0,40	2,47	-	5,50
120408	12,70	12,70	4,76	0,80	2,30	-	5,50
120412	12,70	12,70	4,76	1,20	2,14	-	5,50

Geometría T

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SCMT09T304E													◆			
SCMT09T308E													◆		◆	
SCMT12M504E													◆			◆◆
SCMT12M508E	◆◆ ◆			◆◆ ◆	◆◆ ◆								◆		◆	◆◆



Geometría 3G

SCMT09T304E-3G				◆◆ ◆			◆◆ ◆									
SCMT09T308E-3G			◆◆ ◆		◆◆		◆◆ ◆									
SCMT120408E-3G					◆◆		◆◆ ◆									
SCMT120412E-3G					◆◆											
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

SCMT, SCMW, SCMX

Geometría 73



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SCMT09T304E-73		◊			◊											
SCMT09T308E-73		◊			◊											
SCMT12M504E-73		◊			◊											
SCMT12M508E-73	◊	◊		◊	◊											◊

Sin rompe virutas



SCMW09T304E															◊	
SCMW09T308E															◊	
SCMW12M508E															◊	

Geometría X



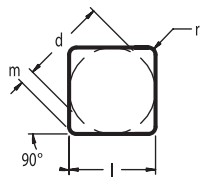
SCMX09T304FL															◊	
SCMX09T304FL															◊	
SCMX09T308FL															◊	
SCMX09T308FR															◊	
SCMX12M508FL															◊	
SCMX12M508FR															◊	
SCMX12M512ER															◊	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

SNGN, SNUN



Dimensiones para SNGN y SNUN							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
120412	12,70	12,70	4,76	1,20	2,14	-	-
120432	12,70	12,70	4,76	3,20	1,30	-	-
190412	19,05	19,05	4,76	1,20	3,45	-	-

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SNGN120432E						♦										

Sin rompe virutas

SNUN120412E		♦														
SNUN190412E		♦														
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

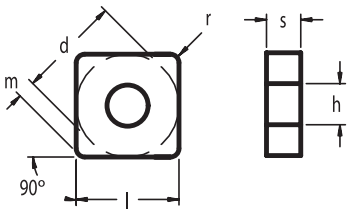
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

SNMA



Dimensiones para SNMA, SNMG, SNMM							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
090308	9,53	9,53	3,18	0,80	1,64	-	3,81
120408	12,70	12,70	4,76	0,80	2,30	-	5,16
120412	12,70	12,70	4,76	1,20	2,14	-	5,16
120416	12,70	12,70	4,76	1,60	1,96	-	5,16
150608	15,88	15,88	6,35	0,80	2,96	-	6,35
150612	15,88	15,88	6,35	1,20	2,80	-	6,35
150616	15,88	15,88	6,35	1,60	2,63	-	6,35
190612	19,05	19,05	6,35	1,20	3,45	-	7,94
190616	19,05	19,05	6,35	1,60	3,29	-	7,94
190632	19,05	19,05	6,35	3,20	2,64	-	7,94

Sin rompe virutas



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SNMA120408E						♦										
SNMA120412E						♦										
SNMA120416E		♦														
SNMA190616E						♦	♦									
SNMA190632E						♦	♦									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

♢ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 91

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SNMG120408E-91								◊								

Geometría 2B



SNMG120408E-2B							◊									

Geometría 2N



SNMG120408E-2N		◊			◊			◊								
SNMG120412E-2N					◊											
SNMG150612E-2N	◊				◊											
SNMG190612E-2N		◊			◊											

Geometría 3G



SNMG090308E-3G							◊									
SNMG120408E-3G		◊					◊									
SNMG120412E-3G	◊															
SNMG120416E-3G		◊														
SNMG190612E-3G	◊															
SNMG190616E-3G														◊		
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

SNMG

Geometría 3J



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SNMG120408E-3J		◊							◊		◊					
SNMG120412E-3J									◊		◊					
SNMG150612E-3J		◊		◊												
SNMG190616E-3J				◊												

Geometría 4T



SNMG090308E-4T		◊														
SNMG120404E-4T																
SNMG120408E-4T	◊	◊		◊	◊		◊							◊		
SNMG120412E-4T	◊	◊		◊	◊											
SNMG120416E-4T		◊														
SNMG150608E-4T		◊														
SNMG150612E-4T	◊	◊			◊											
SNMG150616E-4T				◊												
SNMG190612E-4T	◊	◊		◊	◊		◊									
SNMG190616E-4T		◊		◊	◊		◊							◊		
SNMG250924E-4T		◊														
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

SNMG, SNMM

Geometría 4U

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 SNMG120408E-4U						♦										
SNMG120412E-4U						♦										

Geometría 4M

 SNMM190612E-4M	◊	◊														
SNMM190616E-4M	◊	◊			◊											
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

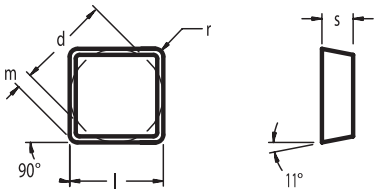
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

SPGN, SPUN



Dimensiones para SPGN y SPUN							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
090308	9,53	9,53	3,18	0,80	1,64	-	-
120308	12,70	12,70	3,18	0,80	2,30	-	-
120312	12,70	12,70	3,18	1,20	2,14	-	-
120412	12,70	12,70	4,76	1,20	2,14	-	-
190412	19,05	19,05	4,76	1,20	3,43	-	-
190416	19,05	19,05	4,76	1,60	3,28	-	-

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
SPGN090308E		♦														
SPGN120308E		♦														
SPGN120308F														♦		
SPGN120312F														♦		
SPGN120412E							♦									
SPGN190412E							♦									
SPGN190412F														♦		
SPGN190416F														♦		



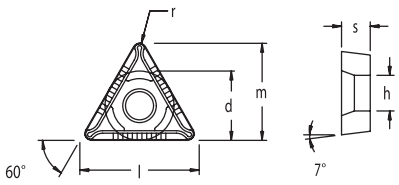
Sin rompe virutas

	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
SPUN120308E		♦														
SPUN190412E		♦														
SPUN190412F														♦		
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		



Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros



Dimensiones para TCMT, TCMW y TCMX							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
110202	6,35	11,00	2,38	0,20	9,32	-	2,80
110204	6,35	11,00	2,38	0,40	9,13	-	2,80
110208	6,35	11,00	2,38	0,80	8,73	-	2,80
16T304	9,53	16,50	3,97	0,40	13,89	-	4,40
16T308	9,53	16,50	3,97	0,80	13,49	-	4,40
22M504	12,70	22,00	5,00	0,40	18,65	-	5,50
22M508	12,70	22,00	5,00	0,80	18,26	-	5,50

Geometría T

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TCMT16T304E	◊				◊										◊	
TCMT16T308E	◊				◊								◊		◊	◊
TCMT22M508E													◊			

Geometría 3G

TCMT110202E-3G																
TCMT110204E-3G				◊	◊		◊									
TCMT110208E-3G					◊		◊									
TCMT16T304E-3G					◊		◊									
TCMT16T308E-3G				◊	◊		◊									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

TCMT, TCMW, TCMX

Geometría 73



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TCMT110202E-73	◆◆◆◆															
TCMT110204E-73	◆◆◆◆	◆◆◆◆														
TCMT16T304E-73	◆◆◆◆	◆◆◆◆			◆◆◆◆								◆◆			
TCMT16T308E-73	◆◆◆◆	◆◆◆◆			◆◆◆◆								◆◆			
TCMT22M508E-73					◆◆◆◆											

Sin rompe virutas



TCMW16T304E															◆	
TCMW22M508E															◆	

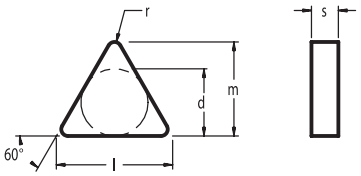
Geometría X



TCMX16T304FL															◆◆◆◆	
TCMX16T304FR															◆◆◆◆	
TCMX16T308FL															◆◆◆◆	
TCMX16T308FR															◆◆◆◆	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P ◆	Aceros no aleados	M ◆	Aceros inoxidables	K ◆	Fundición	S ◆	Aleaciones refractarias
P ◆	Aceros aleados	M ◆	Inoxidables PH	N ◆	Aluminio y Aleaciones	H ◆	Materiales duros



Dimensiones para TNGN							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
160308	9,53	16,50	3,18	0,80	13,49	-	-

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TNGN160308E						◆										

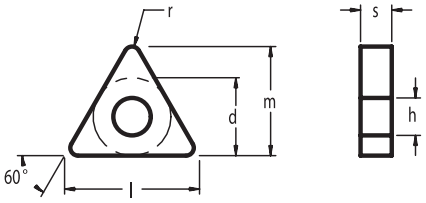


◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales				
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

TNMA



Dimensiones para TNMA, TNMG y TNMM							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
110304	6,35	11,00	3,18	0,40	9,12	-	2,36
160304	9,53	16,50	3,18	0,40	13,89	-	3,81
160308	9,53	16,50	3,18	0,80	13,49	-	3,81
160312	9,53	16,50	3,18	1,20	13,10	-	3,81
160402	9,53	16,50	4,76	0,20	14,08	-	3,81
160404	9,53	16,50	4,76	0,40	13,89	-	3,81
160408	9,53	16,50	4,76	0,80	13,49	-	3,81
160412	9,53	16,50	4,76	1,20	13,10	-	3,81
220404	12,70	22,00	4,76	0,40	16,64	-	5,16
220408	12,70	22,00	4,76	0,80	18,26	-	5,16
220412	12,70	22,00	4,76	1,20	17,86	-	5,16
220416	12,70	22,00	4,76	1,60	17,46	-	5,16
220432	12,70	22,00	4,76	3,20	15,88	-	5,16
270608	15,88	27,50	6,35	0,80	23,01	-	6,35
270612	15,88	27,50	6,35	1,20	22,62	-	6,35
270616	15,88	27,50	6,35	1,60	22,23	-	6,35
270632	15,88	27,50	6,35	3,20	20,63	-	6,35
330924	19,05	33,50	9,52	2,40	26,19	-	7,92

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TNMA160408E	♦					♦	♦									
TNMA220408E						♦										
TNMA220412E						♦										
TNMA220416E	♦					♦										



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 1A

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TNMG160308E-1A									◊							
TNMG160404E-1A											◊					
TNMG160408E-1A									◊		◊					



Geometría 2B

TNMG160404E-2B							◊									
TNMG160408E-2B							◊									
TNMG220408E-2B		◊														
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

TNMG

Geometría 2N



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TNMG160404E-2N	◊															
TNMG160408E-2N	◊	◊			◊											
TNMG220404E-2N	◊															
TNMG220408E-2N	◊	◊			◊											
TNMG220412E-2N					◊											

Geometría 3G



TNMG160304E-3G		◊														
TNMG160308E-3G		◊					◊									
TNMG160404E-3G		◊			◊		◊									
TNMG160408E-3G	◊	◊	◊				◊									
TNMG220404E-3G		◊					◊									
TNMG220408E-3G	◊	◊					◊									
TNMG270608E-3G		◊														
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 3J

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TNMG160404E-3J				◊					◊		◊					
TNMG160408E-3J		◊		◊					◊		◊					
TNMG220408E-3J				◊					◊							
TNMG220412E-3J									◊							



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

TNMG

Geometría 4T

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TNMG160304E-4T		◊					◊									
TNMG160308E-4T	◊	◊			◊											
TNMG160404E-4T		◊					◊									
TNMG160408E-4T	◊	◊		◊	◊		◊									
TNMG160412E-4T	◊				◊											
TNMG220404E-4T		◊			◊		◊									
TNMG220408E-4T	◊	◊		◊	◊		◊							◊		
TNMG220412E-4T		◊			◊		◊									
TNMG220416E-4T		◊			◊											
TNMG220432E-4T		◊														
TNMG270608E-4T		◊		◊			◊									
TNMG270612E-4T		◊			◊		◊									
TNMG270616E-4T		◊			◊											
TNMG270632E-4T		◊														
TNMG330924E-4T				◊												
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 4U

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 TNMG160408E-4U						♦										
TNMG160412E-4U						♦										

Geometría 4M

 TNMM220412E-4M		◊														
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

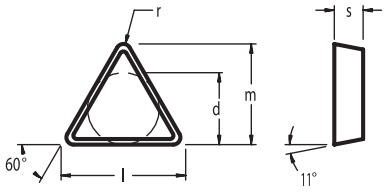
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

TPGN



Dimensiones para TPGN y TPUN							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
110304	6,35	11,00	3,18	0,40	9,13	-	-
160304	9,53	16,50	3,18	0,40	13,89	-	-
160308	9,53	16,50	3,18	0,80	13,49	-	-
160312	9,53	16,50	3,18	1,20	13,10	-	-
160316	9,53	16,50	3,18	1,60	12,70	-	-
220408	12,70	22,00	4,76	0,80	18,26	-	-
220412	12,70	22,00	4,76	1,20	17,86	-	-
220416	12,70	22,00	4,76	1,60	17,46	-	-

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TPGN160304E		♦					♦									
TPGN160304F														♦		
TPGN160308E		♦					♦									
TPGN160308F														♦		
TPGN160312E		♦					♦									
TPGN220404E		♦					♦									
TPGN220408E		♦														
TPGN220408F														♦		
TPGN220412E		♦														
TPGN220412F														♦		
TPGN220416F														♦		



◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

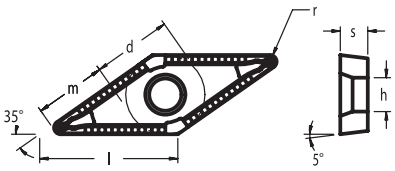
Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Sin rompe virutas

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
TPUN110304E							♦									
TPUN160304E		♦					♦									
TPUN160308E		♦					♦									
TPUN220408E		♦					♦									
TPUN220412E		♦														



◊ Indica existencia en almacén y gama de aplicaciones.



Dimensiones para VBMT							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
160402	9,53	16,60	4,76	0,20	10,59	-	4,40
160404	9,53	16,60	4,76	0,40	10,14	-	4,40
160408	9,53	16,60	4,76	0,80	9,22	-	4,40

Geometría 3G

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
VBMT160402E-3G							♦									
VBMT160404E-3G			♦		♦		♦									
VBMT160408E-3G			♦		♦		♦									



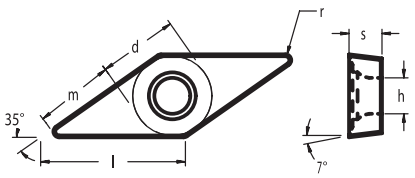
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

VCGT



Dimensiones para VCGT, VCGW, VCMT y VCMW							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
130301	7,94	13,80	3,18	0,10	9,00	-	3,40
130302	7,94	13,80	3,18	0,20	8,76	-	3,40
130304	7,94	13,80	3,18	0,40	8,31	-	3,40
130308	7,94	13,80	3,18	0,80	7,39	-	3,40
160404	9,53	16,60	4,76	0,40	10,14	-	4,40
160408	9,53	16,60	4,76	0,80	9,22	-	4,40

Geometría M

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 VCGT130302E-m	◊	◊														
VCGT130302F-m															◊	
VCGT130304E-m	◊	◊													◊	

Geometría 62

 VCGT130301E-62											◊					
VCGT130302E-62											◊					
VCGT130304E-62											◊					
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

VCGT, VCGW, VCMT, VCMW

Geometría 64

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 VCGT160408F-64															◆	

Geometría 66

 VCGT130302F-66															◆	
VCGT130304F-66															◆	
VCGT130308F-66															◆	

Sin rompe virutas

 VCGW130304F															◆	

Geometría M

 VCMT160404E-m				◆◆◆	◆◆◆								◆◆◆			
VCMT160408E-m				◆◆◆	◆◆◆								◆◆◆			◆◆◆

Sin rompe virutas

 VCMW160408E															◆	
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

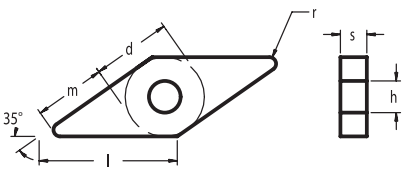
Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

VNGG, VNMA



Dimensiones para VNGA, VNGG, VNMA y VNMG							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
160401	9,53	16,60	4,76	0,10	10,92	-	3,81
160402	9,53	16,60	4,76	0,20	10,66	-	3,81
160404	9,53	16,60	4,76	0,40	10,14	-	3,81
160408	9,53	16,60	4,76	0,80	9,22	-	3,81
160412	9,53	16,60	4,76	1,20	8,31	-	3,81
220404	12,70	22,00	4,76	0,40	13,84	-	5,16
220408	12,70	22,00	4,76	0,80	12,93	-	5,16

Geometría 3F

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
VNGG160401F-3F								◊		◊						
VNGG160402F-3F								◊		◊						
VNGG160404F-3F								◊		◊		◊				
VNGG160408F-3F								◊		◊		◊				

Sin rompe virutas

VNMA220408E							◊									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 1A



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
VNMG160402E-1A											◊					
VNMG160404E-1A											◊					
VNMG160408E-1A		◊														

Geometría 2B



VNMG160408E-2B							◊									
VNMG220404E-2B		◊														
VNMG220408E-2B		◊														

Geometría 2N



VNMG160404E-2N					◊			◊								
VNMG160408E-2N	◊				◊			◊								
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

VNMG

Geometría 3G

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
VNMG160404E-3G	◆◆	◆◆	◆◆◇		◆◆		◆◆									
VNMG160408E-3G	◆◆	◆◆	◆◆◇				◆◆									
VNMG160412E-3G	◆◆		◆◆◇													
VNMG220404E-3G		◆◆					◆◆									
VNMG220408E-3G	◆◆	◆◆					◆◆									

Geometría 3J

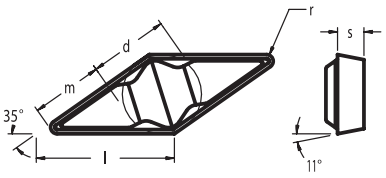
VNMG160408E-3J				◇◇◇					◇◇◇		◇◇◇					
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◇ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

VPGR, VPMR



Dimensiones para VPGR y VPMR						
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm
160404	9,53	16,60	4,76	0,40	10,15	-
160408	9,53	16,60	4,76	0,80	9,23	-

Geometría R

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 VPGR160404E							◊									
VPGR160408E							◊									

Geometría 3G

 VPMR160408E-3G							◊									
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

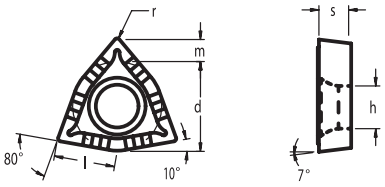
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

WCMT



Dimensiones para WCMT							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
06T308	9,53	6,52	3,97	0,80	2,20	-	4,40

Geometría 3G

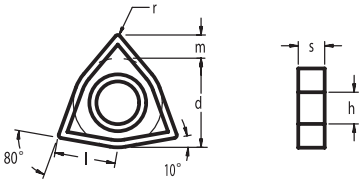
Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 WCMT06T308E-3G							◊									

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

WNGG, WNMA



Dimensiones para WNGG, WNMA y WNMG							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
060404	9,53	6,52	4,76	0,40	2,43	-	3,81
060408	9,53	6,52	4,76	0,80	2,21	-	3,81
080401	12,70	8,69	4,76	0,10	3,45	-	5,16
080402	12,70	8,69	4,76	0,20	3,40	-	5,16
080404	12,70	8,69	4,76	0,40	3,30	-	5,16
080408	12,70	8,69	4,76	0,80	3,09	-	5,16
080412	12,70	8,69	4,76	1,20	2,87	-	5,16

Geometría 3F

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 WNGG080401F-3F								◊								
WNGG080402F-3F								◊								
WNGG080404F-3F								◊				◊				
WNGG080408F-3F								◊				◊				

Sin rompe virutas

 WNMA080408E						◊										
WNMA080412E						◊										
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

WNMG

Geometría 1A



Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
WNMG060404E-1A											◊					
WNMG060408E-1A	◊															
WNMG080408E-1A									◊							

Geometría 2N



WNMG060404E-2N					◊											
WNMG060408E-2N	◊	◊	◊		◊											
WNMG080404E-2N	◊	◊			◊			◊								
WNMG080408E-2N	◊	◊			◊			◊								
WNMG080412E-2N	◊				◊			◊								

Geometría 3G



WNMG060408E-3G	◊															
WNMG080404E-3G							◊									
WNMG080408E-3G	◊	◊	◊		◊		◊									
WNMG080412E-3G			◊													
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Geometría 3J

Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
WNMG060404E-3J									◊		◊					
WNMG060408E-3J		◊		◊					◊		◊					
WNMG080404E-3J				◊							◊					
WNMG080408E-3J				◊					◊		◊					
WNMG080412E-3J									◊		◊					



Geometría 3M



WNMG080408E-3M			◊													
WNMG080412E-3M			◊													

Geometría 4T



WNMG080408E-4T	◊	◊	◊	◊	◊		◊									
WNMG080412E-4T	◊	◊		◊	◊											

Geometría 4U



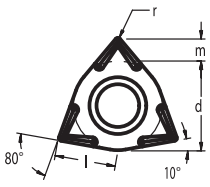
WNMG080408E-4U			◊			◊										
WNMG080412E-4U			◊			◊										
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Calidades	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		

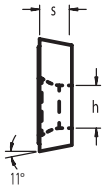
◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

WPMT





Dimensiones para WPMT							
Tamaño	d mm	l mm	s mm	r mm	m mm	m_1 mm	h mm
020102	3,97	2,92	1,59	0,20	0,99	-	1,95
050304	7,94	5,43	3,18	0,40	1,98	-	3,40

Geometría 61

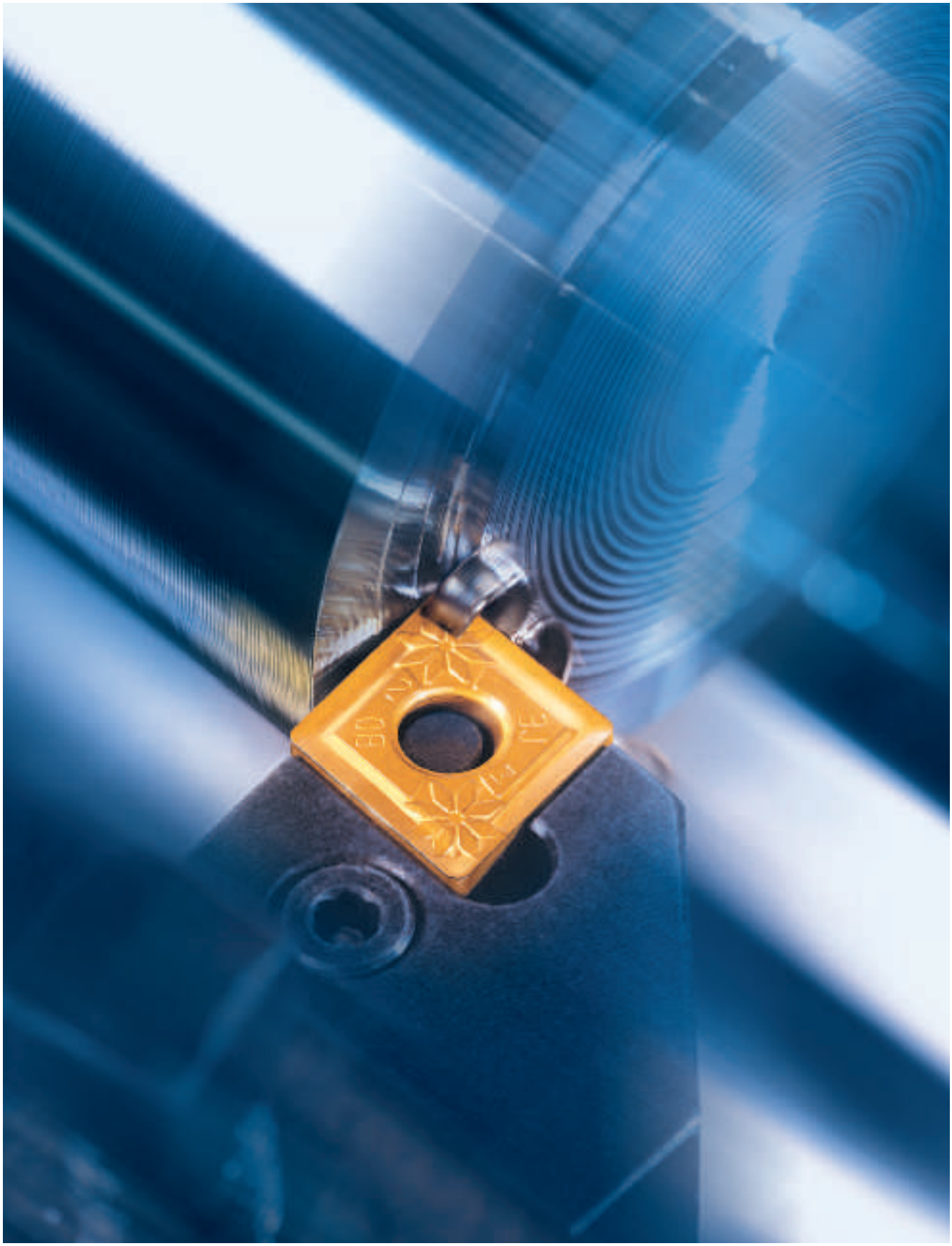
Calidades	RECUBRIMIENTO CVD							RECUBRIMIENTO PVD						SIN RECUBRIR		
	NL25	NL30	NL37	NL40	NL92	SC1519	MP37	SP0864	SP3036	SP3064	SP4036 (DFZ)	SP4064	SFZ	H21	GH1	GH2
DESIGNACION ISO DE CALIDADES	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HC	HW	HF	HF
Referencia ISO																
 WPMT020102E-61													◆			
WPMT050304E-61													◆			

◊ Indica existencia en almacén y gama de aplicaciones.

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros



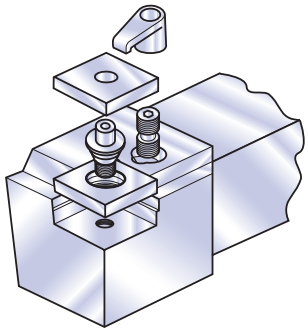
Portaherramientas de exteriores



Los Portaherramientas Stellram están disponibles en todos los tamaños de mango mas populares cubriendo la mayoría de las áreas de aplicación.

Existen 3 métodos de sujeción para cada necesidad.

Amarre con brida y perno

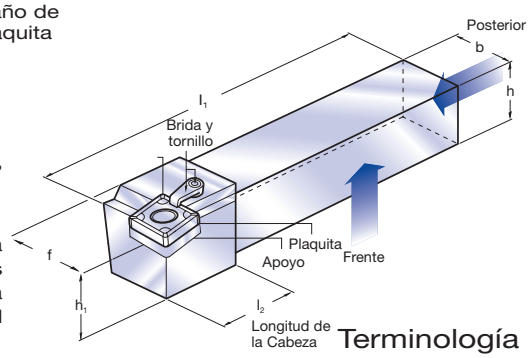


Plaquita tipo | Angulo de Incidencia | Tamaño de la plaquita

M C L N R - 25 25 M 12

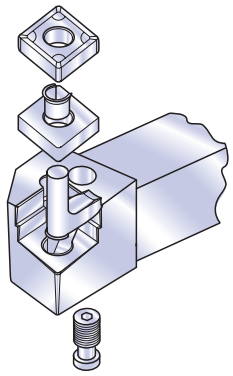
El tipo de amarre con brida y perno “M” para plaquitas negativas ISO.

Un sistema de doble fijación para condiciones difíciles, estas herramientas combinan un perno excéntrico y una brida en la cara superior para una seguridad extra.



Terminología

Amarre con palanca

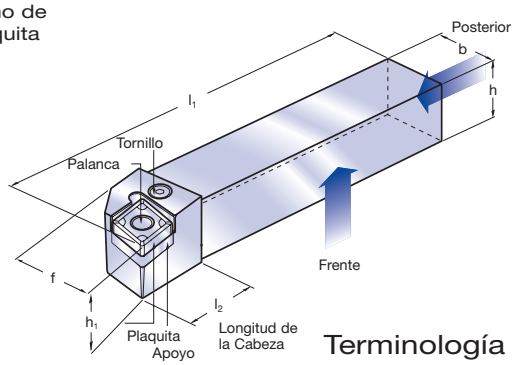


Plaquita tipo | Angulo de Incidencia | Tamaño de la plaquita

P D J N R 2 0 2 0 K 15

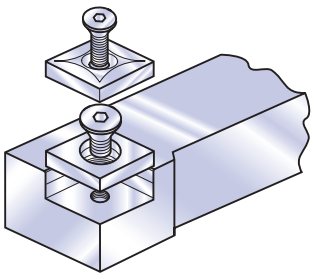
El sistema “P”, amarre con palanca para plaquitas negativas ISO.

La presión mecánica de la palanca sujeta la plaquita en la dirección de la fuerza principal de corte. La ausencia de interferencia de componentes de fijación permite la pronta evacuación de la viruta así como el cambio de arista o plaquita.



Terminología

Tornillo de apriete

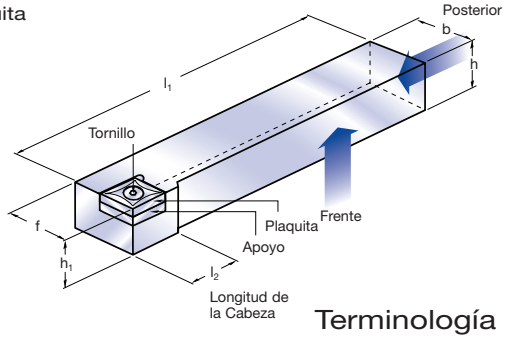


Plaquita tipo | Angulo de Incidencia | Tamaño de la plaquita

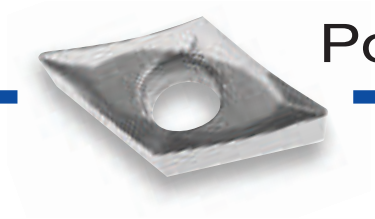
S D J C R 1 0 1 0 M 07

El innovador programa de Stellram Posicut® “S” para plaquitas positivas ISO.

El sistema de sujeción por tornillo utiliza tornillos de calidad superior que sujetan firmemente las plaquitas en la dirección de la fuerza principal.



Terminología



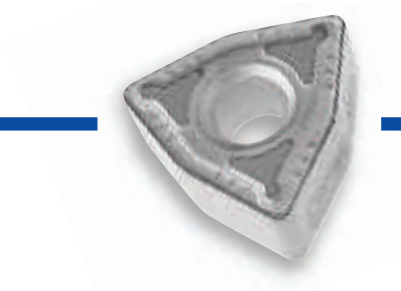
Portaherramientas de exteriores

Plaquita tipo	Angulo de Corte (°)	Brida de amarre	Palanca de amarre	Posicut®	Tamaño del mango											
					06 06	08 08	10 10	12 12	14 14	16 16	20 20	25 25	32 25	32 32	40 40	50 50
CC_06	90			SCAC			■									
	95			SCLC			■									
CC_09	95			SCLC				■		■	■					
	90			SCAC				■		■						
CC_12	95			SCLC							■	■				
	90			SCAC							■					
CN_12	95	MCLN									■	■	■			
	95		PCLN							■	■	■	■	■		
	75		PCKN								■	■	■			
	75		PCBN								■	■				
	45		PCSN								■	■				
CN_16	95		PCLN									■	■	■	■	
	75		PCBN									■	■	■		
	45		PCSN									■	■			
CN_19	95		PCLN									■	■	■	■	
	75		PCKN											■		
	75		PCBN											■	■	
	45		PCSN										■	■		
DC_07	93			SDJC			■	■		■	■					
	90			SDAC			■									
	63			SDNC			■	■								
DC_11	93			SDJC			■	■		■	■	■				
	90			SDAC			■	■		■	■					
	63			SDNC				■		■	■	■				
DC_15	93			SDJC							■	■				
DN_11	93		PDJN							■	■	■	■			
DN_15	93		PDJN								■	■	■	■		
	63		PDNN								■	■	■			
EP_06	90			SEAP		■										
EP_08	97.5			SELP			■	■		■	■	■				
	90			SEAP			■	■		■	■					
	90			SEGP		■	■	■								
	45			SEDP			■	■								
	45			SESP			■	■								
EC_12	97.5			SELC						■	■	■				
EC_16	97			SEJC								■				
KN_19	93			SKJN								■				
RC_06				SRDC						■	■					
			SRSC						■							
RC_10				SRDC							■	■				
			SRSC							■						
RC_12				SRDC								■	■			
			SRSC								■					
RC_16				SRDC										■		
RC_20				SRDC										■		

Portaherramientas de exteriores



Plaquita tipo	Angulo de Corte (°)	Brida de amarre	Palanca de amarre	Posicut®	Tamaño del mango											
					06 06	08 08	10 10	12 12	14 14	16 16	20 20	25 25	32 25	32 32	40 40	50 50
RN_12			PRSN									■				
RN_19			PRSN											■		
RN_25			PRSN												■	
SC_09	75			SSBC				■		■						
	45			SSSC				■		■						
SC_12	75			SSBC							■	■				
	45			SSSC							■	■				
SN_12	75		PSBN								■	■	■			
	45	MSSN									■	■	■			
	45		PSDN								■	■		■		
	45		PSSN								■	■	■			
SN_15	75		PSBN									■		■		
	45		PSSN									■		■		
SN_19	75		PSBN											■	■	
	45		PSDN										■			
	45		PSSN											■	■	
SN_25	75		PSBN												■	
TC_11	93			STJC				■		■						
TC_16	93			STJC						■	■	■				
	90			STCC								■		■		



Portaherramientas de exteriores

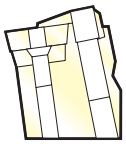
Plaquita tipo	Angulo de Corte (°)	Brida de amarre	Palanca de amarre	Posicut®	Tamaño del mango											
					06 06	08 08	10 10	12 12	14 14	16 16	20 20	25 25	32 25	32 32	40 40	50 50
TN_16	93	MTJN									■	■				
	90		PTGN								■	■	■			
	60	MTEN									■	■	■			
TN_22	93	MTJN										■		■		
	90		PTGN									■				
	60	MTEN										■	■	■		
VB_16	93			SVJB							■	■				
VC_13	93			SVJC				■		■	■	■				
	90			SVAC			■	■		■	■					
	72.5			SVVC			■	■		■	■					
VC_16	93			SVJC						■	■	■				
	72.5			SVVC							■	■				
	107.5			SVHC							■	■	■			
VN_16	72.5	MVVN									■	■				
	93	MVJN									■	■	■			
	117.5	MVPN									■	■				
WN_06	95	MWLN								■	■	■				
	95	PWLN								■	■	■				
WN_08	95	MWLN									■	■	■			
	95	PWLN									■	■	■	■		
WP_05	90			SWAP				■								

Portaherramientas de Exteriores Designación ISO (ISO 5608)

P	D	J	N	R
1	2	3	4	5

1 Tipo de amarre

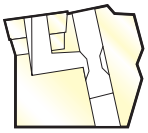
M Brida



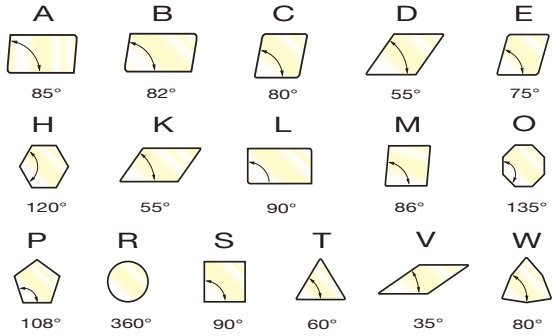
S Posicut®



P Palanca

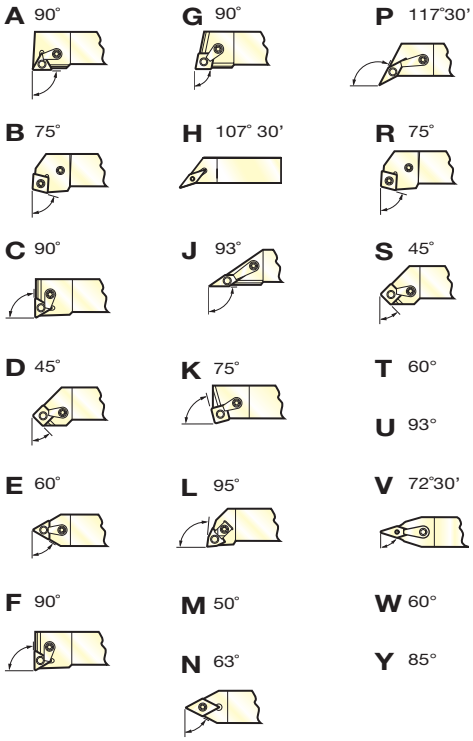


2 Forma de la plaquita

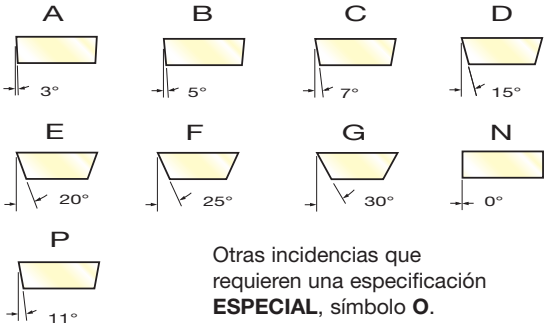


3 Tipo de Portaherramientas

METRICO



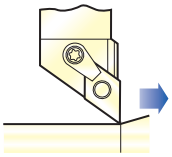
4 Incidencia



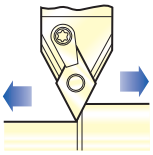
Otras incidencias que requieren una especificación **ESPECIAL**, símbolo **O**.

5 Mano

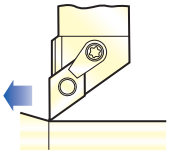
R Derecha



N Neutro



L Izquierda



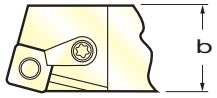
20	20	K	12	-	-
6	7	8	9	10	11

6 Altura de la Herramienta



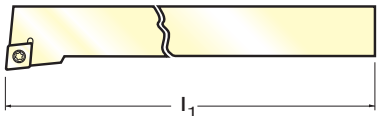
06	= 6
08	= 8
10	= 10
12	= 12
14	= 14
16	= 16
20	= 20
25	= 25
32	= 32
40	= 40
50	= 50

7 Anchura de la Herramienta



06	= 6
08	= 8
10	= 10
12	= 12
14	= 14
16	= 16
20	= 20
25	= 25
32	= 32
40	= 40
50	= 50

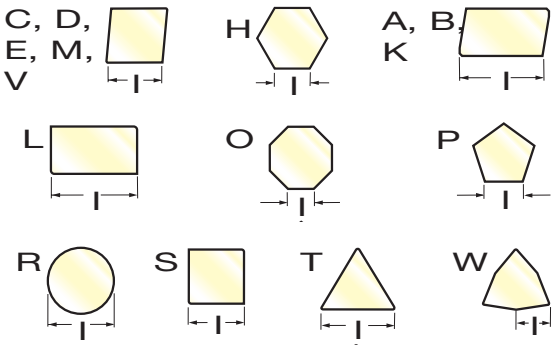
8 Longitud de la Herramienta



A	= 32
B	= 40
C	= 50
D	= 60
E	= 70
F	= 80
G	= 90
H	= 100
J	= 110
K	= 125
L	= 140
M	= 150
N	= 160
P	= 170
Q	= 180
R	= 200
S	= 250
T	= 300
U	= 350
V	= 400
W	= 450
Y	= 500
X	= ESPECIAL

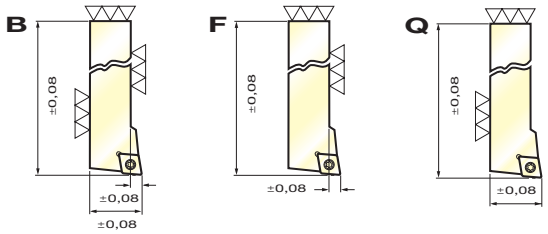
9 Tamaño de la plaquita

Enteros con una sola cifra son precedidos por **0** (cero).
Omitir decimales, e.g. 9,525 = **09**.



10 Opcional

Herramientas de Precisión.



11 Opcional

Adicionales símbolos opcionales (números o letras) añadidas por el fabricante.

Deben de ser separadas de la designación estándar por un guión (-).

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MCLN 95°  PAGINA C100	**MSSN 45°**  PAGINA C101	**MTENN 60°**  PAGINA C102	**MTJN 93°**  PAGINA C103	**MVJN 93°**  PAGINA C104
MVPN 117° 30'  PAGINA C105	**MVVNN 72° 30'**  PAGINA C106	**MWLN 95°**  PAGINA C107	**PCBN 75°**  PAGINA C108	**PCKN 75°**  PAGINA C109
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SCAC 90°  PAGINA C120	**SCLC 95°**  PAGINA C121	**SDAC 90°**  PAGINA C122	**SDJC 93°**  PAGINA C123	**SDNC 62° 30'**  PAGINA C124
SEAP 90°  PAGINA C125	**SEDP 45°**  PAGINA C126	**SEGP 90°**  PAGINA C127	**SEJC 93°**  PAGINA C128	**SELC 97° 30'**  PAGINA C129

Índice de Aplicaciones

SELP 97° 30’



PAGINA C130

SESP 45°



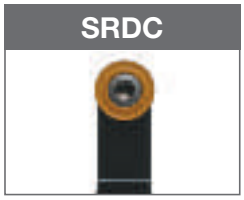
PAGINA C131

SKJN 93°



PAGINA C132

SRDC



PAGINA C133

SRSC



PAGINA C134

SSBC 75°



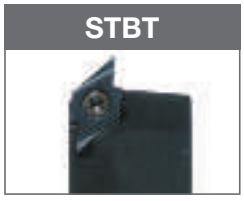
PAGINA C135

SSSC 45°



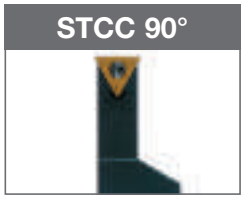
PAGINA C136

STBT



PAGINA C137

STCC 90°



PAGINA C138

STJC 93°



PAGINA C139

SVAC 90°



PAGINA C140

SVHC 107° 30’



PAGINA C141

SVJB 93°



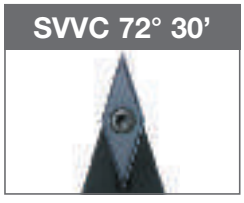
PAGINA C142

SVJC 93°



PAGINA C143

SVVC 72° 30’



PAGINA C144

SWAP 90°



PAGINA C145

33I DXC 32°



PAGINA C146

33I DUC 32°



PAGINA C147

33I DZC 5°



PAGINA C148

33I ELP 7° 30’



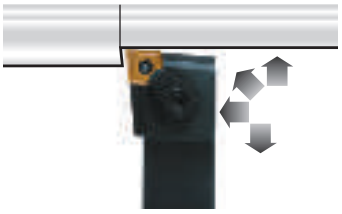
PAGINA C149

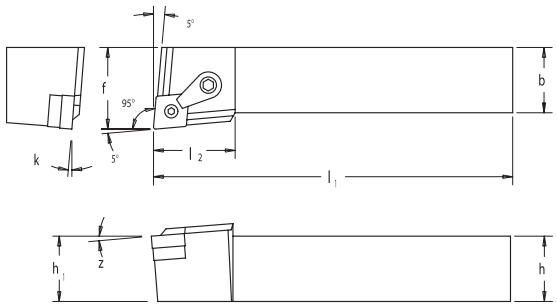
33I WUP 7°



PAGINA C150

MCLN 95°





MCLN 95°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MCLNR/L2020K12-N	20	125	34	25	20	20	5°	5°	CN__1204	0,8
MCLNR/L2525M12-N	25	150	34	32	25	25	5°	5°	CN__1204	0,8
MCLNR/L3225P12-N	25	170	34	32	32	32	5°	5°	CN__1204	0,8

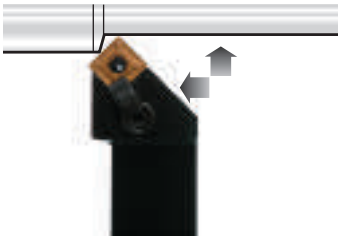
Para Plaquitas consulte Pág. C36 - C41
-N se refiere a doble sujeción

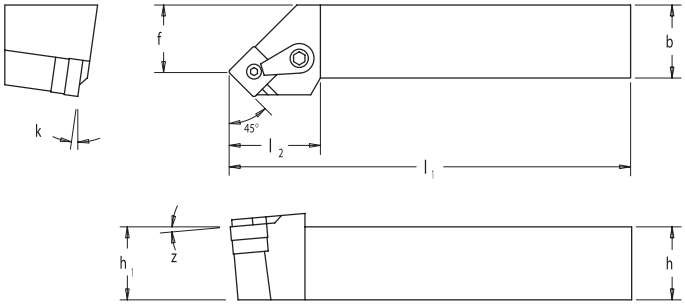
RECAMBIOS

Referencia	 Brida y tornillo	Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	 Tornillo de Perno	Llave para Excéntrico
MCLN_2020K12 to MCLN_3225P12	MC2015	-	KH5005	ICSN433	MLP1661	MLS1394	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = MCLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = MCLNL

MSSN 45°





MSSN 45°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MSSNR/L2020K12-N	20	125	34	27	20	20	8°	5°	SN__1204	0,8
MSSNR/L2525M12-N	25	150	34	32	25	25	8°	5°	SN__1204	0,8
MSSNR/L3225P12-N	32	170	34	32	32	32	8°	5°	SN__1204	0,8

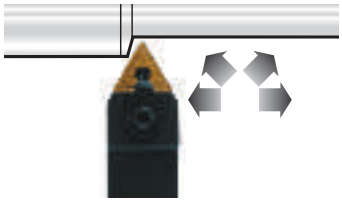
Para Plaquitas consulte Pág. C63 - C67
-N se refiere a doble sujeción

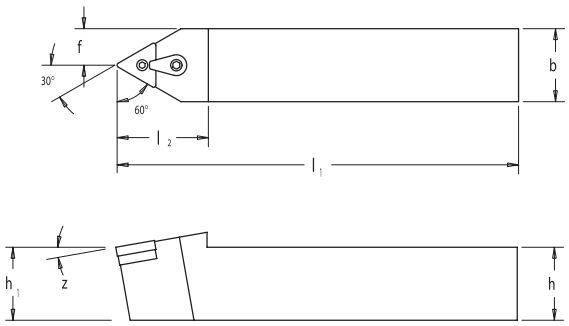
RECAMBIOS

Referencia	 Brida y tornillo	Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	 Tornillo de Perno	Llave para Excéntrico
MSSN_2020K12 to MSSN_3225P12	MC2014	-	KH5005	MA3514	MLP1661	MLS1394	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = MSSNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = MSSNL

MTENN 60°





MTENN 60°

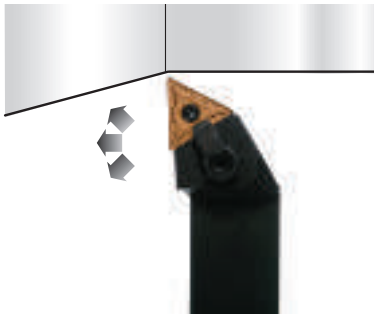
Referencia	Dimensiones (mm)							Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	z		
MTENN2020K16-N	20	125	34	10,0	20	20	10°	TN__1604	0,8
MTENN2525M16-N	25	150	34	12,5	25	25	10°	TN__1604	0,8
MTENN3225P16-N	25	170	34	12,5	32	32	10°	TN__1604	0,8
MTENN2525M22-N	25	150	42	12,5	25	25	10°	TN__2204	0,8
MTENN3225P22-N	25	170	42	12,5	32	32	10°	TN__2204	0,8
MTENN3232P22-N	32	170	42	16,0	32	32	10°	TN__2204	0,8

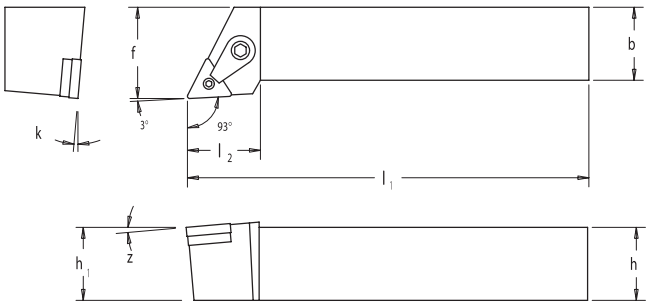
Para Plaquitas consulte Pág. C71 - C77
-N se refiere a doble sujeción

RECAMBIOS

Referencia	 Brida y tornillo	Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	 Tornillo de Perno	Llave para Excéntrico
MTENN2020K16 to MTENN3225P16	MC2014	-	KH5005	MA3414	MLP1642	MLS1393	-
MTENN2525M22 to MTENN3232P22	MC2024	-	KH5005	MA3423	MLP1661	MLS1394	-

MTJN 93°





MTJN 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MTJNR/L2020K16-N	20	125	34	25	20	20	3°	5°	TN__1604	0,8
MTJNR/L2525M16-N	25	150	34	32	25	25	3°	5°	TN__1604	0,8
MTJNR/L2525M22-N	25	150	42	32	25	25	3°	5°	TN__2204	0,8
MTJNR/L3232P22-N	32	170	42	40	32	32	3°	5°	TN__2204	0,8

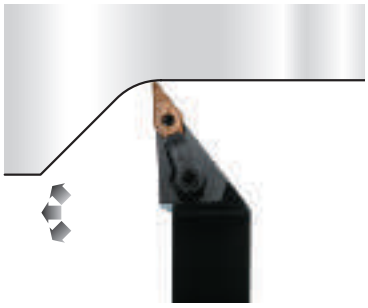
Para Plaquitas consulte Pág. C71 - C77
-N se refiere a doble sujeción

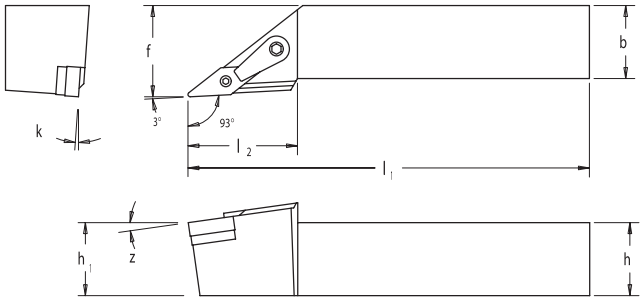
RECAMBIOS

Referencia	 Brida y tornillo	Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	 Tornillo de Perno	Llave para Excéntrico
MTJN_2020K16 to MTJN_2525M16_N	MC2014	-	KH5005	MA3414	MLP1642	MLS1393	-
MTJN_2525M22 to MTJN_3232P22	MC2024	-	KH5005	MA3423	MLP1661	MLS1394	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = MTJNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = MTJNL

MVJN 93°





MVJN 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MVJNR/L2020K16-K	20	125	43	25	20	20	4°	8°	VN__1604	0,8
MVJNR/L2525M16-K	25	150	43	32	25	25	4°	8°	VN__1604	0,8
MVJNR/L3225P16-K	25	170	43	32	32	32	4°	8°	VN__1604	0,8

Para Plaquitas consulte Pág. C82 - C84
-K se refiere a una sujeción simple

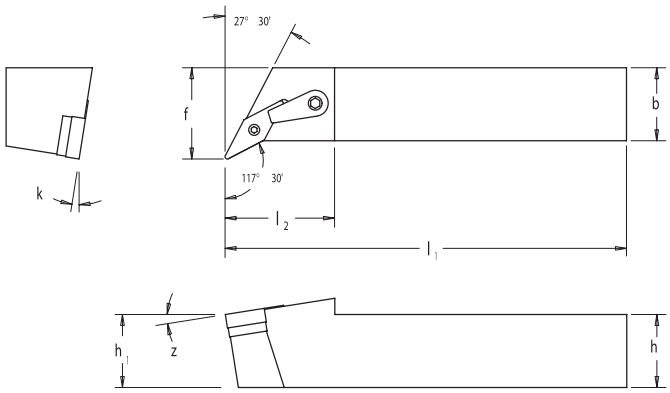
RECAMBIOS

Referencia	 Brida y tornillo	 Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	Tornillo de Perno	 Llave para Excéntrico
MVJN_2020K16 to MVJN_3225P16	MC2616	MCS1086	KH5003	MA3717	MLP1665	-	KH5002

Para Portaherramientas y plaquitas a DERECHAS, especifique R = MVJNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = MVJNL

MVPN 117° 30’





MVPN 117° 30’

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MVPNR/L2020K16-K	20	125	37	25	20	20	40	80	VN__1604	0,8
MVPNR/L2525M16-K	25	150	37	32	25	25	40	80	VN__1604	0,8

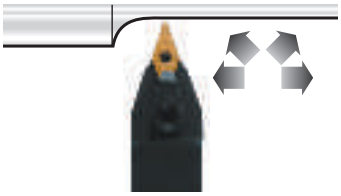
Para Plaquitas consulte Pág. C82 - C84
-K se refiere a una sujeción simple

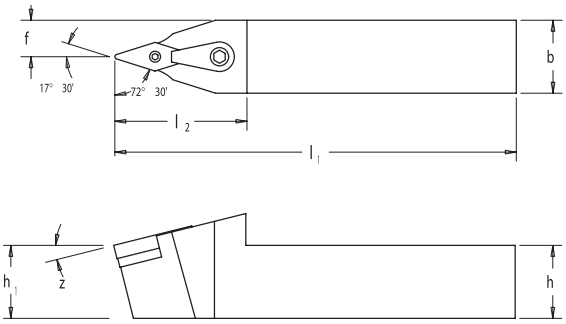
RECAMBIOS

Referencia	 Brida y tornillo	 Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	Tornillo de Perno	 Llave para Excéntrico
MVPN_2020K16 to MVPN_2525M16	MC2616	MCS1086	KH5003	MA3717	MLP1665	-	KH5002

Para Portaherramientas y plaquitas a DERECHAS, especifique R = MVPNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = MVPNL

MVVNN 72° 30’





MVVNN 72° 30’

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MVVNN2020K16-K	20	125	43	10,0	20	20	-	14°	VN__1604	0,8
MVVNN2525M16-K	25	150	43	12,5	25	25	-	14°	VN__1604	0,8

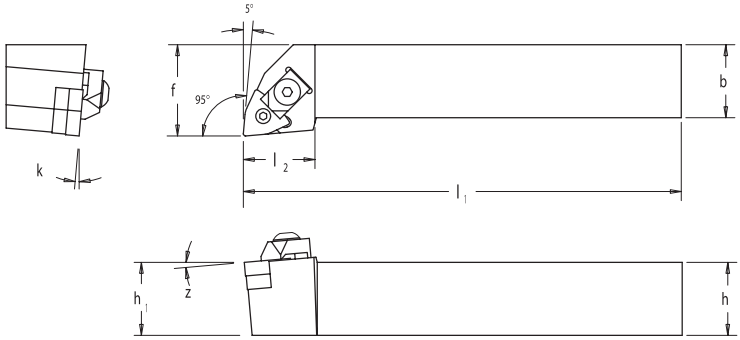
Para Plaquitas consulte Pág. C82 - C84
-K se refiere a una sujeción simple

RECAMBIOS

Referencia	 Brida y tornillo	 Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	Tornillo de Perno	 Llave para Excéntrico
MVVNN2020K16 to MVVNN2525M16	MC2616	MCS1086	KH5003	MA3717	MLP1665	-	KH5002

MWLN 95°





MWLN 95°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
MWLNR/L1616H06-N	16	100	15	20	16	16	7°	7°	WN__0604	0,8
MWLNR/L2020K06-N	20	125	25	25	20	20	7°	7°	WN__0604	0,8
MWLNR/L2525M06-N	25	150	25	32	25	25	7°	7°	WN__0604	0,8
MWLNR/L2020K08-N	20	125	34	25	20	20	7°	7°	WN__0804	0,8
MWLNR/L2525M08-N	25	150	34	32	25	25	7°	7°	WN__0804	0,8
MWLNR/L3225P08-N	25	170	34	32	32	32	7°	7°	WN__0804	0,8

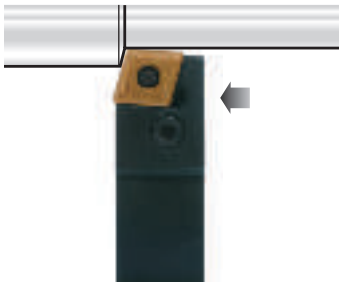
Para Plaquitas consulte Pág. C87 - C89
-N referirse a la cuña de apriete

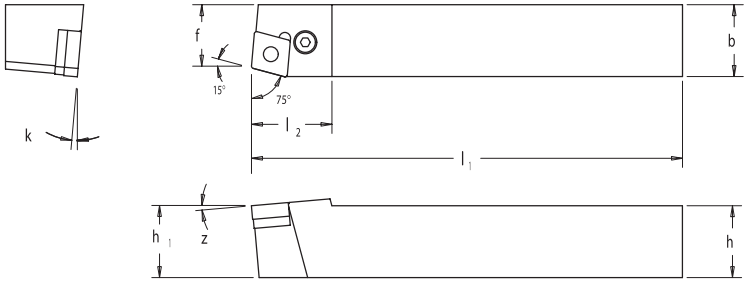
RECAMBIOS

Referencia	 Brida y tornillo	Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	 Tornillo de Perno	Llave para Excéntrico
MWLNR/L1616H06-N	MC2006	-	KH5003	MA3006	MLP1644	MLS1393	-
MWLN_2020K06 to MWLN_2525M06	MC2006	-	KH5003	MA3006	MLP1642	MLS1393	-
MWLN_2020K08 to MWLN_3225P08	MC2011	-	KH5005	MA3009	MLP1661	MLS1394	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = MWLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = MWLNL

PCBN 75°





PCBN 75°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PCBNR/L2020K12	20	125	28	17	20	20	5°	5°	CN__1204	0,8
PCBNR/L2525M12	25	150	28	22	25	25	5°	5°	CN__1204	0,8
PCBNR/L2525M16	25	150	34	22	25	25	5°	5°	CN__1606	1,2
PCBNR/L3225P16	25	170	34	22	32	32	5°	5°	CN__1606	1,2
PCBNR/L3232P16	32	170	34	27	32	32	5°	5°	CN__1606	1,2
PCBNR/L3232P19	32	170	42	27	32	32	5°	5°	CN__1906	1,2
PCBNR/L4040S19	40	250	45	35	40	40	5°	5°	CN__1906	1,2

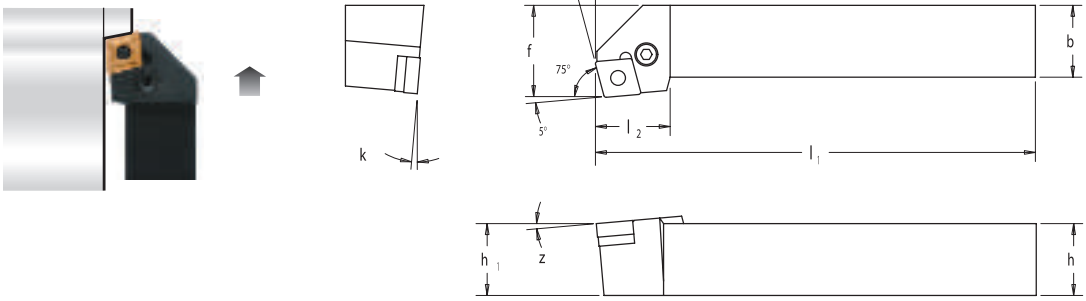
Para Plaquitas consulte Pág. C36 - C41

RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PCBN_2020K12 to PCBN_2525M12	PL8012	PLS1608	KH5003	PA3612	PC4112	PCP0012
PCBN_2525M16 to PCBN_3232P16	PL8016	PLS1618	KH5003	PA3616	PC4115	PCP0015
PCBN_3232P19 to PCBN_4040S19	PL8019	PLS1610	KH5004	PA3619	PC4119	PCP0019

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PCBNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PCBNL

PCKN 75°



PCKN 75°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PCKNR/L2020K12	20	125	28	25	20	20	5°	5°	CN__1204	0,8
PCKNR/L2525M12	25	150	28	32	25	25	5°	5°	CN__1204	0,8
PCKNR/L3225P12	25	170	28	32	32	32	5°	5°	CN__1204	0,8
PCKNR/L3232P19	32	170	34	40	32	32	5°	5°	CN__1906	1,2

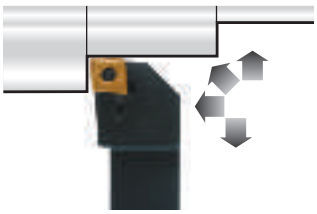
Para Plaquitas consulte Pág. C36 - C41

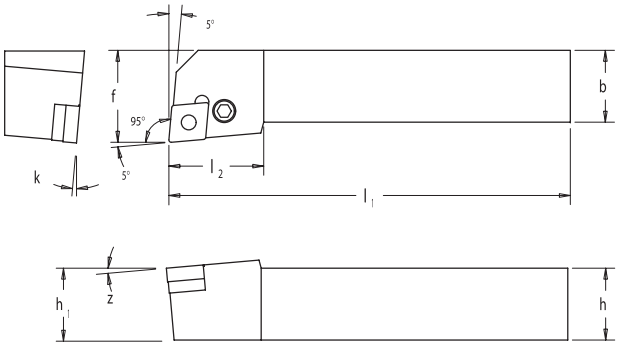
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PCKN_2020K12 to PCKN_3225P12	PL8012	PLS1608	KH5003	PA3612	PC4112	PCP0012
PCKN_3232P19	PL8019	PLS1610	KH5004	PA3619	PC4119	PCP0019

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PCKNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PCKNL

PCLN 95°





PCLN 95°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PCLNR/L1616H12	16	100	26	20	16	16	5°	5°	CN__1204	0,8
PCLNR/L2020K12	20	125	28	25	20	20	5°	5°	CN__1204	0,8
PCLNR/L2525M12	25	150	28	32	25	25	5°	5°	CN__1204	0,8
PCLNR/L3225P12	25	170	28	32	32	32	5°	5°	CN__1204	0,8
PCLNR/L3232P12	32	170	28	40	32	32	5°	5°	CN__1204	0,8
PCLNR/L2525M16	25	150	34	32	25	25	5°	5°	CN__1606	1,2
PCLNR/L3225P16	25	170	34	32	32	32	5°	5°	CN__1606	1,2
PCLNR/L3232P16	32	170	34	40	32	32	5°	5°	CN__1606	1,2
PCLNR/L4040S16	40	250	34	50	40	40	5°	5°	CN__1606	1,2
PCLNR/2525M19	25	150	42	32	25	25	5°	5°	CN__1906	1,2
PCLNR/L3225P19	25	170	42	32	32	32	5°	5°	CN__1906	1,2
PCLNR/L3232P19	32	170	42	40	32	32	5°	5°	CN__1906	1,2
PCLNR/L4040S19	40	250	45	50	40	40	5°	5°	CN__1906	1,2

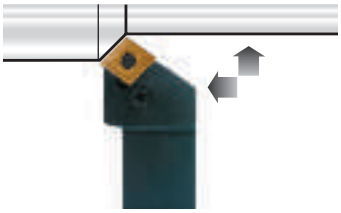
Para Plaquitas consulte Pág. C36 - C41

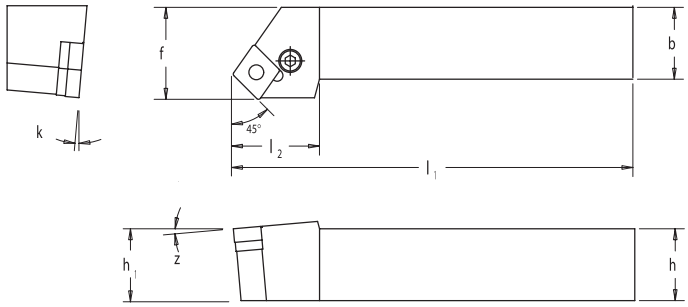
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PCLN_1616H12	PL8312	PLS1648	KH5003	PA3612	PC4112	PCP0012
PCLN_2020K12 to PCLN_3232P12	PL8012	PLS1608	KH5003	PA3612	PC4112	PCP0012
PCLN_2525M16 to PCLN_4040S16	PL8016	PLS1618	KH5003	PA3616	PC4115	PCP0015
PCLN_2525M19 to PCLN_4040S19	PL8019	PLS1610	KH5004	PA3619	PC4119	PCP0019

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PCLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PCLNL

PCSN 45°





PCSN 45°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PCSNR/L2020K12	20	125	28	25	20	20	5°	5°	CN__1204	0,8
PCSNR/L2525M12	25	150	28	32	25	25	5°	5°	CN__1204	0,8
PCSNR/L2525M16	25	150	34	32	25	25	5°	5°	CN__1606	1,2
PCSNR/L3225P16	25	170	34	32	32	32			CN__1606	1,2
PCSNR/L3225P19	25	170	42	32	32	32	5°	5°	CN__1906	1,2
PCSNR/L3232P19	32	170	42	40	32	32	5°	5°	CN__1906	1,2

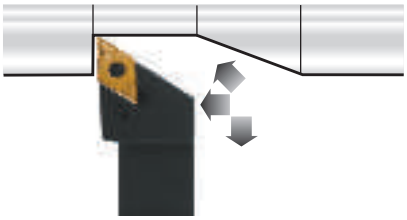
Para Plaquitas consulte Pág. C36 - C41

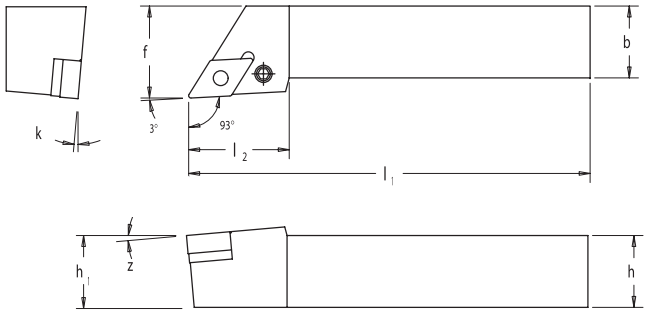
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PCSN_2020K12 to PCSN_2525M12	PL8012	PLS1608	KH5003	PA3612	PC4112	PCP0012
PCSN_2525M16 to PCSN_3225P16	PL8016	PLS1618	KH5003	PA3616	PC4115	PCP0015
PCSN_3225P19 to PCSN_3232P19	PL8019	PLS1610	KH5004	PA3619	PC4119	PCP0019

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PCSNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PCSNL

PDJN 93º





PDJN 93º

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PDJNR/L1616H11	16	100	28	20	16	16	5°	5°	DN__1104	0,8
PDJNR/L2020K11	20	125	28	25	20	20	5°	5°	DN__1104	0,8
PDJNR/L2525M11	25	150	28	32	25	25	5°	5°	DN__1104	0,8
PDJNR/L3225P11	25	170	28	32	32	32	5°	5°	DN__1104	0,8
PDJNR/L2020K15	20	125	34	25	20	20	5°	5°	DN__1506	0,8
PDJNR/L2525M15	25	150	34	32	25	25	5°	5°	DN__1506	0,8
PDJNR/L3225P15	25	170	34	32	32	32	5°	5°	DN__1506	0,8
PDJNR/L3232P15	32	170	34	40	32	32	5°	5°	DN__1506	0,8

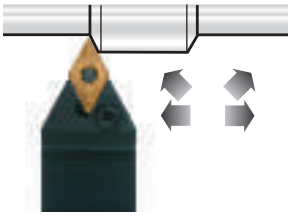
Para Plaquitas consulte Pág. C46 - C50

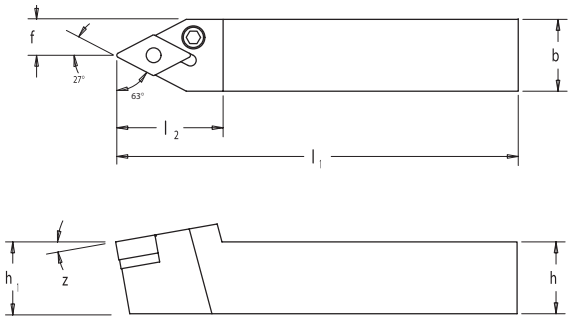
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PDJN_1616H11 to PDJN_3225P11	PL8009	PLS1606	KH5025	PA3711	PC4109	PCP0009
PDJN_2020K15 to PDJN_3232P15	PL8415	PLS1638	KH5003	PA3715	PC4112	PCP0012

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PDJNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PDJNL

PDNN 63°





PDNN 63°

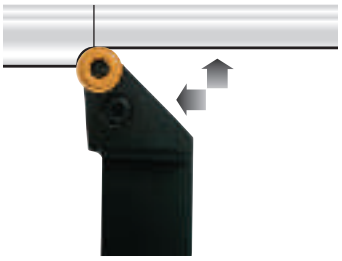
Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PDNNN2020K15	20	125	34	10,0	20	20	-	10°	DN__1506	0,8
PDNNN2525M15	25	150	34	12,5	25	32	-	10°	DN__1506	0,8
PDNNN3232P15	32	170	34	16,0	32	32	-	10°	DN__1506	0,8

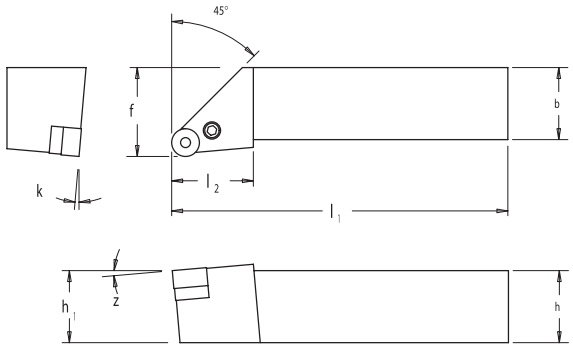
Para Plaquitas consulte Pág. C46 - C50

RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PDNNN2020K15 to PDNNN3232P15	PL8415	PLS1638	KH5003	PA3715	PC4112	PCP0012

PRSN





PRSN

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PRSNR/L2525M12	25	150	28	32	25	25	-	-	RN__120400	-
PRSNR/L3232P19	32	170	42	40	32	32	-	-	RN__190600	-
PRSNR/L4040S25	40	250	45	50	40	40	-	-	RN__250900	-

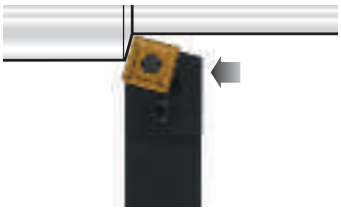
For Inserts refer to page C59

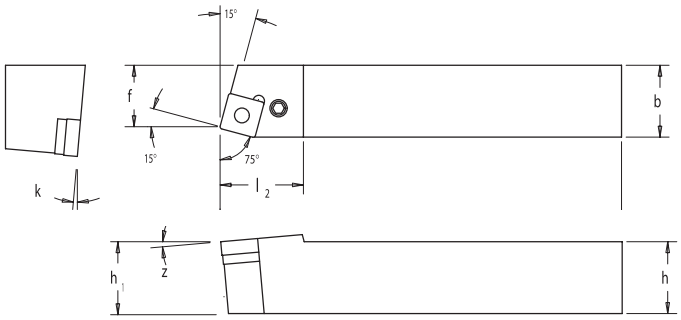
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PRSN_2525M12	PL8012	PLS1608	KH5003	PA3912	PC4112	PCP0012
PRSN_3232P19	PL8019	PLS1610	KH5004	PA3919	PC4119	PCP0019
PRSN_4040S25	PL8025	PLS1612	KH5005	PA3925	PC4125	PCP0025

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PRSNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PRSNL

PSBN 75°





PSBN 75°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PSBNR/L2020K12	20	125	28	17	20	20	5°	5°	SN__1204	0,8
PSBNR/L2525M12	25	150	28	22	25	25	5°	5°	SN__1204	0,8
PSBNR/L3225P12	25	170	28	22	32	32	5°	5°	SN__1204	0,8
PSBNR/L2525M15	25	150	34	22	25	25	5°	5°	SN__1506	1,2
PSBNR/L3232P15	32	170	34	27	32	32	5°	5°	SN__1506	1,2
PSBNR/L3232P19	32	170	42	27	32	32	5°	5°	SN__1906	1,2
PSBNR/L4040S19	40	250	45	35	40	40	5°	5°	SN__1906	1,2
PSBNR/L4040S25	40	250	45	35	40	40	5°	5°	SN__2509	2,4

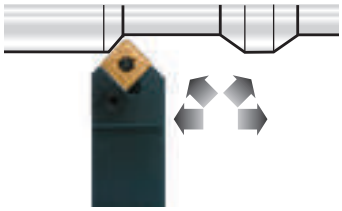
Para Plaquitas consulte Pág. C63 - C67

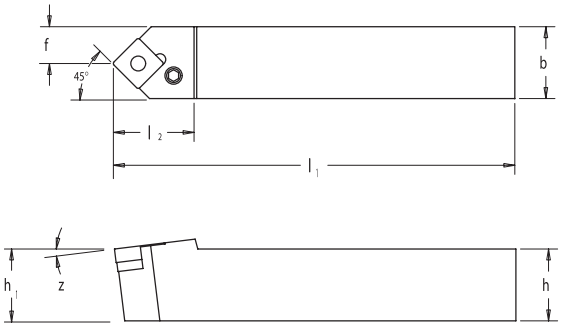
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PSBN_2020K12 to PSBN_3225P12	PL8012	PLS1608	KH5003	PA3512	PC4112	PCP0012
PSBN_2525M15 to PSBN_3232P15	PL8016	PLS1618	KH5003	PA3515	PC4115	PCP0015
PSBN_3232P19 to PSBN_4040S19	PL8019	PLS1610	KH5004	PA3519	PC4119	PCP0019
PSBN_4040S25	PL8025	PLS1612	KH5005	PA3525	PC4125	PCP0025

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PSBNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PSBNL

PSDN 45°





PSDN 45°

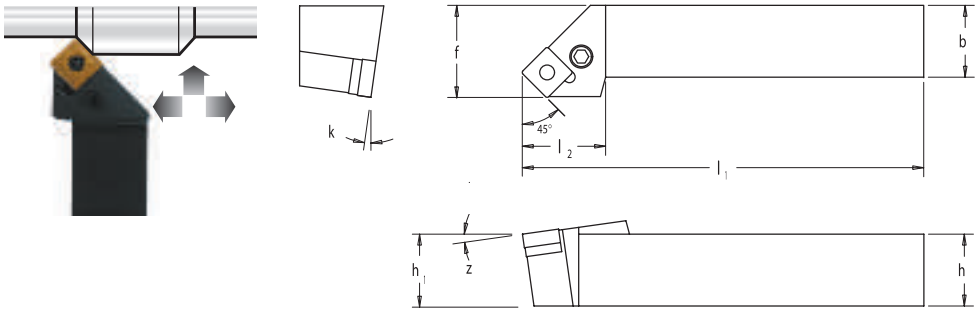
Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PSDNN2020K12	20	125	28	10,0	20	20	-	7°	SN__1204	0,8
PSDNN2525M12	25	150	28	12,5	25	25	-	7°	SN__1204	0,8
PSDNN3232P12	32	170	28	16,0	32	32	-	7°	SN__1204	0,8
PSDNN3225P19	25	170	42	12,5	32	32	-	7°	SN__1906	1,2

Para Plaquitas consulte Pág. C63 - C67

RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PSDNN2020K12 to PSDNN3232P12	PL8012	PLS1608	KH5003	PA3512	PC4112	PCP0012
PSDNN3225P19	PL8019	PLS1610	KH5004	PA3519	PC4119	PCP0019

PSSN 45°



PSSN 45°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PSSNR/L2020K12	20	125	28	25	20	20	8°	5°	SN__1204	0,8
PSSNR/L2525M12	25	150	28	32	25	25	8°	5°	SN__1204	0,8
PSSNR/L3225P12	25	170	28	32	32	32	8°	5°	SN__1204	0,8
PSSNR/L2525M15	25	150	34	32	25	25	8°	5°	SN__1506	1,2
PSSNR/L3232P15	32	170	34	40	32	32	8°	5°	SN__1506	1,2
PSSNR/L3232P19	32	170	42	40	32	32	8°	5°	SN__1906	1,2
PSSNR/L4040S19	40	250	45	50	40	40	8°	5°	SN__1906	1,2

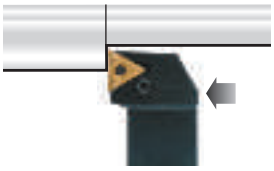
Para Plaquitas consulte Pág. C63 - C67

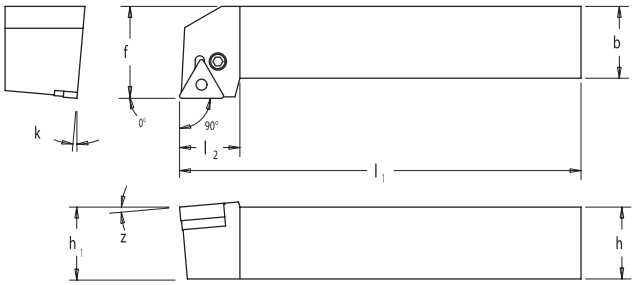
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PSSN_2020K12 to PSSN_3225P12	PL8012	PLS1608	KH5003	PA3512	PC4112	PCP0012
PSSN_2525M15 to PSSN_3232P15	PL8016	PLS1618	KH5003	PA3515	PC4115	PCP0015
PSSN_3232P19 to PSSN_4040S19	PL8019	PLS1610	KH5004	PA3519	PC4119	PCP0019

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PSSNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PSSNL

PTGN 90°





PTGN 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PTGNR/L2020K16	20	125	22	25	20	20	5°	5°	TN__1604	0,8
PTGNR/L2525M16	25	150	22	32	25	25	5°	5°	TN__1604	0,8
PTGNR/L3225P16	25	170	22	32	32	32	5°	5°	TN__1604	0,8
PTGNR/L2525M22	25	150	28	32	25	25	5°	5°	TN__2204	0,8

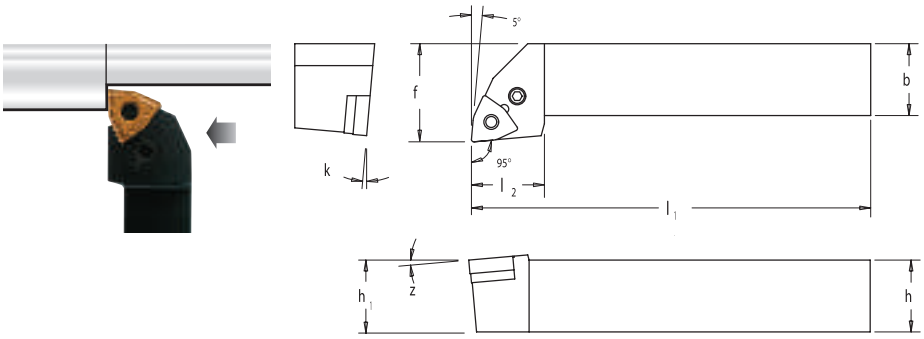
Para Plaquitas consulte Pág. C71 - C77

RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PTGN_2020K16 to PTGN_3225P16	PL8009	PLS1606	KH5025	PA3416	PC4109	PCP0009
PTGN_2525M22	PL8012	PLS1608	KH5003	PA3422	PC4112	PCP0012

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PTGNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PTGNL

PWLN 95°



PWLN 95°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
PWLNR/L1616H06	16	100	15	20	16	16	14°	5°	WN__0604	0,8
PWLNR/L2020K06	20	125	25	25	20	20	14°	5°	WN__0604	0,8
PWLNR/L2525M06	25	150	25	32	25	25	14°	5°	WN__0604	0,8
PWLNR/L2020K08	20	125	34	25	20	20	14°	5°	WN_0804	0,8
PWLNR/L2525M08	25	150	34	32	25	25	14°	5°	WN_0804	0,8
PWLNR/L3225P08	25	170	34	32	32	32	14°	5°	WN_0804	0,8
PWLNR/L3232P08	32	170	34	40	32	32	14°	5°	WN_0804	0,8

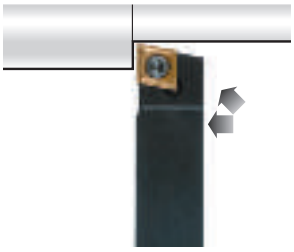
Para Plaquitas consulte Pág. C87 - C89

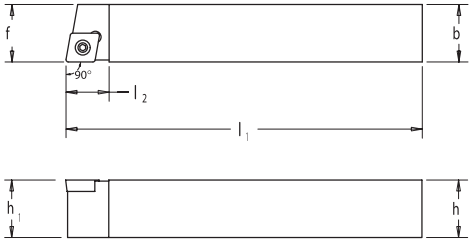
RECAMBIOS

Referencia	 Palanca	 Tornillo para Palanca	 Llave	 Apoyo	 Pasador	 Coloca pasador
PWLN_1616H06 to PWLN_2525M06	PL8009	PLS1606	KH5025	PA3007	PC4109	PCP0009
PWLN_2020K08 to PWLN_3232P08	PL8012	PLS1608	KH5003	PA3008	PC4112	PCP0012

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PWLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PWLNL

SCAC 90°





SCAC 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SCACR/L1010M06	10	150	15	10	10	10	-	-	CC__0602	0,4
SCACR/L1212M09	12	150	15	12	12	12	-	-	CC__09T3	0,8
SCACR/L1616M09	16	150	15	16	16	16	-	-	CC__09T3	0,8
SCACR/L2020K12	20	125	18	20	20	20	-	-	CC__1204	0,8

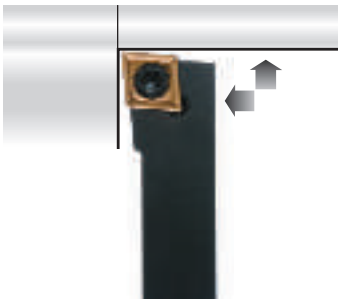
Para Plaquitas consulte Pág. C34 - C35

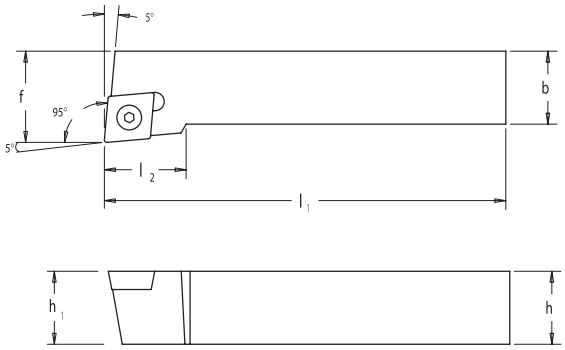
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SCAC_1010E06	F2507T	K5507	-	-
SCAC_1212M09 to SCAC_1616M09	D4010T	K5515	-	-
SCAC_2020K12	43D4014T	K5517	MA3614	SAS1760

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SCACR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SCACL

SCLC 95°





SCLC 95°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SCLCR/L1010E06	10	70	10	12	10	10	-	-	CC__0602	0,4
SCLCR/L1212F09	12	80	16	16	12	12	-	-	CC__09T3	0,8
SCLCR/L1616H09	16	100	16	20	16	16	-	-	CC__09T3	0,8
SCLCR/L2020K09	20	125	16	25	20	20	-	-	CC__09T3	0,8
SCLCR/L2020K12	20	125	25	25	20	20	-	-	CC__1204	0,8
SCLCR/L2525M12	25	150	25	32	25	25	-	-	CC__1204	0,8

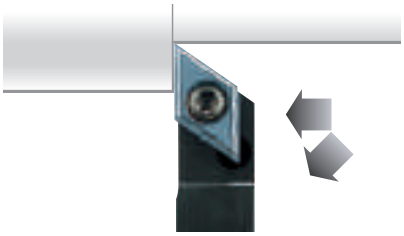
Para Plaquitas consulte Pág. C34 - C35

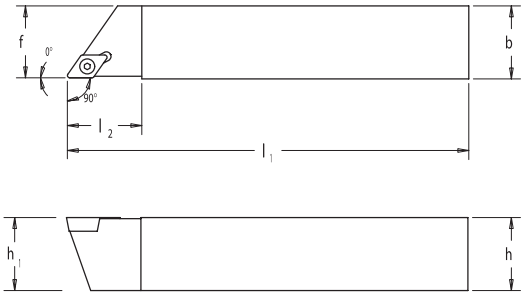
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SCLC_1010E06	F2507T	K5507	-	-
SCLC_1212F09 to SCLC_2020K09	D4010T	K5515	-	-
SCLC_2020K12 to SCLC_2525M12	43D4014T	K5517	MA3614	SAS1760

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SCLCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SCLCL

SDAC 90°





SDAC 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SDACR/L1010M07	10	150	20	10	10	10	-	-	DC__0702	0,4
SDACR/L1010M11	10	150	20	10	10	10	-	-	DC__11T3	0,8
SDACR/L1212M11	12	150	20	12	12	12	-	-	DC__11T3	0,8
SDACR/L1616M11	16	150	20	16	16	16	-	-	DC__11T3	0,8
SDACR/L2020K11	20	125	20	20	20	20	-	-	DC__11T3	0,8

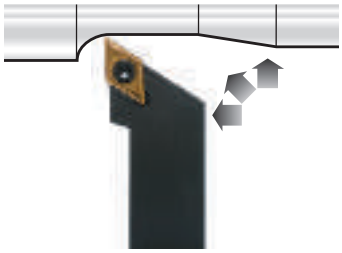
Para Plaquitas consulte Pág. C43 - C45

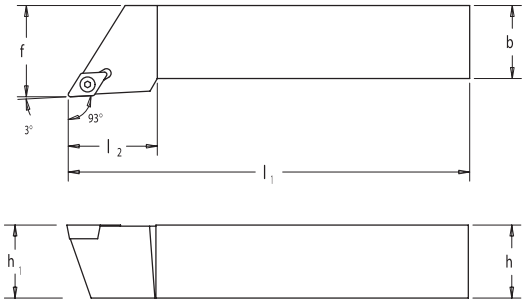
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SDAC_1010M07	F2505T	K5507	-	-
SDAC_1010M11 to SDAC_2020K11	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SDACR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SDACL

SDJC 93°





SDJC 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SDJCR/L1010M07	10	150	16	12	10	10	-	-	DC__0702	0,4
SDJCR/L1212F07	12	80	18	16	12	12	-	-	DC__0702	0,4
SDJCR/L1616H07	16	100	20	20	16	16	-	-	DC__0702	0,4
SDJCR/L2020K07	20	125	20	25	20	20	-	-	DC__0702	0,4
SDJCR/L1010M11	10	150	18	12	10	10	-	-	DC__11T3	0,8
SDJCR/L1212F11	12	80	18	16	12	12	-	-	DC__11T3	0,8
SDJCR/L1616H11	16	100	22	20	16	16	-	-	DC__11T3	0,8
SDJCR/L2020K11	20	125	22	25	20	20	-	-	DC__11T3	0,8
SDJCR/L2525M11	25	150	22	32	25	25	-	-	DC__11T3	0,8
SDJCR/L2020K15	20	125	22	25	20	20	-	-	DC__1504	0,8
SDJCR/L2525M15	25	150	22	32	25	25	-	-	DC__1504	0,8

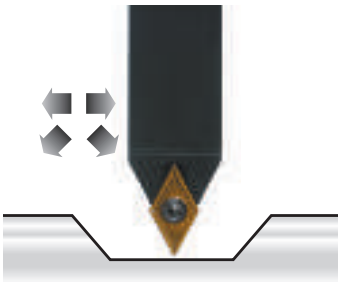
Para Plaquitas consulte Pág. C43 - C45

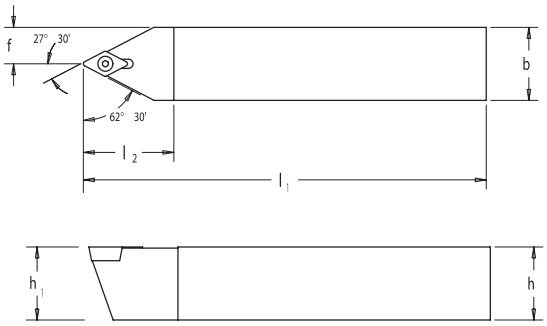
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SDJC_1010M07 to SDJC_2020K07	F2507T	K5507	-	-
SDJC_1010M11	F4010T	K5515	-	-
SDJC_1212F11	D4010T	K5515	-	-
SDJC_1616H11 to SDJC_2525M11	F3512T	K5515	SA3714	SAS1750
SDJC_2020K15	43D4014T	K5517	SA3715	SAS1765
SDJC_2525M15	43D4014T	K5517	SA3715	SAS1765

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SDJCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SDJCL

SDNC 62° 30’





SDNC 62° 30’

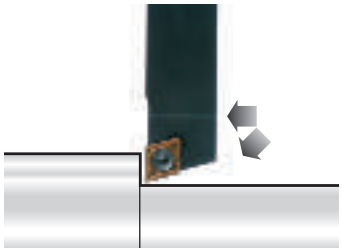
Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SDNCN1010M07	10	150	16	5,0	10	10	-	-	DC__0702	0,4
SDNCN1212M07	12	150	18	6,0	12	12	-	-	DC__0702	0,4
SDNCN1212M11	12	150	22	6,0	12	12	-	-	DC__11T3	0,8
SDNCN1616M11	16	150	22	8,0	16	16	-	-	DC__11T3	0,8
SDNCN2020K11	20	125	22	10,0	20	20	-	-	DC__11T3	0,8
SDNCN2525M11	25	150	22	12,5	25	25	-	-	DC__11T3	0,8

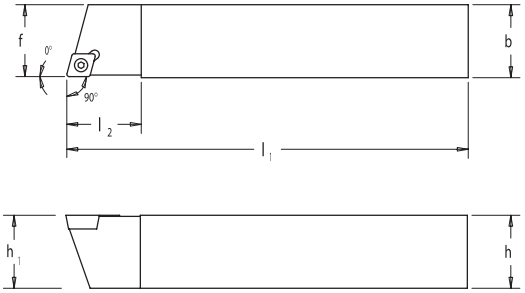
Para Plaquitas consulte Pág. C43 - C45

RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SDNCN1010M07 to SDNCN1212M07	F2507T	K5507	-	-
SDNCN1212M11	D4010T	K5515	-	-
SDNCN1616M11 to SDNCN2525M11	F3512T	K5515	SA3714	SAS1750

SEAP 90°





SEAP 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SEAPR/L0808K06	8	125	12	8	8	8	-	-	EP__0602	0,4
SEAPR/L1010M08	10	150	15	10	10	10	-	-	EP__08M3	0,8
SEAPR/L1212M08	12	150	15	12	12	12	-	-	EP__08M3	0,8
SEAPR/L1616M08	16	150	15	16	16	16	-	-	EP__08M3	0,8
SEAPR/L2020K08	20	125	15	20	20	20	-	-	EP__08M3	0,8

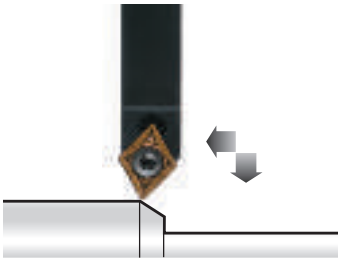
Para Plaquitas consulte Pág. C53 - C57

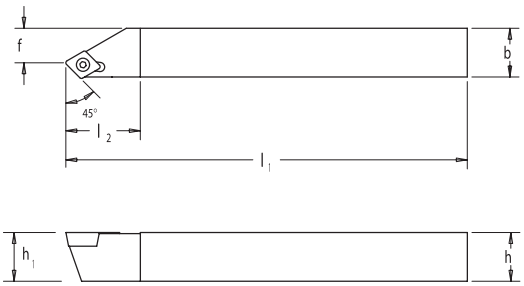
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SEAP_0808K06	F2505T	K5507	-	-
SEAP_1010M08 to SEAP_2020K08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SEAPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SEAPL

SEDP 45°





SEDP 45°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SEDPR/L1010M08	10	150	15	4,2	10	10	-	-	EP__08M3	0,8
SEDPR/L1212N08	12	160	15	6,2	12	12	-	-	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

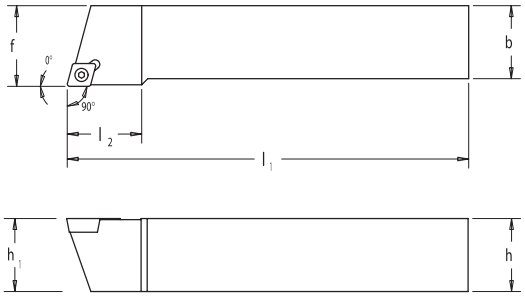
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SEDP_1010M08 to SEDP_1212N08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SEDPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SEDPL

SEGP 90°





SEGP 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SEGPR/L0808F08	8	80	13	11	8	8	-	-	EP__08M3	0,8
SEGPR/L1010F08	10	80	13	12	10	10	-	-	EP__08M3	0,8
SEGPR/L1212F08	12	80	15	16	12	12	-	-	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

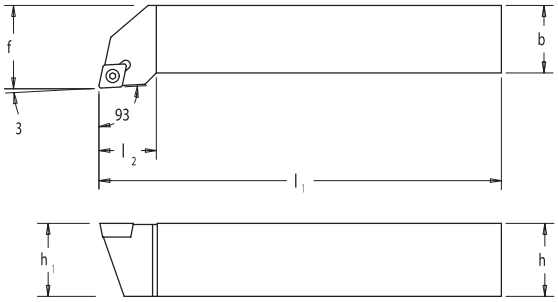
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SEGP_0808F08 to SEGP_1212F08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SEGPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SEGPL

SEJC 93°





SEJC 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SEJCR/L2525M16	25	150		32	25	25	-	-	EC__16M6	1,2

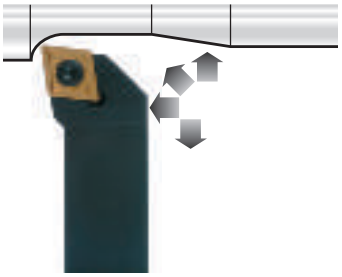
Para Plaquitas consulte Pág. C51

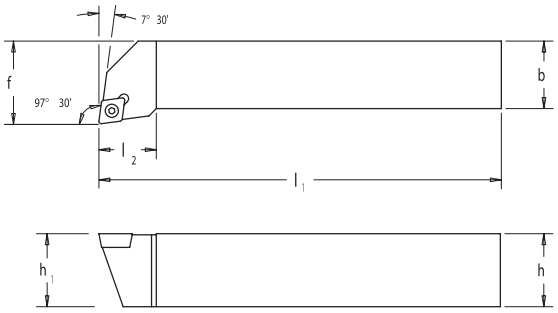
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SEJC_2525M16	A5025T	K5520	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SEJCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SEJCL

SELC 97° 30’





SELC 97° 30’

Referencia	Dimensiones								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SELCR/L1616H12	16	100	18	20	16	16	-	-	EC_12T3	0,8
SELCR/L2020K12	20	125	19	25	20	20	-	-	EC_12T3	0,8
SELCR/L2525M12	25	150	21	32	25	25	-	-	EC_12T3	0,8

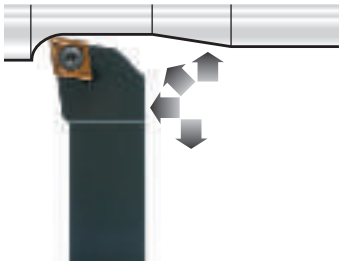
Para Plaquitas consulte Pág. C51 - C52

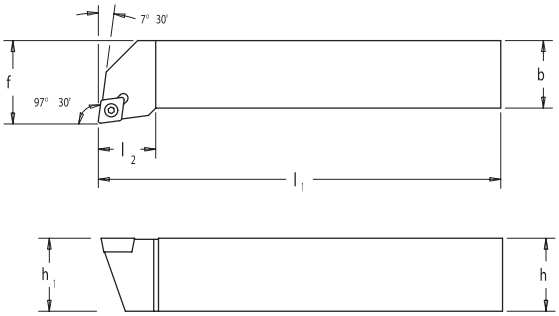
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	 Tornillo del apoyo
SELC_1616H12 to SELC_2525M12	43D4014T	K5517	SA3712	SAS1760

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SESPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SESPL

SELP 97° 30’





SELP 97° 30’

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SELPR/L1010F08	10	80	13	12	10	10	-	-	EP__08M3	0,8
SELPR/L1212F08	12	80	15	16	12	12	-	-	EP__08M3	0,8
SELPR/L1616H08	16	100	18	20	16	16	-	-	EP__08M3	0,8
SELPR/L2020K08	20	125	19	25	20	20	-	-	EP__08M3	0,8
SELPR/L2525M08	25	150	21	32	25	25	-	-	EP__08M3	0,8

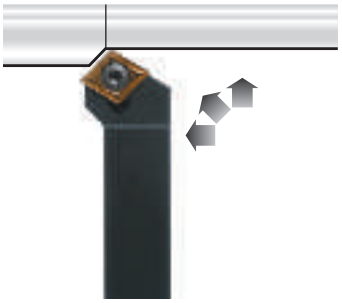
Para Plaquitas consulte Pág. C53 - C57

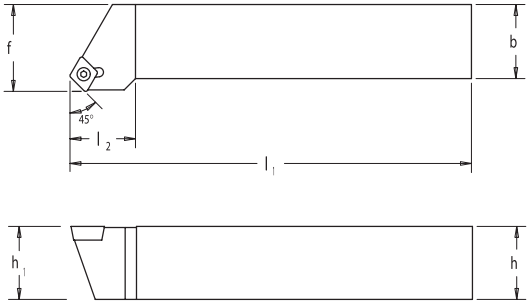
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SELP_1010F08 to SELP_2525M08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SELPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SELPL

SESP 45°





SESP 45°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SESPR/L1010F08	10	80	13	13,7	10	10	-	-	EP__08M3	0,8
SESPR/L1212F08	12	80	13	16,0	12	12	-	-	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

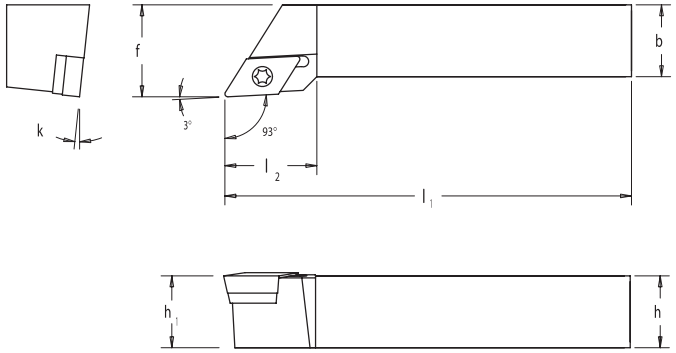
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SESP_1010F08 to SESP_1212F08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SESPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SESPL

SKJN 93°





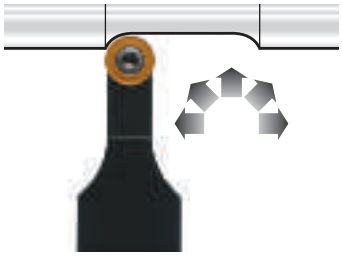
SKJN 93°										
Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SKJNR/L2525X19	25	155	28	32	25	25	6°	-	KN__1904	0,8

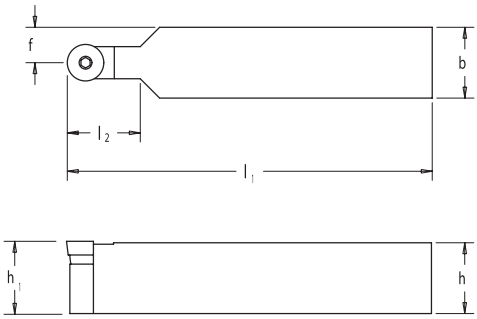
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Pasador
SKJN_2525X19	F4021T	K5520	26.944	26.972

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SKJNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SKJNL

SRDC





SRDC

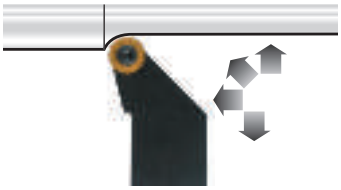
Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SRDCN1616H06	16	100	12	8,0	16	16	-	-	RC__0602	3,0
SRDCN2020K06	20	125	12	10,0	20	20	-	-	RC__0602	3,0
SRDCN2020K10	20	125	22	10,0	20	20	-	-	RC__10T3	5,0
SRDCN2525M10	25	150	22	12,5	25	25	-	-	RC__10T3	5,0
SRDCN2525M12	25	150	28	12,5	25	25	-	-	RC__1204	6,0
SRDCN3225P12	25	170	28	12,5	32	32	-	-	RC__1204	6,0
SRDCN3232P16	32	170	28	16,0	32	32	-	-	RC__1606	8,0
SRDCN3232P20	32	170	32	16,0	32	32	-	-	RC__2006	10,0

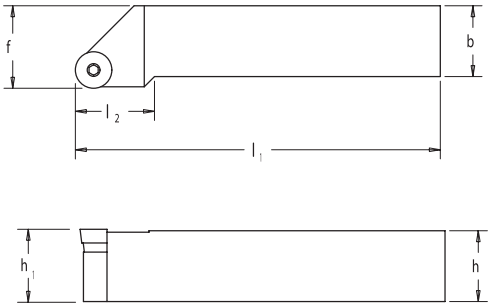
Para Plaquitas consulte Pág. C58 - C59

RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SRDCN1616H06 to SRDCN2020K06	F2505T	K5507	-	-
SRDCN2020K10 to SRDCN2525M10	D4010T	K5515	-	-
SRDCN2525M12 to SRDCN3225P12	D5016T	K5520	30.053	-
SRDCN3232P16	D5016T	K5520	30.054	-
SRDCN3232P20	D6018S	SW4	30.055	30.682

SRSC





SRSC

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SRSCR/L1616H06	16	100	16	20	16	16	-	-	RC__0602	3,0
SRSCR/L2020K10	20	125	20	25	20	20	-	-	RC__10T3	5,0
SRSCR/L2525M12	25	150	25	32	25	25	-	-	RC__1204	6,0

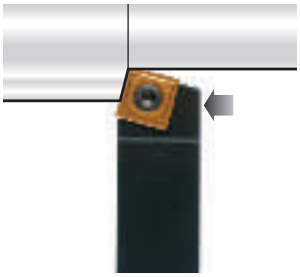
Para Plaquitas consulte Pág. C58 - C59

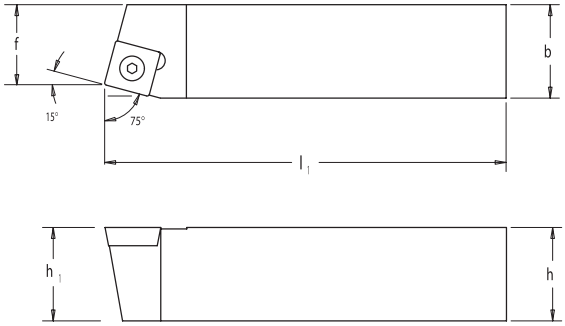
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SRSC_1616H06	F2505T	K5507	-	-
SRSC_2020K10	D4010T	K5515	-	-
SRSC_2525M12	D5016T	K5520	30,053	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SRSCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SRSCL

SSBC 75°





SSBC 75°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SSBCR/L1212F09	12	80	-	11	12	12	-	-	SC__09T3	0,8
SSBCR/L1616H09	16	100	-	13	16	16	-	-	SC__09T3	0,8
SSBCR/L2020K12	20	125	-	17	20	20	-	-	SC__12M5	0,8
SSBCR/L2525M12	25	150	-	22	25	25	-	-	SC__12M5	0,8

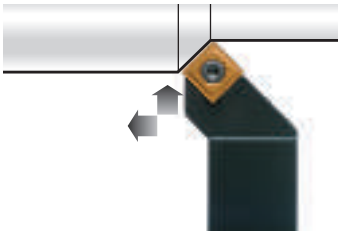
Para Plaquitas consulte Pág. C61 - C62

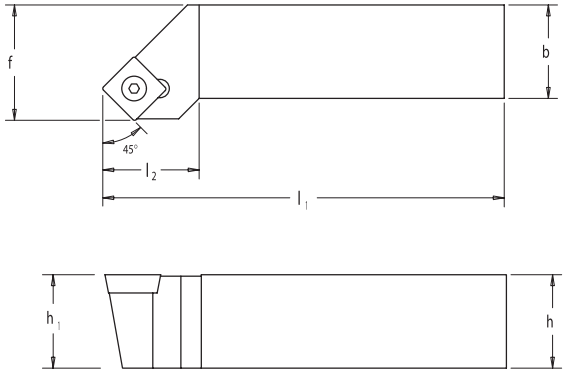
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SSBC_1212F09 to SSBC_1616H09	D4010T	K5515	-	-
SSBC_2020K12 to SSBC_2525M12	43D4014T	K5517	SA3514	SAS1760

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SSBCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SSBCL

SSSC 45°





SSSC 45°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SSSCR/L1212F09	12	80	11	16	12	12	-	-	SC__09T3	0,8
SSSCR/L1616H09	16	100	22	20	16	16	-	-	SC__09T3	0,8
SSSCR/L2020K12	20	125	22	25	20	20	-	-	SC__12M5	0,8
SSSCR/L2525M12	25	150	22	32	25	25	-	-	SC__12M5	0,8

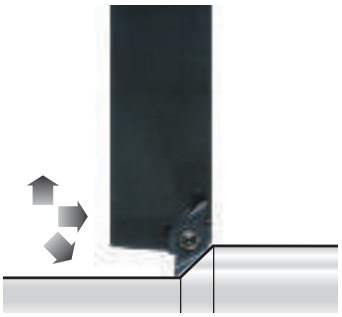
Para Plaquitas consulte Pág. C61 - C62

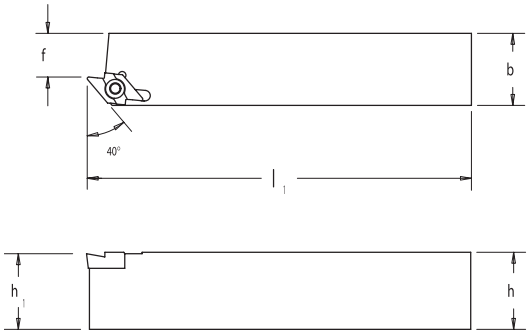
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SSSC_1212F09 to SSSC_1616H09	D4010T	K5515	-	-
SSSC_2020K12 to SSSC_2525M12	43D4014T	K5517	SA3514	SAS1760

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SSSCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SSSCL

STBT





STBT Torneado en Retroceso

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
STBTR1010M09	10	150	-	2,5	10	10	-	-	SBET0903	0,15
STBTR1212M09	12	150	-	4,5	12	12	-	-	SBET0903	0,15
STBTR1616M09	16	150	-	8,5	16	16	-	-	SBET0903	0,15
STBTR2020K09	20	125	-	12,5	20	20	-	-	SBET0903	0,15

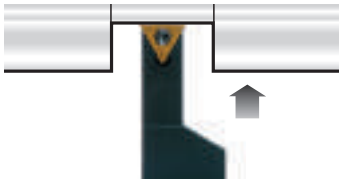
Para Plaquitas consulte Pág. C60

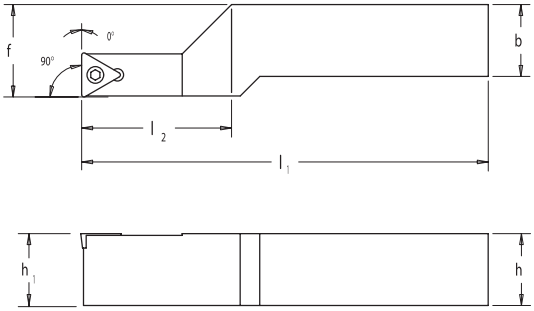
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
STBTR1010M09 to STBTR2020K09	F3008T	K5509	-	-

NOTA: La referencia para estas herramientas son específicas de Stellram ya que ISO 5608 no prevé este tipo de herramienta. Disponible solo a DERECHAS.

STCC 90°





STCC 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
STCCR2525M16	25	150	35	32	25	35	-	-	TC__16T3	0,8
STCCR3232P16	32	170	35	32	32	32	-	-	TC__16T3	0,8

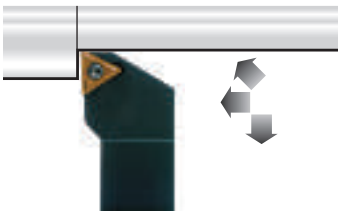
Para Plaquitas consulte Pág. C69 - C70

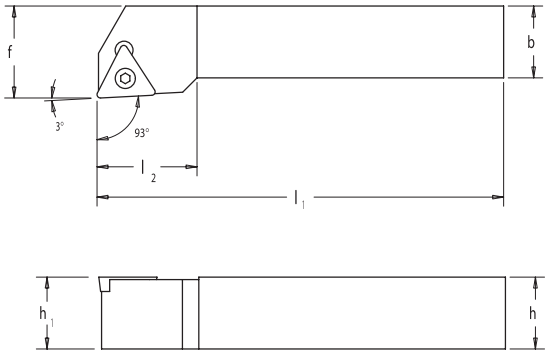
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
STCC_2525M16 to STCC_3232P16	F3512T	K5515	SA3414	SAS1750

Para Portaherramientas y plaquitas a DERECHAS, especifique R = STCCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = STCCL

STJC 93°





STJC 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
STJCR/L1212F11	12	80	18	16	12	12	-	-	TC__1102	0,4
STJCR/L1616H11	16	100	22	20	16	16	-	-	TC__1102	0,4
STJCR/L1616H16	16	100	22	20	16	16	-	-	TC__16T3	0,8
STJCR/L2020K16	20	125	22	25	20	20	-	-	TC__16T3	0,8
STJCR/L2525M16	25	150	22	32	25	25	-	-	TC__16T3	0,8

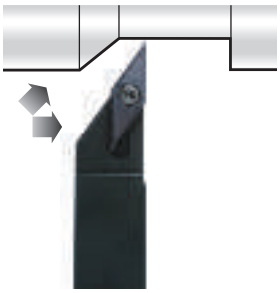
Para Plaquitas consulte Pág. C69 - C70

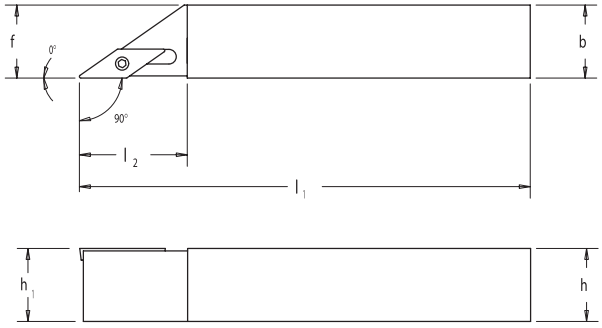
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
STJC_1212F11 to STJC_1616H11	F2507T	K5507	-	-
STJC_1616H16 to STJC_2525M16	F3512T	K5515	SA3414	SAS1750

Para Portaherramientas y plaquitas a DERECHAS, especifique R = STJCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = STJCL

SVAC 90°





SVAC 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SVACR/L1010M13	10	150	29	10	10	10	-	-	VC__1303	0,8
SVACR/L1212M13	12	150	29	12	12	12	-	-	VC__1303	0,8
SVACR/L1616M13	16	150	29	16	16	16	-	-	VC__1303	0,8
SVACR/L2020K13	20	125	29	20	20	20	-	-	VC__1303	0,8

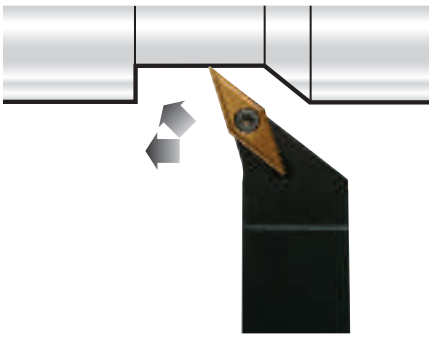
Para Plaquitas consulte Pág. C80 - C81

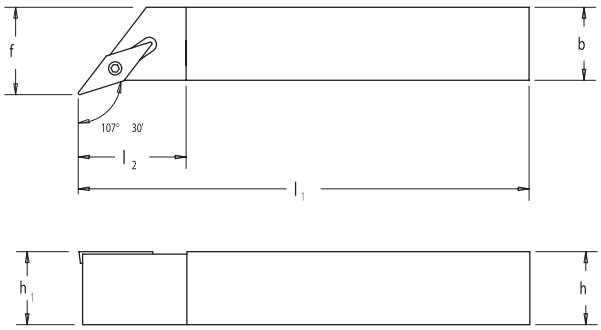
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	Apoyo	Tornillo del apoyo
SVAC_1010M13 to SVAC_2020K13	F3008T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SVACR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SVACL

SVHC 107° 30’





SVHC 107° 30’

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SVHCR/L2020K16	20	125	15,4	25	20	20	-	-	VC__1604	0,8
SVHCR/L2525M16	25	150	21,0	32	25	25	-	-	VC__1604	0,8
SVHCR/L3225P16	25	170	21,0	32	32	32	-	-	VC__1604	0,8

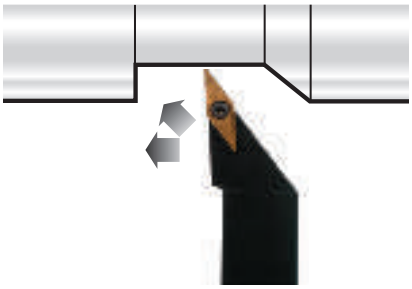
Para Plaquitas consulte Pág. C81

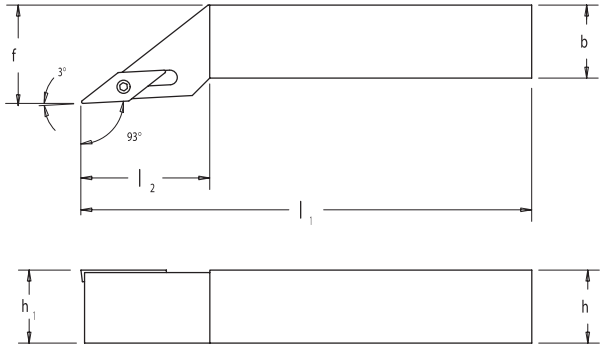
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SVHC_2020K16 to SVHC_3225P16	F3512T	K5515	SA3718	SAS1750

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SVHCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SVHCL

SVJB 93°





SVJB 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SVJBR/L2020K16	20	125	37	25	20	20	-	-	VB__1604	0,8
SVJBR/L2525M16	25	150	37	32	25	25	-	-	VB__1604	0,8

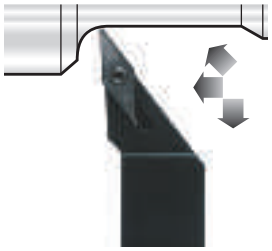
Para Plaquitas consulte Pág. C79

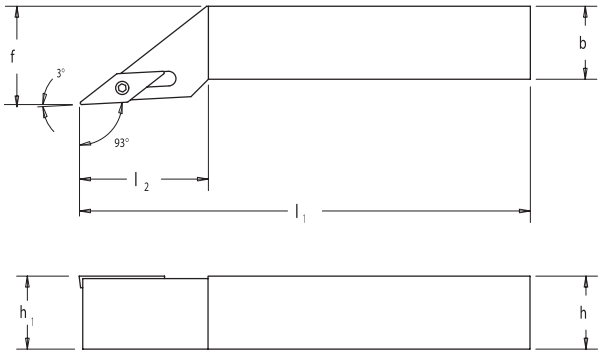
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SVJB_2020K16 to SVJB_2525M16	F3512T	K5515	SA3718	SAS1750

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SVJBR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SVJBL

SVJC 93°





SVJC 93°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SVJCR/L1212F13	12	80	26	16	12	12	-	-	VC__1303	0,8
SVJCR/L1616H13	16	100	30	20	16	16	-	-	VC__1303	0,8
SVJCR/L2020K13	20	125	30	25	20	20	-	-	VC__1303	0,8
SVJCR/L2525M13	25	150	35	32	25	25	-	-	VC__1303	0,8
SVJCR/L1616H16	16	100	30	20	16	16	-	-	VC__1604	0,8
SVJCR/L2020K16	20	125	37	25	20	20	-	-	VC__1604	0,8
SVJCR/L2525M16	25	150	37	32	25	25	-	-	VC__1604	0,8

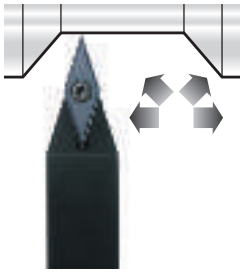
Para Plaquitas consulte Pág. C80 - C81

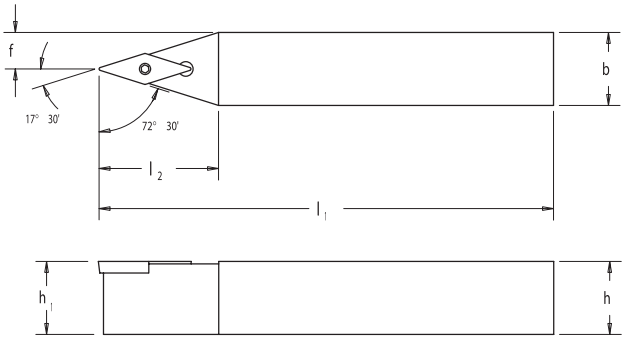
RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SVJC_1212F13 to SVJC_2525M13	F3008T	K5509	-	-
SVJC_1616H16 to SVJC_2525M16	F3512T	K5515	SA3718	SAS1750

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SVJCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SVJCL

SVVC 72° 30’





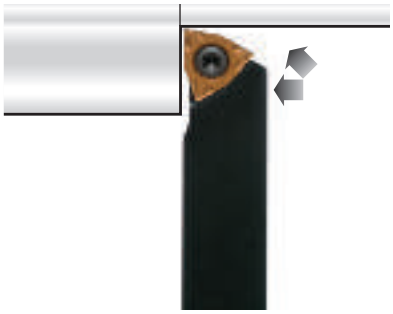
SVVC 72° 30’										
Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SVVCN1010M13	10	150	28	5,0	10	10	-	-	VC__1303	0,8
SVVCN1212M13	12	150	28	6,0	12	12	-	-	VC__1303	0,8
SVVCN1616M13	16	150	28	8,0	16	16	-	-	VC__1303	0,8
SVVCN2020K13	20	125	28	10,0	20	20	-	-	VC__1303	0,8
SVVCN2020K16	20	125	37	10,0	20	20	-	-	VC__1604	0,8
SVVCN2525M16	25	150	37	12,5	25	25	-	-	VC__1604	0,8

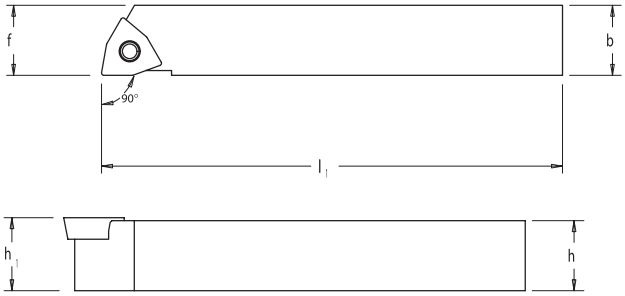
Para Plaquitas consulte Pág. C80 - C81

RECAMBIOS

Referencia	 Tornillo de la plaquita	 Llave	 Apoyo	 Tornillo del apoyo
SVVCN1010M13 to SVVCN2020K13	F3008T	K5509	-	-
SVVCN2020K16 to SVVCN2525M16	F3512T	K5515	SA3718	SAS1750

SWAP 90°





SWAP 90°

Referencia	Dimensiones (mm)								Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	k	z		
SWAPR/L1212F05	12	80	-	12,5	12	12	-	-	WP__0503	0,4

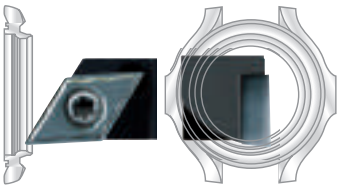
Para Plaquitas consulte Pág. C90

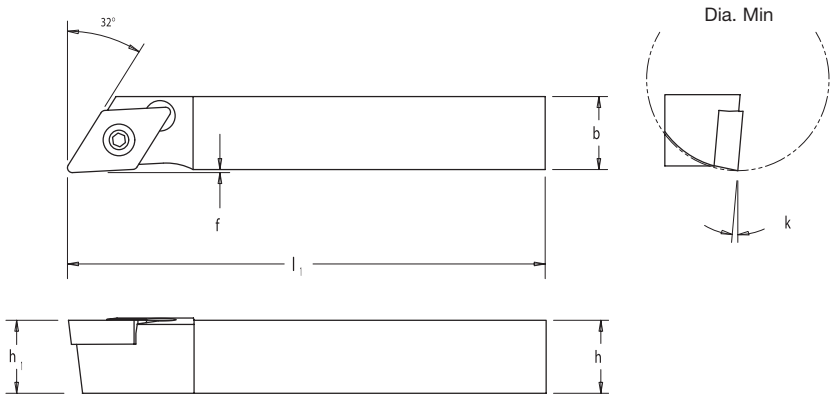
RECAMBIOS

Referencia	Tornillo de la plaquita	Llave	Apoyo	Tornillo del apoyo
SWAP_1212F05	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = PTGNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = PTGNL

33I DXC 32°





33I DXC 32°

Referencia	Dimensiones (mm)									Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	Dia. Min ø	k	z		
33IR/LDXC1212F11	12	80	-	6,5	12	12	30	5°	-	DC__11T3	0,8

Para Plaquitas consulte Pág. C43 - C45

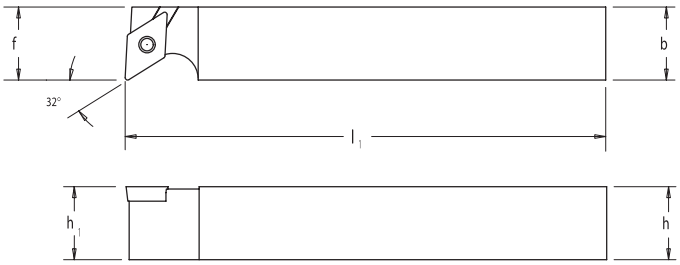
RECAMBIOS

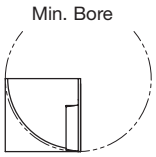
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
33I_DXC1212F11	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = 33IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = 33IL

33I DUC 32°







33I DUC 32°

Referencia	Dimensiones (mm)									Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	Dia. Min ø	k	z		
33IR/LDUC1212F07	12	80	-	6	12	12	24	-	-	DC__0702	0,4

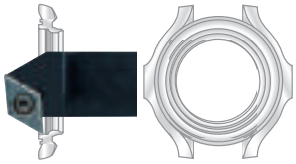
Para Plaquitas consulte Pág. C43 - C45

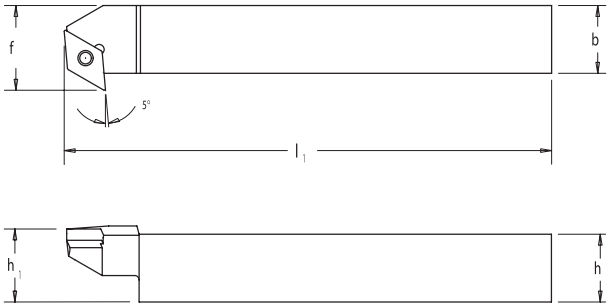
RECAMBIOS

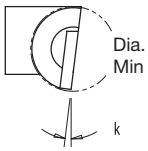
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
33I_DUC1212F07	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = 33IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = 33IL

33I DZC 5°







33I DZC 5°

Referencia	Dimensiones (mm)									Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	Dia. Min ø	k	z		
33IR/LDZC1212F07	12	80	-	9	12	12	15	7°	-	DC__0702	0,4

Para Plaquitas consulte Pág. C43 - C45

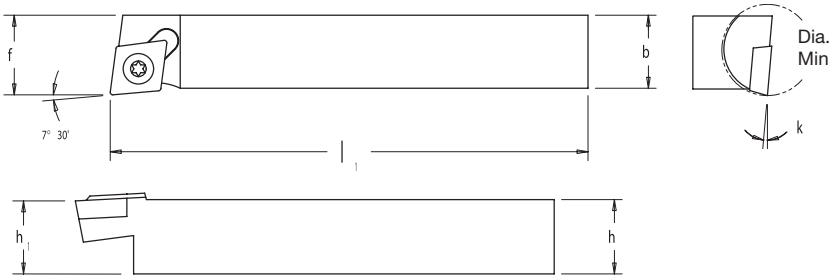
RECAMBIOS

Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
33I_DZC1212F07	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = 33IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = 33IL

33I ELP 7° 30’





33I ELP 7° 30’

Referencia	Dimensiones (mm)									Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	Dia. Min ø	k	z		
33IR/LELP1212F08	12	80	-	7	12	11,1	15	7°	-	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

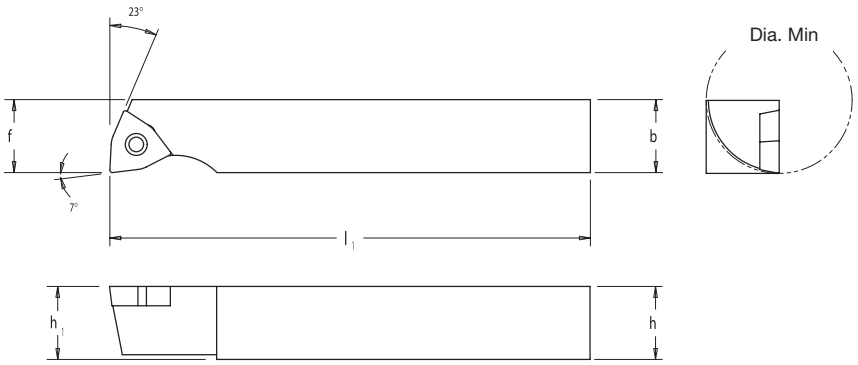
RECAMBIOS

Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
33I_ELP1212F08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = 33IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = 33IL

33I WUP 7°





33I WUP 7°

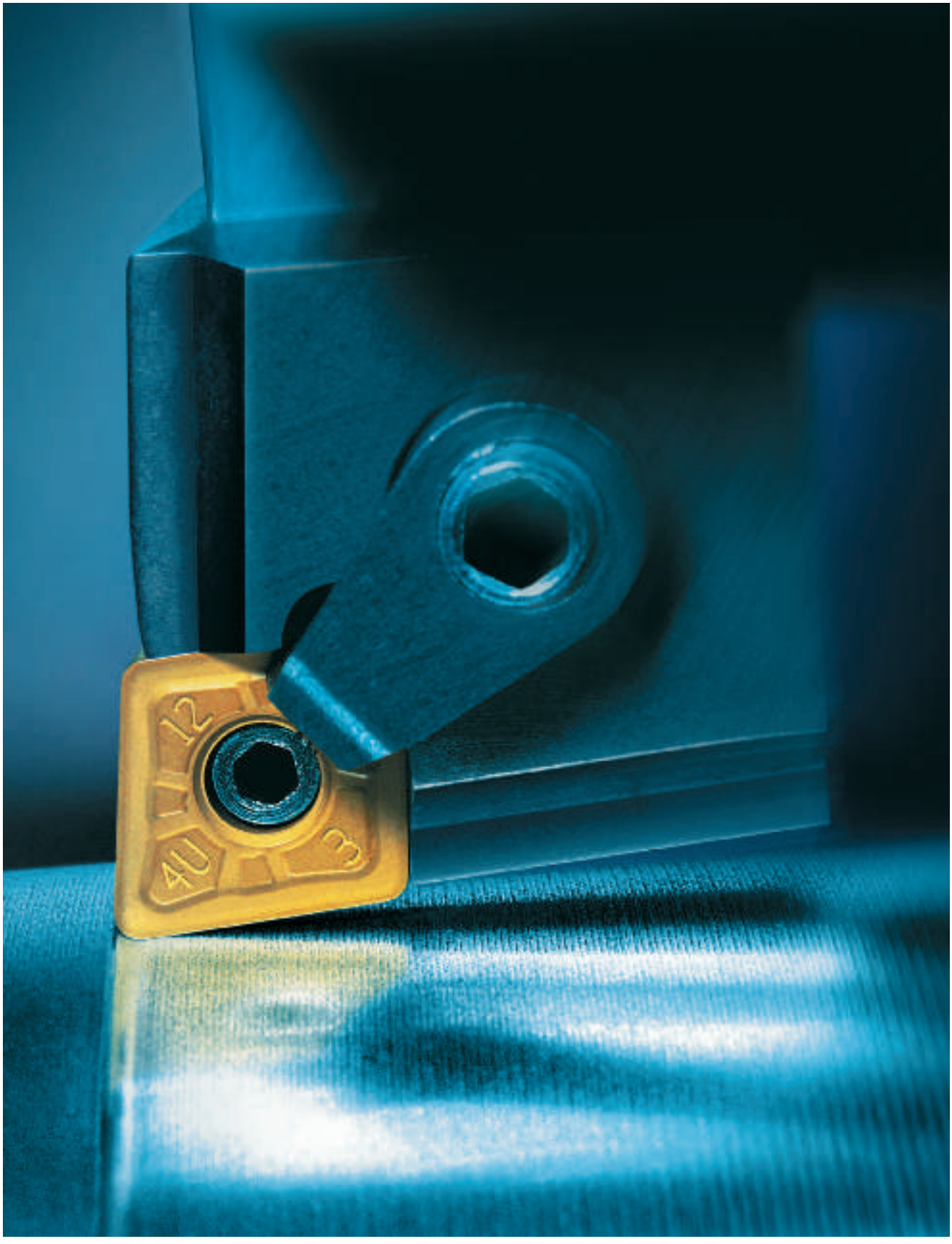
Referencia	Dimensiones (mm)									Plaquitas	Radio de Plaquita Maestra
	b	l_1	l_2	f	h	h_1	Dia. Min ø	k	z		
33IR/LWUP1212F05	12	80	-	6	12	12	24	-	-	WP__0503	0,4

Para Plaquitas consulte Pág. C90

RECAMBIOS

Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
33I_WUP1212F05	F3008T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = 33IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = 33IL


12
40
3

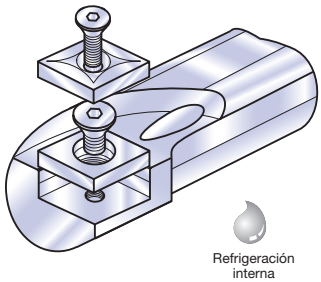
Portaherramientas de interiores



Los portaherramientas de interiores Stellram están disponibles en los tamaños más populares cubriendo la mayoría de aplicaciones.

Existen tres métodos de sujeción para cada necesidad.

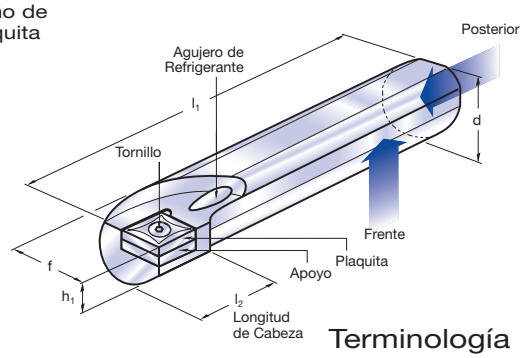
1 Amarre por Tornillo Posicut®



Plaquita tipo		Incidencia		Tamaño de la plaquita	
A	1 6 M - S	S	S C	R	0 9

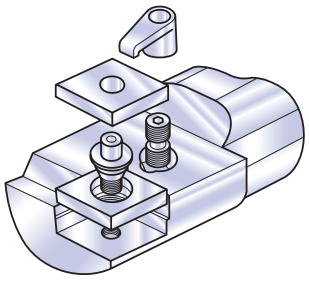
El innovador programa de Stellram Posicut® "S" para plaquitas positivas ISO.

El sistema de sujeción por tornillo utiliza tornillos de calidad superior que sujetan firmemente las plaquitas en la dirección de la fuerza principal.



Terminología

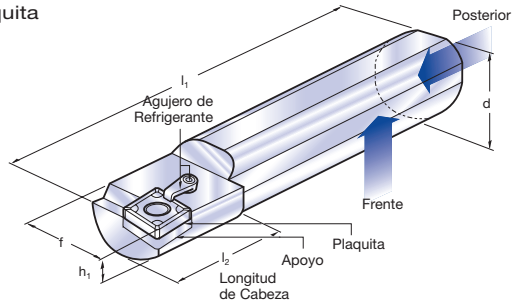
2 Brida y Perno



Plaquita tipo		Incidencia		Tamaño de la plaquita	
A	3 2 S - M	W	L N	R	0 8

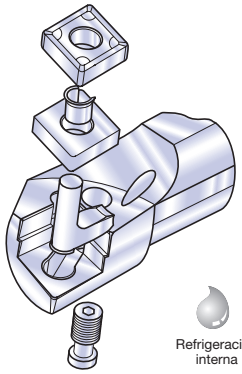
El tipo "M" Brida y Perno para plaquitas negativas ISO.

Doble sujeción para condiciones difíciles, estos portaherramientas combinan un perno excéntrico y una Brida superior para una seguridad extra.



Terminología

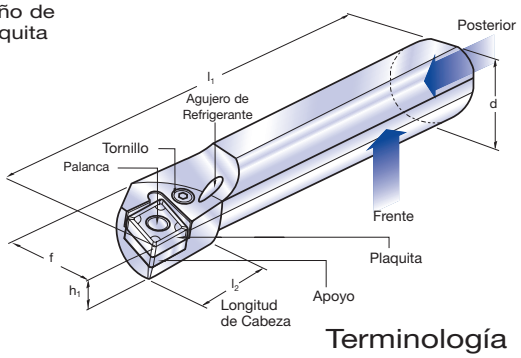
3 Palanca



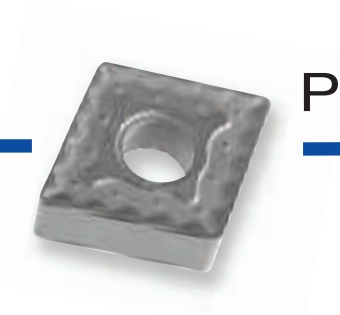
Plaquita tipo		Incidencia		Tamaño de la plaquita	
A	2 5 R - P	C	L N	R	1 2

El sistema "P" de Palanca para plaquitas negativas ISO.

La presión mecánica de la palanca sujeta la plaquita en la dirección de la fuerza de corte principal. La ausencia de cualquier interferencia de un sistema de sujeción ayuda a la evacuación de viruta, así como al cambio de arista o de plaquita.



Terminología



Portaherramientas de interiores

Plaquita tipo	Angulo de Corte	Brida y perno	Palanca	Posicut®	Tamaño del portaherramientas									
					06	08	10	12	16	20	25	32	40	50
CC_06	95			SCLC			■	■						
CC_09	95			SCLC					■	■	■			
CC-12	95			SCLC						■	■			
CN_12	95		PCLN								■	■	■	■
CN_16	95		PCLN										■	■
CN_19	95		PCLN											■
DC_07	100			SDXC				■	■					
	95			SDZC				■	■	■				
	93			SDUC			■	■	■	■				
	62.5			SDWC				■	■					
DC_11	100			SDXC					■	■	■			
	95			SDZC						■	■			
	93			SDUC						■	■	■		
	62.5			SDWC						■	■			
DN_11	93		PDUN								■	■		
DN_15	93		PDUN									■	■	
EC_12	97,5			SELC						■	■	■		
EP_04	97,5			SELP	■	■								
	93			SEUP	■									
EP_06	97,5			SELP		■	■							
	93			SEUP		■	■							
EP_08	97,5			SELP			■	■	■	■	■	■		
			SEUP				■	■	■					
SC_09	75			SSKC					■	■	■			
	75			SSSC					■	■	■			
TC_16	93			STUC					■	■	■	■		
TN_16	90		PTFN								■	■		
TN_22		PTFN											■	
VC_13	107.5			SVQC						■	■			
	93			SVUC						■	■			
VC_16	107.5			SVQC								■		
WN_06	95	MWLN								■	■	■		
		PWLN							■	■	■			
WN_08	95	MWLN									■	■	■	
		PWLN									■	■		
WP_02	95			SWLP	■	■	■							
WP_05	95			SWLP				■	■					

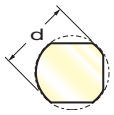
Designación ISO (ISO 6261) para Portaherramientas de interiores Posicut® Brida y Perno y Palanca

A	25	R	-	P	C
1	2	3		4	5

1 Portaherramientas tipo

A	Mango de acero y refrigeración interna.
B	Mango de acero y dispositivo antivibración.
C	Mango de metal duro con cabeza de acero.
D	Mango de acero con dispositivo antivibración y refrigeración interna.
E	Mango de metal duro con cabeza de acero y refrigeración interna.
F	Mango de metal duro con cabeza de acero y dispositivo antivibración.
G	Mango de metal duro con cabeza de acero, dispositivo antivibración y refrigeración interna.
H	Mango de metal pesado.
J	Mango de metal pesado y refrigeración interna.
S	Mango de acero.

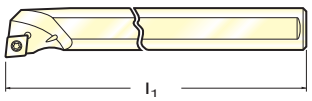
2 Ø Portaherramientas



METRICO

06	=	6
08	=	8
10	=	10
12	=	12
16	=	16
20	=	20
25	=	25
32	=	32
40	=	40
50	=	50

3 Longitud del portaherramientas

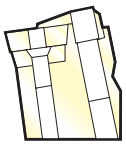


METRICO

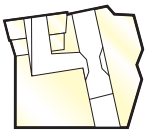
F	=	80
H	=	100
K	=	125
M	=	150
P	=	170
Q	=	180
R	=	200
S	=	250
T	=	300
U	=	350
V	=	400
W	=	450
Y	=	500
X	=	ESPECIAL

4 Amarre

M Brida y Perno



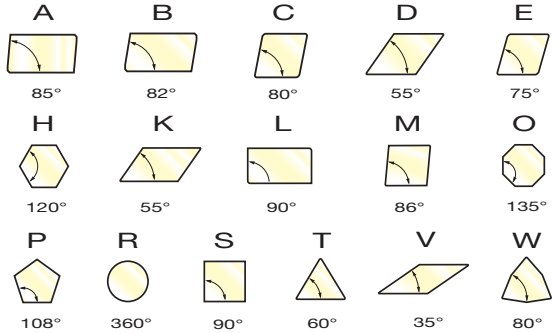
P Palanca



S Posicut®

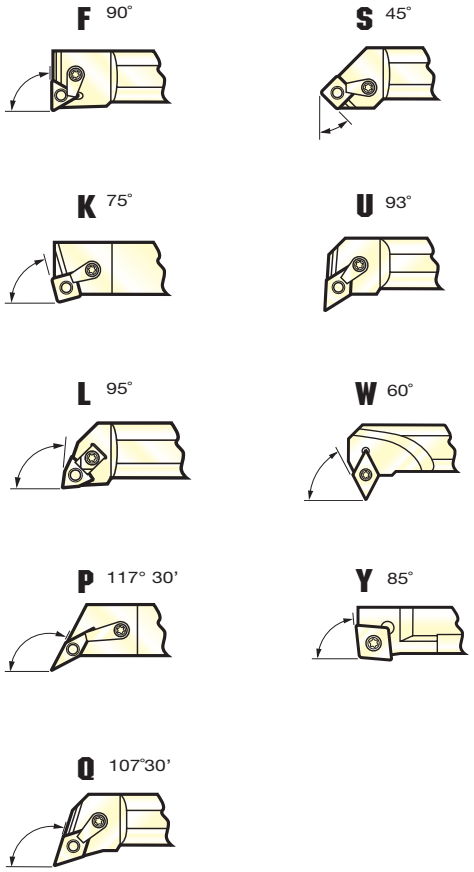


5 Forma de la plaquita

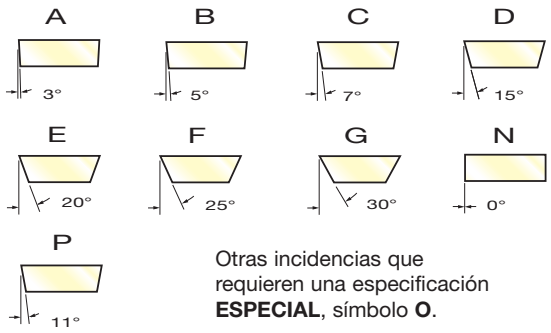


L	N	R	12	-
6	7	8	9	10

6 Tipo de herramienta



7 Incidencia



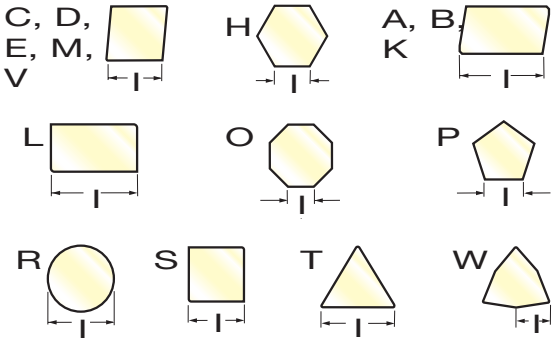
Otras incidencias que requieren una especificación **ESPECIAL**, símbolo **O**.

8 Mano



9 Tamaño de la plaquita

Enteros con una sola cifra son precedidos por **0** (cero).
Omitir decimales, e.g. 9,525 = **09**.



10 Opcional

Adicionales símbolos opcionales (números o letras) añadidas por el fabricante.

Deben de ser separadas de la designación estándar por un guión (-).

Índice de Aplicaciones

MWLN 95°



PAGINA C157

PCLN 95°



PAGINA C158

PDUN 93°



PAGINA C159

PTFN 90°



PAGINA C160

PWLN 95°



PAGINA C161

SCLC 95°



PAGINA C162

SDUC 93°



PAGINA C163

SDWC 62° 30'



PAGINA C164

SDXC 100°



PAGINA C165

SDZC 95°



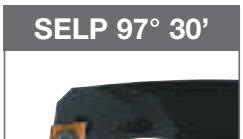
PAGINA C166

SELC 97° 30'



PAGINA C167

SELP 97° 30'



PAGINA C168

SEUP 93°



PAGINA C169

SSKC 75°



PAGINA C170

SSSC 45°



PAGINA C171

STUC 93°



PAGINA C172

SVQC 107° 30'



PAGINA C173

SVUC 93°



PAGINA C174

SWLP 95°



PAGINA C175

E_31V 60°



PAGINA C176

E_32V 45°



PAGINA C177

E_36V 90°



PAGINA C178

SEFP 90°



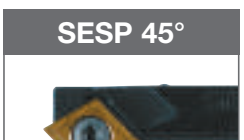
PAGINA C179

SELP 97° 30'



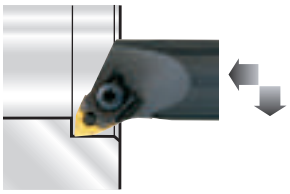
PAGINA C180

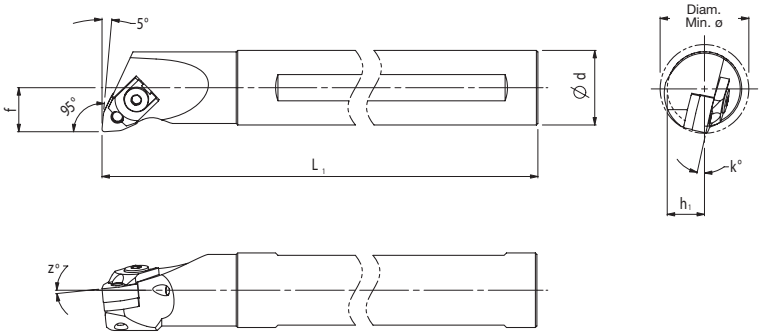
SESP 45°



PAGINA C181

MWLN 95°





MWLN 95°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A20Q-MWLNR/L06	27	20	180	13	10,0			WN__0604	0,4
A25R-MWLNR/L06	31	25	200	17	11,5			WN__0604	0,4
A32S-MWLNR/L06	39	32	250	22	15,0			WN__0604	0,4
A25R-MWLNR/L08	32	25	200	17	12,5	14°	5°	WN__0804	0,8
A32S-MWLNR/L08	40	32	250	22	16,0	14°	5°	WN__0804	0,8
A40T-MWLNR/L08	50	40	300	27	20,0	12°	5°	WN__0804	0,8

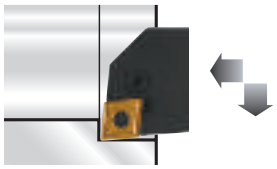
Para Plaquitas consulte Pág. C87 - C89

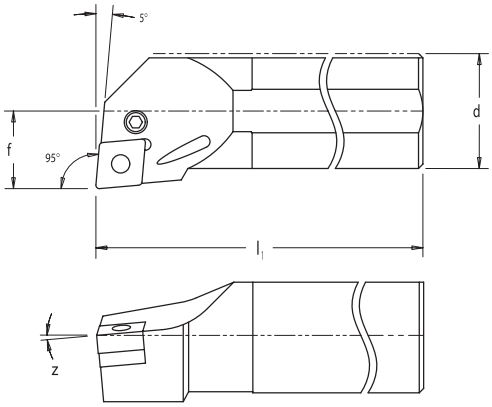
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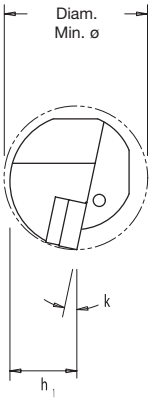
Referencia	 Brida y Tornillo	Tornillo de Brida	 Llave	 Apoyo	 Perno Excéntrico	 Tornillo de Perno
A20Q-MWLN_06	MC2006	-	KH5003	-	MLP1643	MLS1813
A25R-MWLN_06	MC2006	-	KH5003	MA3006	MLP1644	MLS1813
A32S-MWLN_06	MC2006	-	KH5003	MA3006	MLP1644	MLS1393
A25R-MWLN_08	MC2011	-	KH5005	-	MLP1647	MLS1814
A32S-MWLN_08	MC2011	-	KH5005	MA3009	MLP1661	MLS1814
A40T-MWLN_08	MC2011	-	KH5005	MA3009	MLP1661	MLS1394

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A20Q-MWLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A20Q-MWLNL

PCLN 95°







PCLN 95°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A25R-PCLNR/L12	31	25	200	17	12,5	14°	5°	CN__1204	0,8
A32S-PCLNR/L12	39	32	250	22	16,0	14°	5°	CN__1204	0,8
A40T-PCLNR/L12	48	40	300	27	20,0	12°	5°	CN__1204	0,8
A50U-PCLNR/L12	61	50	350	35	25,0	12°	5°	CN__1204	0,8
A40T-PCLNR/L16	48	40	300	27	20,0	12°	5°	CN__1606	1,2
A50U-PCLNR/L16	61	50	350	35	25,0	12°	5°	CN__1606	1,2
A50U-PCLNR/L19	61	50	350	35	25,0	12°	5°	CN__1906	1,2

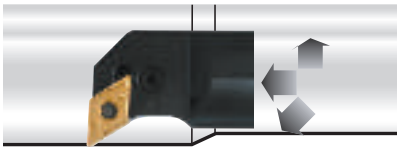
Para Plaquitas consulte Pág. C36 - C41

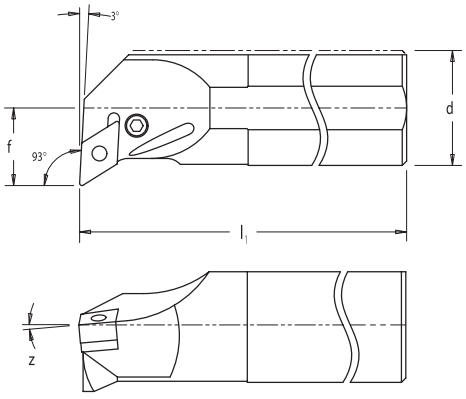
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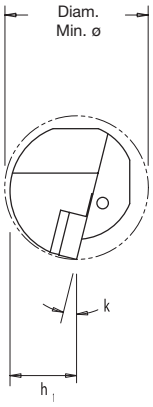
Referencia	 Palanca	 Tornillo de Palanca	 Llave	 Apoyo	 Pasador	 Coloca Pasador
A25R-PCLN_12	PL8212	PLS1626	KH5025	-	-	-
A32S-PCLN_12	PL8312	PLS1648	KH5003	PA3612	PC4112	PCP0012
A40T-PCLN_12	PL8012	PLS1608	KH5003	PA3612	PC4112	PCP0012
A50U-PCLNR_12	PL8012	PLS1608	KH5003	PA3612	PC4112	PCP0012
A40T-PCLN_16 to A50UPCLN_16	PL8016	PLS1618	KH5003	PA3616	PC4115	PCP0015
A50U-PCLN_19	PL8219	PLS1610	KH5004	PA3619	PC4119	PCP0019

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A16M-PCLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A16M-PCLNL

PDUN 93°







PDUN 93°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A25R-PDUNR/L11	32	25	200	17	12,5	14°	5°	DN__1104	0,8
A32S-PDUNR/L11	40	32	250	22	16,0	14°	5°	DN__1104	0,8
A32S-PDUNR/L15	39	32	250	22	16,0	14°	5°	DN__1506	0,8
A40T-PDUNR/L15	48	40	300	27	20,0	14°	5°	DN__1506	0,8

Para Plaquitas consulte Pág. C46 - C50

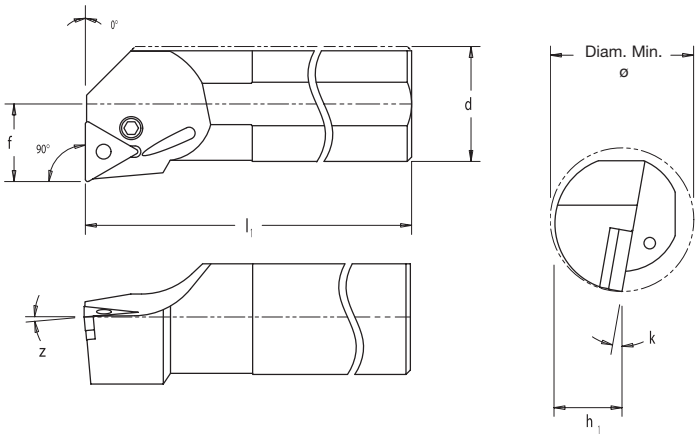
RECAMBIOS

Referencia	 Palanca	 Tornillo de Palanca	 Llave	 Apoyo	 Pasador	 Coloca Pasador
A25R-PDUN_11 to A32S-PDUN_11	PL8009	PLS1606	KH5025	PA3711	PC4109	PCP0009
A32S-PDUN_15 to A40T-PDUN_15	PL8415	PLS1648	KH5003	PA3715	PC4112	PCP0012

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A25R-PDUNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A25R-PDUNL

PTFN 90°





PTFN 90°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A25R-PTFNR/L16	31	25	200	17	12,5	14°	5°	TN__1604	0,8
A32S-PTFNR/L16	39	32	250	22	16,0	10°	5°	TN__1604	0,8
A40T-PTFNR/L22	48	40	300	27	20,0	10°	5°	TN__2204	0,8

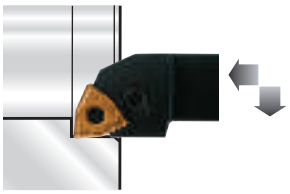
Para Plaquitas consulte Pág. C71 - C77

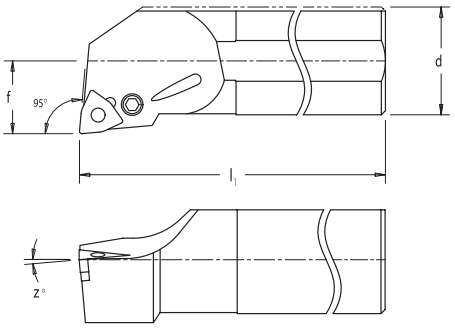
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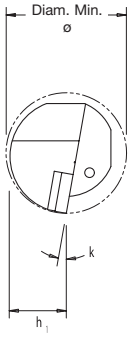
Referencia	 Palanca	 Tornillo de Palanca	 Llave	 Apoyo	 Pasador	 Coloca Pasador
A25R-PTFN_16	PL8216	PLS1605	KH5002	-	-	-
A32S-PTFN_16	PL8009	PLS1606	KH5025	PA3416	PC4109	PCP0009
A40T-PTFN_22	PL8012	PLS1608	KH5003	PA3422	PC4112	PCP0012

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A25R-PTFNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A25R-PTFNL

PWLN 95°







PWLN 95°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A16M-PWLNR/L06	20	16	150	11	7,5	-	-	WN__0604	0,8
A20Q-PWLNR/L06	27	20	180	13	9,0	-	-	WN__0604	0,8
A25R-PWLNR/L06	31	25	200	17	11,5	-	-	WN__0604	0,8
A25R-PWLNR/L08	31	25	200	17	11,5	-	-	WN__0804	0,8
A32S-PWLNR/L08	39	32	250	22	15,0	-	-	WN__0804	0,8

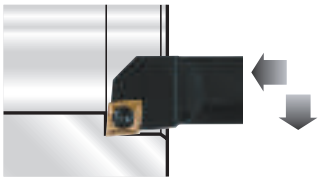
Para Plaquitas consulte Pág. C87 - C89

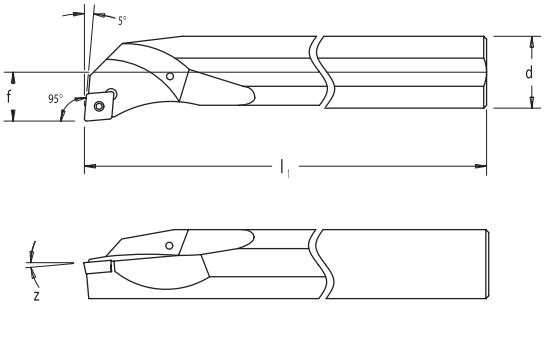
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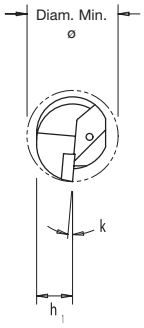
Referencia	 Palanca	 Tornillo de Palanca	 Llave	 Apoyo	 Pasador	 Coloca Pasador
A16M-PWLN_06 to A20Q-PWLN_06	PL8216	PLS1605	KH5002			
A25R-PWLN_06	PL8009	PLS1606	KH5025	PA3007	PC4109	PCP0009
A25R-PWLN_08	PL8312	PLS1648	KH5003			
A32S-PWLN_08	PL8012	PLS1608	KH5003	PA3008	PC4112	PCP0012

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A16M-PWLNR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A16M-PWLNL

SCLC 95°







SCLC 95°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A10K-SCLCR/L06	13	10	125	7	5,0	5°	3°	CC__0602	0,4
A12K-SCLCR/L06	16	12	125	9	6,0	5°	3°	CC__0602	0,4
A16M-SCLCR/L09	20	16	150	11	8,0	5°	3°	CC__09T3	0,8
A20Q-SCLCR/L09	25	20	180	13	10,0	5°	5°	CC__09T3	0,8
A25R-SCLCR/L09	32	25	200	17	12,5	5°	5°	CC__09T3	0,8
A20Q-SCLCR/L12	25	20	180	13	10,0	5°	5°	CC__12	0,8
A25R-SCLCR/L12	32	25	200	17	12,5	5°	5°	CC__12	0,8

Portaherramientas antivibratorios

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
J08K-SCLCR/L06	11	8	125	5	4	5°	3°	CC__0602	0,4
J10M-SCLCR/L06	13	10	150	7	5	5°	3°	CC__0602	0,4
J12M-SCLCR/L06	16	12	150	9	6	5°	3°	CC__0602	0,4
J16R-SCLCR/L09	20	16	200	11	8	5°	3°	CC__09T3	0,8

Para Plaquitas consulte Pág. C34 - C35

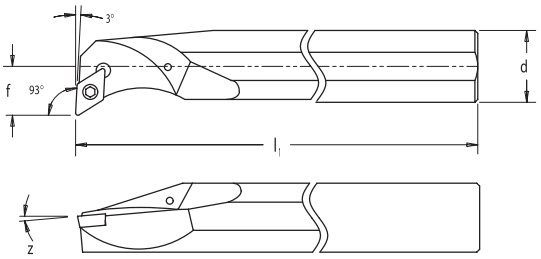
RECAMBIOS

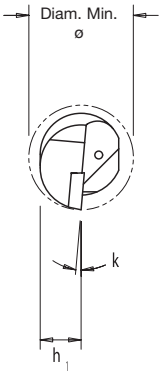
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
J08K-SCLC_06 to A12K-SCLC_06	F2505T	K5507	-	-
A16M-SCLC_09 to A25R-SCLC_09	D4010T	K5515	-	-
J16R-SCLCR_09	D4008T	K5515		
A20Q-SCLC_12 to A25R-SCLC_12	D5013T	K5520	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A10K-SCLCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A10K-SCLCL

SDUC 93°







SDUC 93°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A12K-SDUCR/L07	16	12	125	9	6,0	5°	3°	DC__0702	0,4
A16M-SDUCR/L07	20	16	150	11	8,0	5°	3°	DC__0702	0,4
A20Q-SDUCR/L07	25	20	180	13	10,0	5°	5°	DC__0702	0,4
A20Q-SDUCR/L11	25	20	180	13	10,0	5°	5°	DC__11T3	0,8
A25R-SDUCR/L11	32	25	200	17	12,5	5°	5°	DC__11T3	0,8
A32S-SDUCR/L11	40	32	250	22	16,0	5°	5°	DC__11T3	0,8

Portaherramientas antivibratorios

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
J10M-SDUCR/L07	13	10	150	7	5,0	5°	3°	DC__0702	0,4
J12M-SDUCR/L07	16	12	150	9	6,0	5°	3°	DC__0702	0,4
J16R-SDUCR/L07	20	16	200	11	8,0	5°	3°	DC__0702	0,4

Para Plaquitas consulte Pág. C43 - C45

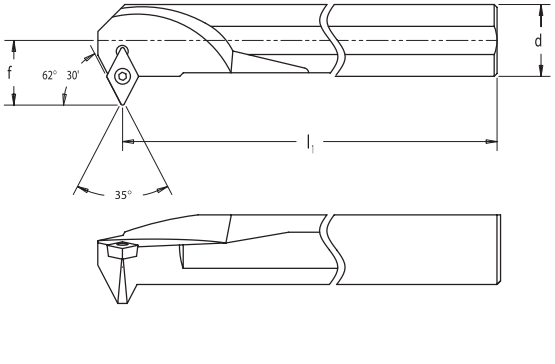
RECAMBIOS

Referencia	 Tornillo de Plaquita	 Llave	 Apoyo	 Tornillo de Apoyo
J10M-SDUC_07	F2506TP	K5507	-	-
J12R-SDUC_07 to J16R-SDUC_07	F2505T	K5507	-	-
A12K-SDUC_07 to A20Q-SDUC_07	F2505T	K5507	-	-
A20Q-SDUC_11 to A25R-SDUC_11	D4010T	K5515	-	-
A32S-SDUC_11	F3512T	K5515	SA3714	SAS1750

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A12K-SDUCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A12K-SDUCL

SDWC 62° 30’





SDWC 62° 30’

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
S12K-SDWCR/L07	19	12	125	12,0	6,0	5°	-	DC__0702	0,4
S16M-SDWCR/L07	23	16	150	14,0	8,0	5°	-	DC__0702	0,4
S20Q-SDWCR/L11	30	20	180	19,0	10,0	5°	-	DC__11T3	0,8
S25R-SDWCR/L11	35	25	200	21,5	12,5	5°	-	DC__11T3	0,8

Para Plaquitas consulte Pág. C43 - C45

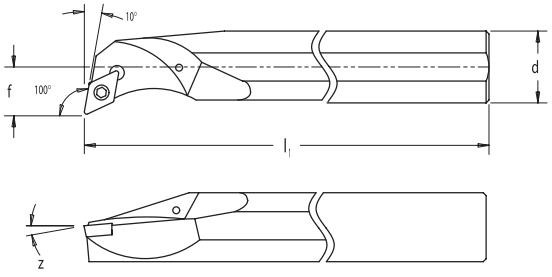
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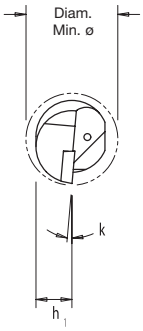
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
S12K-SDWC_07 to S16M-SDWC_07	F2505T	K5507	-	-
S20Q-SDWC_11 to S25R-SDWC_11	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = S12K-SDWCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = S12K-SDWCL

SDXC 100°







SDXC 100°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A12K-SDXCR/L07	16	12	125	9	6,0	5°	3°	DC__0702	0,4
A16M-SDXCR/L07	20	16	150	11	8,0	5°	3°	DC__0702	0,4
A16M-SDXCR/L11	20	16	150	11	8,0	5°	3°	DC__11T3	0,8
A20Q-SDXCR/L11	25	20	180	13	10,0	5°	5°	DC__11T3	0,8
A25R-SDXCR/L11	32	25	200	17	12,5	5°	5°	DC__11T3	0,8

Para Plaquitas consulte Pág. C43 - C45

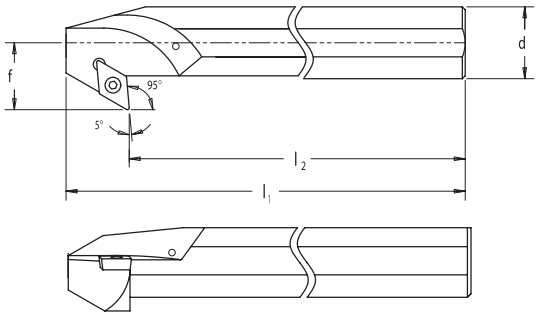
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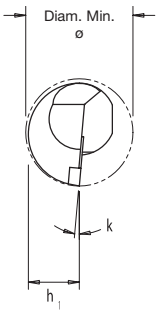
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A12K-SDXC_07 to A16M-SDXC_07	F2505T	K5507	-	-
A16M-SDXC_11 to A25R-SDXC_11	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A12K-SDXCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A12K-SDXCL

SDZC 95°







SDZC 95°

Descripción	Dimensiones (mm)								Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	l_2	f	h_1	k	z		
A12K-SDZCR/L07	19	12	138	125	12,0	6,0	5°	-	DC__0702	0,4
A16M-SDZCR/L07	23	16	163	150	14,0	8,0	5°	-	DC__0702	0,4
A20Q-SDZCL/R07	30	20	198	180	19,0	10,0	5°	-	DC__0702	0,4
A20Q-SDZCR/L11	30	20	198	180	19,0	10,0	5°	-	DC__11T3	0,8
A25R-SDZCR/L11	37	25	222	200	23,5	12,5	5°	-	DC__11T3	0,8

Para Plaquitas consulte Pág. C43 - C45

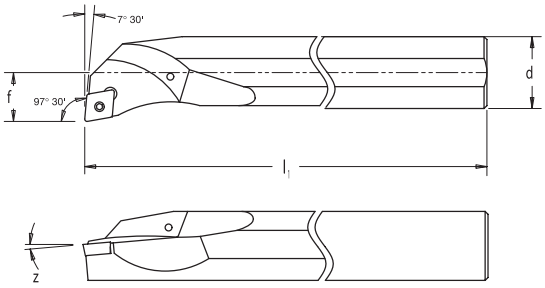
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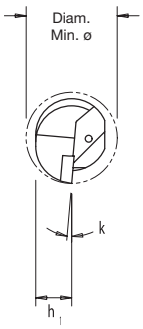
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A12K-SDZC_07 to A20Q-SDZC_07	F2505T	K5507	-	-
A20Q-SDZC_11 to A25R-SDZC_11	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = S12K-SDZCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = S12K-SDZCL

SELC 97° 30’







SELC 97° 30’

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A20Q-SELCR/L12	25	20	180	13	10,0	5°	5°	EC__12T3	0,8
A25R-SELCR/L12	32	25	200	17	12,5	5°	5°	EC__12T3	0,8
A32S-SELCR/L12	40	32	250	22	16,0	5°	5°	EC__12T3	0,8

Para Plaquitas consulte Pág. C51 - C52

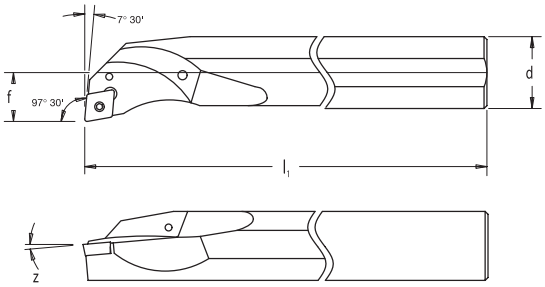
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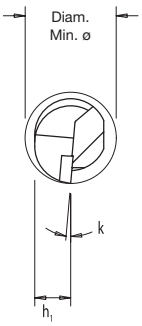
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A20Q-SELCR/L12 to A32S-SELC_12	F4011T	K5520	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A20Q-SELCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A20Q-SELCL

SELP 97° 30’







SELP 97° 30’

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
S06F-SELPR/L04	8	6	80	4	4,2	10°	0°	EP__0402	0,4
A08H-SELPR/L04	11	8	100	6	4,0	8°	0°	EP__0402	0,4
A08H-SELPR/L06	11	8	100	6	4,0	8°	0°	EP__0602	0,4
A10K-SELPR/L06	13	10	125	7	5,0	5°	3°	EP__0602	0,4
A10K-SELPR/L08	13	10	125	7	5,0	5°	3°	EP__08M3	0,8
A12K-SELPR/L08	16	12	125	9	6,0	5°	3°	EP__08M3	0,8
A16M-SELPR/L08	20	16	150	11	8,0	5°	3°	EP__08M3	0,8
A20Q-SELPR/L08	24	20	180	13	10,0	5°	5°	EP__08M3	0,8
A25R-SELPR/L08	31	25	200	17	12,5	5°	5°	EP__08M3	0,8
A32S-SELPR/L08	39	32	250	22	16,0	5°	5°	EP__08M3	0,8

Portaherramientas antivibratorios

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
D08H-SELPR/06	11	8	100	6	4,0	8°	0°	EP__0602	0,4
D10K-SELPR/L08	13	10	125	7	5,0	5°	3°	EP__08M3	0,8
D12K-SELPR/L08	16	12	125	9	6,0	5°	3°	EP__08M3	0,8
D16M-SELPR/L08	20	16	150	11	8,0	5°	3°	EP__08M3	0,8
D20Q-SELPR/L08	24	20	180	13	10,0	5°	5°	EP__08M3	0,8

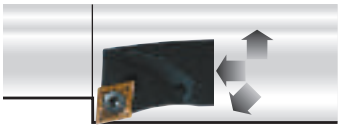
Para Plaquitas consulte Pág. C53 - C57

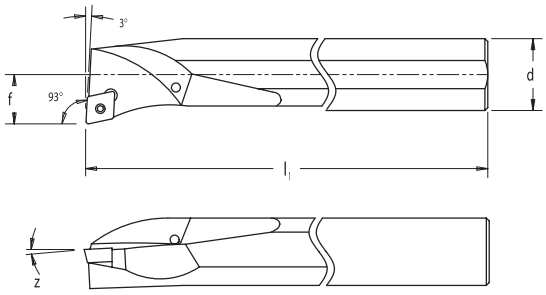
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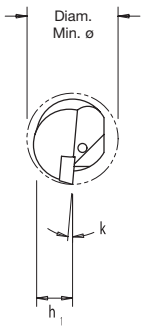
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
S06F-SELP_04 to A08H-SELP_04	F2004T	K5506	-	-
A08H-SELP_06 to A10K-SELP_06	F2505T	K5507	-	-
A10K-SELP_08 to A32S-SELP_08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = S06F-SELPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = S06F-SELPL

SEUP 93°







SEUP 93°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
S06F-SEUPR/L04	8	6	80	4	4,2	10°	0°	EP__0402	0,4
A08H-SEUPR/L06	11	8	100	6	4	8°	0°	EP__0602	0,4
A10K-SEUPR/L06	13	10	125	7	5	5°	3°	EP__0602	0,4
A10K-SEUPR/L08	13	10	125	7	5	5°	3°	EP__08M3	0,8
A12K-SEUPR/L08	16	12	125	9	6	5°	3°	EP__08M3	0,8
A16M-SEUPR/L08	20	16	150	11	8	5°	3°	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

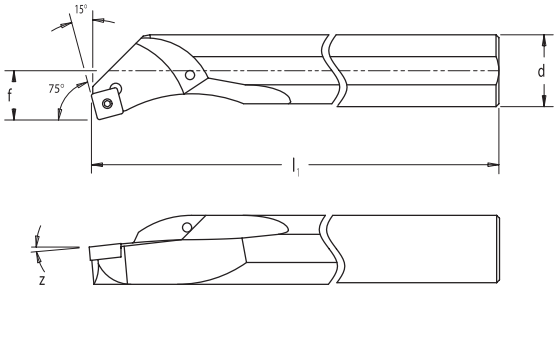
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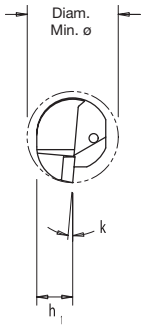
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
S06F-SEUP_04	F2004T	K5506	-	-
A08H-SEUP_06 to A10K-SEUP_06	F2505T	K5507	-	-
A10K-SEUP_08 to A16M-SEUP_08	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = S06F-SEUPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = S06F-SEUPL

SSKC 75°







SSKC 75°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A16M-SSKCR/L09	20	16	150	11	8,0	5°	3°	SC__09T3	0,8
A20Q-SSKCR/L09	25	20	180	13	10,0	5°	5°	SC__09T3	0,8
A25R-SSKCR/L09	32	25	200	17	12,5	5°	5°	SC__09T3	0,8

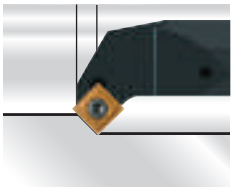
Para Plaquitas consulte Pág. C61 - C62

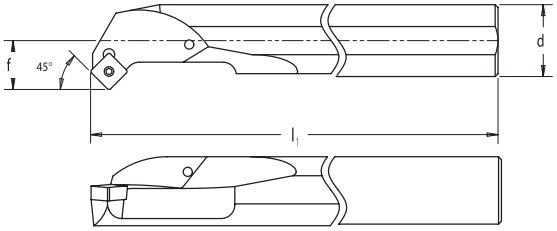
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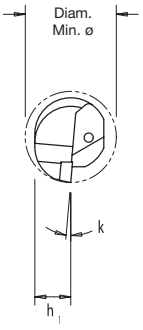
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A16M-SSKC_09	D4008T	K5515	-	-
A20Q-SSKC_09 to A25R-SSCK_09	D4010T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A16M-SSKCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A16M-SSKCL

SSSC 45°







SSSC 45°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A16M-SSSCR/L09	20	16	150	11	8,0	5°	-	SC__09T3	0,8
A20Q-SSSCR/L09	25	20	180	13	10,0	5°	-	SC__09T3	0,8
A25R-SSSCR/L09	32	25	200	17	12,5	5°	-	SC__09T3	0,8

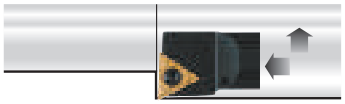
Para Plaquitas consulte Pág. C61 - C62

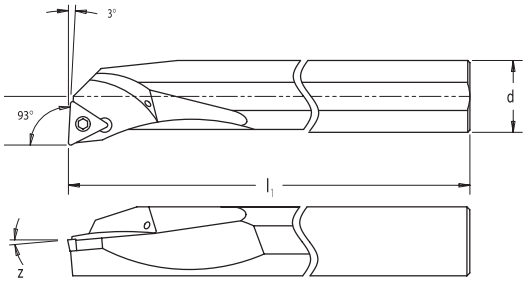
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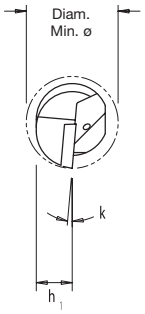
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A16M-SSSC_09 to A25R-SSSC_09	D4008T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A16M-SSSCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A16M-SSSCL

STUC 93°







STUC 93°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A16R-STUCR/L16	20	16	200	11	8,0	5°	3°	TC__16T3	0,8
A20S-STUCR/L16	25	20	250	13	10,0	5°	3°	TC__16T3	0,8
A25T-STUCR/L16	32	25	300	17	12,5	5°	5°	TC__16T3	0,8
A32U-STUCR/L16	40	32	350	22	16,0	5°	5°	TC__16T3	0,8

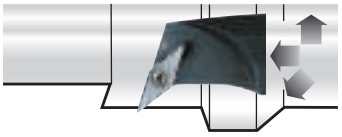
Para Plaquitas consulte Pág. C69 - C70

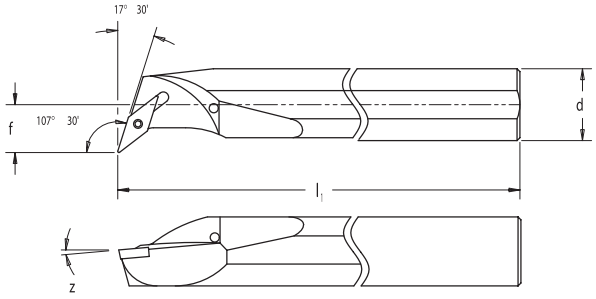
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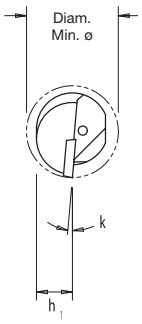
Referencia	 Tornillo de Plaquita	 Llave	 Apoyo	 Tornillo de Apoyo
A16R-STUC_16	D4008T	K5515	-	-
A20S-STUC_16 to A25T-STUC_16	D4010T	K5515	-	-
A32U-STUC_16	F3510T	K5515	30,077	30,673

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A16R-STUCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A16R-STUCL

SVQC 107° 30’







SVQC 107° 30’

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A20Q-SVQCR/L13	25	20	180	13	10,0	5°	5°	VC__1303	0,8
A25R-SVQCR/L13	32	25	200	17	12,5	5°	5°	VC__1303	0,8
A32U-SVQCR/L16	40	32	350	22	16,0	5°	5°	VC__1604	0,8

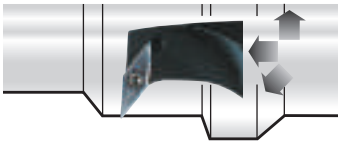
Para Plaquitas consulte Pág. C80 - C81

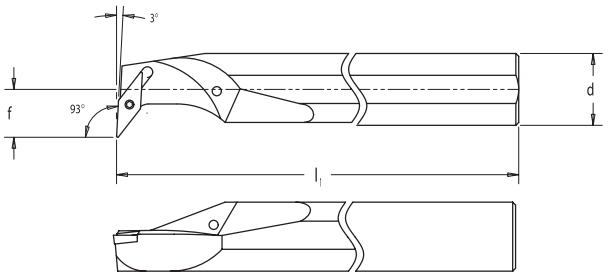
RECAMBIOS

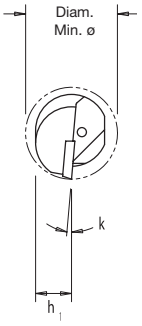
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A20Q-SVQC_13 to A25R-SVQC_13	F3008T	K5509	-	-
A32U-SVQC_16	F3510T	K5515	30.078	30.673

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A20Q-SVQCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A20Q-SVQCL

SVUC 93°







SVUC 93°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
A20Q-SVUCR/L13	24	20	180	13	10,0	5°	-	VC__1303	0,8
A25S-SVUCR/L13	31	25	250	17	12,5	5°	-	VC__1303	0,8

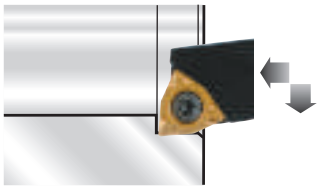
Para Plaquitas consulte Pág. C80 - C81

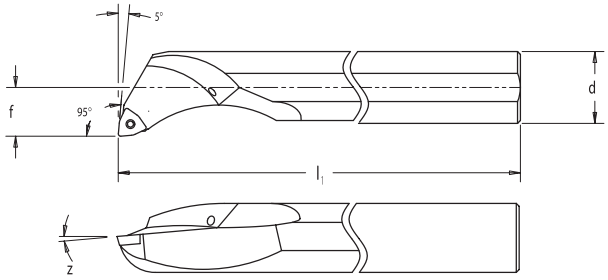
RECAMBIOS

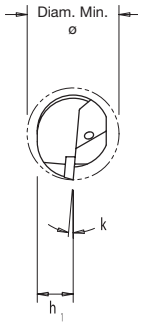
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
A20Q-SVUC_13 to A25S-SVUC_13	F3008T	K5515	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = A20Q-SVUCR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = A20Q-SVUCL

SWLP 95°







SWLP 95°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	d	l_1	f	h_1	k	z		
S06F-SWLPR/L02	7,5	6	80	3,2	4,2	5°	0°	WP__0201	0,2
A08H-SWLPR/L02	11,0	8	100	6	4	8°	3°	WP__0201	0,2
A10H-SWLPR/L02	13,0	10	100	7	5	5°	3°	WP__0201	0,2
A12K-SWLPR/L05	16,0	12	125	9	6	5°	3°	WP__0503	0,4
A16M-SWLPR/L05	20,0	16	150	11	8	5°	5°	WP__0503	0,4

For Plaquitas refer to page C90

RECAMBIOS

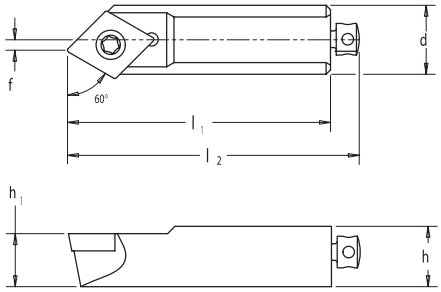
Referencia	 Tornillo de Plaquita	 Llave	Apoyo	Tornillo de Apoyo
S06F-SWLP_02 to A10H_SWLP_02	55F1803T	K5506	-	-
A12K-SWLP_05 to A16M-SWLP_05	A3006T	K5509	-	-

Para Portaherramientas y plaquitas a DERECHAS, especifique R = S06F-SWLPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = S06F-SWLPL

E_31V 60°







E_31V 60°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	d	l_1	l_2		f	h	h_1		
			min.	max.					
E031V08R/L	8	30	-	-	1,1	7	7	EP__0602	0,4
E131V10R/L	10	50	-	-	1,5	8,2	8,5	EP__08M3	0,8
E131V12R/L	12	60	66	72	2,4	10,2	10,15	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

RECAMBIOS

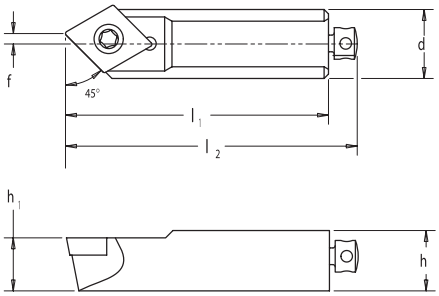
Referencia	Tornillo	Llave	Tornillo de Ajuste	Tornillo de Ajuste lateral
E03_V08_	F2505T	K5507	-	-
E13_V10_	A3006T	K5509	-	-
E13_V12_	A3006T	K5509	ASA30641	30901

Para Portaherramientas y plaquitas a DERECHAS, especifique R = E031V08R
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = E031V08L

E_32V 45°







E_32V 45°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	d	l_1	l_2		f	h	h_1		
			min.	max.					
EM32V06R/L	6	25	-	-	3,0	5,0	4,10	EP__0402	0,4
E032V08R/L	8	30	-	-	1,1	7,0	7,00	EP__0602	0,4
E132V10R/L	10	50	-	-	0,6	8,2	8,50	EP__08M3	0,8
E132V12R/L	12	60	66	72	0,2	10,2	10,15	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

RECAMBIOS

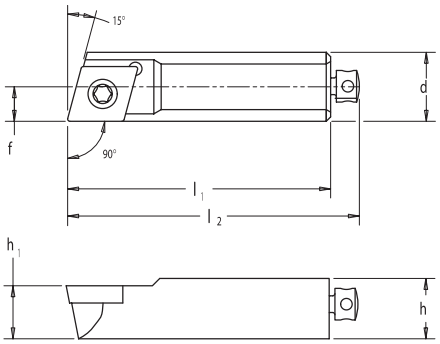
Referencia	Tornillo	Llave	Tornillo de Ajuste	Tornillo de Ajuste lateral
EM32V06_	F2004T	K5506	-	-
E03_V08_	F2505T	K5507	-	-
E13_V10_	A3006T	K5509	-	-
E13_V12_	A3006T	K5509	ASA30641	30901

Para Portaherramientas y plaquitas a DERECHAS, especifique R = EM32V06R
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = EM32V06L

E_36V 90°







E_36V 90°

Descripción	Dimensiones (mm)							Plaquitas	Radio de la Plaquita maestra
	d	l_1	l_2		f	h	h_1		
			min.	max.					
E036V08R/L	8	30	-	-	4,0	7,0	7,00	EP__0602	0,4
E136V10R/L	10	50	-	-	5,0	8,2	8,15	EP__08M3	0,8
E136V12R/L	12	60	66	72	6,5	10,2	10,15	EP__08M3	0,8

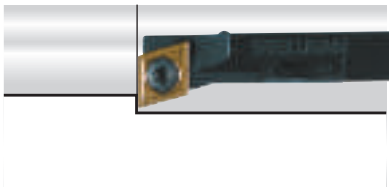
Para Plaquitas consulte Pág. C53 - C57

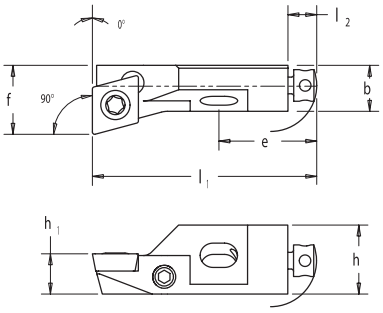
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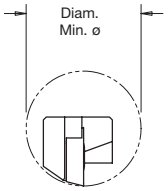
Referencia	Tornillo	Llave	Tornillo de Ajuste	Tornillo de Ajuste lateral
E03_V08_	F2505T	K5507	-	-
E13_V10_	A3006T	K5509	-	-
E13_V12_	A3006T	K5509	ASA30641	30901

Para Portaherramientas y plaquitas a DERECHAS, especifique R = E036V08R
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = E036V08L

SEFP 90°







SEFP 90°

Descripción	Dimensiones (mm)								Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	b	l_1	l_2	f	e_1	h	h_1		
SEFPR/L06CAX0625	17	6	25	-	9	5	10	5,7	EP__0602	0,4
SEFPR/L07CAX0839	20	8	39	5	12	17	12	6,7	EP__08M3	0,8

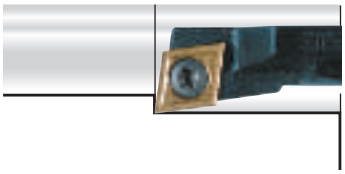
Para Plaquitas consulte Pág. C53 - C57

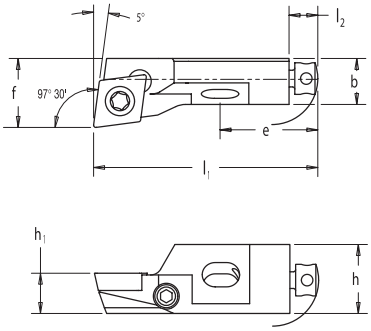
RECAMBIOS

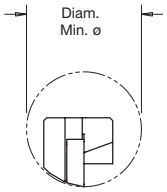
Referencia	Tornillo	Llave	Tornillo de Ajuste Axial	Tornillo de Ajuste Radial	Tornillo de Montaje
SE_P_06CAX0625	F2505T	K5507	-	ASR30602	CBS30646
SE_P_07CAX0839	A3006T	K5509	ASA30643	ASR30603	CBS30647

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SEFPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SEFPL

SELP 97° 30’







SELP 97° 30’										
Descripción	Dimensiones (mm)								Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	b	l_1	l_2	f	e_1	h	h_1		
SELPR/L06CAX0625	17	6	25	-	9	5	10	5,7	EP__0602	0,4
SELPR/L07CAX0839	20	8	39	5	12	17	12	6,7	EP__08M3	0,8

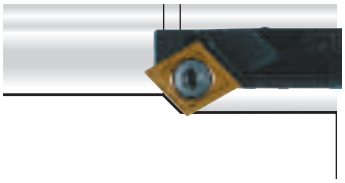
Para Plaquitas consulte Pág. C53 - C57

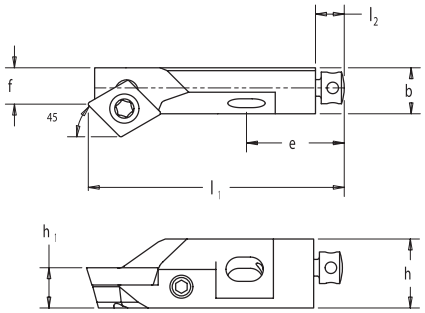
RECAMBIOS

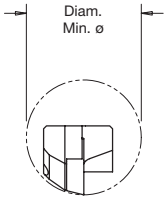
Referencia	Tornillo	Llave	Tornillo de Ajuste Axial	Tornillo de Ajuste Radial	Tornillo de Montaje
SELP_06CAX0625	F2505T	K5507	-	ASR30602	CBS30646
SELP_07CAX0839	A3006T	K5509	ASA30643	ASR30603	CBS30647

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SELPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SELPL

SESP 45°







SESP 45°

Descripción	Dimensiones (mm)								Plaquitas	Radio de la Plaquita maestra
	Diam. Min. ø	b	l_1	l_2	f	e_1	h	h_1		
SESPR/L06CAX0625	17	6	25	-	9	5	10	5,7	EP__0602	0,4
SESPR/L07CAX0839	20	8	39	5	12	17	12	6,7	EP__08M3	0,8

Para Plaquitas consulte Pág. C53 - C57

RECAMBIOS

Referencia	Tornillo	Llave	Tornillo de Ajuste Axial	Tornillo de Ajuste Radial	Tornillo de Montaje
SESP_06CAX0625	F2505T	K5507	-	ASR30602	CBS30646
SESP_07CAX0839	A3006T	K5509	ASA30643	ASR30603	CBS30647

Para Portaherramientas y plaquitas a DERECHAS, especifique R = SESPR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = SESPL



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Análisis de Fallo

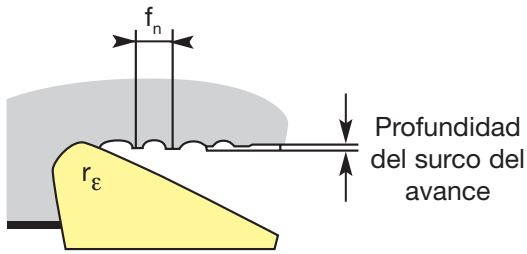
Causa	Corrección	Fallo
Calentamiento intermitente de la arista de corte. Alta velocidad, gran arranque de material.	**A** Utilice calidades resistentes al calor con mayor TaC. **B** Utilice herramientas con Ángulos de ataque positivos. **C** Incremente el radio de punta. **D** Reduzca la velocidad, avance o profundidad de corte. **E** Evite el uso de refrigerante.	 **Fisuras Térmicas**
Herramienta de corte excesivamente frágil. Herramienta muy dura para la aplicación.	**A** Utilice una calidad mas tenaz con mayor contenido de cobalto. **B** Utilice plaquitas con ángulo de ataque negativo. **C** Utilice un radio de punta mayor. **D** Utilice una plaquita con un bisel mayor. **E** Incremente la velocidad de corte.	 **Astillado**
Herramienta muy blanda. Velocidad de mecanizado muy alta.	**A** Utilice una calidad más dura y resistente al desgaste. **B** Reduzca la velocidad de corte. **C** Incremente el avance. **D** Use refrigerante.	 **Excesivo desgaste del flanco**
Muesca en la línea de profundidad de corte. Habitualmente debido a una superficie endurecida, o con corteza.	**A** Incremente el ángulo de aproximación al máximo. **B** Utilice un radio mayor para pasadas poco profundas. **C** Reduzca la velocidad de corte y el avance. **D** Varíe la profundidad de corte.	 **Muesca**
Velocidad de corte muy baja para el material a mecanizar.	**A** Incremente la velocidad de corte. **B** Utilice una calidad con menor fricción v.g.TiAlN. **C** Use refrigerante con mayor lubricación.	 **Adherencias**
Grandes avances o altas velocidades de corte.	**A** Reduzca la velocidad de corte. **B** Reduzca el avance. **C** Utilice una calidad con mayor dureza. **D** Utilice una calidad con mayor resistencia al calor.	 **Deformación Plástica**
Excesivo calentamiento y presión sueldan la viruta a la arista.	**A** Utilice una calidad mas dura. **B** Reduzca la velocidad. **C** Reduzca el avance.	 **Craterización**

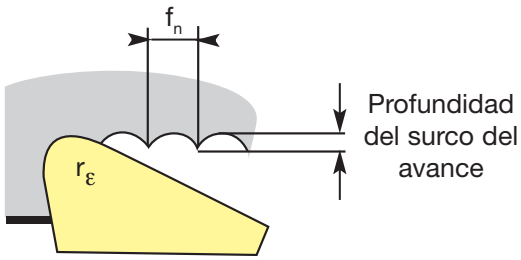
Acabado superficial

El radio de la plaquita juega un importante papel en la calidad del acabado superficial, que a su vez esta en relación directa con el avance (f_n). Con radios grandes, mejores acabados pueden alcanzarse a mayores avances. La utilización de radios grandes produce una mayor area de contacto e incrementa la potencia y las fuerzas de corte.

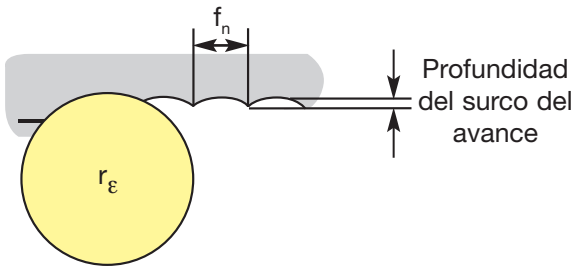
Para operaciones de desbaste, es preferible seleccionar un radio grande para asegurar la rigidez de la plaquita. Sin embargo, para algunos materiales es preferible utilizar radios pequeños para obtener un corte suave. La plaquita es mas frágil pero es mejor para operaciones sensibles a las vibraciones.

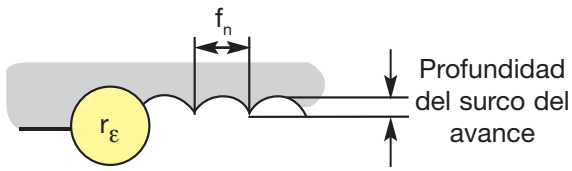
Generalmente una plaquita se debe utilizar con un avance máximo, igual a la mitad de su radio. El avance mínimo esta relacionado a la preparación de la arista de corte o al comienzo del control de viruta. Un incremento de la velocidad de corte contribuye a la calidad del acabado superficial.





Para un radio dado:
A mayor avance, mayor ondulación de la superficie mecanizada.





Para un radio dado:
A mayor radio, menor ondulación de la superficie mecanizada.

Formula para calcular el avance:

$$f_n = \sqrt{\frac{R_{max} \times 8\, r_\varepsilon}{1000}}$$

$$R_{max} = \frac{f_n^2}{8 \times r_\varepsilon} \times 1000\ (\mu m)$$

El valor medio de R_a, pede ser calculado con la siguiente fórmula:

$$R_a = \frac{f_n^2 \times 50}{r_\varepsilon}$$

Acabado superficial Valor de R_a (µm)	Radio de punta r_ε (mm)						
	0,2	0,4	0,8	1,2	1,6	2,4	3,2
	Avance, f_n (mm/rev)						
0,6	0,05	0,07	0,10	0,12	0,14	0,17	0,20
1,6	0,08	0,12	0,16	0,20	0,23	0,29	0,32
3,2	0,12	0,16	0,23	0,29	0,33	0,40	0,46
6,3	-	0,23	0,33	0,40	0,47	0,57	0,66
8,0	-	-	0,40	0,49	0,57	0,69	0,80

Rmax = profundidad del perfil (µm)

r_ε = radio de punta (mm)

f_n = Avance (mm/rev)

Gráfico de Comparación de Acabado Superficial

R_{max}	R_a = CLA = AA		RMS		Operación
µm	µm	µinch	µm	µinch	
1,6	0,30	11.8	0,33	13.1	
1,8	0,35	13.8	0,39	15.3	
2,0	0,40	15.7	0,44	17.4	
2,2	0,44	17.5	0,49	19.4	
2,4	0,49	19.2	0,54	21.3	
2,6	0,53	20.8	0,59	23.1	
2,8	0,58	22.7	0,64	25.2	
3,0	0,63	24.6	0,70	27.3	
3,5	0,71	27.8	0,79	30.9	
4,0	0,80	31.4	0,89	34.8	
4,5	0,90	35.2	1,00	39.1	
5,0	0,99	38.8	1,10	43.1	
6,0	1,20	47.2	1,30	52.4	
7,0	1,40	55.1	1,50	61.2	
8,0	1,60	63.0	1,80	70.0	
9,0	1,80	71.0	2,00	78.8	
10,0	2,00	79.0	2,20	87.7	
15,0	3,20	126.0	3,10	140.0	
20,0	4,40	173.0	4,90	192.0	
25,0	5,80	238.0	6,40	264.0	
27,0	6,30	247.0	7,00	274.0	
30,0	7,40	292.0	8,20	324.0	
35,0	8,80	346.0	9,80	384.0	
40,0	10,70	422.0	11,00	468.0	
45,0	12,50	485.0	13,90	538.0	
50,0	14,00	552.0	15,50	613.0	

ACABADO FINO

MEDIO

DESBASTE

Dureza de la pieza y velocidades de corte

Diferencia en dureza (HBN):
Cuando la dureza de la pieza a trabajar difiere del valor mostrado en la gráfica de calidades y velocidades, multiplique la velocidad de corte señalada por el factor mostrado abajo para obtener la nueva velocidad de corte.

Pieza a trabajar — Suave ← (dureza de la pieza a trabajar) → Duro

ISO/ANSI	120HBN	140HBN	160HBN	180HBN	200HBN	220HBN	240HBN	260HBN	280HBN	300HBN	320HBN	340HBN
P	1,42	1,25	1,13	1,0	0,93	0,86	0,75	0,71	0,66	-	-	-
M	1,40	1,22	1,10	1,0	0,93	0,86	0,80	0,70	0,69	-	-	-
K	1,40	1,34	1,30	1,25	1,20	1,10	1,05	1,0	0,94	0,90	0,85	0,82

Comparación Entre Diferentes Escalas de dureza

Resistencia a la tracción	Vickers	Brinell	Rockwell	
N/mm²	HV	HBN	HRC	HRB
255	80	76.0	-	-
270	85	80.7	-	41.0
285	90	85.5	-	48.0
305	95	90.2	-	52.0
320	100	95.0	-	56.2
350	110	105	-	62.3
385	120	114	-	66.7
415	130	124	-	71.2
450	140	133	-	75.0
480	150	143	-	78.7
510	160	152	-	81.7
545	170	162	-	85.0
575	180	171	-	87.5
610	190	181	-	89.5
640	200	190	-	91.5
660	205	195	-	92.5
675	210	199	-	93.5
690	215	204	-	94.0
705	220	209	-	95.0
720	225	214	-	96.0
740	230	219	-	96.7
770	240	228	20.3	98.1
800	250	238	22.2	99.5
820	255	242	23.1	-
835	260	247	24.0	(101)
850	265	252	24.8	-
865	270	257	25.6	(102)
900	280	266	27.1	-
930	290	276	28.5	(105)
950	295	280	29.2	-
965	300	285	29.8	-
995	310	295	31.0	-

Resistencia a la tracción	Vickers	Brinell	Rockwell
N/mm²	HV	HBN	HRC
1030	320	304	32.2
1060	330	314	33.3
1095	340	323	34.4
1125	350	333	35.5
1155	360	342	36.6
1190	370	352	37.7
1220	380	361	38.8
1255	390	371	39.8
1290	400	380	40.8
1320	410	390	41.8
1350	420	399	42.7
1385	430	409	43.6
1420	440	418	44.5
1485	460	437	46.1
1555	480	450	47.7
1595	490	457	48.4
1630	500	465	49.1
1665	510	474	49.8
1700	520	482	50.5
1740	530	489	51.1
1775	540	496	51.7
1810	550	503	52.3
1845	560	511	53.0
1880	570	520	53.6
1920	580	527	54.1
1955	590	533	54.7
1995	600	538	55.2
2030	610	543	55.7
2070	620	549	56.3
2105	630	555	56.8
2145	640	561	57.3
2180	650	568	57.8

HV = Dureza Vickers
HBN = Dureza Brinell
HRC = Dureza Rockwell, escala C
HRB = Dureza Rockwell, escala B

Terminología y Formulas en Torneado

ISO	Material	Rm y Dureza	Kc: N/mm²
P	Aceros no Aleados	400-600 N/mm² 120-180 HBN	2050
		600-950 N/mm² 180-200 HBN	2300
	Aceros Aleados	700-950 N/mm² 200-280 HBN	2599
		950-1200 N/MM² 280-355 HBN	2851
		1200-1400 N/mm² 355-415 HBN	3172
	Aceros de Herramienta	1200-1400 N/mm² 355-415 HBN	3895
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	1847
		Martensítico Series 400	2599
		Refractario P.H.	3199
K	Fundiciones	Gris GG-Ft	1200
		Esferoidal GGG-FGS	1500
		Nodular GGGNi - L - N	1600
		Maleable GTS - MN/MP	1050
N	Aluminio y Aleaciones	<16% Si 116HBN	827
		>16% Si 92HBN	965
S	Aleaciones Refractarias	Base Hierro	2999
		Base Cobalto	3799
		Base Níquel	3500
		Base Titanio 425-456HBN	1500

Terminología y Formulas en Torneado

Formulas

$V_c = \frac{D_m \times \pi \times n}{1000}$ **Velocidad de corte (m/min)**

$n = \frac{V_c \times 1000}{D_m \times \pi}$ **Velocidad del Husillo (rev/min)**

$P_c = \frac{V_c \times a_p \times f_n \times k_c}{60 \times 1000 \times \eta}$ **Potencia demandada (kW)**

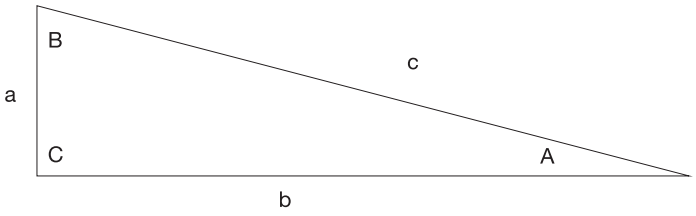
$Q_z = V_c \times f_n \times a_p$ **Arranque de viruta (cm³/min)**

$T_c = \frac{l_m}{f_n \times n}$ **Tiempo de contacto (min)**

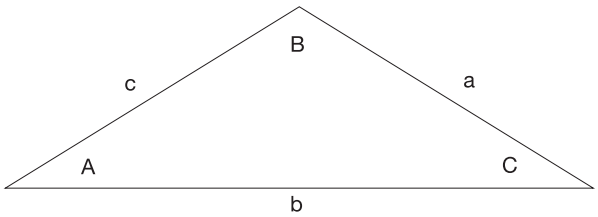
Terminología

D_m	=	Diámetro mecanizado	mm
V_c	=	Velocidad de corte	m/min
n	=	Velocidad del Husillo	rev/min
T_c	=	Tiempo de contacto	min
Q_z	=	Arranque de viruta	cm^3/min
l_m	=	Longitud mecanizada	mm
P_c	=	Potencia demandada	kW
K_c	=	Fuerza de corte especifica	N/mm^2
f_n	=	Avance por revolución	mm/rev
k_r	=	Angulo de entrada	Grados
R max=		Profundidad de perfil	µm
r_ε	=	Radio de punta	mm
a_p	=	Profundidad de corte	mm
η	=	Eficiencia	

Equivalencias trigonométricas



Dimensión dada	Parte a se encontrada				
	A	B	a	b	c
a & c	sin A = a ÷ c	cos B = a ÷ c		$b = \sqrt{c^2 - a^2}$	
a & b	tan A = a ÷ b	cos B = a ÷ b			$c = \sqrt{a^2 + b^2}$
c & b	cos A = b ÷ c	sin B = b ÷ c	$a = \sqrt{c^2 - b^2}$		
A & a		B = 90° - A		b = a x cot A	c = a ÷ sin A
A & b		B = 90° - A	a = b x tan A		c = b ÷ cos A
A & c		B = 90° - A	a = c x sin A	b= c x cos A	

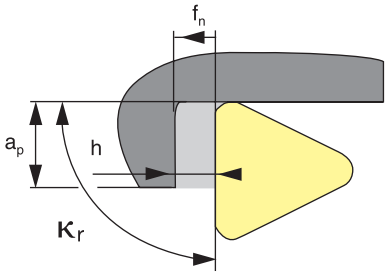


Dimensión dada	Parte a ser encontrada	Fórmula
a b c	A	cos A = $b^2+c^2-a^2$ ÷ 2bc
a b A	B	sin B = b x sin A ÷ a
a b A	C	C = 180 - (A + B)
a A B	b	b = a x sin B ÷ sin A
a A B	c	c = (a x sin C ÷ sin A) x (a x sin (180 - A - B) ÷ sin A)
a b C	B	B = 180 - (A + C)

Máxima Profundidad de Corte y Espesor de Viruta

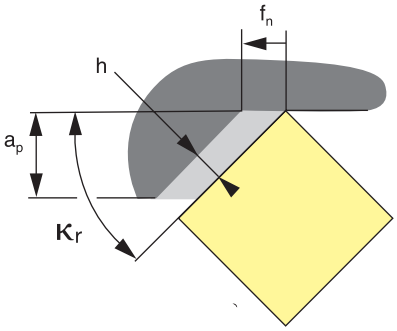
Cuando se determina la mayor profundidad de corte (a_p) para una plaquita dada, el ángulo de entrada [κr] juega un papel muy importante en el tipo de la viruta producida. Para una ángulo cercano a 90°, el espesor de la viruta será igual al avance. Para otros casos, será necesario calcularla.

$h = f_n$



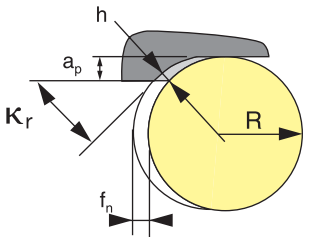
$\kappa_r = 90°$

$h = f_n \sin [\kappa_r]$



$\kappa_r < 90°$

$h = 2f_n \sqrt{[(a_p/2R).(1-a_p/2R)]}$



$\kappa_r = \cos\text{-}1.\ [1-a_p/R]$

El tipo de plaquita utilizada juega un papel significante en la rigidez de la arista de corte. Un ángulo de corte κ_r de 75° or 45° permite operaciones de mecanizado mas difíciles. La plaquita con mayor robustez es la redonda y la mas frágil es el rombo a 35° (V).

El tamaño y tipo de plaquita determina la máxima profundidad de corte. En general se aconseja seleccionar la longitud de la arista de corte en relación con la profundidad de corte máxima a mecanizar.

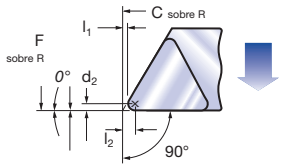
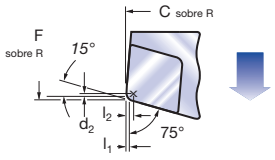
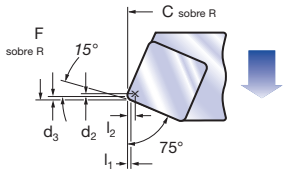
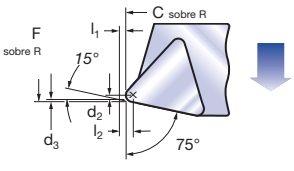
Longitud de la arista de corte para una profundidad de corte (a_p) y ángulo κ_r										
Una profundidad pequeña también puede generar un gran tiempo de contacto										
κ_r/a_p	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00
90	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00
75	1,04	2,06	3,10	4,14	5,18	6,20	7,24	8,28	9,32	10,34
60	1,14	2,31	3,45	4,62	5,77	6,93	8,08	9,25	10,39	11,56
45	1,42	2,82	4,24	5,66	7,06	8,48	9,91	11,30	12,73	14,15
30	2,00	4,00	6,00	8,00	10,00	12,00	14,00	16,00	18,00	20,00

Máxima Profundidad de Corte y Espesor de Viruta

Para asegurar condiciones de mecanizado seguras el máximo contacto teórico del filo no debe exceder los valores de la siguiente tabla.

Máxima Profundidad de Corte			
Símbolo	Plaquita tipo		Max . longitud de contacto
R	Redondo 360°		0.4 x diámetro
S	Cuadrado 90°		2/3 x longitud de la arista
T	Triangular 60°		1/2 x longitud de la arista
E	Rómbico 75°		2/3 x longitud de la arista
C	Rómbico 80°		2/3 x longitud de la arista
D	Rómbico 55°		1/2 x longitud de la arista
V	Rómbico 35°		1/4 x longitud de la arista
W	Hexagonal 80°		1/4 x longitud de la arista

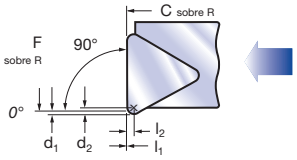
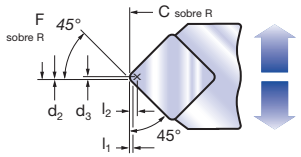
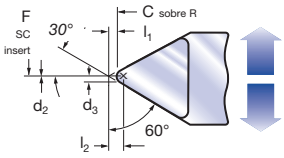
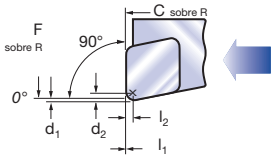
Compensación del Radio de la Plaquita

Tipo radio	Tipo y Descripción de Plaquita	Radio	Dimensiones					
			d_1	d_2	d_3	l_1	l_2	l_3
A & G 	**Plaquita tipo T** Triangulo, corte negativo y positivo, 90°/0° AP.	0,4	0,00	0,396	-	0,289	0,688	-
		0,8	0,00	0,792	-	0,582	1,374	-
		1,2	0,00	1,191	-	0,871	2,062	-
		1,6	0,00	1,587	-	1,163	2,748	-
B 	**Plaquita tipo C** Rombo a 100°, corte negativo y positivo, 75°/15° AP.	0,4	-	0,297	0,008	0,028	0,424	-
		0,8	-	0,594	0,015	0,056	0,975	-
		1,2	-	0,891	0,023	0,081	1,272	-
		1,6	-	1,189	0,030	0,109	1,697	-
B 	**Plaquita tipo S** Cuadrado, corte negativo y positivo, 75°/15° AP.	0,4	-	0,279	0,023	0,089	0,485	-
		0,8	-	0,561	0,048	0,178	0,973	-
		1,2	-	0,841	0,071	0,267	1,458	-
		1,6	-	1,123	0,096	0,356	1,943	-
B & R 	**Plaquita tipo T** Triangulo, corte negativo y positivo, 75°/15° AP.	0,4	-	0,206	0,099	0,371	0,767	-
		0,8	-	0,411	0,198	0,739	1,534	-
		1,2	-	0,617	0,297	1,109	2,301	-
		1,6	-	0,823	0,396	1,478	3,066	-

d_1 - 1_1 = PT (punta teórica) a R (radio).
d_2 - 1_2 = PT (punta teórica) a línea de centros de R (radio).
d_3 - 1_3 = PT (punta teórica) a punto prefijado.
1_4 = Sobre Radio de Plaquita R al punto prefijado.

AP = ángulo de posición.
AC = ángulo complementario.

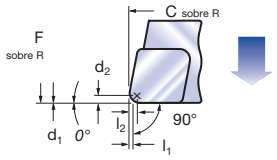
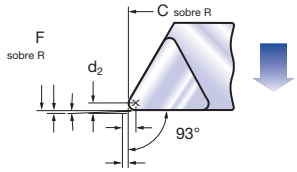
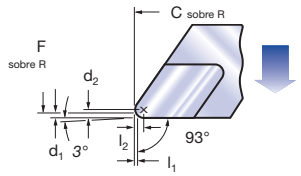
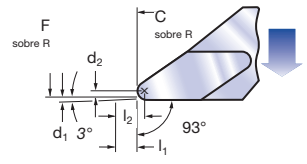
Compensación del Radio de la Plaquita

Tipo radio	Tipo y Descripción de Plaquita	Radio	Dimensiones					
			d_1	d_2	d_3	l_1	l_2	l_3
C & F 	**Plaquita tipo T** Triangulo, corte negativo y positivo, 90°/0° AC.	0,4	0,289	0,688	-	0,396	-	-
		0,8	0,582	1,374	-	0,792	-	-
		1,2	0,871	2,062	-	1,191	-	-
		1,6	1,163	2,748	-	1,587	-	-
D & S 	**Plaquita tipo S** Cuadrado, corte negativo y positivo, 45°/45° AP y AC.	0,4	-	0,00	1,651	1,651	0,561	-
		0,8	-	0,00	0,328	0,328	1,122	-
		1,2	-	0,00	0,492	0,492	1,684	-
		1,6	-	0,00	1,163	1,163	2,245	-
E 	**Plaquita tipo T** Triangulo, corte negativo y positivo, 60°/30° AP.	0,4	-	0,00	0,229	0,396	0,792	-
		0,8	-	0,00	0,457	0,792	1,587	-
		1,2	-	0,00	0,686	1,191	2,382	-
		1,6	-	0,00	0,917	1,587	3,175	-
F 	**Plaquita tipo C** Rombo a 80°, corte negativo y positivo, 90°/0° AC.	0,4	0,076	0,472	-	0,00	0,396	-
		0,8	0,152	0,945	-	0,00	0,792	-
		1,2	0,227	1,420	-	0,00	1,191	-
		1,6	0,305	1,892	-	0,00	1,587	-

d_1 - 1_1 = PT (punta teórica) a R (radio).
d_2 - 1_2 = PT (punta teórica) a línea de centros de R (radio).
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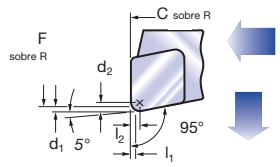
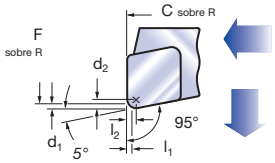
Compensación del Radio de la Plaquita

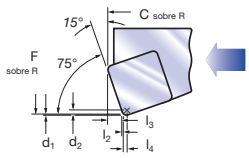
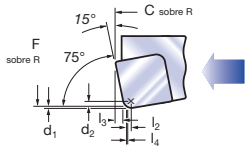
Tipo radio	Tipo y Descripción de Plaquita	Radio	Dimensiones					
			d_1	d_2	d_3	l_1	l_2	l_3
G 	**Plaquita tipo C** Rombo a 80°, corte negativo y positivo, 90°/0° AC.	0,4	0,00	0,396	-	0,076	0,472	-
		0,8	0,00	0,792	-	0,152	0,792	-
		1,2	0,00	1,191	-	0,229	1,420	-
		1,6	0,00	1,587	-	1,305	1,892	-
J 	**Plaquita tipo T** Triangulo, corte negativo y positivo, 93°/3° AP.	0,4	0,035	0,432	-	0,269	0,066	-
		0,8	0,071	0,864	-	0,538	1,331	-
		1,2	0,107	1,298	-	0,808	1,996	-
		1,6	1,189	1,730	-	1,074	2,662	-
J 	**Plaquita tipo D** Rombo a 55°, corte negativo y positivo, 93°/3° AP.	0,4	0,038	0,437	-	0,343	0,742	-
		0,8	0,075	0,871	-	0,688	1,481	-
		1,2	0,117	1,318	-	1,031	1,222	-
		1,6	0,157	1,745	-	1,374	2,962	-
J 	**Plaquita tipo V** Rombo a 35°, corte negativo y positivo, 93°/3° AP.	0,4	0,066	0,462	-	0,838	1,237	-
		0,8	0,129	0,924	-	1,679	2,471	-
		1,2	0,195	1,387	-	2,517	3,708	-
		1,6	0,262	1,849	-	3,358	4,945	-

d_1 - 1_1 = PT (punta teórica) a R (radio).
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Compensación del Radio de la Plaquita

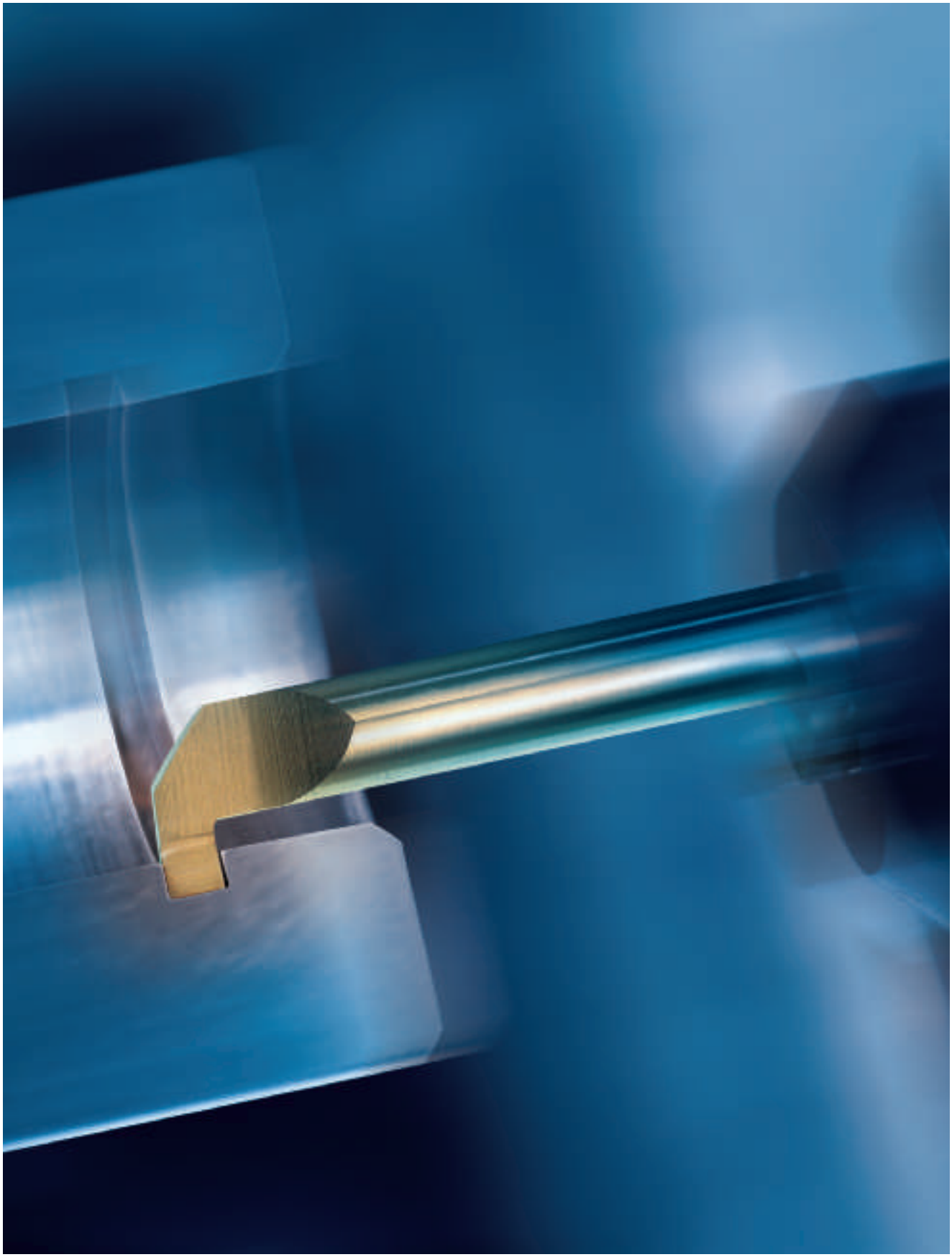
Tipo radio	Tipo y Descripción de Plaquita	Radio	Dimensiones					
			d_1	d_2	d_3	l_1	l_2	l_3
L 	**Plaquita tipo C** Rombo a 80°, corte negativo y positivo, 95°/5° rev. AP y AC.	0,4	0,041	0,437	-	0,041	0,437	-
		0,8	0,079	0,874	-	0,079	0,874	-
		1,2	0,119	1,311	-	0,119	1,311	-
		1,6	0,157	1,747	-	0,157	1,747	-
L 	**Plaquita tipo W** Trigono°, corte negativo y positivo, 95°/5° rev. AP y AC.	0,4	0,041	0,437	-	0,041	0,437	-
		0,8	0,079	0,874	-	0,079	0,874	-
		1,2	0,119	1,311	-	0,119	1,311	-
		1,6	0,157	1,747	-	0,157	1,747	-

Tipo radio	Tipo y Descripción de Plaquita	Radio	Dimensiones			
			d_1	d_2	l_2	l_3
K 	**Plaquita tipo S** Cuadrado, corte negativo y positivo, 75°/15° rev. AC.	0,4	0,089	0,485	0,279	0,023
		0,8	0,178	0,973	0,561	0,048
		1,2	0,267	1,458	0,841	0,071
		1,6	0,356	1,943	1,123	0,096
K 	**Plaquita tipo C** Rombo a 80°, corte negativo y positivo, 75°/15° rev. AC.	0,4	0,028	0,424	0,297	0,007
		0,8	0,056	0,848	0,594	0,015
		1,2	0,081	1,272	0,891	0,022
		1,6	0,109	1,697	1,189	0,030

d_1 - 1_1 = PT (punta teórica) a R (radio).
d_2 - 1_2 = PT (punta teórica) a línea de centros de R (radio).
d_3 - 1_3 = PT (punta teórica) a punto prefijado.
1_4 = Sobre Radio de Plaquita R al punto prefijado.

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Ranurado y tronzado



Contenido

Herramientas de ranurado y plaquitas de dos cortes . . . . . .D3 – D5

Herramientas de ranurado y plaquitas de tres cortes . . . . .D6 – D7

Herramientas de ranurado y mandrinado Ultra-Mini D8

Insertos de mandrinar Ultra-Mini D9

Insertos de ranurar Ultra-Mini . . . . . .D10 – D12

Insertos de roscar Ultra-Mini D13

Información técnica de tronzado D14

Lamas para tronzado D15

Soportes para tronzado D16

Plaquitas para tronzado D16

Herramientas de tronzado Mini D17

Plaquitas de tronzado Mini D17

Descripciones de Calidades para Ranurado

- SFZ – Calidad recubierta PVD con TIN con substrato de micrograno para mecanizado a velocidades bajas. Ideal para aceros inoxidables y materiales dúctiles.

Velocidad de Corte (Vc) m/min				
ISO	Material	Rm y Dureza	SFZ Max - Min	HC Max - Min
P	Aceros no Aleados	600 N/mm² 180HBN	270	135
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	-	-
		Martensítico Series 400	-	-
		Refractario P.H.	100	50
K	Fundiciones	Gris GG-Ft	270	135
		Esferoidal-Dúctil GGG-FGS	230	115
		Maleable GTS - MN/MP	155	80
N	Aluminio y Aleaciones	< 16% Si 116HB	915	360
	Aluminio con Silicio	> 16% Si 92HB	610	245
S	Aleaciones Refractarias	Base Hierro	40	20
		Base Cobalto	30	15
		Base Níquel	35	20
		Base Titanio	55	25

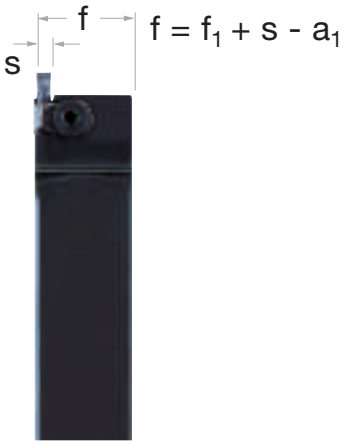
Rendimiento optimo de la calidad

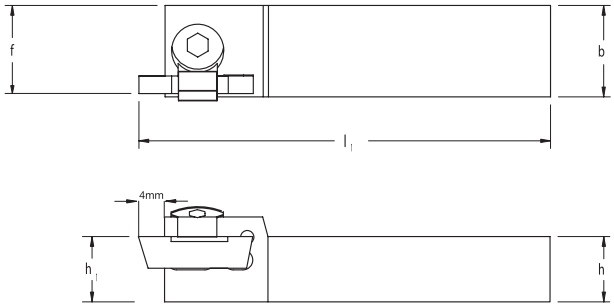
	Materiales	Código C	Código ISO	Recubierto CALIDAD HC SFZ
P	Aceros Aleados y no Aleados	C8	P01	
			P05	
			P10	
		C7	P15	
			P20	
			P25	
		C6	P30	
			P35	
		C5	P40	
			P45	
			P50	
M	Aceros Inoxidables		M05	
			M10	
			M15	
			M20	
			M25	
			M30	
			M35	
			M40	
K	Fundiciones	C4	K01	
			K05	
		C3	K10	
			K15	
		C2	K20	
			K25	
		C1	K30	
			K35	
			K40	
N	Aluminio y Aleaciones		N01	
			N05	
			N10	
			N15	
			N20	
			N25	
			N30	
S	Aleaciones Refractarias		S01	
			S05	
			S10	
			S15	
			S20	
			S25	
			S30	

Mayor resistencia al desgaste – Mayor velocidad de corte

Mayor resistencia al choque – Mayor avance

GR240





GR240

Descripción	Dimensiones (mm)						Anchura nominal de la ranura (W)
	b +/-0,1	h +/-0,1	h_1 js14	l_1	f_1 +/-0,05	t max	
GR/L2401212M01	12	12	12	150	11,5	4	0,50 - 1,74
GR/L2401616M01	16	16	16	150	14,5	4	
GR/L2402020K01	20	20	20	125	18,5	4	
GR/L2401212M02	12	12	12	150	10,5	4	1,74 - 2,74
GR/L2401616M02	16	16	16	150	13,5	4	
GR/L2402020K02	20	20	20	125	17,5	4	
GR/L2401212M03	12	12	12	150	9,5	4	2,74 - 3,74
GR/L2401616M03	16	16	16	150	12,5	4	
GR/L2402020K03	20	20	20	125	16,5	4	
GR/L2401616M04	16	16	16	150	10,8	4	3,74 - 5,29
GR/L2402020K04	20	20	20	125	14,8	4	

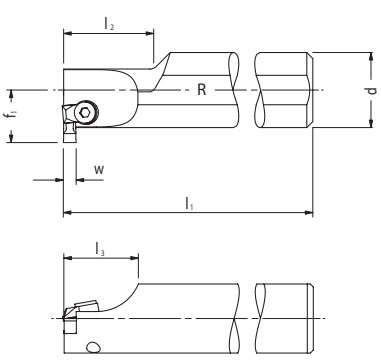
Para Plaquitas consulte Pág. D5.

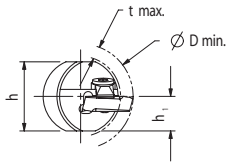
RECAMBIOS

Referencia	Clip	Perno	Brida	Plaquitas
G_2401010M0_ to G_2401616M0_	SN135	SN136	SG24083	G217
G_2402020K0_	SN135	SN136	SG24084	G217

GR 230 / GR 233 / GR250 / GR253







GR 230 / GR 233 / GR250 / GR253

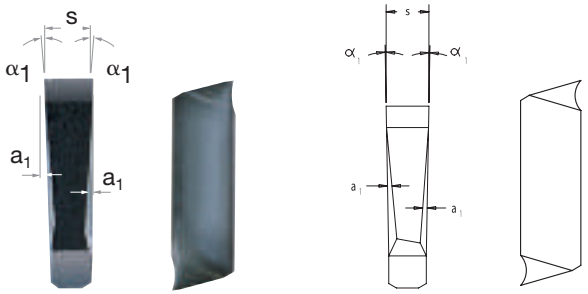
Descripción	Dimensiones (mm)					Anchura nominal de la ranura (W)
	D Mínimo	l_2 Llegar a	l_1	f	t max	
GR233002001	20,0	25,0	130	13,3	3,0	0,50 - 1,74
GR233002002	20,0	25,0	130	13,3	3,0	1,74 - 2,74
GR233002003	20,0	25,0	130	13,3	3,0	2,74 - 3,74
GR233002004	20,0	25,0	130	13,3	3,0	3,74 - 5,29
GR253002501	25,0	30,0	150	17,5	4,7	0,50 - 1,74
GR253002502	25,0	30,0	150	17,5	4,7	1,74 - 2,74
GR253002503	25,0	30,0	150	17,5	4,7	2,74 - 3,74
GR253002504	25,0	30,0	150	17,5	4,7	3,74 - 5,29
GR230002001	20,0	60,0	180	13,3	3,0	0,50 - 1,74
GR230002002	20,0	60,0	180	13,3	3,0	1,74 - 2,74
GR230002003	20,0	60,0	180	13,3	3,0	2,74 - 3,74
GR230002004	20,0	60,0	180	13,3	3,0	3,74 - 5,29
GR250002501	25,0	80,0	250	17,5	4,7	0,50 - 1,74
GR250002502	25,0	80,0	250	17,5	4,7	1,74 - 2,74
GR250002503	25,0	80,0	250	17,5	4,7	2,74 - 3,74
GR250002504	25,0	80,0	250	17,5	4,7	3,74 - 5,29

Para Plaquitas consulte Pág. D5.

RECAMBIOS

Referencia	Brida	Tornillo	Plaquitas
GR233_01/03	G83	G514	G217
GR233_04	G84	G514	G217
GR253_01/03	G83	G514	G217
GR253_04	G84	G514	G217
GR230_01/03	G83	G514	G217
GR230_04	G84	G514	G217
GR250_01/03	G83	G514	G217
GR250_04	G84	G514	G217

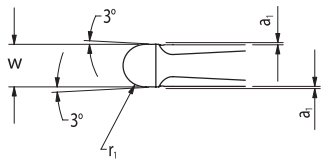
G217 Anchos de Ranura Estándar

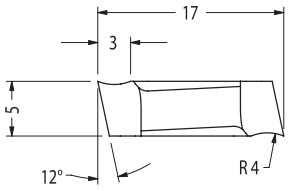


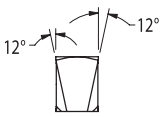
G217

Descripción	Dimensiones (mm)			Ranura Numero	Para herramienta referencia
	s	α_1	a_1		
G217005000	0,57	1°	0,06	0,5	0,1
G217006000	0,67	1°	0,06	0,6	
G217007000	0,77	1°	0,06	0,7	
G217008000	0,87	1°	0,06	0,8	
G217009000	0,97	1°	0,06	0,9	
G217010000	1,07	1°	0,06	1,0	
G217011000	1,24	3°	0,1	1,1	
G217013000	1,44	3°	0,1	1,3	
G217016000	1,74	3°	0,1	1,6	
G217018500	1,99	3°	0,1	1,85	0,2
G217021500	2,29	3°	0,1	2,15	
G217026500	2,79	3°	0,1	2,65	
G217031500	3,29	3°	0,1	3,15	0,3
G217041500	4,29	3°	0,1	4,15	0,4
G217051500	5,29	3°	0,1	5,15	

Todos los anchos de ranuras son basados en el estándar para clips circulares DIN 472/471.







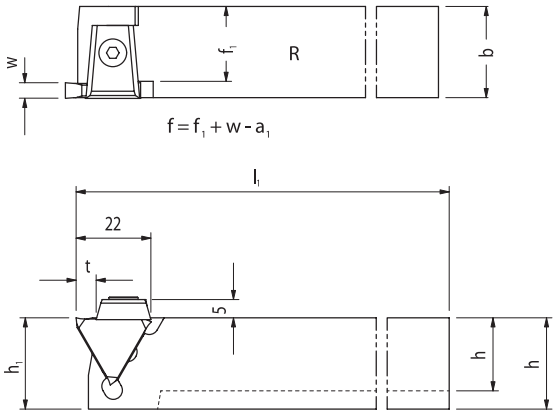
Tipo G217 plaquita a radio completo

Descripción	Dimensiones (mm)				Herramienta referencia
	w - 0,05	r_1	a_1 - 0,05	t max	
G217001020	2,0	1,0	0,2	3 / 4*	02
G217001530	3,0	1,5	0,2	3 / 4*	03
G217002040	4,0	2,0	0,2	3 / 4*	04

* junto con la herramienta pertinente 3mm para interiores 4mm para exteriores.

GR/L 360





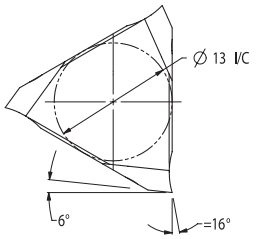
GR/L 360							
Descripción	Dimensiones (mm)						Anchura nominal de la ranura (W)
	b +/-0,1	h +/-0,1	h_1 js14	l_1	f_1 +/-0,05	t max	
GR/L360121201	12	12	12	100	10,5	4	0,5 - 1,74
GR/L360161601	16	16	16	125	14,5	4	
GR/L360202001	20	20	20	125	18,5	4	
GR/L360252501	25	25	25	150	23,5	4	
GR/L360121202	12	12	12	100	9,5	6	1,74 - 2,74
GR/L360161602	16	16	16	125	13,5	6	
GR/L360202002	20	20	20	125	17,5	6	
GR/L360252502	25	25	25	150	22,5	6	
GR/L360161603	16	16	16	125	12,5	6	2,74 - 3,74
GR/L360202003	20	20	20	125	16,5	6	
GR/L360252503	25	25	25	150	21,5	6	
GR/L360202004	20	20	20	125	14,8	6	3,74 - 5,29
GR/L360252504	25	25	25	150	19,8	6	

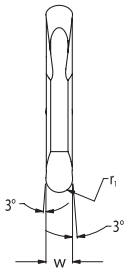
Para Plaquitas consulte Pág. D7.

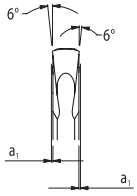
RECAMBIOS

Referencia	Brida	Tornillo	Plaquitas
GR/L360121201/02/03	G113	6-25	G312
GR/L360016101/02/03	G113	6-25	G312
GR/L360161604	G134	6-25	G312
GR/L360202001/02/03/04	G164	6-25	G312
GR/L360252501/02/03/04	G164	6-25	G312





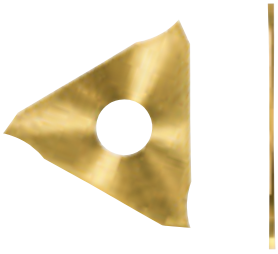


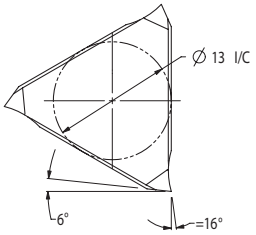


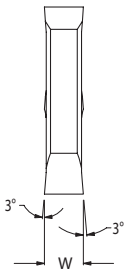
Tipo G312 plaquita a radio completo

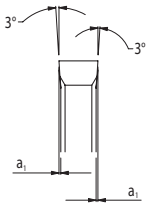
Descripción	Dimensiones (mm)				Herramienta referencia
	w - 0,05	r_1	a_1 - 0,05	t max	
G312001020	2,0	1,0	0,3	6*	02
G312001530	3,0	1,5	0,3	6*	03
G312002040	4,0	2,0	0,3	6*	04

* junto con la herramienta pertinente.







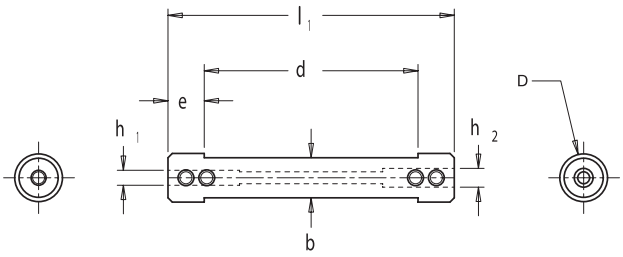


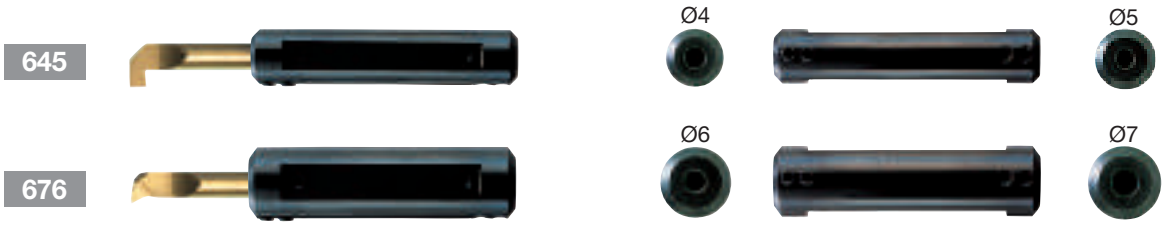
Tipo G312 DIN 471 / 472, DIN 983 / 984

Descripción	Dimensiones (mm)				Herramienta referencia
	Ranura referencia	w - 0,05	a_1 - 0,05	t max	
G312005000	0,5	0,5	0,06	4*	01
G312006000	0,6	0,6	0,06	4*	
G312007000	0,7	0,7	0,08	4*	
G312008000	0,8	0,8	0,08	4*	
G312009000	0,9	0,9	0,08	4*	
G312010000	1,0	1,0	0,09	4*	
G312011000	1,1	1,24	0,20	4*	
G312013000	1,3	1,44	0,22	4*	
G312016000	1,6	1,74	0,22	4*	
G312018500	1,85	1,99	0,22	6*	02
G312021500	2,15	2,29	0,22	6*	
G312026500	2,65	2,79	0,22	6*	
G312031500	3,15	3,29	0,22	6*	03
G312041500	4,15	4,29	0,22	6*	04
G312051500	5,15	5,29	0,22	6*	

* junto con la herramienta pertinente.

645 - 676





645 - 676

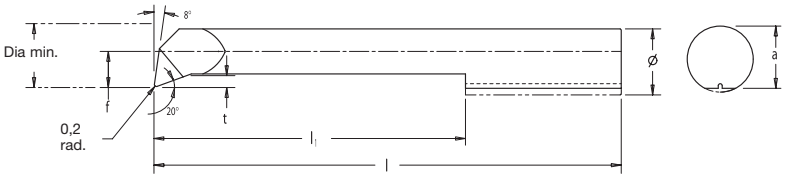
Descripción	Dimensiones (mm)						
	D	b	d	e	l_1	h_1	h_2
6450012D	12	10,3	55	10	75	4	5
6450016D	16	14,0	55	10	75	4	5
6450020D	20	18,0	70	10	90	4	5
6760016D	16	14,0	55	10	75	6	7
6760020D	20	18,0	70	10	90	6	7

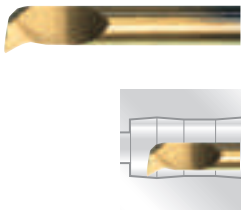
Para Plaquitas consulte Pág. D9 - D13.

RECAMBIOS

Referencia	Tornillo
6450012D to 6760020D	110.64

050...



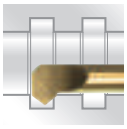


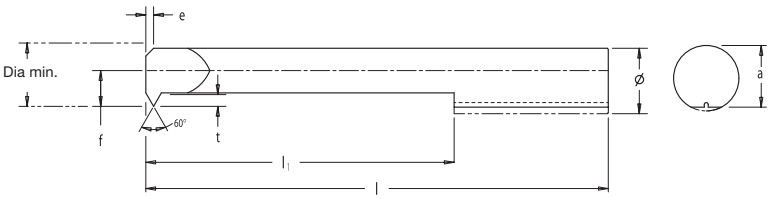
050...

Descripción	Dimensiones (mm)								Portaherramientas
	b	f	a	l	l_1	t max	Dia min.	ø	tipo
R050310	-	0,6	2,6	24	10	0,2	2,8	4,0	645...
R050316	-	0,6	2,6	30	16	0,2	2,8	4,0	645...
R050320	-	0,6	2,6	34	20	0,2	2,8	4,0	645...
R050410	-	1,5	3,5	24	10	0,3	4,0	4,0	645...
R050416	-	1,5	3,5	30	16	0,3	4,0	4,0	645...
R050420	-	1,5	3,5	34	20	0,3	4,0	4,0	645...
R050510	-	1,9	4,4	25	10	0,5	5,0	5,0	645...
R050515	-	1,9	4,4	30	15	0,5	5,0	5,0	645...
R050520	-	1,9	4,4	35	20	0,5	5,0	5,0	645...
R050525	-	1,9	4,4	40	25	0,5	5,0	5,0	645...
R050530	-	1,9	4,4	45	30	0,5	5,0	5,0	645...
R050615	-	2,3	5,3	30	15	0,5	6,0	6,0	676...
R050622	-	2,3	5,3	37	22	0,5	6,0	6,0	676...
R050625	-	2,3	5,3	40	25	0,5	6,0	6,0	676...
R050630	-	2,3	5,3	45	30	0,5	6,0	6,0	676...
R050720	-	2,7	6,3	35	20	0,6	6,8	7,0	676...
R050725	-	2,7	6,3	40	25	0,6	6,8	7,0	676...
R050730	-	2,7	6,3	45	30	0,6	6,8	7,0	676...

060...





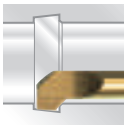


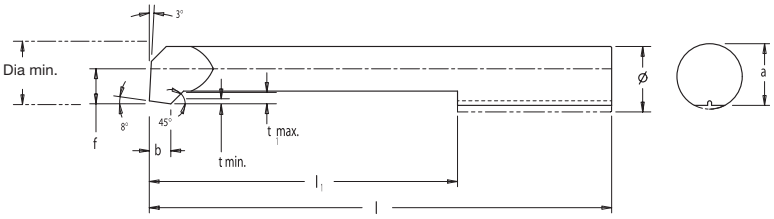
060...

Descripción	Dimensiones (mm)								Portaherramientas tipo
	b	f	a	l	l_1	t max	Dia min.	ø	
R060515	-	1,9	4,4	30	15	0,7	5,0	5,0	645...
R060520	-	1,9	4,4	35	20	0,7	5,0	5,0	645...
R060720	-	2,7	6,3	35	20	0,7	6,8	7,0	676...

070...





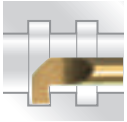


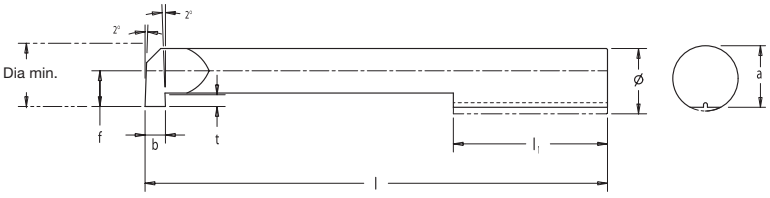
070...

Descripción	Dimensiones (mm)								Portaherramientas tipo
	b	f	a	l	l_1	t max	Dia min.	ø	
R070515	1,0	1,9	4,4	30	15	0,2	5,0	5,0	645...
R070520	1,0	1,9	4,4	35	20	0,2	5,0	5,0	645...

004...



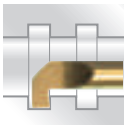


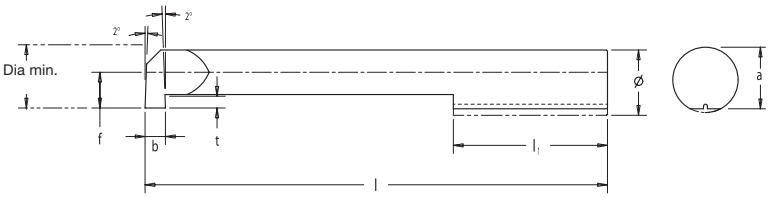


004...

Descripción	Dimensiones (mm)									Portaherramientas tipo
	b	f	d	a	l	l_1	t max	Dia min.	ø	
R004010010	1,0	1,5	2,4	3,5	24	10	0,8	4,0	4,0	645...
R004010016	1,0	1,5	2,4	3,5	30	16	0,8	4,0	4,0	645...
R004010020	1,0	1,5	2,4	3,5	34	20	0,8	4,0	4,0	645...

005...

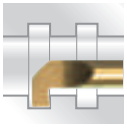


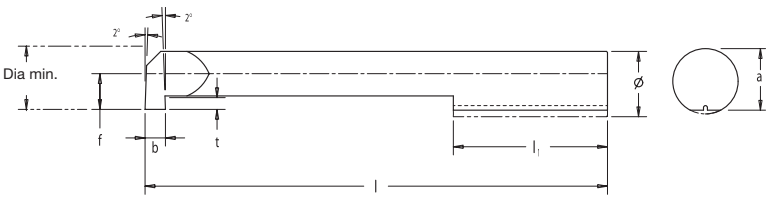


005...

Descripción	Dimensiones (mm)								Portaherramientas tipo
	b	f	a	l	l_1	t max	Dia min.	ø	
R005010010	1,0	1,9	4,4	25	10	1,0	5,0	5,0	645...
R005010015	1,0	1,9	4,4	30	15	1,0	5,0	5,0	645...
R005010020	1,0	1,9	4,4	35	20	1,0	5,0	5,0	645...
R005010025	1,0	1,9	4,4	40	25	1,0	5,0	5,0	645...
R005010030	1,0	1,9	4,4	45	30	1,0	5,0	5,0	645...
R005015010	1,5	1,9	4,4	25	10	1,0	5,0	5,0	645...
R005015015	1,5	1,9	4,4	30	15	1,0	5,0	5,0	645...
R005015020	1,5	1,9	4,4	35	20	1,0	5,0	5,0	645...
R005015025	1,5	1,9	4,4	40	25	1,0	5,0	5,0	645...
R005015030	1,5	1,9	4,4	45	30	1,0	5,0	5,0	645...
R005020010	2,0	1,9	4,4	25	10	1,0	5,0	5,0	645...
R005020015	2,0	1,9	4,4	30	15	1,0	5,0	5,0	645...
R005020020	2,0	1,9	4,4	35	20	1,0	5,0	5,0	645...
R005020025	2,0	1,9	4,4	40	25	1,0	5,0	5,0	645...
R005020030	2,0	1,9	4,4	45	30	1,0	5,0	5,0	645...

006...

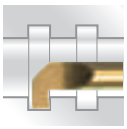


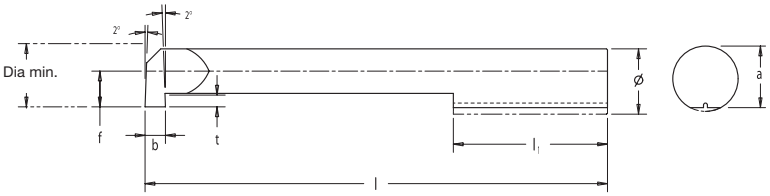


006...

Descripción	Dimensiones (mm)								Portaherramientas tipo
	b	f	a	l	l_1	t max	Dia min.	ø	
R006010010	1,0	2,3	5,3	25	10	1,8	6,0	6,0	676...
R006010015	1,0	2,3	5,3	30	15	1,8	6,0	6,0	676...
R006010022	1,0	2,3	5,3	37	22	1,8	6,0	6,0	676...
R006010025	1,0	2,3	5,3	40	25	1,8	6,0	6,0	676...
R006010030	1,0	2,3	5,3	45	30	1,8	6,0	6,0	676...
R006015010	1,5	2,3	5,3	25	10	1,8	6,0	6,0	676...
R006015015	1,5	2,3	5,3	30	15	1,8	6,0	6,0	676...
R006015022	1,5	2,3	5,3	37	22	1,8	6,0	6,0	676...
R006015025	1,5	2,3	5,3	40	25	1,8	6,0	6,0	676...
R006015030	1,5	2,3	5,3	45	30	1,8	6,0	6,0	676...
R006020010	2,0	2,3	5,3	25	10	1,8	6,0	6,0	676...
R006020015	2,0	2,3	5,3	30	15	1,8	6,0	6,0	676...
R006020022	2,0	2,3	5,3	37	22	1,8	6,0	6,0	676...
R006020025	2,0	2,3	5,3	40	25	1,8	6,0	6,0	676...
R006020030	2,0	2,3	5,3	45	30	1,8	6,0	6,0	676...

007...

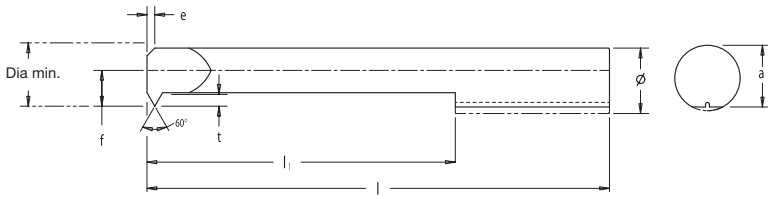




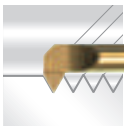
007...

Descripción	Dimensiones (mm)								Portaherramientas tipo
	b	f	a	l	l_1	t max	Dia min.	ø	
R007010010	1,0	2,7	6,3	25	10	2,5	6,8	7,0	676...
R007010015	1,0	2,7	6,3	30	15	2,5	6,8	7,0	676...
R007010022	1,0	2,7	6,3	37	22	2,5	6,8	7,0	676...
R007010025	1,0	2,7	6,3	40	25	2,5	6,8	7,0	676...
R007010030	1,0	2,7	6,3	45	30	2,5	6,8	7,0	676...
R007015010	1,5	2,7	6,3	25	10	2,5	6,8	7,0	676...
R007015015	1,5	2,7	6,3	30	15	2,5	6,8	7,0	676...
R007015022	1,5	2,7	6,3	37	22	2,5	6,8	7,0	676...
R007015025	1,5	2,7	6,3	40	25	2,5	6,8	7,0	676...
R007015030	1,5	2,7	6,3	45	30	2,5	6,8	7,0	676...
R007020010	2,0	2,7	6,3	25	10	2,5	6,8	7,0	676...
R007020015	2,0	2,7	6,3	30	15	2,5	6,8	7,0	676...
R007020022	2,0	2,7	6,3	37	22	2,5	6,8	7,0	676...
R007020025	2,0	2,7	6,3	40	25	2,5	6,8	7,0	676...
R007020030	2,0	2,7	6,3	45	30	2,5	6,8	7,0	676...

004/5/6/7







005/6/7..

Descripción	Dimensiones (mm)									Portaherramientas tipo
	Paso	e	f	a	l	l_1	t	Dia min.	ø	
Paso Medio										
R005051015	1,0	0,55	1,9	4,4	30	15	0,55	4,8	5,0	645...
R006061215	1,25	0,65	2,3	5,3	30	15	0,68	6,0	6,0	676...
R006081515	1,5	0,75	2,3	5,3	30	15	0,81	6,0	6,0	676...
R007081515	1,5	0,75	2,7	6,3	30	15	0,81	7,0	7,0	676...
Paso Fino										
R004020515	0,5	0,35	1,5	3,5	30	15	0,27	4,0	4,0	645...
R005020515	0,5	0,35	1,9	4,4	30	15	0,27	5,0	5,0	645...
R005040715	0,75	0,45	1,9	4,4	30	15	0,40	5,0	5,0	645...
R006051015	1,0	0,55	2,3	5,3	30	15	0,55	6,0	6,0	676...

Tronzado

Se cuenta con dos sistemas de tronzado. El primero es un bloque y una lama con anchos desde 2mm hasta 6mm. El segundo sistema esta diseñado para Tornos Multihusillos con anchos desde 1.6mm hasta 3mm. Ambos sistemas están disponibles en neutro, derechas e izquierdas.

Descripción de Calidades para Ranurado

- SP3014 – Calidad con recubrimiento PVD de TiAlN que ofrece una condición de arista viva. Ideal para aceros inoxidables y aleaciones refractarias.
- MP91M – Calidad con recubrimiento CVD deTiN-TiCN-Al_2O_3 que ofrece muy buena resistencia al desgaste. Ideal para aceros y fundiciones.

Velocidad de Corte (Vc) m/min			Recubrimiento			
			CVD MP91M		PVD SP3014	
ISO	Material	Rm y Dureza	HC Max	HC Min	HC Max	HC Min
P	Aceros no Aleados	400 - 600 N/mm² 120 - 180HBN	350	140	430	200
		600 - 950 N/mm² 180 - 280HBN	300	120	280	130
	Aceros Aleados	700 - 950 N/mm² 200 - 280 HBN	270	100	255	120
		950 - 1200 N/mm² 280 - 355 HBN	200	80	232	110
		1200 - 1400 N/mm² 355 - 415 HBN	-	-	158	75
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	200	120	290	135
		Martensítico Series 400	180	110	301	145
		Refractario P.H.	-	-	154	75
K	Fundiciones	Gris GG-Ft	360	140	425	200
		Esferoidal-Dúctil GGG-FGS	280	110	365	175
		Maleable GTS - MN/MP	260	100	245	115
S	Aleaciones Refractarias	Base Hierro	-	-	60	30
		Base Cobalto	-	-	50	25
		Base Níquel	-	-	55	25
		Base Titanio	-	-	85	40

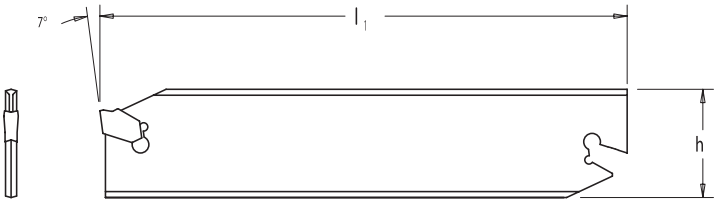
Rendimiento Optimo de la Calidad

Materiales	Código C	Código ISO	Recubrimiento CVD CALIDAD HC MP91M	Recubrimiento PVD CALIDAD HC SP3014
P Aceros no Aleados y Aleados	C8	P01		
		P05		
		P10		
	C7	P15		
		P20		
		P25		
	C6	P30		
		P35		
	C5	P40		
		P45		
		P50		
M Aceros Inoxidables		M05		
		M10		
		M15		
		M20		
		M25		
		M30		
		M35		
		M40		
K Fundiciones	C4	K01		
		K05		
	C3	K10		
		K15		
	C2	K20		
		K25		
	C1	K30		
		K35		
		K40		
S Aleaciones Refractarias		S01		
		S05		
		S10		
		S15		
		S20		
		S25		
		S30		

Mayor resistencia al desgaste – Mayor velocidad de corte

Mayor resistencia al choque – Mayor avance

Lamas de Acero Endurecido



SGIH

Descripción	Dimensiones (mm)			Plaquitas
	h	l_1	Max. ø	
SGIH26.2PSHD	26	110	75	TGT_2/2.4
SGIH26.3PSHD	26	110	75	TGT_3
SGIH26.4PSHD	26	110	75	TGT_4
SGIH26.5PSHD	26	110	75	TGT_4.8/5
SGIH32.3PSHD	32	150	100	TGT_3
SGIH32.4PSHD	32	150	100	TGT_4
SGIH32.5PSHD	32	150	125	TGT_4.8/5
SGIH32.6PSHD	32	150	125	TGT_6

Para Plaquitas consulte Pág. D16.

RECAMBIOS

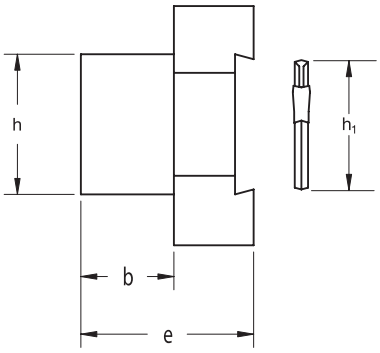
Referencia	Llave de Extracción
SGIH26.2PSHD to SGIH32.6PSHD	E219EXTKEY

SGTB

Descripción	Dimensiones (mm)				Para lama
	h_1	h	b	L	
SGTB2026	26	20	20	87	SGIH26-
SGTB2526	26	25	25	87	SGIH26-
SGTB2032	32	20	20	100	SGIH32-
SGTB2532	32	25	25	110	SGIH32-
SGTB3232	32	32	32	120	SGIH32-

Soporte de Lama

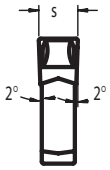




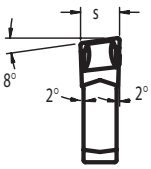
TGTB					
Descripción	Dimensiones (mm)				Acepta Lamas
	a	b	d	e	
TGTBN195	19,1	19,1	38,1	36,5	SGIH26.2/3/4/5/6
TGTBN196	19,1	19,1	47,6	36,5	SGIH32.3/4/5/6
TGTBN255	25,40	19,8	38,1	37,3	SGIH26.2/3/4/5/6
TGTBN256	25,40	19,8	47,6	37,3	SGIH32.3/4/5/6
TGTBN326	31,75	28,6	47,6	46,1	SGIH32.3/4/5/6

Plaquitas TGT





TGTN

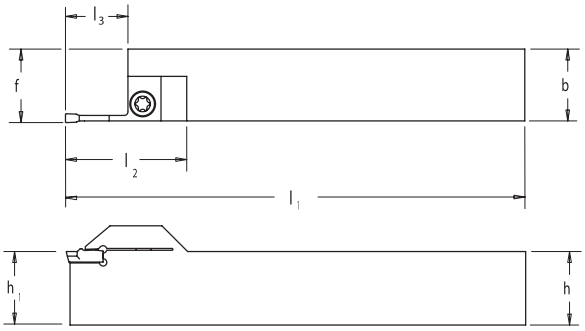


TGTR/L

TGTN,TGTR & TGTL	
Descripción	s
TGTN2	2,21
TGTN2.4	2,39
TGTN3	3,10
TGTR38	3,10
TGTL38	3,10
TGTN4	4,09
TGTN4.8	4,78
TGTN5	5,08
TGTN6	6,35

STPOR





STPOR

Descripción	Dimensiones (mm)						ø Max. de Ranurado	Plaquitas de Ranurado
	b	l_1	l_2	l_3	h	h_1		
STPOR1010M1.6	10	150	33	17	10	10	32	STT_1.6
STPOR1010M2.0/2.4	10	150	33	17	10	10	32	STT_2.0/2.4
STPOR1212M1.6	12	150	33	17	12	12	32	STT_1.6
STPOR1212M2.0/2.4	12	150	33	17	12	12	32	STT_2.0/2.4
STPOR1616M2.0/2.4	16	150	33	17	16	16	32	STT_2.0/2.4
STPOR1616M3.0	16	150	33	17	16	16	32	STT_3.0
STPOR2020K2.0/2.4	20	125	33	17	20	20	32	STT_2.0/2.4
STPOR2020K3.0	20	125	33	17	20	20	32	STT_3.0

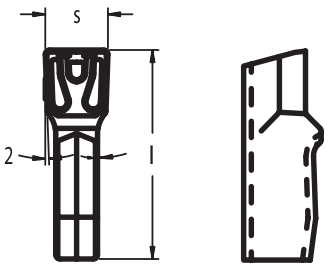
RECAMBIOS

Referencia	Tornillo	Llave
STPOR1010M1.6 to STPOR2020K3.0	F4015T	T20

NOTA: Las referencias para estas herramientas son específicas de Stellram, ya que ISO 5608 no prevé este tipo de herramienta. Disponible solo en versión a derechas.

STTN





STTN

Descripción	s	l
STTN1.6	1,6	10
STTN2.0	2,0	10
STTN2.4	2,4	10
STTN2.4CF	2,4	10
STTN3.0CF	3,0	10

Roscado



Contenido

Índice de formas de rosca . . . . . .E2 – E3

Designación de plaquitas de roscado . . . . . .E4 – E5

Plaquitas de roscado . . . . . .E6 – E33

Designación herramientas de roscar E34

Herramientas de roscar exteriores E35

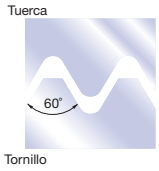
Herramientas de roscar interiores . . . . . .E36 – E37

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Información técnica . . . . . .E40 – E57

Índice de Perfil de Roscas

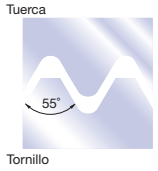
Perfil Parcial 60°



ISO, UN

PAGINA E6

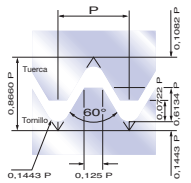
Perfil Parcial 55°



W, BSPT

PAGINA E7

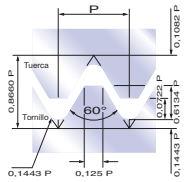
ISO



ISO

PAGINA E8 - E10

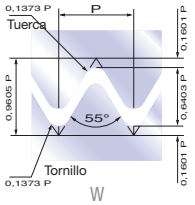
Unificada



UN

PAGINA E11 - E13

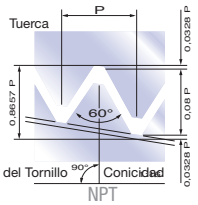
Estándar Británica Whitworth



W

PAGINA E14 - E16

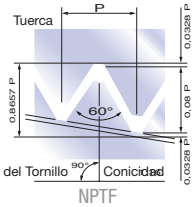
Rosca Nacional Cónica para Tubería



NPT

PAGINA E17 - E18

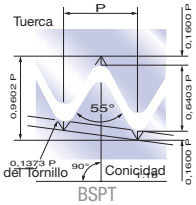
Rosca Nacional Cónica para Tubería (Sello seco)



NPTF

PAGINA E19 - E20

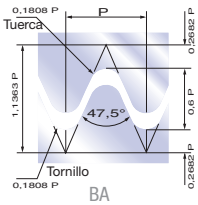
Rosca Británica Cónica para Tubería



BSPT

PAGINA E21

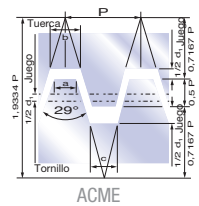
Asociación Británica



BA

PAGINA E22

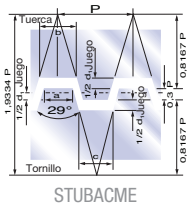
ACME



ACME

PAGINA E23

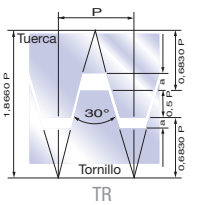
STUB ACME



STUBACME

PAGINA E24

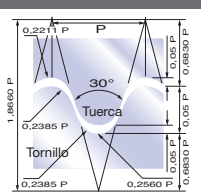
Trapezoidal (DIN 103)



TR

PAGINA E25

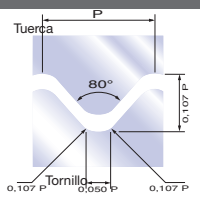
Redonda (DIN 405)



RD

PAGINA E26

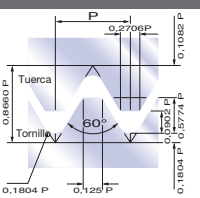
Panzer Gewinde (DIN 40430)



PG

PAGINA E27

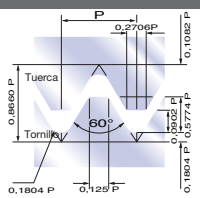
Forma Unificada J



UNJ

PAGINA E28

Forma Métrica J

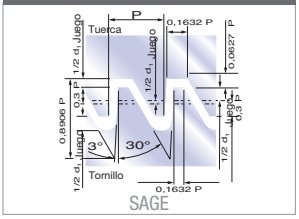


MJ

PAGINA E29

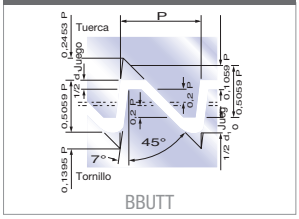
Índice de Perfil de Roscas

Buttress (SAGE) DIN 513



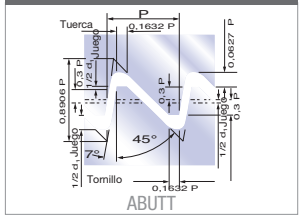
Disponible bajo presupuesto

Buttress Británica BS1657



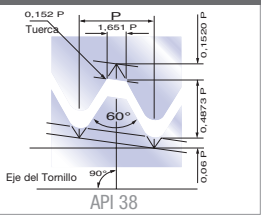
PAGINA E30

Buttress Americana 45/7°



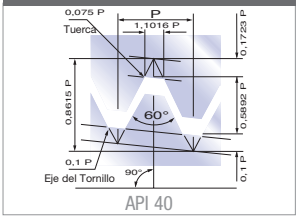
PAGINA E31

API V0.038



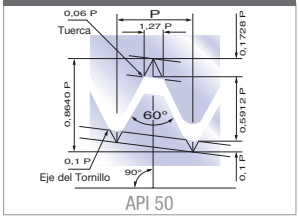
PAGINA E32 - E33

API V0.040



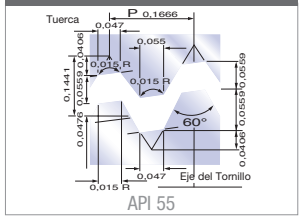
PAGINA E32 - E33

API V0.050



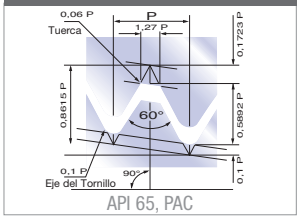
PAGINA E32 - E33

API V0.055



PAGINA E132 - E33

API V0.065 & PAC



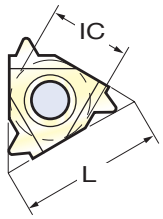
PAGINA E32 - E33
PAC: Disponible bajo presupuesto

Nota: Otras formas de rosca disponibles bajo presupuesto.

Designación de Plaquitas de Roscado

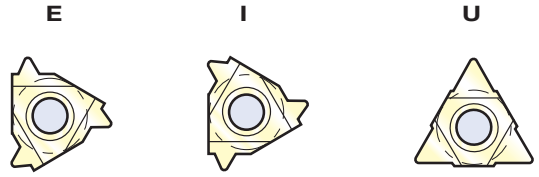
16	E	R	20
1	2	3	4

1 Tamaño



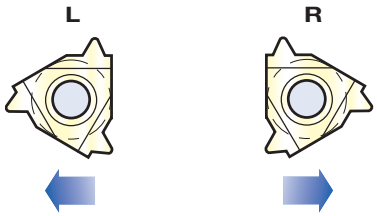
L mm	IC pul
06	5/32
08	3/16
11	1/4
16	3/8
22	1/2
22U	1/2U
27	5/8
27U	5/8U

2 Utilización



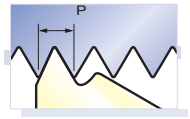
Exterior Interior Neutra

3 Diseño



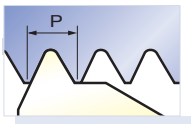
A izquierdas A derechas

4 Paso de Rosca o Hilos por Pulgada



Perfil Parcial 60° o 55°

	Paso de Rosca mm	Hilos por pulgada
A	0,5 - 1,5	48 - 16
G	1,75 - 3	14 - 8
AG	0,5 - 3	48 - 8
N	3,5 - 5	7 - 5
Q	5,5 - 6	4 1/2 - 4
U (22)	5,5 - 8	4 1/2 - 3 1/4
U (27)	6,5 - 9	2 3/4 - 4



Perfil Completo
0,35 hasta 8,0mm (72-3 T.P.I)
Tamaño de paso mostrados en todas las referencias

Designación de Plaquitas de Roscado

UN 5 – 6 **SFZ** 7

5 Perfil de Rosca

Perfil Parcial

60°	**60**	
55°	**55**	

Perfil Completo

45°/7°	**ABUTT**	
29°	**ACME**	
60°	**API RD**	
60°	**API**	
47,5°	**BA**	
45°/7°	**BBUTT**	
55°	**BSPT**	
3°/10°	**BUTT**	
12°	**ELC**	
60°	**ISO**	

Perfil Completo

60°	**MJ**	
60°	**NPT**	
60°	**NPTF**	
60°	**PAC**	
80°	**PG**	
30°	**RD**	
3°/30°	**SAGE**	
29°	**STACME**	
30°	**TR**	
60°	**UN**	
60°	**UNJ**	
3°/10°	**VAM**	
55°	**W**	

6 Otros

SC M T Z



Con rompe virutas

Tipo Multi-diente y numero de dientes

7 Calidades

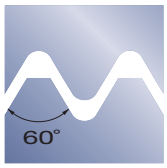
SFZ/SP4036 Recubiertas PVD

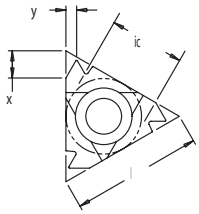
Para las descripciones de las calidades, consulte Pág. E57

60° perfil parcial

Perfil Parcial *Exterior 60°*

Para Formas de Rosca Unificadas y métricas





Plaquitas a Derechas

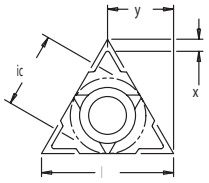
Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
11	11ERA60	0,5 - 1,5	48 - 16	0,07	0,8	0,9
16	16ERA60	0,5 - 1,5	48 - 16	0,09	0,8	0,9
	16ERG60	1,75 - 3,5	14 - 8	0,15	1,2	1,7
	16ERAG60	0,5 - 3,0	48 - 8	0,10	1,2	1,7
22	22ERN60	3,5 - 5.0	7 - 5	0,48	1,7	2,5
27	27ERQ60	5,5 - 6,0	4.5 - 4	0,79	2,6	3,1

Plaquitas a Izquierdas

Descripción
11ELA60
16ELA60
16ELG60
16ELAG60
22ELN60
27ELQ60

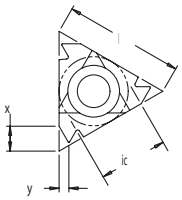
Plaquitas Tipo U

Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
22	22EILRU60	5,5 - 8,0	4.5 - 3.25	0,79	0,6	11,0
27	27EILRU60	6,5 - 9,0	4 - 2.75	0,85	1,0	13,7



Perfil Parcial *Interior 60°*

Para Formas de Rosca Unificadas y métricas



Plaquitas a Derechas

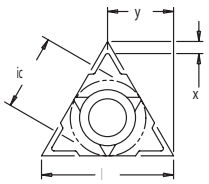
Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
6	06IRA60	0,5 - 1,25	48 - 20	0,07	0,8	0,9
8	08IRA60	0,5 - 1,5	48 - 16	0,09	0,8	0,9
11	11IRA60	0,5 - 1,5	48 - 16	0,15	1,2	1,7
16	16IRA60	0,5 - 1,5	48 - 16	0,10	1,2	1,7
	16IRG60	1,75 - 3,0	14 - 8	0,15	1,2	1,7
	16IRAG60	0,5 - 3,0	48 - 8	0,10	1,2	1,7
22	22IRN60	3,5 - 5.0	7 - 5	0,32	1,7	2,5
27	27IRQ60	5,5 - 6,0	4.5 - 4	0,45	2,6	3,1

Plaquitas a Izquierdas

Descripción
-
08ILA60
11ILA60
16ILA60
16ILG60
16ILAG60
22ILN60
27ILQ60

Plaquitas Tipo U

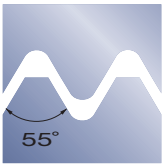
Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
8	08ILRU60	1,75 - 2,0	14 - 11	0,15	0,8	4,0

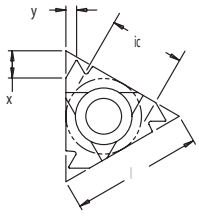


Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Perfil Parcial *Exterior 55°*

Para estándar Británica Whitworth y estándar Británica de Tubería Paralela





Plaquitas a Derechas

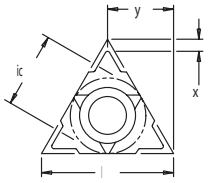
Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
11	11ERA55	0,5 - 1,5	48 - 16	0,07	0,8	0,9
16	16ERA55	0,5 - 1,5	48 - 16	0,07	0,8	0,9
	16ERG55	1,75 - 3,0	14 - 8	0,25	1,2	1,7
	16ERAG55	0,5 - 3,0	48 - 8	0,07	1,2	1,7
22	22ERN55	3,5 - 5,0	7 - 5	0,52	1,7	2,5
27	27ERQ55	5,5 - 6,0	4.5 - 4	0,82	2,6	3,1

Plaquitas a Izquierdas

Descripción
11ELA55
16ELA55
16ELG55
16ELAG55
22ELN55
27ELQ55

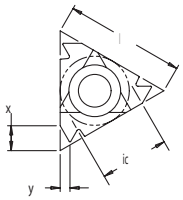
Plaquitas Tipo U

Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
22	22EILRU55	5,5 - 8,0	4.5 - 3.25	0,82	0,9	11,0
27	27EILRU55	6,5 - 9,0	4 - 2.75	0,97	1,2	13,7



Perfil Parcial *Interior 55°*

Para estándar Británica Whitworth y estándar Británica de Tubería Paralela



Plaquitas a Derechas

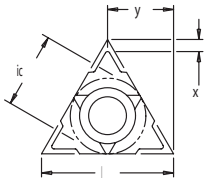
Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
6	06IRA55	0,5 - 1,25	48 - 20	0,07	0,6	0,6
8	08IRA55	0,5 - 1,5	48 - 16	0,07	0,6	0,7
11	11IRA55	0,5 - 1,5	48 - 16	0,07	0,8	0,9
16	16IRA55	0,5 - 1,5	48 - 16	0,07	0,8	0,9
	16IRG55	1,75 - 3,0	14 - 8	0,13	1,2	1,7
	16IRAG55	0,5 - 3,0	48 - 8	0,07	1,2	1,7
22	22IRN55	3,5 - 5,0	7 - 5	0,52	1,7	2,5
27	27IRQ55	5,5 - 6,0	4.5 - 4	0,82	2,6	3,1

Plaquitas a Izquierdas

Descripción
-
08ILA55
11ILA55
16ILA55
16ILG55
16ILAG55
22ILN55
27ILQ55

Plaquitas Tipo U

Tamaño	Descripción	Gama de pasos mm	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
8	08ILRU55	1,75 - 2,0	14 - 11	0,25	0,8	4,0

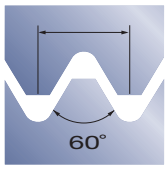


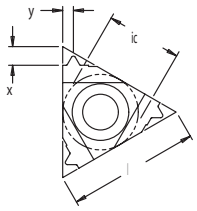
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Métrica ISO

ISO *Exterior*

Referencia estándar ISO 262 (DIN 13)
Tolerancia clase 6g / 6H





Plaquitas a Derechas

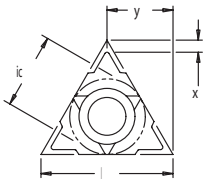
Tamaño	Descripción	Gama de pasos mm	Radio de Punta mm	X mm	Y mm
11	11ER0,35ISO	0,35	0,06	0,8	0,4
	11ER0,4ISO	0,4	0,07	0,7	0,4
	11ER0,45ISO	0,45	0,08	0,7	0,4
	11ER0,5ISO	0,5	0,08	0,6	0,6
	11ER0,6ISO	0,6	0,09	0,6	0,6
	11ER0,7ISO	0,7	0,10	0,6	0,6
	11ER0,75ISO	0,75	0,10	0,6	0,6
	11ER0,8ISO	0,8	0,13	0,6	0,6
	11ER1,0ISO	1,0	0,14	0,7	0,7
	11ER1,25ISO	1,25	0,18	0,8	0,9
	11ER1,5ISO	1,5	0,22	0,8	1,0
	11ER1,75ISO	1,75	0,25	0,8	1,1
	11ER2,0ISO	2,0	0,29	0,8	0,9
16	16ER0,35ISO	0,35	0,06	0,8	0,4
	16ER0,4ISO	0,4	0,07	0,7	0,4
	16ER0,45ISO	0,45	0,08	0,7	0,4
	16ER0,5ISO	0,5	0,08	0,6	0,6
	16ER0,6ISO	0,6	0,09	0,6	0,6
	16ER0,7ISO	0,7	0,10	0,6	0,6
	16ER0,75ISO	0,75	0,10	0,6	0,6
	16ER0,8ISO	0,8	0,13	0,6	0,6
	16ER1,0ISO	1,0	0,14	0,7	0,7
	16ER1,25ISO	1,25	0,18	0,8	0,9
	16ER1,5ISO	1,5	0,22	0,8	1,0
	16ER1,75ISO	1,75	0,25	0,9	1,2
	16ER2,0ISO	2,0	0,29	1,0	1,3
	16ER2,5ISO	2,5	0,36	1,1	1,5
	16ER3,0ISO	3,0	0,46	1,2	1,6
22	22ER3,5ISO	3,5	0,53	1,6	2,3
	22ER4,0ISO	4,0	0,61	1,6	2,3
	22ER4,5ISO	4,5	0,68	1,7	2,4
	22ER5,0ISO	5,0	0,76	1,7	2,5
27	27ER5,5ISO	5,5	0,79	1,9	2,7
	27ER6,0ISO	6,0	0,89	2,0	2,9

Plaquitas a Izquierdas

Descripción
11EL0,35ISO
11EL0,4ISO
11EL0,45ISO
11EL0,5ISO
11EL0,6ISO
11EL0,7ISO
11EL0,75ISO
11EL0,8ISO
11EL1,0ISO
11EL1,25ISO
11EL1,5ISO
11EL1,75ISO
11EL2,0ISO
16EL0,35ISO
16EL0,4ISO
16EL0,45ISO
16EL0,5ISO
16EL0,6ISO
16EL0,7ISO
16EL0,75ISO
16EL0,8ISO
16EL1,0ISO
16EL1,25ISO
16EL1,5ISO
16EL1,75ISO
16EL2,0ISO
16EL2,5ISO
16EL3,0ISO
22EL3,5ISO
22EL4,0ISO
22EL4,5ISO
22EL5,0ISO
27EL5,5ISO
27EL6,0ISO

Plaquitas Tipo U

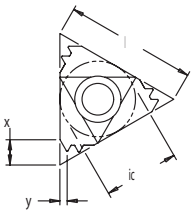
Tamaño	Descripción	Gama de pasos mm	Radio de Punta mm	X mm	Y mm
22	22ELRU5,5ISO	5,5	0,79	2,3	11,0
	22ELRU6,0ISO	6,0	0,87	2,6	11,0
27	27ELRU8,0ISO	8,0	1,15	2,4	13,7



Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

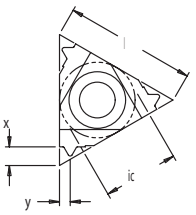
Multidiente

Tamaño	Descripción	Gama de pasos mm	X mm	Y mm
16	16IR1,0ISO3M	1,0	2,6	-
	16IR1,5ISO2M	1,5	1,6	2,4
22	22IR1,5ISO3M	1,5	2,4	3,8
	22IR2,0ISO2M	2,0	3,0	-
	22IR2,0ISO3M	2,0	4,9	-
27	27IR3,0ISO2M	3,0	4,3	-



ISO *Interior*

Referencia estándar ISO 262 (DIN 13)
Tolerancia clase 6g / 6H



Plaquitas a Derechas

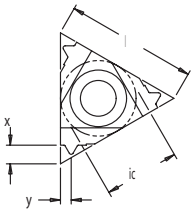
Tamaño	Descripción	Gama de pasos mm	Radio de Punta mm	X mm	Y mm
6	06IR0.5ISO	0,5	0,04	0,6	0,5
	06IR0.75ISO	0,75	0,06	0,6	0,5
	06IR1.0ISO	1,0	0,08	0,6	0,6
	06IR1.25ISO	1,25	0,10	0,6	0,7
8	08IR0.5ISO	0,5	0,06	0,6	0,5
	08IR0.75ISO	0,75	0,06	0,6	0,5
	08IR1.0ISO	1,0	0,11	0,6	0,6
	08IR1.25ISO	1,25	0,10	0,6	0,7
	08IR1.5ISO	1,5	0,11	0,6	1,0
	08IR1.75ISO	1,75	0,13	0,6	1,0
11	11IR0.35ISO	0,35	0,03	0,8	0,3
	11IR0.4ISO	0,4	0,04	0,8	0,4
	11IR0.45ISO	0,45	0,04	0,8	0,4
	11IR0.5ISO	0,5	0,04	0,6	0,6
	11IR0.6ISO	0,6	0,05	0,6	0,6
	11IR0.7ISO	0,7	0,06	0,6	0,6
	11IR0.75ISO	0,75	0,06	0,6	0,6
	11IR0.8ISO	0,8	0,06	0,6	0,6
	11IR1.0ISO	1,0	0,08	0,6	0,7
	11IR1.25ISO	1,25	0,10	0,8	0,8
	11IR1.5ISO	1,5	0,11	0,8	1,0
	11IR1.75ISO	1,75	0,13	0,8	1,0
	11IR2.0ISO	2,0	0,14	0,8	1,1
	11IR2.5ISO	2,5	0,18	0,8	1,3
16	16IR0.35ISO	0,35	0,03	0,8	0,3
	16IR0.4ISO	0,4	0,04	0,8	0,4
	16IR0.45ISO	0,45	0,04	0,8	0,4
	16IR0.5ISO	0,5	0,04	0,6	0,6
	16IR0.6ISO	0,6	0,05	0,6	0,6
	16IR0.7ISO	0,7	0,06	0,6	0,6

Plaquitas a Izquierdas

Descripción
-
-
-
-
08IL0.5ISO
08IL0.75ISO
08IL1.0ISO
08IL1.25ISO
08IL1.5ISO
08IL1.75ISO
11IL0.35ISO
11IL0.4ISO
11IL0.45ISO
11IL0.5ISO
11IL0.6ISO
11IL0.7ISO
11IL0.75ISO
11IL0.8ISO
11IL1.0ISO
11IL1.25ISO
11IL1.5ISO
11IL1.75ISO
11IL2.0ISO
11IL2.5ISO
16IL0.35ISO
16IL0.4ISO
16IL0.45ISO
16IL0.5ISO
16IL0.6ISO
16IL0.7ISO

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Métrica ISO *Continuación*



Plaquitas a Derechas

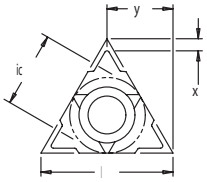
Tamaño	Descripción	Gama de pasos mm	Radio de Punta mm	X mm	Y mm
16	16IR0.75ISO	0,75	0,06	0,6	0,6
	16IR0.8ISO	0,8	0,06	0,6	0,6
	16IR1.0ISO	1,0	0,08	0,6	0,7
	16IR1.25ISO	1,25	0,10	0,8	0,9
	16IR1.5ISO	1,5	0,11	0,8	1,0
	16IR1.75ISO	1,75	0,13	0,9	1,2
	16IR2.0ISO	2,0	0,14	1,0	1,3
	16IR2.5ISO	2,5	0,18	1,1	1,5
	16IR3.0ISO	3,0	0,23	1,1	1,5
	16IR3.5ISO	3,5	0,25	1,2	1,8
22	22IR3.5ISO	3,5	0,25	1,6	2,3
	22IR4.0ISO	4,0	0,33	1,6	2,3
	22IR4.5ISO	4,5	0,36	1,6	2,4
	22IR5.0ISO	5,0	0,39	1,6	2,6
27	27IR4.0ISO	4,0	0,33	1,6	2,3
	27IR5.0ISO	5,0	0,39	1,6	2,4
	27IR5.5ISO	5,5	0,38	1,8	2,8
	27IR6.0ISO	6,0	0,41	1,8	3,1

Plaquitas a Izquierdas

Descripción
16IL0.75ISO
16IL0.8ISO
16IL1.0ISO
16IL1.25ISO
16IL1.5ISO
16IL1.75ISO
16IL2.0ISO
16IL2.5ISO
16IL3.0ISO
16IL3.5ISO
22IL3.5ISO
22IL4.0ISO
22IL4.5ISO
22IL5.0ISO
27IL4.0ISO
27IL5.0ISO
27IL5.5ISO
27IL6.0ISO

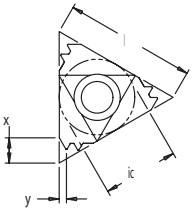
Plaquitas Tipo U

Tamaño	Descripción	Gama de pasos mm	Radio de Punta mm	X mm	Y mm
22	22ILRU5.5ISO	5,5	0,38	2,4	11,0
	22ILRU6.0ISO	6,0	0,41	2,1	11,0
27	27ILRU8.0ISO	8,0	0,55	2,4	13,7



Multidiente

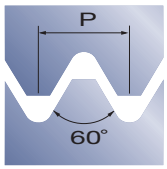
Tamaño	Descripción	Gama de pasos mm	X mm	Y mm
16	16IR1.0ISO3M	1,0	1,8	2,6
	16IR1.5ISO2M	1,5	1,6	2,4
22	22IR1.5ISO3M	1,5	2,5	3,8
	22IR2.0ISO2M	2,0	2,1	3,1
	22IR2.0ISO3M	2,0	3,2	5,1
27	27IR3.0IS02M	3,0	3,0	4,6

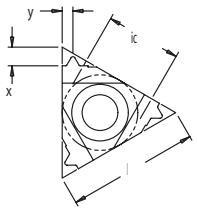


Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

UN *Exterior*

Referencia estándar: ANSI B1.1:74
Tolerancia clase: 2A / 2B





Plaquitas a Derechas

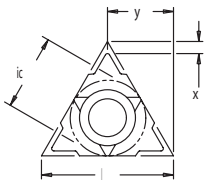
Tamaño	Descripción	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
11	11ER40UN	40	0,09	0,6	0,6
	11ER36UN	36	0,11	0,6	0,6
	11ER32UN	32	0,13	0,6	0,6
	11ER28UN	28	0,14	0,6	0,7
	11ER27UN	27	0,15	0,7	0,8
	11ER24UN	24	0,17	0,7	0,8
	11ER20UN	20	0,19	0,8	0,9
	11ER18UN	18	0,20	0,8	1,0
	11ER16UN	16	0,22	0,9	1,1
	11ER14UN	14	0,25	1,0	1,2
16	16ER40UN	40	0,09	0,6	0,6
	16ER36UN	36	0,11	0,6	0,6
	16ER32UN	32	0,13	0,6	0,6
	16ER28UN	28	0,14	0,6	0,7
	16ER27UN	27	0,15	0,7	0,8
	16ER24UN	24	0,17	0,7	0,8
	16ER20UN	20	0,18	0,8	0,9
	16ER18UN	18	0,20	0,8	1,0
	16ER16UN	16	0,22	0,9	1,1
	16ER14UN	14	0,25	1,0	1,2
	16ER13UN	13	0,28	1,0	1,3
	16ER12UN	12	0,29	1,1	1,4
	16ER11UN	11	0,33	1,1	1,5
	16ER10UN	10	0,38	1,1	1,5
	16ER9UN	9	0,38	1,2	1,7
	16ER8UN	8	0,48	1,2	1,6
22	22ER8UN	8	0,48	1,2	1,6
	22ER7UN	7	0,53	1,6	2,3
	22ER6UN	6	0,64	1,6	2,3
	22ER5UN	5	0,76	1,7	2,5
27	27ER4.5UN	4.5	0,82	1,9	2,7
	27ER4UN	4	0,91	2,1	3,0

Plaquitas a Izquierdas

Descripción
11EL40UN
11EL36UN
11EL32UN
11EL28UN
11EL27UN
11EL24UN
11EL20UN
11EL18UN
11EL16UN
11EL14UN
16EL40UN
16EL36UN
16EL32UN
16EL28UN
16EL27UN
16EL24UN
16EL20UN
16EL18UN
16EL16UN
16EL14UN
16EL13UN
16EL12UN
16EL11UN
16EL10UN
16EL9UN
16EL8UN
22EL8UN
22EL7UN
22EL6UN
22EL5UN
27EL4.5UN
27EL4UN

Plaquitas Tipo U

Tamaño	Descripción	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
22	22ELRU4.5UN	4.5	0,82	2,0	11,0
	22ELRU4UN	4	0,91	2,0	11,0
27	27ELRU3UN	3	1,22	2,5	13,7

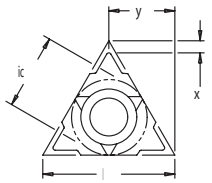


Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Unificada Americana *Continuación*

Tipo M

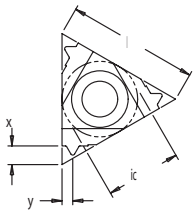
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16ER16UN2M	16	1,7	2,5
22	22ER16UN3M	16	2,6	4,1
	22ER12UN2M	12	2,1	3,2
	22ER12UN3M	12	3,4	5,3
27	27ER8UN2M	8	3,2	5,0



UN *Interior*

Referencia estándar: ANSI B1.1:74

Tolerancia clase: 2A / 2B



Plaquitas a Derechas						Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	Radio de Punta mm	X mm	Y mm	Descripción
6	06IR32UN	32	0,06	0,8	0,5	-
	06IR28UN	28	0,09	0,8	0,6	-
	06IR24UN	24	0,09	0,7	0,6	-
	06IR20UN	20	0,10	0,6	0,6	-
	06IR18UN	18	0,11	0,6	0,7	-
8	08IR32UN	32	0,06	0,6	0,5	08IL32UN
	08IR28UN	28	0,09	0,6	0,6	08IL28UN
	08IR24UN	24	0,09	0,6	0,6	08IL24UN
	08IR20UN	20	0,10	0,6	0,7	08IL20UN
	08IR18UN	18	0,11	0,6	0,7	08IL18UN
	08IR16UN	16	0,11	0,6	0,7	08IL16UN
	08IR14UN	14	0,15	0,6	0,8	08IL14UN
11	11IR40UN	40	0,05	0,6	0,6	11IL40UN
	11IR36UN	36	0,07	0,6	0,6	11IL36UN
	11IR32UN	32	0,09	0,6	0,6	11IL32UN
	11IR28UN	28	0,09	0,6	0,7	11IL28UN
	11IR27UN	27	0.09	0,7	0,8	11IL27UN
	11IR24UN	24	0,09	0,7	0,8	11IL24UN
	11IR20UN	20	0,10	0,8	0,9	11IL20UN
	11IR18UN	18	0,11	0,8	1,0	11IL18UN
	11IR16UN	16	0,11	0,9	1,1	11IL16UN
	11IR14UN	14	0,15	0,9	1,1	11IL14UN
	11IR13UN	13	0,17	0,8	1,0	11IL13UN
	11IR12UN	12	0,18	0,9	1,1	11IL12UN
	11IR11UN	11	0,18	0,8	1,1	11IL11UN
16	16IR40UN	40	0,05	0,6	0,6	16IL40UN
	16IR36UN	36	0,05	0,6	0,6	16IL36UN
	16IR32UN	32	0,06	0,6	0,6	16IL32UN
	16IR28UN	28	0,09	0,6	0,7	16IL28UN

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Plaquitas a Derechas

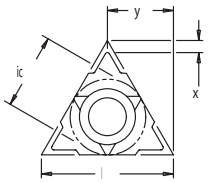
Tamaño	Descripción	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
	16IR26UN	26	0,09	0,7	0,8
	16IR24UN	24	0,09	0,7	0,8
	16IR20UN	20	0,10	0,8	0,9
	16IR18UN	18	0,11	0,8	1,0
	16IR16UN	16	0,11	0,9	1,1
	16IR14UN	14	0,15	0,9	1,1
	16IR13UN	13	0,17	1,0	1,3
	16IR12UN	12	0,18	1,1	1,4
	16IR11.5UN	11.5	0,18	1,1	1,5
	16IR11UN	11	0,18	1,1	1,5
	16IR10UN	10	0,20	1,1	1,5
	16IR9UN	9	0,20	1,2	1,7
	16IR8UN	8	0,24	1,1	1,5
22	22IR7UN	7	0,29	1,6	2,3
	22IR6UN	6	0,33	1,6	2,3
	22IR5UN	5	0,37	1,6	2,3
27	27IR4.5UN	4.5	0,42	1,7	2,4
	27IR4UN	4	0,46	1,8	2,7

Plaquitas a Izquierdas

Descripción
16IL26UN
16IL24UN
16IL20UN
16IL18UN
16IL16UN
16IL14UN
16IL13UN
16IL12UN
16IL11.5UN
16IL11UN
16IL10UN
16IL9UN
16IL8UN
22IL7UN
22IL6UN
22IL5UN
27IL4.5UN
27IL4UN

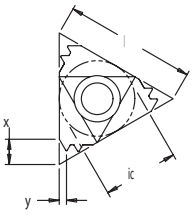
Plaquitas Tipo U

Tamaño	Descripción	Gama H.P.P.	Radio de Punta mm	X mm	Y mm
8	08ILRU12UN	12	0,18	0,9	4,0
	08ILRU11UN	11	0,18	0,9	4,0
22	22ILRU4.5UN	4.5	0,42	2,4	11,0
	22ILRU4UN	4	0,46	2,4	11,0
27	27ILRU3UN	3	0,62	2,7	13,7



Tipo M

Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16IR16UN2M	16	1,7	2,5
22	22IR16UN3M	16	2,6	4,1
	22IR12UN2M	12	2,1	3,2
	22IR12UN3M	12	3,4	5,3
27	27IR8UN2M	8	3,2	5,0



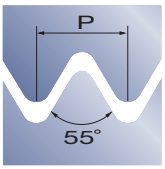
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

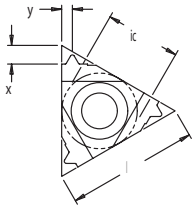
Whitworth para BSW/BSF y BSP

Whitworth *Exterior*

Referencia estándar: ISO 228/1: 1982, B.S. 84: 1956, DIN 259

Tolerancia clase: Clase Media A





Plaquitas a Derechas

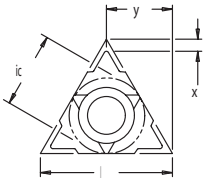
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER40W	40	0,6	0,6
	11ER36W	36	0,6	0,6
	11ER32W	32	0,6	0,6
	11ER28W	28	0,6	0,7
	11ER26W	26	0,7	0,8
	11ER24W	24	0,7	0,8
	11ER22W	22	0,8	0,9
	11ER20W	20	0,8	0,9
	11ER19W	19	0,8	1,0
	11ER18W	18	0,8	1,0
	11ER16W	16	0,9	1,1
	11ER14W	14	0,9	1,1
16	16ER40W	40	0,6	0,6
	16ER36W	36	0,6	0,6
	16ER32W	32	0,6	0,6
	16ER28W	28	0,6	0,7
	16ER26W	26	0,7	0,8
	16ER24W	24	0,7	0,8
	16ER22W	22	0,8	0,9
	16ER20W	20	0,8	0,9
	16ER19W	19	0,8	1,0
	16ER18W	18	0,8	1,0
	16ER16W	16	0,9	1,1
	16ER14W	14	1,0	1,2
	16ER12W	12	1,1	1,4
	16ER11W	11	1,1	1,5
	16ER10W	10	1,1	1,5
	16ER9W	9	1,2	1,7
	16ER8W	8	1,2	1,5
22	22ER8W	8	1,6	2,3
	22ER7W	7	1,6	2,3
	22ER6W	6	1,6	2,3
	22ER5W	5	1,6	2,4
27	27ER4.5W	4.5	1,8	2,6
	27ER4W	4	2,0	2,9

Plaquitas a Izquierdas

Descripción
11EL40W
11EL36W
11EL32W
11EL28W
11EL26W
11EL24W
11EL22W
11EL20W
11EL19W
11EL18W
11EL16W
11EL14W
16EL40W
16EL36W
16EL32W
16EL28W
16EL26W
16EL24W
16EL22W
16EL20W
16EL19W
16EL18W
16EL16W
16EL14W
16EL12W
16EL11W
16EL10W
16EL9W
16EL8W
22EL8W
22EL7W
22EL6W
22EL5W
27EL4.5W
27EL4W

Plaquitas Tipo U

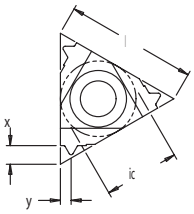
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16ER14W2M	14	1,9	2,8
22	22ER14W3M	14	2,9	4,6
	22ER11W2M	11	2,3	3,5



Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Whitworth *Interior*

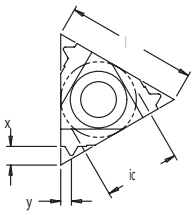
Referencia estándar: ISO 228/1: 1982, B.S. 84: 1956, DIN 259
Tolerancia clase: Clase Media A



Plaquitas a Derechas					Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm	Descripción
6	06IR22W	22	0,6	0,6	-
	06IR20W	20	0,6	0,7	-
	06IR19W	19	0,6	0,7	-
	06IR18W	18	0,6	0,7	-
8	08IR28W	28	0,6	0,6	08IL28W
	08IR26W	26	0,6	0,6	08IL26W
	08IR24W	24	0,6	0,7	08IL24W
	08IR20W	20	0,6	0,7	08IL20W
	08IR19W	19	0,6	0,7	08IL19W
	08IR18W	18	0,6	0,7	08IL18W
	08IR16W	16	0,6	0,7	08IL16W
11	11IR40W	40	0,6	0,6	11IL40W
	11IR36W	36	0,6	0,6	11IL36W
	11IR32W	32	0,6	0,6	11IL32W
	11IR28W	28	0,6	0,7	11IL28W
	11IR26W	26	0,7	0,8	11IL26W
	11IR24W	24	0,7	0,8	11IL24W
	11IR22W	22	0,8	0,9	11IL22W
	11IR20W	20	0,8	0,9	11IL20W
	11IR19W	19	0,8	1,0	11IL19W
	11IR18W	18	0,8	1,0	11IL18W
	11IR16W	16	0,9	1,1	11IL16W
	11IR14W	14	0,9	1,1	11IL14W
	11IR12W	12	1,0	1,1	11IL12W
	11IR11W	11	0,9	1,2	11IL11W
16	16IR40W	40	0,6	0,6	16IL40W
	16IR36W	36	0,6	0,6	16IL36W
	16IR32W	32	0,6	0,6	16IL32W
	16IR28W	28	0,6	0,7	16IL28W
	16IR26W	26	0,7	0,8	16IL26W
	16IR24W	24	0,7	0,8	16IL24W
	16IR22W	22	0,8	0,9	16IL22W
	16IR20W	20	0,8	0,9	16IL20W
	16IR19W	19	0,8	1,0	16IL19W
	16IR18W	18	0,8	1,0	16IL18W
	16IR16W	16	0,9	1,1	16IL16W
	16IR14W	14	1,0	1,2	16IL14W
	16IR12W	12	1,1	1,4	16IL12W
	16IR11W	11	1,1	1,5	16IL11W
	16IR10W	10	1,1	1,5	16IL10W

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Whitworth para BSW/BSF y BSP *Continuación*



Plaquitas a Derechas

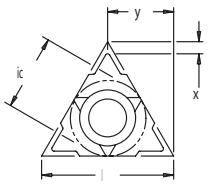
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16IR9W	9	1,2	1,7
	16IR8W	8	1,2	1,5
22	22IR7W	7	1,6	2,3
	22IR6W	6	1,6	2,3
	22IR5W	5	1,7	2,4
27	27IR4.5W	4.5	1,8	2,6
	27IR4W	4	2,0	2,9

Plaquitas a Izquierdas

Descripción
16IL9W
16IL8W
22IL7W
22IL6W
22IL5W
27IL4.5W
27IL4W

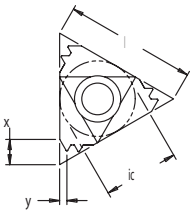
Plaquitas Tipo U

Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
8	08ILRU14W	14	1,0	4,0
	08ILRU12W	12	0,9	4,0
	08ILRU11W	11	0,9	4,0
22	22EILRU4.5W	4.5	2,3	11,0
	22EILRU4W	4	1,8	11,0
27	27EILRU3.5	3.5	2,1	13,7
	27EILRU3.25	3.25	2,0	13,7
	27EILRU3	3	2,3	13,7
	27EILRU2.75	2.75	2,4	13,7



Multidiente

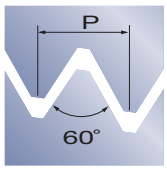
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16IR14W2M	14	1,9	2,8
22	22IR14W3M	14	2,9	4,6
	22IR11W2M	11	2,3	3,5

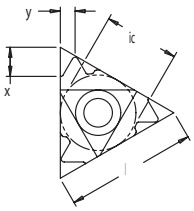


Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

NPT *Exterior*

Referencia estándar: USAS B2.1: 1968
Tolerancia clase: Estándar NPT





Plaquitas a Derechas

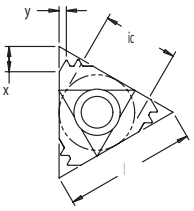
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER27NPT	27	0,7	0,8
	11ER18NPT	18	0,8	1,0
	11ER14NPT	14	0,8	1,0
16	16ER27NPT	27	0,7	0,8
	16ER18NPT	18	0,8	1,0
	16ER14NPT	14	0,9	1,2
	16ER11.5NPT	11.5	1,1	1,5
	16ER8NPT	8	1,3	1,8

Plaquitas a Izquierdas

Descripción
11EL27NPT
11EL18NPT
11EL14NPT
16EL27NPT
16EL18NPT
16EL14NPT
16EL11.5NPT
16EL8NPT

Multidiente

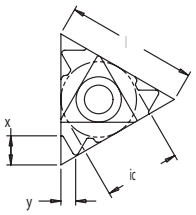
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
22	22ER11,5NPT2M	11.5	3,4	2,2
27	27ER11.5NPT3M	11.5	3,5	5,6
	27ER8NPT2M	8	2,9	4,7



Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

NPT *Interior*

Referencia estándar: USAS B2.1 :1968
Tolerancia clase: Estándar NPT



Plaquitas a Derechas

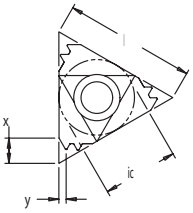
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
6	06IR27NPT	27	0,6	0,6
8	08IR27NPT	27	0,6	0,6
	08IR18NPT	18	0,6	0,6
11	11IR27NPT	27	0,7	0,8
	11IR18NPT	18	0,8	1,0
	11IR14NPT	14	0,8	1,0
16	16IR27NPT	27	0,7	0,8
	16IR18NPT	18	0,8	1,0
	16IR14NPT	14	0,9	1,2
	16IR11.5NPT	11.5	1,1	1,5
	16IR8NPT	8	1,3	1,8

Plaquitas a Izquierdas

Descripción
-
08IL27NPT
08IL18NPT
11IL27NPT
11IL18NPT
11IL14NPT
16IL27NPT
16IL18NPT
16IL14NPT
16IL11.5NPT
16IL8NPT

Multidiente

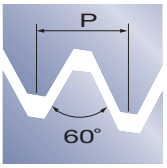
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
22	22IR11,5NPT2M	11.5	3,4	2,2
27	27IR11.5NPT3M	11.5	3,5	5,6
	27IR8NPT2M	8	2,9	4,7

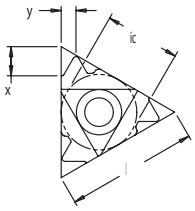


Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

NPTF *Exterior*

Referencia estándar: ANSI B1. 20.3 – 1976
Tolerancia clase: Clase 2





Plaquitas a Derechas

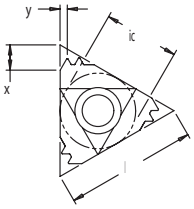
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER27NPTF	27	0,7	0,8
	11ER18NPTF	18	0,8	1,0
	11ER14NPTF	14	0,8	1,0
16	16ER27NPTF	27	0,7	0,8
	16ER18NPTF	18	0,8	1,0
	16ER14NPTF	14	0,9	1,2
	16ER11.5NPTF	11.5	1,1	1,5
	16ER8NPTF	8	1,3	1,8

Plaquitas a Izquierdas

Descripción
11EL27NPTF
11EL18NPTF
11EL14NPTF
16EL27NPTF
16EL18NPTF
16EL14NPTF
16EL11.5NPTF
16EL8NPTF

Multidiente

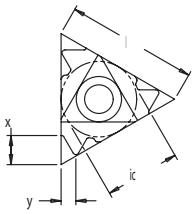
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
22	22ER11,5NPTF2M	11.5	3,4	2,2
27	27ER11.5NPTF3M	11.5	3,5	5,6
	27ER8NPTF2M	8	2,9	4,7



Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

NPTF *Interior*

Referencia estándar: ANSI B1. 20.3 – 1976
Tolerancia clase: Clase 2



Plaquitas a Derechas

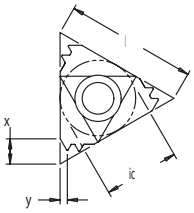
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
6	06IR27NPTF	27	0,7	0,6
8	08IR27NPTF	27	0,6	0,6
	08IR18NPTF	18	0,6	0,6
11	11IR27NPTF	27	0,7	0,7
	11IR18NPTF	18	0,8	1,0
	11IR14NPTF	14	0,8	1,0
16	16IR27NPTF	27	0,7	0,7
	16IR18NPTF	18	0,8	1,0
	16IR14NPTF	14	0,9	1,2
	16IR11.5NPTF	11.5	1,1	1,5
	16IR8NPTF	8	1,3	1,8

Plaquitas a Izquierdas

Descripción
-
08IL27NPTF
08IL18NPTF
11IL27NPTF
11IL18NPTF
11IL14NPTF
16IL27NPTF
16IL18NPTF
16IL14NPTF
16IL11.5NPTF
16IL8NPTF

Multidiente

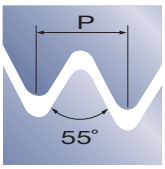
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
22	22IR11,5NPT2M	11.5	3,4	2,2
27	27IR11.5NPT3M	11.5	3,5	5,6
	27IR8NPT2M	8	2,9	4,7

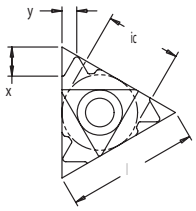


Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

BSPT *Exterior*

Referencia estándar: : B.S. 21:1985
Tolerancia clase: Estándar BSPT



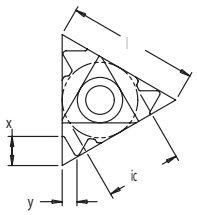


Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16ER28BSPT	28	0,7	0,8
	16ER19BSPT	19	0,8	1,0
	16ER14BSPT	14	0,9	1,2
	16ER11BSPT	11	1,1	1,5

Plaquitas a Izquierdas
Descripción
16EL28BSPT
16EL19BSPT
16EL14BSPT
16EL11BSPT

BSPT *Interior*

Referencia estándar: : B.S. 21:1985
Tolerancia clase: Estándar BSPT



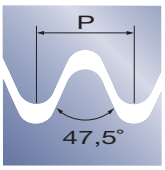
Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
6	06IR28BSPT	28	0,6	0,6
8	08IR28BSPT	28	0,6	0,6
	08IR19BSPT	19	0,6	0,6
11	11IR28BSPT	28	0,7	0,8
	11IR19BSPT	19	0,8	1,0
	11IR14BSPT	14	0,8	1,0
16	16IR28BSPT	28	0,7	0,8
	16IR19BSPT	19	0,8	1,0
	16IR14BSPT	14	0,9	1,2
	16IR11BSPT	11	1,1	1,5

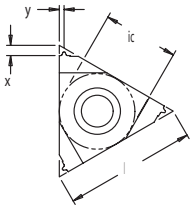
Plaquitas a Izquierdas
Descripción
-
08IL28BSPT
08IL19BSPT
11IL28BSPT
11IL19BSPT
11IL14BSPT
16IL28BSPT
16IL19BSPT
16IL14BSPT
16IL11BSPT

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Asociación Británica

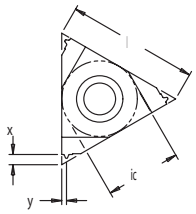
Forma Asociación Británica BA *Exterior*





Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER4BA	38.48	0,8	0,5
16	16ER0BA	25.40	0,8	0,7
	16ER2BA	31.35	0,8	0,6
	16ER4BA	38.48	0,8	0,5
	16ER6BA	47.92	0,8	0,5
	16ER8BA	59.07	0,8	0,4

Forma Asociación Británica BA *Interior*

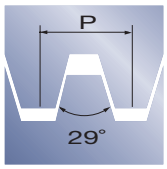


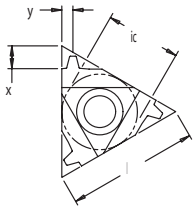
Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11IR4BA	38.48	0,8	0,5
16	16IR0BA	25.40	0,8	0,7
	16IR2BA	31.35	0,8	0,6
	16IR4BA	38.48	0,8	0,5
	16IR6BA	47.92	0,8	0,5
	16IR8BA	59.07	0,8	0,4

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Forma ACME *Exterior*

Referencia estándar: ANSI B1.5: 1988
Tolerancia clase: 3G





Plaquitas a Derechas

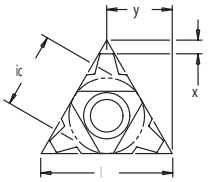
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER16ACME	16	0,9	1,0
16	16ER16ACME	16	0,9	1,0
	16ER14ACME	14	1,0	1,2
	16ER12ACME	12	1,1	1,2
	16ER10ACME	10	1,3	1,3
	16ER8ACME	8	1,5	1,5
22	22ER8ACME	8	1,5	1,5
	22ER6ACME	6	1,8	2,1
	22ER5ACME	5	2,0	2,3
27	27ER4ACME	4	2,3	2,7

Plaquitas a Izquierdas

Descripción
11EL16ACME
16EL16ACME
16EL14ACME
16EL12ACME
16EL10ACME
16EL8ACME
22EL8ACME
22EL6ACME
22EL5ACME
27EL4ACME

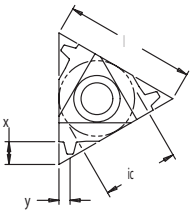
Plaquitas Tipo U

Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
22	22EILRU4ACME	4	2,3	11,0
27	27EILRU3ACME	3	2,8	13,7



Forma ACME *Interior*

Referencia estándar: ANSI B1.5: 1988
Tolerancia clase: 3G



Plaquitas a Derechas

Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11IR16ACME	16	0,9	1,0
16	16IR16ACME	16	0,9	1,0
	16IR14ACME	14	1,0	1,2
	16IR12ACME	12	1,1	1,2
	16IR10ACME	10	1,3	1,3
	16IR8ACME	8	1,5	1,5
22	22IR8ACME	8	1,5	1,5
	22IR6ACME	6	1,8	2,1
	22IR5ACME	5	2,0	2,3
27	27IR4ACME	4	2,3	2,7

Plaquitas a Izquierdas

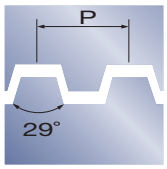
Descripción
11IL16ACME
16IL16ACME
16IL14ACME
16IL12ACME
16IL10ACME
16IL8ACME
22IL8ACME
22IL6ACME
22IL5ACME
27IL4ACME

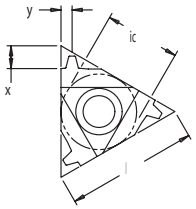
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

STUB ACME Exterior e Interior

STUB ACME *Exterior*

Referencia estándar: ANSI B1.8: 1988
Tolerancia clase: 2G

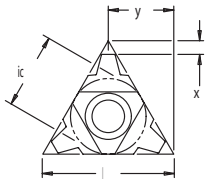




Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER16STACME	16	1,0	1,0
16	16ER16STACME	16	1,0	1,0
	16ER14STACME	14	1,1	1,1
	16ER12STACME	12	1,2	1,2
	16ER10STACME	10	1,3	1,3
	16ER8STACME	8	1,5	1,5
	16ER6STACME	6	1,8	1,8
22	22ER5STACME	5	2,0	2,3
	22ER4STACME	4	2,3	2,4
27	27ER4STACME	4	2,3	2,4
	27ER3STACME	3	2,8	2,9

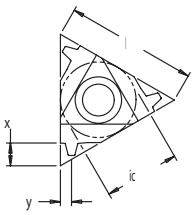
Plaquitas a Izquierdas
Descripción
11EL16STACME
16EL16STACME
16EL14STACME
16EL12STACME
16EL10STACME
16EL8STACME
16EL6STACME
22EL5STACME
22EL4STACME
27EL4STACME
27EL3STACME

Plaquitas Tipo U				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
22	22EILRU4STACME	4	2,5	11,0
27	27EILRU3STACME	3	3,3	13,7



STUB ACME *Interior*

Referencia estándar: ANSI B1.8: 1988
Tolerancia clase: 2G



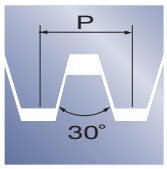
Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11IR16STACME	16	1,0	1,0
16	16IR16STACME	16	1,0	1,0
	16IR14STACME	14	1,1	1,1
	16IR12STACME	12	1,2	1,2
	16IR10STACME	10	1,3	1,3
	16IR8STACME	8	1,5	1,5
	16IR6STACME	6	1,8	1,8
22	22IR5STACME	5	2,0	2,3
	22IR4STACME	4	2,3	2,4
27	27IR4STACME	4	2,3	2,4
	27IR3STACME	3	2,8	2,9

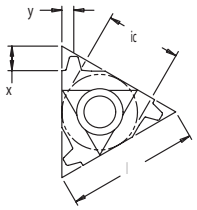
Plaquitas a Izquierdas
Descripción
11IL16STACME
16IL16STACME
16IL14STACME
16IL12STACME
16IL10STACME
16IL8STACME
16IL6STACME
22IL5STACME
22IL4STACME
27IL4STACME
27IL3STACME

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Trapezoidal *Exterior*

Referencia estándar: DIN 103
Tolerancia clase: 7e / 7H

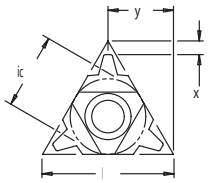




Plaquitas a Derechas				
Tamaño	Descripción	Gama de pasos	X mm	Y mm
16	16ER1.5TR	1,5	1,0	1,1
	16ER2.0TR	2,0	1,0	1,3
	16ER3.0TR	3,0	1,3	1,5
22	22ER4.0TR	4,0	1,8	1,9
	22ER5.0TR	5,0	2,0	2,4
	22ER6.0TR	6,0	2,3	2,7
27	27ER6.0TR	6,0	2,3	2,7

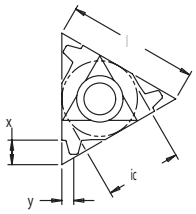
Plaquitas a Izquierdas
Descripción
16EL1.5TR
16EL2.0TR
16EL3.0TR
22EL4.0TR
22EL5.0TR
22EL6.0TR
27EL6.0TR

Plaquitas Tipo U				
Tamaño	Descripción	Gama de pasos	X mm	Y mm
22	22EILRU6.0TR	6,0	2,0	11,0
	22EILRU8.0TR	7,0	2,3	11,0
27	27EILRU8.0TR	8,0	2,5	13,7
	27EILRU9.0TR	9,0	3,0	13,7



Trapezoidal *Interior*

Referencia estándar: DIN 103
Tolerancia clase: 7e / 7H



Plaquitas a Derechas				
Tamaño	Descripción	Gama de pasos	X mm	Y mm
16	16IR1.5TR	1,5	1,0	1,1
	16IR2.0TR	2,0	1,0	1,3
	16IR3.0TR	3,0	1,3	1,5
22	22IR4.0TR	4,0	1,8	1,9
	22IR5.0TR	5,0	2,0	2,4
	22IR6.0TR	6,0	2,3	2,7
27	27IR6.0TR	6,0	2,3	2,7

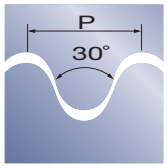
Plaquitas a Izquierdas
Descripción
16IL1.5TR
16IL2.0TR
16IL3.0TR
22IL4.0TR
22IL5.0TR
2IL6.0TR
27IL6.0TR

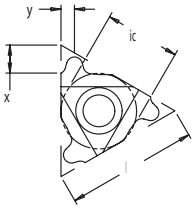
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Redonda Exterior e Interior

Redonda *Exterior*

Referencia estándar: DIN 405
Tolerancia clase: 7h / 7H



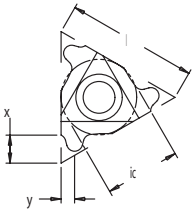


Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16ER6RD	6	1,5	1,7
	16ER8RD	8	1,4	1,3
	16ER10RD	10	1,1	1,2
22	22ER6RD	6	1,5	1,7
	22ER4RD	4	2,2	2,3
27	27ER4RD	4	2,2	2,3

Plaquitas a Izquierdas
Descripción
16EL6RD
16EL8RD
16EL10RD
22EL6RD
22EL4RD
27EL4RD

Redonda *Interior*

Referencia estándar: DIN 405
Tolerancia clase: 7h / 7H



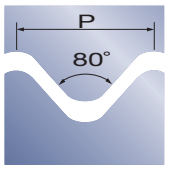
Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16IR6RD	6	1,5	1,7
	16IR8RD	8	1,4	1,3
	16IR10RD	10	1,1	1,2
22	22IR6RD	6	1,5	1,7
	22IR4RD	4	2,2	2,3
27	27IR4RD	4	2,2	2,3

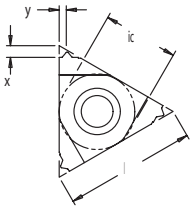
Plaquitas a Izquierdas
Descripción
16IL6RD
16IL8RD
16IL10RD
22IL6RD
22IL4RD
27IL4RD

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

PG *Exterior*

Referencia estándar: DIN 40430
Tolerancia clase: Estándar

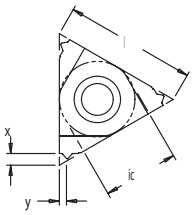




Plaquitas a Derechas						Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm	Roscas Nominales	Descripción
16	16ER20PG	20	0,7	0,8	Pg 7	16EL20PG
	16ER18PG	18	0,8	0,9	Pg 9/11/13.5/16	16EL18PG
	16ER16PG	16	0,8	1,0	Pg 21/29/36/42/48	16EL16PG

PG *Interior*

Referencia estándar: DIN 40430
Tolerancia clase: Estándar

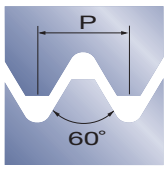


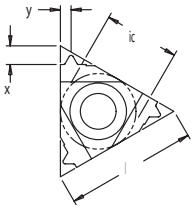
Plaquitas a Derechas						Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm	Roscas Nominales	Descripción
8	08IR20PG	20	0,6	0,7	Pg 7	08IL20PG
11	11IR20PG	20	0,7	0,8	Pg 7	11IL20PG
	11IR18PG	18	0,8	0,9	Pg 9/11/13.5/16	11IL18PG
	11IR16PG	16	0,8	1,0	Pg 21/29/36/42/48	11IL16PG
16	16IR20PG	20	0,7	0,8	Pg 7	16IL20PG
	16IR18PG	18	0,8	0,9	Pg 9/11/13.5/16	16IL18PG
	16IR16PG	16	0,8	1,0	Pg 21/29/36/42/48	16IL16PG

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

UNJ *Exterior*

Referencia estándar: MIL - S 8879C
Tolerancia clase: 3A / 3B





Plaquitas a Derechas					Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm	Descripción
11	11ER48UNJ	48	0,6	0,6	11EL48UNJ
	11ER44UNJ	44	0,6	0,6	11EL44UNJ
	11ER40UNJ	40	0,6	0,6	11EL40UNJ
	11ER36UNJ	36	0,6	0,6	11EL36UNJ
	11ER32UNJ	32	0,6	0,6	11EL32UNJ
	11ER28UNJ	28	0,6	0,6	11EL28UNJ
	11ER24UNJ	24	0,7	0,8	11EL24UNJ
	11ER20UNJ	20	0,8	0,9	11EL20UNJ
	11ER18UNJ	18	0,8	1,0	11EL18UNJ
	11ER16UNJ	16	0,8	1,0	11EL16UNJ
	11ER14UNJ	14	0,9	1,0	11EL14UNJ
16	16ER48UNJ	48	0,6	0,6	16EL48UNJ
	16ER44UNJ	44	0,6	0,6	16EL44UNJ
	16ER40UNJ	40	0,6	0,6	16EL40UNJ
	16ER36UNJ	36	0,6	0,6	16EL36UNJ
	16ER32UNJ	32	0,6	0,6	16EL32UNJ
	16ER28UNJ	28	0,6	0,6	16EL28UNJ
	16ER24UNJ	24	0,7	0,8	16EL24UNJ
	16ER20UNJ	20	0,8	0,9	16EL20UNJ
	16ER18UNJ	18	0,8	1,0	16EL18UNJ
	16ER16UNJ	16	0,8	1,0	16EL16UNJ
	16ER14UNJ	14	1,0	1,2	16EL14UNJ
	16ER13UNJ	13	1,0	1,3	16EL13UNJ
	16ER12UNJ	12	1,1	1,4	16EL12UNJ
	16ER11UNJ	11	1,1	1,5	16EL11UNJ
	16ER10UNJ	10	1,1	1,5	16EL10UNJ
	16ER9UNJ	9	1,2	1,6	16EL9UNJ
	16ER8UNJ	8	1,2	1,6	16EL8UNJ

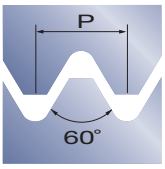
Para mecanizar roscas interiores UNJ utilizar estándar UN y hacer un taladro que genere el correcto truncado de la rosca.

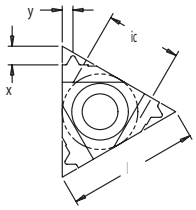
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

MJ *Exterior*

Referencia estándar: ISO 5855

Tolerancia clase: 4h / 6h - 4H / 5H





Plaquitas a Derechas				
Tamaño	Descripción	Gama de pasos	X mm	Y mm
16	16ER1.0MJ	1,0	0,6	0,7
	16ER1.25MJ	1,25	0,7	0,9
	16ER1.5MJ	1,5	0,8	1,0
	16ER2.0MJ	2,0	1,0	1,3
	16ER2.5MJ	2,5	1,1	1,5
	16ER3.0MJ	3,0	1,2	1,6

Plaquitas a Izquierdas
Descripción
16EL1.0MJ
16EL1.25MJ
16EL1.5MJ
16EL2.0MJ
16EL2.5MJ
16EL3.0MJ

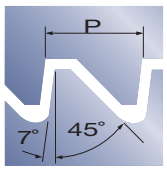
Para mecanizar roscas interiores MJ utilizar estándar ISO y hacer un taladro que genere el correcto truncada de la rosca.

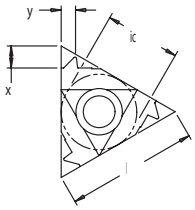
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Buttress Británica

Exterior Buttress Británica

Tolerancia clase: Clase Media



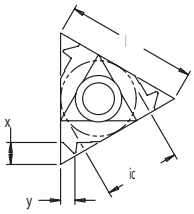


Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16ER20BBUTT	20	1,0	1,4
	16ER16BBUTT	16	1,3	1,9
	16ER12BBUTT	12	1,4	2,0
	16ER10BBUTT	10	1,5	2,3
22	22ER8BBUTT	8	2,0	3,2
	22ER6BBUTT	6	2,2	3,5
27	27ER4BBUTT	4	2,2	3,5

Plaquitas a Izquierdas
Descripción
16EL20BBUTT
16EL16BBUTT
16EL12BBUTT
16EL10BBUTT
22EL8BBUTT
22EL6BBUTT
27EL4BBUTT

Interior Buttress Británica

Tolerancia clase: Clase Media



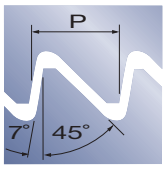
Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16IR20BBUTT	20	1,0	1,4
	16IR16BBUTT	16	1,3	1,9
	16IR12BBUTT	12	1,4	2,0
	16IR10BBUTT	10	1,5	2,3
22	22IR8BBUTT	8	2,0	3,2
	22IR6BBUTT	6	2,2	3,5
27	27IR4BBUTT	4	2,2	3,5

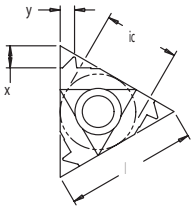
Plaquitas a Izquierdas
Descripción
16IL20BBUTT
16IL16BBUTT
16IL12BBUTT
16IL10BBUTT
22IL8BBUTT
22IL6BBUTT
27IL4BBUTT

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Buttress Americana *Exterior*

Referencia estándar: ANSI B1.9.1973
Tolerancia clase: Clase 2





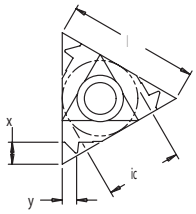
Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11ER20ABUTT	20	1,0	1,3
	11ER16ABUTT	16	1,0	1,5
16	16ER20ABUTT	20	1,0	1,3
	16ER16ABUTT	16	1,0	1,5
	16ER12ABUTT	12	1,4	2,0
	16ER10ABUTT	10	1,5	2,3
22	22ER8ABUTT	8	2,1	3,3
	22ER6ABUTT	6	2,1	3,4

Plaquitas a Izquierdas
Descripción
11EL20ABUTT
11EL16ABUTT
16EL20ABUTT
16EL16ABUTT
16EL12ABUTT
16EL10ABUTT
22EL8ABUTT
22EL6ABUTT

Plaquitas Tipo U				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
27	27ERU3ABUTT	3	3,1	11,7

Buttress Americana *Interior*

Referencia estándar: ANSI B1.9.1973
Tolerancia clase: Clase 2



Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
11	11IR20ABUTT	20	1,0	1,3
	11IR16ABUTT	16	1,0	1,5
16	16IR20ABUTT	20	1,0	1,3
	16IR16ABUTT	16	1,0	1,5
	16IR12ABUTT	12	1,4	2,0
	16IR10ABUTT	10	1,5	2,3
22	22IR8ABUTT	8	2,1	3,3
	22IR6ABUTT	6	2,1	3,4

Plaquitas a Izquierdas
Descripción
11IL20ABUTT
11IL16ABUTT
16IL20ABUTT
16IL16ABUTT
16IL12ABUTT
16IL10ABUTT
22IL8ABUTT
22IL6ABUTT

Plaquitas Tipo U				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
27	27IRU3ABUTT	3	3,1	11,7

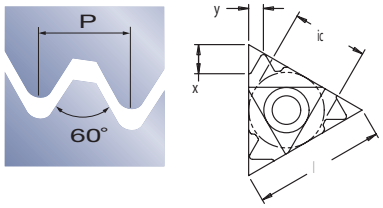
Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

API (Petróleo)

API *Exterior*

Referencia estándar: API
Especificación 7:1990

Tolerancia clase: estándar API

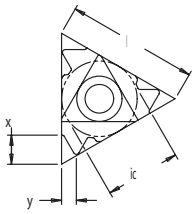


Plaquitas a Derechas							Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	Conicidad I.P.F	Angulo de conicidad	X mm	Y mm	Descripción
22	22ER4API382	4	2	4° - 43'	2,1	2,8	22EL4API382
	22ER4API383	4	3	7° - 1'	2,1	2,8	22EL4API383
	22ER4API502	4	3	7° - 1'	2,0	3,0	22EL4API502
	22ER4API503	4	3	7° - 1'	2,0	3,0	22EL4API503
	22ER5API403	5	3	7° - 1'	1,8	2,5	22EL5API403
	22ER6API551.5	6	1.5	3° - 33'	1,8	2,6	22EL6API551.5
27	27ER4API380.5	4	0.5	1° - 1'	2,1	2,8	27EL4API380.5
	27ER4API382	4	2	4° - 43'	2,1	2,8	27EL4API382
	27ER4API383	4	3	7° - 1'	2,1	2,8	27EL4API383
	27ER4API502	4	2	4° - 43'	2,0	3,0	27EL4API502
	27ER4API503	4	3	7° - 1'	2,0	2,0	27EL4API503
	27ER4API652	4	2	4° - 43'	2,1	3,1	27EL4API652

API *Interior*

Referencia estándar: API
Especificación 7:1990

Tolerancia clase: estándar API



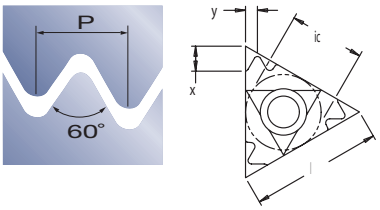
Plaquitas a Derechas							Plaquitas a Izquierdas
Tamaño	Descripción	Gama H.P.P.	Conicidad I.P.F	Angulo de conicidad	X mm	Y mm	Descripción
22	22IR4API382	4	2	4° - 43'	2,1	2,8	22IL4API382
	22IR4API383	4	3	7° - 1'	2,1	2,8	22IL4API383
	22IR4API502	4	2	4° - 43'	2,0	3,0	22IL4API502
	22IR4API503	4	3	7° - 1'	2,0	3,0	22IL4API503
	22IR5API403	5	3	7° - 1'	1,8	2,5	22IL5API403
	22IR6API551.5	6	1.5	3° - 33'	1,8	2,6	22IL6API551.5
27	27IR4API380.5	4	0.5	1° - 11'	2,1	2,8	27IL4API380.5
	27IR4API382	4	2	4° - 43'	2,1	2,8	27IL4API382
	27IR4API383	4	3	7° - 1'	2,1	2,8	27IL4API383
	27IR4API502	4	2	4° - 43'	2,0	3,0	27IL4API502
	27IR4API503	4	3	7° - 1'	2,0	2,0	27IL4API503
	27IR4API652	4	2	4° - 43'	2,1	3,1	27IL4API652

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

API Redonda (Petróleo)

API Redonda *Exterior*

Referencia estándar: API Standard 5B : 1979
Tolerancia clase: Estándar API redonda

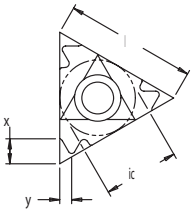


Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16ER10APIRD	10	1,2	1,4
	16ER8APIRD	8	1,3	1,5
22	22ER8APIRD	8	1,3	1,5

Plaquitas a Izquierdas
Descripción
16EL10APIRD
16EL8APIRD
22EL8APIRD

API Redonda *Interior*

Referencia estándar: API Standard 5B : 1979
Tolerancia clase: Estándar API redonda



Plaquitas a Derechas				
Tamaño	Descripción	Gama H.P.P.	X mm	Y mm
16	16IR10APIRD	10	1,2	1,4
	16IR8APIRD	8	1,3	1,5
22	22IR8APIRD	8	1,3	1,5

Plaquitas a Izquierdas
Descripción
16IL10APIRD
16IL8APIRD
22IL8APIRD

Las plaquitas a izquierdas tienen el mismo tamaño, gama de pasos, gama de H.P.P., radio de punta e informaciones X,Y que las plaquitas a derechas.

Conectores para Petróleo

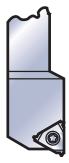
Conectores para Petróleo			
Ver referencias	H.P.P	Conicidad I.P.F	CONECTOR No. o Tamaño
API V 0.038R	4	2	NC23, NC28, NC31, NC35, NC38, NC40, NC44, NC46 NC50, 4FH, 2-3 /8IF, 3-1/2IF,4IF, 4-1/2IF, 5-1/2IF
API V 0.038R	4	3	NC56, NC61, NC70, NC77
API V 0.040	5	3	2-3/8REG, 2-7/8 REG, 3-1/2REG, 4-1/2 REG, 3-1/2FH, 4-1/2 FH
API V 0.050	4	3	5-1/2 REG, 7-5/8 REG, 8-5/8 REG
API V 0.050	4	2	6-5/8 REG, 5-1/2 FH, 6-5/8 FH
API V 0.055	6	1.5	NC10, NC12, NC13, NC16
API V 0.065	4	2	Reemplazada por API V 0.038R

Designación de Portaherramientas de Roscado

E	R	-	20	20	K	16	-
1	2	3	4	5	6	7	8

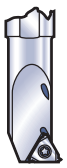
1 Utilización

E



Exterior

I



Interior

2 Mano

L



A izquierdas

R

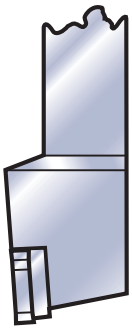


A derechas

3 Opción

N = Sin apoyo

4 Tamaño del Mango o Diámetro de la Herramienta

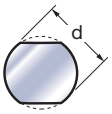


Exterior
Mango Cuadrado

e.g. 20 x 20 mm

5 Diámetro Mínimo



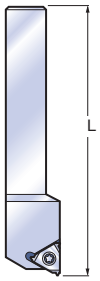


Interior
Mango Redondo Ø

e.g. 2021 =
d Ø 20 mm
D_1 Ø 21 mm

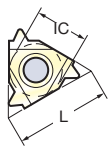
6 Longitud de la Herramienta

D	= 60	Q	= 180
F	= 80	R	= 200
H	= 100	S	= 250
K	= 125	T	= 300
L	= 140	U	= 350
M	= 150	V	= 400
P	= 170		



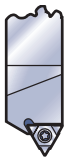
7 Tamaño de la Plaquita

L mm	IC pul
06	5/32
08	3/16
08U	3/16
11	1/4
16	3/8
22	1/2
22U	1/2U
27	5/8
27U	5/8U



8 Opción

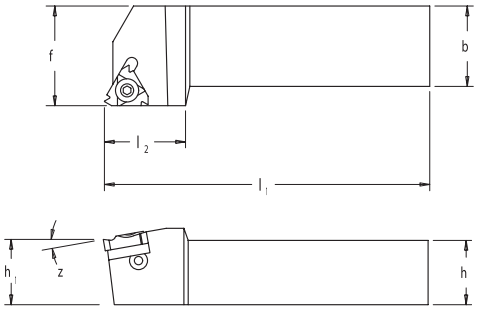
U



Neutra

ER





ER

Descripción	Dimensiones (mm)						Plaquitas
	b	l_1	l_2	f	h	h_1	
ERNM1010H11	10	100	13	14	10	10	11ER
ERN1010M16	10	150	19	13	10	10	16ER
ER/L1212F16	12	80	22	16	12	12	16E_
ER1212M16	12	150	22	16	12	12	16ER
ER/L1616H16	16	100	22	20	16	16	16E_
ER/L2020K16	20	125	27	25	20	20	16E_
ER/L2525M16	25	150	27	32	25	25	16E_
ER/L3232Q16	32	180	27	40	32	32	16E_
ER/L2525M22	25	150	30	32	25	25	22E_
ER3232Q22	32	180	30	40	32	32	22ER
ER/L4040R22	40	200	30	50	40	40	22E_
ER/L3232Q27	32	180	35	40,0	32	32	27E_
ER/L4040R27	40	200	35	50,0	40	40	27E_
ER3232Q27U	32	180	-	18,3	32	32	27ER_U

RECAMBIOS

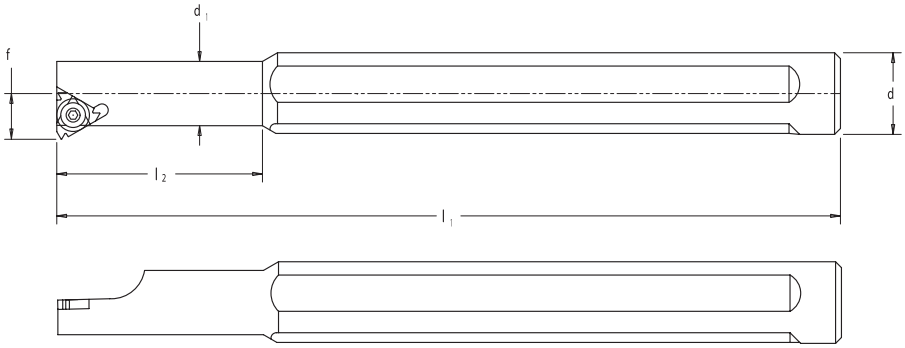
Referencia	Tornillo de la Plaquita	Llave	Apoyo	Tornillo del Apoyo
E_1010M16 to E_3232Q16	SA3T	T10F	YE3/YI3	SY3T
E_2525M22 to E_4040R22U	SA4T	T20F	YE4/YI4	SY4T
E_3232Q27 to E_3232Q27U	SA5T	T25F	YE5/YI5	SY5T

Ejemplo de Pedido: ER1010M16

Para Portaherramientas y plaquitas a DERECHAS, especifique R = ER
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = EL

IR





IR

Descripción	Dimensiones (mm)					Min ø Menor de la Rosca	Plaquitas
	d	d_1	l_1	l_2	f		
IRN1206H06	12	5,8	100	13	4,2	6,0	06IR
IR/LN1608K08	16	6,3	125	17	5,1	7,8	08I_
IRN1610K08	16	7,8	125	17	6,0	10,0	08IR
IR/LN1013K11	10	9,5	125	25	7,3	13,0	11I_
IRN2013M11	20	10,0	150	25	7,3	13,0	11IR
IR/LN1616M11	16	12,5	150	40	8,9	16,0	11I_
IR/LN1618M16	16	12,0	150	40	9,4	18,0	16I_
IR/LN2021Q16	20	15,8	180	40	12,4	21,0	16I_
IR/L2024Q16	20	18,5	180	50	13,0	24,0	16I_
IR/L2529R16	25	24,0	200	60	16,0	29,0	16I_
IR/L3236S16	32	31,5	250	60	19,6	36,0	16I_
IR4044T16	40	40,0	300	-	23,8	44,0	16IR
IR/LN2027Q22	20	20,0	180	-	15,6	27,0	22I_
IR2532R22	25	24,5	200	-	17,8	32,0	22IR
IR/L3239S22	32	32,0	250	-	21,5	39,0	22I_
IR4047T22	40	40,0	300	-	25,8	47,0	22IR
IR3240S27	32	32,0	250	-	22,4	40,0	27IR
IR4048T27	40	40,0	300	-	26,4	48,0	27IR

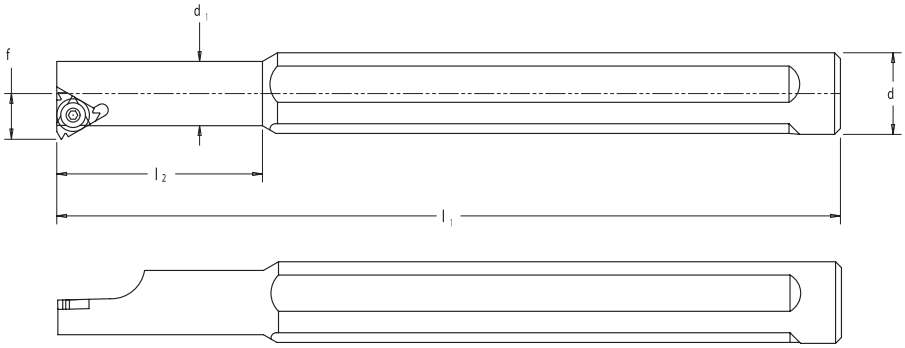
Todas las herramientas con agujero de refrigerante (Desde 12mm - 25mm diametro).

Para cualquier portaherramienta disponible a mano derecha, la existencia del portaherramienta a mano izquierda necesita ser consultada.

Para Portaherramientas y plaquitas a DERECHAS, especifique R = IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = IL

IR





IR – RESISTENTE A VIBRACION

Descripción	Dimensiones (mm)					Min ø Menor de la Rosca	Plaquitas
	d	d_1	l_1	l_2	f		
IRN1206H06CF	12	5,8	98	18	4,2	6,0	06IR
IRN1608H08CF	16	6,3	98	23	5,1	7,8	08IR
IRN1610H08CF	16	8,1	98	23	6,0	10,0	08IR
IRN1013H11CF	10	9,5	98	33	7,3	13,0	11IR
IRN1616M11CF	16	12,5	150	53	8,9	16,0	11IR
IRN1618M16CF	16	12,0	150	53	9,4	18,0	16IR
IRN2021M16CF	20	15,8	150	53	12,4	21,0	16IR
IR2024R16CF	20	18,5	200	67	13,0	24,0	16IR

RECAMBIOS

Referencia	Tornillo de la plaquita	Llave	Apoyo	Tornillo del apoyo
I_N1206H06	S6T	T6	-	-
I_N1608K08 to I_N1610K08	S8T	T6	-	-
I_N1013K11 to I_N1616M11	SN2T	T8F	-	-
I_N1618M16 to I_N2021M16	SA3T	T10F	-	-
I_2024R16	SA3T	T10F	YE3/YI3	SY3T
I_2027Q22-I-4047722	SA3T	T20F	YE4/YI4	SY4T
I_3240S27 -I-4048T27	SA5T	T25F	YE5/YI5	SY5T

Para Portaherramientas y plaquitas a DERECHAS, especifique R = IR
Para Portaherramientas y plaquitas a IZQUIERDAS, especifique L = IL

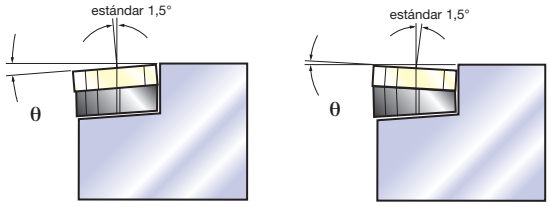
Selección de Apoyos

Con el sistema de roscado Stellram, una amplia gama de ángulos de hélice pueden obtenerse sin cambiar o modificar el portaherramientas, solo cambiando el apoyo de metal duro con el ángulo necesario.

La mayoría de los portaherramientas son fabricados con un ángulo de hélice de 1.5° como estándar.

Los apoyos permiten variaciones de hélice entre +4.5° y -1.5° manteniendo la arista de corte de la plaquita constante.

Ángulos de hélice negativos se utilizan para mecanizar roscas a derechas con portaherramientas a izquierdas o roscas a izquierdas con portaherramientas a derechas.



Hélice Negativa

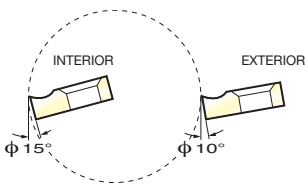
Tamaño de la plaquita			Angulo de hélice θ							
			4.5°	3.5°	2.5°	1.5°	0.5°	0°	-0.5°	-1.5°
mm	pul	Portaherramientas	Referencia del Apoyo							
16	3/8"	EX RH / IN LH	YE33P	YE32P	YE31P	**YE3**	YE31N	YE31.5N	YE32N	YE33N
		EX LH / IN RH	YI33P	YI32P	YI31P	**YI3**	YI31N	YI31.5N	YI32N	YI33N
22	1/2"	EX RH / IN LH	YE43P	YE42P	YE41P	**YE4**	YE41N	YE41.5N	YE42N	YE43N
		EX LH / IN RH	YI43P	YI42P	YI41P	**YI4**	YI41N	YI41.5N	YI42N	YI43N
22U	1/2"	EX RH / IN LH	YE4U3P	YE4U2P	YE4U1P	**YE4U**	YE4U1N	YE4U1.5N	YE4U2N	YE4U3N
		EX LH / IN RH	YI4U3P	YI4U2P	YI4U1P	**YI4U**	YI4U1N	YI4U1.5N	YI4U2N	YI4U3N
27	5/8"	EX RH / IN LH	YE53P	YE52P	YE51P	**YE5**	YE51N	YE51.5N	YE52N	YE53N
		EX LH / IN RH	YI53P	YI52P	YI51P	**YI5**	YI51N	YI51.5N	YI52N	YI53N
27U	5/8"	EX RH / IN LH	YE5U3P	YE5U2P	YE5U1P	**YE5U**	YE5U1N	YE5U1.5N	YE5U2N	YE5U3N
		EX LH / IN RH	YI5U3P	YI5U2P	YI5U1P	**YI5U**	YI5U1N	YI5U1.5N	YI5U2N	YI5U3N

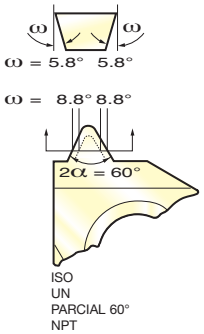
Nota: Los portaherramientas estándar son suministrados con un ángulo de hélice de 1.5°.

Calculo del ángulo de hélice para una rosca dada.

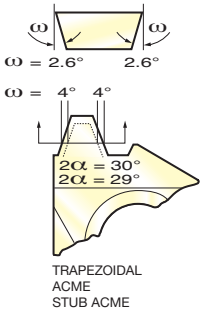
$$\text{Angulo de hélice} = \text{Tan}^{-1}\,\theta = \frac{\text{Paso de la rosca}}{\text{Diámetro de Paso} \times \pi}$$

Selección del ángulo de Incidencia del Flanco

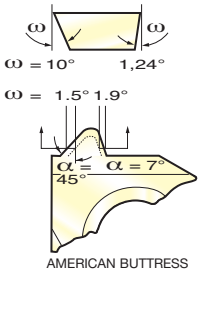




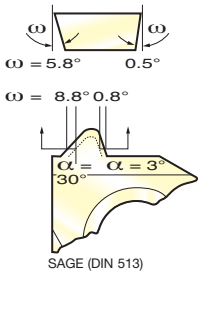
ISO
UN
PARCIAL 60°
NPT



TRAPEZOIDAL
ACME
STUB ACME



AMERICAN BUTTRESS



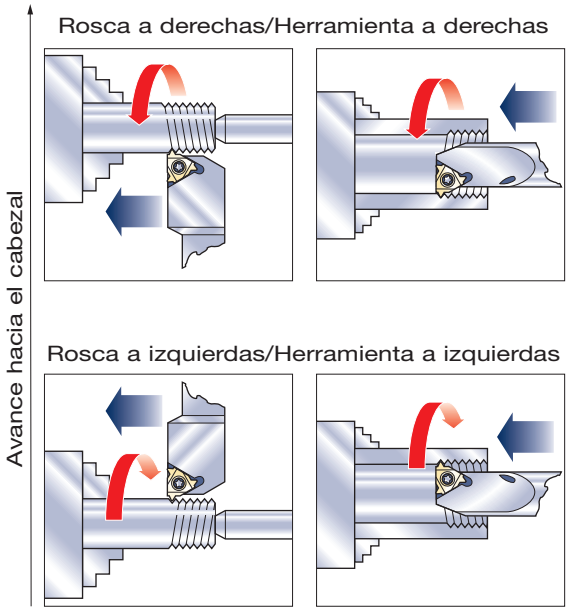
SAGE (DIN 513)

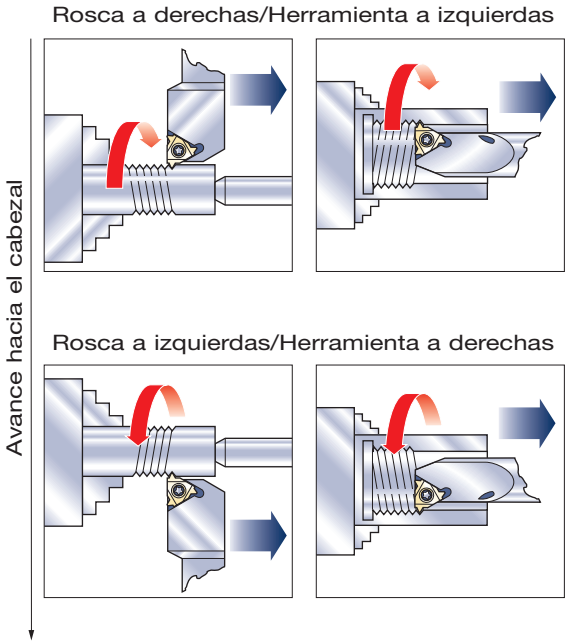
Tabla de Calculo Ángulo de hélice

Diámetro Mayor mm	Paso								
	1	1,25	1,5	1,75	2	3	4	5	6
	Angulo de hélice (Grados y Minutos)								
5	3° - 38´	4° - 33´	5° - 27´	-	-	-	-	-	-
6	3° - 2´	3° - 48´	4° - 33´	5° - 18´	6° - 33´	-	-	-	-
8	2° - 17´	2° - 51´	3° - 25´	3° - 59´	4° - 33´	6° - 49´	-	-	-
10	1° - 49´	2° - 16´	2° - 44´	3° - 11´	3° - 39´	5° - 27´	-	-	-
12	1° - 31´	1° - 54´	2° - 17´	2° - 39´	3° - 2´	4° - 33´	-	-	-
14	1° - 18´	1° - 38´	1° - 57´	2° - 17´	2° - 36´	3° - 54´	-	-	-
16	1° - 8´	1° - 42´	1° - 42´	2° - 0´	2° - 17´	3° - 25´	-	-	-
18	1° - 1´	1° - 16´	1° - 31´	1° - 46´	2° - 2´	3° - 2´	4° - 3´	-	-
20	55´	1° - 8´	1° - 22´	1° - 36´	1° - 49´	2° - 44´	3° - 39´	-	-
25	44´	55´	1° - 6´	1° - 16´	1° - 28´	2° - 11´	2° - 55´	-	-
30	36´	46´	55´	1° - 4´	1° - 13´	1° - 49´	2° - 26´	3° - 2´	3° - 39´
35	31´	39´	47´	55´	1° - 3´	1° - 33´	2° - 5´	2° - 36´	3° - 8´
40	27´	34´	41´	48´	55´	-	1° - 49´	2° - 17´	2° - 44´
45	24´	30´	36´	43´	48´	1° - 13´	1° - 37´	2° - 2´	2° - 26´
50	-	-	-	38´	44´	1° - 6´	1° - 28´	1° - 49´	2° - 11´
60	-	-	-	-	36´	55´	1° - 13´	1° - 31´	1° - 49´
70	-	-	23´	-	31´	47´	1° - 3´	1° - 18´	1° - 34´
80	-	-	-	-	-	41´	55´	1° - 8´	1° - 22´
90	-	-	-	21´	24´	36´	48´	1° - 1´	1° - 13´
100	-	-	17´	19´	-	33´	-	55´	1°- 6´

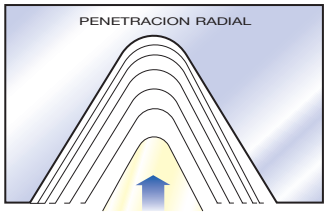
Calculo del ángulo de hélice para una rosca dada.

$$\text{Angulo de hélice} = \text{Tan}^{-1}\,\theta = \frac{\text{Paso de la rosca}}{\text{Diámetro de Paso x } \pi}$$





Penetración y Recomendaciones



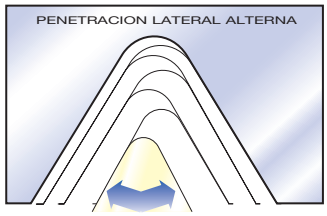
Penetración Radial

- Es el método mas comúnmente usado en tornos manuales.
- Desgaste uniforme en la arista principal y secundaria.
- Buen acabado superficial con las aristas secundarias.
- Utilización en materiales endurecidos.
- Utilización en materiales de viruta corta.
- Para pasos de menos de 1.5mm o 16 H.P.P.



Penetración Lateral Modificada

- Para roscas mayores de 1.5mm o 16 H.P.
- Presión de corte reducida en pasos grandes.
- Vibraciones reducidas.
- Desvía la viruta fuera de la arista de corte.
- El ángulo desplazado incrementa el acabado superficial.
- Primera opción para roscado interior.

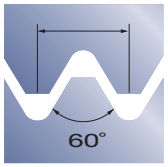


Penetración Lateral Alterna

- Recomendado para pasos grandes, ACME cuadrada y roscas trapezoidales.
- Recomendado para materiales de viruta larga.
- Este método divide el trabajo en ambos flancos.
- Produce un desgaste parejo.
- Menor presión de corte.
- No disponible en todos los tornos.

Roscado

La siguiente tabla suministra recomendaciones para profundidades de corte para las diferentes pasadas. Estas recomendaciones son consideradas como punto de partida para el mecanizado en acero e incluye un sobrematerial de 0.020 – 0.075mm arriba de la cresta. El numero de pases correcto debe ser determinado mediante prueba y error.



I.S.O Métrico(ISO) 60°, Exterior

No. de Pasadas	Paso (mm)															
	0,5	0,75	0,8	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0
	Avance lateral por pasada															
1	0,102	0,178	0,178	0,178	0,178	0,229	0,229	0,254	0,279	0,279	0,330	0,330	0,381	0,406	0,432	0,457
2	0,102	0,152	0,152	0,178	0,178	0,203	0,203	0,229	0,254	0,254	0,305	0,330	0,330	0,381	0,406	0,432
3	0,076	0,102	0,127	0,127	0,152	0,178	0,152	0,178	0,203	0,203	0,254	0,254	0,279	0,330	0,330	0,356
4	0,076	0,076	0,076	0,102	0,127	0,152	0,152	0,152	0,178	0,178	0,203	0,229	0,229	0,279	0,279	0,305
5	**0,356**	**0,508**	**0,533**	0,076	0,102	0,127	0,127	0,152	0,152	0,152	0,178	0,178	0,229	0,229	0,229	0,279
6				**0,660**	0,076	0,076	0,102	0,127	0,127	0,152	0,178	0,178	0,203	0,229	0,229	0,229
7					**0,813**	**0,965**	0,102	0,102	0,127	0,127	0,152	0,152	0,178	0,203	0,203	0,229
8							0,076	0,076	0,102	0,127	0,152	0,152	0,178	0,178	0,178	0,203
9							**1,143**	**1,270**	0,102	0,127	0,152	0,152	0,152	0,178	0,178	0,203
10									0,076	0,102	0,127	0,127	0,152	0,178	0,178	0,178
11									**1,600**	0,102	0,102	0,127	0,152	0,152	0,152	0,178
12										0,076	0,076	0,127	0,127	0,152	0,152	0,152
13										**1,880**	**2,210**	0,102	0,127	0,127	0,127	0,152
14												0,076	0,102	0,102	0,127	0,152
15												**2,515**	**2,819**	**3,124**	0,127	0,127
16															0,102	0,102
															3,429	**3,734**

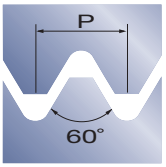
La ultima pasada es igual a la profundidad total de la rosca.

I.S.O Métrico (ISO) 60°, Interior

No. de Pasadas	Paso (mm)														
	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0
	Avance lateral por pasada														
1	0,102	0,178	0,178	0,203	0,254	0,229	0,254	0,279	0,279	0,305	0,330	0,356	0,381	0,381	0,406
2	0,102	0,127	0,152	0,178	0,203	0,203	0,229	0,229	0,229	0,279	0,305	0,330	0,356	0,356	0,406
3	0,076	0,102	0,102	0,127	0,152	0,152	0,178	0,178	0,203	0,229	0,229	0,279	0,305	0,305	0,356
4	0,076	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,152	0,203	0,203	0,229	0,254	0,254	0,279
5	**0,356**	**0,483**	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,178	0,178	0,203	0,229	0,229	0,229
6			**0,610**	0,076	0,076	0,102	0,102	0,127	0,152	0,152	0,152	0,178	0,203	0,203	0,229
7				**0,787**	**0,889**	0,102	0,102	0,102	0,127	0,152	0,152	0,152	0,178	0,178	0,203
8						0,076	0,076	0,102	0,102	0,152	0,152	0,152	0,152	0,178	0,178
9						**1,092**	**1,219**	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,178
10								0,076	0,102	0,102	0,127	0,152	0,152	0,152	0,152
11								**1,499**	0,102	0,102	0,102	0,127	0,152	0,152	0,152
12									0,076	0,076	0,102	0,127	0,152	0,152	0,152
13									**1,778**	**2,057**	0,102	0,102	0,127	0,152	0,152
14											0,076	0,102	0,102	0,127	0,152
15											**2,337**	**2,642**	**2,896**	0,127	0,127
16														0,102	0,102
														3,200	**3,454**

La ultima pasada es igual a la profundidad total de la rosca.

Recomendaciones para Pasadas



UNIFICADA (UN) 60°, Exterior

No. de Pasadas	T.P.I																	
	32	28	24	20	18	16	14	13	12	11	10	9	8	7	6	5	4.5	4
	Avance lateral por pasada																	
1	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,254	0,279	0,279	0,279	0,279	0,305	0,356	0,356	0,432	0,406	0,483
2	0,152	0,152	0,178	0,178	0,203	0,203	0,229	0,229	0,229	0,254	0,229	0,229	0,254	0,330	0,330	0,406	0,381	0,432
3	0,127	0,127	0,152	0,152	0,152	0,152	0,178	0,178	0,203	0,203	0,203	0,203	0,229	0,254	0,254	0,330	0,330	0,356
4	0,076	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,152	0,178	0,178	0,178	0,178	0,229	0,229	0,279	0,279	0,330
5	**0,533**	0,076	0,076	0,102	0,127	0,127	0,127	0,152	0,152	0,152	0,152	0,152	0,178	0,178	0,203	0,229	0,254	0,305
6		**0,635**	**0,711**	0,076	0,076	0,102	0,102	0,127	0,152	0,152	0,152	0,152	0,152	0,178	0,178	0,229	0,229	0,254
7				**0,838**	**0,940**	0,076	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,178	0,203	0,203	0,229
8						**1,041**	0,076	0,076	0,076	0,102	0,127	0,127	0,152	0,152	0,152	0,178	0,203	0,229
9							**1,194**	**1,270**	**1,372**	0,076	0,102	0,127	0,127	0,152	0,152	0,178	0,178	0,229
10										**1,499**	0,076	0,102	0,127	0,127	0,152	0,178	0,178	0,203
11											**1,651**	0,076	0,102	0,102	0,152	0,178	0,152	0,178
12												**1,778**	0,076	0,076	0,127	0,152	0,152	0,178
13													**2,032**	**2,286**	0,102	0,127	0,152	0,152
14															0,102	0,102	0,152	0,152
15															**2,667**	**3,200**	0,152	0,127
16																	0,127	0,102
																	3,531	**3,937**

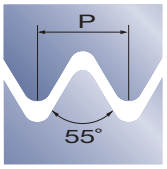
La ultima pasada es igual a la profundidad total de la rosca.

UNIFICADA (UN) 60°, Interior

No. de Pasadas	T.P.I																	
	32	28	24	20	18	16	14	13	12	11	10	9	8	7	6	5	4.5	4
	Avance lateral por pasada																	
1	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,254	0,279	0,279	0,279	0,279	0,305	0,330	0,356	0,406	0,406	0,457
2	0,152	0,152	0,152	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,229	0,229	0,279	0,305	0,330	0,356	0,406	0,432
3	0,102	0,102	0,152	0,127	0,152	0,152	0,152	0,152	0,178	0,178	0,152	0,178	0,203	0,229	0,229	0,305	0,330	0,356
4	0,076	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,152	0,152	0,178	0,203	0,203	0,254	0,254	0,305
5	**0,508**	0,076	0,076	0,102	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,178	0,178	0,229	0,229	0,254
6		**0,610**	**0,660**	0,076	0,076	0,102	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,152	0,203	0,203	0,229
7				**0,787**	**0,864**	0,076	0,102	0,102	0,102	0,102	0,102	0,127	0,127	0,152	0,152	0,178	0,178	0,229
8						**0,940**	0,076	0,076	0,076	0,102	0,102	0,102	0,102	0,152	0,152	0,178	0,178	0,178
9							**1,118**	**1,194**	**1,245**	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,178	0,178
10										**1,397**	0,076	0,102	0,102	0,127	0,127	0,152	0,152	0,178
11											**1,499**	0,076	0,102	0,102	0,127	0,152	0,152	0,178
12												**1,651**	0,076	0,076	0,102	0,152	0,152	0,152
13													**1,880**	**2,134**	0,102	0,127	0,152	0,152
14															0,102	0,102	0,127	0,152
15															**2,464**	**2,946**	0,127	0,127
16																	0,102	0,102
17																	**3,277**	**3,658**

La ultima pasada es igual a la profundidad total de la rosca.

Recomendaciones para Pasadas

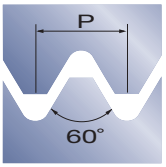


Whitworth

No. de Pasadas	T.P.I																
	28	26	20	19	18	16	14	12	11	10	9	8	7	6	5	4.5	4
	Avance lateral por pasada																
1	0,203	0,203	0,203	0,229	0,229	0,203	0,254	0,279	0,279	0,305	0,279	0,305	0,356	0,356	0,381	0,406	0,457
2	0,178	0,152	0,203	0,203	0,203	0,203	0,229	0,254	0,254	0,254	0,229	0,279	0,305	0,305	0,381	0,406	0,432
3	0,127	0,152	0,152	0,152	0,178	0,152	0,178	0,203	0,203	0,203	0,229	0,229	0,279	0,279	0,356	0,356	0,356
4	0,102	0,102	0,127	0,127	0,152	0,152	0,152	0,178	0,178	0,178	0,203	0,203	0,229	0,254	0,305	0,305	0,330
5	0,076	0,076	0,102	0,127	0,127	0,127	0,127	0,152	0,152	0,152	0,178	0,178	0,203	0,203	0,279	0,279	0,330
6	**0,635**	**0,686**	0,076	0,076	0,102	0,127	0,127	0,152	0,152	0,127	0,152	0,152	0,203	0,203	0,254	0,254	0,279
7			**0,864**	**0,914**	0,076	0,102	0,102	0,127	0,127	0,127	0,152	0,152	0,178	0,203	0,229	0,229	0,279
8					**1,067**	0,076	0,076	0,076	0,127	0,127	0,127	0,152	0,152	0,178	0,203	0,229	0,254
9						**1,143**	**1,245**	**1,422**	0,076	0,127	0,127	0,127	0,152	0,152	0,203	0,203	0,254
10									**1,549**	0,076	0,127	0,127	0,152	0,152	0,203	0,178	0,229
11										**1,676**	0,076	0,127	0,127	0,152	0,178	0,178	0,203
12											**1,880**	0,076	0,076	0,152	0,152	0,152	0,203
13												**2,108**	**2,413**	0,127	0,127	0,152	0,178
14														0,102	0,102	0,152	0,152
15														**2,819**	**3,353**	0,147	0,127
16																0,102	0,102
																3,708	**4,166**

La ultima pasada es igual a la profundidad total de la rosca.

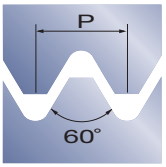
Recomendaciones para Pasadas



UNIFICADA "J" para Aviación (UNJ), Exterior

No. de Pasadas	T.P.I									
	32	28	24	20	18	16	14	12	10	8
	Avance lateral por pasada									
1	0,178	0,178	0,178	0,203	0,229	0,229	0,229	0,279	0,279	0,305
2	0,152	0,152	0,152	0,178	0,203	0,203	0,203	0,229	0,229	0,279
3	0,127	0,102	0,152	0,152	0,152	0,152	0,152	0,203	0,203	0,203
4	0,076	0,102	0,102	0,102	0,127	0,127	0,127	0,152	0,152	0,178
5	**0,533**	0,076	0,076	0,102	0,102	0,102	0,127	0,152	0,152	0,152
6		**0,610**	**0,660**	0,076	0,076	0,102	0,102	0,102	0,127	0,152
7				**0,813**	**0,889**	0,076	0,102	0,102	0,127	0,127
8						**0,991**	0,076	0,076	0,102	0,127
9							**1,118**	**1,295**	0,102	0,127
10									0,076	0,102
11									**1,549**	0,102
12										0,076
										1,930

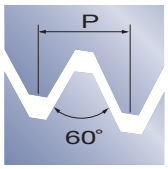
La ultima pasada es igual a la profundidad total de la rosca.



Métrica "J" para Aviación (MJ), Exterior

No. de Pasadas	Paso (mm)				
	1,0	1,5	1,75	2,0	2,5
	Radial infeed per pass, (mm)				
1	-	-	0,2286	0,254	-
2	-	-	0,2032	0,2286	-
3	-	-	0,1524	0,1778	-
4	-	-	0,1524	0,1524	-
5	-	-	0,127	0,127	-
6	-	-	0,0762	0,127	-
7	-	-	**0,9398**	0,1016	-
8	-	-	-	0,0762	-
	-	-	-	**1,2446**	-

La ultima pasada es igual a la profundidad total de la rosca.

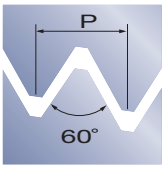


Nacional Cónica de Tubería Sello seco (NPTF) Exterior e Interior

No. de Pasadas	T.P.I				
	27	18	14	11.5	8
	Avance lateral por pasada				
1	0,178	0,229	0,254	0,254	0,254
2	0,152	0,203	0,229	0,254	0,229
3	0,127	0,152	0,152	0,203	0,229
4	0,102	0,127	0,152	0,152	0,203
5	0,102	0,102	0,127	0,152	0,178
6	0,076	0,102	0,127	0,127	0,152
7	**0,737**	0,102	0,102	0,102	0,152
8		0,076	0,102	0,102	0,152
9		**1,092**	0,102	0,102	0,127
10			0,076	0,102	0,127
11			**1,422**	0,102	0,127
12				0,076	0,127
13				**1,727**	0,102
14					0,102
15					0,102
16					0,102
					2,464

La ultima pasada es igual a la profundidad total de la rosca.

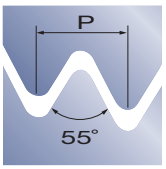
Recomendaciones para Pasadas



Nacional Cónica de Tubería (NPT) Exterior e Interior

No. de Pasadas	T.P.I				
	27	18	14	11.5	8
	Avance lateral por pasada				
1	0,203	0,229	0,229	0,229	0,254
2	0,152	0,178	0,203	0,203	0,229
3	0,127	0,152	0,178	0,178	0,203
4	0,102	0,152	0,152	0,152	0,203
5	0,102	0,127	0,152	0,152	0,178
6	0,076	0,127	0,127	0,152	0,178
7	**0,762**	0,102	0,127	0,152	0,178
8		0,076	0,102	0,127	0,178
9		**1,143**	0,102	0,127	0,152
10			0,076	0,102	0,152
11			**1,448**	0,102	0,152
12				0,076	0,127
13				**1,753**	0,127
14					0,102
15					0,076
					2,489

La ultima pasada es igual a la profundidad total de la rosca.

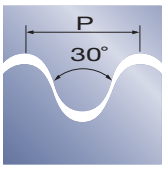


Cónica de Tubería Británica (BSPT) Exterior e Interior

No of Pasadas	T.P.I				
	28	19	14	11	8
	Avance lateral por pasada				
1	0,178	0,229	0,254	0,254	0,279
2	0,152	0,203	0,203	0,229	0,279
3	0,127	0,152	0,178	0,203	0,229
4	0,102	0,127	0,152	0,178	0,203
5	0,076	0,127	0,127	0,152	0,178
6	**0,660**	0,076	0,127	0,152	0,152
7		**0,914**	0,102	0,127	0,152
8			0,076	0,127	0,152
9			**1,219**	0,076	0,127
10				**1,499**	0,127
11					0,127
12					0,076
					2,083

La ultima pasada es igual a la profundidad total de la rosca.

Recomendaciones para Pasadas

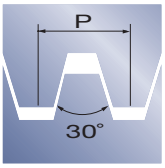


Redonda DIN 405, Exterior e Interior

No of Pasadas	T.P.I			
	10	8	6	4
	Avance lateral por pasada			
1	0,229	0,229	0,279	0,356
2	0,229	0,229	0,254	0,330
3	0,203	0,203	0,229	0,305
4	0,203	0,203	0,229	0,279
5	0,152	0,178	0,203	0,279
6	0,127	0,152	0,203	0,254
7	0,102	0,152	0,178	0,254
8	0,076	0,127	0,152	0,229
9	**1,321**	0,102	0,152	0,203
10		0,076	0,127	0,178
11		**1,651**	0,102	0,152
12			0,076	0,127
13			**2,184**	0,127
14				0,102
				3,200

La ultima pasada es igual a la profundidad total de la rosca.

Recomendaciones para Pasadas

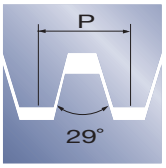


Trapezoidal DIN 103

No. de passes	Paso (mm)							
	1,5	2	3	4	5	6	7	8
	Avance lateral por pasada							
1	0,229	0,254	0,279	0,279	0,305	0,356	0,356	0,381
2	0,203	0,229	0,229	0,229	0,305	0,330	0,330	0,330
3	0,152	0,178	0,203	0,229	0,254	0,305	0,305	0,330
4	0,127	0,152	0,152	0,203	0,229	0,279	0,279	0,330
5	0,102	0,127	0,152	0,178	0,203	0,254	0,254	0,279
6	0,076	0,127	0,127	0,178	0,203	0,254	0,254	0,279
7	**0,889**	0,102	0,127	0,152	0,203	0,203	0,254	0,254
8		0,076	0,102	0,152	0,203	0,203	0,229	0,254
9		**1,245**	0,102	0,152	0,178	0,203	0,203	0,229
10			0,102	0,152	0,152	0,203	0,203	0,229
11			0,102	0,127	0,152	0,178	0,203	0,229
12			0,076	0,127	0,127	0,152	0,203	0,203
13			**1,753**	0,102	0,127	0,152	0,178	0,203
14				**2,261**	0,102	0,152	0,178	0,178
15					**2,743**	0,152	0,178	0,178
16						0,127	0,127	0,178
17						**3,505**	**3,734**	0,152
18								0,152
19								0,127
								4,496

La ultima pasada es igual a la profundidad total de la rosca.

Recomendaciones para Pasadas

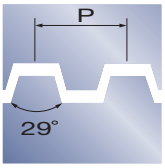


ACME

No. de Pasadas	Paso (H.P.P.)								
	16	14	12	10	8	6	5	4	3
	Avance lateral por pasada								
1	0,229	0,229	0,254	0,254	0,279	0,330	0,356	0,356	0,381
2	0,203	0,203	0,203	0,229	0,254	0,279	0,330	0,330	0,356
3	0,178	0,178	0,178	0,203	0,203	0,229	0,254	0,305	0,330
4	0,152	0,152	0,152	0,178	0,178	0,203	0,229	0,279	0,279
5	0,127	0,127	0,127	0,152	0,152	0,178	0,229	0,254	0,279
6	0,076	0,102	0,127	0,127	0,127	0,178	0,203	0,254	0,279
7	**0,965**	0,076	0,102	0,127	0,127	0,152	0,203	0,203	0,279
8		**1,067**	0,102	0,102	0,127	0,152	0,203	0,203	0,254
9			**1,245**	0,102	0,127	0,152	0,178	0,203	0,229
10				0,102	0,102	0,152	0,152	0,178	0,229
11				**1,575**	0,102	0,152	0,152	0,178	0,229
12					0,102	0,127	0,152	0,152	0,203
13					**1,880**	0,102	0,127	0,152	0,203
14						**2,515**	0,102	0,152	0,178
15							**2,845**	0,152	0,178
16								0,127	0,178
17								**3,480**	0,178
18									0,152
19									0,127
									4,521

La ultima pasada es igual a la profundidad total de la rosca.

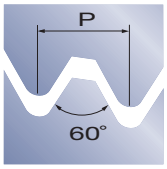
Recomendaciones para Pasadas



STUB-ACME

No. de passes	T.P.I								
	16	14	12	10	8	6	5	4	3
	Avance lateral por pasada								
1	0,203	0,229	0,229	0,229	0,254	0,279	0,279	0,305	0,356
2	0,152	0,178	0,178	0,203	0,203	0,203	0,254	0,279	0,279
3	0,127	0,152	0,152	0,178	0,203	0,203	0,203	0,254	0,279
4	0,102	0,127	0,127	0,152	0,178	0,178	0,203	0,203	0,229
5	0,102	0,102	0,102	0,152	0,152	0,152	0,178	0,203	0,203
6	**0,686**	**0,787**	0,102	0,127	0,152	0,152	0,152	0,178	0,203
7			**0,889**	0,102	0,127	0,152	0,152	0,152	0,203
8				**1,143**	0,102	0,127	0,152	0,152	0,203
9					**1,372**	0,102	0,127	0,127	0,178
10						**1,549**	0,102	0,127	0,152
11							**1,803**	0,102	0,127
12								0,102	0,127
13								**2,184**	0,127
14									0,102
15									0,102
									3,099

La ultima pasada es igual a la profundidad total de la rosca.



Roscas API

Roscas API	Avance Total	No. de pasadas/Avance lateral por pasada — Pasadas 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
API-Buttress 22ER5BUTT0.75 22IR5BUTT0.75	**1,651**	0,279	0,229	0,178	0,152	0,127	0,127	0,127	0,127	0,127	0,102	0,076	-	-	-	-
22ER5BUTT1.0 22IR5BUTT1.0	**1,651**	0,279	0,229	0,178	0,152	0,127	0,127	0,127	0,127	0,127	0,102	0,076	-	-	-	-
API Rd 16ER10APIRD 16IR10APIRD	**1,448**	0,279	0,203	0,152	0,152	0,127	0,127	0,127	0,102	0,102	0,076	-	-	-	-	-
16ER8APIRD 16IR8APIRD	**1,854**	0,279	0,229	0,203	0,152	0,152	0,152	0,127	0,127	0,127	0,127	0,102	0,076	-	-	-
API-V-0.038R 22ER4API382 22IR4API382	**3,175**	0,457	0,381	0,381	0,330	0,305	0,305	0,254	0,254	0,203	0,127	0,102	0,076	-	-	-
22ER4API383 22IR4API383	**3,175**	0,457	0,381	0,381	0,330	0,305	0,305	0,254	0,254	0,203	0,127	0,102	0,076	-	-	-
API-V-0.050 27ER4API502 27IR4API502	**3,861**	0,457	0,381	0,356	0,330	0,305	0,305	0,279	0,254	0,254	0,229	0,203	0,203	0,127	0,102	0,076
27ER4API503 27IR4API503	**3,835**	0,457	0,381	0,356	0,330	0,305	0,279	0,279	0,254	0,254	0,229	0,203	0,203	0,127	0,102	0,076
API-V-0.040 22ER5API403 22IR5API403	**3,073**	0,432	0,381	0,381	0,330	0,279	0,279	0,254	0,254	0,178	0,127	0,102	0,076	-	-	-

Recomendaciones para Pasadas

Plaquitas Multipunto

Exterior	Métrico 60° (I.S.O) Paso (mm)					Unificada 60° (UN) H.P.P.					Whitworth (W) T.P.I			NPT T.P.I
	1,0	1,5	2,0	2,5	3,0	20	18	16	14	12	19	14	11	11.5
No. de Pasadas	Avance lateral por pasada					Avance lateral por pasada					Avance lateral por pasada			
1	0,356	0,356	0,483	0,457	0,559	0,432	0,483	0,381	0,432	0,533	0,483	0,483	0,457	0,508
2	0,330	0,330	0,483	0,432	0,533	0,381	0,432	0,356	0,406	0,483	0,432	0,432	0,432	0,019
3	**0,686**	0,279	0,330	0,406	0,483	**0,813**	**0,914**	0,279	0,330	0,356	**0,914**	0,330	0,381	0,432
4		**0,965**	**1,295**	0,279	0,330			**1,016**	**1,168**	**1,372**		**1,245**	0,279	0,254
				1,575	**1,905**								**1,549**	**1,676**

Interior	Paso (mm)					T.P.I					T.P.I			T.P.I
	1,0	1,5	2,0	2,5	3,0	20	18	16	14	12	19	14	11	11,5
No. de Pasadas	Avance lateral por pasada					Avance lateral por pasada					Avance lateral por pasada			
1	0,330	0,330	0,457			0,356	0,483				0,356	0,483	0,457	0,508
2	0,305	0,305	0,432			0,330	0,432				0,305	0,432	0,432	0,483
3	**0,635**	0,254	0,330			0,254	0,330				0,254	0,330	0,381	0,432
4		**0,889**	**1,219**			**0,940**	**1,245**				**0,914**	**1,245**	0,279	0,254
													1,549	**1,676**

Numero de Pasadas Recomendado

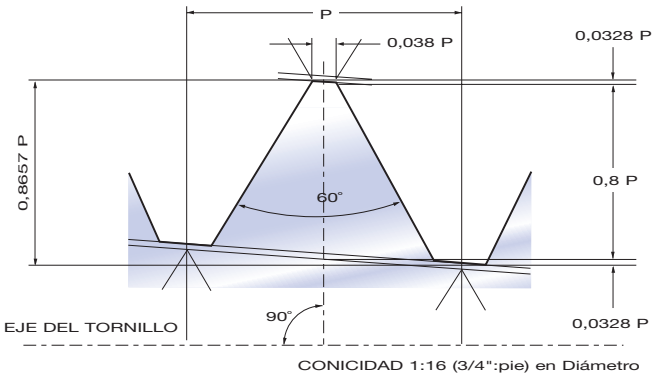
Grupo Específico de Materiales

Hilos Por Pulgada (H.P.P.)			24	20	16	14	12	10	8
Paso (mm)			1,0	1,25	1,5	1,75	2,0	2,5	3,0
ISO	Material	Resistencia a la Tracción y Dureza	Numero de Pasadas Recomendado						
P	Aceros no Aleados	<600 N/mm² <180HBN	4 - 5	5 - 6	6 - 7	7 - 8	7 - 8	8 - 9	10 - 11
		<950 N/mm² <280HBN	4 - 6	5 - 7	7 - 8	7 - 9	7 - 9	9 - 10	11 - 12
	Aceros Aleados	700 - 950 N/mm² 200 - 280 HBN	4 - 6	5 - 7	7 - 8	7 - 9	7 - 9	9 - 10	11 - 12
		950 - 1200 N/mm² 280 - 355 HBN	5 - 6	6 - 9	7 - 10	8 - 10	8 - 10	10 - 12	112 - 14
		1200 - 1400 N/mm² 355 - 415 HBN	5 - 6	6 - 9	7 - 10	8 - 12	8 - 12	12 - 14	13 - 16
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	4 - 6	5 - 7	7 - 8	8 - 9	8 - 9	10 - 13	12 - 15
		Martensítico Series 400	5 - 6	6 - 9	7 - 10	8 - 10	8 - 10	9 - 11	9 - 12
		Refractario P.H.	5 - 8	6 - 10	7 - 12	8 - 11	8 - 11	9 - 12	10 - 14
K	Fundiciones	Gris GG-Ft	4 - 6	5 - 7	7 - 8	8 - 11	8 - 11	10 - 14	12 - 16
		Esferoidal-Dúctil GGG-FGS	4 - 8	5 - 9	7 - 10	8 - 11	8 - 11	8 - 14	10 - 16
		Maleable GTS - MN/MP							
N	Aluminio y Aleaciones	< 16% Si 116HBN	4 - 6	5 - 7	7 - 10	8 - 11	8 - 11	8 - 14	10 - 16
	Aluminio con Silicio	> 16% Si 92HBN							
S	Aleaciones Refractarias	Base Hierro Base Cobalto	4 - 6	5 - 7	7 - 8	8 - 10	8 - 10	9 - 11	9 - 12
		Base Níquel Base Titanio	5 - 6	6 - 9	7 - 10	8 - 11	8 - 11	9 - 12	10 - 14
H	Aceros endurecidos	>1400 N/mm² >415 HBN	6 - 8	6 - 10	7 - 12	9 - 12	9 - 12	13 - 14	14 - 16
	Fundiciones Dúctil Bainítica	1400 N/mm² 400 HBN	6 - 8	6 - 10	7 - 12	9 - 12	9 - 12	13 - 14	14 - 16

Numero de Pasadas Recomendado

Rosca Paso (mm)	Rosca H.P.P.	Numero de Pasadas Recomendado
0,5	48	4 - 6
1,0	24	4 - 8
1,25	20	5 - 10
1,5	16	6 - 12
2	12	7 - 12
3	8	9 - 16
4	6	11 - 18
5	5	12 - 20
6	4	12 - 22
8	3	15 - 24

Roscas Americanas Cónicas de Tubería



Roscas Americanas Cónicas de Tubería

NPT- Rosca Nacional Cónica de Tubería

NPTF – Rosca Nacional Cónica de Tubería Sello Seco.

API – (Instituto Americano del Petróleo) Rosca de Tubería.

Muchas de las dimensiones básicas son comunes en estas roscas.

La Diferencia crítica es la tolerancia en el límite de Truncado en la raíz y cresta de la rosca que altera las características de sellado en el momento del ensamblado.

Límites de Truncado

NPT- Rosca Nacional Cónica de Tubería

	Truncado en la Cresta		Truncado en la raíz	
T.P.I	Mínimo (pul)	Máximo (pul)	Mínimo (pul)	Máximo (pul)
27	0.0012	0.0036	0.0012	0.0036
18	0.0018	0.0049	0.0018	0.0049
14	0.0024	0.0056	0.0024	0.0056
11.5	0.0029	0.0063	0.0029	0.0063
8	0.0041	0.0078	0.0041	0.0078

NPTF – Rosca Nacional Cónica de Tubería Sello Seco

	Truncado en la Cresta		Truncado en la raíz	
T.P.I	Mínimo (pul)	Máximo (pul)	Mínimo (pul)	Máximo (pul)
27	0.0017	0.0035	0.0035	0.0052
18	0.0026	0.0043	0.0043	0.0061
14	0.0026	0.0043	0.0043	0.0061
11.5	0.0035	0.0052	0.0052	0.0078
8	0.0052	0.0069	0.0069	0.0095

API – (Instituto Americano del Petróleo) Rosca de Tubería

	Truncado en la Cresta	Truncado en la raíz
T.P.I	pul	pul
27	0.0027	0.0012
18	0.0041	0.0018
14	0.0052	0.0024
11.5	0.0063	0.0029
8	0.0091	0.0041

Tamaño

Rosca para tubería Nacional Cónica, Rosca cónica de sellado en seco y Rosca API para tubería.

Roscas básicas NPT, NPTF y API

Diámetro Nominal	Hilos Por Pulgada
Pulgada	H.P.P.
1/8 y menor	27
1/4	18
3/8	18
1/2	14
3/4	14
1	11 1/2
1 1/4	11 1/2
1 1/2	11 1/2
2	11 1/2
2 1/2 y Mayor	8

Estándar Británica Series Whitworth

Tamaños Básicos BSW	
Diámetro Nominal	Hilos Por Pulgada
Pulgada	H.P.P.
1/8	40
3/16	24
1/4	20
5/16	18
3/8	16
7/16	14
1/2	12
9/16	12
5/8	11
11/16	11
3/4	10
7/8	9
1	9
1 1/8	7
1 1/4	7
1 1/2	6
1 3/4	5
2	4.5
2 1/4	4
2 1/2	4
2 3/4	3.5
3	3.5

Estándar Británica Serie Fina

Tamaños Básicos BSW	
Diámetro Nominal	Hilos Por Pulgada
Pulgada	H.P.P.
3/16	32
7/32	28
1/4	26
9/32	26
5/16	22
3/8	20
7/16	18
1/2	16
9/16	16
5/8	14
11/16	14
3/4	12
13/16	12
7/8	11
1	10
1 1/8	9
1 1/4	9
1 1/2	8
1 3/4	8

Estándar Británica Series para Tubería

Tamaños Básicos BSP y BSPT	
Diámetro Nominal	Hilos Por Pulgada
Pulgada	H.P.P.
1/8	28
1/4	19
3/8	19
1/2	14
3/4	14
1	11
1 1/4	11
1 1/2	11
2	11
2 1/2	11
3	11
3 1/2	11
4	11
5	11
6	11

Otras roscas con forma Whitworth

BS Con/	
BS Conduit	Estándar Británico Rosca Conduit
BSP.F	Estándar Británico de Tubería de Seguridad
BSP.L	Estándar Británico de Tubería de Tornillo Largo
Cycle	Estándar Británico Roscas de Ciclo
Gas/G series	Estándar Británico Roscas de Gas

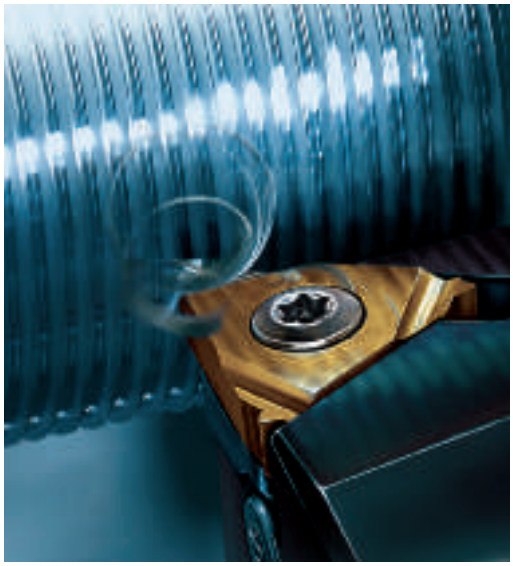
Roscas Americanas Unificadas Series Anchas

Tamaños Básicos UNC	
Diámetro Nominal	Hilos Por Pulgada
Pulgada	H.P.P.
No. 5	40
No. 6	32
No. 8	32
No. 10	24
No. 12	24
1/4	20
5/16	18
3/8	16
7/16	14
1/2	13
9/16	12
5/8	11
3/4	10
7/8	9
1	8
1 1/8	7
1 1/4	7
1 3/8	6
1 1/2	6
1 3/4	5
2	4.5
2 1/4	4.5

Roscas Americanas Unificadas Series Finas

Tamaños Básicos UNF	
Diámetro Nominal	Hilos Por Pulgada
Pulgada	H.P.P.
No. 5	44
No. 6	40
No. 8	36
No. 10	32
No. 12	28
1/4	28
5/16	24
3/8	24
7/16	20
1/2	20
9/16	18
5/8	18
3/4	16
7/8	14
1	14
1 1/8	12
1 1/4	12
1 3/8	12
1 1/2	12

Nomenclatura



Diámetro Mayor
Es el Diámetro mayor de la rosca del tornillo.

Paso o Diámetro efectivo
En roscas rectas, es donde el perfil de la cresta y de la raíz tienen el mismo espesor

Diámetro Menor o de raíz
Es el diámetro mas pequeño de la rosca del tornillo.

Rosca Exterior
Es la rosca producida en la superficie exterior de un cilindro o cono.

Profundidad de Rosca
Es la distancia medida entre la cresta y la raíz de la rosca.

Paso
Es la distancia medida entre dos puntos correspondientes en dos hilos adyacentes paralelos a la línea de centros. Puede ser especificada en milímetros o H.P.P.

Raíz
Es la superficie menor que conecta los flancos de una rosca.

Cresta
Es la superficie mayor que conecta los flancos de una rosca.

Diámetro Nominal
Es la dimensión nominal desde la cual todas las tolerancias y límites son calculadas.

Rosca Interior
Es una rosca producida en la superficie interior de un cilindro o cono.

Ángulo de la Rosca
Es el ángulo incluido entre dos flancos individuales.

Hélice
Es el ángulo de inclinación de la rotación en un avance de un hilo. Este es el ángulo opuesto en el triangulo rectángulo creado por el paso de la rosca y diámetro de paso.

Rosca Paralela
Es la rosca producida alrededor de un cilindro.

Rosca Cónica
Es la rosca producida alrededor de un cono de determinado ángulo.

Descripciones de Calidades para Roscado

- SFZ – Calidad recubierta PVD con TIN con substrato de micrograno para mecanizado a velocidades bajas. Ideal para aceros inoxidables y materiales dúctiles.

- SP4036 – Calidad recubierta PVD con TIAIN con substrato de micrograno que ofrece una gran estabilidad a altas temperaturas y un bajo coeficiente de fricción. Ideal para mecanizado de la mayoría de los materiales a mas altas velocidades.

Velocidad de Corte (Vc) m/min			Recubrimiento PVD			
ISO	Material	Rm y Dureza	SFZ Max - Min HC Max - Min		SP4036 Max - Min HC Max - Min	
P	Aceros no Aleados	600 N/mm² 180HBN	270	135	450	200
		950 N/mm² 280HBN	-	-	290	130
	Aceros Aleados	700 - 950 N/mm² 200 - 280 HBN	-	-	260	120
M	Aceros Inoxidables	Austenítico + Ferrítico Series 300	-	-	300	140
		Martensítico Series 400	-	-	310	150
		Refractario P.H.	100	50	160	75
K	Fundiciones	Gris GG-Ft	270	135	440	200
		Esferoidal-Dúctil GGG-FGS	230	115	380	180
		Maleable GTS - MN/MP	155	80	260	120
N	Aluminio y Aleaciones	< 16% Si 116HBN	915	365	-	-
	Aluminio con Silicio	> 16% Si 92HBN	610	245	-	-
S	Aleaciones Refractarias	Base Hierro	40	20	65	30
		Base Cobalto	30	15	50	25
		Base Níquel	35	20	55	25
		Base Titanio	55	25	90	40

Rendimiento optimo de la calidad

Materiales	Recubrimiento PVD			
	Código		CALIDAD	
	C	ISO	HC SFZ	HC SP4036
P Aceros Aleados y no Aleados	C8	P01		
		P05		
		P10		
	C7	P15		
		P20		
		P25		
	C6	P30		
		P35		
	C5	P40		
		P45		
		P50		
M Aceros Inoxidables		M05		
		M10		
		M15		
		M20		
		M25		
		M30		
		M35		
		M40		
K Fundiciones	C4	K01		
		K05		
	C3	K10		
		K15		
	C2	K20		
		K25		
	C1	K30		
		K35		
		K40		
N Aluminio y Aleaciones		N01		
		N05		
		N10		
		N15		
		N20		
		N25		
		N30		
S Aleaciones Refractarias		S01		
		S05		
		S10		
		S15		
		S20		
		S25		
		S30		

Mayor resistencia al desgaste – Mayor velocidad de corte

Mayor resistencia al choque – Mayor avance

Gráfico de Materiales

Grupo de Material	País/Estándar							
	Rm (N/mm²)	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN	BS	AFNOR	AIS/SAE
Acero de Mecanizado libre	390-710			1.0722	10SPb20		10PbF2	
Acero de Mecanizado libre	410-710			1.0715	9SMn28	230M07	S250	1213
Acero de Mecanizado libre	410-710			1.0718	9SMnPb28		S250Pb	12L13
Acero de Mecanizado libre	430-740			1.0736	9SMn36	240M07	S300	1215
Acero de Mecanizado libre	430-740			1.0737	9SMnPb36		S300Pb	12L14
Acero para tratamientos térmicos	500-650			1.0402	C22	050A20	CC20	1020
Acero para tratamientos térmicos	500-650			1.1158	Ck25			1025
Acero de Mecanizado libre	510-740			1.0726	35S20	212M36	35MF4	1140
Acero endurecido superficialmente	540-730			1.1183	Cf35	060A35	XC38TS	1035
Acero para tratamientos térmicos	550-750			1.0501	C35	060A35	CC35	1035
Acero forjado	590-780			1.0401	C15	080M15	CC12	1015
Acero forjado	590-780			1.1141	Ck15	080M15	XC12	1015
Acero para tratamientos térmicos	630-800			1.0503	C45	080M46	CC45	1045
Acero para tratamientos térmicos	630-800			1.1191	Ck45	080M46	XC42	1045
Acero endurecido superficialmente	640-830			1.1213	Cf53	060A52	XC48TS	1050
Acero al carbono	640-830			1.1545	C105W1		Y1105	W.110
Acero para tratamientos térmicos	640-840			1.1170	28Mn6	160M28	20M5	1330
Acero para tratamientos térmicos	640-880			1.1167	36Mn5		40M5	1335
Acero para tratamientos térmicos	690-930			1.1157	40Mn4	150M36	35M5	1039
Acero al carbono	650-750			1.1663	C125W		Y2120	W.112
Acero para tratamientos térmicos	700-900			1.0535	C55	070M55	1055	
Acero para tratamientos térmicos	700-900			1.1203	Ck55	070M55	XC55	1055
Acero para tratamientos térmicos	750-900			1.0601	C60	080A62	CC55	1060
Acero para tratamientos térmicos	750-950			1.1221	Ck60	080A62	XC60	1060
Acero para resortes	1000-1100			1.1274	Ck101	060A96		1095
Acero de construcción alta temp.	440-570			1.5415	15Mo3	1501-240	15D3	ASTM A20Gr.A
Acero de construcción alta temp.	440-590			1.7335	13CrMo4 4	1501-620Gr.27	15CD3.5	ASTM A182
Acero de construcción alta temp.	440-590			1.7380	10CrMo9 10	1501-622	12CD9;10	ASTM A182
Acero de construcción alta temp.	450-590			1.5423	16Mo5	1503-245-420		4520
Endurecido bajo cero	490-640			1.5622	14Ni6		16N6	ASTM A350LF5
Acero de construcción alta temp.	490-640			1.7715	14MoV6 3	1503-660-440		
Endurecido bajo cero	510-710			1.5680	12Ni19		Z18N5	2515
Acero forjado	640-1080			1.7131	16MnCr5	(527M20)	16MC5	5115
Acero forjado	640-1080			1.7262	15CrMo5		12CD4	
Acero trabajado en frío	640-670		O1					O1
Acero de herramientas en Caliente/Frío	640-720		S7					S7
Endurecido bajo cero	640-840			1.5662	X8Ni9	1501-509;510		ASTM A353
Acero para rodamientos	650-750			1.3505	100Cr6	534A99	100C6	52100
Acero para tratamientos térmicos	650-950			1.7218	25CrMo4	1717CDS 110	25CD4	4130
Acero forjado	690-1080			1.6523	21NiCrMo2	805M20	20NCD2	8620
Acero forjado	690-880			1.7015	15Cr3	523M15	12C3	5015
Acero para tratamientos térmicos	690-930			1.5710	36NiCr6	640A35	35NC6	3135
Acero endurecido superficialmente	700-750			1.7045	42Cr4			5140

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Grupo de Material	País/Estándar							
	Rm (N/mm²)	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN	BS	AFNOR	AIS/SAE
Acero para tratamientos térmicos	700-950			1.7033	34Cr4	530A32	32C4	5132
Acero trabajado en frío	720-775		A6					A6
Acero endurecido superficialmente	740-1080			1.7223	41CrMo4	708M40	42CD4TS	4140;4142
Acero para tratamientos térmicos	750-1100			1.7220	34CrMo4	708A37	35CD4	4137;4135
Acero trabajado en frío	750-775		O7					O7
Acero trabajado en frío	750-800			1.2542	45WSCrV7	BS1		S1
Acero trabajado en frío	750-850			1.2067	100Cr6	BL3	Y100C6	L3
Acero trabajado en frío	750-850		A2	1.2363	X100CrMoV51	BA2	Z100CDV5	A2
Acero trabajado en frío	750-850			1.2419	105WCr6		105WC13	
Acero trabajado en frío	750-850			1.2833	100V1	BW2	Y1105V	W210
Acero alta velocidad	775-990		M2	1.3343	S 6-5-2	BM2	Z85WDCV 06-05-04-02	M2
Acero alta velocidad	775-990			1.3348	S 2-9-2		Z100WCWV 09-04-02-02	M7
Acero para tratamientos térmicos	780-1080			1.3401	X120Mn12	Z120M12	Z120M12	
Acero endurecido superficialmente	780-1180			1.8159	50CrV4	735A50	50CV4	6150
Acero alta velocidad	795-870		M3					M3
Acero trabajado en frío	795-910		A7					A7
Acero alta velocidad	800-1050			1.3355	S 18-0-1	BT1	Z80WCV 18-04-01	T1
Acero para tratamientos térmicos	800-1100			1.6511	36CrNiMo4	816M40	40NCD3	9840
Acero para tratamientos térmicos	800-1100			1.7035	41Cr4	530M40	42C4	5140
Acero para tratamientos térmicos	800-1200			1.7225	42CrMo4	708M40	42CD4	4140
Acero trabajado en frío	800-850			1.2713	55NiCrMoV6		55NCDV7	L6
Acero alta velocidad	820-1050			1.3243	S 6-5-2-5		Z85WDKCV 06-05-05-04-02	
Acero alta velocidad	820-1050			1.3255	S 18-1-2-5	BT4	Z80WKCV 18-05-04-01	T4
Acero forjado	830-1180			1.5732	14NiCr10		14NC11	3415
Acero trabajado en frío	850-900		D2	1.2379	X155CrVMo12-1	BD2	Z160CDV12	D2
Acero trabajado en frío	850-900			1.2080	X210Cr12	BD3	Z200Cr12	D3
Acero trabajado en frío	850-900			1.2436	X210CrW12			
Acero trabajado en frío	850-900			1.2601	X165CrMoV12			
Acero forjado	880-1230			1.5752	14NiCr14	655M13	12NC15	3415
Acero para tratamientos térmicos	900-1200	Nickelvac 4340		1.6582	34CrNiMo6	817M40	35NCD6	4340
Acero nitrurado	950-1000			1.8509	41CrAlMo7	905M39	40CAD6, 12	
Acero para resortes	950-1050			1.0904	55Si7	250A53	55S7	9255
Acero forjado	980-1320			1.6587	17CrNiMo6	820A16	18NCD6	
Acero para tratamientos térmicos	980-1420			1.7361	32CrMo12	722M24	30CD12	
Acero para resortes	1050-1100			1.7176	55Cr3	527A60	55C3	5155
Acero para resortes	1050-1100			1.0961	60SiCr7		60SC7	9262
Acero nitrurado	1080-1270			1.2606	39CrMoV13 9	BH12		H12
Acero trabajado en caliente	1180-1570			1.2343		BH11		H11
Acero trabajado en caliente	1180-1670			1.2365		BH10		H10
Acero trabajado en caliente	1180-1770		H13	1.2344	X40CrMoV51	BH13	Z40CDV5	H13
Acero trabajado en caliente	1180-1770			1.2581	X30WCrV9 3	BH21	Z30WCV9	H21
Acero trabajado en caliente	1270-1670			1.2678		BH19		H19

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Gráfico de Materiales

Grupo de Material	País/Estándar							
	Rm (N/mm²)	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Acero Inoxidable	400-600	Nickelvac 410 / 403	AL 403	1.4000	X6Cr13	403S17	Z6C13	403
Acero moldeado de alta resistencia	400-600			1.4865	G-X40NiCrSi38 18	330C11		
Forja de acero inoxidable	440-640			1.4308	G-X6CrNi18 9	304C15	Z6CN18.10M	
Forja de acero inoxidable	440-640			1.4408	G-X6CrNiMo18 10	316C16		
Forja de acero inoxidable	440-640			1.4581	G-X7CrNiMoNb18 10	318C17	Z4CNNDNb18 12M	
Acero resistente al calor	450-650		AL 405	1.4724	X10CrAl13	403S17	Z10C13	405
Acero Inoxidable	450-650	Nickelvac 410 / 403	AL 410	1.4006	X10Cr13	410S21	Z10C14	410
Acero Inoxidable	450-650		AL 430	1.4016	X6Cr17	430S15	Z8C17	430
Acero Inoxidable	450-650		AL 434	1.4113	X6CrMo17	434S17	Z8CD17.01	434
Acero Inoxidable	460-680		AL 304L	1.4306	X2CrNi19 11	304S12	Z3CN18.10	304L
Acero Inoxidable	490-690		AL 305	1.4303	X5CrNi18 12			305
Acero Inoxidable	490-690	Allvac 316 L	AL 316L	1.4435	X2CrNiMo18 12	316S12	Z2CND17.13	316L
Acero Inoxidable	490-690		AL 317L	1.4438	X2CrNiMo18 16	317S12	Z2CND19.15	317L
Acero Inoxidable	490-740			1.4583	X10CrNiMoNb18 12		Z6CNDNb17 13B	318
Acero Inoxidable	500-550		E-Brite Alloy					ASTM A240
Acero Inoxidable	500-700		AL 303	1.4305	X10CrNiS18 9	303S21	Z10CNF 18.09	303
Acero Inoxidable	500-700		AL 304	1.4301	X5CrNi18 10	304S15	Z6CN18.09	304
Acero Inoxidable	500-730		AL 321	1.4541	X6CrNiTi18 10	2337	Z6CNT18.10	321
Acero Inoxidable	500-730			1.4571	X6CrNiMoTi17 12 2	320S17	Z6NDT17.12	316Ti
Acero resistente al calor	500-750		AL 309	1.4828	X15CrNiSi20 12	309S24	Z15CNS20.12	309
Acero resistente al calor	500-750		AL 310S	1.4845	X12CrNi25 21	310S24	Z12CN25 20	310S
Acero Inoxidable	500-750		AL 904L	1.4539				ASTM B625
Acero resistente al calor	500-750			1.4878	X12CrNiTi18 9	321S320	Z6CNT18.12B	
Acero Inoxidable	510-710		AL 316	1.4401	X5CrNiMo18 10	316S16	Z6CND17.11	316
Acero Inoxidable	510-740		AL 347	1.4550	X6CrNiNb18 10	347S17	Z6CNNb18.10	347
Acero resistente al calor	520-720			1.4762	X10CrAl 24		Z10CAS24	446
Acero Inoxidable	550-760			1.4311	X2CrNiN18 10	304S62	Z2CN18.10	304LN
Acero resistente al calor	550-800			1.4841	X15CrNiSi25 20			310
Acero resistente al calor	550-800			1.4864	X12NiCrSi36 16		Z12NCS35.16	330
Acero Inoxidable	580-800		AL 316LXN	1.4429	X2CrNiMoN17 13 3		Z2CND17.13	316LN
Acero Inoxidable	590-780		AL 416	1.4005	X12CrS13			416
Acero Inoxidable	640-840			1.4104	X12CrMoS17		Z10CF17	430F
Acero Inoxidable	640-900			1.4460	X8CrNiMo27 5			329
Acero Inoxidable	700-800			1.4034	X45Cr13	420S45	Z40CM Z38C13M	
Acero Inoxidable	700-950		AL 301	1.4310	X12CrNi17 7		Z12CN17.07	301
Acero Inoxidable	750-800			1.4027	G-X20Cr14	420C29	Z20C13M	
Acero Inoxidable	750-950		AL 420	1.4021	X20Cr13			420
Forja de acero inoxidable	760-960			1.4313	X5CrNi13 4	425C11	Z4CND13.4M	
Acero Inoxidable	800-900		AL 2205					ASTM A240
Acero Inoxidable	850-950			1.4057	X20CrNi172	431S29	Z15CNi6.02	431
Acero Inoxidable	1100-1200		AM 350					ASTM A693
Aceros endurecidos por precipitación			AL 13-8					13-8 PH
Aceros endurecidos por precipitación		Nickelvac 15-5 PH	AL 15-5	1.4540	X4CrNiCuNb164		Z6CNU15.05	15-5 PH
Aceros endurecidos por precipitación			AL 15-7	1.4532	X7CrNiMoAl157		Z8CNDA15.07	15-7 PH
Aceros endurecidos por precipitación		Nickelvac 17-4 PH	AL 17-4	1.4542	X5CrNiCuNb174		Z6CNU17.04	17-4 PH
Aceros endurecidos por precipitación			AL 17-7	1.4568	X7CrNiAl177		Z8CNA17.07	17-7 PH

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Cr	Ni	C	Mn	Si	P	S	Mo	Cu	Ti	Otros
12.0		0.15	0.5	0.50	0.02	0.01				
18.8	38.0	0.4	1.0	1.75	0.045	0.03				W 4.75
19.0	10.0	0.07	1.5	2.0	0.045	0.03				
19.0	11.0	0.07	1.5	1.5	0.045	0.03	2.5			
19.0	11.5	0.06	1.5	1.5	0.045	0.03	2.25			
12.0		0.08	1.0	0.50	0.04	0.03				Al 0.10-0.30
12.0		0.15	0.5	0.50	0.02	0.01	0.5	0.5		
16.0		0.08	1.0	1.0	0.04	0.03				
17.0		0.08					0.75			
19.0	10.0	0.015	1.0	0.5	0.023	0.015				
18.0	11.5	0.12	2.0	1.0	0.04	0.03				
17.0	12.0	0.015	1.0	0.5	0.023	0.015	2.5			
19.0	13.0	0.015	1.0	1.0	0.023	0.015	3.5			
18.0	14.0	0.08	2.0				2.0			
26		0.003					1			
19.5	10.5	0.16	1.5	2.0	0.04	0.3	0.6			
19.5	9.0	0.08	1.5	2.0	0.04	0.04				
18.0	9.5	0.08	2.0	1.0	0.04	0.03			0.40	
17.5	12.0	0.08	2.0	1.0	0.045	0.03	2.25		5.0	
23.5	14.0	0.20	1.5	2.0	0.04	0.04				
25.0	20.5	0.15	2.0	0.75	0.045	0.03				
20.5							4.5	1.5		
18.0	10.5	0.12	2.0	1.0	0.045	0.03			0.40	Al 0.40
17.0	13.0	0.08	2.0	0.75	0.04	0.03	1.5	0.50		
18.0	11.0	0.08	2.0	1.0	0.045	0.03				
25.0		0.12	1.0	1.0	0.04	0.03				Al 1.50
18.0	10.0	0.03	2.0	1.0	0.045	0.03				N 0.16
24.5	20.5	0.18	2.0	1.5	0.04	0.03	0.5	0.5		
15.0	35.0	0.15	1.0	2.5	0.04	0.04				
17.5	13.0	0.03	2.0	1.0	0.045	0.025	2.75			N 0.16
13.0		0.15	1.25	1.0	0.07	0.07	0.60			
17.0		0.12	1.25	1.0	0.06	0.15	0.5			
25.5	3.5	0.1			0.04	0.03	1.0			
13.5		0.5	1.0	1.0	0.045	0.03				
17.0	7.0	0.14	2.0	1.0	0.045	0.03				
13.5	1.0	0.2	1.0	1.0	0.045	0.03				
12.5		0.20	1.0	1.0	0.04	0.04				
13.0	4.5	0.07	1.5	1.0	0.035	0.025	0.7			
22	5.5						3			N 0.16
16.0	2.0	0.20	1.0	1.0	0.04	0.03				
16.5	4.3	0.08					2.8			
13	8						2.2			Al 1.2
14.8	4.5	0.03	0.5	0.5	0.02	0.015		3.5		Cb 0.3
15.0	7.0	0.045	0.5	0.5	0.02	0.015	2.5			Al 1.15
16.3	4.0	0.035	0.5	0.5	0.02	0.015		4.0		Cb 0.3
17.0	7.0	0.045	0.5	0.5	0.02	0.02				Al 1.15

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Gráfico de Materiales

Grupo de Material	País/Estándar							
	HBN	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN	BS	AFNOR	ASTM/SAE
Fundición Gris	175			0.6010	GG 10	Grade 100	Ft 10 D	No 20 B
Fundición Gris	185			0.6015	GG 15	Grade 150	Ft 15 D	No 25 B
Fundición Gris	205			0.6020	GG 20	Grade 220	Ft 20 D	No 30 B
Fundición Gris	220			0.6025	GG 25	Grade 260	Ft 25 D	No 35 B
Fundición Gris	230			0.6030	GG 30	Grade 300	R 30 D	No 45 B
Fundición Gris	235			0.6035	GG 35	Grade 350	Ft 35 D	No 50 B
Fundición Gris	250			0.6040	GG 40	Grade 400	Ft 40 D	No 55 B
Fundición Esferoidal/ Nodular/Dúctil	150-180				GGG 35.3	350/22	FGS 350-22	60-40-18
Fundición Esferoidal/ Nodular/Dúctil	155-220			0717-02	GGG 40	420/12		65-45-12
Fundición Esferoidal/ Nodular/Dúctil	190-255			0727-02	GGG 50	500/7	FGS 500-7	80-55-06
Fundición Esferoidal/ Nodular/Dúctil	200-260			0732-03	GGG 60	600/3	FGS 600-3	80-60-03
Fundición Esferoidal/ Nodular/Dúctil	240-300			0737-01	GGG 70	700/2	FGS 700-2	100-70-03
Fundición Esferoidal/ Nodular/Dúctil	265-300				GGG 80	900/2	FGS 900-2	120-90-02
Fundición maleable	150				GTS-35-10	B 340/12	MN 35-1	32510
Fundición maleable	175			0.8145	GTS-45-06	P 440/7		40010
Fundición maleable	205			0.8155	GTS-55-04	P 510/4	MP 50-5	50005
Fundición maleable	230			0.8165	GTS-65-02	P 570/3	Mn 650-3	A220-70003
Fundición maleable	265			0.8170	GTS-70-02	P 690/2	Mn 700-2	A220-80002
Aleaciones de Aluminio				3.0255	Al99,9	1B	A5	1050
Aleaciones de Aluminio				3.0515	AlMn	N3		
Aleaciones de Aluminio				3.0615	AlMgSiPb			
Aleaciones de Aluminio				3.1325	AlCuMg1		A-U4G	2017
Aleaciones de Aluminio				3.1355	AlCuMg2	L97	A-U4G1	2024
Aleaciones de Aluminio				3.1645	AlCuMgPb			
Aleaciones de Aluminio				3.1655	AlCuBiPb	FC1	A-U5PbBi	2011
Aleaciones de Aluminio				3.2245	AlSi5			
Aleaciones de Aluminio				3.2305	AlRMgSi			
Aleaciones de Aluminio				3.2315	AlMgSi1	H30		6351
Aleaciones de Aluminio				3.3206	AlMgSi0,5	H9		6063
Aleaciones de Aluminio				3.3309	AlRMg0,5			
Aleaciones de Aluminio				3.3315	AlMg1	N41	A-G0,6	5005
Aleaciones de Aluminio				3.3316	AlMg1,5	3L44	A-G1,5	5050
Aleaciones de Aluminio				3.3319	AlRMg1			
Aleaciones de Aluminio				3.3523	AlMg2,5	2L56	A-G2,5C	5052
Aleaciones de Aluminio				3.3535	AlMg3	N5	A-G3M	5754
Aleaciones de Aluminio				3.3545	AlMg4Mn		A-G4MC	5086
Aleaciones de Aluminio				3.3547	AlSiMg4,5Mn	N8	A-G4,5MC	5083
Aleaciones de Aluminio				3.3549	AlMg5	N6		5056
Aleaciones de Aluminio				3.4365	AlZnMgCu1,5	DTD5074	A-Z5GU	7075
Aleaciones de Aluminio					AlZnMg1			7005
Aleaciones de Aluminio					AlMg2,5Mn	N51	A-G2,5MC	5454
Aleaciones de Aluminio					AlSi3,5			

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti			
0.25	0.4	0.05	0.05	0.05		0.07	0.05			
0.5	0.7	0.1	1.2	0.3	0.1	0.2	0.1			
1.0	0.5	0.1	0.7	0.9	0.3	0.3	0.2			
0.5	0.7	4.0	0.7	0.7	0.1	0.25				
0.5	0.5	4.3	0.6	1.5	0.1	0.25	0.15			
0.8	0.8	4.0	0.75	1.1	0.1	0.8	0.2			
0.4	0.7	5.5				0.3				
5.0	0.4	0.05	0.1	0.1		0.2	0.25			
0.55	0.15	0.02		0.45		0.15				
1.0	0.5	0.1	0.6	0.9	0.25	0.2	0.1			
0.45	0.15	0.1	0.1	0.45	0.05	0.15	0.1			
0.01	0.008			0.35		0.01	0.008			
0.3	0.45	0.05	0.15	0.9	0.1	0.2				
0.4	0.45	0.05	0.15	1.5	0.1	0.2				
0.1	0.008			1.00		0.01	0.008			
0.25	0.4	0.1	0.1	2.5	0.2	0.1				
0.4	0.4	0.1	0.5	3.1	0.3	0.2	0.15			
0.4	0.5	0.1	0.45	4.0	0.15	0.25	0.15			
0.4	0.4	0.1	0.7	4.5	0.15	0.25	0.15			
0.2	0.35	0.15	0.35	4.5	0.1	0.25	0.1			
0.4	0.5	1.6	0.3	2.5	0.23	5.5	0.2			
0.35	0.4	0.1	0.45	1.4	0.13	4.5	0.03			
0.4	0.4	0.05	0.75	2.7	0.1	0.1	0.15			
4.5				0.04						

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Gráfico de Materiales

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones base Hierro	VascoMax C-250	VascoMax C-250						6501, 6512, 6520
Aleaciones base Hierro	VascoMax C-350	VascoMax C-350						
Aleaciones base Hierro	VascoMax C-200	VascoMax C-200						
Aleaciones base Hierro	VascoMax C-300	VascoMax C-300						6514
Aleaciones base Hierro	VascoMax T-200	VascoMax T-200						
Aleaciones base Hierro	VascoMax T-250	VascoMax T-250						6518, 6519, 6591
Aleaciones base Hierro	Greek Ascoloy		AL 418					5508
Aleaciones base Hierro	Jethete M-152						Z12 CND 12	5718, 5719
Aleaciones base Hierro	Haynes 556				X12CrCoNi2120			5768
Aleaciones base Hierro	N 155						Z12 CNKDW 20	5768
Aleaciones base Hierro	S 590				X40CoCrNi2020		Z42 CKNDW	5533
Aleaciones base Hierro	Crucible A286		ALTEMP A 286	1.4980		HR 5152	Z06 NCT 25	ASTM 368
Aleaciones base Hierro	Discaloy 16/25/6						Z3 NCT 25	5725
Aleaciones base Hierro	AL-6XN Alloy		AL-6XN Alloy					ASTM SB688
Aleaciones base Hierro	Discaloy 24						Z3 NCT 25	ASTM A638
Aleaciones base Hierro	Armco 18							
Aleaciones base Hierro	Incoloy 801				G-X50CrNi3030			5552
Aleaciones base Hierro	Incoloy 800	Nickelvac 800	AL 800		X10NiCrAlTi3220	3082-76	25 NC 3520	ASME SB 409
Aleaciones base Hierro	Incoloy 802							
Aleaciones base Hierro	N 156							
Aleaciones base Hierro	20CB-3		AL 20					ASTM B463
Aleaciones base Hierro	Sanicro 30				X2NiCrAlTi3220			
Aleaciones base Hierro	Incoloy 803							
Aleaciones base Hierro	Allvac 330	Allvac 330						5592, 5716
Aleaciones base Hierro	AL 36		AL 36					ASTM F1684
Aleaciones base Hierro	Incoloy DS				X12NiCrSi3616	3072-76		
Aleaciones base Hierro	AL 42		AL 42					ASTM F30
Aleaciones base Hierro	Armco 20-45-5							
Aleaciones base Hierro	AL 4750		AL 4750					ASTM B753
Aleaciones base Hierro	ALLOY 21-6-9		ALLOY 21-6-9					ASTM A666
Aleaciones base Hierro	Vasco 13-8 Mo	Vasco 13-8 Mo						5629

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones base Cobalto	MP35N	Allvac 35N						
Aleaciones base Cobalto	L 605	Nickelvac L-605			CoCr20W15Ni		KC 20 WN	5759
Aleaciones base Cobalto	Nickelvac TJA-1537	Nickelvac TJA-1537						ASTM F1537
Aleaciones base Cobalto	Altemp S 816				CoCr20Ni20W			5534
Aleaciones base Cobalto	HS 21				CoCr28Mo	3531		ASTM F-75
Aleaciones base Cobalto	HS 25				CoCr20W15Ni		KC 20 WN	AISI 670
Aleaciones base Cobalto	HS 30				CoCr26Ni14Mo			
Aleaciones base Cobalto	HS 31				CoCr25NiW	3146	KC 25 NW	ASTM A567
Aleaciones base Cobalto	HS 36				CoCr19W14NiB			
Aleaciones base Cobalto	Jetalloy 209							
Aleaciones base Cobalto	L 251							
Aleaciones base Cobalto	M 203							

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

Ni	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Otros
18.5	7.8		4.8		0.05	0.05	0.02	0.1	0.4	0.005	0.005	
18.5	12.0		4.8		0.05	0.05	0.02	0.1	1.4	0.005	0.005	
18.5	8.5		3.25		0.05	0.05	0.01		0.2	0.005	0.005	
18.5	8.8		4.8		0.05	0.05	0.02	0.1	0.73	0.005	0.005	
18.5			3.0		0.05	0.05	0.01		0.7	0.005	0.005	
18.5			3.0		0.03	0.05	0.02	0.1	1.4	0.005	0.005	
2		12		2.5			0.19					
2.5		12	1.7				0.15					V 0.3
20	20	21	3	2.5			0.1					Nb + Ta
20	20	21	3	2.5	0.5	1.5	0.15					Nb 1.0
20	20	21	4	4			0.43					
25		14	1.3		0.5	1.3	0.05	0.2	2.1			
25		16	6		0.7	1.35	0.12		0.3			Nb 0.4
25		20.5	6.5				0.02					N 0.2
26		13.5	2.7		0.8	0.9	0.04	0.1	1.7			
3.7		17.2			0.47	12.5	0.06					
32		20.5			0.5	0.8	0.05		1.1			
32.5		21.0			0.5	0.75	0.05	0.37	0.37		0.007	Cu 0.37
32.5		21.5			0.4	0.8	0.4					
33	24	17	3	2			0.33					
33		20	2.2									Cu 3.3
34		22			0.55	0.55	0.03	0.3	0.5			Cu 0.1
35		25					0.08	0.15	0.15			
35.5		18.5			1.13	1.0	0.04			0.01	0.01	Cu 0.5
36												
37		18			2.3	1.0	0.06					
41												
46		20	2.3		1.0	5	0.08					Nb 0.4
49												
6.5		21				6.0						No 0.3
8.0		12.8	2.3		0.05	0.10	0.03	1.05		0.005	0.004	

Ni	Fe	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Otros
35		20	9.8				0.013					
10	0.5	20		15		1.7	0.1					
0.2	0.25	28	6		0.5	0.5	0.06					N 0.2
20	4	20	4	4	0.4	1.2			0.38			
3	1	27	5		0.6	0.6			0.25			
10	3	20		15	2	1.5			0.1			
16	1	24	6		0.6	0.6			0.4			
10	1.5	25		8	0.75	0.6			0.4			
10	2	18		15		1.5			0.4			
10	1	20		15				2.0	0.02			
10	1	19		14					0.4			
24.5	1	19.5		12	1	0.8	2.15	24.5	0.07			

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

STELLRAM®

Gráfico de Materiales

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones base Cobalto	M 204							
Aleaciones base Cobalto	M 205							
Aleaciones base Cobalto	MAR-M 302				CoCrW10TaZrB			
Aleaciones base Cobalto	MAR-M 322				CoCr22W9TaZrNb			
Aleaciones base Cobalto	MAR-M 509				CoCr24Ni10WtaZrB	3146-3		
Aleaciones base Cobalto	MAR-M 905							
Aleaciones base Cobalto	MAR-M 918				CoCr20Ni20Ta			
Aleaciones base Cobalto	Stellite 1						KC 33 W13	
Aleaciones base Cobalto	Stellite 6						KC 26 NW	
Aleaciones base Cobalto	Stellite 12						KC 28 W8	
Aleaciones base Cobalto	V-36				CoCr25Ni20M0WNb			
Aleaciones base Cobalto	WI-52				CoCr21Mo11W			
Aleaciones base Cobalto	X 40				CoCr25NiW	3146-2		ASTM A567
Aleaciones base Cobalto	X 45							
Aleaciones base Cobalto	X 50							

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones base Níquel	AL 22		AL 22					ASME SB575
Aleaciones base Níquel	Allcor	Allvac Allcorr						
Aleaciones base Níquel	Astroloy	Allvac Astroloy						
Aleaciones base Níquel	Duranickel 310							
Aleaciones base Níquel	GMR 235							AISI:686
Aleaciones base Níquel	GMR 235-D				NiCr16MoAl			
Aleaciones base Níquel	Hastelloy B	Nickelvac H-B			S-NiMo30		ND27FeV	5396A
Aleaciones base Níquel	Hastelloy B-2	Nickelvac H-B-2						
Aleaciones base Níquel	Hastelloy C				NiCr17Mo17FeW		NC17DWY	5388C
Aleaciones base Níquel	Hastelloy D							
Aleaciones base Níquel	Hastelloy N	Nickelvac H-N						
Aleaciones base Níquel	Hastelloy R235							
Aleaciones base Níquel	Hastelloy W	Nickelvac H-W						
Aleaciones base Níquel	Hastelloy X	Nickelvac H-X	ALTEMP HX	2.4665	NiCr22FeMo	HR6,204	NC22FeD	5536
Aleaciones base Níquel	Haynes 75							
Aleaciones base Níquel	HS 27				NiCo32Cr26Mo		KC20WN	
Aleaciones base Níquel	IN 100				NiCo15Cr10MoAlTi		NK15CAT	5397
Aleaciones base Níquel	IN 713							
Aleaciones base Níquel	Incoloy 020			2.4660				ASME SB463
Aleaciones base Níquel	Incoloy 804							
Aleaciones base Níquel	Incoloy 825	Nickelvac 825	AL 825	2.4858	NiCr21Mo	3072-76	NC21FeDU	ASME SB424
Aleaciones base Níquel	Incoloy 901				NiFe35Cr14MoTi		Z8NCDT42	5660
Aleaciones base Níquel	Incoloy 903							
Aleaciones base Níquel	Incoloy 925							
Aleaciones base Níquel	Inconel 600	Nickelvac 600	AL 600	2.4816	NiCr15Fe	3072-76	NC15Fe	5540
Aleaciones base Níquel	Inconel 601	Nickelvac 601	AL 601	2.4851				5715
Aleaciones base Níquel	Inconel 617	Nickelvac 617		2.4663				
Aleaciones base Níquel	Inconel 622			2.4602				
Aleaciones base Níquel	Inconel 625	Nickelvac 625	ALTEMP 625	2.4856	NiCr22Mo9Nb		NC22FeDNB	ASME SB443

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

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Ni	Fe	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Otros
24.5		18.5		12	1	1			0.07			
24.5		18.5		12			2.75		0.07			
		21.5		10					0.85			Ta 9.0
		21.5		9	0.1	0.1		0.75	1.0			Ta 4.5, Zr 2.25
10	1	23.5		7	0.1	0.1		0.2	0.6			Ta 3.5, Zr 0.5
20		20						0.5	0.05			Ta 7.5, Zr 0.1
20	0.4	20			0.1	0.1			0.05			Ta 7.5, Zr 0.1
		33		13			2.5					
		26		5			1.0					Nb 6.0
		29		9			1.8					
20	3	25	4	2	0.4	1			0.26			Nb 2.0
1	2	21		11	0.25				0.45			Nb 2.0
10.5	1.5	25.5		7.5	0.75	0.75			0.5			
10.5	2	25.5		7		0.7			0.25			B 0.01
20.5	4	22.5		12					0.75			

Fe	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Otros
2.5		20.6	13.9	2.65								
		31.0	10.0	2.0			0.02	0.25	0.25			Nb 0.4
	17.0	15.0	5.0				0.04	4.0	3.5			B 0.025
0.6			0.5		1.0	0.5		4.4	0.6			
10.0		15.5	5.2		0.4	0.2	0.15	3.0	2.0			
4.5		15.5	5.0				0.15	3.5	2.5			B0.05
5.0	2.0	1.5	28.0		0.05	0.5	0.02					V 0.4
1.0	0.5	0.5	16.0		0.05	0.5	0.01			0.02	0.015	
6.0	2.0	15.0	17.0	5			0.04					
2.0		1.0			9.0	1.0	0.1					Cu 3.0
4.0		7.0	16.5				0.02					
10.0	2.5	15.5	5.5				0.15	2	2.5			
4.0		5.0	24.5				0.02					
18	1.5	22	9.0	0.6			0.1					
5.0		20.0					0.12	0.25	0.4			Cu 0.5
2.0	31.5	26.0	6.0				0.4					
	15.0	10.0	3.0				0.18	5.5	4.7			V 1.0
2.5		13.0	4.6		0.4	0.2	0.18	6.0	0.8			Nb 2.6
37		20	2.5									Nb 0.6 Cu 3.5
25.4		29.5			0.5	0.75	0.06	0.25	0.6			Cu 0.4
30		21.5		3.0	0.5	0.65	0.03	0.2	0.9			Cu 2.25
35.3		13.45	6.20		0.22	0.48	0.05		2.5			
42.0	15.0							0.7	1.4			Nb3.0
28		21	3					0.3	2.1			Cu 1.8
8.0		15.5					0.075					
14.0		23.0			0.2	0.5	0.05	1.3			0.008	Cu 0.5
	12.5	22	9.0				0.07	1.0				
2.3		20.5	14.2	3.2								
2.5		21.5	9.0				0.05	0.3	0.3			Cb 3.7

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Gráfico de Materiales

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones base Níquel	Inconel 690	Nickelvac 690		2.4642				
Aleaciones base Níquel	Inconel 700				NiCo28Cr15MoAlTi		NK27CADT	
Aleaciones base Níquel	Inconel 702							5550
Aleaciones base Níquel	Inconel 706	Allvac 706						57-2
Aleaciones base Níquel	Inconel 713				G-NiCr13Al16MoNb	3146.3	NC13AD	5391
Aleaciones base Níquel	Inconel 718	Allvac 718	ALTEMP 718	2.4668	NiCr19Fe19NbMo	HR8	NC19FeNb	5383
Aleaciones base Níquel	Inconel 718-OP	Allvac 718-OP						
Aleaciones base Níquel	Inconel 720	Allvac 720						
Aleaciones base Níquel	Inconel 721							
Aleaciones base Níquel	Inconel 722	Nickelvac W-722			NiCr16FeTi		NC16Feti	5541
Aleaciones base Níquel	Inconel 725							
Aleaciones base Níquel	Inconel 751	Nickelvac X-751		2.4694				
Aleaciones base Níquel	Inconel X-750	Nickelvac X-750	ALTEMP 750	2.4669	NiCr16FetTi		NC15FeTNb	5542
Aleaciones base Níquel	Jessop G 81				NiCr20Co18Ti			
Aleaciones base Níquel	Jethete M-252	Allvac M-252			G-NiCr19Co			5551
Aleaciones base Níquel	MAR-M 200				NiW13Co10Cr9AlTi		NKW10CATaHf	
Aleaciones base Níquel	MAR-M 246				NiCo10W10Cr9AlTi			
Aleaciones base Níquel	MAR-M 421				NiCr16Co10WalTi			
Aleaciones base Níquel	MAR-M 432				NiCo20Cr16WAlTi			
Aleaciones base Níquel	Monel 400	Nickelvac 400	AL 400	2.4360	NiCu30Fe	3072-76	NU30	4544
Aleaciones base Níquel	Monel K 500	Nickelvac K-500		2.4375	NiCu30Al	3072-76		4676
Aleaciones base Níquel	Monel R 405							4674
Aleaciones base Níquel	Nimocast 713				G-NiCr13A16MoNb	HC203	NC13AD	5391A
Aleaciones base Níquel	Nimocast PD 16				NiFe33Cr17Mo			
Aleaciones base Níquel	Nimocast PE 10					HC202	NC20N13	
Aleaciones base Níquel	Nimonic 105			2.4634	NiCo20Cr15MoAlTi	HR3	NCKD20ATV	
Aleaciones base Níquel	Nimonic 115			2.4636	NiCo15Cr15MoAlTi	HR401, 601	NCVK15ATD	
Aleaciones base Níquel	Nimonic 75			2.4630	NiCr20Ti	HR5, 203-4	NC20T	
Aleaciones base Níquel	Nimonic 80A	Nickelvac 80 A		2.4631	NiCr20TiAl	HR401, 601	NC20TA	
Aleaciones base Níquel	Nimonic 86							
Aleaciones base Níquel	Nimonic 90	Nickelvac N-90		2.4632	NiCr20Co18Ti	HR2,202	NCK20TA	
Aleaciones base Níquel	Nimonic 901	Nickelvac 901		2.4662	NiCr15MoTi		Z8NCDT42	5660, 5661
Aleaciones base Níquel	Nimonic 95							
Aleaciones base Níquel	Nimonic C-22	Nickelvac C-22						
Aleaciones base Níquel	Nimonic C-263	Nickelvac C-263	ALTEMP 263	2.4650	NiCr20CoMoTi	HR10	NCK20D	
Aleaciones base Níquel	Nimonic C-276	Nickelvac C-276	AL 276	2.4819				ASME SB575
Aleaciones base Níquel	Nimonic PE 13				NiCr22Fe18Mo	HR6,204	NC22FeD	5536E
Aleaciones base Níquel	Nimonic PE 16				NiFe33Cr17Mo	HR207	NW11AC	
Aleaciones base Níquel	Nimonic PK 25						NKCD20ATU	5751A
Aleaciones base Níquel	Nimonic PK 31							
Aleaciones base Níquel	Nimonic PK 33				NiCr20Co16MoTi	5057	NC19KDU/V	
Aleaciones base Níquel	R-235							
Aleaciones base Níquel	Refractaloy 26						Z6NKCDT38	AISI:690
Aleaciones base Níquel	René 100				NiCo15Cr10MoAlTi			
Aleaciones base Níquel	René 125							
Aleaciones base Níquel	René 41	Rene 41			NiCr19Co11MoTi	NC19KDT		5712, 5713
Aleaciones base Níquel	René 63							

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Fe	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Otros
9.0		29.0			0.2	0.2	0.25				0.007	Cu 0.2
0.7	28.5	15	3.7		0.3	0.1	0.12	3.0	2.2			
0.4		15.6			0.2	0.05	0.04	3.4	0.7			
		16.0					0.03		1.8			Cb 2.9
		12	4.5				0.13	6	0.6			
17.2		19.0	3.1				0.02	0.5	0.9			Cb 5.2
17.2		19.0	3.1				0.02	0.5	0.9			Cb 5.2
	14.7	18	3	1.25				2.5	5			
8.0		16			0.15	2.25	0.07	0.1	3.0			Cu0.2
7.0		15.5					0.04	0.7	2.4			
7.5		21	8					0.3	1.5			Nb 3.5
7.0		15.5			0.2	0.5	0.05	1.2	2.3		0.005	Cb 1.1, Cu 0.2
7.0		15.5					0.04	0.7	2.5			Cb 0.95
0.5	16.9	20.6			0.2	0.5	0.08	1.5	2.5			
2.5	10.0	19.0	9.75				0.15	1.0	2.5			B 0.007
	10.0	9.0		12.5			0.15	5.0	2.0			Nb1.0
	10.0	9.0	2.5	10.0			0.15	5.5	1.5			Ta1.5
	10.0	15.5	1.7	3.5			0.15	4.25	1.75			Nb1.75
	20.0	15.5		3			0.15	2.5	4.3			Nb2.0
1.2					0.25		0.15				0.01	
1.0					0.25	0.7	0.1	2.7	0.6		0.01	
1.25					0.25	1.0	0.15					Cu31.5
		13.5	4.5				0.12	6.0	0.9			
34.0		16.5	3.3				0.06	1.2	1.2			
3.0		20.0	6.0	2.5			0.03					
0.5	20	14.75	5		0.5	0.5	0.1	4.7	1.2			Cu
	13.2	14.2	4				0.16	5	4			Zr
4		20			0.45	0.45	0.45	0.1	0.35			Cu+S
0.55		19.5			0.2	0.55	0.08	1.4	2.4			Cu+S
		25	10									Ce 0.03
0.3	18.0	19.5					0.065	1.4	2.4			
35.0		12.5	6.0				0.05		2.8			B 0.015
5.0	18.0	19.5			1.0	1.0	0.1	2.0	3.5			
4.0	1.2	21.2	13.5	3.0	0.04	0.2	0.07			0.01		V 0.17
	20.0	20.0	5.85				0.06	0.45	2.15			
5.0	0.5	15.5	16.0	3.5			0.01					
18.5	1.5	21.75	9	0.6	0.5	0.5	0.1					
1.2		16.5	3.5				0.05	1.2	1.2			
	19.5	19	4		0.75	0.75	0.08	2.9	2.9			B 0.01
	14	20	4.5					0.4	2.3			Nb5
0.5	14	18	7		0.25	0.25	0.05	2.1	2			
10.0	1.15	15.0	5.5		0.3	0.1	0.12	20	2.5			
16.0	20.0	18.0	3.2		1.0	0.8	0.03	0.2	2.8			
	15.0	10.0	3.0				0.18	5.5	4.7			V1.0
	10.0	8.9	2.0	7.0			0.1	4.7	2.5			Hf1.05, Ta3.0
3.0	11.0	19.0	9.75				0.06	1.6	2.5			B 0.007
3.5	15.0	14.0	6.0	3.5	0.2	0.1	0.05	3.8	2.5			

Estrella guía Llave para encontrar la herramienta idónea



Código ISO de materiales

P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

STELLRAM®

Gráfico de Materiales

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones base Níquel	René 77							
Aleaciones base Níquel	René 80							
Aleaciones base Níquel	René 95						NC14K8	
Aleaciones base Níquel	TRW VIA				NiTa9Co8W6CrAl			
Aleaciones base Níquel	Udimet 500				NiCr18CoMoAlTi		NCK19DAT	AISI:684
Aleaciones base Níquel	Udimet 520	Allvac 520						
Aleaciones base Níquel	Udimet 630				NiCr19NbMo			
Aleaciones base Níquel	Udimet 700				NiCo15Cr15MoAlTi		NCKD20AT	AISI:687
Aleaciones base Níquel	Udimet 710						NCK18TDA	
Aleaciones base Níquel	Udimet 718				NiCr19Fe19NbMo	HR8	NC19FeNb	5583
Aleaciones base Níquel	Waspaloy	Allvac Waspaloy		2.4654	NiCr20Co14MoTi		NC20K14	5544

Grupo de Material	País/Estándar							
	Comercial Designación	Designación Allvac	Designación Allegheny Ludlum	ALEMANIA/ITALIA		U.K.	FRANCIA	USA
				W.-Nr.	DIN		AFNOR	AMS
Aleaciones Titanio Alfa	Ti-5Al-2.5Sn	Allvac 5-2.5			TiAl5Sn2	TA 14,17	T-A5E	ASTM: B 265
Aleaciones Titanio Alfa	Ti-7Al-4Mo				TiAl7Mo4			ASTM: B 381
Aleaciones Titanio Alfa	Ti-8Al-1Mo-1V	Allvac 8-1-1			TiAl8Mo1V1			4915, 4933, 4972
Aleaciones Titanio Alfa	Ti-6Al-4Zr-2Mo-2Sn	Allvac 6-2-4-2			TiAl6Zr4Mo2Sn2			4919, 4975, 4976
Aleaciones Titanio Alfa Beta	Ti-6Al-4V	Allvac 6-4			TiAl6V4	TA 10-13 TA 28	T-A6V	4906, 4920,4928, 4965, 4967
Aleaciones Titanio Alfa Beta	Ti-6Al-6V-2Sn	Allvac 6-6-2			TiAl6V6Sn2			4971
Aleaciones Titanio Alfa Beta	Ti-4Al-4Mo-2Sn-0.5Si	Allvac 4-4-2			TiAl4Mo4Sn2Si0.5	5103	T-A4DE	
Aleaciones Titanio Alfa Beta	Ti-4Al-4Mo-4Sn-0.5Si				TiAl4Mo4Sn4Si0.5	5203		
Aleaciones Titanio Alfa Beta	Ti-7Al-4Mo				TiAl7Mo4			ASTM: B 381
Aleaciones Titanio Alfa Beta	Ti-6Al-5Zr-0.5Mo-0.25Si				TiA6Zr5Mo0.5Si0.25		T-AGZ-50	
Aleaciones Titanio Alfa Beta	Ti-6Al-5Zr-4Mo-Cu-0.2Si				TiAl6Zr5Mo4CuSi0.2	M201		
Aleaciones Titanio Alfa Beta	Allvac 3-2.5	Allvac 3-2.5						4943, 4944
Aleaciones Titanio Alfa Beta	Allvac 6-4ELI	Allvac 6-4ELI						4907, 4930, 4931
Aleaciones Titanio Alfa Beta	Allvac 6-2-4-6	Allvac 6-2-4-6						4981
Aleaciones Titanio Alfa Beta	Allvac Ti-17	Allvac Ti-17						4995
Aleaciones Titanio Beta	Ti-13V-11Cr-3Al	Allvac 13-11-3			TiV13Cr11Al3			4917
Aleaciones Titanio Beta	Ti-8Mo-8V-2Fe-3Al							
Aleaciones Titanio Beta	Ti-3Al-8V-6Cr-4Mo-4Zr	Allvac 38-644						
Aleaciones Titanio Beta	Ti-11.5Mo-6Zr-4.5Sn							
Titanio puro	Ti 99.5	Allvac 70, Ti CP-4			Ti 99.5	TA 6	AIR: 9182 T60	ASTM: B381F4
Titanio puro	Ti 99.6	Allvac 55, Ti CP-3			Ti 99.6		AIR: 9182 T50	ASTM: B381F3
Titanio puro	Ti 99.7	Allvac 40, Ti CP-2			Ti 99.7a	TA 2-5	AIR: 9182 T40	ASTM: B381F2
Titanio puro	Ti 99.8	Allvac 30, Ti CP-1			Ti 99.8	TA 1	AIR: 9182 T35	ASTM: B381F1
Hierro dúctil templado	269-321				EN-GJS-800-8			125/80/10 (grade 1)
Hierro dúctil templado	269-321				EN-JS1100			850/550/10 (grade 1)
Hierro dúctil templado	302-363				EN-GJS-1000-5			150/100/7 (grade 2)
Hierro dúctil templado	302-363				EN-JS1110			1050/700/7 (grade 2)
Hierro dúctil templado	341-444				EN-GJS-1200-2			175/125/4 (grade 3)
Hierro dúctil templado	341-444				EN-JS1120			1200/850/4 (grade 4)
Hierro dúctil templado	444-555				EN-GJS-1400-1			230/185/--- (grade 5)
Hierro dúctil templado	444-555				EN-JS-1130			1600/1300/-- (grade 5)

Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales							
P	Aceros no aleados	M	Aceros inoxidables	K	Fundición	S	Aleaciones refractarias
P	Aceros aleados	M	Inoxidables PH	N	Aluminio y Aleaciones	H	Materiales duros

Fe	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Otros
0.4	15.0	15.0	4.2		0.1	0.1	0.07	4.3	3.3			
	9.5	14.0	4.0	4.0			0.17	3.0	5.0			
	8.0	14.0	3.5	3.5			0.15	3.5	2.5			Nb3.5
	7.5	6.0	2.0	5.8			0.13	5.4	1.0			Nb0.5, Ta9.0
	19.0		4.0		0.1	0.1	0.07	3.0	3.0			
	12	19	6	1				2	3			
18.0	18.0		3.0				0.03	0.5	1.0			Nb6.5
	16.5	15.0	5.0				0.07	4.4	3.4			
	15.0	18.0	3.0	1.5			0.07	2.5	5.0			
18.0		18.0	3.0				0.05	0.6	1.0			Nb+Ta5.2
	13.0	19.5	4.3				0.05	1.40	3.0			Zr .07

Al	Sn	Mo	V	Zr	Si							Otros
5.0	2.5											
7.0		4.0										
8.0		1.0	1.0									
6.0	2.0	2.0		4.0								
6.0			4.0									
5.5	2.0		5.5									
4.0	2.0	4.0			0.55							
4.0	4.0	4.0			0.5							
7.0		4.0										Fe 0.3
6.0		0.5		5.0	0.25							
6.0		4.0		5.0	0.2							Cu 1.0
3.0			2.5									Fe 0.13
6.0												Fe 0.2
6.0	2.0	6.0		4.0								Fe 0.10
5.0	2.0	4.0		2.0								Cr 4.0
3.0			13.0									Cr 11.0
3.0		8.0	8.0									
3.0		4.0	8.0	4.0								Cr 6.0
	4.5	11.5		6.0								

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Estrella guía Llave para encontrar la herramienta idónea

Código ISO de materiales			
P Aceros no aleados	M Aceros inoxidables	K Fundición	S Aleaciones refractarias
P Aceros aleados	M Inoxidables PH	N Aluminio y Aleaciones	H Materiales duros

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