

ZELLAMID®

ENGINEERING PLASTIC STOCK SHAPES




Zell-Metall

**Engineering
Plastics**

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PRODUCT RANGE

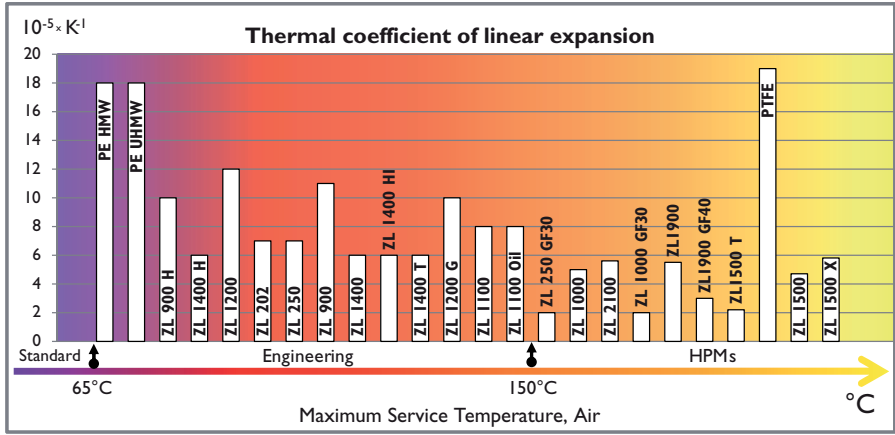
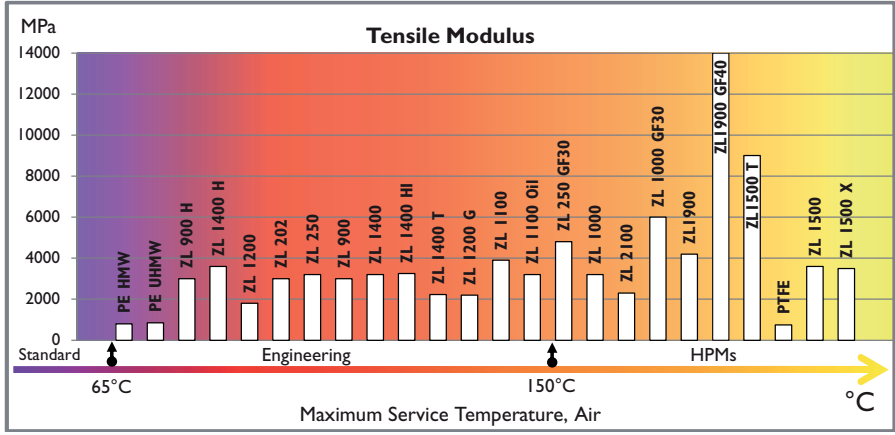
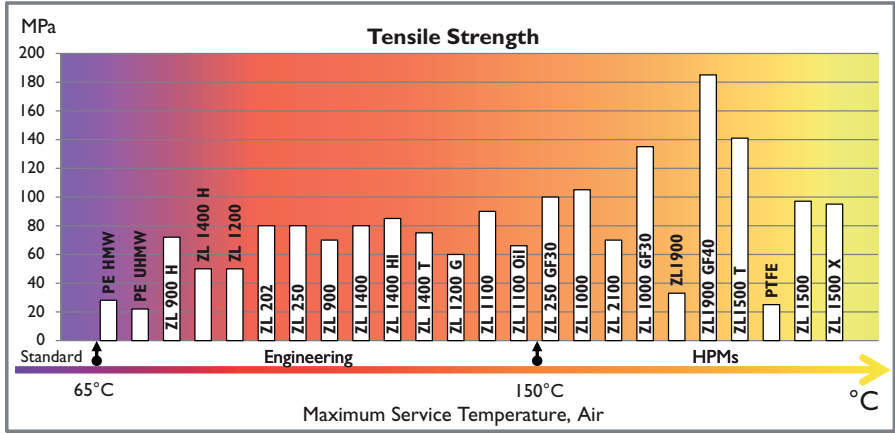
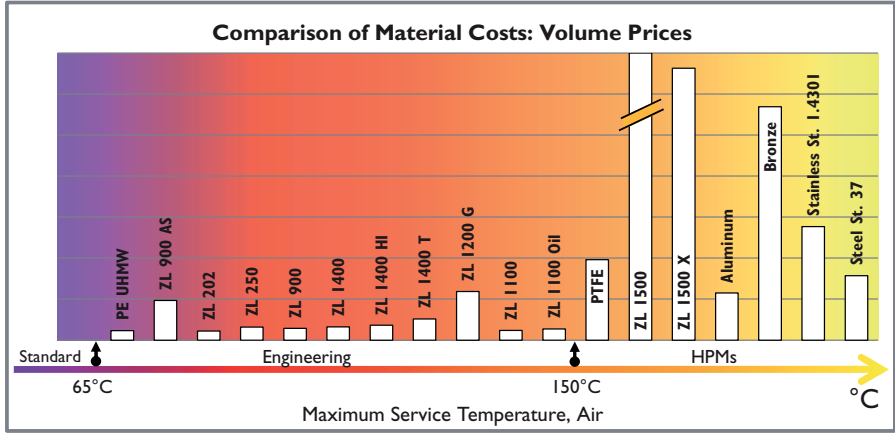
Material	ZELLAMID®	Remark	Colour	Density [g/cm ³]
PA6	ZELLAMID® 202	PA 6	white	1,15
	ZELLAMID® 202 SW	PA 6 black	black	1,15
PA6 filled	ZELLAMID® 202 XN	PA 6 Nanotechnology	ivory	1,15
	ZELLAMID® 202 MO	PA 6 + MoS ₂	black	1,15
PA66	ZELLAMID® 250	PA 6.6	ivory	1,15
	ZELLAMID® 250 SW	PA 6.6 black	black	1,15
PA66 filled	ZELLAMID® 250 MO	PA 6.6 + MoS ₂	anthracite	1,15
	ZELLAMID® 250 HI	PA 6.6 High Impact	ivory	1,08
	ZELLAMID® 250 PE	PA 6.6 solid lubricant filled	light green	1,12
	ZELLAMID® 250 GF30	PA 6.6 + 30% Glassfibre	black	1,35
POM-C	ZELLAMID® 900	POM-C	white	1,42
	ZELLAMID® 900 SW	POM-C black	black	1,42
POM-C filled	ZELLAMID® 900 PE	POM-C + solid lubricant filled	light blue	1,34
	ZELLAMID® 900 AS	POM-C Antistatic	ivory	1,35
	ZELLAMID® 900 XU ELS	POM-C ELS Nanotechnology	black	1,41
	ZELLAMID® 900 XT	POM-C + PTFE	light grey	1,44
	ZELLAMID® 900 XMD	POM-C, metal detectable	sapphire blue	1,56
POM-H	ZELLAMID® 900 H	POM-H	white	1,43
	ZELLAMID® 900 H SW	POM-H black	black	1,43
PA12	ZELLAMID® 1200	PA 12 extruded	natural	1,02
PET-C	ZELLAMID® 1400	PET	white	1,36
	ZELLAMID® 1400 SW	PET black	black	1,36
PET-H	ZELLAMID® 1400 HI	PET High Impact	natural	1,40
PET filled	ZELLAMID® 1400 T	PET+ solid lubricant PTFE	light grey	1,38
PBT	ZELLAMID® 1400 PBT	Polybutylene terephthalate	ivory	1,30
PEEK	ZELLAMID® 1500	PEEK	brown	1,32
	ZELLAMID® 1500 SW	PEEK black	black	1,32
	ZELLAMID® 1500 X	PEEK	brown	1,29
	ZELLAMID® 1500 X SW	PEEK black	black	1,29
PEEK filled	ZELLAMID® 1500 T	PEEK modified	black	1,48
	ZELLAMID® 1500 GF30	PEEK + 30% Glassfibre	grey	1,51
	ZELLAMID® 1500 CA30	PEEK + 30% Carbon fibre	anthracite	1,40
	ZELLAMID® 1500 C20	PEEK Ceramic filled	white	1,49
PEI	ZELLAMID® 1000	PEI	amber	1,27
PEI filled	ZELLAMID® 1000 GF30	PEI + 30% Glassfibre	grey	1,51
PPS	ZELLAMID® 1900	PPS	beige	1,35
	ZELLAMID® 1900 GF40	PPS + 40 % Glassfibre	beige	1,64
PPSU	ZELLAMID® 2100	PPSU	amber	1,29
PA6 cast	ZELLAMID® 1100	PA 6 Cast	ivory	1,15
	ZELLAMID® 1100 black	PA 6 Cast black	black	1,15
	ZELLAMID® 1100 blue	PA 6 Cast blue	blue	1,15
PA6 cast filled	ZELLAMID® 1100 MOX	PA 6 Cast heat stabilized	black	1,15
	ZELLAMID® 1100 Oil	PA 6 Cast Oil	yellow	1,14
	ZELLAMID® 1100 MO	PA 6 Cast MoS ₂	black	1,15
	ZELLAMID® 1100 T	PA 6 Cast + solid lubricant	light grey	1,14
	ZELLAMID® 1100 TX	PA 6 Cast + solid lubricant	natural	1,14
	ZELLAMID® 1115	PA 6/12 Cast HI Grade	natural	1,13
	ZELLAMID® 1115 FE	PA 6/12 metal core	natural	--
PA12 cast	ZELLAMID® 1200 G	Cast PA 12	natural	1,03

Rod Dia [mm]	Tube O.D. [mm]	Sheet Thckn.[mm]	Availa- bility	Continuous use Temp., Air [°C]					Dimensional Stability	Food Contact	Wear resistance	Coeff. of Friction	Chemical Resistance	Page	Page	Page
				-100	0	100	200	300								
6,0 - 310	25 - 310	0,3 - 100	✓						o	+	o	+	+	28	42	32
6,0 - 310	25 - 310	0,3 - 100	✓						o	-	o	+	+	28		
6,0 - 150		8,0 - 100	•						o	-	+	+	+	28		33
6,0 - 200	25 - 280	2,0 - 100	✓						o	-	+	+	o	28	42	32
6,0 - 150	25 - 265	2,0 - 60	✓						o	+	o	+	+	28	42	33
6,0 - 150	25 - 265	8,0 - 60	✓						o	-	o	+	+	28		34
6,0 - 100	25 - 265	8,0 - 60	✓						o	-	+	+	o			
10 - 100		8,0 - 50	•						o	/	o	o	+			
6,0 - 150		8,0 - 60	✓						o	+	+	+	+	28		35
6,0 - 160		8,0 - 100	✓						+	-	o	o	+	28		34
6,0 - 500	25 - 500	0,5 - 150	✓						+	+	-	+	+	29	42	35
6,0 - 500	25 - 500	2,0 - 150	✓						+	o	-	+	+	29	42	36
6,0 - 150		8,0 - 100	✓						o	+	+	+	+	29		36
6,0 - 150		8,0 - 50	✓						+	+	o	o	+	29		36
6,0 - 150		8,0 - 50	✓						+	-	o	o	+	29		37
6,0 - 150		8,0 - 50	✓						+	+	+	+	+			
6,0 - 150		8,0 - 50	•						+	+	+	o	o			
6,0 - 150		8,0 - 100	✓						+	+	o	+	+	29		37
6,0 - 150		8,0 - 100	✓						+	+	o	+	+	29		38
6,0 - 150		8,0 - 100	•						+	/	/	+	+			
6,0 - 200	25 - 280	3,0 - 100	✓						+	+	o	+	+	30	42	38
6,0 - 150	25 - 280	8,0 - 60	✓						+	-	o	+	+	30		38
6,0 - 210		8,0 - 100	✓						+	+	+	+	+	30		39
6,0 - 160	25 - 280	8,0 - 100	✓						+	+	+	+	+	30	42	39
6,0 - 150		8,0 - 100	•						+	+	+	+	+	30		40
6,0 - 200	25 - 280	8,0 - 60	✓						+	+	o	o	+	30		40
6,0 - 200	25 - 160	8,0 - 60	✓						+	/	o	o	+			
6,0 - 200	25 - 160	8,0 - 60	✓						+	+	o	o	+	30		40
6,0 - 200	25 - 160	8,0 - 60	✓						+	+	o	o	+			
6,0 - 160	25 - 160	8,0 - 60	✓						+	-	+	+	+	30		40
8,0 - 90	25 - 160	10 - 50	•						+	+	o	o	+	31		41
8,0 - 90		10 - 50	•						+	/	+	+	+			
8,0 - 90		10 - 50	•						+	/	+	+	+			
10 - 125		10 - 125	•						+	+	/	o	+	31		41
10 - 60		10 - 50	•						+	/	/	o	+	31		41
10 - 60		10 - 50	•						+	+	o	o	+	31		41
10 - 50		10 - 50	•						+	+	o	o	+	31		41
10 - 150		10 - 100	•						+	/	/	o	+	31		41
80 - 710	50 - 510	8,0 - 160	✓						+	+	o	+	+	see POLYTECH leaflet 		
80 - 710	50 - 510	8,0 - 160	✓						+	+	o	+	+			
80 - 710	50 - 510	8,0 - 160	✓						+	-	o	+	+			
80 - 710	50 - 510	8,0 - 160	✓						+	-	+	+	+			
20 - 710	50 - 510	8,0 - 160	✓						+	-	+	+	+			
80 - 710	50 - 510	8,0 - 160	✓						+	-	+	+	+			
80 - 710	50 - 510	8,0 - 160	✓						+	-	+	+	+			
80 - 710	50 - 510	8,0 - 160	•						+	/	+	+	+			
80 - 710	50 - 510	8,0 - 160	✓						+	-	o	+	+			
80 - 400		--	•						+	-	o	o	o			
20 - 230	20 - 250	8,0 - 60	✓						+	+	o	+	+			

✓standard product •made to order

+ high, o med., - low, / n.a

ZELLAMID® - SELECTED PROPERTIES



PRODUCT RANGE

ZELLAMID®

Our trade name defines consistent top quality, thoroughly annealed, stress released and easy machineable thermoplastic stock shapes.

ZELLAMID® quality is insured by rigorous control according to DIN ISO 9001:2008 in combination with internally developed traceability systems and in house testing.

ZELLAMID® stands for ongoing research and development in the fields of new manufacturing technologies and innovative materials.

ZELLAMID® stands for customer service and reactivity to customer's needs. It is easy to do business with us.

ZELLAMID® Extruded stock shapes

To maintain technology leadership permanent research and development are the guarantee for our product advantage. State of the art production facilities, quality and cost leadership, permanent further training of our staff and the use of exclusively high value raw materials are the visible signs of this strategy. Our tight relationship with nature and the environment is documented in careful production processes.



ZELLAMID® Cast Nylon Products

According to the Klepsch Group's business philosophy to concentrate on core-competences our company POLYTECH GmbH is taking care of the Cast product range. If you require additional information please ask for our special literature on **ZELLAMID® I 100**.



ZELLAMID® Near-Netshape high performance materials

This revolutionary proprietary manufacturing technology combines the advantages of extrusion, compression and injection moulding. For the first time the application engineer is offered the unique ability to choose from virtually all commercially available resin grades, even proprietary formulations. Blanks, discs, rings, tubes and even unique shapes are the base shapes for parts with large geometries, cross sections and inconsistent wall thicknesses.



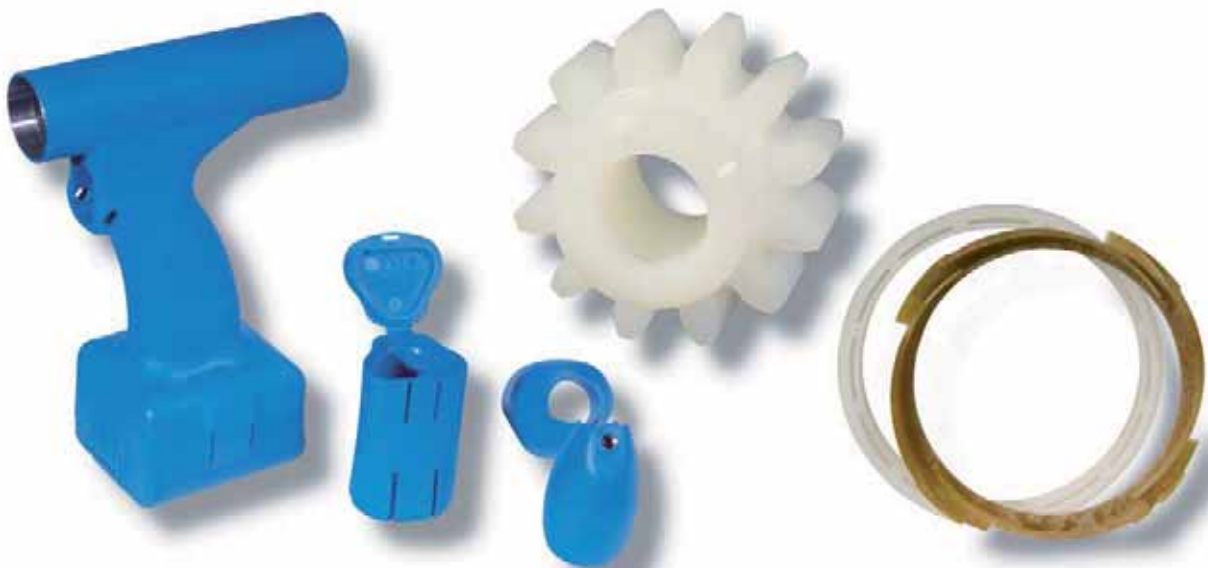
ZELLAMID® Machined Parts

Many decades of experience in parts design are helping us to assist you focusing on machining the semifinished products that we produce. Machining is the best method to produce small quantities of finished plastic parts or parts with configurations which cannot be injection moulded. Either giving you machining advice or helping you purchase a part you cannot do yourself we can supply your needs. From consulting through to serial production we guarantee our clients the best solution for their applications.



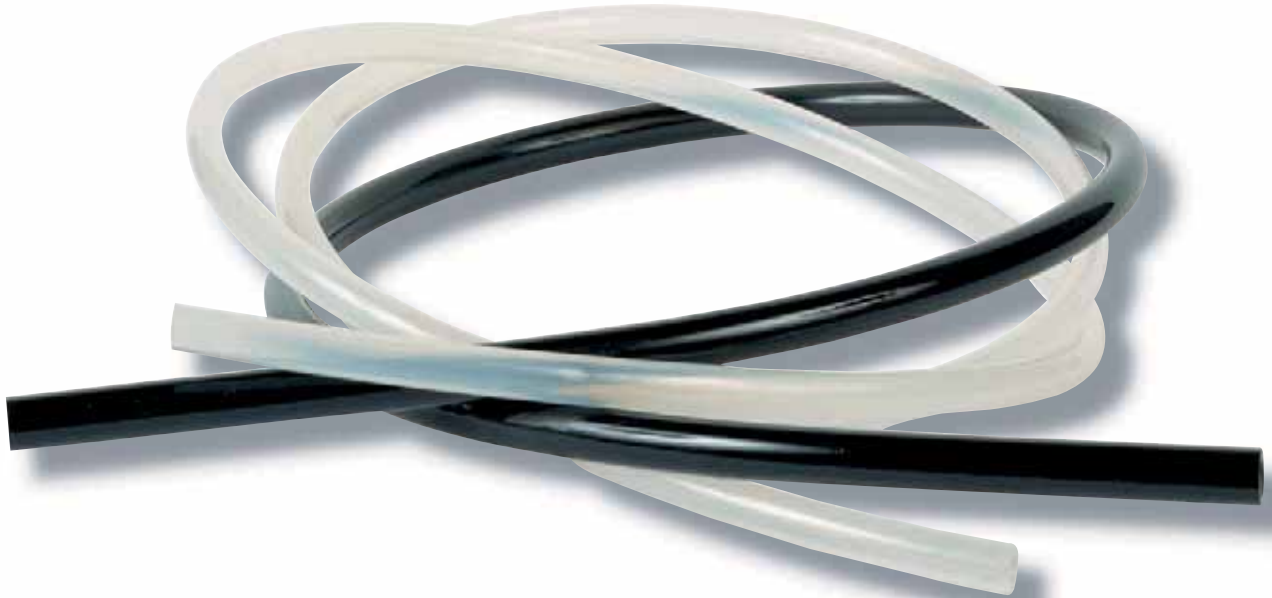
ZELLAMID® Injection Moulding

Since 1955 we have agglomerated a level of experience second to none. SELETEC GmbH, the company focused on this technology, will accompany our clients from idea to finish product, from design to construction, from simulation to commercial production. Our own tool-making department in combination with modern CAD/CAM techniques form the basis for the production of custom made and cost-effective injection moulded parts from engineering, special- and high-performance polymers. Seletec has injection capabilities from micro parts to 2kg in mono- and multi-component technology as well as back-injection technology. For further information please ask for our special literature on injection moulded ZELLAMID® or visit www.SELETEC.com



ZELLAMID® Flexible Pressure Tubing

This product range of PA 6, PA 6.6, POM, PA 11 and PA 12 tubing from 4 up to 20mm O.D. is designed for high pressure pneumatic, oil-hydraulic and air systems and for low-pressure fluid handling and transportation. Please ask us for further details.



ZELLAMID® Web Shop and Data base

Log in at our website www.ZELLAMID.com and we will provide you with quick and reliable information on product availability and give you access to one of the industries most comprehensive data-bases. You look for a material, want to compare properties of various polymers or look for a polymer which has to display various properties visit our interactive cyber-platform. You also can look up MSDS sheets, fire ratings, food contact approvals, trade names and many more subjects.

Our “coffee beans” - acetal resin



ZELLAMID PRODUCT RANGE:

3Ps, SPMs and HPMs

General Purpose Materials are also known as the **3Ps** (Polyamide, POM and thermoplastic Polyester). In general these are unfilled polymers. Special Performance Plastics, also known as **SPMs** are innovative materials tailored for specific needs, by blending polymers, adding fillers and using break-through technologies in order to advance the performance of general purpose Engineering Plastics. In 2006 Zell-Metall Engineering Plastics was worldwide the first manufacturer commercially introducing Nanotechnology to the stock shape industry.

High Performance Materials, also known as **HPMs** are materials which have a temperature resistance over 150°C and in general very similar properties over a broad range of temperatures and chemical environments.

ZELLAMID® extruded is available in following shapes:



ROD

(6 - 500mm diameter)



PLATE AND SHEET

(0,3 - 160mm thickness)



TUBULAR BAR

(25 - 500mm O.D.)



FLEXIBLE TUBING

(4 - 20mm O.D.)



ZELLAMID® 202

General and Special Performance Engineering Plastics

Extruded PA Products: Polyamide (Nylon)

ZELLAMID® 202 (Nylon 6), natural milky colour and ZELLAMID 202 SW, (Nylon 6) black colour

PA 6 extruded is a tough material with high resistance to abrasion and impact. PA 6 is commonly used as a substitution material for bronze, aluminium and other non-ferrous metals, as it has significant weight advantages. ZELLAMID® 202 has a specific gravity of 1,15 g/cm³ and bronze has 8,8 g/cm³ making the comparative volume price very attractive. Using PA 6 also reduces lubrication requirements and is non-abrasive to mating surfaces. It features good mechanical properties. Nylons can absorb up to 8% water (by weight) under humidity or submerged in water. This increases the excellent shock and vibration resistance but can also lead to dimensional changes. Mechanical, electrical and dimensional properties are accordingly influenced by moisture absorption. ZELLAMID® 202 is approved for contact with food (BfR, FDA). All these important characteristics add up to impressive cost-/performance ratios.

ZELLAMID® 202 can also be custom made in various colours.

Quick facts: Material for general purpose wear and structural parts which need a good balance of strength and toughness.

Used in: pulp and paper industry, offshore and marine, textile, general machine building, food industry, material handling, electronics, construction, mining, aerospace and many more.

Applications: sliding parts, wear components, ball bearing races, friction bearings, pulleys, bogies, rope pulleys, sheaves, rollers, wheels, gears, slipper blocks, vibration dampeners and absorbers, bowing pin setters, scrapers, spiral conveyors.



ZELLAMID® 202



ZELLAMID® 202 XN

ZELLAMID® 202 MO (Nylon 6 filled with Molybdenum Disulfide (MoS₂)), black colour

In comparison with unfilled PA 6 improved sliding properties at slightly higher compressive strength. UV-radiation resistance is enhanced by its black colour. It has also improved wear resistance and lower surface friction than unfilled PA 6, moisture absorption is also a bit lower.

Applications: slide bearings with low coefficient of friction, sleeves, cams, gears, pinions, thrust washers, valve seats and bearings.

ZELLAMID® 202 XN (Nylon 6 reinforced with Nanoparticles), ivory colour

This Polyamide is a high tech material, developed with Zell-Metall Engineering Plastics brand-new technology which goes beyond the boundaries of Newton's physics and enters into Quantum physics. This uniquely reinforced PA 6 outperforms standard PA 6, PA 6.6 and in several properties PA 6.6 with 30% glass fibres. ZELLAMID® 202 XN has an elevated service temperature of 140°C with an HDT of 168°C. It features increased mechanical strength with a tensile modulus of elasticity of 4200 MPa (ISO 527, dry).

Reduced water absorption ensures better dimen-

sional stability. This product is applicable for direct food contact (BfR, FDA) and offers in comparison to glass-filled nylons approx. 15% lower specific gravity resulting in less volume costs.

The flame-retardant effect of the nanoparticles is expressing additionally the extraordinary properties of ZELLAMID® 202 XN.

Applications: ZELLAMID® 202 XN is the alternate choice for many applications, where other products are lacking the necessary properties (e.g. service temperature) or standard materials are too soft as PTFE or too expensive as PEEK. In comparison to glass filled Nylons it is easy to machine as no preheating or usage of diamond tipped tools is necessary.

ZELLAMID® 250 (Nylon 6.6), ivory colour and ZELLAMID® 250 SW (Nylon 6.6) black colour

PA 6.6 noted for its high temperature resistance and high tensile strength. It is the hardest and most rigid type of extruded Nylon. Main characteristics are high resistance to fuels, oils, greases, most organic solvents and alkalis. Moisture absorption is lower than for PA 6.



ZELLAMID® 250 GF30

Used in: parts exposed to mechanical stress and strain under elevated temperatures.

Applications: Friction bearings, gears and guide rails, cams and cam followers, guides and clutch parts, sleeves, valve seats and articles subjected to high loads and/or for high temperature.

ZELLAMID® 250 MO (Nylon 6.6 filled with Molybdenum Disulfide), anthracite colour

PA 6.6 filled with Molybdenum Disulfide (MoS₂) offers improved strength, rigidity and friction ratio.

Used in: gears, sheaves, sprockets.

ZELLAMID® 250 GF30 (Nylon 6.6 + 30 % Glass fibre), black colour

It offers increased compressive strength and rigidity, stiffness, creep resistance and dimensional stability whilst retaining good wear resistance. It also allows higher max. service temperature.

ZELLAMID® 250 GF30 is used when improved load capacity or better frictional characteristics are requested. In order to machine parts in larger dimensions, it is necessary to preheat the material to 120°C before cutting and use diamond tipped saw blades. Please consult our machining guidelines.

Used in: transport and conveyer, mechanical and automotive engineering, precision engineering, paper and packaging processing machinery.

Applications: machine parts used at high temperatures, friction rings, levers, support rings, thermal insulators, housing parts and distance pieces.

ZELLAMID® 250 HI (Nylon 6.6 impact modified), ivory colour

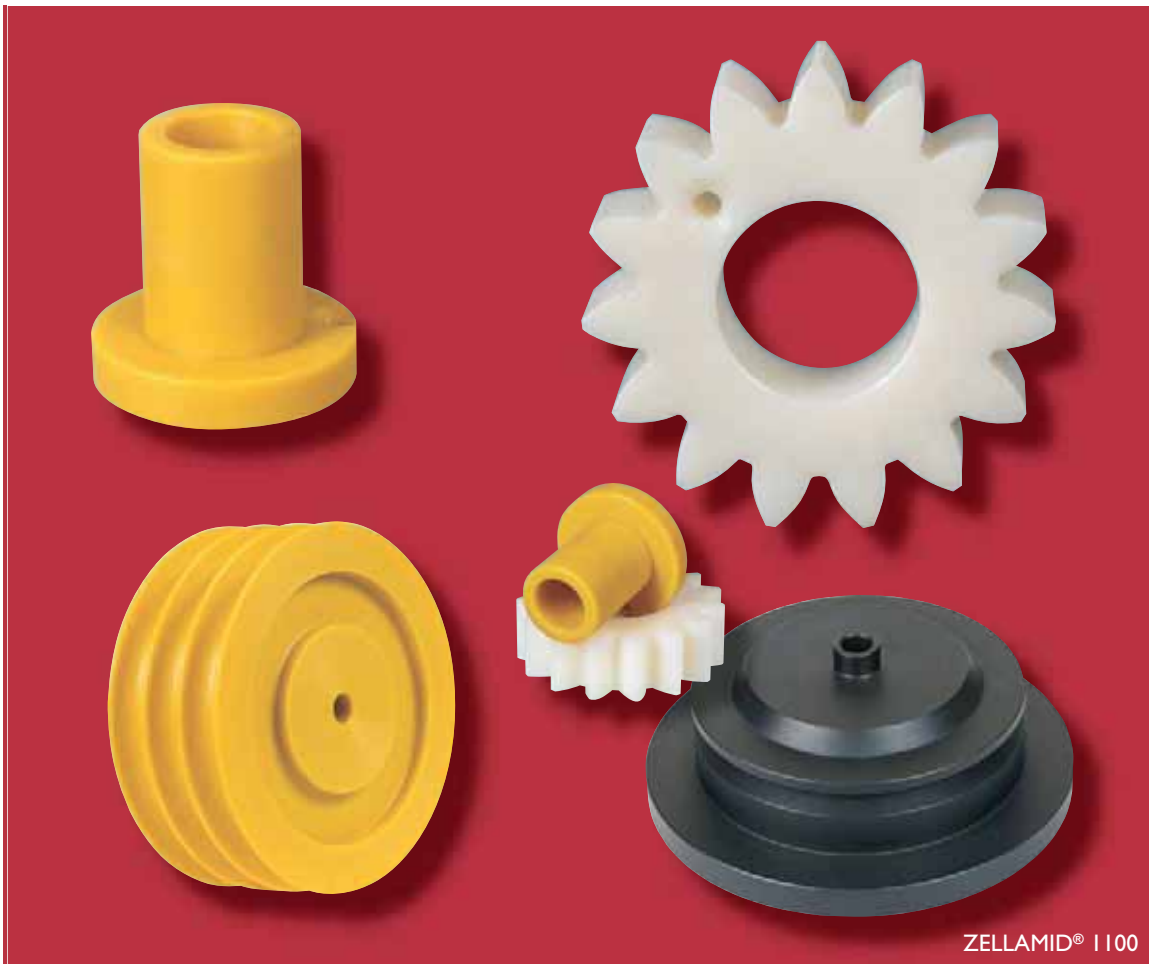
This special performance material is a super tough Polyamide 6.6 which provides high impact resistance even at low temperatures.

Applications: recoilless hammer heads and bumper pads.

ZELLAMID® 250 PE (Nylon 6.6 with a solid lubricant), light green colour

This material has a very low coefficient of friction combined with very little wear. It is resistant to high loads and has virtually no slip/stick.

Applications: gripper rods in weaving machines, bushes for brake linkages of bogies for freight wagons, gliding and wear pads in the crane industry.



ZELLAMID® 1100

ZELLAMID® 1200 (Nylon 12), natural colour

This extruded Polyamide, type PA12 (Polylaurin-lactam) has an outstanding impact resistance; it withstands most chemicals and displays same properties over a large range of temperatures, even with cryogenic applications. It has the lowest density of the polyamide product family.

Applications: hydraulic cylinder inlays for loading ramps and platforms, valves and gaskets in the chemical industry.

**Cast PA Products:
Polyamide (Cast Nylon)**

For details consult our special Leaflet: Polytech

ZELLAMID® 1100 (Cast Nylon 6), ivory, black, blue and custom colours

This material is a heavy duty, high impact and chemical resistant material appropriate for larger parts. It has high wear resistance at low and middle speeds and performs especially well under harsh conditions such as contact with sand or dust. Due to its balanced mechanical properties and its exceptional machineability it is the ideal engineering material for a wide range of applications.

ZELLAMID® 1100 MO (Cast Nylon 6 filled with Molybdenum Disulfide (MoS₂)), black colour

Molybdenum Disulfide (MoS₂) is added evenly throughout the PA 6 polymer matrix to improve its load carrying capabilities. It offers improved UV-resistance and good sliding characteristics. The impact and fatigue resistance inherent to unmodified ZELLAMID® 1100 remains unchanged.

ZELLAMID® 1100 Oil (Cast Nylon 6, filled with oil), yellow colour

Our company was world-wide the first manufacturer to develop a really usable cast nylon in which a special oil is embedded homogeneously into the molecular structure giving the stock shapes a superior wear resistance and a lower coefficient of friction. These advantages are particularly noticeable when there is a combination of static and dynamic friction.

ZELLAMID® 1100 T (Cast Nylon 6, filled with a solid lubricant), grey colour

A cast nylon with special additives and solid lubricants with a focus on the sliding properties of the material, making a low friction coefficient of just 0,15 possible. Additionally, the tendency towards



ZELLAMID® 1100

unwanted stick-slip effect can be reliably reduced to a minimum.

ZELLAMID® 1100 TX (Cast Nylon 6 with solid lubricants), natural, grey, green, red colours

This special performance Cast Nylon, improved with additional internal lubricants has even better wear resistance and PV capabilities than Zellamid® 1100 T with almost no stick-slip effect at all. It is the ideal bearing material for applications in which low friction, long life-time and a precise and uniform motion control under load are important.

ZELLAMID® 1100 X (Cast Nylon 6 heat stabilized), black colour

This product offers a 20-30°C higher continuously allowable service temperature. Its resistance to thermal-oxidative degradation and heat-aging performance is excellent.

ZELLAMID® 1115 (Cast Nylon 6/12 impact modified), natural colour

This copolymer has higher impact strength, lower moisture absorption and better creep resistance than Cast Nylon 6.

ZELLAMID® 1120 FE (Cast Nylon 6/12 with a metal core), natural colour

The combination of ZELLAMID® 1120 with a metal core unites the advantages and special properties of both materials into one exceptional product which assures optimal and reliable power transmission.

ZELLAMID® 1200 G (Cast Nylon 12), natural colour

Cast nylon 12 is manufactured from the raw material Laurinlactam in a pressureless monomer moulding process. The seamless transition from



ZELLAMID® 900 SW

polymerisation to crystallisation creates a high crystalline structure for rigid applications.

Applications: Vibration dampeners, tie fasteners for High Speed Rail Roads, shock absorbers in bumpers and crash buffers in railway-wagons, mobile phone antennas.

POM Products:

Acetal (Polyoxymethylene)

ZELLAMID® 900 (POM Copolymer), natural white colour and ZELLAMID® 900 SW, (POM-C), black colour

POM is a semicrystalline thermoplastic and is characterized by a low coefficient of friction and good wear properties, unaffected by wet environments. POM offers good resistance to a wide range of chemicals including many solvents. As water absorption is almost zero, dimensional accuracy and stability is higher than that of Nylons. Acetal provides high strength and stiffness coupled with easy machineability. ZELLAMID® 900 is also noted for its high mechanical strength, heat resistance and good antifriction properties.

ZELLAMID® 900 is according to ASTM D 6100 porosity free and most formulations are approved for contact with food (BfR, FDA compliant). For parts which need to be dimensional stable even exposed to humid or wet environments copolymeric Acetal offers better hot water, thermal and chemical resistance than homopolymeric Acetal.

ZELLAMID® 900 can also be custom made in various colours.

Used in: Food processing, agriculture, medical, electric, electronic, automotive, general machine building, transport and logistics, bottle and car washing equipment, sports equipment, office machinery, textile.

Applications: bearings and bushings in humid and wet environments, gears, guide rollers in lift gate systems, levers, springs, snap connectors, cam switches, clamps, pump components, mud handling equipment, instrument handles.

ZELLAMID® 900 AS (Antistatic POM Copolymer), ivory colour

Static electricity is dissipated along the surface and this product does not need humidity or other surface treatments to achieve the antistatic performance. The excellent technical value of surface resistivity of $10^{10} \Omega$ and volume resistivity of $10^9 \Omega \cdot \text{cm}$ are offering cutting edge properties for new applications in various industries. The permanently antistatic property is not influenced by humidity and there is no migration taking place. The product is not containing carbon and therefore prepared for clean room applications. The excellent POM-C (Acetal copolymer) properties as high impact strength, low wear and dimensional stability are not much changed.

Applications for electrical conductive and antistatic Acetals: Parts in use where electrical discharge in operation is a problem.

Used in: robotics, material handling, mining, high speed printing, electric, electronic and semiconductor industries, mobile phone production plants.

Applications: insulators, relay and transformer housings, bearings, slide pads, integrated circuits, hard disk drives, circuit boards, coil bodies.

ZELLAMID® 900 XU ELS (Conductive POM Copolymer filled with Carbon Nanotubes), black colour

Zell-Metall Engineering Plastic's groundbreaking Nanotechnology insures that the important properties of POM-C (Acetal copolymer) remain unchanged, outperforming commonly available grades which are using up to 40% of carbon fillers which reduce the stiffness and yield strength as much as 50%. The very low surface resistivity of $10^3 \Omega$ to $10^4 \Omega$ and the volume resistivity of $10^4 \Omega \cdot \text{cm}$ are achieved by adding Nanoparticles.

ZELLAMID® 900 PE (POM copolymer with a solid lubricant), light blue colour

The ZELLAMID® PE series have been created for demanding sliding applications. They are used in mechanical systems and apparatus engineering. They are polymer alloys suitable for structural parts. ZELLAMID® PE products have to withstand the highest loads. Both formulations have extreme tribological properties. They are wear resistant with minimal coefficients of friction.

Used in: Highly stressed sliding and guide elements.

ZELLAMID® 900 XT (POM Copolymer with a solid lubricant), light grey colour

This solid lubricated Copolymer Acetal displays outstanding tribological properties. Parts can operate at higher speeds while exhibiting reduced wear. The stick-slip behaviour is reduced.

Applications: Bearings and moving parts where low friction and long wear life are important.

ZELLAMID® 900 XAF (POM Homopolymer with PTFE fibres), brown colour

This special performance material is a POM Homopolymer Type filled with PTFE fibers, uniformly dispersed in the polymer matrix. It displays better wear characteristics than unfilled POM-Homopolymer. Parts made of this material are virtually free of stick-slip behaviour.

Applications: Bushes and bearings.

ZELLAMID® 900 XMD (metal detectable POM Copolymer), sapphire colour

This special POM grade was developed for the Food Industry in order to detect foreign material during food processing. This material is detectable by standard metal detectors.

ZELLAMID® 900 H (POM Homopolymer), white colour and ZELLAMID® 900 H SW, (POM-H) black colour

POM homopolymers have a higher density, hardness, strength and better creep resistance due to their higher degree of crystallinity.

ZELLAMID® 900 H has also a lower thermal expansion rate. However, POM homopolymer has a higher impact resistance and better abrasion resistance. Homopolymeric Acetal offers additional strength and rigidity and slightly higher mechanical properties than copolymeric Acetal and delivers outstanding fatigue and impact resistance. ZELLAMID® 900 H has very good kinetic friction properties.

Used in: medical, pumps, chemical equipment, sport equipment, automotive.

Applications: sliding elements, coil bodies, snap elements, structural keels for prosthetic devices, guides for blood pumps, thin walled bushings, cages and clutch elements.



ZELLAMID® I400 T

**Thermoplastic Polyester:
PET, PBT and TPE Products**
(Polyethylene Terephthalate, Polybutylene Terephthalate, Co-Polyester Elastomere)

ZELLAMID® I400 (PET copolymer), white colour and ZELLAMID® I400 SW (PET-C), black colour

PET is a partly crystalline thermoplastic Polyester based on Polyethylene-Terephthalate. This material features outstanding dimensional stability as it is virtually unaffected by ambient moisture. A low coefficient of friction and excellent wear resistance combined with low creep and high modulus make this the choice material for moving parts. Hot water resistance is low but it has better resistance to acids than Nylon or Acetal.

ZELLAMID® I400 is produced without centreline porosity and is approved for contact with food (BfR, FDA). As it is more rigid than other thermoplastics, please consult our machining guidelines.

ZELLAMID® I400 T (PET Copolymer with a solid lubricant), light grey colour

This internally lubricated material shows a significantly reduced friction coefficient and increased

resistance to wear compared to unfilled PET. It even outperforms materials such as wax or oil filled Cast Nylon products or other lubricated materials such as Delrin® AF blends. It is also a material of choice for applications involving soft metal and plastic mating surfaces.

Used for: parts exposed to high pressure and velocity.

Applications: rollers, toothed gears, valves, distribution valves, precision plain bearings, plug connectors.

ZELLAMID® I400 HI (PET Homopolymer impact modified), white colour

This product is a proprietary special performance PET Homopolymer. It has the highest impact resistance of all PET products and shows enhanced wear resistance and stiffness with superior tribological properties. It is produced out of PET Homopolymer and shows enhanced wear resistance and stiffness.

For high impact and applications which call for very good abrasion properties and parts with sharp edges. Through the toughness of this material machining is easier and quicker.

Used in: medical, pharmaceutical, food processing,



printing, logistics and transport, electric, electronic and semiconductor, automotive. Used for parts with especially high demand on precision.

Applications: bushings and bearings, gears, cams, mandrels, manifolds, wear strips, hamburger and nugget dies, food piston pumps, valves and valve bodies, feeder blocks, filter tracks, electrical insulators, liquid and gas proof parts, locating disks, timing screws, fuel pump components, fuel system connectors and rotors. All applications in which unfilled PET-Copolymer and PET Homopolymer are used; ideal for threaded applications and for those parts which have sharp edges.

ZELLAMID® 1400 HIT (PET Homopolymer impact modified with a solid lubricant), grey colour

For high impact and applications which need very good abrasion properties and at the same time call for significantly reduced friction coefficient and increased resistance to wear compared to unfilled.

ZELLAMID® 1400 PBT (Polybutylene Terephthalate), ivory colour

This thermoplastic Polyester is based on the Butylene molecule instead of the Ethylene molecule

(PET). PBT offers excellent mechanical properties combined with good chemical resistance.

ZELLAMID® 1400 PBT has good impact resistance and toughness, low coefficient of friction combined with good sliding and wear characteristics. High strength and durability with good dimensional stability due to low water absorption are some of the other properties. ZELLAMID® 1400 PBT is approved in USA for medical applications (USP6).

Used in: plug connector strips, cams, control discs, medical devices.

ZELLAMID® 6000 X (TPE), natural colour

This Thermoplastic Copolyester Elastomer combines the advantages of engineering thermoplastics with the flexibility of rubbers and can be used over a wide range of temperatures and has exceptional fatigue resistance, creep resistance and resistance to oils, greases and many other chemicals. It can perform or even outperform functions that normally require conventional rubbers.

Used in: Railway Industry for vibration dampening connectors between tie and rail and as shock absorber inside the crash-bumpers of the wagons.

High performance extruded engineering plastic products

PEEK Products: Polyetheretherketone

ZELLAMID® 1500 (PEEK), brown colour

PEEK is a high-temperature-resistant thermoplastic and can be used continuously up to 260° C and in hot water or steam. It displays outstanding mechanical performance in both high temperature and cryogenic conditions.

When exposed to a flame there is very low smoke and toxic gas emission. Unfilled ZELLAMID® 1500 (and 1500 X) stock shapes are compliant for food contact (BfR, FDA). The material also resists a wide range of solvents and organic solvents. It is self-extinguishing and carries a flammability UL 94V-0 rating. ZELLAMID® 1500 (and 1500 X) have a balanced profile of properties such as low level of creep combined with a high modulus of elasticity.

PEEK is a high strength alternative to Fluoropolymers featuring better performance in wear and abrasion applications. It is a material with outstanding tribological properties.

ZELLAMID® 1500 X (PEEK), brown colour

This special PEEK product displays slightly higher temperature resistance and impact strength. Due to lower Ion emissions it has advantages in the electric and electronic industries as well as in the semiconductor industries. In addition it is a superior material when it comes to cost-effectiveness.

Used in: food processing, aerospace, automotive, defence, electronics and semiconductor, oil and gas, nuclear- and hydropower, vacuum, medical, wire and cable production.

Applications: plastic valves and rings in compressor applications, bearings, seals, precision cutting blades, energy efficient pumps, piston units, washers, bearings, transmission components, braking and air-conditioning systems, actuators, gears and electronic sensors, impeller wheels for pumps, centrifugal pump wear parts, CMP rings, wafer carriers, etch rings, gaskets, wafer chucks, back-end components, test sockets, fasteners and wands, grips.

ZELLAMID® 1500 T (PEEK filled with 10% Carbon Fibre, 10% Grafite, 10% PTFE), black colour

High performance tribological properties and very low wear are further characteristics of this modified PEEK with high pressure-velocity capabilities. The material has good engineering properties, as it is tough, strong, rigid and creep resistant.

Applications: Friction bearings under high load and at the same time exposed to high temperatures.

ZELLAMID® 1500 GF30 (PEEK filled with 30% Glass fibre), grey colour

This glass fiber filled material significantly reduces the rate of thermal expansion and increases the flexural modulus of unfilled PEEK. This grade is ideal for structural applications that require improved strength, stiffness or dimensional stability, especially at temperatures above 150°C.

ZELLAMID® 1500 CA30 (PEEK filled with 30% Carbon Fibre), anthracite colour

Stiffness and compressive strength are superior to unfilled PEEK. This carbon fibre filled material features improved dimensional stability and offers excellent wear resistance as well as a very low coefficient of friction. The carbon fibres reduce dramatically the thermal expansion and the much higher thermal conductivity helps to keep the surface of a bearing cool.

ZELLAMID® 1500 C20 (Ceramic filled PEEK), white colour

This product, blended with ceramic fillers, has excellent dimensional stability across a broad range of temperature and humidity conditions and has good dielectric properties for isolative applications. When compared to PAI or other imidized polymers, this grade has greater hydrolytic stability. When compared with ceramics, it is half the weight and offers greater impact resistance and toughness.

Other high performance materials:

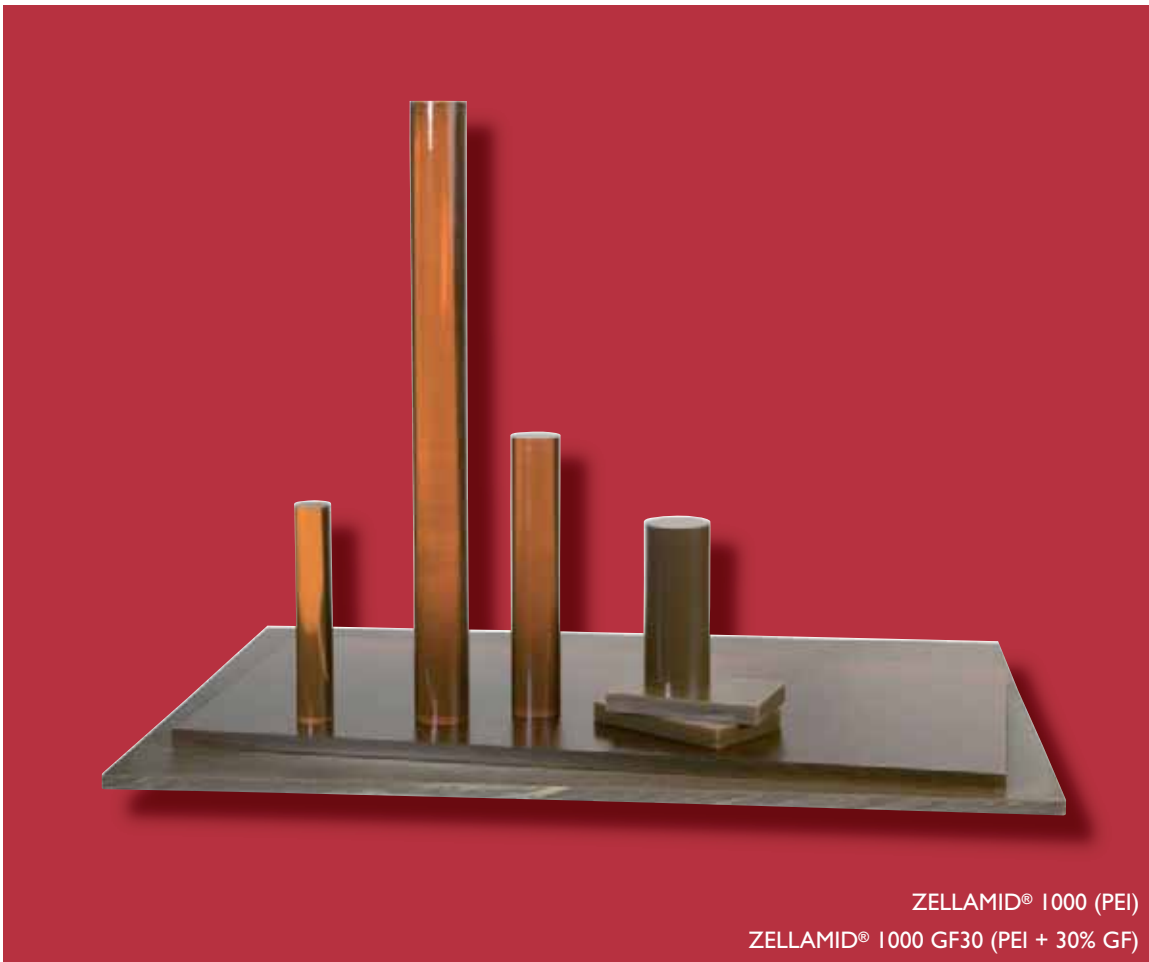
ZELLAMID® 1000 (PEI), amber colour and ZELLAMID® 1000 GF30 (PEI filled with 30% Glass fibre), grey colour

PEI is a high strength amorphous thermoplastic polymer and performs in continuous use up to 170°C paired with an excellent flame resistance (UL 94V-0) and low smoke generation.

ZELLAMID® 1000 is ideal for high strength plus high heat applications and those requiring excellent electrical insulating properties which are stable over wide ranges of temperature and frequency. It is hydrolysis resistant, highly resistant to a broad range of chemicals though chemical resistance is strongly dependent on stress.

ZELLAMID® 1000 is capable of withstanding repeated autoclaving cycles. PEI is also resistant to gamma radiation. It excels in medical reusable applications requiring repeated sterilization.

The glass reinforced ZELLAMID® 1000 GF30 (PEI filled with 30% Glass fibre) yields a product with



ZELLAMID® 1000 (PEI)

ZELLAMID® 1000 GF30 (PEI + 30% GF)

an exceptional strength-to-weight ratio and increased tensile strength with even greater rigidity and dimensional stability and low creep. PEI can also be custom made with 10% (ZELLAMID® 1000 GF10) or 20% (ZELLAMID® 1000 GF20) Glass fibre filling.

Good impact resistance, although chemical attack under stress might lead to cracking.

Used in: medical, electrical, electronic and semiconductor, automotive, aerospace and specialty applications.

Applications: load-bearing components, structural probes, microwave applications, replacing glass in medical lamps, reusable medical devices, manifolds resistant to daily sanitation, high voltage circuit-breaker housings, electrical insulators, electrical hardware components, integrated-circuit chip carriers for accelerated testing at high temperatures, non-combustible plenum connectors, high-temperature bobbins, coils and fuse blocks, under-the-hood automotive components, connector clamps for printed-wiring boards, jet-engine components.

ZELLAMID® 1900 (Polyphenylenesulfide), beige colour

PPS is a lower cost alternative to PEEK in applications at somewhat lower temperatures. PPS is a semi-crystalline engineering thermoplastic suitable for components demanding thermal stability up to 200°C, high dimensional stability and offers broad resistance to chemicals. PPS has good creep resistance at elevated temperatures. Moisture absorption in ZELLAMID® 1900 is negligible and so ensures that electrical insulating properties such as dielectric constant and dissipation (loss) factor are unaffected by wet or humid application conditions. ZELLAMID® 1900 has no known solvents below 200°C and is inert to steam, strong bases, fuels and acids. Unfilled PPS is not usually considered for bearing or other wear applications, but it has shown superior wear resistance in such applications involving aggressive chemical environments. PPS products are inherently flame retardant.

ZELLAMID® 1900 GF 40 (PPS filled with 40% Glass fibre), beige colour

This material offers better dimensional stability and thermal performance than unfilled ZELLAMID® 1900.



Used in: medical, automotive, electrical equipment, electronic and semiconductor, gas and oil exploration and production, chemical production, pump and under-hood automotive applications.

Applications: High pressure liquid chromatography components, diagnostic device parts, parts for electrical ovens, pump housings and valve, compressor components, lantern rings in centrifugal, chemical and mining pumps, flow meter rotors, engine sensors, electronic test sockets and fixtures, plug connectors, wafer retaining rings for CMP polishing, chip nests, sensor housings, highly stressed engine components for motor racing.

Zellamid® 1900 XGT (PPS modified), dark blue colour

This Bearing grade PPS is internally lubricated offering a low coefficient of thermal expansion and uncompromised chemical and hydrolysis resistance. Even at temperatures up to 220°C in air it maintains good mechanical properties such as rigidity, stiffness and creep.

ZELLAMID® 2100 (Polyphenylsulfone), amber colour

PPSU is an amorphous high performance thermoplastic with very good mechanical, electrical and

thermal properties for use at higher operating temperatures with low mechanical loads.

ZELLAMID® 2100 offers superior hydrolysis resistance when compared to other amorphous thermoplastics as measured by steam autoclaving cycles to failure. This makes it an excellent choice for medical devices. It also resists common acids and bases, including commercial washing solutions, over a broad temperature range. It withstands up to 210°C. Parts machined out of PPSU have very high dimensional stability.

PPSU has better impact and chemical resistance than PSU and PEI and has virtually unlimited steam sterilizability.

Used in: medical, pharmaceutical equipment, electronic, wastewater and water treatment.

Applications: sterilization trays, dental and surgical instrument handles, endoscopic probe positioning ferrules, medical wands, fluid handling coupling and fitting applications, end caps, dental and surgical instrument handles.

TECHNICAL PROPERTIES OF ZELLAMID®

Property	Unit	Test method	Condition of specimen	ZELLAMID® 202 (PA6)	ZELLAMID® 202 MO (PA6 + MoS ₂)	ZELLAMID® 202 XN (PA6 reinforced)	ZELLAMID® 250, 250 SW (PA 6.6)	ZELLAMID® 250 HI (PA 6.6)	ZELLAMID® 250 PE (PA 6.6+PE)	ZELLAMID® 250 GF30 (PA 6.6+30% Glassfibre)	ZELLAMID® 900, 900 SW (POM-C)	ZELLAMID® 900 PE (POM-C+PE)	ZELLAMID® 900 AS (POM-C antistatic)	ZELLAMID® 900 XU ELS (POM-C conductive)	ZELLAMID® 900 XT (POM-C+PTFE)	ZELLAMID® 900 XMD (POM-C metal detectable)	ZELLAMID® 900 H, 900 H SW (POM-H)	ZELLAMID® 1400, 1400 SW (PET-C)
MECHANICAL PROPERTIES																		
Tensile strength at break	MPa	ISO 527	dry	80	75	93	80	50	65	100	70	40	40	69	63	56	72	80
	%	ISO 527	moist	50			60											
Elongation at break	%	ISO 527	dry	50-100	25	5	50	32	11	8	40	7	72	11	22	10	40	20
	MPa	ISO 527	moist	200			150											
Modulus of elasticity in tension	MPa	ISO 527	dry	3000	2700	4200	3200	2000	2700	4800	3000	2200	1380	3600	2800	3200	3100	3200
	kJ/m ²	ISO 179/1eU	moist	1500			1600											
Charpy Impact strength	+ 23°C	ISO 179/1eU	dry	no break	no break		no break	no break	35	20	no break	17	no break	80		90	no break	82
	- 40°C	ISO 179/1eA	dry	no break			no break	no break			80							
Charpy Impact strength (notched)	kJ/m ²		dry	70			80	80	3			2,5		3,4			11	14
	kJ/m ²	ISO 868	moist					18										
Hardness Shore, scale D			dry	75	80	80	80		80	85	81	77	74	80	80	81	84	81
Time yield limit $\sigma_{1/1000}$	23°C/50% RH	ISO 899	moist	5,5			6,0				14							12
	100°C	ISO 899	dry	2,5			3,5									60		
Apparent modulus E _{C1000 20}	23°C/50% RH	ISO 899	moist	230			400											
THERMAL PROPERTIES																		
Heat distortion temperature, ISO 75	Method A	ISO 75	dry	55-75		168	100	64	120	250	110	120				98	105	67
	Method B	ISO 75	dry	>160			>200	132		250	160							165
Melting point	Method A	ISO 3146		220	220	215	255	263		255	164-168		165	175	165		178	255
Max. service temperature for few hours operation				≤ 180			≤200			200					140	100		160
TEP 5 000 hours (50% of tensile strength) ¹⁾		IEC 216		90			95											115
TEP 20 000 hours (50% of tensile strength) ¹⁾		IEC 216		75		140	80			150	100				100			100
Thermal coefficient of linear expansion		DIN 53752	dry	7-10			7-10		8,5	2-3	11	14				120	10	6
Thermal conductivity	Method A		dry	0,23			0,23			0,27								
Specific heat		IEC 1006	dry	1,7			1,7			1,5	1,5					10		
DIELECTRIC PROPERTIES																		
Dielectric constant	1 MHz	IEC 250	dry	3,5			3,2		3,3		3,8	4,4				3,7		3,3
		IEC 250	moist	7,0			5,0											
Dissipation factor tan δ	1 MHz	IEC 250	dry	0,023			0,026				0,024	0,003						0,02
		IEC 250	moist	0,3			0,2											
Dielectric strength	KV/mm	IEC 243	dry	100			120	31		30	>20		14		33			50
	KV/mm	IEC 243	moist	60			80											
Volume resistivity	$\Omega \cdot \text{cm}$	IEC 93	dry	10 ¹⁵	>10 ¹²	>10 ¹²	10 ¹⁵		10 ¹⁵	>10 ¹²	10 ¹⁵	10 ¹⁴	10 ⁹	10 ⁴	>10 ¹³	>10 ¹²	>10 ¹²	10 ¹⁶
	$\Omega \cdot \text{cm}$	IEC 93	moist	10 ¹²			10 ¹²											
Surface resistivity R _{OA}	Ω	IEC 93	dry	10 ¹³	>10 ¹²	10 ¹¹	10 ¹³	>10 ¹²	10 ¹³	10 ¹¹		10 ¹⁴	10 ¹⁰	10 ⁴	>10 ¹³	>10 ¹²	>10 ¹²	
	Ω	IEC 93	moist	10 ¹⁰			10 ¹⁰											
Resistance to tracking	KA/ KB method	IEC 112	dry/moist	KB > 600			KB>600					KB >600						KA>450
	KC method	IEC 112	dry/moist	KC > 600			KC>600											KC>600
MISCELLANEOUS PROPERTIES																		
Mass density	Method D, E	ISO 1183	dry	1,13 - 1,15	1,15	1,15	1,15	1,08	1,12	1,35	1,41-1,43	1,34	1,35	1,41	1,44	1,56	1,42-1,43	1,36
Moisture absorption at 23°C, 50% RH	Saturation	ISO 62		3,0± 0,4	3		2,8± 0,3		2,2	1,5	0,20	0,2			0,2	<0,1	0,2	~0,23
Water absorption at 23 °C	Saturation	ISO 62		8,0± 0,5	8		8,5± 0,5	2,2	8,5	5,5	0,25	0,8			0,6			0,5
Fire performance	Flameability Acc.VDE	VDE 0304	dry	II b			II b											II b
	Flameability of interior materials in passenger cars h>1mm	FMVSS 302	moist	< 100			<100											<100
	Flameability according UL Stand. (thickness of specimen 1,6 mm)	UL 94		HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB		HB	HB
Resistance to wear ²⁾		ISO 7148-2	dry						4,3			2,1			3			22

● Dry = dried at 80°C and 1 mbar until weight is constant (moisture content less than 0,2%) ● Moist = after storage in a standard atmosphere of 23° C and 50% relative humidity (DIN 50014) until saturation.
 ● ¹⁾ Data of the resin only ● ²⁾ Made by a pin / rotating disc test according DIN-ISO 7148-2 under following conditions: R_a = 0,35 – 0,45 μm (steel disc), v = 0,3 m/s, p = 3 N/mm², time T>16h ● All information is without warranty and liability. ● See page 49 - Legal Notes

Property	Unit	Test method	Condition of specimen	ZELLAMID® 1400 HI (PET-High imp.)	ZELLAMID® 1400 T (PET-C+solid lubricant)	ZELLAMID® 1400 PBT (PBT)	ZELLAMID® 1500 (PEEK)	ZELLAMID® 1500 T (PEEK mod.)	ZELLAMID® 1500 X (PEEK)	ZELLAMID® 1500 GF 30 (PEEK+30% Glassfibre)	ZELLAMID® 1500 CA 30 (PEEK+30% Carbon fibre)	ZELLAMID® 1500 C20 (PEEK Ceramic filled)	ZELLAMID® 1000 (PEI)	ZELLAMID® 1000 GF30 (PEI+30% Glassfibre)	ZELLAMID® 1900 (PPS)	ZELLAMID® 1900 GF40 (PPS+40% Glassfibre)	ZELLAMID® 2100 (PPSU)	
MECHANICAL PROPERTIES																		
Tensile strength at break	MPa	ISO 527	dry	85	75	56	97	141	95	155	240	95	105	169	33	185	70	
	%	ISO 527	moist															
Elongation at break	%	ISO 527	dry	23	5	>50	25	2	30	2	1,7	20	60			1,9	>60	
	MPa	ISO 527	moist															
Modulus of elasticity in tension	MPa	ISO 527	dry	3250	3230	2600	3600	9000	3500	11000	25	4100	3200	9300	4200	14000	2300	
	kJ/m²	ISO 179/1eU	moist															
Charpy Impact strength	+ 23°C	kJ/m²	ISO 179/1eU	dry	59	23	no break	no break		no break	11,3	45	no break	no break		no break	45	no break
	- 40°C	kJ/m²	ISO 179/1eA	dry									section break					
Charpy Impact strength (notched)	kJ/m²			dry	3,9	10	6			6,5	8,9	6,4	7 break					
	kJ/m²	ISO 868	moist										7 break					
Hardness Shore, scale D			dry	84	81	80	88	85	87	91			86	93			84	
Time yield limit $\sigma_{1/1000}$	23°C/50% RH	MPa	ISO 899	moist														
	100°C	MPa	ISO 899	dry														
Apparent modulus $E_{C/1000,20}$	23°C/50% RH	MPa	ISO 899	moist														
THERMAL PROPERTIES																		
Heat distortion temperature, ISO 75	Method A	°C	ISO 75	dry	93,6		50	152	293	153	315	336	155	190	210	95	200	207
	Method B	°C	ISO 75	dry	189,5		135			176			210	200	212	115	270	
Melting point	Method A	°C	ISO 3146		249		235	340	340	340	340	343	ca.340			280	280	225
Max. service temperature for few hours operation		°C			160	160		300	300	300			240					
TEP 5 000 hours (50% of tensile strength) ¹⁾		°C	IEC 216		115	115		260	260	260								
TEP 20 000 hours (50% of tensile strength) ¹⁾		°C	IEC 216		100	100				234								
Thermal coefficient of linear expansion		1/K.10 ⁻⁵	DIN 53752	dry		6	9-15	4,7	2,2	5,8	1,7	5	0,45	5		5,5	3	5,6
Thermal conductivity	Method A	W/(K.m)		dry				0,25	0,24			0,92						
Specific heat		J/(g.K)	IEC 1006	dry								8						
DIELECTRIC PROPERTIES																		
Dielectric constant	1 MHz		IEC 250	dry			3,2	3,2			3,2					3,4		
			IEC 250	moist														
Dissipation factor tan δ	1 MHz		IEC 250	dry				0,004		0,005	0,004					0,0023		
			IEC 250	moist														
Dielectric strength	KV/mm	IEC 243	dry					20			20							
	KV/mm	IEC 243	moist															
Volume resistivity	Ω .cm	IEC 93	dry				5x10 ¹³	10 ¹⁶		10 ¹⁵	10 ¹⁶			>10 ¹³	>10 ¹³	>10 ¹²	>10 ¹²	>10 ¹³
	Ω .cm	IEC 93	moist															
Surface resistivity R_{0A}	Ω	IEC 93	dry	>10 ¹³			>10 ¹²			10 ¹⁵				>10 ¹³	>10 ¹⁵	>10 ¹²	>10 ¹²	>10 ¹⁵
	Ω	IEC 93	moist															
Resistance to tracking	KA/ KB method		IEC 112	dry/moist														
	KC method		IEC 112	dry/moist														
MISCELLANEOUS PROPERTIES																		
Mass density	Method D, E	g/cm³	ISO 1183	dry	1,4	1,38	1,3	1,32	1,48	1,29	1,51	1,4	1,49	1,27	1,51	1,35	1,64	1,29
Moisture absorption at 23°C, 50% RH	Saturation	%	ISO 62		0,3	~0,23		0,1	0,06		0,11			0,7				0,37
Water absorption at 23 °C	Saturation	%	ISO 62		0,5	~0,5		0,5	0,5		0,04	0,04	0,4	1,25		0,02	0,02	1,1
Fire performance	Flameability Acc.VDE		VDE 0304	dry														
	Flameability of interior materials in passenger cars h>1mm	mm/min	FMVSS 302	moist														
	Flameability according UL Stand. (thickness of specimen 1,6 mm)		UL 94		HB	HB	HB	V0	V0	V0	V0	V0	V-0	V0	V0	V0	V0	V0
Resistance to wear ²⁾		μ m/km	ISO 7148-2	dry	1,9	1,1												

● Dry = dried at 80°C and 1 mbar until weight is constant (moisture content less than 0,2%) ● Moist = after storage in a standard atmosphere of 23° C and 50% relative humidity (DIN 50014) until saturation.
 ● ¹⁾ Data of the resin only ● ²⁾ Made by a pin / rotating disc test according DIN-ISO 7148-2 under following conditions: $R_a = 0,35 - 0,45 \mu$ m (steel disc), $v = 0,3$ m/s, $p = 3$ N/mm², time $T > 16$ h ● All information is without warranty and liability. ● See page 49 - Legal Notes

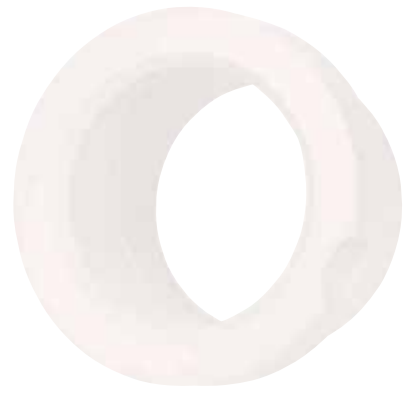
ZELLAMID® RESISTANCE TO CHEMICALS

		202 (PA 6) 202 MO (PA6+MoS ₂) 250 (PA 6.6) 250 GF30 (PA 6.6 + 30% Glassfibre) 250 PE (PA6.6+PE) 1100 (PA 6 C)	900 (POM-C) 900 SW (POM-C) 900 PE (POM-C+PE) 900 H (POM-H) 900 H SW (POM-H)	1400 (PET-C) 1400 SW (PET-C) 1400 T (PET-C+solid lubricant) 1400 HI (PET-H) 1400 PBT (PBT)	1500 (PEEK) 1500 GF30 (PEEK+30% Glassfibre) 1500 T (modified)	1000 (PEI) 1000 GF30 (PEI+30% Glassfibre)	1900 (PPS) 1900 GF40 (PPS+40% Glassfibre)	2100 (PPSU)
Acetone	TR	A	A	C	A	D	A	D
Acetylchloride	TR	D	D					
Acetylene	TR	A	A	A	A			A
Alkylbenzoic	TR	A	A					
Alu. salts of min.acids	20	B	B	A	A			A
Formic acid	10	B	D	A	B	A		A
Ammonia	TR	B	A	D	A			
Benzene, Benzaldehyde	H	A	A	D	A	C	B	B
Chlorine moist	H	D	D	B	D			
Boric acid	10	A/B	A	A	A			A
Bromwater	GL	D	D		A			
Butadien	TR	A	A	A			A	
n-Butyleneglycol	TR	A	A	A	A			
Calcium chloride alcoholic	20		A					A
Chlorine, Chlorine moist	H	D	D	D	D			
Chlorobenzene	TR	A	A	D	A	A	B	C
Chloroform	TR	B	C	D	A	C	B	D
Citric acid aqueous	10	A	A	A	A			A
Cyclohexane/Cyclopetone	TR	A	A	A	A	A	A	A
Dichlortrethylene	TR	A	D	D	A			
Dichlortetrafluorethan	TR	A	A	A	A			
Dimethyleter	TR	A	A	A	A			
Inert Gas	TR	A	A	A	A	A	A	A
Developing liquid	H	A	A	A	A			
Mineral oil, Natural gas	H	A	A	A	A	A	A	A
Acetic acid aqueous	95	D	D	C	A	C	A	A
Ethanol	96	A/B	A	A	A	A	A	A
Essential oils	H	A	A	A	A			
Alcoholic fat	H	A	A	A	A			
Fatty acid	TR	A	A	A	A			
Flurinated hydrocarbons	H	A	A	A				
Flurinated hydroacid aq.	40	D	D	D				
Fixer solution	H	A	A	A				
Galvanic baths	H	B/D	D					
Glycerine	TR	A	A	A	A	A		A
Glyceral	TR	A	A	A	A			
Glyceral acid aqueous	30	D						
Glystantin	H	A	A	D				
Uric acid aqueous	10	A	A	A	A			A
Helium and rare gas	TR	A	A	A	A	A	A	A
Heptan Hexan	TR	A	A	A	A	A	A	A
Hydraulic oils	H	A	A	A	A	A	A	A
Impregnating oils	H	A	A	A	A			
Iso-octan	80	A	A	A	A	A	A	A
Isocyanate	H	A	A	A				
Cold machine oil	H	A	A	A	A			
Potash lye	50	A	A	D	A		A	A
Potassiumchloride	10	A	A	A	A		A	A
Hydrofluoristic acid	30	D		D				
Carbon dioxide		A	A	A	A		A	A
Super Otto-fuel	H	A	A		A			
Diesel fuel	H	A	A	A	A		A	A
Turbine aircraft fuel	H	A	A	A	A		A	A
Kerosene	H	A	A	A	A		A	A

● A: Little or no change in weight and no damage ● B: After some time significant change in weight, possible discoloration, reduction in strength and possible light embrittlement ● C: Under certain conditions, e.g. if exposure to the reagent is brief, articles may sometimes remain serviceable ● D: Strongly attacked within a short time ● GL: Saturated aqueous solution (at 23°C) ● H: Commercial quality ● TR: Technical clean ● All information is without warranty and liability. Please see page 49 - Legal Notes.

ZELLAMID® RESISTANCE TO CHEMICALS

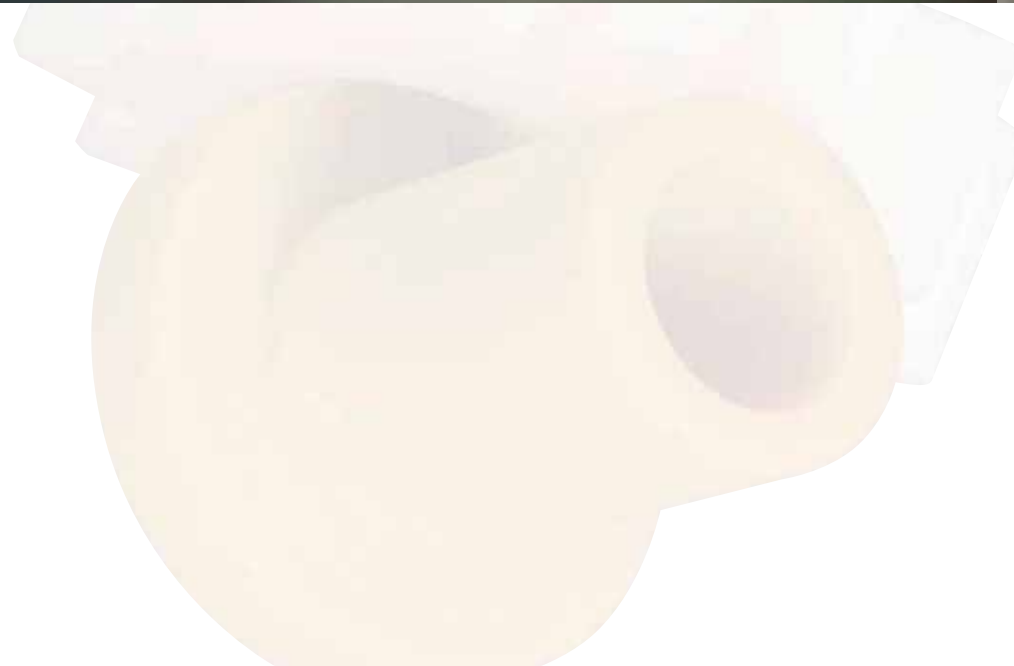
		202 (PA 6) 202 MO (PA6+MoS ₂) 250 (PA 6.6) 250 GF30 (PA 6.6 + 30% Glassfibre) 250 PE (PA6.6+PE) 1100 (PA 6 C)	900 (POM-C) 900 SW (POM-C) 900 PE (POM-C+PE) 900 H (POM-H) 900 H SW (POM-H)	1400 (PET-C) 1400 SW (PET-C) 1400 T (PET-C+solid lubricant) 1400 HI (PET-H) 1400 PBT (PBT)	1500 (PEEK) 1500 GF30 (PEEK+30% Glassfibre) 1500 T (modified)	1000 (PEI) 1000 GF30 (PEI+30% Glassfibre)	1900 (PPS) 1900 GF40 (PPS+40% Glassfibre)	2100 (PPSU)
Soldering solution	H	D	D	A	A			
Magnesium salt aqueous	10	A	A	A	A			
Seawater		A	A	A	A		A	A
Methan	TR	A	A	A	A			A
Methyl acetate	TR	A	B	B	A	B		
Methylene Chloride	TR	B/C	D	D	A		B	D
Methylene Glycol	TR	A			A	C		
Methylenglycolacetate	TR	A						
Mixed acids		D	D	D				
Engine oil	H	A	A	A				A
Naphtalene	H	A	A	A	A		A	
Naphtalenesulfanacids	TR	D	D	D	C			
Sodium salts aqueous	10	A	A	A	A			A
Sodium hypophosphit aqueous	10	A	A	A				
Sodium bisulfit aqueous	10	A	A	A	A			A
Caustic soda solution	10	A	D	D				
Nitrobenzene	TR	B	A	A	A		A	
Octane Octene	TR	A	A	A	A	A		A
Oleric acid	H	A	A	A	A			A
Ozone	TR	B/C	B/C	B/C	A/B			A
Petroleum	TR	A	A	A	A		A	A
Phenylethylalcohol	TR	A/B						
Phosphoric acid	10	D	A	A	A	A	A	
	85							
Propane	TR	A	A	A	A			A
Mercury	TR	A	A	A	A			A
Mercury chlorid aqueous	GL	D			A			A
Nitric acid	>50	D	C	C	B			A
Hydrochloric aqueous	>20	D	B	B	A	B	A	B
Oxygen under pressure	TR	A	A	A	A			
Sulphurdioxid dry	TR	A			A			
	moist	TR	B		A		A	
Sulphereous acid	GL	B	A	A	A			
Sulphuric acid	>80	D	D	D	A			
Sodium Carbonate	10	A	A	A	A		A	A
Nitrogen gas	TR	A	A	A	A	A	A	A
Styrol	TR	A	A	A	A			
Turpentine oil	H	A	A	A	A		A	A
Tetrachloride-carbon	TR	A	A	A				
Transformer oil	H	A	A	A	A		A	A
Trichlorethylene	TR	A/B	D	D	A		B	
Uraniumfluoride	TR	D	D	D				A
Urine		A	A	A	A			A
Vinylchloride	TR	A	A	A	A			
Steam	>100	B/D	D	D	A	A		A
Hydrogen	TR	A	A	A	A	A	A	A
Hydrogensuperoxid		A	A	A				
Acidity of Wine	10	A			A			
	50	B						
Xylol	TR	A	B	B	A	B	A	B
	TR/100	A	D	D				A
Zincchloride	10	B		A	A	A	A	A
	37,5	D						
Zinc		A	A	A	A			



WE MEASURE WELL (EXACTLY)

SO THAT EVERYTHING RUNS STRAIGHT

AND OUR CUSTOMER HAS A WIDE RANGE OF CHOICES.



ZELLAMID® ROD (extruded qualities)

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities**

● ⇒ Length tolerance ⇒ 1000 mm +20/+40 mm ⇒ 3000 mm +60/ +80 mm ● Please contact us for special dimensions not listed ● Other lengths available upon request. ● Up to outside diameter 60 mm centreless ground available also ●

ZELLAMID® - Grade			202	202 MO	202 XN	250	250 SW	250 GF30	250 PE
			PA 6	PA 6+MoS ₂	PA 6	PA 6.6	PA 6.6	PA 6.6	PA 6.6 + PE
			white	black	reinforced ivory	ivory	black	+ 30% Glassfibre black	light green
Ø mm	Tolerance mm	Length mm	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m
6	+0,1/+0,4	3000	+ 0,038	+ 0,038	- 0,038	+ 0,038	- 0,038	- 0,044	- 0,037
8	+0,1/+0,5	3000	+ 0,067	+ 0,067	- 0,067	+ 0,067	- 0,067	- 0,078	- 0,065
10	+0,1/+0,5	3000	+ 0,102	+ 0,102	- 0,102	+ 0,102	- 0,102	+ 0,119	- 0,099
12	+0,2/+0,7	3000	+ 0,149	+ 0,149	- 0,149	+ 0,149	- 0,149	+ 0,174	- 0,145
14	+0,2/+0,7	3000	o 0,199	- 0,199	- 0,199	o 0,199	- 0,199	- 0,234	- 0,194
15	+0,2/+0,7	3000	+ 0,227	+ 0,227	- 0,227	+ 0,227	- 0,227	+ 0,266	- 0,221
16	+0,2/+0,7	3000	+ 0,26	+ 0,26	- 0,26	+ 0,26	- 0,26	o 0,31	- 0,25
18	+0,2/+0,7	3000	+ 0,33	+ 0,33	- 0,33	+ 0,33	- 0,33	- 0,39	- 0,32
20	+0,2/+0,7	3000	+ 0,40	+ 0,40	- 0,40	+ 0,40	- 0,40	+ 0,47	- 0,39
22	+0,2/+0,9	3000	+ 0,49	o 0,49	- 0,49	+ 0,49	- 0,49	- 0,58	- 0,48
25	+0,2/+0,9	3000	+ 0,62	+ 0,62	+ 0,62	+ 0,62	- 0,62	+ 0,73	- 0,60
27	+0,2/+0,9	3000	- 0,72	o 0,72	- 0,72	o 0,72	- 0,72	- 0,85	- 0,70
28	+0,2/+0,9	3000	o 0,77	o 0,77	- 0,77	+ 0,77	- 0,77	- 0,90	- 0,75
30	+0,2/+0,9	3000	+ 0,88	+ 0,88	- 0,88	+ 0,88	- 0,88	+ 1,03	- 0,86
32	+0,2/+0,9	3000	o 1,00	o 1,00	- 1,00	o 1,00	- 1,00	o 1,17	- 0,97
35	+0,2/+1,1	3000	+ 1,21	+ 1,21	- 1,21	+ 1,21	- 1,21	o 1,42	- 1,18
38	+0,2/+1,1	3000	o 1,41	o 1,41	- 1,41	+ 1,41	- 1,41	- 1,66	- 1,37
40	+0,2/+1,1	3000	+ 1,56	+ 1,56	- 1,56	+ 1,56	- 1,56	+ 1,83	- 1,52
45	+0,3/+1,3	3000	+ 1,98	+ 1,98	- 1,98	+ 1,98	- 1,98	- 2,32	- 1,93
50	+0,3/+1,3	3000	+ 2,43	+ 2,43	+ 2,43	+ 2,43	- 2,43	+ 2,85	- 2,37
55	+0,3/+1,3	3000	+ 2,92	+ 2,92	- 2,92	+ 2,92	- 2,92	- 3,43	- 2,84
60	+0,3/+1,6	3000	+ 3,50	+ 3,50	- 3,50	+ 3,50	- 3,50	+ 4,11	- 3,41
65	+0,3/+1,6	3000	+ 4,09	+ 4,09	- 4,09	+ 4,09	- 4,09	- 4,80	- 3,98
70	+0,3/+1,6	3000	+ 4,73	+ 4,73	- 4,73	+ 4,73	- 4,73	+ 5,55	- 4,61
75	+0,3/+1,6	3000	+ 5,41	+ 5,41	- 5,41	+ 5,41	- 5,41	- 6,35	- 5,27
80	+0,4/+2,0	3000	+ 6,20	+ 6,20	- 6,20	+ 6,20	- 6,20	+ 7,28	- 6,04
85	+0,4/+2,0	3000	+ 6,97	+ 6,97	- 6,97	+ 6,97	- 6,97	- 8,18	- 6,79
90	+0,5/+2,2	3000	+ 7,83	+ 7,83	- 7,83	+ 7,83	- 7,83	- 9,19	- 7,63
95	+0,5/+2,2	3000	o 8,70	- 8,70	- 8,70	- 8,70	- 8,70	- 10,21	- 8,47
100	+0,6/+2,5	3000	+ 9,68	+ 9,68	+ 9,68	+ 9,68	- 9,68	+ 11,36	- 9,43
110	+0,7/+3,0	3000	+ 11,76	+ 11,76	- 11,76	+ 11,76	- 11,76	- 13,81	- 11,45
120	+0,8/+3,5	3000	+ 14,05	+ 14,05	- 14,05	+ 14,05	- 14,05	+ 16,49	- 13,68
125	+0,8/+3,5	3000	+ 15,21	- 15,21	- 15,21	o 15,21	- 15,21	- 17,86	- 14,81
130	+0,8/+3,5	3000	+ 16,42	+ 16,42	- 16,42	+ 16,42	- 16,42	o 19,28	- 15,99
135	+0,8/+3,5	3000	o 17,67	- 17,67	- 17,67	- 17,67	- 17,67	- 20,74	- 17,21
140	+0,9/+3,8	3000	+ 19,05	+ 19,05	- 19,05	+ 19,05	- 19,05	- 22,36	- 18,55
150	+1,0/+3,8	3000	+ 21,79	+ 21,79	- 21,79	+ 21,79	- 21,79	+ 25,58	- 21,22
160	+1,1/+4,2	1000	+ 24,83	+ 24,83				- 29,15	
170	+1,1/+4,5	1000	+ 28,04	o 28,04					
175	+1,2/+5,0	1000	o 29,84	- 29,84					
180	+1,2/+5,0	1000	+ 31,52	+ 31,52					
190	+1,2/+5,0	1000	+ 35,02	- 35,02					
200	+1,3/+5,5	1000	+ 38,89	+ 38,89					
210	+1,4/+5,8	1000	+ 42,89						
220	+1,4/+5,8	1000	+ 46,95						
230	+1,4/+5,8	1000	+ 51,20						
250	+1,5/+6,2	1000	+ 60,45						
260	+1,5/+6,2	1000	+ 65,26						
280	+1,6/+6,5	1000	+ 75,59						
300	+1,7/+7,0	1000	+ 86,79						
310	+2,0/+8,0	1000	- 93,12						
350	+2,0/+8,0	1000							
400	+2,0/+8,0	1000							
450	+2,0/+10,0	1000							
500	+2,0/+10,0	1000							

ZELLAMID® ROD (extruded qualities)

+ bold type: dimensions normally ex stock available **o** dimensions occasionally ex stock available
- dimensions available upon minimum quantities

● →Length tolerance →1000 mm+20/+40 mm → 3000 mm +60/ +80 mm ● Please contact us for special dimensions not listed ● Other lengths available upon request. ● Up to outside diameter 60 mm centreless ground available also ●



ZELLAMID® - Grade			900	900 SW	900 PE	900 AS	900 XU ELS	900 H	900 H SW
			POM-C	POM-C	POM-C+PE	POM-C	POM-C	POM-H	POM-H
			white	black	light blue	antistatic ivory	electric conductive black	white	black
Ø mm	Tolerance mm	Length mm	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m
6	+0,1/+0,4	3000	+ 0,047	o 0,047	- 0,045	- 0,045	- 0,047	- 0,047	- 0,047
8	+0,1/+0,5	3000	+ 0,083	o 0,083	- 0,079	- 0,079	- 0,083	- 0,084	- 0,084
10	+0,1/+0,5	3000	+ 0,127	+ 0,127	- 0,120	- 0,121	- 0,127	- 0,128	- 0,128
12	+0,2/+0,7	3000	+ 0,185	+ 0,185	- 0,176	- 0,177	- 0,185	- 0,187	- 0,187
14	+0,2/+0,7	3000	+ 0,248	o 0,248	- 0,236	- 0,238	- 0,248	- 0,250	- 0,250
15	+0,2/+0,7	3000	+ 0,283	+ 0,283	- 0,269	- 0,271	- 0,283	- 0,285	- 0,285
16	+0,2/+0,7	3000	+ 0,32	+ 0,32	- 0,31	- 0,31	- 0,32	- 0,33	- 0,33
18	+0,2/+0,7	3000	+ 0,41	+ 0,41	- 0,39	- 0,39	- 0,41	- 0,41	- 0,41
20	+0,2/+0,7	3000	+ 0,50	+ 0,50	- 0,47	- 0,48	- 0,50	- 0,50	- 0,50
22	+0,2/+0,9	3000	+ 0,61	+ 0,61	- 0,58	- 0,59	- 0,61	- 0,62	- 0,62
25	+0,2/+0,9	3000	+ 0,77	+ 0,77	- 0,74	- 0,74	- 0,77	- 0,78	- 0,78
27	+0,2/+0,9	3000	- 0,90	o 0,90	- 0,85	- 0,86	- 0,90	- 0,90	- 0,90
28	+0,2/+0,9	3000	+ 0,96	+ 0,96	- 0,91	- 0,92	- 0,96	- 0,97	- 0,97
30	+0,2/+0,9	3000	+ 1,10	+ 1,10	- 1,04	- 1,05	- 1,10	- 1,11	- 1,11
32	+0,2/+0,9	3000	+ 1,25	+ 1,25	- 1,19	- 1,19	- 1,25	- 1,26	- 1,26
35	+0,2/+1,1	3000	+ 1,51	+ 1,51	- 1,43	- 1,45	- 1,51	- 1,52	- 1,52
38	+0,2/+1,1	3000	o 1,76	- 1,76	- 1,67	- 1,68	- 1,76	- 1,77	- 1,77
40	+0,2/+1,1	3000	+ 1,95	+ 1,95	- 1,85	- 1,86	- 1,95	- 1,96	- 1,96
45	+0,3/+1,3	3000	+ 2,47	+ 2,47	- 2,35	- 2,37	- 2,47	- 2,49	- 2,49
50	+0,3/+1,3	3000	+ 3,03	+ 3,03	- 2,88	- 2,90	- 3,03	- 3,05	- 3,05
55	+0,3/+1,3	3000	+ 3,64	+ 3,64	- 3,46	- 3,49	- 3,64	- 3,67	- 3,67
60	+0,3/+1,6	3000	+ 4,37	+ 4,37	- 4,15	- 4,18	- 4,37	- 4,40	- 4,40
65	+0,3/+1,6	3000	+ 5,10	+ 5,10	- 4,85	- 4,89	- 5,10	- 5,14	- 5,14
70	+0,3/+1,6	3000	+ 5,90	+ 5,90	- 5,61	- 5,65	- 5,90	- 5,94	- 5,94
75	+0,3/+1,6	3000	+ 6,75	+ 6,75	- 6,42	- 6,46	- 6,75	- 6,80	- 6,80
80	+0,4/+2,0	3000	+ 7,74	+ 7,74	- 7,35	- 7,41	- 7,74	- 7,79	- 7,79
85	+0,4/+2,0	3000	+ 8,70	+ 8,70	- 8,27	- 8,33	- 8,70	- 8,76	- 8,76
90	+0,5/+2,2	3000	+ 9,77	+ 9,77	- 9,29	- 9,35	- 9,77	- 9,84	- 9,84
95	+0,5/+2,2	3000	o 10,86	- 10,86	- 10,32	- 10,39	- 10,86	- 10,93	- 10,93
100	+0,6/+2,5	3000	+ 12,08	+ 12,08	- 11,48	- 11,56	- 12,08	- 12,16	- 12,16
110	+0,7/+3,0	3000	+ 14,67	+ 14,67	- 13,95	- 14,05	- 14,67	- 14,78	- 14,78
120	+0,8/+3,5	3000	+ 17,53	+ 17,53	- 16,66	- 16,79	- 17,53	- 17,66	- 17,66
125	+0,8/+3,5	3000	+ 18,98	+ 18,98	- 18,04	- 18,17	- 18,98	- 19,11	- 19,11
130	+0,8/+3,5	3000	+ 20,49	+ 20,49	- 19,47	- 19,62	- 20,49	- 20,63	- 20,63
135	+0,8/+3,5	3000	- 22,05	- 22,05	- 20,95	- 21,11	- 22,05	- 22,20	- 22,20
140	+0,9/+3,8	3000	+ 23,77	+ 23,77	- 22,59	- 22,76	- 23,77	- 23,94	- 23,94
150	+1,0/+3,8	3000	+ 27,19	+ 27,19	- 25,84	- 26,03	- 27,19	- 27,38	- 27,38
160	+1,1/+4,2	1000	+ 30,98	+ 30,98					
170	+1,1/+4,5	1000	+ 34,99	+ 34,99					
175	+1,2/+5,0	1000	o 37,23	- 37,23					
180	+1,2/+5,0	1000	+ 39,33	+ 39,33					
190	+1,2/+5,0	1000	+ 43,70	+ 43,70					
200	+1,3/+5,5	1000	+ 48,53	+ 48,53					
210	+1,4/+5,8	1000	+ 53,52	+ 53,52					
220	+1,4/+5,8	1000	+ 58,58	- 58,58					
230	+1,4/+5,8	1000	+ 63,89	+ 63,89					
250	+1,5/+6,2	1000	+ 75,43	+ 75,43					
260	+1,5/+6,2	1000	+ 81,43	o 81,43					
280	+1,6/+6,5	1000	+ 94,32	- 94,32					
300	+1,7/+7,0	1000	+ 108,30	+ 108,30					
310	+2,0/+8,0	1000	o 116,19	- 116,19					
350	+2,0/+8,0	1000	+ 147,26	- 147,26					
400	+2,0/+8,0	1000	+ 191,27	- 191,27					
450	+2,0/+10,0	1000	+ 243,13	- 243,13					
500	+2,0/+10,0	1000	+ 298,86	- 298,86					

ZELLAMID® ROD (extruded qualities)

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities**

● ⇒ Length tolerance ⇒ 1000 mm +20/+40 mm ⇒ 3000 mm +60/ +80 mm ● Please contact us for special dimensions not listed ● Other lengths available upon request. ● Up to outside diameter 60 mm centreless ground available also ●

ZELLAMID® - Grade			I 400	I 400 SW	I 400 HI	I 400 PBT	I 400 T	I 500	I 500 X	I 500 T
			PET	PET	PET HI	PBT	PET+PTFE	PEEK	PEEK	PEEK mod.
			white	black	natural	ivory	light grey	brown	brown	black
Ø mm	Tolerance mm	Length mm	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m
6	+0,1/+0,4	3000	- 0,045	- 0,045	- 0,047	- 0,043	○ 0,046	+ 0,043	+ 0,042	- 0,049
8	+0,1/+0,5	3000	○ 0,080	- 0,080	- 0,082	- 0,076	- 0,081	○ 0,076	○ 0,075	- 0,086
10	+0,1/+0,5	3000	+ 0,122	+ 0,122	- 0,126	- 0,116	+ 0,124	+ 0,117	+ 0,114	- 0,131
12	+0,2/+0,7	3000	+ 0,179	- 0,179	- 0,184	- 0,170	○ 0,181	+ 0,170	+ 0,167	- 0,191
14	+0,2/+0,7	3000	○ 0,239	- 0,239	- 0,247	- 0,228	- 0,243	○ 0,228	○ 0,223	- 0,256
15	+0,2/+0,7	3000	+ 0,273	+ 0,273	- 0,281	- 0,261	+ 0,277	+ 0,261	+ 0,255	- 0,292
16	+0,2/+0,7	3000	+ 0,31	- 0,31	- 0,32	- 0,30	- 0,32	+ 0,30	+ 0,29	- 0,33
18	+0,2/+0,7	3000	+ 0,40	- 0,40	- 0,41	- 0,38	- 0,40	- 0,38	- 0,37	- 0,42
20	+0,2/+0,7	3000	+ 0,48	+ 0,48	- 0,50	- 0,46	+ 0,49	+ 0,46	+ 0,45	- 0,51
22	+0,2/+0,9	3000	○ 0,59	- 0,59	- 0,61	- 0,56	- 0,60	- 0,56	- 0,55	- 0,63
25	+0,2/+0,9	3000	+ 0,75	+ 0,75	- 0,77	- 0,71	+ 0,76	+ 0,71	+ 0,70	- 0,80
27	+0,2/+0,9	3000	- 0,87	- 0,87	- 0,89	- 0,83	- 0,88	- 0,83	- 0,81	- 0,93
28	+0,2/+0,9	3000	- 0,93	- 0,93	- 0,95	- 0,89	- 0,94	- 0,88	- 0,86	- 0,99
30	+0,2/+0,9	3000	+ 1,06	+ 1,06	- 1,09	- 1,01	+ 1,07	+ 1,01	+ 0,99	- 1,13
32	+0,2/+0,9	3000	○ 1,20	- 1,20	- 1,24	- 1,15	- 1,22	○ 1,15	○ 1,12	- 1,29
35	+0,2/+1,1	3000	+ 1,46	- 1,46	- 1,50	- 1,39	+ 1,48	+ 1,39	+ 1,36	- 1,56
38	+0,2/+1,1	3000	○ 1,70	- 1,70	- 1,75	- 1,62	- 1,72	○ 1,62	○ 1,58	- 1,81
40	+0,2/+1,1	3000	+ 1,88	+ 1,88	- 1,93	- 1,79	+ 1,91	+ 1,79	+ 1,75	- 2,01
45	+0,3/+1,3	3000	+ 2,38	- 2,38	- 2,45	- 2,28	○ 2,42	○ 2,27	○ 2,22	- 2,55
50	+0,3/+1,3	3000	+ 2,92	+ 2,92	- 3,01	- 2,80	+ 2,97	+ 2,79	+ 2,73	- 3,13
55	+0,3/+1,3	3000	+ 3,51	- 3,51	- 3,62	- 3,36	○ 3,57	- 3,35	- 3,28	- 3,76
60	+0,3/+1,6	3000	+ 4,21	+ 4,21	- 4,34	- 4,03	+ 4,27	+ 4,02	+ 3,93	- 4,50
65	+0,3/+1,6	3000	+ 4,92	- 4,92	- 5,07	- 4,71	○ 4,99	- 4,69	- 4,59	- 5,26
70	+0,3/+1,6	3000	+ 5,69	+ 5,69	- 5,86	- 5,44	+ 5,78	+ 5,43	+ 5,31	- 6,09
75	+0,3/+1,6	3000	+ 6,51	- 6,51	- 6,70	- 6,22	- 6,61	○ 6,21	○ 6,07	- 6,96
80	+0,4/+2,0	3000	+ 7,46	+ 7,46	- 7,68	- 7,13	+ 7,57	+ 7,12	+ 6,95	- 7,98
85	+0,4/+2,0	3000	○ 8,39	- 8,39	- 8,64	- 8,02	- 8,51	- 8,00	- 7,82	- 8,97
90	+0,5/+2,2	3000	+ 9,42	+ 9,42	- 9,70	- 9,01	○ 9,56	○ 8,99	○ 8,78	- 10,08
95	+0,5/+2,2	3000	- 10,47	- 10,47	- 10,78	- 10,01	- 10,62	- 9,99	- 9,76	- 11,20
100	+0,6/+2,5	3000	+ 11,65	+ 11,65	- 11,99	- 11,14	+ 11,82	+ 11,11	+ 10,86	- 12,46
110	+0,7/+3,0	3000	+ 14,15	+ 14,15	- 14,57	- 13,53	+ 14,36	○ 13,50	○ 13,19	- 15,13
120	+0,8/+3,5	3000	+ 16,91	+ 16,91	- 17,41	- 16,16	+ 17,16	+ 16,13	+ 15,76	- 18,08
125	+0,8/+3,5	3000	○ 18,31	- 18,31	- 18,84	- 17,50	- 18,58	- 17,46	- 17,06	- 19,57
130	+0,8/+3,5	3000	+ 19,76	+ 19,76	- 20,34	- 18,89	+ 20,05	○ 18,85	○ 18,42	- 21,13
135	+0,8/+3,5	3000	- 21,27	- 21,27	- 21,89	- 20,33	- 21,58	- 20,28	- 19,82	- 22,74
140	+0,9/+3,8	3000	+ 22,93	○ 22,93	- 23,60	- 21,92	+ 23,26	+ 21,87	+ 21,37	- 24,52
150	+1,0/+3,8	3000	+ 26,23	+ 26,23	- 27,00	- 25,07	+ 26,61	○ 25,01	○ 24,44	- 28,04
160	+1,1/+4,2	1000	+ 29,88		- 30,76		○ 30,32	○ 28,50	○ 27,85	- 31,96
170	+1,1/+4,5	1000	+ 33,75		- 34,74			- 32,19	- 31,45	
175	+1,2/+5,0	1000	- 35,91		- 36,97			- 34,25	- 33,47	
180	+1,2/+5,0	1000	+ 37,94		- 39,05			- 36,18	- 35,36	
190	+1,2/+5,0	1000	- 42,15		- 43,39			- 40,20	- 39,28	
200	+1,3/+5,5	1000	+ 46,81		- 48,18			- 44,64	- 43,62	
210	+1,4/+5,8	1000			- 53,14					
220	+1,4/+5,8	1000								
230	+1,4/+5,8	1000								
250	+1,5/+6,2	1000								
260	+1,5/+6,2	1000								
280	+1,6/+6,5	1000								
300	+1,7/+7,0	1000								
310	+2,0/+8,0	1000								
350	+2,0/+8,0	1000								
400	+2,0/+8,0	1000								
450	+2,0/+10,0	1000								
500	+2,0/+10,0	1000								



ZELLAMID® ROD (extruded qualities)

+ bold type: dimensions normally ex stock available **o** dimensions occasionally ex stock available
- dimensions available upon minimum quantities

● →Length tolerance ⇒1000 mm+20/+40 mm ⇒ 3000 mm +60/ +80 mm ● Please contact us for special dimensions not listed ● Other lengths available upon request. ● Up to outside diameter 60 mm centreless ground available also ●

ZELLAMID® - Grade			1000	1000 GF30	1500 GF30	1900	1900 GF40	2100
			PEI	PEI +30% GF	PEEK+30% GF	PPS	PPS + 40% GF	PPSU
			amber	grey	grey	beige	beige	amber
Ø mm	Tolerance mm	Length mm	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m	weight appr. kg/m
8	+0,1/+0,5	3000			- 0,087			
10	+0,1/+0,5	3000	- 0,112	- 0,133	- 0,133	- 0,119	- 0,145	- 0,114
12	+0,2/+0,7	3000	- 0,164	- 0,195	- 0,195	- 0,174	- 0,212	- 0,167
14	+0,2/+0,7	3000	- 0,220	- 0,261	- 0,261	- 0,234	- 0,284	- 0,223
15	+0,2/+0,7	3000	- 0,251	- 0,298	- 0,298	- 0,266	- 0,324	- 0,255
16	+0,2/+0,7	3000	- 0,29	- 0,34	- 0,34	- 0,31	- 0,37	- 0,29
18	+0,2/+0,7	3000	- 0,36	- 0,43	- 0,43	- 0,39	- 0,47	- 0,37
20	+0,2/+0,7	3000	- 0,44	- 0,53	- 0,53	- 0,47	- 0,57	- 0,45
22	+0,2/+0,9	3000	- 0,54	- 0,64	- 0,64	- 0,58	- 0,70	- 0,55
25	+0,2/+0,9	3000	- 0,68	- 0,81	- 0,81	- 0,73	- 0,88	- 0,70
27	+0,2/+0,9	3000	- 0,80	- 0,95	- 0,95	- 0,85	- 1,03	- 0,81
28	+0,2/+0,9	3000	- 0,85	- 1,01	- 1,01	- 0,90	- 1,10	- 0,86
30	+0,2/+0,9	3000	- 0,97	- 1,16	- 1,16	- 1,03	- 1,25	- 0,99
32	+0,2/+0,9	3000	- 1,10	- 1,31	- 1,31	- 1,17	- 1,43	- 1,12
35	+0,2/+1,1	3000	- 1,34	- 1,59	- 1,59	- 1,42	- 1,73	- 1,36
38	+0,2/+1,1	3000	- 1,56	- 1,85	- 1,85	- 1,66	- 2,01	- 1,58
40	+0,2/+1,1	3000	- 1,72	- 2,05	- 2,05	- 1,83	- 2,22	- 1,75
45	+0,3/+1,3	3000	- 2,19	- 2,60	- 2,60	- 2,32	- 2,82	- 2,22
50	+0,3/+1,3	3000	- 2,68	- 3,19	- 3,19	- 2,85	- 3,47	- 2,73
55	+0,3/+1,3	3000	- 3,22	- 3,83	- 3,83	- 3,43		- 3,28
60	+0,3/+1,6	3000	- 3,87	- 4,60	- 4,60	- 4,11		- 3,93
65	+0,3/+1,6	3000	- 4,52		- 5,37			- 4,59
70	+0,3/+1,6	3000	- 5,22		- 6,21			- 5,31
75	+0,3/+1,6	3000	- 5,97		- 7,10			- 6,07
80	+0,4/+2,0	3000	- 6,85		- 8,14			- 6,95
85	+0,4/+2,0	3000	- 7,70		- 9,15			- 7,82
90	+0,5/+2,2	3000	- 8,65		- 10,28			- 8,78
95	+0,5/+2,2	3000	- 9,61					- 9,76
100	+0,6/+2,5	3000	- 10,69					- 10,86
110	+0,7/+3,0	3000	- 12,99					- 13,19
120	+0,8/+3,5	3000	- 15,52					- 15,76
125	+0,8/+3,5	3000	- 16,80					- 17,06
130	+0,8/+3,5	3000						- 18,42
135	+0,8/+3,5	3000						- 19,82
140	+0,9/+3,8	3000						- 21,37
150	+1,0/+3,8	3000						- 24,44



ZELLAMID® SHEET

(extruded qualities)

+ **bold type**: dimensions normally ex stock available ○ dimensions occasionally ex stock available
 - dimensions available upon minimum quantities ● Please contact us for special dimensions not listed ●

ZELLAMID® 202 (PA 6, white)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm Reel Length: 50 m	Width: 1000 +30+0mm Reel Length: 100 m	Width: 500 +25+5mm Length: 2000 +60+0mm	Width: 610 +18+0mm Length: 2000 +60+0mm	Width: 610 +18+0mm Length: 3000 +90+0mm	Width: 1000 +30+0mm Length: 2000 +60+0mm
		appr. kg/reel	appr. kg/reel	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet
0,3	+/- 0,03		+ 40,00				
0,5	+/- 0,05	○ 32,50	+ 65,00				
0,8	+/- 0,08	+ 50,00	○ 100,00				
1,0	+/- 0,10	+ 65,00	○ 130,00				
1,5	+/- 0,15	○ 95,00	○ 190,00				+ 3,99
2,0	+/- 0,15						+ 5,20
2,5	+/- 0,20						+ 6,53
3,0	+/- 0,20						+ 7,74
4,0	+/- 0,20						+ 10,16
5,0	+/- 0,25						+ 12,70
6,0	+/- 0,25						+ 15,12
8,0	+ 0,2/+ 0,9			+ 10,76	○ 13,13	○ 19,69	+ 21,53
10,0	+ 0,2/+ 0,9			+ 13,18	○ 16,08	○ 24,11	+ 26,37
12,0	+ 0,3/+ 1,5			+ 16,33	○ 19,91	○ 29,86	+ 32,65
15,0	+ 0,3/+ 1,5			+ 19,96	○ 24,33	○ 36,50	+ 39,91
20,0	+ 0,3/+ 1,5			+ 26,00	○ 31,71	○ 47,56	+ 52,01
25,0	+ 0,3/+ 1,5			+ 32,05	○ 39,08	○ 58,62	+ 64,10
30,0	+ 0,3/+ 1,5			+ 38,10	○ 46,46	○ 69,68	+ 76,19
35,0	+ 0,5/+ 2,5			+ 45,35	○ 55,30	○ 82,96	+ 90,71
40,0	+ 0,5/+ 2,5			+ 51,40	○ 62,68	○ 94,02	+ 102,80
50,0	+ 0,5/+ 2,5			+ 63,49	○ 77,43	○ 116,14	+ 126,99
60,0	+ 0,5/+ 3,5			+ 76,80	○ 93,65	○ 140,47	+ 153,60
70,0	+ 0,5/+ 3,5			+ 88,89	○ 108,40	○ 162,60	+ 177,79
80,0	+ 0,5/+ 3,5			+ 100,99	○ 123,15	○ 184,72	+ 201,97
90,0	+ 0,8/+ 4,5			+ 111,53	○ 135,37	○ 203,06	+ 223,07
100,0	+ 1,0/+ 5,5			+ 124,52	○ 151,13	○ 226,70	+ 249,03

ZELLAMID® 202 MO (PA 6 MoS₂, black)

Thick- ness mm	Tolerance mm	Width: 500 +25+5mm Length: 2000 +60+0mm	Width: 610 +18+0mm Length: 2000 +60+0mm	Width: 610 +18+0mm Length: 3000 +90+0mm	Width: 1000 +30+0mm Length: 2000 +60+0mm
		appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet
2,0	+/- 0,15				- 5,20
2,5	+/- 0,20				- 6,53
3,0	+/- 0,20				- 7,74
4,0	+/- 0,20				- 10,16
5,0	+/- 0,25				- 12,70
6,0	+/- 0,25				- 15,12
8,0	+ 0,2/+ 0,9	- 10,76	- 13,13	- 19,69	- 21,53
10,0	+ 0,2/+ 0,9	- 13,18	- 16,08	- 24,11	- 26,37
12,0	+ 0,3/+ 1,5	- 16,33	- 19,91	- 29,86	- 32,65
15,0	+ 0,3/+ 1,5	- 19,96	- 24,33	- 36,50	- 39,91
20,0	+ 0,3/+ 1,5	- 26,00	- 31,71	- 47,56	- 52,01
25,0	+ 0,3/+ 1,5	- 32,05	- 39,08	- 58,62	- 64,10
30,0	+ 0,3/+ 1,5	- 38,10	- 46,46	- 69,68	- 76,19
35,0	+ 0,5/+ 2,5	- 45,35	- 55,30	- 82,96	- 90,71
40,0	+ 0,5/+ 2,5	- 51,40	- 62,68	- 94,02	- 102,80
50,0	+ 0,5/+ 2,5	- 63,49	- 77,43	- 116,14	- 126,99
60,0	+ 0,5/+ 3,5	- 76,80	- 93,65	- 140,47	- 153,60
70,0	+ 0,5/+ 3,5	- 88,89	- 108,40	- 162,60	- 177,79
80,0	+ 0,5/+ 3,5	- 100,99	- 123,15	- 184,72	- 201,97
90,0	+ 0,8/+ 4,5	- 111,53	- 135,37	- 203,06	- 223,07
100,0	+ 1,0/+ 5,5	- 124,52	- 151,13	- 226,70	- 249,03





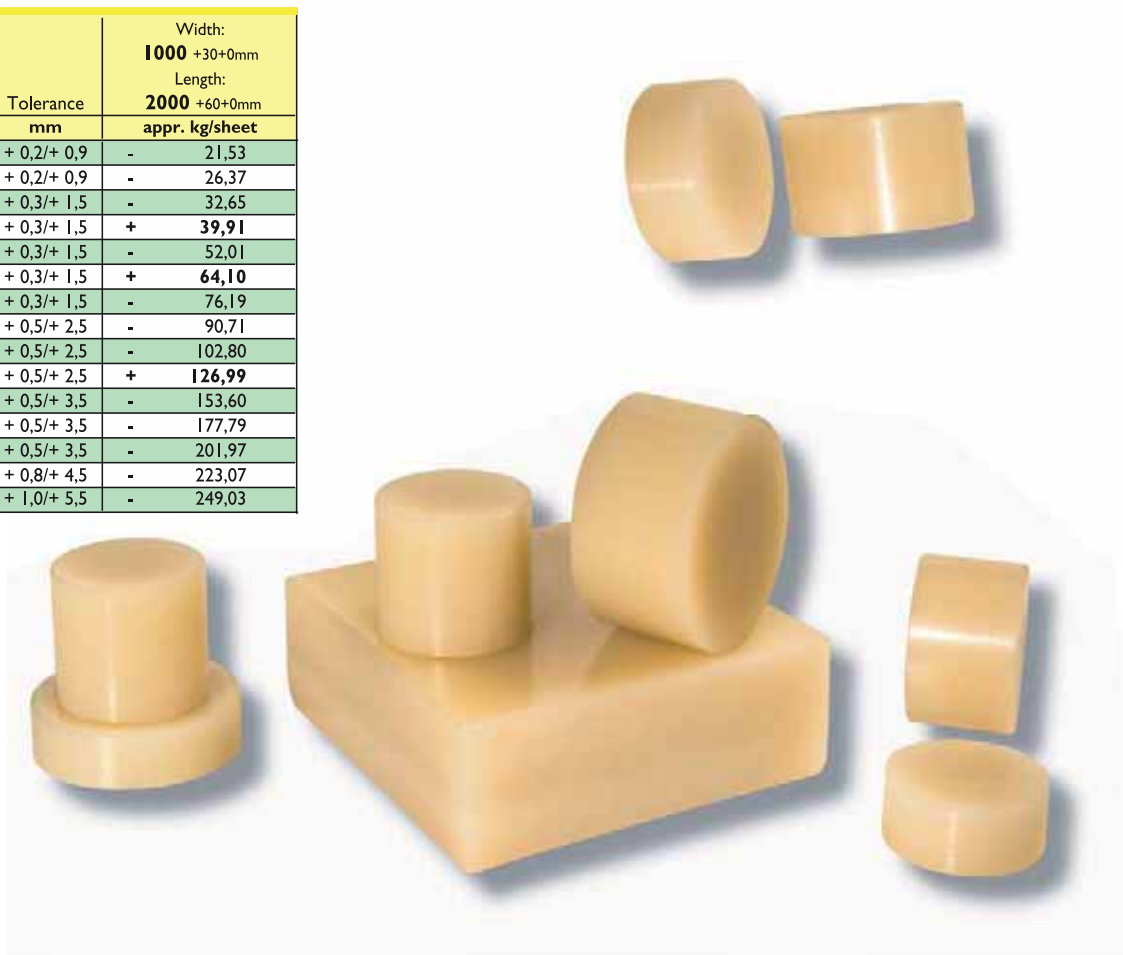
ZELLAMID® SHEET

(extruded qualities)

- + **bold type: dimensions normally ex stock available**
 ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities**
 ● Please contact us for special dimensions not listed ●

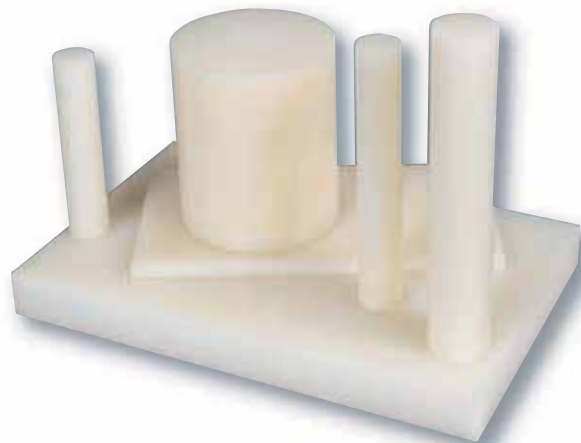
ZELLAMID® 202 XN (PA 6 nanoreinforced, ivory)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm	
		Length: 2000 +60+0mm	
appr. kg/sheet			
8,0	+ 0,2/+ 0,9	-	21,53
10,0	+ 0,2/+ 0,9	-	26,37
12,0	+ 0,3/+ 1,5	-	32,65
15,0	+ 0,3/+ 1,5	+	39,91
20,0	+ 0,3/+ 1,5	-	52,01
25,0	+ 0,3/+ 1,5	+	64,10
30,0	+ 0,3/+ 1,5	-	76,19
35,0	+ 0,5/+ 2,5	-	90,71
40,0	+ 0,5/+ 2,5	-	102,80
50,0	+ 0,5/+ 2,5	+	126,99
60,0	+ 0,5/+ 3,5	-	153,60
70,0	+ 0,5/+ 3,5	-	177,79
80,0	+ 0,5/+ 3,5	-	201,97
90,0	+ 0,8/+ 4,5	-	223,07
100,0	+ 1,0/+ 5,5	-	249,03



ZELLAMID® 250 (PA 6.6, ivory)

Thick- ness mm	Tolerance mm	Width: 610 +18+0mm		Width: 1000 +30+0mm	
		Length: 2000 +60+0mm		Length: 2000 +60+0mm	
appr. kg/sheet					
2,0	+/- 0,15			○	5,20
3,0	+/- 0,20			○	7,74
4,0	+/- 0,20			○	10,16
5,0	+/- 0,25			+	12,70
6,0	+/- 0,25			+	15,12
8,0	+ 0,2/+ 0,9	○	13,13	+	19,69
10,0	+ 0,2/+ 0,9	○	16,08	+	24,11
12,0	+ 0,3/+ 1,5	○	19,91	+	29,86
15,0	+ 0,3/+ 1,5	○	24,33	+	36,50
20,0	+ 0,3/+ 1,5	○	31,71	+	47,56
25,0	+ 0,3/+ 1,5	○	39,08	+	58,62
30,0	+ 0,3/+ 1,5	○	46,46	+	69,68
35,0	+ 0,5/+ 2,5	○	55,30	○	82,96
40,0	+ 0,5/+ 2,5	○	62,68	+	94,02
50,0	+ 0,5/+ 2,5	○	77,43	+	116,14
60,0	+ 0,5/+ 3,5	○	93,65	○	140,47



ZELLAMID® SHEET

(extruded qualities)

- + **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities** ● Please contact us for special dimensions not listed ●

ZELLAMID® 250 SW (PA 6.6, black)

Thick- ness mm	Tolerance mm	Width: 610 +18+0mm			
		Length: 2000 +60+0mm appr. kg/sheet	Length: 3000 +90+0mm appr. kg/sheet		
8,0	+ 0,2/+ 0,9	-	13,13	-	19,69
10,0	+ 0,2/+ 0,9	-	16,08	-	24,11
12,0	+ 0,3/+ 1,5	-	19,91	-	29,86
15,0	+ 0,3/+ 1,5	-	24,33	-	36,50
20,0	+ 0,3/+ 1,5	-	31,71	-	47,56
25,0	+ 0,3/+ 1,5	-	39,08	-	58,62
30,0	+ 0,3/+ 1,5	-	46,46	-	69,68
35,0	+ 0,5/+ 2,5	-	55,30	-	82,96
40,0	+ 0,5/+ 2,5	-	62,68	-	94,02
50,0	+ 0,5/+ 2,5	-	77,43	-	116,14
60,0	+ 0,5/+ 3,5	-	93,65	-	140,47

ZELLAMID® 250 GF30 (PA 6.6 + 30 % Glassfibre, black)

Thick- ness mm	Tolerance mm	Width: 610 +18+0mm	
		Length: 3000 +90+0mm appr. kg/sheet	
8,0	+ 0,2/+ 0,9	-	23,32
10,0	+ 0,2/+ 0,9	+	28,55
12,0	+ 0,3/+ 1,5	-	35,37
15,0	+ 0,3/+ 1,5	+	43,23
20,0	+ 0,3/+ 1,5	+	56,32
25,0	+ 0,3/+ 1,5	+	69,42
30,0	+ 0,3/+ 1,5	+	82,52
35,0	+ 0,5/+ 2,5	-	98,24
40,0	+ 0,5/+ 2,5	+	111,34
50,0	+ 0,5/+ 2,5	+	137,53
60,0	+ 0,5/+ 3,5	+	166,35
70,0	+ 0,5/+ 3,5	-	192,55
80,0	+ 0,5/+ 3,5	+	218,75
90,0	+ 0,8/+ 4,5	-	240,47
100,0	+ 1,0/+ 5,5	+	268,46



ZELLAMID® SHEET (extruded qualities)

+ **bold type**: dimensions normally ex stock available ○ dimensions occasionally ex stock available
- dimensions available upon minimum quantities ● Please contact us for special dimensions not listed ●

ZELLAMID® 250 PE (PA 6.6 + PE, light green)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm Length: 2000 +60+0mm appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 21,15
10,0	+ 0,2/+ 0,9	- 25,90
12,0	+ 0,3/+ 1,5	- 32,08
15,0	+ 0,3/+ 1,5	- 39,21
20,0	+ 0,3/+ 1,5	- 51,09
25,0	+ 0,3/+ 1,5	- 62,98
30,0	+ 0,3/+ 1,5	- 74,86
35,0	+ 0,5/+ 2,5	- 89,12
40,0	+ 0,5/+ 2,5	- 101,00
50,0	+ 0,5/+ 2,5	- 124,76
60,0	+ 0,5/+ 3,5	- 150,90



ZELLAMID® 900 (POM-C, white)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm Reel Length: 50 m	Width: 1000 +30+0mm Reel Length: 100 m	Width: 500 +25+5mm Length: 2000 +60+0mm	Width: 610 +18+0mm Length: 2000 +60+0mm	Width: 610 +18+0mm Length: 3000 +90+0mm	Width: 1000 +30+0mm Length: 2000 +60+0mm	Width: 1220 +30+0mm Length: 2000 +60+0mm	Width: 1220 +30+0mm Length: 3000 +90+0mm	
		appr. kg/reel	appr. kg/reel	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	
0,5	+/- 0,05	○ 44,00	+ 81,00							
0,8	+/- 0,08	- 62,00								
1,0	+/- 0,10	+ 81,00					+ 3,29			
1,5	+/- 0,15						○ 4,94			
2,0	+/- 0,15						+ 6,43			
2,5	+/- 0,20						○ 8,08			
3,0	+/- 0,20						+ 9,57			
4,0	+/- 0,20						+ 12,57			
5,0	+/- 0,25						+ 15,71			
6,0	+/- 0,25						+ 18,70			
8,0	+ 0,2/+ 0,9			+ 13,31	+ 16,23	+ 24,35	+ 26,63	○ 32,47	+ 48,70	
10,0	+ 0,2/+ 0,9			+ 16,30	+ 19,88	+ 29,82	+ 32,61	○ 39,77	+ 59,65	
12,0	+ 0,3/+ 1,5			+ 20,19	+ 24,63	+ 36,94	+ 40,39	○ 49,25	+ 73,88	
15,0	+ 0,3/+ 1,5			+ 24,68	+ 30,10	+ 45,15	+ 49,36	○ 60,19	+ 90,29	
20,0	+ 0,3/+ 1,5			+ 32,16	+ 39,22	+ 58,83	+ 64,32	○ 78,44	+ 117,65	
25,0	+ 0,3/+ 1,5			+ 39,64	+ 48,34	+ 72,51	+ 79,28	○ 96,68	+ 145,02	
30,0	+ 0,3/+ 1,5			+ 47,12	+ 57,46	+ 86,19	+ 94,24	○ 114,92	+ 172,38	
35,0	+ 0,5/+ 2,5			+ 56,10	+ 68,40	+ 102,60	+ 112,19	○ 136,81	+ 205,21	
40,0	+ 0,5/+ 2,5			+ 63,57	+ 77,52	+ 116,29	+ 127,15	○ 155,05	+ 232,57	
45,0	+ 0,5/+ 2,5			- 71,05	○ 86,64	○ 129,97	- 142,11	○ 173,29	○ 259,93	
50,0	+ 0,5/+ 2,5			+ 78,53	+ 95,76	+ 143,65	+ 157,07	○ 191,53	+ 287,29	
60,0	+ 0,5/+ 3,5			+ 94,99	+ 115,83	+ 173,74	+ 189,98	○ 231,66	+ 347,49	
70,0	+ 0,5/+ 3,5				+ 131,94	+ 197,90	- 219,89	○ 263,87	+ 395,81	
80,0	+ 0,5/+ 3,5				+ 149,89	+ 224,83	- 249,81	○ 299,77	+ 449,66	
90,0	+ 0,8/+ 4,5				+ 169,63	+ 254,45	- 282,72	○ 339,26	+ 508,89	
100,0	+ 1,0/+ 5,5				+ 189,38	+ 284,07	- 315,63	○ 378,75	+ 568,13	
110,0	+ 1,0/+ 5,5					○ 207,33	+ 310,99	- 345,55	○ 414,65	+ 621,98
125,0	+ 1,0/+ 6,0					○ 235,15	- 352,73	- 391,92	- 470,30	- 705,45
150,0	+ 1,0/+ 6,0					- 280,03	- 420,04	- 466,71	- 560,05	- 840,08



07/2011

ZELLAMID® SHEET

(extruded qualities)

- + **bold type**: dimensions normally ex stock available ○ dimensions occasionally ex stock available
 - dimensions available upon minimum quantities ● Please contact us for special dimensions not listed ●

ZELLAMID® 900 SW (POM-C, black)

Thick- ness mm	Tolerance mm	Width: 610 +18+0mm	Width: 610 +18+0mm	Width: 1000 +30+0mm	Width: 1220 +30+0mm	Width: 1220 +30+0mm
		Length: 2000 +60+0mm	Length: 3000 +90+0mm	Length: 2000 +60+0mm	Length: 2000 +60+0mm	Length: 3000 +90+0mm
		appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet
2,0	+/- 0,15			○ 6,43		
3,0	+/- 0,20			○ 9,57		
4,0	+/- 0,20			○ 12,57		
5,0	+/- 0,25			○ 15,71		
6,0	+/- 0,25			○ 18,70		
8,0	+ 0,2/+ 0,9	+ 16,23	○ 24,35	+ 26,63	○ 32,47	○ 48,70
10,0	+ 0,2/+ 0,9	+ 19,88	+ 29,82	+ 32,61	○ 39,77	○ 59,65
12,0	+ 0,3/+ 1,5	+ 24,63	○ 36,94	+ 40,39	○ 49,25	○ 73,88
15,0	+ 0,3/+ 1,5	+ 30,10	+ 45,15	+ 49,36	○ 60,19	○ 90,29
20,0	+ 0,3/+ 1,5	+ 39,22	+ 58,83	+ 64,32	○ 78,44	○ 117,65
25,0	+ 0,3/+ 1,5	+ 48,34	+ 72,51	+ 79,28	○ 96,68	○ 145,02
30,0	+ 0,3/+ 1,5	+ 57,46	+ 86,19	+ 94,24	○ 114,92	○ 172,38
35,0	+ 0,5/+ 2,5	+ 68,40	+ 102,60	+ 112,19	○ 136,81	○ 205,21
40,0	+ 0,5/+ 2,5	+ 77,52	+ 116,29	+ 127,15	○ 155,05	○ 232,57
45,0	+ 0,5/+ 2,5	- 86,64	- 129,97	- 142,11	- 173,29	- 259,93
50,0	+ 0,5/+ 2,5	+ 95,76	+ 143,65	+ 157,07	○ 191,53	○ 287,29
60,0	+ 0,5/+ 3,5	+ 115,83	+ 173,74	+ 189,98	○ 231,66	○ 347,49
70,0	+ 0,5/+ 3,5	+ 131,94	+ 197,90	- 219,89	○ 263,87	○ 395,81
80,0	+ 0,5/+ 3,5	+ 149,89	+ 224,83	- 249,81	○ 299,77	○ 449,66
90,0	+ 0,8/+ 4,5	○ 169,63	- 254,45	- 282,72	○ 339,26	- 508,89
100,0	+ 1,0/+ 5,5	+ 189,38	+ 284,07	- 315,63	○ 378,75	○ 568,13
110,0	+ 1,0/+ 5,5	○ 207,33	○ 310,99	- 345,55	○ 414,65	○ 621,98
125,0	+ 1,0/+ 6,0	- 235,15	- 352,73	- 391,92	- 470,30	- 705,45
150,0	+ 1,0/+ 6,0	- 280,03	- 420,04	- 466,71	- 560,05	- 840,08

ZELLAMID® 900 PE (POM-C+PE, light blue)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm
		Length: 2000 +60+0mm
		appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 25,30
10,0	+ 0,2/+ 0,9	- 30,99
12,0	+ 0,3/+ 1,5	- 38,38
15,0	+ 0,3/+ 1,5	- 46,91
20,0	+ 0,3/+ 1,5	- 61,13
25,0	+ 0,3/+ 1,5	- 75,35
30,0	+ 0,3/+ 1,5	- 89,56
35,0	+ 0,5/+ 2,5	- 106,62
40,0	+ 0,5/+ 2,5	- 120,84
45,0	+ 0,5/+ 2,5	- 135,05
50,0	+ 0,5/+ 2,5	- 149,27
60,0	+ 0,5/+ 3,5	- 180,54
70,0	+ 0,5/+ 3,5	- 208,98
80,0	+ 0,5/+ 3,5	- 237,41
90,0	+ 0,8/+ 4,5	- 268,68
100,0	+ 1,0/+ 5,5	- 299,96

ZELLAMID® 900 AS (POM-C antistatic, ivory)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm
		Length: 2000 +60+0mm
		appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 25,49
10,0	+ 0,2/+ 0,9	- 31,22
12,0	+ 0,3/+ 1,5	- 38,67
15,0	+ 0,3/+ 1,5	- 47,26
20,0	+ 0,3/+ 1,5	- 61,59
25,0	+ 0,3/+ 1,5	- 75,91
30,0	+ 0,3/+ 1,5	- 90,23
35,0	+ 0,5/+ 2,5	- 107,42
40,0	+ 0,5/+ 2,5	- 121,74
45,0	+ 0,5/+ 2,5	- 136,06
50,0	+ 0,5/+ 2,5	- 150,38



ZELLAMID® SHEET

(extruded qualities)

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities** ● Please contact us for special dimensions not listed ●



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ZELLAMID® 900 XU ELS (POM-C, Nano Grade, electric conductive, black)

Thick- ness mm	Tolerance mm	Width: 1000 +30+0mm Length: 2000 +60+0mm appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 26,63
10,0	+ 0,2/+ 0,9	- 32,61
12,0	+ 0,3/+ 1,5	- 40,39
15,0	+ 0,3/+ 1,5	- 49,36
20,0	+ 0,3/+ 1,5	- 64,32
25,0	+ 0,3/+ 1,5	- 79,28
30,0	+ 0,3/+ 1,5	- 94,24
35,0	+ 0,5/+ 2,5	- 112,19
40,0	+ 0,5/+ 2,5	- 127,15
45,0	+ 0,5/+ 2,5	- 142,11
50,0	+ 0,5/+ 2,5	- 157,07



ZELLAMID® 900 H (POM-H, white)

Thick- ness mm	Tolerance mm	Width: 610 +18+0mm Length: 2000 +60+0mm appr. kg/sheet	Width: 610 +18+0mm Length: 3000 +90+0mm appr. kg/sheet	Width: 1220 +30+0mm Length: 2000 +60+0mm appr. kg/sheet	Width: 1220 +30+0mm Length: 3000 +90+0mm appr. kg/sheet
		appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 16,35	- 24,52	- 32,70	- 49,05
10,0	+ 0,2/+ 0,9	- 20,02	- 30,04	- 40,05	- 60,07
12,0	+ 0,3/+ 1,5	- 24,80	- 37,20	- 49,60	- 74,40
15,0	+ 0,3/+ 1,5	- 30,31	- 45,47	- 60,62	- 90,93
20,0	+ 0,3/+ 1,5	- 39,50	- 59,24	- 78,99	- 118,49
25,0	+ 0,3/+ 1,5	- 48,68	- 73,02	- 97,36	- 146,04
30,0	+ 0,3/+ 1,5	- 57,87	- 86,80	- 115,73	- 173,60
35,0	+ 0,5/+ 2,5	- 68,89	- 103,33	- 137,78	- 206,67
40,0	+ 0,5/+ 2,5	- 78,07	- 117,11	- 156,15	- 234,22
45,0	+ 0,5/+ 2,5	- 87,26	- 130,89	- 174,52	- 261,78
50,0	+ 0,5/+ 2,5	- 96,44	- 144,67	- 192,89	- 289,33
60,0	+ 0,5/+ 3,5	- 116,65	- 174,98	- 233,30	- 349,95
70,0	+ 0,5/+ 3,5	- 132,87	- 199,31	- 265,74	- 398,61
80,0	+ 0,5/+ 3,5	- 150,95	- 226,42	- 301,90	- 452,85
90,0	+ 0,8/+ 4,5	- 170,83	- 256,25	- 341,67	- 512,50
100,0	+ 1,0/+ 5,5	- 190,72	- 286,08	- 381,44	- 572,16

ZELLAMID® SHEET

(extruded qualities)

+ **bold type**: dimensions normally ex stock available ○ dimensions occasionally ex stock available
 - dimensions available upon minimum quantities ● Please contact us for special dimensions not listed ●

ZELLAMID® 900 H SW (POM-H, black)

Thick- ness mm	Tolerance mm	Width: 610 +18+0mm Length: 2000 +60+0mm appr. kg/sheet	Width: 610 +18+0mm Length: 3000 +90+0mm appr. kg/sheet	Width: 1220 +30+0mm Length: 2000 +60+0mm appr. kg/sheet	Width: 1220 +30+0mm Length: 3000 +90+0mm appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 16,35	- 24,52	- 32,70	- 49,05
10,0	+ 0,2/+ 0,9	- 20,02	- 30,04	- 40,05	- 60,07
12,0	+ 0,3/+ 1,5	- 24,80	- 37,20	- 49,60	- 74,40
15,0	+ 0,3/+ 1,5	- 30,31	- 45,47	- 60,62	- 90,93
20,0	+ 0,3/+ 1,5	- 39,50	- 59,24	- 78,99	- 118,49
25,0	+ 0,3/+ 1,5	- 48,68	- 73,02	- 97,36	- 146,04
30,0	+ 0,3/+ 1,5	- 57,87	- 86,80	- 115,73	- 173,60
35,0	+ 0,5/+ 2,5	- 68,89	- 103,33	- 137,78	- 206,67
40,0	+ 0,5/+ 2,5	- 78,07	- 117,11	- 156,15	- 234,22
45,0	+ 0,5/+ 2,5	- 87,26	- 130,89	- 174,52	- 261,78
50,0	+ 0,5/+ 2,5	- 96,44	- 144,67	- 192,89	- 289,33
60,0	+ 0,5/+ 3,5	- 116,65	- 174,98	- 233,30	- 349,95
70,0	+ 0,5/+ 3,5	- 132,87	- 199,31	- 265,74	- 398,61
80,0	+ 0,5/+ 3,5	- 150,95	- 226,42	- 301,90	- 452,85
90,0	+ 0,8/+ 4,5	- 170,83	- 256,25	- 341,67	- 512,50
100,0	+ 1,0/+ 5,5	- 190,72	- 286,08	- 381,44	- 572,16

ZELLAMID® I400 (PET, white)

ZELLAMID® I400 SW (PET, black)

Thick- ness mm	Tolerance mm	ZELLAMID® I400 white Width: 610 +18+0mm Length: 2000 +60+0mm appr. kg/sheet	ZELLAMID® I400 white Width: 610 +18+0mm Length: 3000 +90+0mm appr. kg/sheet	ZELLAMID® I400 white Width: 1000 +30+0mm Length: 2000 +60+0mm appr. kg/sheet	ZELLAMID® I400SW black Width: 1000 +30+0mm Length: 2000 +60+0mm appr. kg/sheet
3,0	+/- 0,20			○ 9,23	
4,0	+/- 0,20			○ 12,12	
5,0	+/- 0,25			○ 15,15	
6,0	+/- 0,25			○ 18,04	
8,0	+ 0,2/+ 0,9	+ 15,66	○ 23,49	+ 25,68	- 25,68
10,0	+ 0,2/+ 0,9	+ 19,18	○ 28,77	+ 31,45	+ 31,45
12,0	+ 0,3/+ 1,5	+ 23,75	○ 35,63	+ 38,96	- 38,96
15,0	+ 0,3/+ 1,5	+ 29,03	○ 43,55	+ 47,61	+ 47,61
20,0	+ 0,3/+ 1,5	+ 37,83	○ 56,74	+ 62,04	+ 62,04
25,0	+ 0,3/+ 1,5	+ 46,62	○ 69,94	+ 76,47	+ 76,47
30,0	+ 0,3/+ 1,5	+ 55,42	○ 83,13	+ 90,90	+ 90,90
35,0	+ 0,5/+ 2,5	+ 65,98	○ 98,97	○ 108,21	○ 108,21
40,0	+ 0,5/+ 2,5	+ 74,77	○ 112,16	+ 122,64	+ 122,64
50,0	+ 0,5/+ 2,5	+ 92,37	○ 138,55	+ 151,50	+ 151,50
60,0	+ 0,5/+ 3,5	+ 111,72	○ 167,58	+ 183,24	- 183,24
70,0	+ 0,5/+ 3,5	○ 129,32	○ 193,97	○ 212,10	
80,0	+ 0,5/+ 3,5	○ 146,91	○ 220,37	○ 240,95	
90,0	+ 0,8/+ 4,5	○ 166,26	○ 249,40		
100,0	+ 1,0/+ 5,5	○ 185,62	○ 278,43		

ZELLAMID® SHEET

(extruded qualities)

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities** ● Please contact us for special dimensions not listed ●



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ZELLAMID® I 400 HI (PET-H impact modified, natural)

Thick- ness mm	Tolerance mm	ZELLAMID® 1400 HI natural	ZELLAMID® 1400 HI natural	ZELLAMID® 1400 HI natural
		Width: 610 +18+0mm Length: 2000 +60+0mm appr. kg/sheet	Width: 610 +18+0mm Length: 3000 +90+0mm appr. kg/sheet	Width: 1000 +30+0mm Length: 2000 +60+0mm appr. kg/sheet
8,0	+ 0,2/+ 0,9	- 16,12	- 24,18	- 26,44
10,0	+ 0,2/+ 0,9	- 19,74	- 29,61	- 32,38
12,0	+ 0,3/+ 1,5	- 24,45	- 36,68	- 40,10
15,0	+ 0,3/+ 1,5	- 29,88	- 44,83	- 49,01
20,0	+ 0,3/+ 1,5	- 38,94	- 58,41	- 63,87
25,0	+ 0,3/+ 1,5	- 48,00	- 71,99	- 78,72
30,0	+ 0,3/+ 1,5	- 57,05	- 85,58	- 93,57
35,0	+ 0,5/+ 2,5	- 67,92	- 101,88	- 111,39
40,0	+ 0,5/+ 2,5	- 76,97	- 115,46	- 126,25
50,0	+ 0,5/+ 2,5	- 95,09	- 142,63	- 155,95
60,0	+ 0,5/+ 3,5	- 115,01	- 172,51	- 188,63
70,0	+ 0,5/+ 3,5	- 133,12	- 199,68	- 218,33
80,0	+ 0,5/+ 3,5	- 151,23	- 226,85	- 248,04
90,0	+ 0,8/+ 4,5	- 171,15	- 256,73	
100,0	+ 1,0/+ 5,5	- 191,08	- 286,61	

ZELLAMID® I 400 T (PET+solid lubricant, light grey)

Thick- ness mm	Tolerance mm	ZELLAMID® I 400 T light grey	ZELLAMID® I 400 T light grey
		Width: 610 +18+0mm Length: 2000 +60+0mm appr. kg/sheet	Width: 610 +18+0mm Length: 3000 +90+0mm appr. kg/sheet
8,0	+ 0,2/+ 0,9	+ 15,89	○ 23,83
10,0	+ 0,2/+ 0,9	+ 19,46	○ 29,19
12,0	+ 0,3/+ 1,5	+ 24,10	○ 36,15
15,0	+ 0,3/+ 1,5	+ 29,46	○ 44,19
20,0	+ 0,3/+ 1,5	+ 38,38	○ 57,58
25,0	+ 0,3/+ 1,5	+ 47,31	○ 70,96
30,0	+ 0,3/+ 1,5	+ 56,24	○ 84,35
35,0	+ 0,5/+ 2,5	- 66,95	- 100,42
40,0	+ 0,5/+ 2,5	+ 75,87	○ 113,81
50,0	+ 0,5/+ 2,5	+ 93,73	○ 140,59
60,0	+ 0,5/+ 3,5	+ 113,37	○ 170,05
70,0	+ 0,5/+ 3,5	- 131,22	- 196,83
80,0	+ 0,5/+ 3,5	○ 149,07	○ 223,61
90,0	+ 0,8/+ 4,5	- 168,71	- 253,06
100,0	+ 1,0/+ 5,5	○ 188,35	○ 282,52



ZELLAMID® SHEET

(extruded qualities)

- + **bold type**: dimensions normally ex stock available ○ dimensions occasionally ex stock available
 - dimensions available upon minimum quantities
 ● Please contact us for special dimensions not listed ● *cut to size upon request for ZELLAMID® I500, I500X and I500T ●

ZELLAMID® I400 PBT (PBT, ivory)

Thick- ness mm	Tolerance mm	ZELLAMID® I400 PBT ivory Width: 1000 +30+0mm Length: 2000 +60+0mm	
		appr. kg/sheet	
8,0	+ 0,2/+ 0,9	-	24,55
10,0	+ 0,2/+ 0,9	-	30,07
12,0	+ 0,3/+ 1,5	-	37,24
15,0	+ 0,3/+ 1,5	-	45,51
20,0	+ 0,3/+ 1,5	-	59,30
25,0	+ 0,3/+ 1,5	-	73,10
30,0	+ 0,3/+ 1,5	-	86,89
35,0	+ 0,5/+ 2,5	-	103,44
40,0	+ 0,5/+ 2,5	-	117,23
50,0	+ 0,5/+ 2,5	-	144,81
60,0	+ 0,5/+ 3,5	-	175,15
70,0	+ 0,5/+ 3,5	-	202,74
80,0	+ 0,5/+ 3,5	-	230,32
90,0	+ 0,8/+ 4,5	-	260,66
100,0	+ 1,0/+ 5,5	-	291,00

ZELLAMID® I500 X (PEEK, brown)

Thick- ness mm	Tolerance mm	ZELLAMID® I500 X brown Width: 1000 +30+0mm Length: 1000 +30+0mm		ZELLAMID® I500 X brown Width: 1000 +30+0mm Length: 2000 +60+0mm	
		appr. kg/sheet		appr. kg/sheet	
8,0	+ 0,2/+ 0,9	-	12,18	-	24,36
10,0	+ 0,2/+ 0,9	+	14,92 *	+	29,83 *
12,0	+ 0,3/+ 1,5	+	18,48 *	+	36,95 *
15,0	+ 0,3/+ 1,5	+	22,58 *	+	45,16 *
20,0	+ 0,3/+ 1,5	+	29,42 *	+	58,85 *
25,0	+ 0,3/+ 1,5	+	36,27 *	+	72,53 *
30,0	+ 0,3/+ 1,5	+	43,11 *	+	86,22 *
35,0	+ 0,5/+ 2,5	-	51,32	-	102,64
40,0	+ 0,5/+ 2,5	+	58,16 *	+	116,33 *
50,0	+ 0,5/+ 2,5	+	71,85 *	+	143,70 *
60,0	+ 0,5/+ 3,5	-	86,90	-	173,81

ZELLAMID® I500 (PEEK, brown)

ZELLAMID® I500 T (PEEK+10% Carbonfibre+10% PTFE+10% Graphite, black)

Thick- ness mm	Tolerance mm	ZELLAMID® I500 brown Width: 1000 +30+0mm Length: 1000 +30+0mm		ZELLAMID® I500 brown Width: 1000 +30+0mm Length: 2000 +60+0mm		ZELLAMID® I500 T black Width: 1000 +30+0mm Length: 2000 +60+0mm	
		appr. kg/sheet		appr. kg/sheet		appr. kg/sheet	
8,0	+ 0,2/+ 0,9	-	12,46	-	24,93	-	27,95
10,0	+ 0,2/+ 0,9	+	15,26 *	+	30,53 *	-	34,23
12,0	+ 0,3/+ 1,5	+	18,91 *	+	37,81 *	-	42,39
15,0	+ 0,3/+ 1,5	+	23,11 *	+	46,21 *	-	51,81
20,0	+ 0,3/+ 1,5	+	30,11 *	+	60,22 *	-	67,52
25,0	+ 0,3/+ 1,5	+	37,11 *	+	74,22 *	-	83,22
30,0	+ 0,3/+ 1,5	+	44,11 *	+	88,22 *	-	98,92
35,0	+ 0,5/+ 2,5	-	52,51	-	105,03	-	117,76
40,0	+ 0,5/+ 2,5	+	59,52 *	+	119,03 *	-	133,46
50,0	+ 0,5/+ 2,5	+	73,52 *	+	147,04 *	-	164,86
60,0	+ 0,5/+ 3,5	-	88,92	-	177,85	-	199,41

ZELLAMID® SHEET

(extruded qualities)

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities** ● Please contact us for special dimensions not listed ●



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ZELLAMID® I000 (PEI, amber)

ZELLAMID® I000 GF30 (PEI+30% Glassfibre, grey)

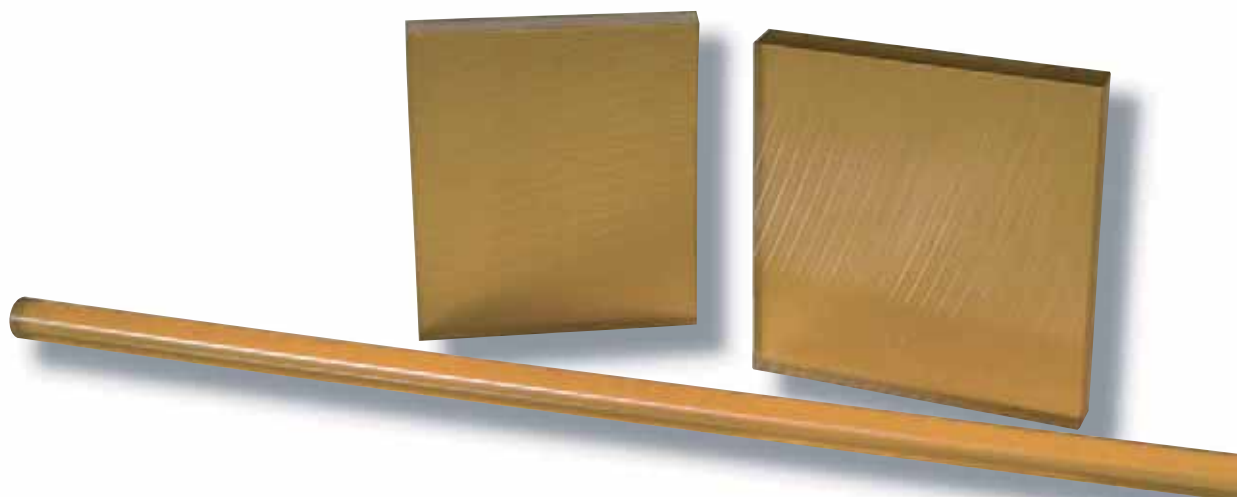
ZELLAMID® I500 GF30 (PEEK+30% Glassfibre, grey)

ZELLAMID® I900 (PPS, beige)

ZELLAMID® I900 GF40 (PPS+40% Glassfibre, beige)

ZELLAMID® 2100 (PPSU, amber)

ZELLAMID® - Grade		I000	I000 GF30	I500 GF30	I900	I900 GF40	2100
		PEI amber	PEI + 30% GF grey	PEEK + 30% GF grey	PPS beige	PPS + 40% GF beige	PPSU amber
Thick- ness	Tolerance	Width: I000 +30+0mm	Width: I000 +30+0mm	Width: I000 +30+0mm	Width: I000 +30+0mm	Width: I000 +30+0mm	Width: I000 +30+0mm
		Length: 2000 +60/+0mm	Length: 2000 +60/+0mm	Length: 2000 +60/+0mm	Length: 2000 +60/+0mm	Length: 2000 +60/+0mm	Length: 2000 +60/+0mm
mm	mm	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet	appr. kg/sheet
10,0	+ 0,2/+ 0,9	- 29,37	- 34,92	- 34,92	- 31,22	- 37,93	- 29,83
12,0	+ 0,3/+ 1,5	- 36,38	- 43,25	- 43,25	- 38,67	- 46,98	- 36,95
15,0	+ 0,3/+ 1,5	- 44,46	- 52,86	- 52,86	- 47,26	- 57,42	- 45,16
20,0	+ 0,3/+ 1,5	- 57,94	- 68,88	- 68,88	- 61,59	- 74,81	- 58,85
25,0	+ 0,3/+ 1,5	- 71,41	- 84,90	- 84,90	- 75,91	- 92,21	- 72,53
30,0	+ 0,3/+ 1,5	- 84,88	- 100,92	- 100,92	- 90,23	- 109,61	- 86,22
35,0	+ 0,5/+ 2,5	- 101,05	- 120,15	- 120,15	- 107,42	- 130,49	- 102,64
40,0	+ 0,5/+ 2,5	- 114,52	- 136,17	- 136,17	- 121,74	- 147,89	- 116,33
50,0	+ 0,5/+ 2,5	- 141,47	- 168,21	- 168,21	- 150,38	- 182,69	- 143,70
60,0	+ 0,5/+ 3,5	- 171,11					- 173,81
70,0	+ 0,5/+ 3,5	- 198,06					- 201,18
80,0	+ 0,5/+ 3,5	- 225,01					- 228,55
90,0	+ 0,8/+ 4,5	- 254,65					- 256,66
100,0	+ 1,0/+ 5,5	- 284,29					- 288,77
110,0	+ 1,0/+ 5,5	- 311,24					
125,0	+ 1,0/+ 6,0	- 353,00					



ZELLAMID® TUBE

Standard length: 3000 mm

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities**

● → Length tolerance → 3000 mm+60/+80 mm ● Please contact us for special dimensions not listed ● Other lengths available upon request ● Up to outside diameter 60 mm centreless ground available also ●

NOMINAL SIZE		TOLERANCE		ZELLAMID® 202 (PA6) white	ZELLAMID® 202 MO (PA6 MoS ₂) black	ZELLAMID® 250 (PA6.6) ivory	ZELLAMID® 900 (POM-C) white	ZELLAMID® 900 SW (POM-C) black	ZELLAMID® I400 (PET) white	ZELLAMID® I400 T (PET + solid lubricant) l. grey
ODØ mm	IDØ mm	ODØ mm	IDØ mm	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m
25	10	+1,1	-0,4	○ 0,54	○ 0,54	- 0,54	○ 0,66	- 0,66	- 0,64	- 0,65
25	12	+0,4	-1,1	○ 0,50	- 0,50	- 0,50	- 0,62	- 0,62	- 0,60	- 0,60
25	15			+ 0,43	○ 0,43	- 0,43	+ 0,53	- 0,53	- 0,51	- 0,52
25	20			○ 0,27	- 0,27	- 0,27	○ 0,34	- 0,34	- 0,32	- 0,33
30	15			+ 0,70	+ 0,70	- 0,70	+ 0,85	- 0,85	- 0,82	- 0,84
30	20			○ 0,54	○ 0,54	○ 0,54	+ 0,66	○ 0,66	+ 0,64	+ 0,65
35	15	+2,0	-0,6	+ 1,06	○ 1,06	- 1,06	+ 1,30	- 1,30	- 1,25	- 1,27
35	20	+0,6	-2,0	+ 0,91	- 0,91	- 0,91	+ 1,11	- 1,11	- 1,07	- 1,09
35	25			+ 0,71	- 0,71	- 0,71	+ 0,87	- 0,87	+ 0,84	+ 0,85
35	30			○ 0,46	- 0,46	- 0,46	- 0,57	- 0,57	- 0,55	- 0,56
40	15			- 1,43	- 1,43		○ 1,75	- 1,75		
40	20			+ 1,27	+ 1,27	- 1,27	+ 1,56	- 1,56	- 1,51	- 1,53
40	25			+ 1,07	+ 1,07	○ 1,07	+ 1,32	- 1,32	- 1,27	- 1,29
40	30			+ 0,83	○ 0,83	- 0,83	+ 1,02	○ 1,02	- 0,98	- 0,99
40	35			- 0,54	- 0,54	- 0,54	- 0,66	- 0,66	- 0,63	- 0,64
45	20			+ 1,68	○ 1,68	- 1,68	+ 2,07	- 2,07		
45	25			+ 1,49	+ 1,49	- 1,49	+ 1,82	- 1,82	- 1,76	- 1,78
45	30			+ 1,24	○ 1,24	- 1,24	+ 1,52	- 1,52	+ 1,47	+ 1,49
45	35			○ 0,95	○ 0,95	- 0,95	○ 1,16	- 1,16	- 1,12	- 1,14
50	20			+ 2,14	+ 2,14		+ 2,63	- 2,63		
50	25			+ 1,94	○ 1,94	- 1,94	+ 2,38	- 2,38	- 2,30	- 2,33
50	30			+ 1,70	+ 1,70	- 1,70	+ 2,08	○ 2,08	- 2,01	- 2,04
50	35			+ 1,40	- 1,40	- 1,40	+ 1,72	- 1,72	- 1,66	- 1,69
50	40			+ 1,06	+ 1,06	- 1,06	○ 1,31	- 1,31	+ 1,26	+ 1,28
55	25	+2,5	-0,8	+ 2,50	+ 2,50		- 3,07	- 3,07		
55	30	+0,8	-2,5	+ 2,26	- 2,26	- 2,26	+ 2,77	- 2,77	- 2,67	- 2,71
55	35			+ 1,97	○ 1,97	- 1,97	+ 2,41	- 2,41	- 2,33	- 2,36
55	45			○ 1,25	- 1,25	- 1,25	- 1,53	- 1,53	- 1,48	- 1,50
55	50			○ 0,82	- 0,82	- 0,82	- 1,00	- 1,00	- 0,97	- 0,98
60	20			+ 3,25	- 3,25		○ 3,99	- 3,99		
60	25			○ 3,06	- 3,06		○ 3,75	- 3,75		
60	30			+ 2,81	+ 2,81	- 2,81	+ 3,45	- 3,45	+ 3,33	+ 3,38
60	35			+ 2,52	- 2,52	- 2,52	+ 3,09	- 3,09	- 2,99	- 3,03
60	40			+ 2,19	+ 2,19	- 2,19	+ 2,68	○ 2,68	- 2,59	- 2,63
60	45			○ 1,80	○ 1,80	- 1,80	- 2,21	- 2,21	- 2,13	- 2,16
60	50			+ 1,37	- 1,37	- 1,37	+ 1,68	- 1,68	- 1,62	- 1,65
60	55			○ 0,90	- 0,90	- 0,90	- 1,10	- 1,10	- 1,06	- 1,08
65	30	+3,0	-0,8	- 3,46	- 3,46	- 3,46	+ 4,24	- 4,24	- 4,09	- 4,15
65	35	+0,8	-3,0	+ 3,17	- 3,17	- 3,17	○ 3,89	- 3,89	- 3,75	- 3,81
65	40			+ 2,84	- 2,84	- 2,84	○ 3,48	- 3,48	- 3,36	- 3,41
65	45			○ 2,46	- 2,46	- 2,46	- 3,01	- 3,01	- 2,91	- 2,95
65	50			+ 2,03	- 2,03	- 2,03	- 2,49	- 2,49	- 2,40	- 2,44
65	55			○ 1,55	- 1,55	- 1,55	○ 1,91	- 1,91	- 1,84	- 1,87
70	25			○ 4,35	- 4,35		- 5,34	- 5,34		
70	30			+ 4,11	○ 4,11	- 4,11	+ 5,04	- 5,04	+ 4,86	+ 4,93
70	35			○ 3,82	- 3,82	- 3,82	○ 4,69	- 4,69	- 4,52	- 4,59
70	40			+ 3,49	+ 3,49	- 3,49	+ 4,28	- 4,28	+ 4,13	+ 4,19
70	45			○ 3,11	- 3,11	- 3,11	- 3,81	- 3,81	- 3,68	- 3,73

ZELLAMID® TUBE

Standard length: 3000 mm

+ bold type: dimensions normally ex stock available ○ dimensions occasionally ex stock available
 - dimensions available upon minimum quantities

● →Length tolerance →3000 mm+60/+80 mm ● Please contact us for special dimensions not listed ● Other lengths available upon request ● Up to outside diameter 60 mm centreless ground available also ●



07/2011

NOMINAL SIZE		TOLERANCE		ZELLAMID® 202 (PA6) white	ZELLAMID® 202 MO (PA6 MoS ₂) black	ZELLAMID® 250 (PA6.6) ivory	ZELLAMID® 900 (POM-C) white	ZELLAMID® 900 SW (POM-C) black	ZELLAMID® 1400 (PET) white	ZELLAMID® 1400 T (PET + solid lubricant) I. grey
ODØ mm	IDØ mm	ODØ mm	IDØ mm	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m	appr. weight kg/m
70	50	+3,0	-0,8	+ 2,68	- 2,68	- 2,68	+ 3,29	○ 3,29	- 3,17	- 3,22
70	55	+0,8	-3,0	○ 2,21	- 2,21	- 2,21	○ 2,71	○ 2,71	- 2,61	- 2,65
70	60			○ 1,68	- 1,68	- 1,68	+ 2,07	- 2,07	- 1,99	- 2,02
75	25			- 5,05	- 5,05		- 6,19	○ 6,19		
75	35			○ 4,52	- 4,52	- 4,52	- 5,55	- 5,55	- 5,35	- 5,43
75	40			+ 4,19	- 4,19	- 4,19	- 5,14	○ 5,14	- 4,95	- 5,03
75	45			○ 3,81	- 3,81	- 3,81	- 4,67	- 4,67	- 4,50	- 4,57
75	50			+ 3,38	- 3,38	- 3,38	○ 4,14	- 4,14	- 4,00	- 4,06
75	60			+ 2,38	○ 2,38	- 2,38	- 2,92	- 2,92	- 2,82	- 2,86
75	65			○ 1,81	- 1,81	- 1,81	- 2,22	- 2,22	- 2,15	- 2,18
80	30			+ 5,56	+ 5,56	- 5,56	○ 6,81	- 6,81	- 6,57	- 6,67
80	35			- 5,27	- 5,27	- 5,27	- 6,46	- 6,46	- 6,23	- 6,32
80	40			+ 4,93	+ 4,93	- 4,93	+ 6,05	- 6,05	+ 5,84	+ 5,92
80	45			○ 4,55	- 4,55	- 4,55	- 5,58	- 5,58	- 5,38	- 5,46
80	50			+ 4,13	+ 4,13	- 4,13	+ 5,06	○ 5,06	- 4,88	- 4,95
80	60			+ 3,13	+ 3,13	○ 3,13	+ 3,84	○ 3,84	+ 3,70	+ 3,75
80	65			○ 2,56	○ 2,56	- 2,56	○ 3,14	○ 3,14	○ 3,03	- 3,07
80	70			○ 1,94	- 1,94	○ 1,94	- 2,38	- 2,38	- 2,30	- 2,33
85	30			○ 6,35	- 6,35	- 6,35	- 7,78	- 7,78	- 7,51	- 7,62
85	40			+ 5,73	- 5,73	- 5,73	- 7,02	- 7,02	- 6,77	- 6,87
85	60			- 3,92	- 3,92	○ 3,92	- 4,81	- 4,81	- 4,64	- 4,70
85	65			○ 3,35	- 3,35	- 3,35	- 4,11	- 4,11	- 3,96	- 4,02
85	70			○ 2,74	- 2,74	- 2,74	- 3,35	- 3,35	- 3,24	- 3,28
85	75			- 2,07	- 2,07	- 2,07	- 2,54	- 2,54	- 2,45	- 2,49
90	30			- 7,19	- 7,19	- 7,19	- 8,81	- 8,81	- 8,50	- 8,63
90	40			+ 6,57	- 6,57	- 6,57	+ 8,05	- 8,05	- 7,77	- 7,88
90	50	+3,6	-1,6	+ 5,97	+ 5,97	- 5,97	+ 7,32	○ 7,32	+ 7,06	+ 7,16
90	60	+1,2	-5,0	+ 5,00	+ 5,00	- 5,00	+ 6,13	- 6,13	- 5,91	- 6,00
90	70			+ 3,84	- 3,84	- 3,84	+ 4,71	- 4,71	+ 4,54	+ 4,61
90	75			○ 3,19	- 3,19	- 3,19	- 3,91	- 3,91	- 3,77	- 3,83
90	80			○ 2,49	- 2,49	- 2,49	- 3,06	- 3,06	- 2,95	- 2,99
100	35			○ 8,90	- 8,90	- 8,90	- 10,91	- 10,91	- 10,53	- 10,68
100	40			+ 8,58	+ 8,58	- 8,58	+ 10,52	- 10,52	- 10,15	- 10,30
100	50			+ 7,80	- 7,80	○ 7,80	+ 9,56	- 9,56	+ 9,22	+ 9,36
100	60			+ 6,83	- 6,83	- 6,83	+ 8,37	- 8,37	- 8,07	- 8,19
100	70			+ 5,67	+ 5,67	- 5,67	+ 6,95	+ 6,95	- 6,70	- 6,80
100	80			+ 4,32	○ 4,32	- 4,32	+ 5,30	○ 5,30	+ 5,11	+ 5,19
100	85			○ 3,58	- 3,58	- 3,58	- 4,39	- 4,39	- 4,23	- 4,29
100	90			+ 2,79	- 2,79	- 2,79	- 3,42	- 3,42	- 3,30	- 3,34
110	40			○ 10,60	- 10,60	- 10,60	○ 12,99	- 12,99	- 12,53	- 12,72
110	45			- 10,23	- 10,23	- 10,23	- 12,54	- 12,54	- 12,10	- 12,27
110	50			+ 9,81	- 9,81	- 9,81	+ 12,03	- 12,03	- 11,61	- 11,78
110	60			+ 8,84	- 8,84	- 8,84	+ 10,84	- 10,84	- 10,46	- 10,61
110	70			+ 7,68	○ 7,68	- 7,68	+ 9,42	○ 9,42	- 9,09	- 9,22
110	80			+ 6,34	- 6,34	- 6,34	+ 7,77	- 7,77	- 7,50	- 7,61
110	90			+ 4,80	○ 4,80	- 4,80	○ 5,89	○ 5,89	- 5,68	- 5,76

ZELLAMID® TUBE

Standard length: 1000 mm/3000 mm

+ **bold type: dimensions normally ex stock available** ○ **dimensions occasionally ex stock available**
 - **dimensions available upon minimum quantities**

● → Length tolerance: → 1000 mm+20/+40 mm → 3000 mm+60/+80 mm ● Please contact us for special dimensions not listed
 ● Other lengths available upon request ● Up to outside diameter 60 mm centreless ground available also ●

NOMINAL SIZE		TOLERANCE		ZELLAMID® 202 (PA6) white	ZELLAMID® 202 MO (PA6 MoS ₂) black	ZELLAMID® 250 (PA6.6) ivory	ZELLAMID® 900 (POM-C) white	ZELLAMID® 900 SW (POM-C) black	ZELLAMID® I400 (PET) white	ZELLAMID® I400 T (PET + solid lubricant) I. grey
ODØ	IDØ	ODØ	IDØ	appr. weight	appr. weight	appr. weight	appr. weight	appr. weight	appr. weight	appr. weight
mm	mm	mm	mm	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
120	50	+4,5	-2,0	+ 12,24	- 12,24	- 12,24	o 15,01	- 15,01	- 14,47	- 14,69
120	60	+1,5	-6,5	+ 11,29	- 11,29	- 11,29	+ 13,84	- 13,84	- 13,35	- 13,54
120	70			+ 10,15	o 10,15	- 10,15	o 12,44	- 12,44	- 12,00	- 12,17
120	80			+ 8,82	o 8,82	- 8,82	+ 10,81	- 10,81	- 10,43	- 10,58
120	90			o 7,30	- 7,30	- 7,30	o 8,95	- 8,95	- 8,63	- 8,76
120	100			+ 5,60	- 5,60	- 5,60	+ 6,86	- 6,86	- 6,62	- 6,72
125	80			+ 10,00	- 10,00	- 10,00	+ 12,25	- 12,25	- 11,82	- 11,99
125	90			+ 8,48	- 8,48	- 8,48	o 10,40	- 10,40	- 10,03	- 10,17
125	100			+ 6,77	- 6,77	- 6,77	- 8,31	- 8,31	- 8,01	- 8,13
130	50			+ 14,64	- 14,64	- 14,64	- 17,95	- 17,95	- 17,32	- 17,57
130	60			+ 13,69	- 13,69	- 13,69	+ 16,78	- 16,78	- 16,19	- 16,43
130	80			- 11,22	- 11,22	- 11,22	- 13,76	- 13,76	- 13,27	- 13,46
130	90			+ 9,70	o 9,70	- 9,70	+ 11,90	- 11,90	- 11,48	- 11,64
130	100			+ 8,00	- 8,00	- 8,00	+ 9,81	- 9,81	- 9,46	- 9,60
130	110			o 6,11	- 6,11	- 6,11	+ 7,49	- 7,49	- 7,22	- 7,33
140	60			+ 16,28	- 16,28	- 16,28	o 19,96	- 19,96	- 19,25	- 19,54
140	70			o 15,14	- 15,14	- 15,14	- 18,56	- 18,56	- 17,90	- 18,17
140	80			o 13,81	- 13,81	- 13,81	+ 16,93	+ 16,93	- 16,33	- 16,57
140	90			+ 12,30	- 12,30	- 12,30	+ 15,08	- 15,08	- 14,54	- 14,75
140	100			+ 10,59	- 10,59	- 10,59	+ 12,99	- 12,99	- 12,53	- 12,71
140	110			+ 8,70	- 8,70	- 8,70	+ 10,67	- 10,67	- 10,29	- 10,44
140	120			- 6,62	o 6,62	- 6,62	o 8,12	- 8,12	- 7,83	- 7,94
150	50			+ 20,01	- 20,01	- 20,01	- 24,54	- 24,54	- 23,67	- 24,02
150	70			+ 17,92	- 17,92	- 17,92	- 21,97	- 21,97	- 21,19	- 21,50
150	80			- 16,59	- 16,59	- 16,59	+ 20,34	- 20,34	- 19,62	- 19,91
150	90			o 15,07	- 15,07	- 15,07	- 18,48	- 18,48	- 17,83	- 18,09
150	100			+ 13,37	- 13,37	- 13,37	+ 16,39	- 16,39	- 15,81	- 16,04
150	110			o 11,48	- 11,48	- 11,48	- 14,07	- 14,07	- 13,57	- 13,77
150	120			+ 9,40	- 9,40	- 9,40	+ 11,52	- 11,52	- 11,12	- 11,28
160	50	+5,4	-2,2	o 23,21	- 23,21	- 23,21	- 28,46	- 28,46	- 27,45	- 27,86
160	60	+1,8	-7,5	+ 22,27	- 22,27	- 22,27	- 27,31	- 27,31	- 26,34	- 26,73
160	80			+ 19,83	- 19,83	- 19,83	- 24,31	- 24,31	- 23,45	- 23,79
160	90			o 18,32	- 18,32	- 18,32	- 22,46	- 22,46	- 21,67	- 21,99
160	100			+ 16,63	- 16,63	- 16,63	+ 20,39	- 20,39	- 19,67	- 19,95
160	120			o 12,68	- 12,68	- 12,68	- 15,55	- 15,55	- 15,00	- 15,22
160	130			o 10,42	- 10,42	- 10,42	o 12,78	- 12,78	- 12,33	- 12,51
160	140			- 7,98	- 7,98	- 7,98	+ 9,78	- 9,78	- 9,44	- 9,58
170	60			+ 25,44	- 25,44	- 25,44	- 31,19	- 31,19	- 30,08	- 30,53
170	80			- 22,99	- 22,99	- 22,99	- 28,19	o 28,19	- 27,19	- 27,59
170	100			+ 19,79	- 19,79	- 19,79	+ 24,27	- 24,27	- 23,41	- 23,75
170	120			- 15,85	- 15,85	- 15,85	o 19,43	- 19,43	- 18,74	- 19,01
170	130			+ 13,59	- 13,59	- 13,59	+ 16,66	- 16,66	- 16,07	- 16,31
170	140			o 11,15	- 11,15	- 11,15	o 13,67	- 13,67	- 13,18	- 13,37
180	70			- 27,66	- 27,66	- 27,66	+ 33,92	- 33,92	- 32,71	- 33,20
180	100			o 23,15	- 23,15	- 23,15	+ 28,38	o 28,38	- 27,38	- 27,78
180	110			- 21,27	- 21,27	- 21,27	o 26,08	- 26,08	- 25,15	- 25,52
180	120			+ 19,20	- 19,20	- 19,20	o 23,54	- 23,54	- 22,71	- 23,04
180	140			+ 14,50	- 14,50	- 14,50	+ 17,78	- 17,78	- 17,15	- 17,40
180	150			- 11,87	o 11,87	- 11,87	o 14,55	- 14,55	- 14,03	- 14,24
180	160			- 9,05	- 9,05	- 9,05	+ 11,09	- 11,09	- 10,70	- 10,86

ZELLAMID® TUBE

Standard length: 1000 mm/3000 mm

+ bold type: dimensions normally ex stock available ○ dimensions occasionally ex stock available
 - dimensions available upon minimum quantities

● → Length tolerance: → 1000 mm+20/+40 mm → 3000 mm+60/+80 mm ● Please contact us for special dimensions not listed
 ● Other lengths available upon request ● Up to outside diameter 60 mm centreless ground available also ●



07/2011

NOMINAL SIZE		TOLERANCE		ZELLAMID® 202 (PA6) white	ZELLAMID® 202 MO (PA6 MoS ₂) black	ZELLAMID® 250 (PA6.6) ivory	ZELLAMID® 900 (POM-C) white	ZELLAMID® 900 SW (POM-C) black	ZELLAMID® I400 (PET) white	ZELLAMID® I400 T (PET + solid lubricant) I. grey
ODØ	IDØ	ODØ	IDØ	appr. weight	appr. weight	appr. weight	appr. weight	appr. weight	appr. weight	appr. weight
mm	mm	mm	mm	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
190	70	+5,4	-2,2	○ 31,20	- 31,20	- 31,20	- 38,26	- 38,26	- 36,90	- 37,45
190	140	+1,8	-7,5	○ 18,04	- 18,04	- 18,04	- 22,12	- 22,12	- 21,33	- 21,65
190	160			○ 12,59	- 12,59	- 12,59	- 15,44	- 15,44	- 14,89	- 15,11
200	70			- 34,93	- 34,93	- 34,93	- 42,83	- 42,83	- 41,31	- 41,92
200	90			+ 32,11	- 32,11	- 32,11	- 39,37	- 39,37	- 37,98	- 38,53
200	100	+6,0	-2,5	+ 30,69	- 30,69	- 30,69	○ 37,63	- 37,63	- 36,29	- 36,82
200	130	+2,0	-8,5	+ 24,52	- 24,52	- 24,52	○ 30,06	- 30,06	- 29,00	- 29,42
200	140			○ 22,09	- 22,09	- 22,09	- 27,08	- 27,08	- 26,12	- 26,50
200	150			○ 19,47	○ 19,47	- 19,47	+ 23,87	- 23,87	- 23,02	- 23,36
200	160			+ 16,66	- 16,66	- 16,66	○ 20,43	- 20,43	- 19,70	- 19,99
210	150			- 23,39	- 23,39	- 23,39	○ 28,68	- 28,68	- 27,66	- 28,07
210	160			- 20,59	- 20,59	- 20,59	+ 25,24	- 25,24	- 24,34	- 24,70
220	70			- 43,20	- 43,20	- 43,20	+ 52,97	- 52,97	- 51,09	- 51,84
220	75			- 42,57	- 42,57	- 42,57	○ 52,20	- 52,20	- 50,35	- 51,09
220	160	+9,0	-3,0	+ 25,83	- 25,83	- 25,83	+ 31,67	- 31,67	- 30,55	- 31,00
220	190	+3,0	-10,0	- 16,34	- 16,34	- 16,34	- 20,03	- 20,03	- 19,32	- 19,61
230	120			+ 40,20	- 40,20	- 40,20	- 49,28	- 49,28	- 47,54	- 48,24
230	160			+ 30,17	- 30,17	- 30,17	- 36,99	- 36,99	- 35,68	- 36,20
230	170			- 27,19	- 27,19	- 27,19	+ 33,34	- 33,34	- 32,16	- 32,63
230	190			- 20,68	- 20,68	- 20,68	+ 25,35	- 25,35	- 24,45	- 24,81
250	70			- 57,74			○ 70,80	- 70,80		
250	150			+ 42,20	- 42,20	- 42,20	- 51,74	- 51,74	- 49,90	- 50,64
250	170			- 36,43	- 36,43	- 36,43	○ 44,67	- 44,67	- 43,08	- 43,72
260	130			○ 52,11	- 52,11	- 52,11	- 63,89	- 63,89	- 61,63	- 62,53
260	160			○ 44,31	- 44,31	- 44,31	- 54,33	- 54,33	- 52,40	- 53,17
260	170			- 41,33	- 41,33	- 41,33	○ 50,68	- 50,68	- 48,88	- 49,60
260	190			+ 34,82	- 34,82	- 34,82	+ 42,69	- 42,69	- 41,17	- 41,78
265	90			- 62,40	- 62,40		○ 76,51	- 76,51		
265	210			- 30,07	- 30,07	- 30,07	○ 36,87	- 36,87	- 35,56	- 36,08
270	90			- 64,97	- 64,97		○ 79,66	- 79,66		
280	100			- 68,59	- 68,59		○ 84,09	- 84,09	- 81,11	- 82,30
280	140			- 60,06	- 60,06		- 73,64	- 73,64	- 71,03	- 72,07
280	210			○ 37,91	- 37,91		○ 46,49	- 46,49	- 44,84	- 45,50
280	240			- 25,61	- 25,61		○ 31,40	- 31,40	- 30,28	- 30,73
300	90			- 81,37			○ 99,76	- 99,76		
300	100			- 79,70			○ 97,72	- 97,72		
310	130			- 79,43			- 97,39	- 97,39		
350	200	+11,0	-3,5				○ 104,61	- 104,61		
400	200	+3,0	-14,0				○ 148,58	- 148,58		
400	300						○ 93,04	- 93,04		
450	200	+13,0	-3,5				○ 199,80	- 199,80		
450	300	+3,0	-16,0				○ 144,49	- 144,49		
500	200						○ 255,40	- 255,40		
500	300						○ 200,09	- 200,09		
500	375						+ 143,50	- 143,50		

Machining instructions

ZELLAMID® - Engineering Plastic Stock Shapes

1. Machines and Tools

Engineering plastic stock shapes can be easily machined on metalworking and woodworking machines with HSS (high speed steel) or hard metal tools. By machining with circular saws it is recommended to use hard metal saw blades. Only use properly sharpened tools.

It is possible to use hard metal tools for machining glass fibre reinforced materials but due to the high wear rates it is difficult to reach good economic results, therefore diamond coated tools are recommended which are more expensive but however have longer life span.

2. Machining and clamping the component

Compared to metals, plastic materials show a lower thermal conductivity and modulus of elasticity. Improper machining leads to heating of the work piece followed by dilation.

High clamping pressure and blunt tools create deformations of the work piece during machining. Dimension and form variations over range of tolerance are the consequences.

In order to achieve a satisfying machining result, some material specific guidelines must be kept.

- cutting speed should be as high as possible
- an ideal chip removal must be assured to prevent wrapping of the swarf around the tool or work piece
- Tools must be kept sharp. Blunt tools lead to heating which causes distortion and dilation
- Too high clamping pressure leads to deformation of the work piece and imprints of clamping tool
- As engineering plastics are not as rigid as metallic materials it is essential to secure the work piece adequately and to ensure a uniform support
- If necessary, materials with high water absorption (e.g. polyamide) should be conditioned before machining
- Machining tolerances for engineering plastic parts are wider than metal parts

3. Cooling during machining

Generally, coolants are not necessary for machi-

ning thermoplastic materials. When coolants are required, compressed air is recommended. Compressed air has an additional benefit of chip removal from the working area, preventing interference with cutting tools and the workpiece. Usual drilling emulsions can also be used; they are particularly recommended when drilling deep holes and long threads. Furthermore it is possible to achieve higher feed rates which leads to a reduction in machining time.

If drilling emulsions are used, consideration must be given to subsequent cleaning operations to prevent contamination of any additional process such as splicing or varnishing.

4. Characteristic data for different machining operations

4.1 Drilling

Usual HSS sharpened tools can be used for drilling. Take care of chip removal when drilling particularly deep holes to prevent excessive temperatures, frequent removal of the drill may also be necessary. It is also recommended for large holes to drill first with a smaller diameter (ca. 10-20 mm) and then to finish with a single-point cutting tool.

Furthermore the drill has to be cooled to ensure an acceptable chip removal otherwise the plastic heats up to melting point and the materials low thermal conductivity prevents heat dissipation which leads to extreme material expansion in the centre. As the outer wall remains cold a huge area of stress is generated. Notch effect of the tool may lead to material failure (cracking) if above-mentioned rules are not observed.

This effect may also appear with high impact strength materials.

As reinforced plastic materials have higher machining residual stress paired with lower impact strength than un-reinforced plastic materials they are especially crack sensitive.

These materials should be heated up to 120°C prior drilling. (Heating time ca. 1 hour per 10 mm thickness)

Also with ZELLAMID® 250 (PA 6.6) as well as ZELLAMID® 1400 and 1400T (PET and PET+ solid lubricant), this procedure is recommended.

4.2 Turning

Turning most thermoplastic plastics produces a continuous chip stream. An ideal chip removal must be assured to prevent wrapping or clamping of the chip around the tool or work piece.

Due to the fact that plastics show lower rigidity,

long turning pieces can sag and therefore the usage of a steady rest is advisable.

4.3 Sawing

Engineering plastics can be cut either with band saws or circular saws.

The choice depends on the shape of semi-finished part.

Application of a band saw is especially recommended when cutting rods and tubes. Generated heat is dissipated by the saw blade. Take care of crosswise teeth setting to prevent clamping of the saw blade.

Circular saws are generally used for cutting plates with straight cutting edges. Work with high feed

rates to ensure a good chip removal and to prevent clamping of the saw blade or overheating of the plastic at the cutting edge.

Usage of saw blades with side cutters and side scrapers is recommendable.

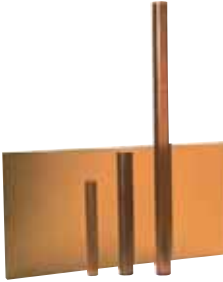
As reinforced plastic materials have higher machining residual stress paired with lower impact strength than un-reinforced plastic materials they are especially crack sensitive.

These materials should be heated up to 120°C prior sawing.

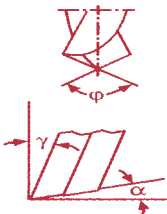
4.4 Milling

High chipping performance paired with good surface quality and accuracy can be achieved with high cutting speed and moderate feed on usual mills.





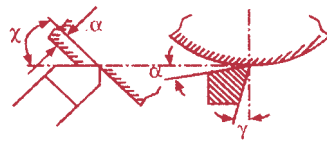
DRILLING



α : side relief angle (°)
 γ : rake angle (°)
 Φ : Top angle (°)
 V : cutting speed (m/min)
 S : feed (mm/rev)

Spin angle β should be between ca. 12 and 16°


TURNING



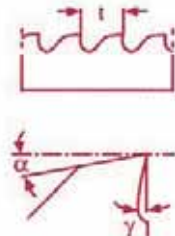
α : side relief angle (°)
 γ : rake angle (°)
 χ : setting angle (°)
 V : cutting speed m/min
 S : feed (mm/rev)

Edge radius r should be minimum 0,5 mm

ZELLAMID®	α	γ	ϕ	V	S	α	γ	χ	V	S
202 (PA6), 202 MO (PA6 + MoS ₂), 1100 (PA6 C)	5 - 15	5 - 20	90	50 - 150	0,1 - 0,3	6 - 10	0 - 5	45 - 60	250 - 500	0,1 - 0,5
250 (PA 66)	5 - 15	10 - 20	90	50 - 150	0,1 - 0,3	6 - 10	0 - 5	45 - 60	200 - 500	0,1 - 0,5
900 (POM-C), 900 H (POM-H), 900 XU ELS (POM-C conductive), 900 AS (POM-C antistatic).	5 - 10	15 - 30	90	50 - 200	0,1 - 0,3	6 - 8	0 - 5	45 - 60	300 - 600	0,1 - 0,4
1400, 1400 H, 1400 PBT	5 - 10	10 - 20	90	50 - 100	0,2 - 0,3	5 - 15	0 - 5	45 - 60	300 - 400	0,2 - 0,4
1500 (PEEK)	5 - 10	10 - 30	90-120	70 - 200	0,1 - 0,3	6 - 8	0 - 5	45 - 60	250 - 500	0,1 - 0,4
1000 (PEI)	3 - 10	10 - 20	90	20 - 80	0,1 - 0,3	6	0	45 - 60	350 - 400	0,1 - 0,3
1900 (PPS)	5 - 10	10 - 30	90	50 - 200	0,1 - 0,3	6 - 8	0 - 5	45 - 60	250 - 500	0,1 - 0,5
2100 (PPSU)	3 - 10	10 - 20	90	20 - 80	0,1 - 0,3	6	0	45 - 60	350 - 400	0,1 - 0,3
Filled/Reinforced Zellamid® products	6	5 - 10	120	80 - 100	0,1 - 0,3	6 - 8	2 - 8	45 - 60	150 - 200	0,1 - 0,5




SAWING



α : side relief angle (°)
 γ : rake angle (°)
 V : cutting speed (m/min)
 T : pitch (mm)

MILLING



α : side relief angle (°)
 γ : Rake angle (°)
 V : cutting speed (m/min)

ZELLAMID®	α	γ	V	t	α	γ	V
202 (PA6), 202 MO (PA6 + MoS ₂), 1100 (PA6 C)	20 - 30	2 - 5	500	3 - 8	10 - 20	5 - 15	250 - 500
250 (PA 66)	20 - 30	2 - 5	500	3 - 8	10 - 20	5 - 15	250 - 500
900 (POM-C), 900 H (POM-H), 900 XU ELS (POM-C conductive), 900 AS (POM-C antistatic).	20 - 30	0 - 5	500 - 800	2 - 5	5 - 15	5 - 15	250 - 500
1400, 1400 H, 1400 PBT	15 - 30	5 - 8	300	2 - 8	5 - 15	5 - 15	250 - 400
1500 (PEEK)	15 - 30	0 - 5	500 - 800	3 - 5	5 - 15	6 - 10	180 - 450
1000 (PEI)	15 - 30	0 - 4	500	2 - 5	2 - 10	1 - 5	250 - 500
1900 (PPS)	15 - 30	0 - 5	500 - 800	3 - 5	5 - 15	6 - 10	250 - 500
2100 (PPSU)	15 - 30	0 - 4	500	2 - 5	2 - 10	1 - 5	250 - 500
Filled/Reinforced Zellamid® products	15 - 30	10 - 15	200 - 300	3 - 5	15 - 30	6 - 10	80 - 100

Reinforced ZELLAMID® Grades as 250 GF30, 1500T, 1500 GF30, 1000 GF30, 1900 GF40 and unfilled grades 1400, 1400H, 1900 should be preheated before sawing or drilling a centre hole for rod dia 80 mm or larger and plate thickness of 50 mm or more. A preheat temperature of 100 °C to 120 °C is recommended with a smooth temperature increase and decrease at a rate of 10 °C per hour. Use only sharpened tools with low feed. **All other materials should be heated equally to room temperature before machining!** Our application technology consultation in word and writing is to support your own work. It is considered as non-committal recommendation, also in the reference to any patent rights third. We do not assume liability for possible damage, which occur during processing. Changes, which serve the technical progress, we reserve ourselves.

Legal Note

ZELLAMID® is an international registered trade name, which stands for quality and service.

The information submitted in this publication is offered as a possible helpful suggestion in experimentation for those to whom we supply our ZELLAMID® products. Since practical operating conditions do not always correspond with testing methods, the information given in this leaflet can only be considered as an indication and not as a basis for calculations since allowances have to be made for field operating conditions. We accept no liability for the application, suitability, working or other use of our products or the consequences resulting therefrom.

The data given in this brochure do not relieve distributors, processors, OEMs or end-users from the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose or application. Buyers and users of ZELLAMID® shall be obligated to inspect the quality and properties of the products; they accept full responsibility for the selection, use, and working of the products and the use of information and the consequences therefrom.

It is the responsibility of those who use ZELLAMID® to ensure that any proprietary rights and existing laws and legislation are observed.

Specifications

Worldwide specifications of plastic materials are used either to assure the quality of stock shapes purchased or to protect the safety of the public. These specifications are issued by governments, private institutions or technical societies. The most common are the US-specs, DIN and JIS.

Being the supplier to the world market ZELLAMID® semi-finished plastic products meet or exceed the commonly used standards.

Our semi-finished products meet or exceed ●
ASTM D-6778 ● ASTM D-5989 ● ASTM D-6100
● ASTM D-6261 ● ASTM D-6779 ● DIN 16977
● DIN 16978 ● DIN 16980 ● DIN 16982 ● DIN
16983 ● DIN 16984 ● DIN 16985 ● DIN 16986
● DIN 16809 ● DIN 16810 ● CEN EN 15860 ●

Industrial specifications from private firms can be met upon information. Specification sheets and material data safety sheets are available on request. Above information is given in good faith, but is subject to revision as additional experience and knowledge are gained, or because the list of particular regulations is also changing continuously. It is therefore recommended, that you consult your ZELLAMID® specialist for the latest status.

For further information, please contact your local ZELLAMID® representative.

CERTIFICATE

ISO 9001:2008





hereby certifies that the company



Zell-Metall GmbH

Business field:
Development, manufacturing and sales of plastic stock shapes and machined parts

Location:
Schulstraße 511 · A-5710 Kaprun
AUSTRIA, EUROPE

has successfully implemented the above mentioned quality management system according to the standard (11/2008) and applies it effectively. The conformity was inspected during the certification audit documented in audit report no. A29221273. This certificate is only valid in connection with the successful performance of the surveillance audits.

Date of the first certification: <u>11.05.2000</u>	Date of the last recertification: <u>26.05.2009</u>
This certificate is valid until: <u>29.05.2012</u>	Certificate registration no.: <u>100500396/3 duplicate</u>
Last audit day: <u>14.05.2009</u>	



DEKRA Certification GmbH
Stuttgart, 26.05.2009



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