ZELL MATERIALS
ENGINEERING PLASTICS

ZELLAMID®

ENGINEERING PLASTIC STOCK SHAPES

EN.09.2025

ZELLAMID® | TABLE OF CONTENTS

ZELLAMID® | PRODUCT DESCRIPTION

ZELLAMID® Designation	Product description	Product colour	Density g/cm³	Temperature Air °C[1]
PA 6 – Polyamid 6 extruded				
ZELLAMID® 202 NA / SW	PA 6 unfilled	natural, black	1,13	-40 – 100
ZELLAMID® 202 MO	PA 6 + MoS_2	black	1,15	-40 – 90
ZELLAMID® 202 HV	PA 6 high viscosity	natural	1,13	-30 – 100
ZELLAMID® 202 IM	PA 6 impact modified	natural	1,08	-30 – 100
ZELLAMID® 202 GF30	PA 6 + 30 % Glass fibre	black	1,22	-30 – 100
PA 6 C – Cast Nylon Products				
ZELLAMID® 1100 NA / SW	PA 6 C unfilled	natural, black	1,15	-40 – 105
ZELLAMID® 1100 Oil	PA 6 C Oil	white, yellow, green, black	1,14	-40 – 105
ZELLAMID® 1100 MO	PA 6 C + MoS_2	black	1,15	-40 – 105
ZELLAMID® 1100 T	PA 6 C Tribotype	grey	1,14	-40 – 105
ZELLAMID® 1100 FR	PA 6 C flame retardent	black	1,15	-40 – 105
ZELLAMID® 1100 BLUE	PA 6 C	blue	1,15	-40 – 105
ZELLAMID® 1100 HS	PA 6 C heat stabilized	black	1,15	-40 – 105
ZELLAMID® 1115 NA	PA 6/12 C high impact	natural	1,13	-40 – 105
ZELLAMID® 1200 NA	PA 12 C	natural	1,03	-60 – 110
PA 6.6 – Polyamid 6.6				
ZELLAMID® 250 NA / SW	PA 6.6 unfilled	ivory, black	1,14	-30 – 100
ZELLAMID® 250 MO	PA 6.6 + MoS_2	anthracite	1,15	-30 – 90
ZELLAMID® 250 GF30	PA 6.6 + 30 % Glass fibre	black	1,35	-20 – 150
ZELLAMID® 250 PE	PA 6.6 + PE Tribotype	light green	1,12	-30 – 90
ZELLAMID® 250 HV	PA 6.6 high impact	natural	1,09	-30 – 100
PE – Polyethylene				
ZELLAMID® 665 NA / SW / GR	Polyethylene 500 (HMW) unfilled	natural, black, green	0,96	-100 – 80
ZELLAMID® 675 NA / SW / GR	Polyethylene 1000 (UHMW) unfilled	natural, black, green	0,94	-200 – 80
POM – Polyoxymethylene				
ZELLAMID® 900 NA / SW	POM-C unfilled	natural, black	1,41	-50 – 100
ZELLAMID® 900 BLUE	POM-C RAL 5002	blue	1,42	-50 – 100
ZELLAMID® 900 Special colours	POM-C unfilled	on request	1,42	-40 – 100
ZELLAMID® 900 PE	POM-C + PE Tribotype	light blue	1,34	-50 – 80
ZELLAMID® 900 GF30	POM-C + 30 % Glass fibre	natural	1,58	-20 – 100
ZELLAMID® 900 AS	POM-C antistatic	white	1,35	-50 – 90
ZELLAMID® 900 AS SW	POM-C antistatic	black	1,35	-50 – 90
ZELLAMID® 900 ELS	POM-C ELS conductive	black	1,41	-40 – 80
ZELLAMID® 900 XT	POM-C + PTFE Tribotype	grey	1,44	-40 – 100
ZELLAMID® 900 H	POM-H unfilled	natural	1,42	-40 – 100

[1] Values are indicative

Dimensional stability	Food contact	Wear resistance	Coefficient of friction	Chemical resistance	Rods in mm	Tubes in mm	Plates in mm
PA 6 – Polyamid 6 extruded							
medium	high	medium	high	high	6 – 300	25 – 310	1 – 110
medium	low	high	high	medium	6 – 100	25 – 310	1,5 – 110
medium	high	medium	high	high	6 – 300	25 – 310	8 – 110
medium	high	medium	high	high	6 – 300	25 – 310	8 – 110
medium	low	high	low	medium	10 – 150	on request	10 – 60
PA 6 C – Cast Nylon Products							
medium	low	high	high	high	20 – 800	50 – 1000	8 – 165
medium	low	high	high	high	20 – 800	50 – 1000	8 – 165
medium	low	high	high	high	80 – 800	50 – 1000	8 – 100
medium	low	high	high	high	80 – 800	50 – 1000	8 – 165
medium	low	high	high	high	20 – 800	50 – 1000	8 – 165
medium	low	high	high	high	20 – 800	50 – 1000	8 – 165
medium	low	high	high	high	20 – 800	50 – 1000	8 – 165
medium	low	high	high	high	80 – 800	50 – 880	8 – 165
medium	high	high	high	high	20 – 230	20 – 250	8 – 60
PA 6.6 – Polyamid 6.6							
medium	high	medium	high	high	6 – 150	25 – 265	5 – 60
medium	low	high	high	high	6 – 100	25 – 265	5 – 60
high	low	high	medium	high	6 – 160	---	5 – 100
medium	high	high	high	high	6 – 150	---	5 – 60
medium	high	high	high	high	6 – 150	---	---
PE – Polyethylene							
low	high	medium	medium	high	---	---	10 – 150
low	high	very high	very high	high	20 – 300	---	10 – 150
POM – Polyoxymethylene							
high	high	low	high	high	6 – 500	25 – 500	0,5 – 150
high	high	low	high	high	6 – 500	25 – 500	0,5 – 150
high	high	high	high	high	on request	on request	on request
medium	high	high	high	high	6 – 150	---	8 – 100
high	low	high	high	high	16 – 150	---	2 – 60
high	high	medium	medium	high	6 – 160	---	8 – 50
high	high	medium	medium	high	6 – 160	---	8 – 50
high	low	medium	medium	high	6 – 150	---	8 – 50
high	high	high	high	high	6 – 150	---	8 – 50
high	medium	medium	medium	medium	6 – 150	on request	8 – 100

ZELLAMID® | PRODUCT DESCRIPTION

ZELLAMID® Designation	Product description	Product colour	Density g/cm³	Temperature Air °C[1]
PET – Thermoplastic Polyester				
ZELLAMID® 1400 NA / SW	PET unfilled	natural, black	1,36	-20 – 100
ZELLAMID® 1400 T	PET Tribotype	light grey	1,39	-20 – 110
PEI – Polyetherimide				
ZELLAMID® 1000 NA / SW	PEI unfilled	amber, black	1,27	-50 – 170
ZELLAMID® 1000 GF30	PEI + 30 % Glass fibre	brown	1,51	-50 – 170
PVDF – Polyvinylidene fluoride				
ZELLAMID® 1700 NA	PVDF unfilled	natural	1,78	-50 – 150
PTFE – Polytetrafluoroethylene				
ZELLAMID® 1800 NA	PTFE unfilled	white	2,13 – 2,20	-200 – 250
PPS – Polyphenylene sulfide				
ZELLAMID® 1900 NA	PPS unfilled	natural	1,35	-50 – 220
ZELLAMID® 1900 GF40	PPS + 40 % Glass fibre	black	1,64	-50 – 220
ZELLAMID® 1900 IM	PPS impact modified	black	1,90	-50 – 220
ZELLAMID® 1900 T	PPS Tribotype	blue	1,61	-50 – 220
PEEK – Polyetheretherketone				
ZELLAMID® 1500 X / XSW	PEEK unfilled	brown, black	1,30	-60 – 260
ZELLAMID® 1500 XC20	PEEK + 20 % Ceramic	white	1,49	-60 – 260
ZELLAMID® 1500 XCA30	PEEK + 30 % Carbon fibre	anthracite	1,40	-20 – 260
ZELLAMID® 1500 XGF30	PEEK + 30 % Glass fibre	brown	1,51	-20 – 260
ZELLAMID® 1500 XT	PEEK modified Tribotype	black	1,45	-30 – 260
ZELLAMID® 1500 XTW	PEEK PFAS-free Tribotype	black	1,44	-60 – 260
ZELLAMID® 1500 XCT2	PEEK cryogenic	green	1,43	-196 – 260
ZELLAMID® 1500 XMG	PEEK medical-grade	brown	1,30	-60 – 260

[1] Values are indicative

Dimensional stability	Food contact	Wear resistance	Coefficient of friction	Chemical resistance	Rods in mm	Tubes in mm	Plates in mm
PET – Thermoplastic Polyester							
high	high	medium	high	high	6 – 200	25 – 210	3 – 100
high	high	high	high	high	6 – 160	25 – 210	8 – 100
PEI – Polyetherimide							
high	high	high	medium	high	6 – 150	---	6 – 100
very high	low	high	medium	high	6 – 50	---	on request
PVDF – Polyvinylidene fluoride							
medium	high	medium	medium	high	10 – 40	---	10 – 20
PTFE – Polytetrafluoroethylene							
medium	high	low	high	high	10 – 100	---	10 – 80
PPS – Polyphenylene sulfide							
high	medium	medium	medium	high	6 – 40	---	6 – 25
very high	low	high	low	high	6 – 40	---	6 – 25
very high	low	medium	medium	high	6 – 40	---	6 – 25
high	low	very high	very high	high	6 – 40	---	6 – 25
PEEK – Polyetheretherketone							
very high	high	medium	medium	high	5 – 160	50 – 160	3 – 100
very high	high	high	medium	high	8 – 90	---	10 – 50
very high	low	high	medium	high	6 – 80	---	5 – 60
very high	low	high	medium	high	6 – 100	---	5 – 80
very high	low	high	high	high	6 – 100	on request	5 – 80
very high	medium	very high	very high	high	on request	---	5 – 20
very high	medium	very high	high	high	5 – 160	---	5 – 80
very high	high	medium	medium	high	5 – 160	---	5 – 100

ZELLAMID® | PRODUCT RANGE

ZELLAMID® | PRODUCT RANGE

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

Our quality is insured by rigorous control according to DIN ISO 9001 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
In order 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 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® | OVERVIEW

ZELLAMID® Extrusion

Since mid 1950´s we are manufacturing engineering plastic stock shapes by extrusion made from various formulations of PA, POM, PET, PEEK and HPMs.

We earn your business by providing you with exceptional high levels of quality, performance and production standards. Together with our strong creative drive for innovation, research and development, our exceptional service, ZELLAMID® rod, plate, tubular bar and flexible tubes offer the better alternative in respect of the future.

ZELLAMID® Cast Nylon Products

Our ZELLAMID® 1100 is available with different compositions in rods, plates or in over 2000 different tube dimensions (combination outer- to innerdiameter).

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 different 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 Plastic Products GmbH & Co KG, the company focuses on injection moulding technology, will accompany our clients from idea to finish product, from design to construction and from simulation to commercial production.

The 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 4,5 kg 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

more information: seletec®

ZELLAMID® | 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 Materials Engineering Plastics was the first manufacturer worldwide to introduce Nanotechnology to the stock shape industry.

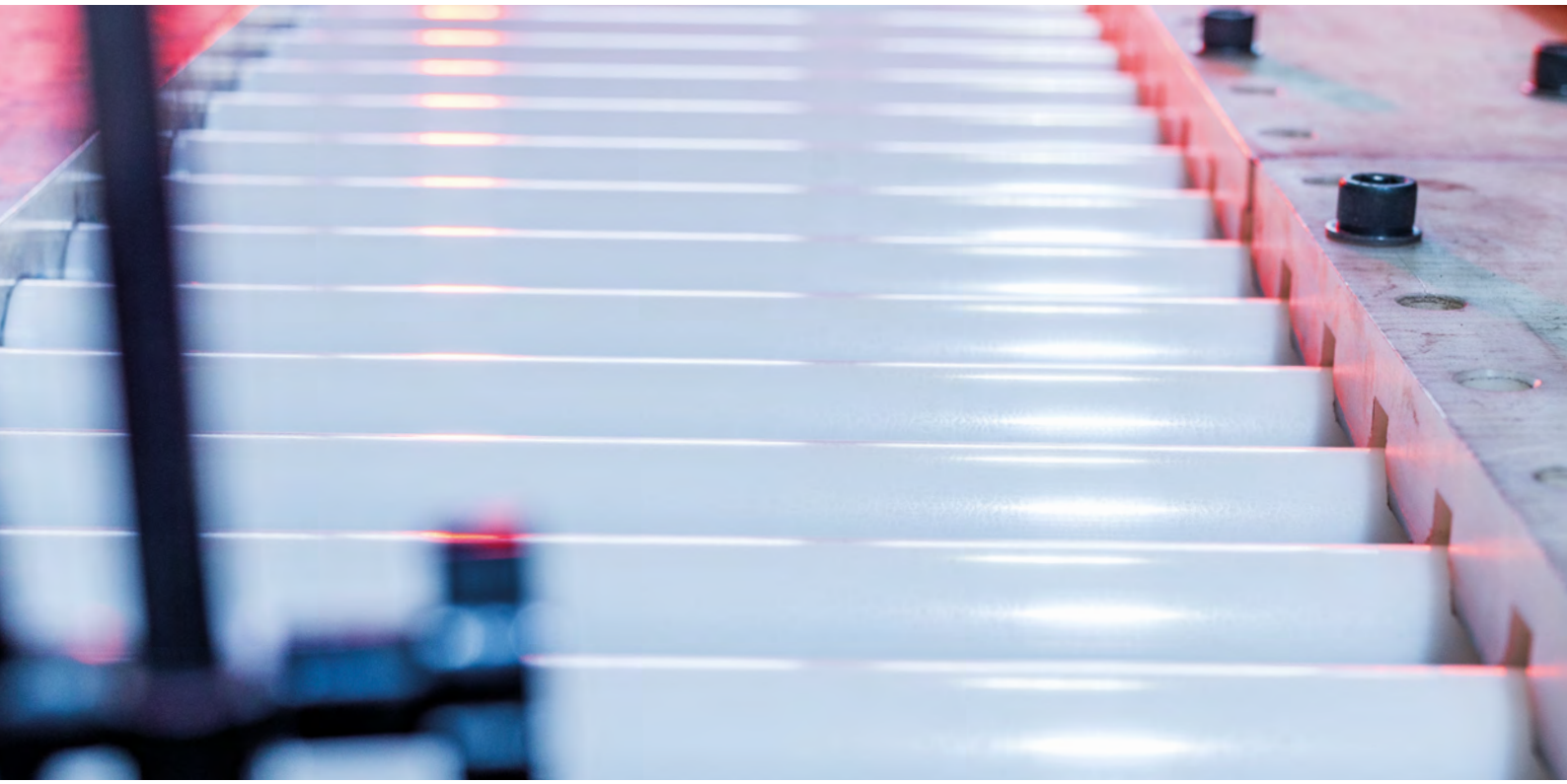
High Performance Materials, also known as HPMs, are materials which have a temperature resistance of over 150 °C maintaining very similar properties over a broad range of temperatures and chemical environments.

ZELLAMID® extruded is available in following shapes:		Pages:
ZELLAMID® Rods	5 or 6 – 500 mm diameter	46 – 56
ZELLAMID® Sheets and Plates	0,3 – 150 mm thickness	57 – 66
ZELLAMID® Tubes	25 - 500 mm outer diameter	67 – 75

ZELLAMID® | GENERAL AND SPECIAL

PERFORMANCE ENGINEERING PLASTICS

ZELLAMID® | PA 6 EXTRUDED



ZELLAMID® 202 – natural
ZELLAMID® 202 SW – black

ZELLAMID® 202 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 1,13 g/cm^3 and bronze has 8,8 g/cm^3 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 (EU 10/2011 and FDA).

Product attribute – Overview	
ZELLAMID® 202	PA 6, natural, tough material, high impact resistance
ZELLAMID® 202 SW	PA 6, black, tough material, high impact resistance
ZELLAMID® 202 MO	PA 6 + MoS_2, black, improved sliding properties, high compressive strength
ZELLAMID® 202 HV	PA 6, natural, high impact resistance, high viscosity

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.

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

ZELLAMID® 202 MO – black, Nylon 6 filled with Molybdenum Disulfide

In comparison with unfilled PA 6 improved sliding properties and 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 HV – natural, Polyamid 6 high viscosity

ZELLAMID® 202 HV is an unreinforced, high viscosity Polyamid 6.

ZELLAMID® 202 HV has a higher impact resistance, also at very low temperatures. The charpy impact strength test has a result with no break at room temperature, the notched test has a value of 9 kJ/m^2.

ZELLAMID® 202 HV is tested according to UL 94 with HB. Humidity absorption and dimensional stability is nearly the same as ZELLAMID® 202.

ZELLAMID® 202 HV is suitable for various engineering elements and building machine parts. Especially applications which require high impact strength at lower temperatures are designated for the use of ZELLAMID® 202 HV.

This material is also perfect for applications, when recoil or split-off is a critical issue.

ZELLAMID® | CAST NYLON PA 6 C

Product attribute – Overview	
ZELLAMID® 1100	PA 6 C, natural, black, blue and custom colours
ZELLAMID® 1100 MO	PA 6 C + MoS_2, black, UV-resistance
ZELLAMID® 1100 Oil	PA 6 C + Oil, yellow, green, black, white
ZELLAMID® 1100 T	PA 6 C, grey, filled with a solid lubricant, coefficient of friction 0,15
ZELLAMID® 1100 HS	PA 6 C, black, heat stabilized
ZELLAMID® 1115	PA 6/12 C, natural, impact modified
ZELLAMID® 1120 FE	PA 6/12 C, natural, metal core, optimal and reliable power transmission
ZELLAMID® 1200	PA 12 C, natural

ZELLAMID® 1100 – natural, 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 – black, filled with Molybdenum Disulfide

Molybdenum Disulfide (MoS_2) 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 – different colours, yellow, green, black, white

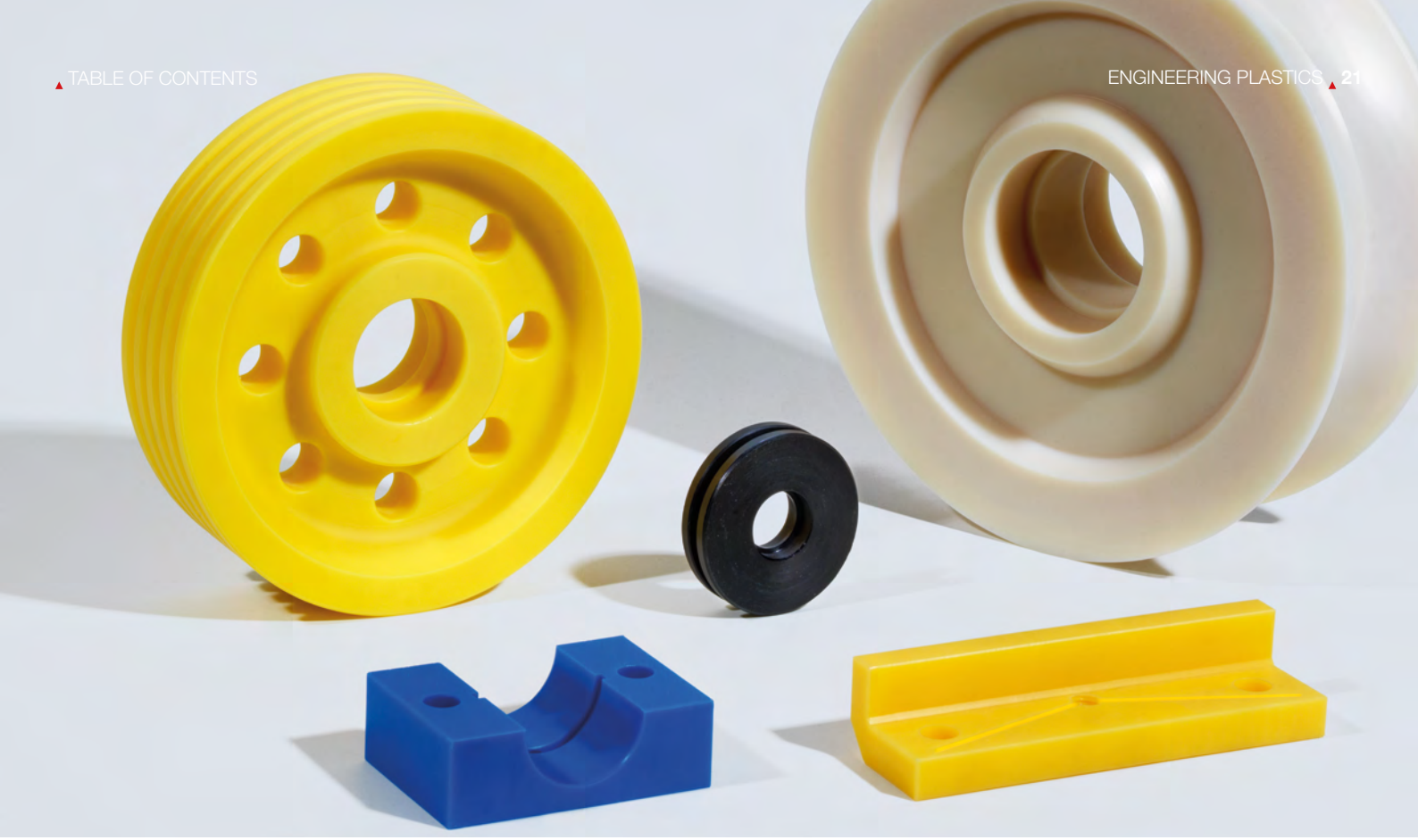
Our company was world-wide the first manufacturer to develop a really usable cast nylon in which a special oil is embedded homogeneously into the molecular structure giving the stock shapes a superior wear resistance and a lower coefficient of friction.

These advantages are particularly noticeable when there is a combination of static and dynamic friction.

ZELLAMID® 1100 T – grey, filled with a solid lubricant

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



- **ZELLAMID® 1100 HS – black, Cast Nylon 6 heat stabilized**

  Basically the properties are to be compared with those of ZELLAMID® 1100 but better protected against thermal oxidative degradation by a heat aging stabilizer. Therefore, this material is mechanically resistant for longer service temperatures.

- **ZELLAMID® 1115 – natural, Cast Nylon 6/12 impact modified**

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

- **ZELLAMID® 1120 FE – natural, Cast Nylon 6/12 with a metal core**

  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.

Following metals are used typically:
- 1.4305 (stainless steel)
- 9SMn28K (free-cutting steel)
- C45 (carbon-steel)

- **ZELLAMID® 1200 C – natural, Cast Nylon 12**

  Cast Nylon 12 is manufactured from the raw material Laurinlactam in a pressureless monomer moulding process.

  The seamless transition from 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.

ZELLAMID® | PA 6.6 EXTRUDED

ZELLAMID® 250 – ivory
ZELLAMID® 250 SW – black

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 Polyamid 6.

Applications:
Parts exposed to mechanical stress and strain under elevated temperatures.

ZELLAMID® 250 MO – anthracite, filled with Molybdenum Disulfide

Polyamid 6.6 filled with Molybdenum Disulfide (MoS_2) offers improved strength, rigidity and friction ratio.

Applications:
Gears and sheaves.

Product attribute – Overview	
ZELLAMID® 250	PA 6.6, ivory, temperature resistant, high tensile strength
ZELLAMID® 250 SW	PA 6.6, black, temperature resistant, high tensile strength
ZELLAMID® 250 MO	PA 6.6 + MoS_2, anthracite, improved strength and rigidity
ZELLAMID® 250 GF30	PA 6.6 + 30% Glass fibre, black, increased rigidity and dimensional stability
ZELLAMID® 250 PE	PA 6.6 + PE, light green, improved strength
ZELLAMID® 250 HI	PA 6.6, ivory, impact modified

ZELLAMID® 250 GF30 – black, Nylon 6.6 + 30 % Glass fibre

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

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.

Applications:
Transport and conveyer, mechanical and automotive engineering, precision engineering, paper and packaging processing machinery.

ZELLAMID® 250 HI – ivory, Nylon 6.6 impact modified

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 – light green, Nylon 6.6 with a solid lubricant

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® | POM EXTRUDED

Product attribute – Overview	
ZELLAMID® 900	POM-C, natural
ZELLAMID® 900 SW	POM-C, black
ZELLAMID® 900 blue	POM-C, blue, RAL 5002
ZELLAMID® 900 AS	POM-C, white, antistatic
ZELLAMID® 900 XU ELS	POM-C ELS, black, filled with Carbon Nanotubes
ZELLAMID® 900 XT	POM-C + PTFE, light grey, with a solid lubricant
ZELLAMID® 900 PE	POM-C + PE, light blue, POM-C with a solid lubricant
ZELLAMID® 900 GF30	POM-C + 30% Glass fibre, natural

ZELLAMID® 900 – natural
ZELLAMID® 900 SW – black
ZELLAMID® 900 blue – RAL 5002

POM-C 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.

POM-C 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 manufactured in accordance to DIN EN 15860, most formulations are approved for contact with food (FDA and EU 10/2011 compliant).

For parts which need to be dimensionally stable even exposed to humidity or wet environments, POM-C offers better hot water, thermal and chemical resistance than POM-H.

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

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

ZELLAMID® 900 AS – white, antistatic POM Copolymer

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} Ω and volume resistivity of 10^{9} Ω.cm are offering cutting edge properties for new applications in various industries. The permanently antistatic property is not influ-

enced by humidity and there is no migration taking place. The product does not contain carbon and is therefore prepared for clean room applications.

The excellent POM-C (Acetal Copolymer) properties such as high impact strength, low wear and dimensional stability are not much changed.

Applications:
Electrical conductive and antistatic Acetals parts are used where electrical discharge in operation is a problem.

ZELLAMID® 900 XU ELS – black, POM-C filled with Carbon Nanotubes

Zell Materials 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 Ω to 10^4 Ω and the volume resistivity of 10^4 Ω.cm are achieved by adding Nanoparticles.

ZELLAMID® 900 XT – light grey, POM-C with a solid lubricant

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

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

ZELLAMID® 900 PE – light blue, POM copolymer with a solid lubricant

The ZELLAMID® 900 PE series has been created for demanding sliding applications and is used in mechanical systems and apparatus engineering. These polymer alloys are suitable for structural parts.

ZELLAMID® 900 PE products have to withstand the highest loads. Both formulations have outstanding tribological properties. They are wear resistant with minimal coefficients of friction.

Applications:
Highly stressed sliding and guide elements.

ZELLAMID® 900 GF30 – natural, POM-C + 30% Glass fibre

Due to reinforcement with 30% Glass fibre this special POM-C grade offers increased stiffness and dimensional stability, reduced humidity absorption, increased hardness, significant increased modulus of elasticity.

ZELLAMID® | POM EXTRUDED

Product attribute – Overview	
ZELLAMID® 900 H	POM-H, natural
ZELLAMID® 900 H SW	POM-H, black

▲ **ZELLAMID® 900 H – natural**
ZELLAMID® 900 H SW – black

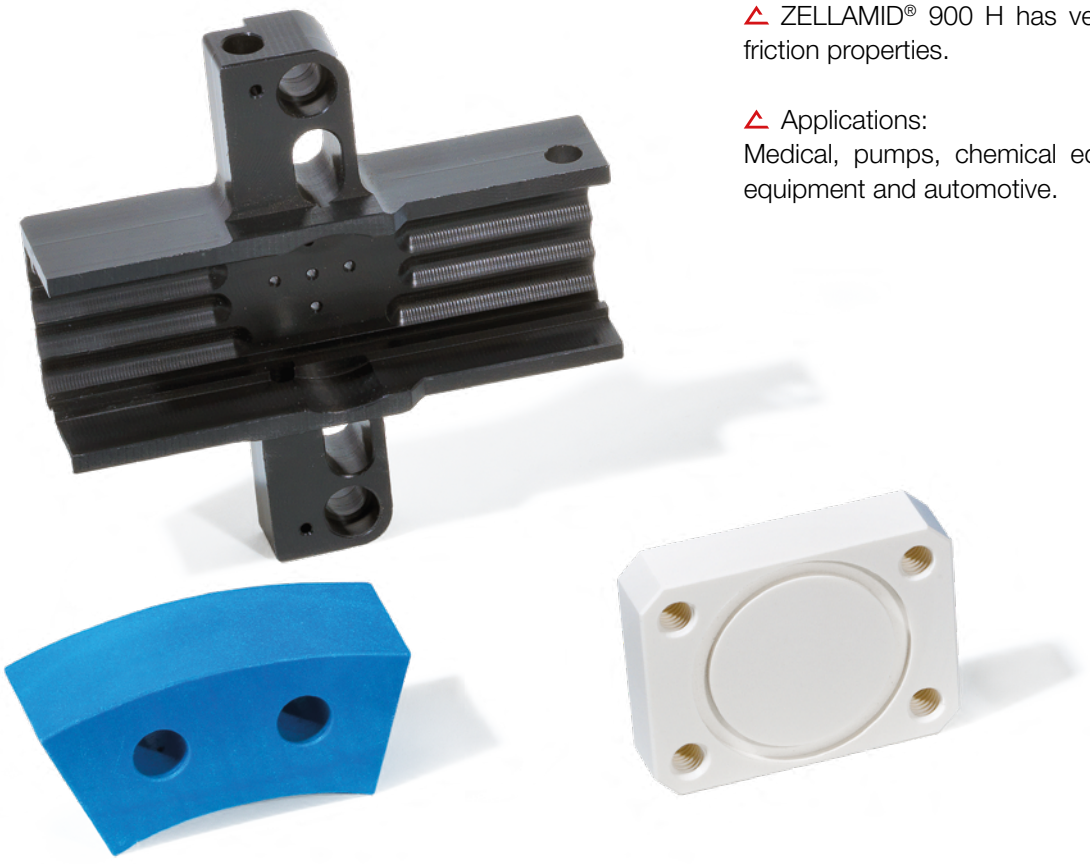
POM Homopolymers have a higher density, hardness, strength and better creep resistance due to their higher degree of crystallinity.

ZELLAMID® 900 H has also a lower thermal expansion rate. However, POM Homopolymer has a higher impact resistance and better abrasion resistance.

POM-H offers additional strength and rigidity and slightly higher mechanical properties than POM-C and delivers outstanding fatigue and impact resistance.

△ ZELLAMID® 900 H has very good kinetic friction properties.

△ Applications:
Medical, pumps, chemical equipment, sport equipment and automotive.



ZELLAMID® | THERMOPLASTIC POLYESTER

Product attribute – Overview	
ZELLAMID® 1400	PET, white
ZELLAMID® 1400 SW	PET, black
ZELLAMID® 1400 T	PET, light grey, with a solid lubricant
ZELLAMID® 1400 PBT	PBT, ivory

ZELLAMID® 1400 – white
ZELLAMID® 1400 SW – black

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 E-modulus of elasticity in tension makes it the choice material for moving parts. Hot water resistance is low but it has better resistance to acids than Nylon or Acetal. ZELLAMID® 1400 is produced without centreline porosity and is approved for contact with food (FDA and EU 10/2011). As it is more rigid than other thermoplastics, please consult our machining guidelines.

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, etc.

ZELLAMID® 1400 T – light grey, PET Copolymer with a solid lubricant

This internally lubricated material shows a significantly reduced coefficient of friction 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.

Parts exposed to high pressure and velocity. ZELLAMID® 1400 T is produced without centreline porosity and is approved for contact with food (BfR, FDA and EU 1935 2004/2011).

Applications:
Rollers, precision plain bearings, toothed gears, valves, distribution valves, etc.

ZELLAMID® 1400 PBT – ivory, Polybutylene Terephthalate

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 (USP VI).

Applications:
Plug connector strips, cams, control discs and medical devices.

ZELLAMID® | HIGH PERFORMANCE MATERIALS

Product attribute – Overview	
ZELLAMID® 1000	PEI, amber
ZELLAMID® 1500 X	PEEK, brown
ZELLAMID® 1500 XSW	PEEK, black
ZELLAMID® 1500 XT	PEEK + 10% Carbon fibre + 10% Graphite + 10% PTFE, black
ZELLAMID® 1500 XGF30	PEEK + 30% Glass fibre, brown

ZELLAMID® 1000 – amber, Polyetherimid

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

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

Industries:
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 circuitbreaker 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® 1500 X – brown
ZELLAMID® 1500 XSW – black

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

ZELLAMID® 1500 X offers advantages in the electric and electronic industries as well as in the semiconductor industries.

This special PEEK product displays high temperature resistance and impact strength. In addition it is a superior material when it comes to costeffectiveness. When exposed to a flame there is very low smoke and toxic gas emission.

Unfilled ZELLAMID® 1500 X stock shapes are compliant for food contact (FDA and EU 10/2011).

The material also resists a wide range of solvents and organic solvents. It is selfextinguishing and carries a flammability UL 94 V-0 rating.

ZELLAMID® 1500 X has a balanced profile of properties such as low level of creep combined with high modulus of elasticity. PEEK is a high strength alternative to Fluorpolymers featuring better performance in wear and abrasion applications. It is a material with outstanding tribological properties.

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

Industries:
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, backend components, test sockets, fasteners and wands grips.

ZELLAMID® 1500 XT – black, 10% Carbon fibre, 10% Graphite, 10% PTFE

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 XGF30 – brown, PEEK filled with 30% Glass fibre

This glass fibre 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.

victrex
MADE WITH VICTREX PEEK

ZELLAMID® | HIGH PERFORMANCE MATERIALS

Product attribute – Overview	
ZELLAMID® 1500 XCA30	PEEK + 30% Carbon fibre, anthracite
ZELLAMID® 1500 XC20	PEEK + 20% Ceramic, white

ZELLAMID® 1500 XCA30 – anthracite, PEEK filled with 30% Carbon Fibre

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 dramatically reduce the thermal expansion and the much higher thermal conductivity helps to keep the surface of a bearing cool.

ZELLAMID® 1500 XC20 – white, PEEK filled with 20% Ceramic

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.

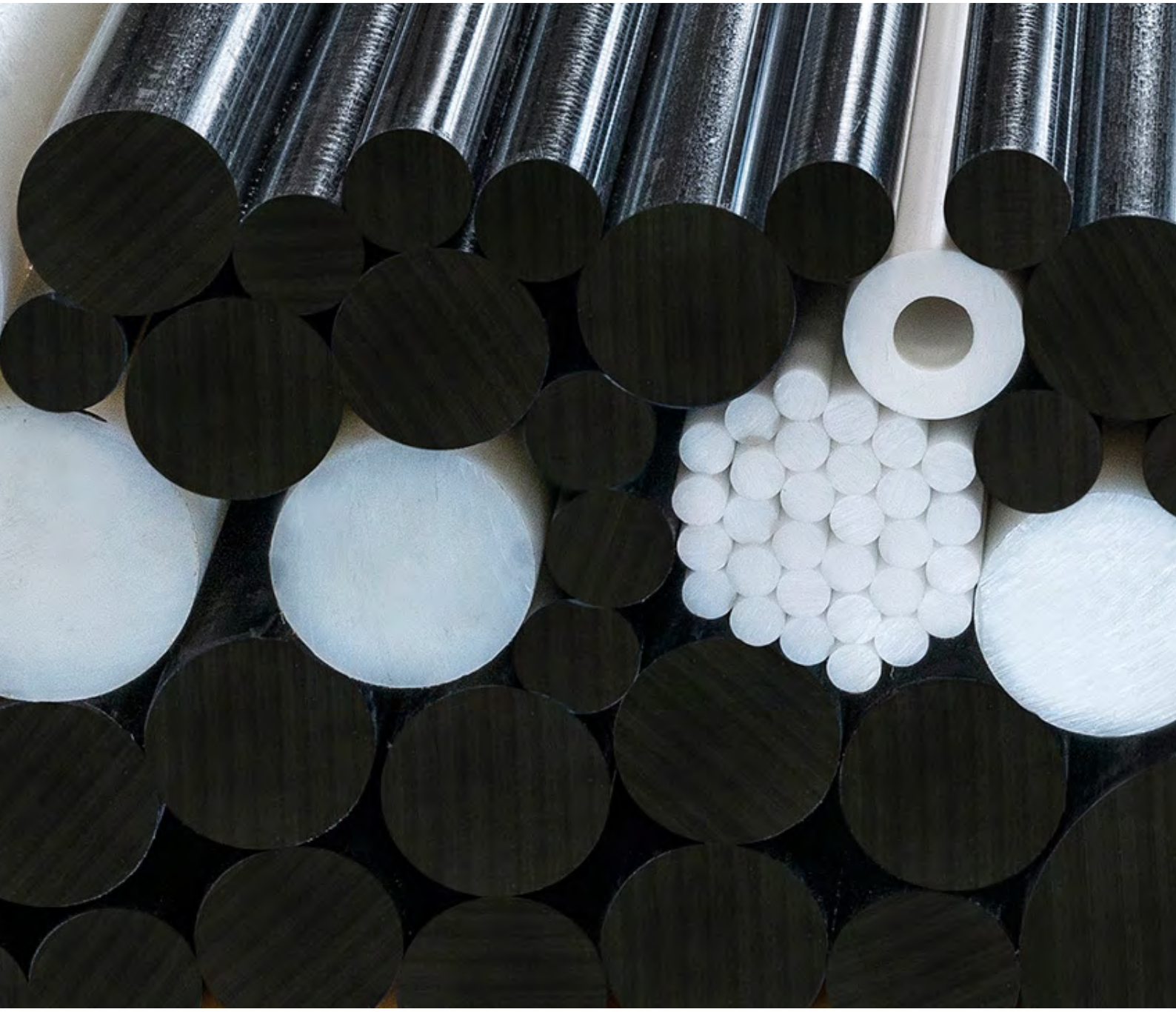
Following products (and more) might be produced on request for you:	
ZELLAMID® 202 RAL Colours	PA 6, different colours
ZELLAMID® 900 RAL Colours	POM-C, different colours
ZELLAMID® 900 H Colours	POM-H, different colours
ZELLAMID® 1400 RAL Colours	PET, different colours
ZELLAMID® 1900 GF40 SW	PPS + 40% Glass fibre, black

More products upon request:

If you do not see your desired product or your desired dimension, please contact us.

Legal notes: page 97

ZELLAMID® | DIMENSIONS AND TECHNICAL DATA



ZELLAMID® | TECHNICAL PROPERTIES

ZELLAMID®	Unit	Test method	202 NA / SW	202 MO	202 HV
Specimen dry, Room temperature			PA 6 unfilled	PA 6 + MoS_2	PA 6 high viscosity
Mechanical Properties					
Yield stress	Mpa	ISO 527	79	90	85
Tensile strength	Mpa	ISO 527	80	90	---
Elongation at break	%	ISO 527	> 70	27	> 50
Modulus of elasticity in tension	MPa	ISO 527	3200	3600	3000
Bending Modulus (flexural test)	MPa	ISO 178	3000	3400	2800
Flexural Strength	MPa	ISO 178	110	130	---
Charpy Impact strength +23°C	kJ/m²	ISO 179/1eU	no break	no break	no break
Charpy notched Impact strength +23°C	kJ/m²	ISO 179/1eA	6	2,5	9
Shore D Hardness	---	ISO 868	82	80	75
Ball indentation hardness	N/mm²	ISO 2039-1	172	172	---
Compressive Modulus	MPa	ISO 604	2400	2400	---
Compressive stress at 1/2/5% nominal strain[1]	MPa	ISO 604	25/49/79	22/46/92	---
Thermal Properties					
Heat distortion temperature, Method A	°C	ISO 75	70	100	65
Melting temperature	°C	ISO 3146	220	220	220
Glass transition temperature	°C	ISO 3146	---	---	---
Max. service temperature for few hours operation	°C	---	170	160	180
Service Temperature long term	°C	---	100	90	100
Minimum Service temperature	°C	---	-40	-40	-30
Thermal coefficient of linear expansion	1/K.10 - 5	DIN 53752	45937	9	45937
Thermal conductivity, Method A	W/(K.m)	---	0,33	0,37	0,23
Specific heat capacity	J/(g.K)	IEC 1006	1,7	1,7	1,7
Dielectric Properties					
Dielectric constant at 1MHZ	---	IEC 250	3,5	---	3,3
Dissipation factor tan δ at 1 MHZ	---	IEC 250	0,03	---	0,02
Dielectric strength	KV/mm	IEC 243	25	25	25
Volume resistivity	Ω.cm	IEC 93	10^{13}	> 10^{12}	10^{14}
Surface resistivity	Ω	IEC 93	10^{13}	> 10^{12}	---
Resistance to Tracking (CTI)	---	DIN EN 60112	---	---	---
Additional Data					
Mass density	g/cm³	ISO 1183	1,13	1,15	1,13
Moisture absorption at 23°C, 50% RH	%	ISO 62	3	3	2,8
Water absorption at 23 °C	%	ISO 62	9	8	9,5
Flammability according to UL Standard	---	UL 94	HB	HB	HB
Resistance to wear 2[2]	µm/km	ISO 7148-2	---	---	---

[1](1 mm/min) [2]Ra = 0,35 - 0,45 µm (steel disc), v = 0,3 m/s, p = 3 N/mm², time T > 16 h

202 IM	202 GF30	250 NA / SW	250 HV	250 PE	250 GF 30	250 MO
PA 6 impact modified	PA 6 + 30 % Glass fibre	PA 6.6 unfilled	PA 6.6 high impact	PA 6.6 + PE Tribotype	PA 6.6 + 30 % Glass fibre	PA 6.6 + MoS_2
Mechanical Properties						
53	120	86	60	64	---	---
---	120	80	---	---	110	90
242	8	> 50	32	12	8	31
2000	6500	3300	2000	2700	5500	3400
---	---	3200	2300	2600	5300	---
---	---	120	110	100	170	---
---	---	no break	no break	35	37	no break
90	---	5	80	3	5,8	7
78	87	82	80	80	85	82
---	---	155	165	---	252	160
---	---	2600	2800	2200	3500	---
---	---	27/53/88	---	19/42/74	33/70/115	---
Thermal Properties						
---	---	80	70	80	150	80
---	---	260	263	---	260	255
250-270	220	60	60	---	---	---
---	---	160	160	120	200	160
100	100	90	90	85	130	90
-30	-30	-30	-30	-30	-20	-30
---	---	8	10	9	5	---
---	---	0,3	---	---	0,27	0,3
---	---	1,6	---	1,7	1,5	1,6
Dielectric Properties						
---	---	3,3	2,9	3,3	---	3,3
---	---	0,02	0,014	---	---	---
25	---	25	27	25	30	---
---	---	10^{13}	10^{14}	10^{15}	> 10^{12}	---
>10^{13}	>10^{13}	10^{12}	10^{14}	10^{13}	10^{11}	10^{12}
---	---	---	600	600	475	---
Additional Data						
1,08	1,35	1,14	1,09	1,12	1,35	1,15
---	---	2,7	2,2	2,2	1,5	2,8
---	---	8,5	7	8,5	5,5	8,5
---	---	HB	---	HB	HB	HB
---	---	---	---	4,3	---	---

ZELLAMID® | TECHNICAL PROPERTIES

ZELLAMID®	Unit	Test method	665 NA	665 SW	665 GR
Specimen dry, Room temperature			PE 500 (HMW) unfilled	PE 500 (HMW) unfilled	PE 500 (HMW) unfilled
Mechanical Properties					
Yield stress	Mpa	ISO 527	---	---	---
Tensile strength	Mpa	ISO 527	27	27	27
Elongation at break	%	ISO 527	100	100	100
Modulus of elasticity in tension	MPa	ISO 527	1060	1060	1060
Bending Modulus (flexural test)	MPa	ISO 178	---	---	---
Flexural Strength	MPa	ISO 178	---	---	---
Charpy Impact strength +23°C	kJ/m²	ISO 179/1eU	no break	no break	no break
Charpy notched Impact strength +23°C	kJ/m²	ISO 179/1eA	no break	no break	no break
Shore D Hardness	---	ISO 868	70	70	70
Ball indentation hardness	N/mm²	ISO 2039-1	46	46	46
Compressive Modulus	MPa	ISO 604	---	---	---
Compressive stress at 1/2/5% nominal strain[1]	MPa	ISO 604	---	---	---
Thermal Properties					
Heat distortion temperature, Method A	°C	ISO 75	---	---	---
Melting temperature	°C	ISO 3146	---	---	---
Glass transition temperature	°C	ISO 3146	130-135	130-135	130-135
Max. service temperature for few hours operation	°C	---	---	---	---
Service Temperature long term	°C	---	80	80	80
Minimum Service temperature	°C	---	-100	-100	-100
Thermal coefficient of linear expansion	1/K.10 - 5	DIN 53752	1,8	1,8	1,8
Thermal conductivity, Method A	W/(K.m)	---	20	20	20
Specific heat capacity	J/(g.K)	IEC 1006	---	---	---
Dielectric Properties					
Dielectric constant at 1MHZ	---	IEC 250	---	---	---
Dissipation factor tan δ at 1 MHZ	---	IEC 250	---	---	---
Dielectric strength	KV/mm	IEC 243	40	40	40
Volume resistivity	Ω.cm	IEC 93	10^{13}	10^{13}	10^{13}
Surface resistivity	Ω	IEC 93	10^{13}	10^{13}	10^{13}
Resistance to Tracking (CTI)	---	DIN EN 60112	---	---	---
Additional Data					
Mass density	g/cm³	ISO 1183	0,96	0,96	0,96
Moisture absorption at 23°C, 50% RH	%	ISO 62	<0,01	<0,01	<0,01
Water absorption at 23 °C	%	ISO 62	---	---	---
Flammability according to UL Standard	---	UL 94	HB	HB	HB
Resistance to wear 2[2]	µm/km	ISO 7148-2	---	---	---

[1](1 mm/min) [2]Ra = 0,35 - 0,45 µm (steel disc), v = 0,3 m/s, p = 3 N/mm², time T > 16 h

675 NA	675 SW	675 GR	900 NA / SW	900 Special colours	900 PE	900 AS
PE 1000 (UHMW) unfilled	PE 1000 (UHMW) unfilled	PE 1000 (UHMW) unfilled	POM-C unfilled	POM-C unfilled	POM-C + PE Tribotype	POM-C antistatic
Mechanical Properties						
---	---	---	65	65	40	42
27	27	27	65	65	40	42
≥ 400	≥ 400	≥ 400	40	40	7	15
≥ 700	≥ 700	≥ 700	2900	2900	2100	1600
---	---	---	2800	2800	---	1600
---	---	---	95	95	---	60
no break	no break	no break	no break	no break	17	no break
>80	>80	>80	7	7	2,5	---
64-70	64-70	64-70	81	81	77	74
38	38	38	125	125	---	84
---	---	---	2400	2400	---	1900
---	---	---	23/44/82	23/44/82	---	18/29/50
Thermal Properties						
---	---	---	110	110	---	---
---	---	---	164	164	---	165
---	---	---	-60	-60	-60	-60
80	80	80	140	140	100	130
-200	-200	-200	100	100	80	90
0,4	0,4	0,4	-50	-50	-50	-50
20	20	20	11	11	14	15
20	20	20	0,336	0,336	---	---
---	---	---	1,5	1,5	---	---
Dielectric Properties						
---	---	---	3,8	3,8	4,4	---
---	---	---	0,005	0,005	0,003	---
---	---	---	> 20	> 20	---	14
10^{13}	10^{13}	10^{13}	10^{14}	10^{14}	10^{13}	$10^{9} – 10^{10}$
10^{14}	10^{14}	10^{14}	10^{13}	10^{13}	10^{13}	$10^{9} – 10^{10}$
---	---	---	600	600	---	---
Additional Data						
0,94	0,94	0,94	1,41	1,41	1,34	1,35
<0,01	<0,01	<0,01	0,2	0,2	0,2	0,8
---	---	---	0,8	0,8	0,8	6,3
HB	HB	HB	HB	HB	HB	HB
---	---	---	---	---	2,1	---

ZELLAMID® | TECHNICAL PROPERTIES

ZELLAMID®	Unit	Test method	900 AS SW	900 ELS	900 XT
Specimen dry, Room temperature			POM-C antistatic	POM-C ELS conductive	POM-C + PTFE Tribotype
Mechanical Properties					
Yield stress	Mpa	ISO 527	42	---	---
Tensile strength	Mpa	ISO 527	42	70	63
Elongation at break	%	ISO 527	15	11	22
Modulus of elasticity in tension	MPa	ISO 527	1600	3100	2800
Bending Modulus (flexural test)	MPa	ISO 178	1600	---	2200
Flexural Strength	MPa	ISO 178	60	---	---
Charpy Impact strength +23°C	kJ/m²	ISO 179/1eU	no break	70	---
Charpy notched Impact strength +23°C	kJ/m²	ISO 179/1eA	---	3,4	---
Shore D Hardness	---	ISO 868	74	80	80
Ball indentation hardness	N/mm²	ISO 2039-1	84	---	---
Compressive Modulus	MPa	ISO 604	1900	---	---
Compressive stress at 1/2/5% nominal strain[1]	MPa	ISO 604	18/29/50	---	---
Thermal Properties					
Heat distortion temperature, Method A	°C	ISO 75	---	125	98
Melting temperature	°C	ISO 3146	165	175	165
Glass transition temperature	°C	ISO 3146	-60	-60	---
Max. service temperature for few hours operation	°C	---	130	100	140
Service Temperature long term	°C	---	90	90	100
Minimum Service temperature	°C	---	-50	-40	-40
Thermal coefficient of linear expansion	1/K.10 - 5	DIN 53752	15	13	---
Thermal conductivity, Method A	W/(K.m)	---	---	0,4	---
Specific heat capacity	J/(g.K)	IEC 1006	---	---	---
Dielectric Properties					
Dielectric constant at 1MHZ	---	IEC 250	---	---	3,7
Dissipation factor tan δ at 1 MHZ	---	IEC 250	---	---	---
Dielectric strength	KV/mm	IEC 243	14	---	33
Volume resistivity	Ω.cm	IEC 93	$10^9 - 10^{10}$	10^4	10^{13}
Surface resistivity	Ω	IEC 93	$10^9 - 10^{10}$	10^4	10^{13}
Resistance to Tracking (CTI)	---	DIN EN 60112	---	---	---
Additional Data					
Mass density	g/cm³	ISO 1183	1,35	1,41	1,44
Moisture absorption at 23°C, 50% RH	%	ISO 62	0,8	0,2	0,2
Water absorption at 23 °C	%	ISO 62	6,3	0,8	0,6
Flammability according to UL Standard	---	UL 94	HB	HB	HB
Resistance to wear 2[2]	µm/km	ISO 7148-2	---	---	3

[1](1 mm/min) [2]Ra = 0,35 - 0,45 µm (steel disc), v = 0,3 m/s, p = 3 N/mm², time T > 16 h

900 GF30	900 H	1000 NA / SW	1000 GF30	1400 NA / SW	1400 T	1500 X / XSW
POM-C + 30 % Glass fibre	POM-H unfilled	PEI unfilled	PEI + 30 % Glass fibre	PET unfilled	PET Tribotype	PEEK unfilled
Mechanical Properties						
---	76	105	165	88	80	105
135	76	---	---	88	80	105
2,5	38	30	2	10	6	20
9200	3400	3200	9300	3400	3300	4200
---	3000	3300	8500	3300	3000	3900
---	---	160	225	130	115	160
30	no break	no break	40	82	60	no break
8	11	10	10	3	3	3,5
---	84	86	93	81	81	86
---	---	140	165	177	175	229
---	---	---	---	2400	2800	3500
---	---	---	---	28/53/100	27/55/97	35/69/130
Thermal Properties						
---	100	190	210	100	100	160
---	178	---	---	255	---	340
---	---	---	---	---	---	150
140	150	200	200	160	160	300
100	90	170	170	100	110	260
-20	-50	-50	-30	-20	-20	-60
45873	10	5	45810	6	6	5,8
---	---	0,24	0,29	---	---	---
---	---	---	---	---	---	---
Dielectric Properties						
---	3,8	3	3,4	3,3	3,3	3,05
---	---	---	0,0023	0,02	---	0,003
50	---	---	15 - 35	20	20	15
10^{14}	10^{14}	10^{15}	10^{15}	10^{15}	---	10^{15}
10^{12}	10^{14}	$> 10^{15}$	$> 10^{15}$	---	10^{13}	10^{14}
---	---	---	---	---	600	---
Additional Data						
1,58	1,42	1,27	1,51	1,36	1,39	1,3
---	0,2	0,7	0,5	0,23	0,23	---
---	0,8	1,25	0,9	0,5	0,5	0,4
HB	HB	V0	V0	HB	HB	V0
---	---	---	---	2,5	1,1	2,3

ZELLAMID® | TECHNICAL PROPERTIES

ZELLAMID®	Unit	Test method	1500 XT	1500 XGF30	1500 XCA30
Specimen dry, Room temperature			PEEK modified Tribotype	PEEK + 30 % Glass fibre	PEEK + 30 % Carbon fibre
Mechanical Properties					
Yield stress	Mpa	ISO 527	120	150	124
Tensile strength	Mpa	ISO 527	---	150	120
Elongation at break	%	ISO 527	2	4	9
Modulus of elasticity in tension	MPa	ISO 527	9000	8700	7100
Bending Modulus (flexural test)	MPa	ISO 178	9100	---	---
Flexural Strength	MPa	ISO 178	190	---	200
Charpy Impact strength +23°C	kJ/m²	ISO 179/1eU	40	55	85
Charpy notched Impact strength +23°C	kJ/m²	ISO 179/1eA	5	5	6
Shore D Hardness	---	ISO 868	85	88	---
Ball indentation hardness	N/mm²	ISO 2039-1	242	305	346
Compressive Modulus	MPa	ISO 604	2800	9950	11000
Compressive stress at 1/2/5% nominal strain[1]	MPa	ISO 604	33/66/115	85/135/175	100/150/190
Thermal Properties					
Heat distortion temperature, Method A	°C	ISO 75	315	312	315
Melting temperature	°C	ISO 3146	340	340	340
Glass transition temperature	°C	ISO 3146	---	150	150
Max. service temperature for few hours operation	°C	---	300	300	300
Service Temperature long term	°C	---	250	240	240
Minimum Service temperature	°C	---	-30	-20	-20
Thermal coefficient of linear expansion	1/K.10 - 5	DIN 53752	2,2	3	45748
Thermal conductivity, Method A	W/(K.m)	---	0,24	---	0,92
Specific heat capacity	J/(g.K)	IEC 1006	---	---	---
Dielectric Properties					
Dielectric constant at 1MHZ	---	IEC 250	4,9	3,3	17
Dissipation factor tan δ at 1 MHZ	---	IEC 250	0,02	0,003	0,23
Dielectric strength	KV/mm	IEC 243	---	17	---
Volume resistivity	Ω.cm	IEC 93	10^3 - 10^7	10^{15}	10^5
Surface resistivity	Ω	IEC 93	10^5	10^{14}	10^5
Resistance to Tracking (CTI)	---	DIN EN 60112	---	---	---
Additional Data					
Mass density	g/cm³	ISO 1183	1,45	1,51	1,4
Moisture absorption at 23°C, 50% RH	%	ISO 62	0,06	0,1	0,1
Water absorption at 23 °C	%	ISO 62	0,4	0,4	0,4
Flammability according to UL Standard	---	UL 94	V0	V0	V0
Resistance to wear 2[2]	µm/km	ISO 7148-2	1,27	---	---

[1](1 mm/min) [2]Ra = 0,35 - 0,45 µm (steel disc), v = 0,3 m/s, p = 3 N/mm², time T > 16 h

1500 XC20	1500 XCT2	1500 XMG	1900 NA	1900 GF40	1900 IM	1900 T
PEEK + 20 % Ceramic	PEEK cryogenic	PEEK medical-grade	PPS unfilled	PPS + 40 % Glass fibre	PPS impact modified	PPS Tribotype
Mechanical Properties						
105	60	105	90	90	62	80
105	60	105	---	---	62	80
17	25	20	8	1,4	25	3
4900	---	4200	3900	7000	2800	4200
---	3000	3900	3900	---	2800	4200
---	110	160	165	---	105	110
no break	---	no break	116	45	---	---
2,1	---	3,5	---	10	49	15
---	80	86	88	90	84	85
246	---	229	234	---	---	---
6900	---	3500	3300	---	---	---
60/100/160	---	35/69/130	37/66/133	---	---	21/61/83
Thermal Properties						
---	---	160	95	270	110	115
340	343	340	280	280	280	280
---	150	150	---	---	---	---
300	---	300	260	260	240	240
250	200	260	220	240	220	220
---	-196	-60	-30	-20	-30	-20
4,5	---	5,8	---	---	---	---
---	0,25	---	5,5	3	---	---
---	---	---	0,25	0,2	---	0,5
Dielectric Properties						
3,9	---	3,05	4,6	4,8	---	---
0,0014	---	0,003	0,0011	0,0062	---	---
---	---	15	18	25	---	---
---	---	10^{15}	10^{9}	$>10^{13}$	---	---
---	---	10^{14}	---	$>10^{13}$	$>10^{13}$	---
---	---	---	---	125	---	---
Additional Data						
1,49	1,4	1,3	1,35	1,64	1,90	1,51
---	---	---	---	0,02	0,1	---
0,2	---	0,4	---	0,01	---	---
V0	---	V0	V0	V0	V0	V0
---	---	2,3	---	---	---	---

ZELLAMID® | TECHNICAL PROPERTIES

ZELLAMID®	Unit	Test method	1700 NA	1800 NA	1100 NA/SW
Specimen dry, Room temperature			PVDF unfilled	PTFE unfilled	PA 6 C unfilled
Mechanical Properties					
Yield stress	Mpa	ISO 527	50	---	80
Tensile strength	Mpa	ISO 527	---	> 20	---
Elongation at break	%	ISO 527	20	> 200	40
Modulus of elasticity in tension	MPa	ISO 527	1700	---	3100
Bending Modulus (flexural test)	MPa	ISO 178	---	---	3400
Flexural Strength	MPa	ISO 178	---	---	140
Charpy Impact strength +23°C	kJ/m²	ISO 179/1eU	---	---	no break
Charpy notched Impact strength +23°C	kJ/m²	ISO 179/1eA	---	---	> 4
Shore D Hardness	---	ISO 868	75	50	---
Ball indentation hardness	N/mm²	ISO 2039-1	---	---	160
Compressive Modulus	MPa	ISO 604	---	---	---
Compressive stress at 1/2/5% nominal strain[1]	MPa	ISO 604	---	---	---
Thermal Properties					
Heat distortion temperature, Method A	°C	ISO 75	---	---	---
Melting temperature	°C	ISO 3146	170	---	220
Glass transition temperature	°C	ISO 3146	---	---	---
Max. service temperature for few hours operation	°C	---	150	---	170
Service Temperature long term	°C	---	140	260	105
Minimum Service temperature	°C	---	-40	-200	-40
Thermal coefficient of linear expansion	1/K.10 - 5	DIN 53752	---	---	45876
Thermal conductivity, Method A	W/(K.m)	---	---	---	0,23
Specific heat capacity	J/(g.K)	IEC 1006	---	---	1,7
Dielectric Properties					
Dielectric constant at 1MHZ	---	IEC 250	7-10	---	3,7
Dissipation factor tan δ at 1 MHZ	---	IEC 250	---	---	0,03
Dielectric strength	KV/mm	IEC 243	20	---	50
Volume resistivity	Ω.cm	IEC 93	---	---	10^{15}
Surface resistivity	Ω	IEC 93	$>10^{14}$	---	10^{13}
Resistance to Tracking (CTI)	---	DIN EN 60112	---	---	600
Additional Data					
Mass density	g/cm³	ISO 1183	1,78	2,14 - 2,18	1,15
Moisture absorption at 23°C, 50% RH	%	ISO 62	---	---	2,2
Water absorption at 23 °C	%	ISO 62	---	---	6,5
Flammability according to UL Standard	---	UL 94	V0	V0	HB
Resistance to wear 2[2]	µm/km	ISO 7148-2	---	---	---

[1](1 mm/min) [2]Ra = 0,35 - 0,45 µm (steel disc), v = 0,3 m/s, p = 3 N/mm², time T > 16 h

1100 MO	1100 HS	1100 FR	1100 Oil	1100 T	1115 NA	1200 NA
PA 6 C + MoS_2	PA 6 C heat stabilized	PA 6 C flame retardent	PA 6 C Oil	PA 6 C Tribotype	PA 6/12 C high impact	PA 12 C
Mechanical Properties						
85	90	80	80	80	80	60
---	---	---	---	---	---	---
40	30	40	50	40	55	55
3200	2500	3100	2500	3100	2500	2200
3500	3000	3400	2800	3300	2800	2400
130	120	140	135	110	135	90
no break	no break	no break	no break	no break	no break	no break
> 5	> 4	> 4	> 5	> 4	> 12	> 15
---	---	---	---	---	---	---
150	170	160	140	160	140	---
---	---	---	---	---	---	---
---	---	---	---	---	---	---
Thermal Properties						
---	---	---	---	---	---	---
220	220	220	220	220	220	190
---	---	---	---	---	---	---
160	180	170	160	160	160	150
105	105	105	105	105	105	110
-40	-40	-40	-40	-40	-40	-60
45876	45876	7-8	45876	45876	45876	45971
0,23	0,23	0,23	0,23	0,23	0,23	0,23
1,7	1,7	1,7	1,7	1,7	1,7	1,7
Dielectric Properties						
3,7	3,7	3,7	3,7	3,7	3,7	3,7
0,03	0,03	0,03	0,03	0,03	0,03	0,03
50	50	50	50	50	50	50
10^{15}	10^{15}	10^{15}	10^{15}	10^{15}	10^{15}	10^{15}
10^{13}	10^{13}	10^{13}	10^{13}	10^{13}	10^{13}	10^{13}
600	600	600	600	600	600	600
Additional Data						
1,15	1,15	1,15	1,14	1,14	1,12	1,03
2,2	2,2	---	1,8	2,2	1,9	0,9
6,5	7	---	5,5	6,5	5,8	1,4
HB	HB	---	HB	HB	HB	HB
---	---	---	---	---	---	---

ZELLAMID® | RESISTANCE TO CHEMICALS

ZELLAMID® Designation		202 / 250 / 1100	900	1400	1500
Chemical substance	**%**	**Resistances capacity and material stability**			
Acetone	TR	A	A	C	A
Acetylchloride	TR	D	D	---	---
Acetylene	TR	A	A	A	A
Alkylbenzoic	TR	A	A	---	---
Alu. salts of min.acids	20	B	B	A	A
Formic acid	10	B	D	A	B
Ammonia	TR	B	A	D	A
Benzene, Benzaldehyde	H	A	A	D	A
Chlorine moist	H	D	D	B	D
Boric acid	10	A / B	A	A	A
Bromwater	GL	D	D	---	A
Butadien	TR	A	A	A	---
n-Butyleneglycol	TR	A	A	A	A
Calcium chloride alcoholic	20	---	A	---	---
Chlorine, Chlorine moist	H	D	D	D	D
Chlorobenzene	TR	A	A	D	A
Chloroform	TR	B	C	D	A
Citric acid	10	A	A	A	A
aqueous	20	A	---	---	---
Cyclohexane/Cyclopetone	TR	A	A	A	A
Dichlortrehylene	TR	D	D	D	A
Dichlortetrafluorethan	TR	A	A	A	A
Dimethyleter	TR	---	---	A	A
Inert Gas	TR	A	A	A	A
Developing liquid	H	A	A	A	A
Mineral oil, Natural gas	H	A	A	A	A
Acetic acid aqueous	95	D	D	C	A
Ethanol	96	A	A	A	A
Essential oils	H	A	A	A	A
Alcoholic fat	H	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	D	D	---	---
Glycerine	TR	A	A	A	A
Glyceral	TR	A	A	A	A
Glyceral acid aqueous	30	---	---	---	---
Glysantin	H	A	A	D	---
Uric acid aqueous	10	A	A	A	A
Helium and rare gas	TR	A	A	A	A
Heptan Hexan	TR	A	A	A	A
Hydraulic oils	H	A	A	A	A
Impregnating oils	H	A	A	A	A
Isooctan	80	A	A	A	A
Isocyante	H	A	A	A	---
Cold machine oil	H	A	A	A	A
Potash lye	50	A	A	D	A
Potasiumchloride	10	A	A	A	A
Hydrofluoristic acid	30	---	---	D	---
Carbon dioxide	---	A	A	A	A
Super Otto-fuel	H	A	A	---	A
Diesel fuel	H	A	A	A	A
Turbine aircraft fuel	H	A	A	A	A

H: commercially **GL:** saturated aqueous solution [at 23 °C] **TR:** technically pure **A:** resistant: only low weight and dimensional changes **B:** not resistant: significant weight, dimensions and property changes of the molding material **C:** inconstant: at long exposure **D:** unstable: within a short time strong attack The legal notes can be found on page 97.

ZELLAMID® Designation		202 / 250 / 1100	900	1400	1500
Chemical substance	**%**	**Resistances capacity and material stability**			
Kerosene	H	A	A	A	A
Soldering solution	H	D	D	A	A
Magnesium salt aqueous	10	A	A	A	A
Seawater	---	A	A	A	A
Methan	TR	A	A	A	A
Methyl acetate	TR	A	B	B	A
Methylene Chloride	TR	B / C	D	D	A
Methylene Glycol	TR	A	---	---	A
Methylenglycolacetate	TR	A	---	---	---
Mixed acids	---	D	D	D	---
Engine oil	H	A	A	A	---
Naphtalene	H	A	A	A	A
Naphtalenesulfanacids	TR	D	D	D	C
Sodium salts aqueous	10	A	A	A	A
Sodium salts hypophosphit aqu	10	A	A	A	---
Sodium bisulfit aqueous	10	A	A	A	A
Caustic soda solution	10	A	D	D	---
Nitrobenzene	TR	B	A	A	A
Octane Octene	TR	A	A	A	A
Oleric acid	H	A	A	A	A
Ozon	TR	B / C	B / C	B / C	A / B
Petroleum	TR	A	A	A	A
Phenylethylalcohol	TR	A / B	---	---	---
Phosphoric acid	10	D	A	A	A
Phosphoric acid	85	---	---	---	---
Propane	TR	A	A	A	A
Mercury	TR	A	A	A	A
Mercury chlorid aqueous	GL	D	---	---	A
Nitric acid	>50	D	C	C	B
Hydrochloric aqueous	>20	D	B	B	A
Oxygen under pressure	TR	A	A	A	A
Sulphurdioxid dry	TR	A	---	---	A
Sulphurdioxid moist	TR	B	---	---	A
Sulphereous acid	GL	B	A	A	A
Sulphuric acid	>80	D	D	D	A
Sodium Carbonate	10	A	A	A	A
Nitrogen gas	TR	A	A	A	A
Styrol	TR	A	A	A	A
Turpentine oil	H	A	A	A	A
Tetrachloride-carbon	TR	A	A	A	---
Transformer oil	H	A	A	A	A
Trichlorethylene	TR	A / B	D	D	A
Uraniumfloride	TR	D	D	D	---
Urin	---	A	A	A	A
Vinylchloride	TR	A	A	A	A
Steam	>100	B / D	D	D	A
Hydrogen	TR	A	A	A	A
Hydreogensuperoxid	---	A	A	A	---
Acidity of Wine	10	A	---	---	A
Acidity of Wine	50	B	---	---	---
Xylol	TR	A	B	B	A
Xylol	TR / 10	A	D	D	---
Zincchloride	10	B	---	A	A
Zincchloride	37,5	D	---	---	---
Zinc	---	A	A	A	A

ZELLAMID® | RODS

ZELLAMID® Quality	202 NA	202 SW	202 MO	202 GF30	202 HV	202 IM
	PA 6 unfilled	PA 6 unfilled	PA 6 + MoS_2	PA 6 + 30 % Glass fibre	PA 6 high viscosity	PA 6 impact modified

Ø mm	Tolerance mm	Length mm	Weight (kg/m)					
6	+0,1/+0,6	3000	0,037	0,037	0,038	---	0,037	0,035
8	+0,1/+0,7	3000	0,065	0,065	0,066	---	0,065	0,062
10	+0,1/+0,7	3000	0,099	0,099	0,101	0,107	0,099	0,094
12	+0,2/+0,8	3000	0,143	0,143	0,145	0,154	0,143	0,137
15	+0,2/+0,8	3000	0,220	0,220	0,224	0,237	0,220	0,210
16	+0,2/+0,8	3000	0,25	0,25	0,25	0,27	0,25	0,24
18	+0,2/+0,8	3000	0,31	0,31	0,32	0,34	0,31	0,30
20	+0,2/+0,8	3000	0,38	0,38	0,39	0,41	0,38	0,37
22	+0,2/+1,0	3000	0,47	0,47	0,48	---	0,47	0,45
25	+0,2/+1,0	3000	0,60	0,60	0,61	0,65	0,60	0,57
28	+0,2/+1,0	3000	0,75	0,75	---	---	0,75	0,71
30	+0,2/+1,0	3000	0,86	0,86	0,87	0,92	0,86	0,82
32	+0,2/+1,2	3000	0,98	0,98	0,99	1,06	0,98	0,93
35	+0,2/+1,2	3000	1,17	1,17	1,19	1,26	1,17	1,11
38	+0,2/+1,2	3000	1,37	1,37	---	---	1,37	1,31
40	+0,2/+1,2	3000	1,51	1,51	1,54	1,63	1,51	1,45
45	+0,3/+1,3	3000	1,92	1,92	1,95	2,07	1,92	1,83
50	+0,3/+1,3	3000	2,36	2,36	2,40	2,55	2,36	2,25
55	+0,3/+1,3	3000	2,85	2,85	2,90	3,07	2,85	2,72
60	+0,3/+1,6	3000	3,40	3,40	3,46	3,67	3,40	3,25
65	+0,3/+1,6	3000	3,98	3,98	4,05	4,29	3,98	3,80
70	+0,3/+1,6	3000	4,60	4,60	4,68	4,97	4,60	4,40
75	+0,4/+2,0	3000	5,31	5,31	5,40	5,73	5,31	5,07
80	+0,4/+2,0	3000	6,03	6,03	6,13	6,51	6,03	5,76
85	+0,5/+2,2	3000	6,82	6,82	6,94	7,36	6,82	6,51
90	+0,5/+2,2	3000	7,63	7,63	7,76	8,24	7,63	7,29
95	+0,6/+2,5	3000	8,52	8,52	8,67	---	8,52	8,14
100	+0,6/+2,5	3000	9,43	9,43	9,59	10,18	9,43	9,01
110	+0,7/+3,0	3000	11,44	11,44	---	12,35	11,44	10,93
120	+0,8/+3,5	3000	13,64	13,64	---	14,73	13,64	13,04
125	+0,8/+3,5	3000	14,78	14,78	---	---	14,78	14,12
130	+0,9/+3,8	3000	16,01	16,01	---	17,29	16,01	15,30
135	+0,9/+3,8	3000	17,24	17,24	---	---	17,24	16,48
140	+0,9/+3,8	3000	18,52	18,52	---	20,00	18,52	17,70
150	+1,0/+4,2	3000	21,29	21,29	---	22,98	21,29	20,35
160	+1,1/+4,5	3000	24,23	24,23	---	---	24,23	23,16
170	+1,2/+5,0	3000	27,39	27,39	---	---	27,39	26,18
175	+1,2/+5,0	3000	29,00	29,00	---	---	29,00	27,71
180	+1,2/+5,0	3000	30,65	30,65	---	---	30,65	29,29
190	+1,3/+5,5	3000	34,19	34,19	---	---	34,19	32,68
200	+1,3/+5,5	3000	37,82	37,82	---	---	37,82	36,15
210	+1,3/+5,8	3000	41,69	---	---	---	---	---
220	+1,3/+5,8	3000	45,68	---	---	---	---	---
230	+1,5/+6,2	3000	49,99	---	---	---	---	---
250	+1,5/+6,2	3000	58,91	---	---	---	---	---
260	+1,5/+6,6	3000	63,73	---	---	---	---	---
280	+1,5/+6,6	3000	73,76	---	---	---	---	---
300	+1,5/+7,5	3000	84,76	---	---	---	---	---

△ Additional diameters and intermediate sizes available on request.

ZELLAMID® Quality			250 NA / SW	250 MO	250 GF30	250 PE	250 HV
			PA 6.6 unfilled	PA 6.6 + MoS_2	PA 6.6 + 30 % Glass fibre	PA 6.6 + PE Tribotype	PA 6.6 high impact
Ø mm	Tolerance mm	Length mm	Weight (kg/m)				
6	+0,1/+0,6	3000	0,037	0,038	---	0,040	0,037
8	+0,1/+0,7	3000	0,065	0,066	---	0,060	0,064
10	+0,1/+0,7	3000	0,100	0,101	0,120	0,100	0,098
12	+0,2/+0,8	3000	0,144	0,145	0,170	0,140	0,142
15	+0,2/+0,8	3000	0,222	0,224	0,260	0,220	0,218
16	+0,2/+0,8	3000	0,25	0,25	0,297	0,25	0,25
18	+0,2/+0,8	3000	0,32	0,32	0,374	0,31	0,31
20	+0,2/+0,8	3000	0,39	0,39	0,459	0,38	0,38
22	+0,2/+1,0	3000	0,47	0,48	---	0,46	0,46
25	+0,2/+1,0	3000	0,60	0,61	0,716	0,59	0,59
28	+0,2/+1,0	3000	0,75	0,76	---	0,74	0,74
30	+0,2/+1,0	3000	0,86	0,87	1,023	0,85	0,85
32	+0,2/+1,2	3000	0,99	0,99	1,168	0,97	0,97
35	+0,2/+1,2	3000	1,18	1,19	1,392	1,15	1,15
38	+0,2/+1,2	3000	1,38	1,39	---	1,36	1,36
40	+0,2/+1,2	3000	1,53	1,54	1,809	1,50	1,50
45	+0,3/+1,3	3000	1,93	1,95	2,291	1,90	1,90
50	+0,3/+1,3	3000	2,38	2,40	2,818	2,34	2,34
55	+0,3/+1,3	3000	2,87	2,90	3,400	2,82	2,82
60	+0,3/+1,6	3000	3,43	3,46	4,057	3,37	3,37
65	+0,3/+1,6	3000	4,01	4,05	4,750	3,94	3,94
70	+0,3/+1,6	3000	4,64	4,68	5,498	4,56	4,56
75	+0,4/+2,0	3000	5,35	5,40	6,341	5,26	5,26
80	+0,4/+2,0	3000	6,08	6,13	7,201	5,97	5,97
85	+0,5/+2,2	3000	6,88	6,94	8,143	6,76	6,76
90	+0,5/+2,2	3000	7,70	7,76	9,113	7,56	7,56
95	+0,6/+2,5	3000	---	---	---	---	---
100	+0,6/+2,5	3000	9,51	9,59	11,262	9,34	9,34
110	+0,7/+3,0	3000	11,54	11,64	13,663	11,33	11,33
120	+0,8/+3,5	3000	13,76	13,88	16,295	13,52	13,52
125	+0,8/+3,5	3000	14,91	15,04	---	14,65	14,65
130	+0,9/+3,8	3000	16,15	16,30	19,130	15,87	15,87
135	+0,9/+3,8	3000	---	---	---	---	---
140	+0,9/+3,8	3000	18,69	18,85	22,130	18,36	18,36
150	+1,0/+4,2	3000	21,48	21,66	25,431	21,10	21,10
160	+1,1/+4,5	3000	---	---	---	---	---
170	+1,2/+5,0	3000	---	---	---	---	---
175	+1,2/+5,0	3000	---	---	---	---	---
180	+1,2/+5,0	3000	---	---	---	---	---
190	+1,3/+5,5	3000	---	---	---	---	---
200	+1,3/+5,5	3000	---	---	---	---	---
210	+1,3/+5,8	3000	---	---	---	---	---
220	+1,3/+5,8	3000	---	---	---	---	---
230	+1,5/+6,2	3000	---	---	---	---	---
250	+1,5/+6,2	3000	---	---	---	---	---
260	+1,5/+6,6	3000	---	---	---	---	---
280	+1,5/+6,6	3000	---	---	---	---	---
300	+1,5/+7,5	3000	---	---	---	---	---

ZELLAMID® | RODS

ZELLAMID® Quality	1100*	1100 Oil 1100 T	1115 NA	1200 NA
	PA 6 C	PA 6 C Oil PA 6 C Tribotype	PA 6/12 C high impact	PA 12 C

Ø mm	Tolerance mm	Length mm	Weight (kg/m)			
30	+0,2/+1,4	1000	0,88	0,87	0,86	0,79
35	+0,2/+1,4	1000	1,19	1,18	1,16	1,07
40	+0,2/+1,4	1000	1,55	1,54	1,51	1,39
45	+0,3/+1,9	1000	1,98	1,96	1,93	1,77
50	+0,3/+1,9	2000	2,43	2,41	2,37	2,18
55	+0,3/+1,9	2000	2,93	2,90	2,85	2,62
60	+0,3/+2,5	2000	3,51	3,48	3,42	3,14
65	+0,3/+2,5	1000	4,10	4,07	3,99	3,67
70	+0,3/+2,5	2000	4,74	4,70	4,62	4,25
75	+0,4/+2,8	1000	5,46	5,41	5,32	4,89
80	+0,4/+2,8	2000	6,19	6,14	6,03	5,55
85	+0,5/+3,2	2000	7,02	6,96	6,83	6,28
90	+0,5/+3,2	2000	7,85	7,78	7,64	7,03
95	+0,6/+3,5	2000	8,76	8,69	8,53	7,85
100	+0,6/+3,5	2000	9,69	9,60	9,44	8,68
110	+0,7/+3,9	2000	11,73	11,63	11,43	10,51
115	+0,8/+4,3	2000	12,85	12,74	12,52	11,51
120	+0,8/+4,3	2000	13,97	13,85	13,61	12,51
125	+0,8/+4,3	2000	15,14	15,00	14,74	13,56
130	+0,8/+5,0	2000	16,43	16,29	16,00	14,72
135	+0,8/+5,0	2000	17,69	17,54	17,23	15,85
140	+0,8/+5,0	2000	19,00	18,83	18,50	17,01
145	+0,8/+5,3	1000	20,39	20,21	19,86	18,26
150	+0,8/+5,3	2000	21,79	21,60	21,22	19,52
155	+0,8/+6,0	1000	23,34	23,14	22,73	20,91
160	+0,8/+6,0	2000	24,84	24,62	24,19	22,25
165	+1,0/+6,5	1000	26,49	26,26	25,80	23,73
170	+1,0/+6,5	2000	28,09	27,84	27,35	25,15
175	+1,0/+6,5	1000	29,72	29,47	28,95	26,62
180	+1,0/+6,5	2000	31,41	31,14	30,59	28,13
190	+1,0/+7,5	2000	35,10	34,80	34,19	31,44
200	+1,0/+7,5	2000	38,81	38,47	37,80	34,76
210	+1,0/+8,5	1000	42,90	42,53	41,78	38,43
220	+1,0/+8,5	1000	46,99	46,58	45,77	42,09
230	+1,0/+9,5	1000	51,49	51,04	50,14	46,11
240	+1,0/+9,5	1000	55,96	55,47	54,50	50,12
250	+1,0/+9,5	1000	60,61	60,08	59,03	54,29
260	+1,0/+11,0	1000	65,82	65,25	64,11	---
270	+1,0/+11,0	1000	70,87	70,25	69,02	---
280	+1,0/+11,0	1000	76,10	75,43	74,11	---
290	+1,5/+12,0	1000	81,92	81,21	79,79	---
300	+1,5/+12,0	1000	87,54	86,78	85,25	---
310	+1,5/+12,0	1000	93,34	92,53	90,90	---
320	+1,5/+12,0	1000	99,32	98,46	96,73	---
330	+1,5/13,5	1000	105,97	105,05	103,20	---
340	+1,5/13,5	1000	112,34	111,36	109,41	---

* 1100 NA – PA 6 C natural / 1100 SW – PA 6 C black / 1100 MO – PA 6 C + MoS_2 / 1100 HS – PA 6 C heat stabilized / 1100 FR – PA 6 C flame retardent / 1100 BLUE – PA 6 C blue

△ Additional diameters and intermediate sizes available on request.

ZELLAMID® Quality			1100*	1100 Oil 1100 T	1115 NA	1200 NA
			PA 6 C	PA 6 C Oil PA 6 C Tribotype	PA 6/12 C high impact	PA 12 C
Ø mm	Tolerance mm	Length mm	Weight (kg/m)			
350	+1,5/13,5	1000	118,90	117,86	115,80	---
360	+1,5/13,5	1000	125,64	124,55	122,37	---
370	+1,5/15,0	1000	133,10	131,94	129,63	---
380	+1,5/15,0	1000	140,23	139,01	136,57	---
390	+1,5/15,0	1000	147,55	146,27	143,70	---
400	+1,5/15,0	1000	155,05	153,70	151,01	---
410	+1,5/16,5	1000	163,33	161,90	159,06	---
420	+1,5/16,5	1000	171,21	169,73	166,75	---
430	+1,5/16,5	1000	179,29	177,73	174,61	---
440	+1,5/16,5	1000	187,55	185,92	182,66	---
450	+1,5/16,5	1000	196,00	194,29	190,88	---
460	+1,5/18,0	1000	205,29	203,50	199,93	---
470	+1,5/18,0	1000	214,12	212,26	208,53	---
480	+1,5/18,0	1000	223,14	221,20	217,32	---
490	+1,5/18,0	1000	232,34	230,32	226,28	---
500	+1,5/18,0	1000	241,73	239,63	235,43	---
510	+3,0/21,0	1000	253,49	251,29	246,88	---
520	+3,0/21,0	1000	263,30	261,01	256,43	---
530	+3,0/21,0	1000	273,29	270,91	266,16	---
540	+3,0/21,0	1000	283,47	281,00	276,07	---
550	+3,0/21,0	1000	293,83	291,28	286,17	---
560	+3,0/21,0	1000	304,38	301,73	296,44	---
570	+3,0/21,0	1000	315,12	312,38	306,90	---
580	+3,0/21,0	1000	326,04	323,20	317,53	---
590	+3,0/21,0	1000	337,15	334,21	328,35	---
600	+3,0/21,0	1000	348,44	345,41	339,35	---
610	+3,0/25,0	1000	362,24	359,09	352,79	---
620	+3,0/25,0	1000	373,94	370,69	364,19	---
625	+3,0/25,0	1000	379,86	376,56	369,95	---
630	+3,0/25,0	1000	385,83	382,48	375,77	---
640	+3,0/25,0	1000	397,91	394,45	387,53	---
650	+3,0/25,0	1000	410,17	406,60	399,47	---
660	+3,0/25,0	1000	422,61	418,94	411,59	---
670	+3,0/25,0	1000	435,25	431,46	423,89	---
690	+3,0/25,0	1000	461,07	457,06	449,05	---
700	+3,0/25,0	1000	474,27	470,14	461,89	---
710	+3,0/25,0	1000	487,64	483,40	474,92	---
720	+3,0/25,0	1000	501,21	496,85	488,13	---
730	+3,0/25,0	1000	514,96	510,48	501,52	---
750	+3,0/25,0	1000	543,01	538,29	528,85	---
770	+3,0/25,0	1000	571,82	566,84	556,90	---
790	+3,0/25,0	1000	601,36	596,13	585,68	---
800	+3,0/25,0	1000	616,42	611,06	600,34	---

* 1100 NA – PA 6 C natural / 1100 SW – PA 6 C black / 1100 MO – PA 6 C + MoS_2 / 1100 HS – PA 6 C heat stabilized / 1100 FR – PA 6 C flame retardent / 1100 BLUE – PA 6 C blue

ZELLAMID® | RODS

ZELLAMID® Quality	900 NA / SW	900 BLUE	900 PE	900 GF30	900 AS 900 AS SW	900 ELS
	POM-C unfilled	POM-C RAL 5002	POM-C + PE Tribotype	POM-C + 30 % Glass fibre	POM-C antistatic	POM-C ELS conductive

Ø mm	Tolerance mm	Length mm	Weight (kg/m)					
6	+0,1/+0,6	3000	0,046	0,046	---	---	0,044	0,046
8	+0,1/+0,7	3000	0,080	0,080	---	---	0,077	0,080
10	+0,1/+0,7	3000	0,123	0,123	---	---	0,118	0,123
12	+0,2/+0,8	3000	0,178	0,178	---	---	0,171	0,178
14	+0,2/+0,8	3000	0,240	0,240	---	---	0,230	0,240
15	+0,2/+0,8	3000	0,274	0,274	---	---	0,262	0,274
16	+0,2/+0,8	3000	0,31	0,31	0,30	0,35	0,30	0,31
18	+0,2/+0,8	3000	0,39	0,39	---	---	0,37	0,39
20	+0,2/+0,8	3000	0,48	0,48	0,46	0,54	0,46	0,48
22	+0,2/+1,0	3000	0,58	0,58	---	---	0,56	0,58
25	+0,2/+1,0	3000	0,75	0,75	0,71	0,84	0,72	0,75
28	+0,2/+1,0	3000	0,93	0,93	---	---	0,89	0,93
30	+0,2/+1,0	3000	1,07	1,07	1,02	1,20	1,02	1,07
32	+0,2/+1,2	3000	1,22	1,22	---	---	1,17	1,22
35	+0,2/+1,2	3000	1,45	1,45	1,38	1,63	1,39	1,45
40	+0,2/+1,2	3000	1,89	1,89	1,80	2,12	1,81	1,89
45	+0,3/+1,3	3000	2,39	2,39	2,27	2,68	2,29	2,39
50	+0,3/+1,3	3000	2,94	2,94	2,80	3,30	2,82	2,94
55	+0,3/+1,3	3000	3,55	3,55	3,38	3,98	3,40	3,55
60	+0,3/+1,6	3000	4,24	4,24	4,03	4,75	4,06	4,24
65	+0,3/+1,6	3000	4,96	4,96	4,71	5,56	4,75	4,96
70	+0,3/+1,6	3000	5,74	5,74	5,46	6,43	5,50	5,74
75	+0,4/+2,0	3000	6,62	6,62	6,29	7,42	6,34	6,62
80	+0,4/+2,0	3000	7,52	7,52	7,15	8,43	7,20	7,52
85	+0,5/+2,2	3000	8,50	8,50	8,08	9,53	8,14	8,50
90	+0,5/+2,2	3000	9,52	9,52	9,05	10,67	9,11	9,52
95	+0,6/+2,5	3000	10,63	10,63	---	---	10,18	10,63
100	+0,6/+2,5	3000	11,76	11,76	11,18	---	11,26	11,76
110	+0,7/+3,0	3000	14,27	14,27	13,56	---	13,66	14,27
120	+0,8/+3,5	3000	17,02	17,02	16,17	---	16,29	17,02
125	+0,8/+3,5	3000	18,44	18,44	---	---	17,66	18,44
130	+0,9/+3,8	3000	19,98	19,98	18,99	---	19,13	19,98
140	+0,9/+3,8	3000	23,11	23,11	21,97	---	22,13	23,11
150	+1,1/+4,2	3000	26,58	26,58	25,26	---	25,45	26,58
160	+1,1/+4,5	3000	30,23	30,23	---	---	28,94	30,23
170	+1,2/+5,0	3000	34,18	34,18	32,48	---	---	---
180	+1,2/+5,0	3000	38,24	38,24	---	---	---	---
190	+1,3/+5,5	3000	42,66	42,66	---	---	---	---
200	+1,3/+5,5	3000	47,19	47,19	44,85	---	---	---
210	+1,3/+5,8	3000	52,02	52,02	---	---	---	---
220	+1,3/+5,8	3000	57,00	57,00	---	---	---	---
230	+1,5/+6,2	3000	62,38	62,38	---	---	---	---
250	+1,5/+6,2	3000	73,50	73,50	69,85	---	---	---
260	+1,5/+6,6	3000	79,53	79,53	---	---	---	---
280	+1,5/+6,6	3000	92,03	92,03	---	---	---	---
300	+1,5/+7,5	3000	105,76	105,76	---	---	---	---
310	+1,5/+7,5	3000	112,82	---	---	---	---	---
350	+1,5/+8,5	1000	143,75	---	---	---	---	---
400	+1,5/+10,5	1000	188,02	---	---	---	---	---
450	+1,5/+10,5	1000	237,18	---	---	---	---	---
500	+1,5/+11,5	1000	292,62	---	---	---	---	---

△ Additional diameters and intermediate sizes available on request.

ZELLAMID® Quality	900 Special colours*	900 XT	900 H
	POM-C unfilled	POM-C + PTFE Tribotype	POM-H unfilled

Ø mm	Tolerance mm	Length mm	Weight (kg/m)		
6	+0,1/+0,6	3000	0,046	0,047	0,046
8	+0,1/+0,7	3000	0,080	0,082	0,081
10	+0,1/+0,7	3000	0,123	0,126	0,124
12	+0,2/+0,8	3000	0,178	0,182	0,179
14	+0,2/+0,8	3000	0,240	0,245	0,242
15	+0,2/+0,8	3000	0,274	0,280	0,276
16	+0,2/+0,8	3000	0,31	0,32	0,31
18	+0,2/+0,8	3000	0,39	0,40	0,39
20	+0,2/+0,8	3000	0,48	0,49	0,48
22	+0,2/+1,0	3000	0,58	0,59	0,59
25	+0,2/+1,0	3000	0,75	0,76	0,75
28	+0,2/+1,0	3000	0,93	0,95	0,94
30	+0,2/+1,0	3000	1,07	1,09	1,08
32	+0,2/+1,2	3000	1,22	1,25	1,23
35	+0,2/+1,2	3000	1,45	1,48	1,46
40	+0,2/+1,2	3000	1,89	1,93	1,90
45	+0,3/+1,3	3000	2,39	2,44	2,41
50	+0,3/+1,3	3000	2,94	3,01	2,96
55	+0,3/+1,3	3000	3,55	3,63	3,58
60	+0,3/+1,6	3000	4,24	4,33	4,27
65	+0,3/+1,6	3000	4,96	5,07	5,00
70	+0,3/+1,6	3000	5,74	5,86	5,78
75	+0,4/+2,0	3000	6,62	6,76	6,67
80	+0,4/+2,0	3000	7,52	7,68	7,57
85	+0,5/+2,2	3000	8,50	8,69	8,57
90	+0,5/+2,2	3000	9,52	9,72	9,59
95	+0,6/+2,5	3000	10,63	10,86	10,71
100	+0,6/+2,5	3000	11,76	12,01	11,85
110	+0,7/+3,0	3000	14,27	14,57	14,37
120	+0,8/+3,5	3000	17,02	17,38	17,14
125	+0,8/+3,5	3000	18,44	18,83	18,57
130	+0,9/+3,8	3000	19,98	20,41	20,12
140	+0,9/+3,8	3000	23,11	23,61	23,28
150	+1,1/+4,2	3000	26,58	27,14	26,77
160	+1,1/+4,5	3000	30,23	30,87	30,45
170	+1,2/+5,0	3000	---	---	---
180	+1,2/+5,0	3000	---	---	---
190	+1,3/+5,5	3000	---	---	---
200	+1,3/+5,5	3000	---	---	---
210	+1,3/+5,8	3000	---	---	---
220	+1,3/+5,8	3000	---	---	---
230	+1,5/+6,2	3000	---	---	---
250	+1,5/+6,2	3000	---	---	---
260	+1,5/+6,6	3000	---	---	---
280	+1,5/+6,6	3000	---	---	---
300	+1,5/+7,5	3000	---	---	---
310	+1,5/+7,5	3000	---	---	---
350	+1,5/+8,5	1000	---	---	---
400	+1,5/+10,5	1000	---	---	---
450	+1,5/+10,5	1000	---	---	---
500	+1,5/+11,5	1000	---	---	---

* For example, RAL 5015, RAL 7035. Each color request is evaluated individually and a specification is agreed upon. Actual semi-finished product colours can only be produced to approximate a color standard and may exhibit streaks or color variations.

ZELLAMID® | RODS

ZELLAMID® Quality			675 NA	675 SW	675 GR
			Polyethylene 1000 (UHMW) unfilled	Polyethylene 1000 (UHMW) unfilled	Polyethylene 1000 (UHMW) unfilled
Ø mm	Tolerance mm	Length mm	Weight (kg/m)		
20	+0,2/+1,2	2000	0,33	0,33	0,33
30	+0,2/+1,2	2000	0,72	0,72	0,72
40	+0,2/+1,5	2000	1,27	1,27	1,27
50	+0,3/+2,0	2000	1,99	1,99	1,99
60	+0,3/+2,3	2000	2,86	2,86	2,86
70	+0,3/+2,5	2000	3,88	3,88	3,88
80	+0,4/+3,0	2000	5,08	5,08	5,08
90	+0,5/+3,4	2000	6,43	6,43	6,43
100	+0,6/+3,8	2000	7,94	7,94	7,94
110	+0,7/+4,2	2000	9,62	9,62	9,62
120	+0,8/+4,6	2000	11,45	11,45	11,45
125	+0,8/+4,6	2000	12,40	12,40	12,40
130	+0,9/+5,4	2000	13,48	13,48	13,48
140	+0,9/+5,4	2000	15,58	15,58	15,58
150	+1,0/+5,8	2000	17,89	17,89	17,89
160	+1,1/+6,3	2000	20,38	20,38	20,38
180	+1,2/+7,4	2000	25,83	25,83	25,83
200	+1,3/+8,5	2000	31,93	31,93	31,93
250	+1,5/+9,5	2000	49,64	49,64	49,64
300	+1,5/+10,5	2000	71,20	71,20	71,20

△ Additional diameters and intermediate sizes available on request.

ZELLAMID® Quality			1000 NA	1000 SW	1000 GF30	1400 NA	1400 SW	1400 T
			PEI unfilled	PEI unfilled	PEI + 30 % Glass fibre	PET unfilled	PET unfilled	PET Tribotype
Ø mm	Tolerance mm	Length mm	Weight (kg/m)					
6	+0,1/+0,6	3000	0,041	0,041	0,049	0,044	0,044	0,045
8	+0,1/+0,7	3000	0,072	0,072	0,086	0,078	0,078	0,079
10	+0,1/+0,7	3000	0,111	0,111	0,132	0,119	0,119	0,122
12	+0,2/+0,8	3000	0,161	0,161	0,191	0,172	0,172	0,176
15	+0,2/+0,8	3000	0,247	0,247	0,293	0,264	0,264	0,270
16	+0,2/+0,8	3000	0,28	0,28	0,33	0,30	0,30	0,31
18	+0,2/+0,8	3000	0,35	0,35	0,42	0,38	0,38	0,38
20	+0,2/+0,8	3000	0,43	0,43	0,51	0,46	0,46	0,47
22	+0,2/+1,0	3000	0,52	0,52	0,62	0,56	0,56	0,57
25	+0,2/+1,0	3000	0,67	0,67	0,80	0,72	0,72	0,74
28	+0,2/+1,0	3000	0,84	0,84	1,00	0,90	0,90	0,92
30	+0,2/+1,0	3000	0,96	0,96	1,14	1,03	1,03	1,05
32	+0,2/+1,2	3000	1,10	1,10	1,31	1,17	1,17	1,20
35	+0,2/+1,2	3000	1,31	1,31	1,56	1,40	1,40	1,43
40	+0,2/+1,2	3000	1,70	1,70	2,02	1,82	1,82	1,86
45	+0,3/+1,3	3000	2,16	2,16	2,56	2,31	2,31	2,36
50	+0,3/+1,3	3000	2,65	2,65	3,15	2,84	2,84	2,90
55	+0,3/+1,3	3000	3,20	---	---	3,43	3,43	3,50
60	+0,3/+1,6	3000	3,82	---	---	4,09	4,09	4,18
65	+0,3/+1,6	3000	4,47	---	---	4,79	4,79	4,89
70	+0,3/+1,6	3000	5,17	---	---	5,54	5,54	5,66
75	+0,4/+2,0	3000	5,97	---	---	6,39	6,39	6,53
80	+0,4/+2,0	3000	6,77	---	---	7,25	7,25	7,41
85	+0,4/+2,0	3000	7,63			8,20	8,20	8,38
90	+0,5/+2,2	3000	8,57	---	---	9,18	9,18	9,38
100	+0,6/+2,5	3000	10,59	---	---	11,35	11,35	11,60
110	+0,7/+3,0	3000	12,85	---	---	13,76	13,76	14,07
120	+0,8/+3,5	3000	15,33	---	---	16,42	16,42	16,78
125	+0,8/+3,5	3000	16,61	---	---	17,79	17,79	18,18
130	+0,9/+3,8	3000	18,00	---	---	19,27	19,27	19,70
135	+0,9/+3,8	3000	19,38	---	---	20,76	20,76	21,21
140	+0,9/+3,8	3000	20,82	---	---	22,29	22,29	22,79
150	+1,1/+4,2	3000	23,94	---	---	25,62	25,62	26,18
160	+1,1/+4,5	1000	---	---	---	29,16	29,16	29,80
170	+1,2/+5,0	1000	---	---	---	32,97	---	---
175	+1,2/+5,0	1000	---	---	---	34,90	---	---
180	+1,2/+5,0	1000	---	---	---	36,88	---	---
190	+1,3/+5,5	1000	---	---	---	41,15	---	---
200	+1,3/+5,5	1000	---	---	---	45,52	---	---

ZELLAMID® | RODS

ZELLAMID® Quality	1500 X	1500 XSW	1500 XC20	1500 XCA30	1500 XGF30	1500 XT
	PEEK unfilled	PEEK unfilled	PEEK + 20 % Ceramic	PEEK + 30 % Carbon fibre	PEEK + 30 % Glass fibre	PEEK modified Tribotype

Ø mm	Tolerance mm	Length mm	Weight (kg/m)					
6	+0,1/+0,6	3000	0,042	0,042	0,049	0,046	0,049	0,047
8	+0,1/+0,7	3000	0,074	0,074	0,085	0,080	0,086	0,083
10	+0,1/+0,7	3000	0,114	0,114	0,130	0,122	0,132	0,127
12	+0,2/+0,8	3000	0,164	0,164	0,188	0,177	0,191	0,183
14	+0,2/+0,8	3000	0,221	0,221	0,253	0,238	0,257	0,247
15	+0,2/+1,0	3000	0,256	0,256	0,293	0,276	0,297	0,285
16	+0,2/+1,0	3000	0,29	0,29	0,33	0,31	0,34	0,32
18	+0,2/+1,0	3000	0,36	0,36	0,42	0,39	0,42	0,41
20	+0,2/+1,0	3000	0,45	0,45	0,51	0,48	0,52	0,50
22	+0,2/+1,0	3000	0,54	0,54	0,62	0,58	0,62	0,60
25	+0,2/+1,0	3000	0,69	0,69	0,79	0,74	0,80	0,77
28	+0,2/+1,0	3000	0,86	0,86	0,99	0,93	1,00	0,96
30	+0,2/+1,0	3000	0,98	0,98	1,13	1,06	1,14	1,10
32	+0,2/+1,2	3000	1,12	1,12	1,29	1,21	1,31	1,25
35	+0,2/+1,2	3000	1,34	1,34	1,54		1,56	1,49
40	+0,2/+1,2	3000	1,74	1,74	2,00	1,88	2,02	1,94
45	+0,3/+1,3	3000	2,21	2,21	2,53	2,38	2,56	2,46
50	+0,3/+1,3	3000	2,71	2,71	3,11	2,92	3,15	3,03
55	+0,3/+1,3	3000	3,27	3,27	3,75		3,80	3,65
60	+0,3/+1,6	3000	3,91	3,91	4,48	4,21	4,54	4,36
65	+0,3/+1,6	3000	4,57	4,57	5,24	4,93	5,31	5,10
70	+0,3/+1,6	3000	5,29	5,29	6,07	5,70	6,15	5,90
75	+0,4/+2,0	3000	6,11	6,11	7,00		7,09	6,81
80	+0,4/+2,0	3000	6,93	6,93	7,95	7,47	8,05	7,73
85	+0,5/+2,2	3000	7,84	7,84	8,99		9,11	8,75
90	+0,5/+2,2	3000	8,78	8,78	10,06	9,45	10,19	9,79
95	+0,6/+2,5	3000	9,80	9,80	11,24	---	11,39	10,93
100	+0,6/+2,5	3000	10,85	10,85	12,43	---	12,60	12,10
110	+0,7/+3,0	3000	13,16	13,16	---	---	---	---
120	+0,8/+3,5	3000	15,69	15,69	---	---	---	---
125	+0,8/+3,5	3000	17,00	17,00	---	---	---	---
130	+0,9/+3,8	3000	18,42	18,42	---	---	---	---
135	+0,9/+3,8	3000	19,84	19,84	---	---	---	---
140	+1,1/+4,2	3000	21,40	21,40	---	---	---	---
150	+1,1/+4,5	3000	24,55	24,55	---	---	---	---
160	+1,1/+4,5	1000	27,87	27,87	---	---	---	---

Additional diameters and intermediate sizes available on request.

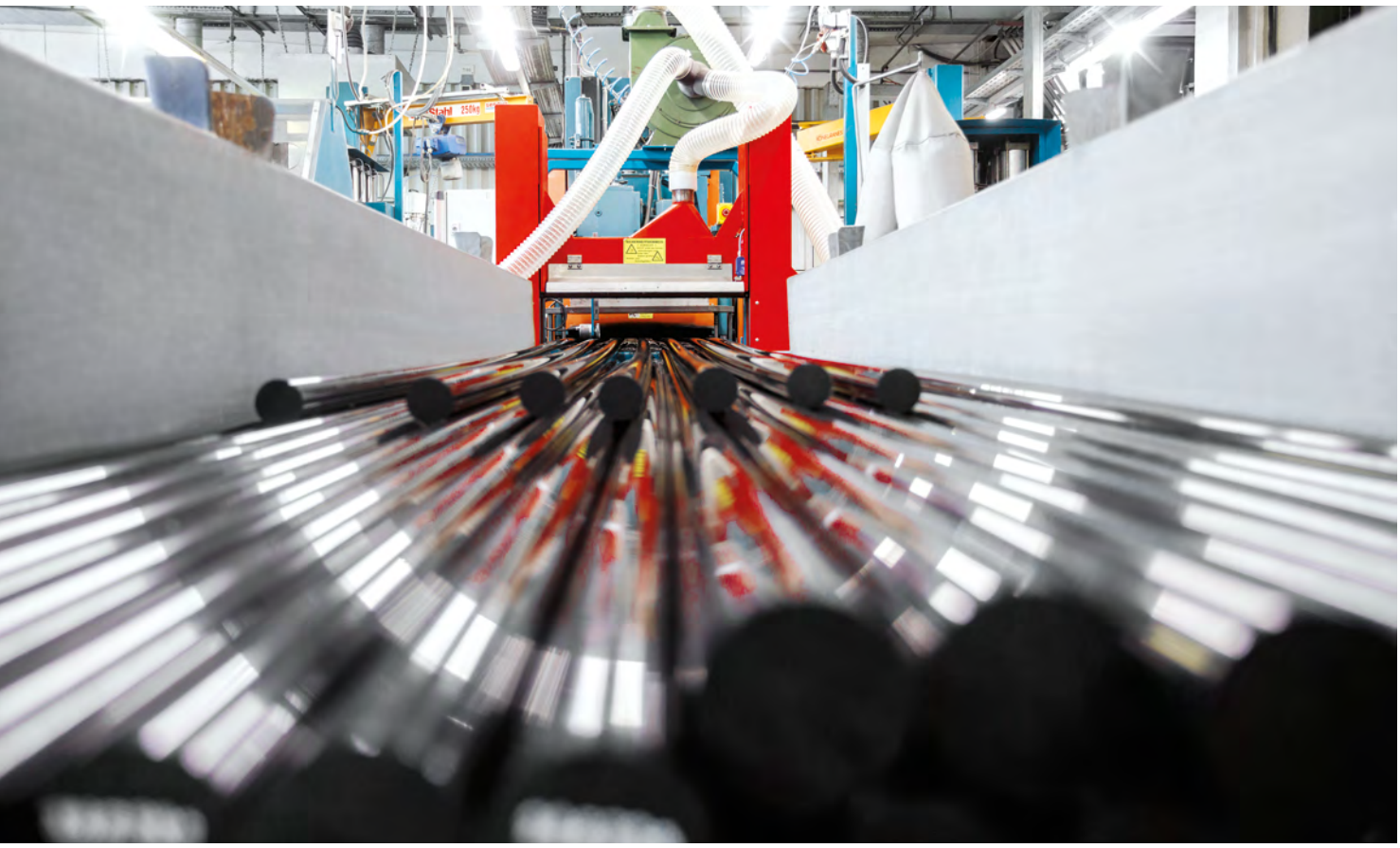
ZELLAMID® Quality			1500 XCT2	1500 XMG
			PEEK cryogenic	PEEK medical-grade
Ø mm	Tolerance mm	Length mm	Weight (kg/m)	
6	+0,1/+0,6	3000	0,047	0,042
8	+0,1/+0,7	3000	0,082	0,074
10	+0,1/+0,7	3000	0,125	0,114
12	+0,2/+0,8	3000	0,181	0,164
14	+0,2/+0,8	3000	0,243	0,221
15	+0,2/+1,0	3000	0,282	0,256
16	+0,2/+1,0	3000	0,32	0,29
18	+0,2/+1,0	3000	0,40	0,36
20	+0,2/+1,0	3000	0,49	0,45
22	+0,2/+1,0	3000	0,59	0,54
25	+0,2/+1,0	3000	0,76	0,69
28	+0,2/+1,0	3000	0,95	0,86
30	+0,2/+1,0	3000	1,08	0,98
32	+0,2/+1,2	3000	1,24	1,12
35	+0,2/+1,2	3000	1,47	1,34
40	+0,2/+1,2	3000	1,92	1,74
45	+0,3/+1,3	3000	2,43	2,21
50	+0,3/+1,3	3000	2,99	2,71
55	+0,3/+1,3	3000	3,60	3,27
60	+0,3/+1,6	3000	4,30	3,91
65	+0,3/+1,6	3000	5,03	4,57
70	+0,3/+1,6	3000	5,82	5,29
75	+0,4/+2,0	3000	6,72	6,11
80	+0,4/+2,0	3000	7,63	6,93
85	+0,5/+2,2	3000	8,63	7,84
90	+0,5/+2,2	3000	9,65	8,78
95	+0,6/+2,5	3000	10,78	9,80
100	+0,6/+2,5	3000	11,93	10,85
110	+0,7/+3,0	3000	---	13,16
120	+0,8/+3,5	3000	---	15,69
125	+0,8/+3,5	3000	---	17,00
130	+0,9/+3,8	3000	---	18,42
135	+0,9/+3,8	3000	---	19,84
140	+1,1/+4,2	3000	---	21,40
150	+1,1/+4,5	3000	---	24,55
160	+1,1/+4,5	1000	---	27,87

ZELLAMID® Quality			1700 NA
			PVDF unfilled
Ø mm	Tolerance mm	Length mm	Weight (kg/m)
6	+0,1/+0,6	1000	---
8	+0,1/+0,7	1000	---
10	+0,1/+0,7	1000	0,156
12	+0,2/+0,8	1000	---
14	+0,2/+0,8	1000	---
15	+0,2/+1,0	1000	0,350
16	+0,2/+1,0	1000	---
18	+0,2/+1,0	1000	---
20	+0,2/+1,0	1000	0,61
22	+0,2/+1,0	1000	---
25	+0,2/+1,0	1000	0,94
28	+0,2/+1,0	1000	---
30	+0,2/+1,0	1000	1,35
32	+0,2/+1,2	1000	---
35	+0,2/+1,2	1000	1,84
40	+0,2/+1,2	1000	2,39

ZELLAMID® | RODS

ZELLAMID® Quality	1900 NA	1900 GF40	1900 IM	1900 T
	PPS unfilled	PPS + 40 % Glass fibre	PPS impact modified	PPS Tribotype

Ø mm	Tolerance mm	Length mm	Weight (kg/m)			
6	+0,1/+0,6	3000	0,044	0,053	0,042	0,046
8	+0,1/+0,7	3000	0,077	0,094	0,074	0,081
10	+0,1/+0,7	3000	0,118	0,143	0,114	0,124
12	+0,2/+0,8	3000	0,171	0,207	0,164	0,179
14	+0,2/+0,8	3000	0,230	0,279	0,221	0,242
15	+0,2/+1,0	3000	0,266	0,323	0,256	0,280
16	+0,2/+1,0	3000	0,30	0,37	0,29	0,32
18	+0,2/+1,0	3000	0,38	0,46	0,36	0,40
20	+0,2/+1,0	3000	0,46	0,56	0,45	0,49
22	+0,2/+1,0	3000	0,56	0,68	0,54	0,59
25	+0,2/+1,0	3000	0,72	0,87	0,69	0,75
28	+0,2/+1,0	3000	0,89	1,09	0,86	0,94
30	+0,2/+1,0	3000	1,02	1,24	0,98	1,08
32	+0,2/+1,2	3000	1,17	1,42	1,12	1,23
35	+0,2/+1,2	3000	1,39	1,69	1,34	1,46
40	+0,2/+1,2	3000	1,81	2,20	1,74	1,90



△ Additional diameters and intermediate sizes available on request.

ZELLAMID® | FILMS

ZELLAMID® Quality	202		900	
	PA 6 unfilled		POM-C unfilled	
Width (mm) x Roll length (m)	1000 x 50	1000 x 100	1000 x 50	1000 x 100

Thickness mm	Tolerance mm	Weight (kg/roll)			
0,3	+/-0,05	---	36,00	---	---
0,5	+/-0,05	---	60,00	39,00	78,00
0,8	+/-0,10	48,00	---	58,50	---
1,0	+/-0,10	61,50	---	73,50	---
1,5	+/-0,15	90,00	---	---	---

ZELLAMID® | PLATES CALENDERED

ZELLAMID® Quality	202 NA / SW 202 MO	250 NA	900 NA / SW
	PA 6 unfilled PA 6 + MoS_2	PA 6.6 unfilled	POM-C unfilled
Width x Length (mm)	1000 x 2000	1000 x 2000	1000 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)		
1	+/- 0,10	1,19	1,20	1,48
1,5	+/- 0,15	1,79	1,80	2,23
2	+/- 0,15	2,38	2,40	2,97
2,5	+/- 0,15	2,98	3,00	3,71
3	+/- 0,20	3,57	3,60	4,45
4	+/- 0,20	4,76	4,80	5,94
5	+/- 0,25	5,95	6,00	7,42
6	+/- 0,25	7,14	7,20	8,91

ZELLAMID® Quality	1400 NA	1500 X
	PET unfilled	PEEK unfilled
Width x Length (mm)	1000 x 2000	1000 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)	
1	+/- 0,10	1,43	---
1,5	+/- 0,15	---	---
2	+/- 0,15	2,86	---
2,5	+/- 0,15	---	---
3	+/- 0,20	4,30	4,11
4	+/- 0,20	5,73	5,48
5	+/- 0,25	7,16	6,85
6	+/- 0,25	8,59	8,21

Additional dimensions available on request.

ZELLAMID® | PLATES

ZELLAMID® Quality	202 NA / SW 202 HV				202 IM			
	PA 6 unfilled PA 6 high viscosity				PA 6 impact modified			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000

Thickness mm	Tolerance mm	Weight (kg/m)							
5	+0,2/+0,7	---	3,96	---	---	---	3,78	---	---
6	+0,2/+0,7	---	4,68	---	---	---	4,47	---	---
8	+0,2/+1,1	5,15	6,28	10,29	12,56	4,92	6,00	9,84	12,00
10	+0,2/+1,1	6,34	7,73	12,67	15,46	6,06	7,39	12,11	14,78
12	+0,3/+1,5	7,68	9,36	15,35	18,73	7,34	8,95	14,67	17,90
15	+0,3/+1,5	9,46	11,54	18,92	23,09	9,05	11,03	18,09	22,06
20	+0,3/+1,5	12,44	15,17	24,87	30,35	11,89	14,50	23,77	29,00
25	+0,3/+1,5	15,41	18,80	30,82	37,61	14,73	17,96	29,46	35,94
30	+0,5/+2,5	18,74	22,86	37,49	45,74	17,92	21,85	35,83	43,71
35	+0,5/+2,5	21,72	26,49	43,44	53,00	20,76	25,32	41,52	50,65
40	+0,5/+2,5	24,69	30,12	49,39	60,26	23,60	28,78	47,20	57,59
45	+0,5/+2,5	27,67	33,74	55,34	67,52	26,45	32,25	52,89	64,53
50	+0,5/+2,5	30,64	37,37	61,29	74,78	29,29	35,72	58,58	71,47
55	+0,5/+3,5	33,92	41,36	67,84	82,76	32,42	39,53	64,83	79,10
60	+0,5/+3,5	36,89	44,99	73,79	90,02	35,26	43,00	70,52	86,04
65	+0,5/+3,5	39,87	48,62	79,74	---	38,11	46,47	76,21	---
70	+0,5/+3,5	42,84	52,25	85,69	---	40,95	49,94	81,89	---
75	+0,5/+5,0	46,26	56,42	92,53	---	44,22	53,93	88,44	---
80	+0,5/+5,0	49,24	60,05	98,48	---	47,06	57,39	94,12	---
85	+0,5/+5,0	52,22	63,68	104,43	---	49,91	60,86	99,81	---
90	+0,5/+5,0	55,19	67,31	110,38	---	52,75	64,33	105,50	---
95	+0,5/+5,0	58,17	70,94	116,33	---	55,59	67,80	111,18	---
100	+0,5/+5,0	61,14	74,56	122,28	---	58,44	71,27	116,87	---
110	+0,5/+5,0	67,09	81,82	134,18	---	64,13	78,20	128,25	---

ZELLAMID® Quality	202 MO				202 GF30			
	PA 6 + MoS_2				PA 6 + 30 % Glass fibre			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000

Thickness mm	Tolerance mm	Weight (kg/m)							
5	+0,2/+0,7	---	4,03	---	---	---	4,27	---	---
6	+0,2/+0,7	---	4,76	---	---	---	5,05	---	---
8	+0,2/+1,1	5,24	6,39	10,48	12,78	5,56	6,78	11,11	13,56
10	+0,2/+1,1	6,45	7,87	12,90	15,74	6,84	8,34	13,68	16,70
12	+0,3/+1,5	7,81	9,53	15,62	19,06	8,29	10,11	16,57	20,22
15	+0,3/+1,5	9,63	11,74	19,26	23,49	10,21	12,46	20,43	24,92
20	+0,3/+1,5	12,66	15,44	25,31	30,88	13,43	16,37	26,85	32,76
25	+0,3/+1,5	15,68	19,13	31,37	38,27	16,64	20,29	33,28	40,60
30	+0,5/+2,5	19,08	23,26	38,15	46,55	20,24	24,68	40,47	49,38
35	+0,5/+2,5	22,10	26,96	44,21	53,93	23,45	28,60	46,90	57,22
40	+0,5/+2,5	25,13	30,65	50,26	61,32	26,66	32,51	53,32	65,06
45	+0,5/+2,5	28,16	34,34	56,32	68,71	29,87	36,43	59,75	72,89
50	+0,5/+2,5	31,19	38,03	62,37	76,10	33,09	40,35	66,17	80,73
55	+0,5/+3,5	34,52	42,10	69,04	84,23	36,62	44,66	73,24	89,35
60	+0,5/+3,5	37,55	45,79	75,09	91,62	39,83	48,58	79,66	97,19

△ Additional dimensions and intermediate thicknesses available on request.

ZELLAMID® Quality	202 MO				202 GF30			
	PA 6 + MoS_2				PA 6 + 30 % Glass fibre			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000

Thickness mm	Tolerance mm	Weight (kg/m)							
65	+0,5/+3,5	40,57	49,48	81,15	---	43,04	52,49	86,09	---
70	+0,5/+3,5	43,60	53,17	87,20	---	46,26	56,41	92,51	---
75	+0,5/+5,0	47,08	57,42	94,17	---	49,95	60,92	99,90	---
80	+0,5/+5,0	50,11	61,11	100,22	---	53,16	64,83	106,32	---
85	+0,5/+5,0	53,14	64,81	106,28	---	56,37	68,75	112,75	---
90	+0,5/+5,0	56,17	68,50	112,33	---	59,59	72,67	119,17	---
95	+0,5/+5,0	59,20	72,19	118,39	---	62,80	76,59	125,60	---
100	+0,5/+5,0	62,22	75,88	124,45	---	66,01	80,50	132,02	---
110	+0,5/+5,0	68,28	83,27	136,56	---	72,43	88,34	144,87	---

ZELLAMID® Quality	1100 NA / SW 1100 MO 1100 HS 1100 FR		1100 Oil 1100 T		1115 NA	1200 NA
	PA 6 C unfilled PA 6 C + MoS_2 PA 6 C heat stabilized PA 6 C flame retardent		PA 6 C Oil PA 6 C Tribotype		PA 6/12 C high impact	PA 12 C
Available Width x Length (mm)	1000 x 2000	1220 x 2000 1220 x 3000	1000 x 2000	1220 x 2000 1220 x 3000	1000 x 2000	1000 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)					
8	+0,2/+1,5	10,72	---	10,63	---	10,44	9,60
10	+0,2/+1,5	13,14	15,75	13,03	---	12,80	11,77
12	+0,3/+2,5	16,23	19,46	16,09	19,80	15,81	14,54
15	+0,3/+2,5	19,86	23,81	19,69	24,23	19,34	17,79
16	+0,3/+2,5	21,07	25,26	20,89	25,71	20,52	18,88
18	+0,3/+2,5	23,50	28,17	23,29	28,67	22,88	21,04
20	+0,3/+2,5	25,92	31,07	25,69	31,62	25,24	23,21
22	+0,3/+2,5	28,34	33,98	28,09	34,58	27,60	---
25	+0,3/+2,5	31,97	38,33	31,70	39,01	31,14	28,64
30	+0,5/+3,5	38,76	46,46	38,42	47,29	37,75	34,71
35	+0,5/+3,5	44,81	53,72	44,42	54,67	43,64	40,14
40	+0,5/+3,5	50,87	60,98	50,43	62,06	49,54	45,56
45	+0,5/+3,5	56,92	68,24	56,43	69,45	55,44	50,98
50	+0,5/+3,5	62,98	75,50	62,43	76,84	61,34	56,41
55	+0,5/+5,0	69,94	83,85	69,34	85,34	68,12	62,65
60	+0,5/+5,0	76,00	91,11	75,34	92,72	74,02	68,07
65	+0,5/+5,0	82,06	98,37	81,34	100,11	79,91	---
70	+0,5/+5,0	88,11	105,63	87,35	107,50	85,81	---
75	+0,5/+7,0	95,38	114,34	94,55	116,37	92,89	---
80	+0,5/+7,0	101,43	121,60	100,55	123,75	98,79	---
85	+0,5/+7,0	107,49	128,86	106,55	131,14	104,69	---
90	+0,5/+7,0	113,55	136,12	112,56	138,53	110,58	---
95	+0,5/+7,0	119,60	143,38	118,56	145,92	116,48	---
100	+0,5/+7,0	125,66	150,64	124,56	153,31	122,38	---
110	+0,5/+9,0	138,98	---	---	---	---	---
120	+0,5/+9,0	151,09	---	---	---	---	---
130	+0,5/+9,0	163,20	---	---	---	---	---
140	+0,5/+10,0	175,92	---	---	---	---	---
150	+0,5/+10,0	188,03	---	---	---	---	---
160	+0,5/+10,0	200,14	---	---	---	---	---

ZELLAMID® | PLATES

ZELLAMID® Quality	250 NA / SW				250 MO			
	PA 6.6 unfilled				PA 6.6 + MoS_2			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000

Thickness mm	Tolerance mm	Weight (kg/m)							
5	+0,2/+0,7	---	3,99	---	---	---	4,03	---	---
6	+0,2/+0,7	---	4,72	---	---	---	4,76	---	---
8	+0,2/+1,1	5,19	6,33	10,39	12,67	5,24	6,39	10,48	12,78
10	+0,2/+1,1	6,39	7,80	12,79	15,60	6,45	7,87	12,90	15,74
12	+0,3/+1,5	7,74	9,44	15,49	18,90	7,81	9,53	15,62	19,06
15	+0,3/+1,5	9,54	11,64	19,09	23,29	9,63	11,74	19,26	23,49
20	+0,3/+1,5	12,55	15,30	25,09	30,61	12,66	15,44	25,31	30,88
25	+0,3/+1,5	15,55	18,96	31,10	37,94	15,68	19,13	31,37	38,27
30	+0,5/+2,5	18,91	23,06	37,82	46,14	19,08	23,26	38,15	46,55
35	+0,5/+2,5	21,91	26,72	43,82	53,47	22,10	26,96	44,21	53,93
40	+0,5/+2,5	24,91	30,38	49,83	60,79	25,13	30,65	50,26	61,32
45	+0,5/+2,5	27,91	34,04	55,83	68,11	28,16	34,34	56,32	68,71
50	+0,5/+2,5	30,92	37,70	61,83	75,44	31,19	38,03	62,37	76,10
55	+0,5/+3,5	34,22	41,73	68,44	83,49	34,52	42,10	69,04	84,23
60	+0,5/+3,5	37,22	45,39	74,44	90,82	37,55	45,79	75,09	91,62
65	+0,5/+3,5	40,22	49,05	80,44	---	40,57	49,48	81,15	---
70	+0,5/+3,5	43,22	52,71	86,44	---	43,60	53,17	87,20	---
75	+0,5/+5,0	46,67	56,92	93,35	---	47,08	57,42	94,17	---
80	+0,5/+5,0	49,68	60,58	99,35	---	50,11	61,11	100,22	---
85	+0,5/+5,0	52,68	64,24	105,35	---	53,14	64,81	106,28	---
90	+0,5/+5,0	55,68	67,90	111,36	---	56,17	68,50	112,33	---
95	+0,5/+5,0	58,68	71,56	117,36	---	59,20	72,19	118,39	---
100	+0,5/+5,0	61,68	75,22	123,36	---	62,22	75,88	124,45	---

Additional dimensions and intermediate thicknesses available on request.

ZELLAMID® Quality	250 GF30	250 PE 250 HV			
	PA 6.6 + 30 % Glass fibre	PA 6.6 + PE Tribotype PA 6.6 high impact			
Available Width x Length (mm)	610 x 1000 610 x 2000 610 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000
Thickness mm	Tolerance mm	Weight (kg/m)				
5	+0,2/+0,7	4,73	---	3,92	---	---
6	+0,2/+0,7	5,59	---	4,64	---	---
8	+0,2/+1,1	7,50	5,10	6,22	10,20	12,45
10	+0,2/+1,1	9,23	6,28	7,66	12,56	15,33
12	+0,3/+1,5	11,18	7,61	9,28	15,22	18,56
15	+0,3/+1,5	13,78	9,38	11,44	18,75	22,88
20	+0,3/+1,5	18,12	12,33	15,03	24,65	30,08
25	+0,3/+1,5	22,45	15,28	18,63	30,55	37,27
30	+0,5/+2,5	27,31	18,58	22,66	37,16	45,33
35	+0,5/+2,5	31,64	21,53	26,25	43,05	52,53
40	+0,5/+2,5	35,98	24,48	29,85	48,95	59,72
45	+0,5/+2,5	40,31	27,42	33,45	54,85	66,92
50	+0,5/+2,5	44,65	30,37	37,04	60,75	74,11
55	+0,5/+3,5	49,42	33,62	41,00	67,23	82,03
60	+0,5/+3,5	53,75	36,57	44,59	73,13	89,23
65	+0,5/+3,5	58,09	39,52	48,19	79,03	---
70	+0,5/+3,5	62,42	42,46	51,79	84,93	---
75	+0,5/+5,0	67,41	45,86	55,92	91,71	---
80	+0,5/+5,0	71,74	48,80	59,52	97,61	---
85	+0,5/+5,0	76,08	51,75	63,12	103,51	---
90	+0,5/+5,0	80,41	54,70	66,71	109,40	---
95	+0,5/+5,0	84,75	57,65	70,31	115,30	---
100	+0,5/+5,0	89,08	60,60	73,90	121,20	---

ZELLAMID® Quality	665 NA / SW / GR		675 NA / SW / GR	
	Polyethylene 500 (HMW) unfilled		Polyethylene 1000 (UHMW) unfilled	
Available Width x Length (mm)	1000 x 2000 1000 x 3000	1220 x 2000 1220 x 3000	1000 x 2000 1000 x 3000	1220 x 2000 1220 x 3000
Thickness mm	Tolerance mm	Weight (kg/m)			
10	+0,2/+0,6	10,44	12,70	10,22	12,44
12	+0,2/+0,6	12,45	15,14	12,19	14,83
15	+0,2/+0,6	15,46	18,81	15,13	18,41
20	+0,2/+0,6	20,47	24,91	20,05	24,39
25	+0,2/+0,6	25,49	31,02	24,96	30,37
30	+0,2/+0,6	30,51	37,12	29,87	36,35
35	+0,2/+0,6	35,53	43,23	34,79	42,33
40	+0,2/+0,6	40,55	49,34	39,70	48,31
50	+0,2/+0,6	50,58	61,55	49,53	60,26
60	+0,2/+0,6	60,62	73,76	59,36	72,22
70	+0,2/+0,6	70,66	85,97	69,18	84,18
80	+0,2/+0,6	80,69	98,18	79,01	96,14
90	+0,2/+0,6	90,73	110,39	88,84	108,09
100	+0,2/+0,6	100,76	122,61	98,67	120,05
110	+0,2/+0,6	110,80	134,82	108,49	132,01
120	+0,2/+0,6	120,84	147,03	118,32	143,97
130	+0,2/+0,6	130,87	159,24	128,15	155,92
140	+0,2/+0,6	140,91	171,45	137,97	167,88
150	+0,2/+0,6	150,95	183,66	147,80	179,84

ZELLAMID® | PLATES

ZELLAMID® Quality	900 NA / SW 900 BLUE				900 AS 900 AS SW			
	POM-C unfilled POM-C RAL 5002				POM-C antistatic			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000

Thickness mm	Tolerance mm	Weight (kg/m)							
5	+0,2/+0,7	---	4,94	---	---	---	4,73	---	---
6	+0,2/+0,7	---	5,84	---	---	---	5,59	---	---
8	+0,2/+1,1	6,42	7,83	12,85	15,67	6,15	7,50	12,30	15,00
10	+0,2/+1,1	7,91	9,64	15,82	19,30	7,57	9,23	15,14	18,47
12	+0,3/+1,5	9,58	11,68	19,16	23,37	9,17	11,18	18,34	22,38
15	+0,3/+1,5	11,81	14,40	23,61	28,81	11,30	13,78	22,61	27,58
20	+0,3/+1,5	15,52	18,93	31,04	37,87	14,86	18,12	29,72	36,25
25	+0,3/+1,5	19,23	23,45	38,46	46,92	18,41	22,45	36,82	44,93
30	+0,5/+2,5	23,39	28,52	46,78	57,07	22,39	27,31	44,79	54,64
35	+0,5/+2,5	27,10	33,05	54,20	66,13	25,95	31,64	51,90	63,31
40	+0,5/+2,5	30,81	37,58	61,63	75,19	29,50	35,98	59,00	71,99
45	+0,5/+2,5	34,53	42,11	69,05	84,25	33,06	40,31	66,11	80,66
50	+0,5/+2,5	38,24	46,63	76,48	93,30	36,61	44,65	73,22	89,33
55	+0,5/+3,5	42,32	51,61	84,64	103,27	40,52	49,42	81,04	98,87
60	+0,5/+3,5	46,03	56,14	92,07	112,33	44,08	53,75	88,15	107,55
65	+0,5/+3,5	49,75	60,67	99,49	121,39	---	---	---	---
70	+0,5/+3,5	53,46	65,20	106,92	130,45	---	---	---	---
75	+0,5/+5,0	57,73	70,40	115,46	140,86	---	---	---	---
80	+0,5/+5,0	61,44	74,93	122,88	149,92	---	---	---	---
85	+0,5/+5,0	65,15	79,46	130,31	158,98	---	---	---	---
90	+0,5/+5,0	68,87	83,99	137,73	168,04	---	---	---	---
95	+0,5/+5,0	72,58	88,51	145,16	177,10	---	---	---	---
100	+0,5/+5,0	76,29	93,04	152,58	186,16	---	---	---	---
110	+0,5/+5,0	83,72	102,10	167,43	204,27	---	---	---	---
115	+0,5/+5,0	87,43	106,62	174,86	---	---	---	---	---
120	+0,5/+6,0	91,51	111,60	183,02	---	---	---	---	---
125	+0,5/+6,0	95,22	116,13	190,45	---	---	---	---	---
130	+0,5/+6,0	98,94	120,66	197,87	---	---	---	---	---
140	+0,5/+7,0	106,73	130,17	213,47	---	---	---	---	---
150	+0,5/+7,0	114,16	139,22	228,32	---	---	---	---	---

Additional dimensions and intermediate thicknesses available on request.

ZELLAMID® Quality	900 ELS			
	POM-C ELS conductive			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000
Thickness mm	**Tolerance mm**	**Weight (kg/m)**		
5	+0,2/+0,7	---	4,94	---	---
6	+0,2/+0,7	---	5,84	---	---
8	+0,2/+1,1	6,42	7,83	12,85	15,67
10	+0,2/+1,1	7,91	9,64	15,82	19,30
12	+0,3/+1,5	9,58	11,68	19,16	23,37
15	+0,3/+1,5	11,81	14,40	23,61	28,81
20	+0,3/+1,5	15,52	18,93	31,04	37,87
25	+0,3/+1,5	19,23	23,45	38,46	46,92
30	+0,5/+2,5	23,39	28,52	46,78	57,07
35	+0,5/+2,5	27,10	33,05	54,20	66,13
40	+0,5/+2,5	30,81	37,58	61,63	75,19
45	+0,5/+2,5	34,53	42,11	69,05	84,25
50	+0,5/+2,5	38,24	46,63	76,48	93,30
55	+0,5/+3,5	42,32	51,61	84,64	103,27
60	+0,5/+3,5	46,03	56,14	92,07	112,33

ZELLAMID® Quality	900 GF30	900 PE	900 XT			
	POM-C + 30 % Glass fibre	POM-C + PE Tribotype	POM-C + PTFE Tribotype			
Available Width x Length (mm)	1000 x 2000	1000 x 2000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000
Thickness mm	**Tolerance mm**	**Weight (kg/m)**					
5	+0,2/+0,7	---	---	---	5,04	---	---
6	+0,2/+0,7	---	---	---	5,96	---	---
8	+0,2/+1,1	0,00	12,21	6,56	8,00	13,12	16,01
10	+0,2/+1,1	17,72	15,03	8,08	9,85	16,15	19,71
12	+0,3/+1,5	21,47	18,21	9,78	11,93	19,56	23,87
15	+0,3/+1,5	26,46	22,44	12,06	14,70	24,11	29,42
20	+0,3/+1,5	34,78	29,50	15,85	19,33	31,70	38,67
25	+0,3/+1,5	43,10	36,55	19,64	23,95	39,28	47,92
30	+0,5/+2,5	---	44,45	23,89	29,13	47,77	58,28
35	+0,5/+2,5	---	51,51	27,68	33,75	55,35	67,54
40	+0,5/+2,5	---	58,57	31,47	38,38	62,94	76,79
45	+0,5/+2,5	---	65,62	35,26	43,00	70,52	86,04
50	+0,5/+2,5	---	72,68	39,05	47,63	78,10	95,29
55	+0,5/+3,5	---	80,44	43,22	52,71	86,44	105,47
60	+0,5/+3,5	---	87,50	47,01	57,34	94,03	114,72

ZELLAMID® | PLATES

ZELLAMID® Quality	1400 NA / SW				1400 T			
	PET unfilled				PET Tribotype			
Available Width x Length (mm)	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000	500 x 1000 500 x 2000 500 x 3000	610 x 1000 610 x 2000 610 x 3000	1000 x 1000 1000 x 2000 1000 x 3000	1220 x 1000 1220 x 2000 1220 x 3000

Thickness mm	Tolerance mm	Weight (kg/m)							
5	+0,2/+0,7	---	4,76	---	---	---	4,87	---	---
6	+0,2/+0,7	---	5,63	---	---	---	5,76	---	---
8	+0,2/+1,1	6,19	7,55	12,39	15,12	6,33	7,72	12,66	15,45
10	+0,2/+1,1	7,63	9,30	15,25	18,61	7,80	9,51	15,59	19,02
12	+0,3/+1,5	9,24	11,27	18,48	22,54	9,44	11,52	18,88	23,04
15	+0,3/+1,5	11,39	13,89	22,77	27,79	11,64	14,19	23,28	28,40
20	+0,3/+1,5	14,97	18,25	29,94	36,52	15,30	18,66	30,60	37,33
25	+0,3/+1,5	18,55	22,62	37,10	45,26	18,96	23,12	37,92	46,26
30	+0,5/+2,5	22,56	27,51	45,12	55,05	23,06	28,12	46,11	56,26
35	+0,5/+2,5	26,14	31,88	52,28	63,78	26,72	32,58	53,43	65,19
40	+0,5/+2,5	29,72	36,25	59,44	72,52	30,38	37,05	60,75	74,12
45	+0,5/+2,5	33,30	40,61	66,60	81,26	34,04	41,51	68,07	83,05
50	+0,5/+2,5	36,88	44,98	73,76	90,00	37,70	45,97	75,39	91,98
55	+0,5/+3,5	40,82	49,78	81,64	99,61	41,72	50,88	83,44	101,80
60	+0,5/+3,5	44,40	54,15	88,80	108,34	45,38	55,35	90,76	110,73
65	+0,5/+3,5	47,98	58,52	95,97	---	49,04	59,81	98,08	---
70	+0,5/+3,5	51,56	62,88	103,13	---	52,70	64,27	105,40	---
75	+0,5/+5,0	55,68	67,91	111,36	---	56,91	69,40	113,82	---
80	+0,5/+5,0	59,26	72,27	118,52	---	60,57	73,87	121,14	---
85	+0,5/+5,0	---	76,64	---	---	---	78,33	---	---
90	+0,5/+5,0	---	81,01	---	---	---	82,79	---	---
95	+0,5/+5,0	---	85,37	---	---	---	87,26	---	---
100	+0,5/+5,0	---	89,74	---	---	---	91,72	---	---

ZELLAMID® Quality	1000 NA / SW	1000 GF30	1700 NA
	PEI unfilled	PEI + 30 % Glass fibre	PVDF unfilled
Available Width x Length (mm)	610 x 1000 610 x 2000	610 x 1000 610 x 2000	1000 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)		
6	+0,2/+0,7	---	---	---
8	+0,2/+1,1	7,05	auf Anfrage	9,89
10	+0,2/+1,1	8,69	auf Anfrage	12,17
12	+0,3/+1,5	10,52	auf Anfrage	14,75
15	+0,3/+1,5	12,97	auf Anfrage	18,18
20	+0,3/+1,5	17,05	auf Anfrage	23,89
25	+0,3/+1,5	21,12	auf Anfrage	---
30	+0,5/+2,5	25,69	auf Anfrage	---
35	+0,5/+2,5	29,77	auf Anfrage	---
40	+0,5/+2,5	33,85	auf Anfrage	---
45	+0,5/+2,5	37,93	auf Anfrage	---
50	+0,5/+2,5	42,00	auf Anfrage	---

△ Additional dimensions and intermediate thicknesses available on request.

ZELLAMID® Quality	1900 NA	1900 GF40	1900 IM	1900 T
	PPS unfilled	PPS + 40 % Glass fibre	PPS impact modified	PPS Tribotype
Available Width x Length (mm)	610 x 1000 610 x 2000	610 x 1000 610 x 2000	610 x 1000 610 x 2000	610 x 1000 610 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)			
6	+0,2/+0,7	---	---	---	---
8	+0,2/+1,1	7,50	9,11	7,22	7,89
10	+0,2/+1,1	9,23	11,22	8,89	9,71
12	+0,3/+1,5	11,18	13,59	10,77	11,76
15	+0,3/+1,5	13,78	16,75	13,27	14,50
20	+0,3/+1,5	18,12	22,01	17,45	19,06
25	+0,3/+1,5	22,45	27,28	21,62	23,62

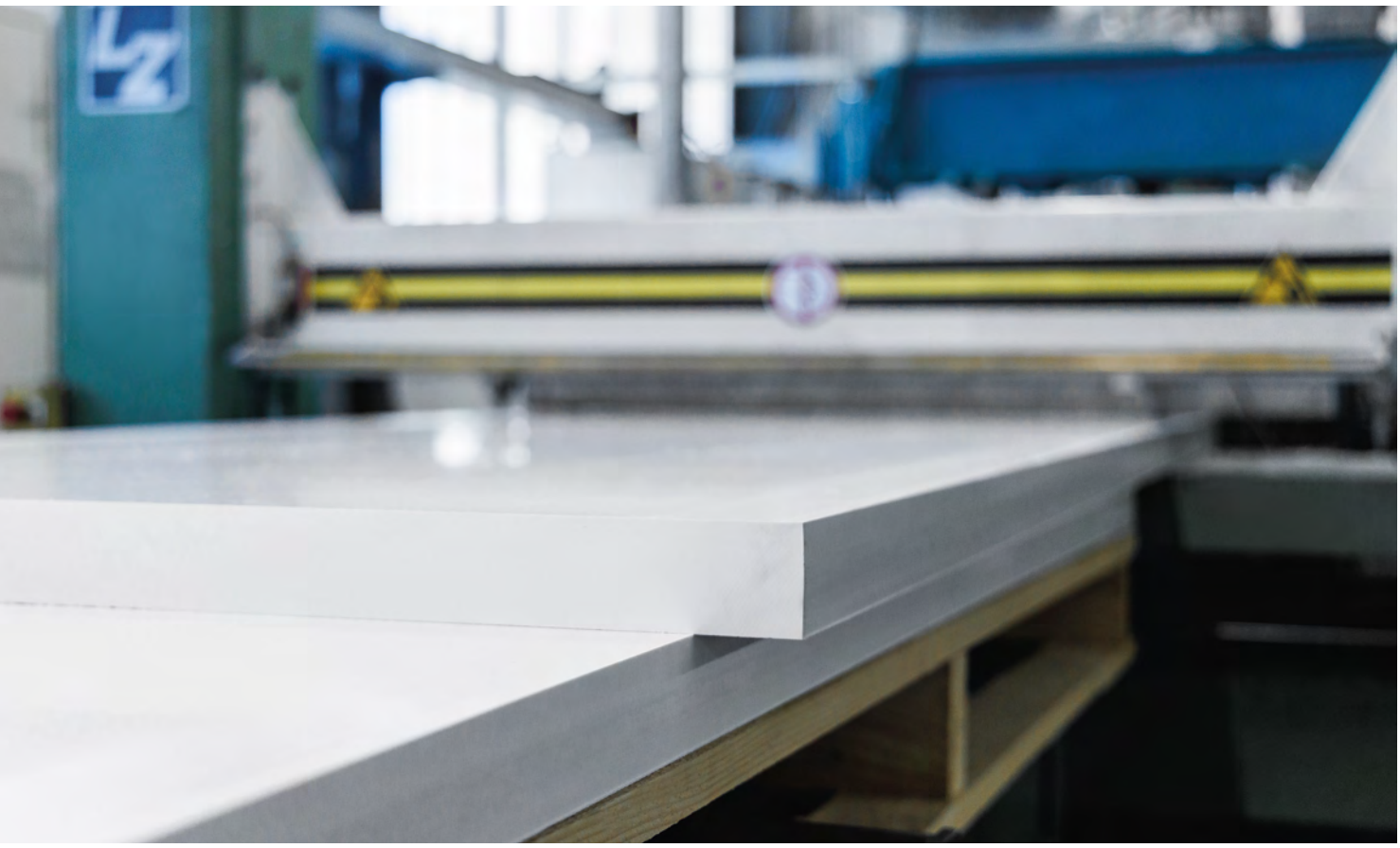
ZELLAMID® Quality	1500 X / XSW 1500 XMG		
	PEEK unfilled PEEK medical-grade		
Available Width x Length (mm)	500 x 1000 500 x 2000	610 x 1000 610 x 2000	1000 x 1000 1000 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)		
5	+0,2/+0,7	---	4,55	---
6	+0,2/+0,7	---	5,38	---
8	+0,2/+1,1	5,92	7,22	11,84
10	+0,2/+1,1	7,29	8,89	14,58
12	+0,3/+1,5	8,83	10,77	17,66
15	+0,3/+1,5	10,88	13,27	21,77
20	+0,3/+1,5	14,31	17,45	28,61
25	+0,3/+1,5	17,73	21,62	35,46
30	+0,5/+2,5	21,56	26,30	43,13
35	+0,5/+2,5	24,99	30,47	49,97
40	+0,5/+2,5	28,41	34,65	56,82
45	+0,5/+2,5	31,83	38,82	63,66
50	+0,5/+2,5	35,26	43,00	70,51
55	+0,5/+3,5	39,02	47,59	78,04
60	+0,5/+3,5	42,44	51,76	84,89
65	+0,5/+3,5	45,87	55,94	91,73
70	+0,5/+3,5	49,29	60,11	98,58
75	+0,5/+5,0	53,22	64,91	106,45
80	+0,5/+5,0	56,65	69,09	113,30
85	+0,5/+5,0	60,07	73,26	120,14
90	+0,5/+5,0	63,49	77,43	126,99
95	+0,5/+5,0	66,92	81,61	133,83
100	+0,5/+5,0	70,34	85,78	140,68

ZELLAMID® | PLATES

ZELLAMID® Quality	1500 XC20	1500 XCA30	1500 XGF30	1500 XT	1500 XCT2		
	PEEK + 20% Ceramic	PEEK + 30% Carbon fibre	PEEK + 30% Glass fibre	PEEK modified Tribotype	PEEK cryogenic		
Available Width x Length (mm)	610 x 1000 610 x 2000	610 x 1000 610 x 2000	610 x 1000 610 x 2000	610 x 1000 610 x 2000	500 x 1000 500 x 2000	610 x 1000 610 x 2000	1000 x 1000 1000 x 2000

Thickness mm	Tolerance mm	Weight (kg/m)						
5	+0,2/+0,7	5,22	4,90	5,29	5,08	---	5,01	---
6	+0,2/+0,7	6,17	5,80	6,25	6,01	---	5,92	---
8	+0,2/+1,1	8,28	7,78	8,39	8,05	6,51	7,94	13,03
10	+0,2/+1,1	10,19	9,58	10,33	9,92	8,02	9,78	16,04
12	+0,3/+1,5	12,34	11,60	12,51	12,01	9,71	11,85	19,43
15	+0,3/+1,5	15,21	14,30	15,42	14,81	11,97	14,60	23,95
20	+0,3/+1,5	20,00	18,79	20,27	19,46	15,74	19,19	31,48
25	+0,3/+1,5	24,78	23,29	25,12	24,12	19,50	23,79	39,01
30	+0,5/+2,5	30,14	28,32	30,55	29,33	23,72	28,93	47,44
35	+0,5/+2,5	34,93	32,82	35,40	33,99	27,49	33,52	54,97
40	+0,5/+2,5	39,71	37,31	40,24	38,64	31,25	38,11	62,50
45	+0,5/+2,5	44,50	41,81	45,09	43,30	35,02	42,70	70,03
50	+0,5/+2,5	49,28	46,30	49,94	47,96	38,78	47,30	77,56
55	+0,5/+3,5	54,54	51,25	55,27	53,08	42,92	52,35	85,84
60	+0,5/+3,5	59,33	55,74	60,12	57,73	46,69	56,94	93,37
65	+0,5/+3,5	64,11	60,24	64,97	62,39	50,45	61,53	100,90
70	+0,5/+3,5	68,90	64,73	69,82	67,05	54,22	66,12	108,43
75	+0,5/+5,0	74,40	69,90	75,40	72,40	58,55	71,40	117,09
80	+0,5/+5,0	79,18	74,40	80,25	77,06	62,31	75,99	124,62



Additional dimensions and intermediate thicknesses available on request.

ZELLAMID® | TUBES

ZELLAMID® Quality		202 NA / SW	250 NA / SW	900 NA / SW 900 BLUE	1400 NA / SW	1400 T	1500 X / XSW 1500 XMG
		PA 6 unfilled	PA 6.6 unfilled	POM-C RAL 5002	PET unfilled	PET Tribotype	PEEK unfilled
Nominal size		**Tolerance**		**Weight (kg/m)**			
OD mm	**ID mm**	**OD mm**	**ID mm**				
25	10	+1,1/+0,4	-0,4/-1,1	0,53	0,53	0,66	0,64	0,65	---
25	12	+1,1/+0,4	-0,4/-1,1	0,49	0,49	0,61	0,59	0,60	---
25	15	+1,1/+0,4	-0,4/-1,1	0,42	0,42	0,52	0,51	0,52	---
30	15	+1,1/+0,4	-0,4/-1,1	0,68	0,68	0,85	0,82	0,83	---
30	20	+1,1/+0,4	-0,4/-1,1	0,53	0,53	0,66	0,63	0,65	---
32	15	+1,1/+0,4	-0,4/-1,1	0,79	0,80	0,99	0,96	0,98	---
35	15	+2,0/+0,6	-0,6/-2,0	1,03	1,04	1,29	1,24	1,27	---
35	20	+2,0/+0,6	-0,6/-2,0	0,88	0,89	1,10	1,06	1,09	---
35	25	+2,0/+0,6	-0,6/-2,0	0,69	0,70	0,86	0,83	0,85	---
40	15	+2,0/+0,6	-0,6/-2,0	1,39	1,40	1,73	1,67	1,71	---
40	20	+2,0/+0,6	-0,6/-2,0	1,24	1,25	1,55	1,49	1,52	---
40	25	+2,0/+0,6	-0,6/-2,0	1,05	1,06	1,30	1,26	1,29	---
40	30	+2,0/+0,6	-0,6/-2,0	0,81	0,81	1,01	0,97	0,99	---
45	20	+2,0/+0,6	-0,6/-2,0	1,64	1,65	2,05	1,97	2,02	---
45	25	+2,0/+0,6	-0,6/-2,0	1,45	1,46	1,80	1,74	1,78	---
45	30	+2,0/+0,6	-0,6/-2,0	1,21	1,22	1,51	1,45	1,48	---
45	35	+2,0/+0,6	-0,6/-2,0	0,92	0,93	1,15	1,11	1,13	---
50	20	+2,0/+0,6	-0,6/-2,0	2,09	2,10	2,60	2,51	2,57	---
50	25	+2,0/+0,6	-0,6/-2,0	1,89	1,91	2,36	2,28	2,33	---
50	30	+2,0/+0,6	-0,6/-2,0	1,65	1,67	2,06	1,99	2,03	1,90
50	35	+2,0/+0,6	-0,6/-2,0	1,37	1,38	1,71	1,65	1,68	---
50	40	+2,0/+0,6	-0,6/-2,0	1,04	1,05	1,29	1,25	1,28	---
55	25	+2,5/+0,8	-0,8/-2,5	2,44	2,46	3,04	2,93	3,00	---
55	30	+2,0/+0,6	-0,6/-2,0	2,14	2,16	2,68	2,58	2,64	---
55	35	+2,0/+0,6	-0,6/-2,0	1,86	1,88	2,32	2,24	2,29	2,14
55	45	+2,0/+0,6	-0,6/-2,0	1,15	1,16	1,44	1,39	1,42	---
55	50	+2,0/+0,6	-0,6/-2,0	0,73	0,74	0,91	0,88	0,90	---
60	20	+2,0/+0,6	-0,6/-2,0	3,12	3,14	3,89	3,75	3,83	---
60	25	+2,0/+0,6	-0,6/-2,0	2,92	2,95	3,65	3,52	3,59	---
60	30	+2,0/+0,6	-0,6/-2,0	2,68	2,71	3,35	3,23	3,30	3,09
60	35	+2,0/+0,6	-0,6/-2,0	2,40	2,42	2,99	2,88	2,95	---
60	40	+2,0/+0,6	-0,6/-2,0	2,07	2,08	2,58	2,49	2,54	2,38
60	45	+2,0/+0,6	-0,6/-2,0	1,69	1,70	2,11	2,03	2,08	---
60	50	+2,0/+0,6	-0,6/-2,0	1,27	1,28	1,58	1,52	1,56	---
60	55	+2,0/+0,6	-0,6/-2,0	0,80	0,81	1,00	0,96	0,98	---
65	30	+3,0/+0,8	-0,8/-3,0	3,37	3,40	4,20	4,06	4,14	3,88
65	35	+3,0/+0,8	-0,8/-3,0	3,09	3,12	3,86	3,72	3,80	---
65	40	+3,0/+0,8	-0,8/-3,0	2,76	2,79	3,45	3,33	3,40	---
65	45	+3,0/+0,8	-0,8/-3,0	2,39	2,41	2,99	2,88	2,94	---
65	50	+3,0/+0,8	-0,8/-3,0	1,98	1,99	2,47	2,38	2,43	---
65	55	+3,0/+0,8	-0,8/-3,0	1,51	1,53	1,89	1,82	1,86	---
70	30	+3,0/+0,8	-0,8/-3,0	4,00	4,04	5,00	4,82	4,93	4,61
70	35	+3,0/+0,8	-0,8/-3,0	3,72	3,76	4,65	4,48	4,58	---
70	40	+3,0/+0,8	-0,8/-3,0	3,40	3,43	4,24	4,09	4,18	3,91
70	45	+3,0/+0,8	-0,8/-3,0	3,03	3,05	3,78	3,64	3,72	---
70	50	+3,0/+0,8	-0,8/-3,0	2,61	2,63	3,26	3,14	3,21	3,00
70	55	+3,0/+0,8	-0,8/-3,0	2,15	2,17	2,68	2,59	2,64	---
70	60	+3,0/+0,8	-0,8/-3,0	1,64	1,65	2,05	1,97	2,02	---
75	30	+3,0/+0,8	-0,8/-3,0	4,68	4,73	5,84	5,64	5,76	---
75	35	+3,0/+0,8	-0,8/-3,0	4,40	4,44	5,50	5,30	5,42	---
75	40	+3,0/+0,8	-0,8/-3,0	4,08	4,11	5,09	4,91	5,02	4,69
75	45	+3,0/+0,8	-0,8/-3,0	3,71	3,74	4,63	4,46	4,56	---

△ **OD:** Outer diameter **ID:** Internal diameter. **Standard length: 3000 mm to OD 310 mm**. Further combinations of internal and external diameters as well as intermediate sizes are possible on request. All tubes are also available in **ZELLAMID® 250 MO**.

ZELLAMID® | TUBES

ZELLAMID® Quality	202 NA / SW	250 NA / SW	900 NA / SW 900 BLUE	1400 NA / SW	1400 T	1500 X / XSW 1500 XMG
	PA 6 unfilled	PA 6.6 unfilled	POM-C RAL 5002	PET unfilled	PET Tribotype	PEEK unfilled

Nominal size		Tolerance		Weight (kg/m)					
OD mm	ID mm	OD mm	ID mm						
75	50	+3,0/+0,8	-0,8/-3,0	3,29	3,32	4,11	3,96	4,05	---
75	55	+3,0/+0,8	-0,8/-3,0	2,83	2,85	3,53	3,40	3,48	---
75	60	+3,0/+0,8	-0,8/-3,0	2,32	2,34	2,89	2,79	2,85	---
75	65	+3,0/+0,8	-0,8/-3,0	1,77	1,78	2,20	2,13	2,17	---
80	30	+3,0/+0,8	-0,8/-3,0	5,41	5,46	6,75	6,51	6,65	6,22
80	35	+3,0/+0,8	-0,8/-3,0	5,13	5,18	6,40	6,17	6,31	---
80	40	+3,0/+0,8	-0,8/-3,0	4,80	4,85	6,00	5,78	5,91	5,53
80	45	+3,0/+0,8	-0,8/-3,0	4,43	4,47	5,53	5,34	5,45	---
80	50	+3,0/+0,8	-0,8/-3,0	4,02	4,05	5,01	4,83	4,94	4,62
80	60	+3,0/+0,8	-0,8/-3,0	3,05	3,07	3,80	3,67	3,75	3,50
80	65	+3,0/+0,8	-0,8/-3,0	2,49	2,51	3,11	3,00	3,07	---
80	70	+3,0/+0,8	-0,8/-3,0	1,89	1,91	2,36	2,28	2,33	---
85	30	+3,6/+1,2	-1,6/-5,0	6,33	6,39	7,90	7,62	7,79	---
85	40	+3,6/+1,2	-1,6/-5,0	5,75	5,80	7,18	6,92	7,07	6,62
85	50	+3,6/+1,2	-1,6/-5,0	4,99	5,03	6,23	6,00	6,14	5,74
85	60	+3,6/+1,2	-1,6/-5,0	4,04	4,08	5,05	4,87	4,97	4,65
85	65	+3,6/+1,2	-1,6/-5,0	3,50	3,53	4,37	4,22	4,31	---
85	70	+3,6/+1,2	-1,6/-5,0	2,92	2,94	3,64	3,51	3,59	---
85	75	+3,6/+1,2	-1,6/-5,0	2,28	2,30	2,85	2,75	2,81	---
90	30	+3,6/+1,2	-1,6/-5,0	7,15	7,22	8,93	8,61	8,80	---
90	40	+3,6/+1,2	-1,6/-5,0	6,57	6,63	8,20	7,91	8,09	7,56
90	50	+3,6/+1,2	-1,6/-5,0	5,81	5,86	7,25	6,99	7,15	6,69
90	60	+3,6/+1,2	-1,6/-5,0	4,87	4,91	6,07	5,86	5,99	5,60
90	70	+3,6/+1,2	-1,6/-5,0	3,74	3,77	4,66	4,50	4,60	4,30
90	75	+3,6/+1,2	-1,6/-5,0	3,11	3,13	3,87	3,74	3,82	---
90	80	+3,6/+1,2	-1,6/-5,0	2,43	2,45	3,03	2,92	2,99	
92	70	+3,6/+1,2	-1,6/-5,0	4,08	4,12	5,09	4,91	5,02	4,69
100	35	+3,6/+1,2	-1,6/-5,0	8,67	8,74	10,81	10,43	10,66	---
100	40	+3,6/+1,2	-1,6/-5,0	8,35	8,43	10,42	10,05	10,28	9,61
100	50	+3,6/+1,2	-1,6/-5,0	7,59	7,66	9,47	9,14	9,34	8,73
100	60	+3,6/+1,2	-1,6/-5,0	6,65	6,71	8,29	8,00	8,18	7,65
100	70	+3,6/+1,2	-1,6/-5,0	5,52	5,57	6,89	6,64	6,79	6,35
100	80	+3,6/+1,2	-1,6/-5,0	4,21	4,24	5,25	5,06	5,18	4,84
100	85	+3,6/+1,2	-1,6/-5,0	3,48	3,51	4,35	4,19	4,29	---
100	90	+3,6/+1,2	-1,6/-5,0	2,71	2,74	3,39	3,27	3,34	---
110	50	+3,6/+1,2	-1,6/-5,0	9,56	9,64	11,92	11,50	11,75	---
110	60	+3,6/+1,2	-1,6/-5,0	8,61	8,69	10,74	10,36	10,59	---
110	70	+3,6/+1,2	-1,6/-5,0	7,48	7,55	9,34	9,00	9,20	---
110	80	+3,6/+1,2	-1,6/-5,0	6,17	6,23	7,70	7,43	7,59	---
110	90	+3,6/+1,2	-1,6/-5,0	4,68	4,72	5,84	5,63	5,75	---
115	80	+3,6/+1,2	-1,6/-5,0	7,22	7,29	9,01	8,69	8,88	8,31
120	50	+4,5/+1,5	-2,0/-6,5	11,92	12,02	14,87	14,34	14,66	---
120	60	+4,5/+1,5	-2,0/-6,5	10,99	11,09	13,71	13,23	13,52	---
120	70	+4,5/+1,5	-2,0/-6,5	9,88	9,97	12,33	11,89	12,15	---
120	80	+4,5/+1,5	-2,0/-6,5	8,58	8,66	10,71	10,33	10,56	---
120	90	+4,5/+1,5	-2,0/-6,5	7,11	7,17	8,87	8,55	8,74	---
120	100	+4,5/+1,5	-2,0/-6,5	5,45	5,50	6,80	6,56	6,70	---
125	80	+4,5/+1,5	-2,0/-6,5	9,73	9,82	12,14	11,71	11,97	---
125	90	+4,5/+1,5	-2,0/-6,5	8,26	8,33	10,30	9,94	10,15	---
125	100	+4,5/+1,5	-2,0/-6,5	6,60	6,65	8,23	7,94	8,11	---
125	110	+4,5/+1,5	-2,0/-6,5	4,75	4,80	5,93	5,72	5,85	---
130	50	+4,5/+1,5	-2,0/-6,5	14,26	14,38	17,79	17,16	17,54	---

△ **OD:** Outer diameter **ID:** Internal diameter. **Standard length: 3000 mm to OD 310 mm**. Further combinations of internal and external diameters as well as intermediate sizes are possible on request. All tubes are also available in **ZELLAMID® 250 MO**.

ZELLAMID® Quality				202 NA / SW	250 NA / SW	900 NA / SW 900 BLUE	1400 NA / SW	1400 T	1500 X / XSW 1500 XMG
				PA 6 unfilled	PA 6.6 unfilled	POM-C RAL 5002	PET unfilled	PET Tribotype	PEEK unfilled
Nominal size		Tolerance		Weight (kg/m)					
OD mm	ID mm	OD mm	ID mm						
130	60	+4,5/+1,5	-2,0/-6,5	13,33	13,45	16,63	16,04	16,40	---
130	70	+4,5/+1,5	-2,0/-6,5	12,22	12,33	15,25	14,71	15,03	---
130	80	+4,5/+1,5	-2,0/-6,5	10,92	11,02	13,63	13,15	13,44	---
130	90	+4,5/+1,5	-2,0/-6,5	9,45	9,53	11,79	11,37	11,62	---
130	100	+4,5/+1,5	-2,0/-6,5	7,79	7,86	9,72	9,37	9,58	---
130	110	+4,5/+1,5	-2,0/-6,5	5,95	6,00	7,42	7,16	7,32	---
140	60	+4,5/+1,5	-2,0/-6,5	15,85	15,99	19,78	19,08	19,50	---
140	70	+4,5/+1,5	-2,0/-6,5	14,74	14,87	18,39	17,74	18,13	---
140	80	+4,5/+1,5	-2,0/-6,5	13,45	13,57	16,78	16,18	16,54	---
140	90	+4,5/+1,5	-2,0/-6,5	11,97	12,08	14,94	14,41	14,73	---
140	100	+4,5/+1,5	-2,0/-6,5	10,31	10,40	12,87	12,41	12,68	---
140	110	+4,5/+1,5	-2,0/-6,5	8,47	8,55	10,57	10,19	10,42	---
140	120	+4,5/+1,5	-2,0/-6,5	6,45	6,50	8,04	7,76	7,93	---
150	50	+4,5/+1,5	-2,0/-6,5	19,49	19,66	24,31	23,45	23,97	---
150	70	+4,5/+1,5	-2,0/-6,5	17,45	17,60	21,77	21,00	21,46	---
150	80	+4,5/+1,5	-2,0/-6,5	16,15	16,30	20,16	19,44	19,87	---
150	90	+4,5/+1,5	-2,0/-6,5	14,68	14,81	18,31	17,66	18,05	---
150	100	+4,5/+1,5	-2,0/-6,5	13,02	13,13	16,24	15,67	16,01	---
150	110	+4,5/+1,5	-2,0/-6,5	11,18	11,27	13,95	13,45	13,75	---
150	120	+4,5/+1,5	-2,0/-6,5	9,15	9,23	11,42	11,01	11,26	---
160	50	+5,4/+1,8	-2,2/-7,5	22,60	22,80	28,20	27,20	27,80	---
160	60	+5,4/+1,8	-2,2/-7,5	21,69	21,88	27,06	26,10	26,68	---
160	80	+5,4/+1,8	-2,2/-7,5	19,30	19,47	24,09	23,23	23,75	---
160	90	+5,4/+1,8	-2,2/-7,5	17,84	18,00	22,26	21,47	21,94	---
160	100	+5,4/+1,8	-2,2/-7,5	16,19	16,33	20,20	19,49	19,92	---
160	120	+5,4/+1,8	-2,2/-7,5	12,35	12,45	15,40	14,86	15,19	---
160	130	+5,4/+1,8	-2,2/-7,5	10,15	10,24	12,66	12,21	12,48	---
160	140	+5,4/+1,8	-2,2/-7,5	7,77	7,84	9,69	9,35	9,56	---
170	60	+5,4/+1,8	-2,2/-7,5	24,77	24,99	30,91	29,81	30,47	---
170	80	+5,4/+1,8	-2,2/-7,5	22,39	22,58	27,93	26,94	27,54	---
170	100	+5,4/+1,8	-2,2/-7,5	19,27	19,44	24,05	23,20	23,71	---
170	110	+5,4/+1,8	-2,2/-7,5	17,44	17,60	21,76	20,99	21,46	---
170	120	+5,4/+1,8	-2,2/-7,5	15,43	15,56	19,25	18,57	18,98	---
170	130	+5,4/+1,8	-2,2/-7,5	13,23	13,35	16,51	15,92	16,28	---
170	140	+5,4/+1,8	-2,2/-7,5	10,85	10,95	13,54	13,06	13,35	---
170	150	+5,4/+1,8	-2,2/-7,5	8,29	8,36	10,34	9,98	10,20	---
180	70	+5,4/+1,8	-2,2/-7,5	26,93	27,17	33,61	32,42	33,13	---
180	100	+5,4/+1,8	-2,2/-7,5	22,54	22,74	28,12	27,13	27,72	---
180	110	+5,4/+1,8	-2,2/-7,5	20,71	20,89	25,84	24,92	25,47	---
180	120	+5,4/+1,8	-2,2/-7,5	18,69	18,86	23,33	22,50	22,99	---
180	140	+5,4/+1,8	-2,2/-7,5	14,12	14,24	17,62	16,99	17,37	---
180	150	+5,4/+1,8	-2,2/-7,5	11,55	11,66	14,42	13,91	14,21	---
180	160	+5,4/+1,8	-2,2/-7,5	8,81	8,89	10,99	10,60	10,84	---
190	70	+6,0/+2,0	-2,5/-8,5	30,60	30,87	38,18	36,83	37,64	---
190	140	+6,0/+2,0	-2,5/-8,5	17,87	18,03	22,29	21,50	21,98	---
190	160	+6,0/+2,0	-2,5/-8,5	12,58	12,69	15,70	15,14	15,48	---
200	70	+6,0/+2,0	-2,5/-8,5	34,24	34,54	42,72	41,21	42,12	---
200	90	+6,0/+2,0	-2,5/-8,5	31,52	31,79	39,32	37,93	38,77	---
200	100	+6,0/+2,0	-2,5/-8,5	29,88	30,14	37,28	35,96	36,75	---
200	130	+6,0/+2,0	-2,5/-8,5	23,87	24,08	29,79	28,73	29,37	---
200	140	+6,0/+2,0	-2,5/-8,5	21,51	21,70	26,83	25,88	26,45	---
200	150	+6,0/+2,0	-2,5/-8,5	18,96	19,12	23,65	22,81	23,32	---

ZELLAMID® | TUBES

ZELLAMID® Quality	202 NA / SW	250 NA / SW	900 NA / SW 900 BLUE	1400 NA / SW	1400 T	1500 X / XSW 1500 XMG
	PA 6 unfilled	PA 6.6 unfilled	POM-C RAL 5002	PET unfilled	PET Tribotype	PEEK unfilled

Nominal size		Tolerance		Weight (kg/m)					
OD mm	ID mm	OD mm	ID mm						
200	160	+6,0/+2,0	-2,5/-8,5	16,22	16,37	20,24	19,52	19,95	---
200	170	+6,0/+2,0	-2,5/-8,5	13,31	13,42	16,60	16,01	16,37	---
210	120	+6,0/+2,0	-2,5/-8,5	29,88	30,14	37,28	35,96	36,75	---
210	150	+6,0/+2,0	-2,5/-8,5	22,78	22,98	28,42	27,41	28,02	---
210	160	+6,0/+2,0	-2,5/-8,5	20,04	20,22	25,01	24,12	24,65	---
220	70	+6,0/+2,0	-2,5/-8,5	42,06	42,44	52,49	---	---	---
220	75	+6,0/+2,0	-2,5/-8,5	41,45	41,82	51,72	---	---	---
220	160	+6,0/+2,0	-2,5/-8,5	24,05	24,26	30,01	---	---	---
220	180	+6,0/+2,0	-2,5/-8,5	18,03	18,19	22,50	---	---	---
220	190	+6,0/+2,0	-2,5/-8,5	14,75	14,88	18,40	---	---	---
230	120	+9,0/+3,0	-3,0/-12,0	39,34	39,69	49,09	---	---	---
230	150	+9,0/+3,0	-3,0/-12,0	32,35	32,64	40,37	---	---	---
230	160	+9,0/+3,0	-3,0/-12,0	29,65	29,92	37,00	---	---	---
230	170	+9,0/+3,0	-3,0/-12,0	26,77	27,01	33,41	---	---	---
230	190	+9,0/+3,0	-3,0/-12,0	20,47	20,65	25,54	---	---	---
250	70	+9,0/+3,0	-3,0/-12,0	56,34	56,84	70,30	---	---	---
250	100	+9,0/+3,0	-3,0/-12,0	52,09	52,55	64,99	---	---	---
250	150	+9,0/+3,0	-3,0/-12,0	41,35	41,71	51,59	---	---	---
250	170	+9,0/+3,0	-3,0/-12,0	35,77	36,09	44,63	---	---	---
260	130	+10,0/+3,0	-3,5/-13,0	51,37	51,83	64,10	---	---	---
260	160	+10,0/+3,0	-3,5/-13,0	43,87	44,26	54,74	---	---	---
260	170	+10,0/+3,0	-3,5/-13,0	41,01	41,37	51,17	---	---	---
260	190	+10,0/+3,0	-3,5/-13,0	34,73	35,03	43,33	---	---	---
260	210	+10,0/+3,0	-3,5/-13,0	27,72	27,96	34,58	---	---	---
265	90	+10,0/+3,0	-3,5/-13,0	61,27	61,82	76,46	---	---	---
265	210	+10,0/+3,0	-3,5/-13,0	30,17	30,44	37,65	---	---	---
270	90	+10,0/+3,0	-3,5/-13,0	63,78	64,34	79,58	---	---	---
280	100	+10,0/+3,0	-3,5/-13,0	67,34	67,93	84,02	---	---	---
280	140	+10,0/+3,0	-3,5/-13,0	59,17	59,69	73,83	---	---	---
280	210	+10,0/+3,0	-3,5/-13,0	37,83	38,16	47,20	---	---	---
280	240	+10,0/+3,0	-3,5/-13,0	25,94	26,17	32,36	---	---	---
300	90	+10,0/+3,0	-3,5/-13,0	79,77	80,47	99,53	---	---	---
300	100	+10,0/+3,0	-3,5/-13,0	78,18	78,87	97,55	---	---	---
310	130	+11,0/+3,0	-3,5/-14,0	78,42	79,11	97,85	---	---	---
310	210	+11,0/+3,0	-3,5/-14,0	54,84	55,32	68,42	---	---	---
310	240	+11,0/+3,0	-3,5/-14,0	42,98	43,36	53,62	---	---	---
350	200	+11,0/+3,0	-3,5/-14,0	83,07	83,80	103,65	---	---	---
350	280	+11,0/+3,0	-3,5/-14,0	49,25	49,68	61,45	---	---	---
400	200	+11,0/+3,0	-3,5/-14,0	117,99	119,03	147,22	---	---	---
400	280	+11,0/+3,0	-3,5/-14,0	84,17	84,91	105,02	---	---	---
400	300	+11,0/+3,0	-3,5/-14,0	73,88	74,54	92,19	---	---	---
450	200	+13,0/+3,0	-3,5/-16,0	158,66	160,07	197,98	---	---	---
450	300	+13,0/+3,0	-3,5/-16,0	114,74	115,76	143,17	---	---	---
500	200	+13,0/+3,0	-3,5/-16,0	202,82	204,61	253,07	---	---	---
500	300	+13,0/+3,0	-3,5/-16,0	158,89	160,30	198,26	---	---	---
500	375	+13,0/+3,0	-3,5/-16,0	113,95	114,96	142,19	---	---	---

OD: Outer diameter **ID:** Internal diameter. **Standard length: 3000 mm to OD 310 mm**. Further combinations of internal and external diameters as well as intermediate sizes are possible on request. All tubes are also available in **ZELLAMID® 250 MO**.

ZELLAMID® Quality	1100 Group
	PA 6 C

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
50	30	+0,8/+3,0	-4,0/-0,8	1,77
50	40			1,17
55	30			2,26
60	30			2,81
60	40			2,21
65	40			2,80
65	50			2,02
70	30			4,03
70	40			3,43
70	45			3,07
70	50			2,65
75	30			4,71
75	40			4,11
75	50			3,33
75	60			2,37
80	30			5,44
80	35			5,16
80	40			4,84
80	50			4,06
80	55			3,60
80	60			3,10
85	35			5,93
85	40			5,61
85	70	+0,8/+4,0	-4,0/-0,8	2,81
90	40	+0,8/+3,0	-4,0/-0,8	6,43
90	50			5,65
90	55			5,19
90	60			4,69
90	65	+0,8/+4,0	-4,0/-0,8	4,22
90	70			3,63
90	75			2,99
95	70			4,49
100	35	+0,8/+3,0	-4,0/-0,8	8,52
100	40			8,20
100	45			7,83
100	50			7,42
100	55			6,96
100	60			6,46
100	65	+0,8/+4,0	-4,0/-0,8	6,00
100	70			5,41
100	75			4,77
100	80			4,08
110	35	+0,8/+3,0	-4,0/-0,8	10,47
110	40			10,15
110	45			9,79
110	50			9,38
110	55			8,92
110	60			8,41
110	65	+0,8/+4,0	-4,0/-0,8	7,97
110	70			7,37
110	75			6,73
110	80			6,04

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
110	90	+1,0/+5,0	-6,0/-1,0	4,83
120	35	+0,8/+3,0	-4,0/-0,8	12,61
120	40			12,29
120	45			11,92
120	50	+0,8/+3,0	-4,0/-0,8	11,51
120	55			11,05
120	60			10,55
120	65			10,00
120	70	+0,8/+4,0	-4,0/-0,8	9,52
120	75			8,88
120	80			8,19
120	90	+1,0/+5,0	-6,0/-1,0	6,99
120	100			5,32
130	35	+0,8/+3,0	-4,0/-0,8	14,93
130	40			14,61
130	45			14,24
130	50			13,83
130	55			13,37
130	60			12,87
130	65	+0,8/+4,0	-4,0/-0,8	12,44
130	70			11,85
130	75			11,21
130	80			10,52
130	90	+1,0/+5,0	-6,0/-1,0	9,33
130	100			7,66
130	110			5,80
140	35	+0,8/+3,0	-4,0/-0,8	17,43
140	40			17,11
140	45			16,75
140	50			16,34
140	55			15,88
140	60			15,37
140	65			14,82
140	70			14,23
140	75			13,59
140	80			12,90
140	90	+1,0/+5,0	-6,0/-1,0	11,85
140	100			10,18
140	110			8,32
140	120	+1,5/+7,5	-7,5/-1,5	6,89
150	35	+0,8/+3,0	-4,0/-0,8	20,12
150	40			19,80
150	45			19,43
150	50			19,02
150	55			18,56
150	60			18,06
150	65	+0,8/+4,0	-4,0/-0,8	17,65
150	70			17,05
150	75			16,41
150	80			15,73
150	90	+1,0/+5,0	-6,0/-1,0	14,56
150	100			12,89

△ These diameters can be produced at short term. Standard length depending on diameter 1000 mm or 2000 mm, longitudinal tolerance +0% / + 3%. Special lengths up to 3000 mm, further combinations of inner and outer diameters as well as intermediate sizes are possible on request.

ZELLAMID® | TUBES

ZELLAMID® Quality	1100 Group
	PA 6 C

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
150	110			11,03
150	120	+1,5/+7,5	-7,5/-1,5	9,63
150	130			7,42
160	35	+0,8/+3,0	-4,0/-0,8	22,99
160	40			22,67
160	45			22,30
160	50			21,89
160	55			21,43
160	60	+0,8/+3,0	-4,0/-0,8	20,93
160	65	+0,8/+4,0	-4,0/-0,8	20,53
160	70			19,93
160	75			19,29
160	80			18,60
160	90	+1,0/+5,0	-6,0/-1,0	17,45
160	100			15,77
160	110			13,92
160	120	+1,5/+7,5	-7,5/-1,5	12,54
160	130			10,34
160	140			7,95
170	35	+0,8/+3,0	-4,0/-0,8	26,04
170	40			25,72
170	45			25,35
170	50			24,94
170	55			24,48
170	60			23,98
170	65	+0,8/+4,0	-4,0/-0,8	23,59
170	70			22,99
170	75			22,35
170	80			21,66
170	90	+1,0/+5,0	-6,0/-1,0	20,52
170	100			18,85
170	110			16,99
170	120	+1,5/+7,5	-7,5/-1,5	15,64
170	130			13,44
170	140			11,05
170	150			8,48
180	35	+0,8/+3,0	-4,0/-0,8	29,27
180	40			28,95
180	45			28,59
180	50			28,18
180	55			27,72
180	60			27,21
180	65	+0,8/+4,0	-4,0/-0,8	26,83
180	70			26,24
180	75			25,59
180	80			24,91
180	90	+1,0/+5,0	-6,0/-1,0	23,77
180	100			22,10
180	110			20,24
180	120	+1,5/+7,5	-7,5/-1,5	18,92
180	130			16,72
180	140			14,33

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
180	150			11,76
180	160	+1,8/+9,0	-9,0/-1,8	9,57
190	35	+0,8/+3,0	-4,0/-0,8	32,69
190	40			32,37
190	45			32,00
190	50			31,59
190	55			31,13
190	60			30,63
190	65	+0,8/+4,0	-4,0/-0,8	30,26
190	70			29,66
190	75			29,02
190	80			28,33
190	90	+1,0/+5,0	-6,0/-1,0	27,21
190	100			25,54
190	110			23,68
190	120	+1,5/+7,5	-7,5/-1,5	22,39
190	130			20,18
190	140			17,80
190	150			15,23
190	160	+1,8/+9,0	-9,0/-1,8	13,05
190	170			10,14
200	35	+0,8/+3,0	-4,0/-0,8	36,29
200	40			35,97
200	45			35,60
200	50			35,19
200	55			34,73
200	60			34,23
200	65	+0,8/+4,0	-4,0/-0,8	33,87
200	70			33,27
200	75			32,63
200	80			31,94
200	90	+1,0/+5,0	-6,0/-1,0	30,83
200	100			29,16
200	110			27,30
200	120	+1,5/+7,5	-7,5/-1,5	26,03
200	130			23,83
200	140			21,45
200	150			18,88
200	160	+1,8/+9,0	-9,0/-1,8	16,72
200	170			13,80
200	180			10,70
210	40	+0,8/+3,0	-4,0/-0,8	39,75
210	45			39,39
210	50			38,97
210	55			38,52
210	60			38,01
210	65	+0,8/+4,0	-4,0/-0,8	37,66
210	70			37,06
210	75			36,42
210	80			35,73
210	90	+1,0/+5,0	-6,0/-1,0	34,63
210	100			32,96

OD: Outer diameter **ID:** Internal diameter.

ZELLAMID® Quality	1100 Group
	PA 6 C

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
210	110			31,10
210	120	+1,5/+7,5	-7,5/-1,5	29,86
210	130			27,66
210	140			25,28
210	150			22,71
210	160	+1,8/+9,0	-9,0/-1,8	20,56
210	170			17,65
210	180			14,55
210	190	+2,0/+11,0	-11,0/-2,0	12,07
220	40	+0,8/+3,0	-4,0/-0,8	43,72
220	45			43,35
220	50			42,94
220	55			42,48
220	60			41,98
220	65	+0,8/+4,0	-4,0/-0,8	41,63
220	70			41,04
220	75	+0,8/+4,0	-4,0/-0,8	40,40
220	80			39,71
220	90	+1,0/+5,0	-6,0/-1,0	38,62
220	100			36,95
220	110			35,09
220	120	+1,5/+7,5	-7,5/-1,5	33,88
220	130			31,67
220	140			29,29
220	150			26,72
220	160	+1,8/+9,0	-9,0/-1,8	24,59
220	170			21,68
220	180			18,58
220	190	+2,0/+11,0	-11,0/-2,0	16,12
220	200			12,67
230	40	+0,8/+3,0	-4,0/-0,8	47,87
230	45			47,50
230	50			47,09
230	55			46,63
230	60			46,13
230	65	+0,8/+4,0	-4,0/-0,8	45,79
230	70			45,19
230	75			44,55
230	80			43,87
230	90	+1,0/+5,0	-6,0/-1,0	42,79
230	100			41,11
230	110			39,26
230	120	+1,5/+7,5	-7,5/-1,5	38,07
230	130			35,87
230	140			33,48
230	150			30,92
230	160	+1,8/+9,0	-9,0/-1,8	28,81
230	170			25,89
230	180			22,79
230	190	+2,0/+11,0	-11,0/-2,0	20,35
230	200			16,90
240	40	+0,8/+3,0	-4,0/-0,8	52,20

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
240	45			51,83
240	50			51,42
240	55			50,96
240	60			50,46
240	65	+0,8/+4,0	-4,0/-0,8	50,13
240	70			49,53
240	75			48,89
240	80			48,21
240	90	+1,0/+5,0	-6,0/-1,0	47,14
240	100			45,47
240	110			43,61
240	120	+1,5/+7,5	-7,5/-1,5	42,45
240	130			40,25
240	140			37,86
240	150			35,29
240	160	+1,8/+9,0	-9,0/-1,8	33,20
240	170			30,28
240	180			27,18
240	190	+2,0/+11,0	-11,0/-2,0	24,76
240	200			21,32
240	210	+2,0/+11,0	-11,0/-2,0	17,69
240	220			13,88
250	50	+0,8/+3,0	-4,0/-0,8	55,93
250	55			55,48
250	60			54,97
250	65			54,42
250	70			53,83
250	75			53,19
250	80			52,50
250	90	+1,0/+5,0	-6,0/-1,0	51,67
250	100			50,00
250	110			48,14
250	120	+1,5/+7,5	-7,5/-1,5	47,01
250	130			44,81
250	140			42,42
250	150			39,86
250	160	+1,8/+9,0	-9,0/-1,8	37,78
250	170			34,86
250	180			31,76
250	190	+2,0/+11,0	-11,0/-2,0	29,36
250	200			25,01
250	210			21,36
250	220			17,53
250	230	+2,5/+12,5	-12,5/-2,5	15,26
260	50	+0,8/+3,0	-4,0/-0,8	60,63
250	55			55,48
250	60			54,97
250	65			54,42
250	70			53,83
250	75			53,19
250	80			52,50
260	90	+1,0/+5,0	-6,0/-1,0	56,39

△ These diameters can be produced at short term. Standard length depending on diameter 1000 mm or 2000 mm, longitudinal tolerance +0% / + 3%. Special lengths up to 3000 mm, further combinations of inner and outer diameters as well as intermediate sizes are possible on request.

ZELLAMID® | TUBES

ZELLAMID® Quality	1100 Group
	PA 6 C

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
260	100			54,72
260	110			52,86
260	120	+1,5/+7,5	-7,5/-1,5	51,76
260	130			49,55
260	140			47,17
260	150			44,60
260	160	+1,8/+9,0	-9,0/-1,8	42,54
260	170			39,62
260	180			36,52
260	190	+2,0/+11,0	-11,0/-2,0	34,14
260	200			30,70
260	210			27,07
260	220			23,26
260	230	+2,5/+12,5	-12,5/-2,5	20,05
260	240			15,89
270	50	+0,8/+3,0	-4,0/-0,8	65,51
270	55			65,05
270	60			64,55
270	65			64,00
270	70			63,40
270	75			62,76
270	80			62,08
270	90	+1,0/+5,0	-6,0/-1,0	61,29
270	100			59,62
270	110	+1,0/+5,0	-6,0/-1,0	57,76
270	120	+1,5/+7,5	-7,5/-1,5	56,68
270	130			54,48
270	140			52,10
270	150			49,53
270	160	+1,8/+9,0	-9,0/-1,8	47,48
270	170			44,57
270	180			41,46
270	190	+2,0/+11,0	-11,0/-2,0	39,11
270	200			34,71
270	210			31,07
270	220			27,23
270	230	+2,5/+12,5	-12,5/-2,5	25,04
270	240			20,87
270	250			16,53
280	50	+0,8/+3,0	-4,0/-0,8	70,57
280	55			70,11
280	60			69,61
280	65	+0,8/+4,0	-4,0/-0,8	69,32
280	70			68,72
280	75			68,08
280	80			67,40
280	90	+1,0/+5,0	-6,0/-1,0	66,37
280	100			64,70
280	110			62,84
280	120	+1,5/+7,5	-7,5/-1,5	61,79
280	130			59,59
280	140			57,21

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
280	150			54,64
280	160	+1,8/+9,0	-9,0/-1,8	52,61
280	170			49,69
280	180			46,59
280	190	+2,0/+11,0	-11,0/-2,0	44,25
280	200			40,81
280	210			37,18
280	220	+2,0/+11,0	-11,0/-2,0	33,37
280	230	+2,5/+12,5	-12,5/-2,5	30,20
280	240			26,04
280	250			21,69
280	260	+3,0/+15,0	-15,0/-3,0	18,76
290	50	+0,8/+3,0	-4,0/-0,8	75,82
290	55			75,36
290	60			74,86
290	65	+0,8/+4,0	-4,0/-0,8	74,57
290	70			73,98
290	75			73,34
290	80			72,65
290	90	+1,0/+5,0	-6,0/-1,0	71,64
290	100			69,96
290	110			68,11
290	120	+1,5/+7,5	-7,5/-1,5	67,09
290	130			64,88
290	140			62,50
290	150			59,93
290	160	+1,8/+9,0	-9,0/-1,8	57,92
290	170			55,00
290	180	+1,8/+9,0	-9,0/-1,8	51,90
290	190	+2,0/+11,0	-11,0/-2,0	49,58
290	200			45,15
290	210			41,50
290	220			37,67
290	230	+2,5/+12,5	-12,5/-2,5	35,55
290	240			31,39
290	250			27,04
290	260	+3,0/+15,0	-15,0/-3,0	24,13
290	270			19,45
300	50	+0,8/+3,0	-4,0/-0,8	81,25
300	55			80,79
300	60			80,28
300	65			79,73
300	70			79,14
300	75			78,50
300	80			77,81
300	90	+1,0/+5,0	-6,0/-1,0	77,09
300	100			75,41
300	110			73,56
300	120	+1,5/+7,5	-7,5/-1,5	72,56
300	130			70,36
300	140			67,97
300	150			65,41

△ **OD:** Outer diameter **ID:** Internal diameter.

ZELLAMID® Quality	1100 Group
	PA 6 C

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
300	160	+1,8/+9,0	-9,0/-1,8	63,41
300	170			60,49
300	180			57,39
300	190	+2,0/+11,0	-11,0/-2,0	55,09
300	200			51,65
300	210			48,02
300	220			44,21
300	230	+2,5/+12,5	-12,5/-2,5	41,08

Nominal size		Tolerance		Weight (kg/m)
OD mm	ID mm	OD mm	ID mm	
300	240			36,92
300	250			32,57
300	260	+3,0/+15,0	-15,0/-3,0	29,69
300	270	+3,0/+15,0	-15,0/-3,0	25,01
300	280			18,43

These diameters can be produced at short term. Standard length depending on diameter 1000 mm or 2000 mm, longitudinal tolerance +0% / + 3%. Special lengths up to 3000 mm, further combinations of inner and outer diameters as well as intermediate sizes are possible on request.

ZELLAMID® Quality	1100 Group
	PA 6 C

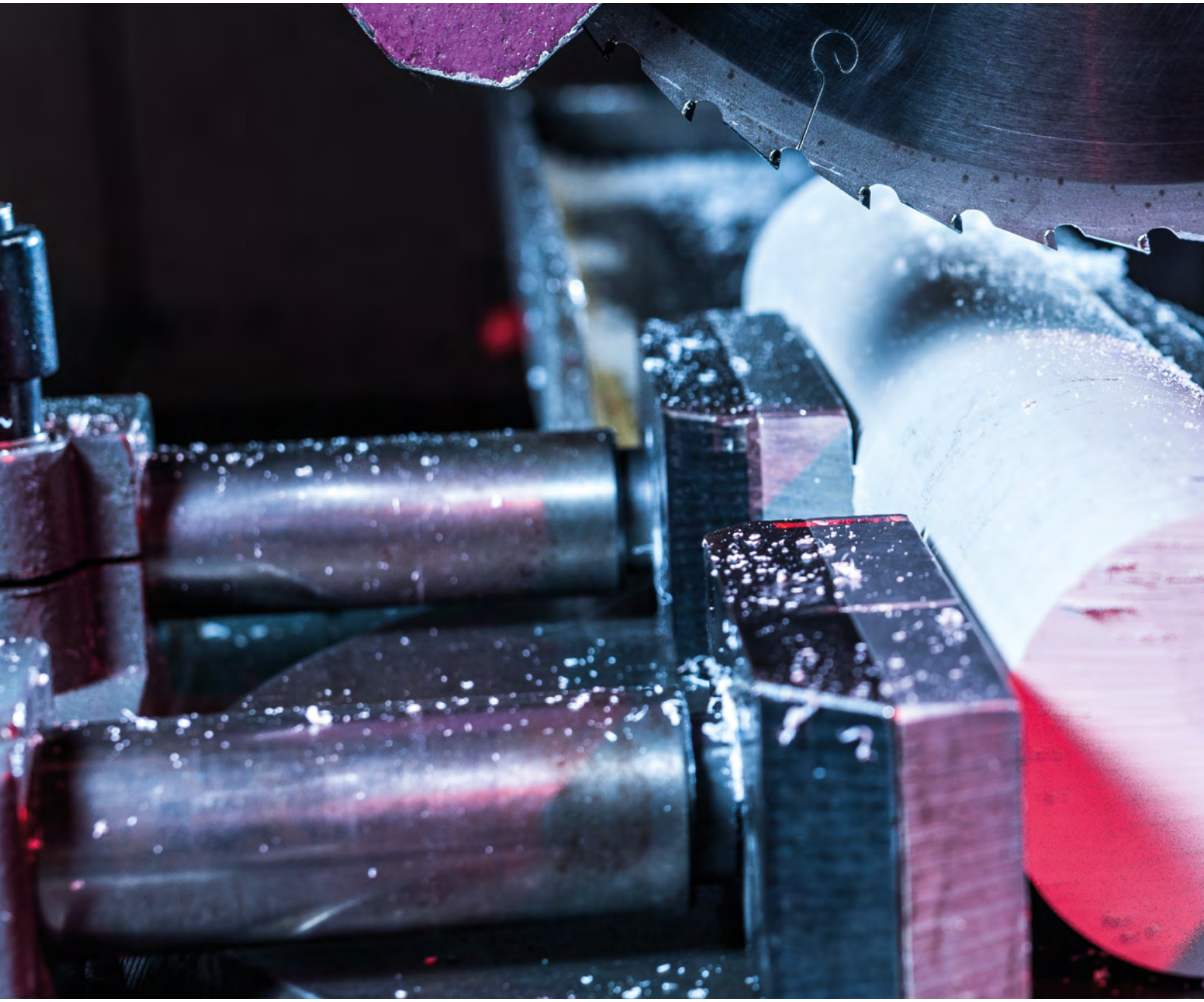
Nominal size in mm		
OD	ID from	ID to
310	80	280
320	80	290
330	80	300
340	80	310
350	80	320
360	80	330
370	80	340
380	80	350
390	80	360
400	80	370
410	80	380
420	80	390
430	80	400
440	80	410
450	80	420
460	80	420

Nominal size in mm		
OD	ID from	ID to
470	80	430
480	80	440
490	80	450
500	80	460
510	80	470
520	100	480
530	100	490
540	100	500
550	100	500
560	100	510
570	100	520
580	100	530
590	100	540
600	100	550
620	120	560
640	120	580

Nominal size in mm		
OD	ID from	ID to
650	130	590
660	140	600
680	140	620
700	140	640
720	140	660
740	300	600
750	330	710
760	380	720
770	700	720
780	400	740
800	420	740
820	440	740
840	460	780
850	450	790
860	480	820
880	500	840

Standard length depending on diameter 1000 mm or 2000 mm. Further combinations up to outer diameter 2000 mm and intermediate sizes are possible on request.

ZELLAMID® | MACHINING INSTRUCTIONS

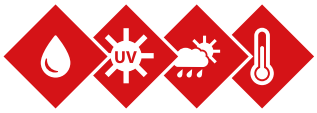


ZELLAMID® | HANDLING & STORAGE

ZELLAMID® Quality plastics are produced with high-end technology and stand out for their excellent quality in numerous applications.

To safeguard the properties and features of our products, the following guidelines will provide you with information on transportation, storage and machining.

Depending on the purpose of use or kind of application, modifications to these can be made by the buyer or customer.



Protected from high moisture weather conditions and UV light sources

Environmental effects like direct sunlight (UV rays) and moisture can modify the polymeric structure. Prolonged exposure to these can result in moisture expansion, volume changes and discoloration. Stock shapes should be stored at 50 % humidity and at temperatures ranging from 0 °C to +30 °C and protected from UV rays (including some interior lighting systems).

Due to the hygroscopic properties of polyamide, panels <8 mm must be wrapped airtight and stored indoors.

Free from chemicals and other liquids

Chemical liquids and gases can also damage the polymeric structure and should be avoided.

Protected from radiation

Energy radiation like X-rays should be avoided as not every type of plastic is resistant to it.

Separate from flammable materials and heat sources

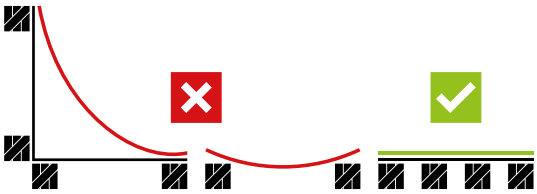
ZELLAMID® products alone do not pose a fire risk. However, some types are flammable, so please store them as regulated by law.

Keep the production code number for traceability

For traceability, certificates and further inquires, please keep the invoice and production code number.

Avoid bending

Store the stock material straight without bending in well supported flat racks, as this can deform the stock material permanently and recovering requires extensive effort. Handle **ZELLAMID®** materials only with suitable lifting jacks and supports. Please consider the safety rules of public authorities.



ZELLAMID® | NEW POSSIBILITIES

ZELLAMID® materials offer new solutions to satisfy your customers. Plastics offer many performance advantages in applications where materials like bronze, stainless steel, cast iron, brass, aluminum or ceramic have previously been used.

The advantages are easier handling, lower machining costs and excellent mechanical performance.

ZELLAMID® materials have a wide range of applications in several industries ranging from basic industries like construction equipment and food processing, through to high technology industries like medical, semiconductor and alternative energy. The benefits of cost, weight and machining savings keep the market growing rapidly.

Our high performance materials like **ZELLAMID® 1500 X** can be used at temperatures up to 260 °C.

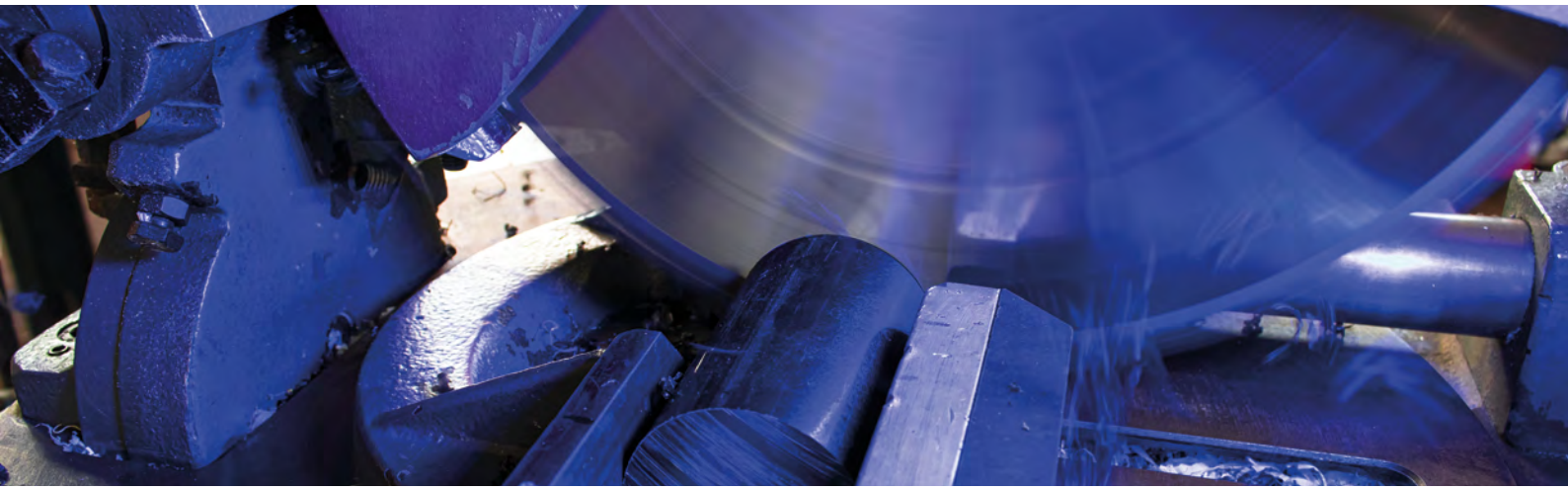
Metals vs. plastics

The most important point is cooling. Plastics are thermal insulating and have much lower heat transfer ability than metals.

The melting temperature is much lower than the one for metals. Thus, plastics are very sensitive to high temperatures which are generated during machining.

The thermal expansion is up to 20 times higher compared to metals. This difference is substantial when using clamping devices and considering machining forces.

ZELLAMID® | ADVICE FOR MACHINING



Plastics and Metals must be machined differently. In comparison to metals one needs to put attention to following:

- Plastics in general do not conduct heat very well. Therefore, one needs to prevent heat buildup and hot-spots at the contact surface of plastic-material and cutting-material. Heat is normally deduced via the tools. In order to prevent excessive heat, the application of coolants is helpful.
- The thermal resistance of plastics compared to metals is far lower. One needs to pay utmost attention not to exceed the glass transition temperature as this will lead to dimensional instability, inferior surface quality and maybe even crack the part to be machined.

Tools must be sharp and well ground

Set form feed as high as possible for low development of heat

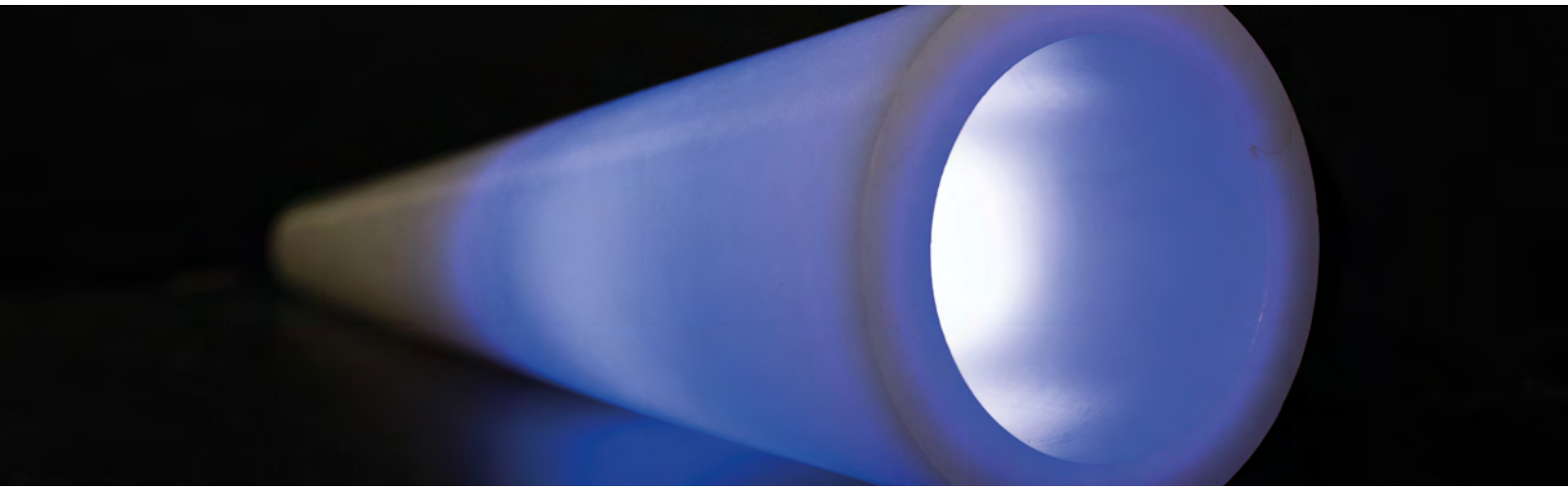
Use sufficient coolant (or compressed air) in order to avoid heat

The tool‘s relief angle should be large enough to keep the chips short

Remove the chips to prevent queue or jamming

Store the stock shape in a machining environment for at least 24 hours before machining

ZELLAMID® | POST-TREATMENT



Accuracy
Even after annealing processes of our **ZELLAMID®** stock shapes at our production site, internal tension can be created by incorrect machining. Try to use raw material with similar dimensions to the desired finished part. To achieve tighter tolerances increase the number of machining steps and implement intermediate annealing.

Conditioning
ZELLAMID® 202, **250** and **1100** have a higher moisture absorption rate than other **ZELLAMID®** materials, they should be conditioned in a warm water bath before machining. The water temperature should be 80 °C and the duration recommended is 1 day per cm of wall thickness. The impact strength can be improved for the application.

Annealing
Annealing is a temperature treatment of plastic to relieve internal stress. The surrounding temperature should be slowly and continuously increased and decreased. This process should not be accelerated as changing the temperature too fast can thermally shock the material, actually increasing the internal stress and reducing dimensional stability of the finished part. The warming and cooling rate should be between 10 °C and 20 °C per hour. The holding temperatures for the different materials are listed below. The holding time should be approx 6 minutes per mm of wall thickness.

ZELLAMID® Description	°C
202 (PA 6) | 900 (POM-C) 1100 (PA 6 C)	150 - 160 °C
250 (PA 6.6) | 1400 (PET) 1400 PBT	170 - 180 °C
1500 X (PEEK)	220 - 240 °C

ZELLAMID® | REINFORCED ZELLAMID

Reinforced **ZELLAMID®**-products have glass, carbon fibres or ceramic fillers integrated in the polymer matrix. This allows strength, temperature resistance increases and other product properties are improved. During processing, especially the changed mechanical properties are difficult to handle..

The most important advice for machining are the following:

- Deploy intensive cooling (external & internal)
- Avoid heat by increasing the feed rate
- Check the sharpness of the tools regularly
- Use diamond equipped or special coated tools
- Preheating

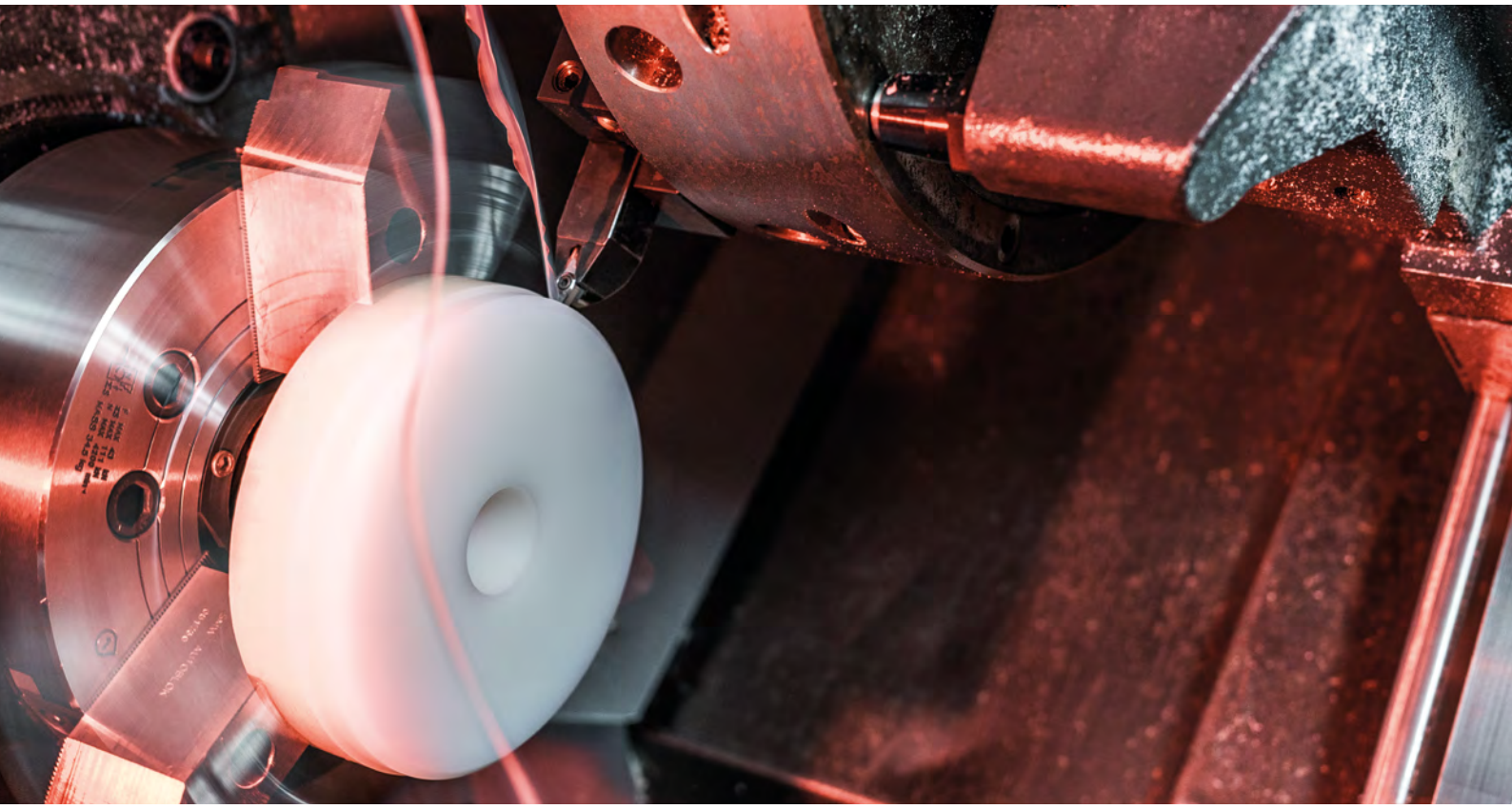
Preheating

Reinforced **ZELLAMID®** products like **250 GF30**, **1500 XT**, **1500 XGF30**, **1500 XCA30**, **1500 XC20**, **1000 GF30**, **1900 GF40** and unreinforced products like **1400** and **1400 BPT** should be pre heated before sawing or drilling (rods from 80 mm and plates from 50 mm thickness). The temperature should be between 90 and 120 °C with a heating and cooling rate of approximately 10 °C per hour. All other materials should have room temperature before machining.

Diamond tipped tools

Reinforced products should be machined with diamond equipped tools, which are expensive, but perform excellently in the endurance of sharp edges.

ZELLAMID® | MACHINING INSTRUCTIONS



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 economically results, therefore diamond coated tools are recommended which are more expensive but however offers 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.

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 for metal parts.

3 Cooling during machining

Generally, coolants are not necessary for machining 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.

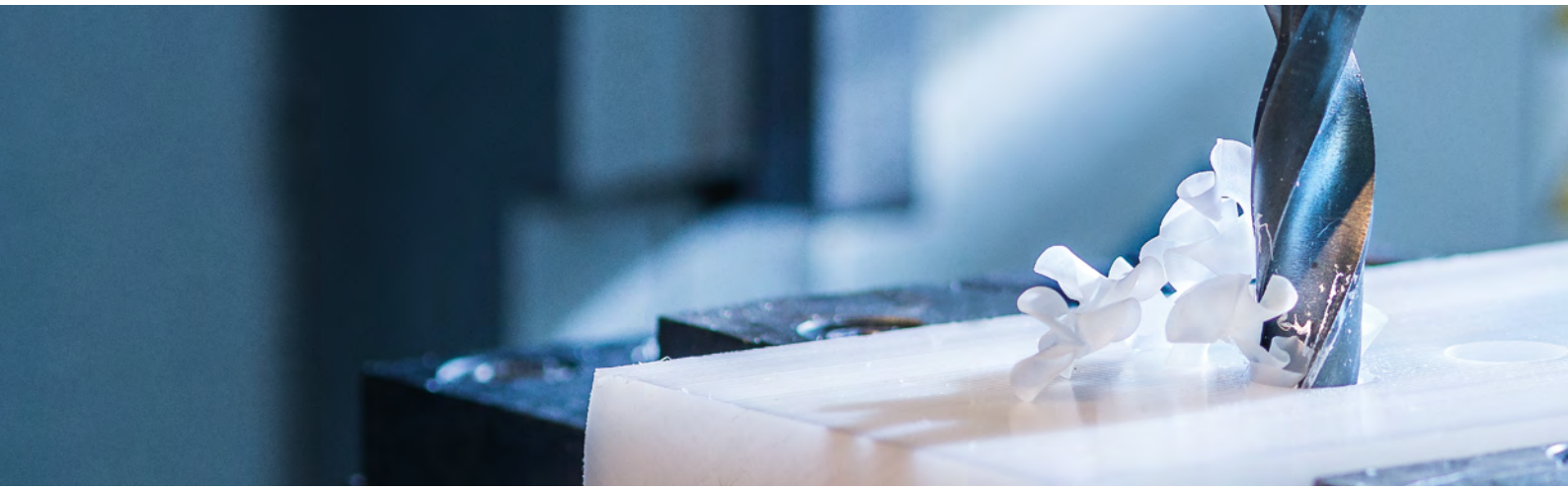
If drilling emulsions are used, consideration must be given to subsequent cleaning operations to prevent contamination of any additional process such as splicing or varnishing.

4 Characteristic data for different machining operations

More about machining-instructions:

 Drilling Page 86 – 87
 Turning Page 88 – 89
 Sawing Page 90 – 91
 Milling Page 92 – 93

ZELLAMID® | DRILLING



Drilling
Turning
Sawing
Milling

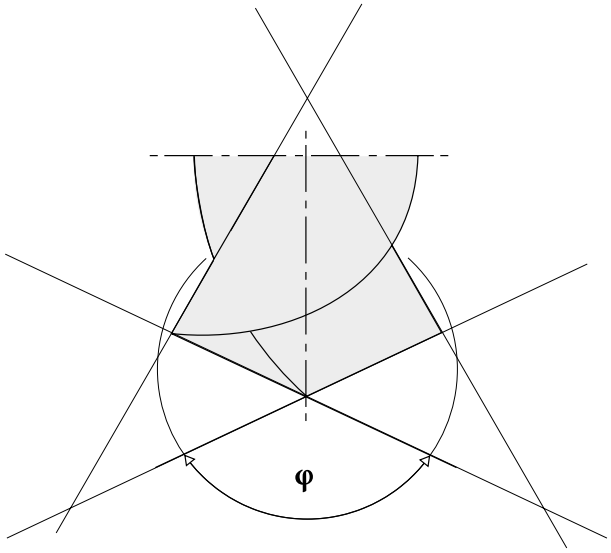
Usual HSS sharpened tools can be used for drilling.Take care of chip removal when drilling particularly deep holes to prevent excessive temperatures, frequent removal of the drill may also be necessary.

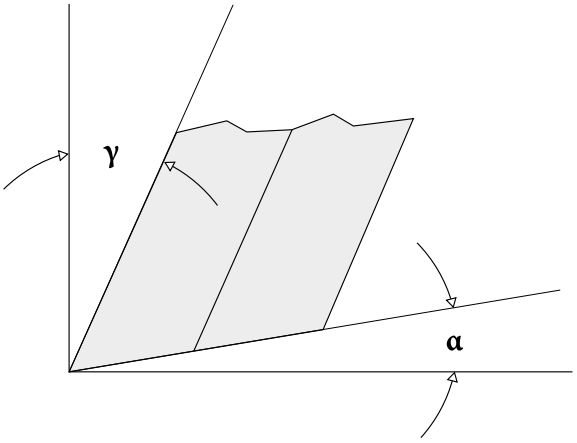
For drilling holes in thin-walled workpieces, it is advisable to choose a high drilling speed and, if applicable, a neutral (0°) effective cutting angle. This prevents the drill from sticking in the workpiece and hinders the associated stripping of the hole or the workpiece being drawn up by the drill.

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 unreinforced 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 GF30 (PA 6.6 + 30% Glass fibre) as well as ZELLAMID® 1400 and 1400 T (PET and PET+ solid lubricant), this procedure is recommended.

When drilling especially high-crystalline materials such as ZELLAMID®, high temperatures build up on the cutting edges, which cannot be adequately dissipated because of the good insulation properties of the plastics. The heat causes an internal expansion in the material, which causes compressive stress in the inside of the rod section.

This stress can be so high that the rod tears and splits and can be avoided to a great extent if the material is machined correctly. It is advisable to predrill the hole and complete it with a right side tool. The pre-drilled holes should not exceed 35 mm in diameter. Drilled holes in long sections of rod must only be made from one side, as otherwise an unfavourable stress relationship is created when the drilled holes





meet in the middle of the rod. That supports the rod section cracking.

⚠ In extreme cases it may be necessary to heat the blank to approx. 50-120 °C and pre-drill it in this condition.

The hole can then be completed when the rod has cooled down and when an even temperature has set in throughout the blank. Finishing can take place after complete cooling and achieving a uniform temperature level inside the stock shape.

ZELLAMID® Description	α	γ	φ	V	S
202 (PA 6) | 202 MO (PA 6 + MoS_2) | 1100 (PA 6 C)	5 - 15	5 - 20	90	50 - 150	0,1 - 0,3
250 (PA 6.6)	5 - 15	10 - 20	90	50 - 150	0,1 - 0,3
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
1400 (PET) | 1400 PBT [i]	5 - 10	10 - 20	90	50 - 100	0,2 - 0,3
1500 X (PEEK)	5 - 10	10 - 30	90 - 120	70 - 200	0,1 - 0,3
1000 (PEI)	5 - 10	10 - 20	90	20 - 80	0,1 - 0,3
1900 (PPS) [i]	5 - 10	10 - 30	90	50 - 200	0,1 - 0,3
2100 (PPSU)	3 - 10	10 - 20	90	20 - 80	0,1 - 0,3
Filled/Reinforced ZELLAMID® products [i]	5 - 10	5 - 10	90	80 - 100	0,1 - 0,3

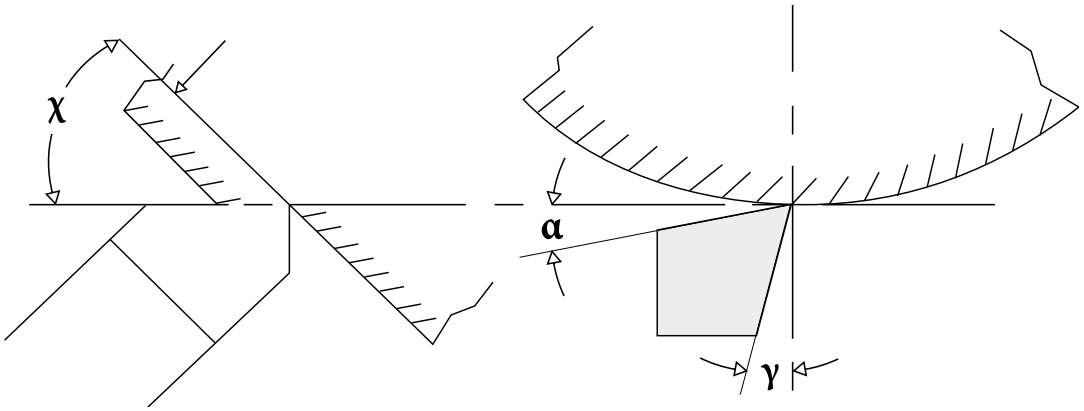
α side relief angle (°) | **γ** rake angle (°) | **φ** Top angle (°) | **V** cutting speed (m/min) | **S** feed (mm/rev) | Spin angle should be between ca. 12 and 16°

[i] Reinforced ZELLAMID® grades as 250 GF30, 1500 T, 1500 GF30, 1000 GF30, 1900 GF40 and filled grades 1400, 1400 H and 1900 should be pre heated 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! For sawing, we recommend using blades with rakers. Our application technology consultation in word and writing is to support your own work. It is considered as noncommittal 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.

ZELLAMID® | TURNING

Drilling
Turning
Sawing
Milling

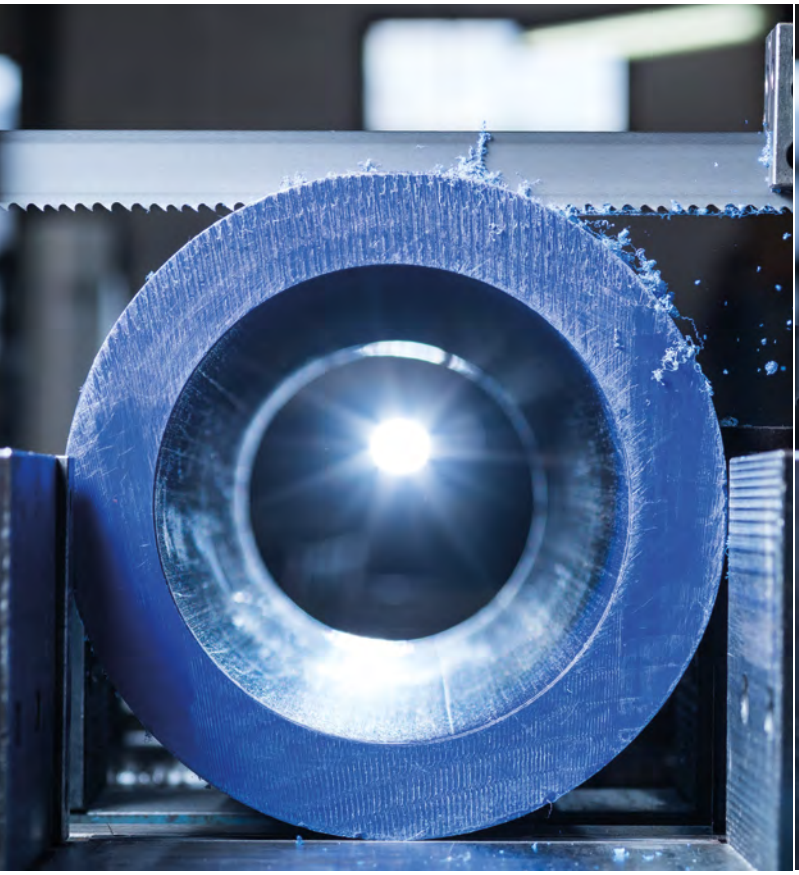
Turning most thermoplastic plastics produces a continuous chip stream. An ideal chip removal must be assured to prevent wrapping or clamping of the chip around the tool or work piece.
Due to the fact that plastics show lower rigidity, long turning pieces can sag and therefore the usage of a steady rest is advisable.

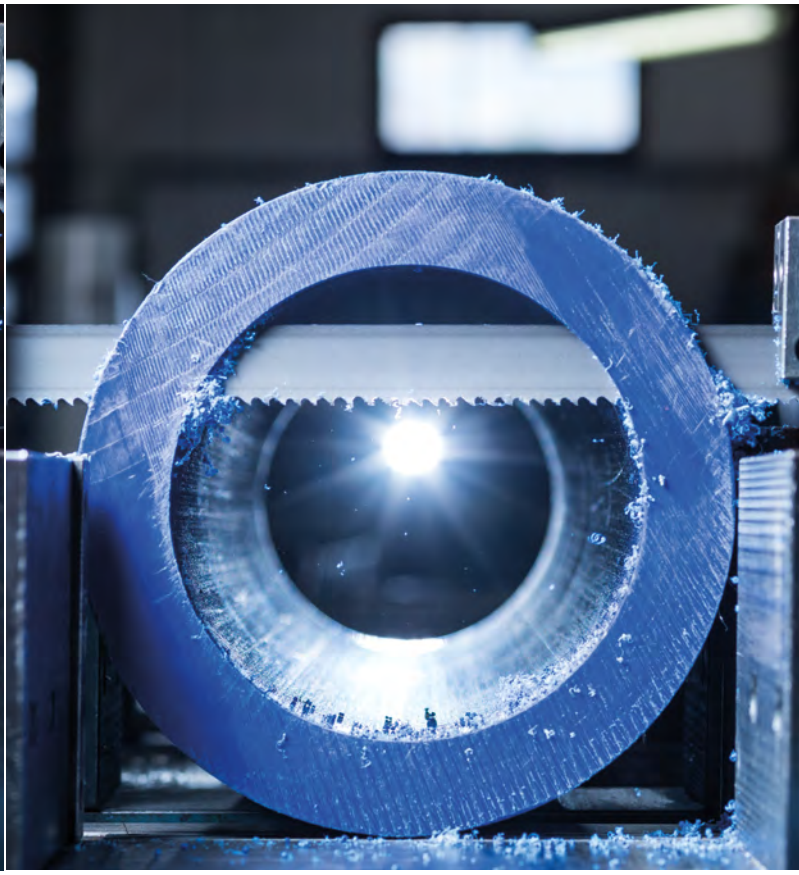


ZELLAMID® Description	**α**	**γ**	**χ**	**V**	**S**
202 (PA 6) | 202 MO (PA 6 + MoS_2) | 1100 (PA 6 C)	6 - 10	0 - 5	45 - 60	250 - 150	0,1 - 0,5
250 (PA 6.6)	6 - 10	0 - 5	45 - 60	200 - 500	0,1 - 0,5
900 (POM-C) | 900 H (POM-H) | 900 XU ELS (POM-C conductive) | 900 AS (POM-C antistatic)	6 - 8	0 - 5	45 - 60	300 - 600	0,1 - 0,4
1400 (PET), 1400 PBT	5 - 15	0 - 5	45 - 60	300 - 400	0,2 - 0,4
1500 X (PEEK)	6 - 8	0 - 5	45 - 60	250 - 500	0,1 - 0,4
1000 (PEI)	6	0	45 - 60	350 - 400	0,1 - 0,3
1900 (PPS)	6 - 8	0 - 5	45 - 60	250 - 500	0,1 - 0,5
2100 (PPSU)	6	0	45 - 60	350 - 400	0,1 - 0,3
Filled/Reinforced ZELLAMID® products	6 - 8	2 - 8	45 - 60	150 - 200	0,1 - 0,5

α side relief angle (°) | **γ** rake angle (°) | **χ** Top angle (°) | **V** cutting speed (m/min) | **S** feed (mm/rev) | Spin angle should be between ca. 12 and 16°

ZELLAMID® | SAWING





Drilling
Turning
Sawing
Milling

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.

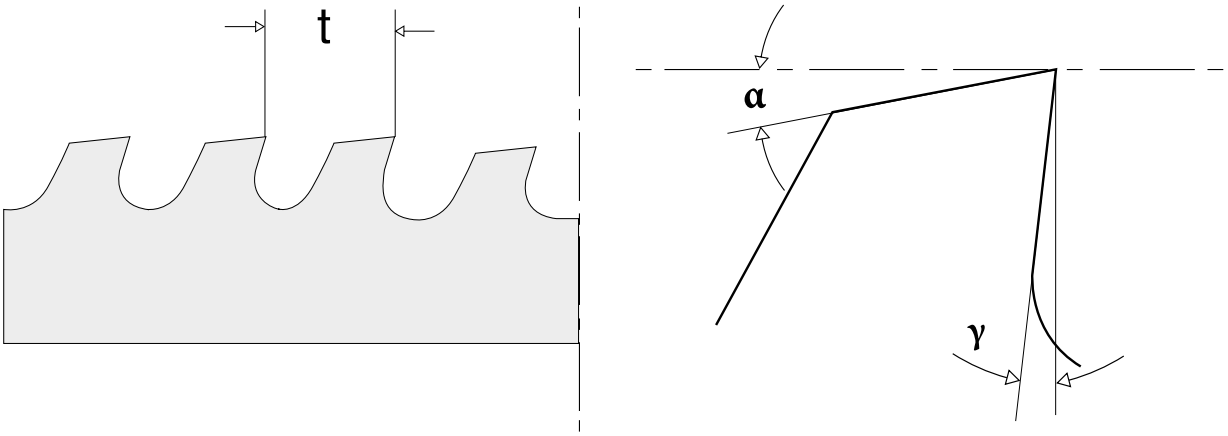
Take care of crosswise teeth setting to prevent clamping of the saw blade. Circular saws are generally used for cutting plates with straight cutting edges.

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.

Reinforced Materials should be heated up between 90 – 100 °C prior sawing. For cutting a band saw is recommended (tooth pitch about 4 – 6 mm), as standard circular saws usually leads to cracks.



ZELLAMID® Description	α	γ	V	t
202 (PA 6) | 202 MO (PA 6 + MoS_2) | 1100 (PA 6 C)	20 - 30	2 - 5	500	3 - 8
250 (PA 6.6)	20 - 30	2 - 5	500	3 - 8
900 (POM-C) | 900 H (POM-H) | 900 XU ELS (POM conductive) 900 AS (POM-C antistatic)	20 - 30	0 - 5	500 - 800	2 - 5
1400 (PET) | 1400 PBT [i]	15 - 30	5 - 8	300	2 - 8
1500 X (PEEK)	15 - 30	0 - 5	500 - 800	3 - 5
1000 (PEI)	15 - 30	0 - 4	500	2 - 5
1900 (PPS) [i]	15 - 30	0 - 5	500 - 800	3 - 5
2100 (PPSU)	15 - 30	0 - 4	500	2 - 5
Filled/Reinforced ZELLAMID® products [i]	15 - 30	10 - 15	80 - 100	3 - 5

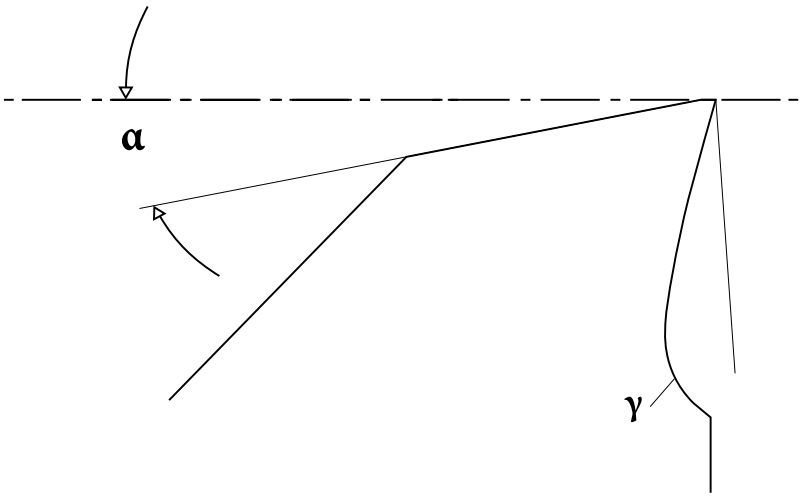
α side relief angle (°) | **γ** rake angle (°) | **V** cutting speed (m/min) | **t** pitch (mm)

[i] Reinforced ZELLAMID® grades as 250 GF30, 1500 T, 1500 GF30, 1000 GF30, 1900 GF40 and filled grades 1400, 1400 H and 1900 should be pre heated 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! For sawing, we recommend using blades with rakers. Our application technology consultation in word and writing is to support your own work. It is considered as noncommittal 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.

ZELLAMID® | MILLING

Drilling
Turning
Sawing
Milling

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



ZELLAMID® Description	α	γ	V
202 (PA 6) | 202 MO (PA 6 + MoS_2) | 1100 (PA 6 C)	10 - 20	5 - 15	250 - 500
250 (PA 6.6)	10 - 20	5 - 15	250 - 500
900 (POM-C) | 900 H (POM-H) | 900 XU ELS (POM-C conductive) 900 AS (POM-C antistatic)	5 - 15	5 - 15	250 - 500
1400 (PET) | 1400 PBT	5 - 15	5 - 15	250 - 400
1500 X (PEEK)	5 - 15	6 - 10	180 - 450
1000 (PEI)	2 - 10	1 - 5	250 - 500
1900 (PPS)	5 - 15	6 - 10	250 - 500
2100 (PPSU)	2 - 10	1 - 5	250 - 500
Filled/Reinforced ZELLAMID® products	15 - 30	6 - 10	80 - 100

α side relief angle (°) | **γ** Rake angle (°) | **V** cutting speed (m/min) | Feed rate can be set up to 0,5mm/tooth

ZELLAMID® | NOTES AND SPECIFICATIONS


Plan 5X
∞/0
JAPAN
0.75


8254
10kN

ZELLAMID® | LEGAL NOTES AND SPECIFICATIONS

Legal Notes

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.

Printing and typographical errors reserved.

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 set standards.

Our semi-finished products meet or exceed:

- ASTM D-6778
- ASTM D-5989
- ASTM D-6100
- ASTM D-6261
- ASTM D-6779
- EU 1935/2004
- DIN EN 15860

Industrial specifications from private firms can be met upon information. Specification sheets and product handling information 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.

ZELLAMID® | COMMITMENT TO QUALITY

Quality starts with the raw materials we use to make **ZELLAMID®** Stock-Shapes. We only purchase virgin pellets, powder, compounds, fillers and additives. We exclusively buy from global chemical corporations, even if the price for such high-quality resins is higher than from secondary suppliers. Our incoming quality control checks the water content of our feedstock, the melt-index MFR DIN EN ISO 1133-A, differential scanning calorimetry (DSC) and rheological analyses with torsional thermometers. Since many years our claim rate is below 0,09 %. In order to maintain and further improve these high levels of customer satisfaction our Quality Management continuously tests our stock-shapes with state-of-the-art equipment and standardized methods.

Our commitment to quality include test processes that we regularly conduct ourselves:

- Ultrasonic Inspection DIN EN 15860
- Determination of Density DIN EN ISO 1183
- Hardness Shore-D ISO 868
- Microcrack Hardness DIN 53799-4.15
- Tensile Testing DIN EN ISO 527-2
- Flexural Testing DIN EN ISO 178
- Impact Bending Test DIN 53453
- Impact Testing on specimen with a Punched Hole or Double-V-notched DIN 53753
- Charpy-Impact Test DIN EN ISO 179
- Instrumented Impact Penetration Test DIN EN ISO 6603-2
- Roughness Test DIN 4777
- Abrasion Resistance analysis according to the friction gear method DIN 53754
- Chemical Resistance DIN 68861-1
- Surface resistance to chemicals according to various standards
- Resistance to Stress Cracking based on environmental influences DIN EN ISO 4599
- Heat Distortion Temperature HDT DIN EN ISO 75-1
- VICAT-Softening Temperature DIN EN ISO 306
- Thermal Ageing Studies according to various standards
- Ageing with Accelerated Weathering Tests, under Xenon-light and field tests
- Alternating Temperature Tests according to various methods
- Microscopic inspection of materials in 2D and 3D with up to thousand-fold magnification

All other tests we outsource to renowned Universities and scientific institutions. The outcome of such testing is intricate part of our Quality Management System. The results are documented and recorded to ensure our clients that all **ZELLAMID®** products are made to specification. Should the users of our stock-shapes require out of routine testing or certifications we can close such Customer Quality-Agreements.

ZELLAMID® Stock-Shapes are manufactured in Austria, Italy and USA. Our focus lies since ages on Quality. As quality has its price we deliberately do not compete against low-priced, cheap quality.

KLEPSCHGROUP
THE NETWORK FOR PLASTICS TECHNOLOGY

SENOPLAST · SENOSAN · seletec · SENO SPEZIALMASCHINEN Sondermaschinen- und Stahlbau · senova

ZELL MATERIALS ENGINEERING PLASTICS · ZELL PARTS by KLEPSCH · TECNOPLAST ENGINEERING PLASTICS · ZL ENGINEERING PLASTICS · EXPERTA

ZELL MATERIALS
ENGINEERING PLASTICS

The **COMPLETE CATALOG** is available
for download on our website:
ZELLMATERIALS.com/en/support/downloads

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