Materials Services
Materials Poland

Engineering plastics

thyssenkrupp

PA 6

extruded or cast polyamide

Unmodified, semi-crystalline thermoplastic polymer.
Basic colours – natural (milk white) and black.

PA 6 - main properties

- High resistance to dynamic loads
- Vibration dampening capacity
- Highest water absorption level among unmodified polyamides.
- Increased moisture content increases PA 6 impact strength and flexibility, enhancing such parameters as vibration dampening and noise attenuation.
- High impact strength, hardness and ductility also at low temperatures
- Due to the fact that it generates “reverse slip”, mating two parts whose operation involves friction is not recommended.
- High friction wear resistance
- High environmental resistance of solvents, liquid fuels and greases (up to approx. 130°C) Poor chemical resistance to concentrated acids
- Excellent machining properties
- Polyamide welding and glueing option
- Generally good sliding properties
- Material approved for contact with foodstuffs

Most popular components made of PA 6

gear wheels, sliding strips, bushings, nuts, rollers, slide bearings, worm conveyors, rope guide rollers, plug parts, electric insulators, coupling elements, levers, valves, all seals

Inventory

- Rolls and panels with different diameters/thickness
- Also available as modified PA:
  - PA 66 – higher dimensional stability, rigidity and hardness
  - Modified PA 6 with better properties for operation in high and low temperatures
  - Modified PA 6 with higher abrasion resistance
  - PA 66 with glass fibres
  - PA 6 with oil or grease
  - PA 6 with oil or grease, FDA certified
  - Modified PA 6 with electroconductive properties (MoS2)
  - Modified PA 6 resistant to the “stick-slip” phenomenon
  - Modified, flame-retardant PA 66

PA 6 – applications

construction of machines, devices, vehicles, wide range of applications in the food, chemical and electronic industries, laboratory equipment, construction of pumps and fittings

POM C

polyacetal copolymer

Semi-crystalline thermoplastic whose crystalline structure ensures the excellent combination of high strength, rigidity and ductility. Due to the parameters, it is widely used in areas previously reserved for metals and perfectly suited for production of precision elements with low dimensional tolerances.
Basic colours – natural (white) and black.

POM C – main properties

- High dimensional stability
- High friction wear resistance
- Good fatigue strength
- High hardness and rigidity
- Low moisture absorption
- Creep resistance better than polyamides
- Excellent impact strength at low temperatures (max. -40°C)
- Suitable for glueing and welding
- Electric and dielectric properties
- Ability to return to the original shape (return elasticity)
- Good sliding properties
- Shape durability at elevated temperatures
- No stress cracks
- Excellent machining properties
- Can be used in direct contact with food

Most popular components made of POM C

relay elements, enclosures, covers, housings, pump elements gaskets, coil bodies, gear wheels, technical seals, snap-on elements, coupling parts, bearings, strips and other sliding elements, insulators, small electric motor components, other elements

Inventory

- Rolls and panels with different diameters/thickness
- Also available as modified POM-C and POMH:
  - POMC – electroconductive material;
  - POMC – material detectable by metal detectors;
  - POMC – with the addition of glass fibre
  - POMH – with the addition of Teflon

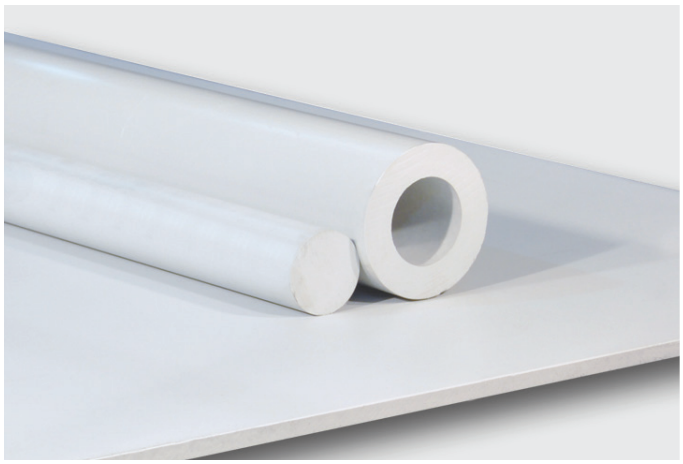
POM C – applications

machinery, automotive, electric, food industries, etc.

PET

polyethylene terephthalate

Semi-crystalline thermoplastic polyester with the main feature consisting of low moisture absorption.



PET – main properties

- Relatively brittle as compared with PA and POM
- Excellent dimensional stability
- Hard and rigid
- High sliding properties
- Not recommended for applications involving contact with steam and temperatures exceeding 70°C
- High (long-term) rigidity, strength and hardness
- Thermal elongation lower than for polyamides
- Low friction wear
- Excellent electro-insulating properties

Inventory

- Rolls and panels with different diameters/thickness
- Also available as modified PET with the addition of oil

PET – applications

gear wheels subjected to heavy loads, levers, bumpers, handles, couplings, bearings and various sliding elements, areas where high precision is required for machine component production

PE 1000

ultra-high molecular weight (UHMW) polyethylene

Obtained as a result of polymerisation of ethene (ethylene) Polyethylene with various properties is obtained, depending on the polymerisation method.

PE 1000 polyethylene properties

- Excellent sliding properties
- High abrasion resistance
- High impact strength
- Excellent resistance to chemicals and corrosion
- Good vibration dampening capacity
- Anti-adhesive properties
- High energy absorption at high loads
- Thermal resistance from -200°C to +80°C (depending on mechanical load intensity)
- Physiological safety
- Difficult to weld

PE 1000 panels in the "virgin version" are approved for contact with foodstuffs.

PE 1000 panels in the "pure version" and as reclaimed materials are available on request.

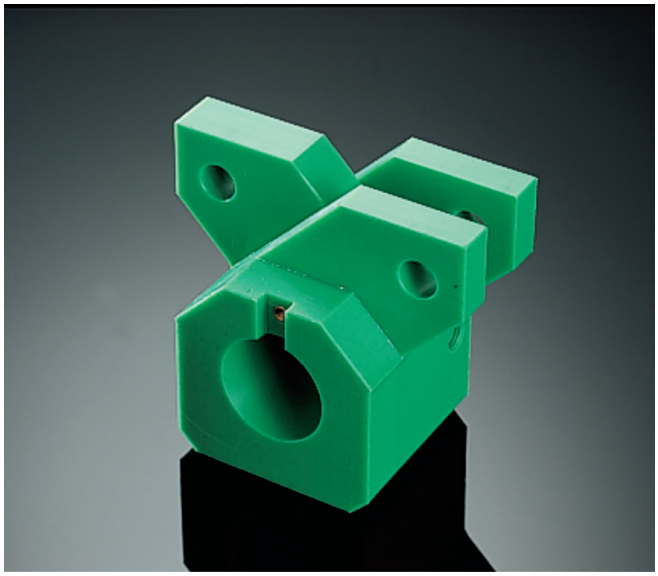
PE 1000 – applications

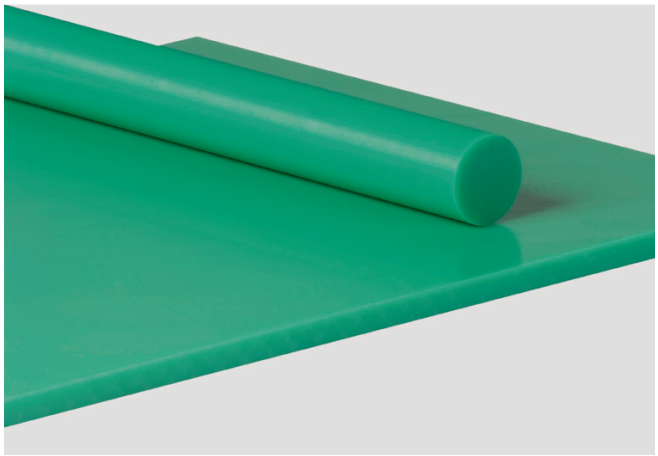
the most popular applications include: chain and belt guides, sliding strips, protective profiles, bottle guides, curved conveyors, conveyor screws, extruded profiles, conveyor system elements, guide rollers, pulleys, gear wheels, bearings, pump components, gaskets and mechanical structure elements.
Main PE 1000 applications include: drive system and conveyor components, packaging industry, food industry or chemical industry

PE 500

high molecular weight (HMW) polyethylene

Its properties are slightly lower as compared with PE 1000. The biggest difference is that the PE 500 polyethylene demonstrates a much higher abrasion coefficient, i.e. it is worn due to abrasion much faster than the PE 1000 polyethylene. Its main characteristics include good rigidity and vibration dampening capability. This material is difficult to weld.





PE 500 panels in the “virgin version” are approved for contact with foodstuffs.

Inventory

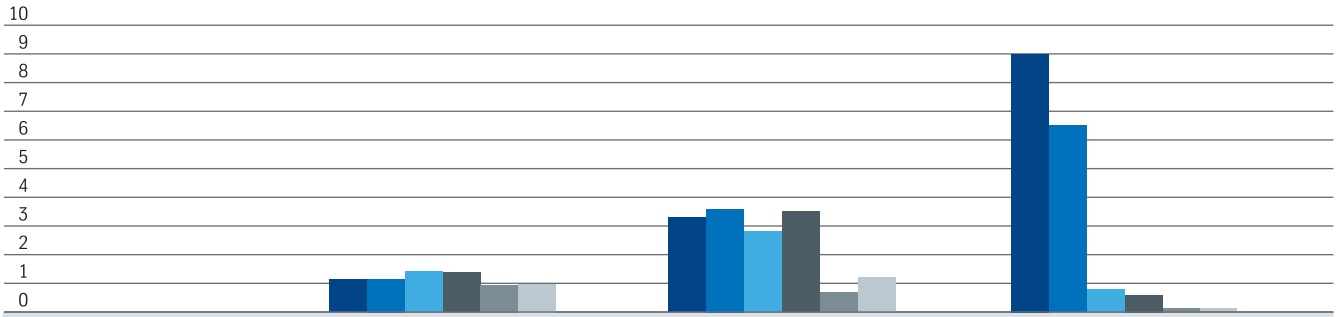
- PE 500 panels in natural and black colour versions (on continuous sale)
- PE 500 in the “pure version” and as a reclaimed material (on request)

PE 500 – applications

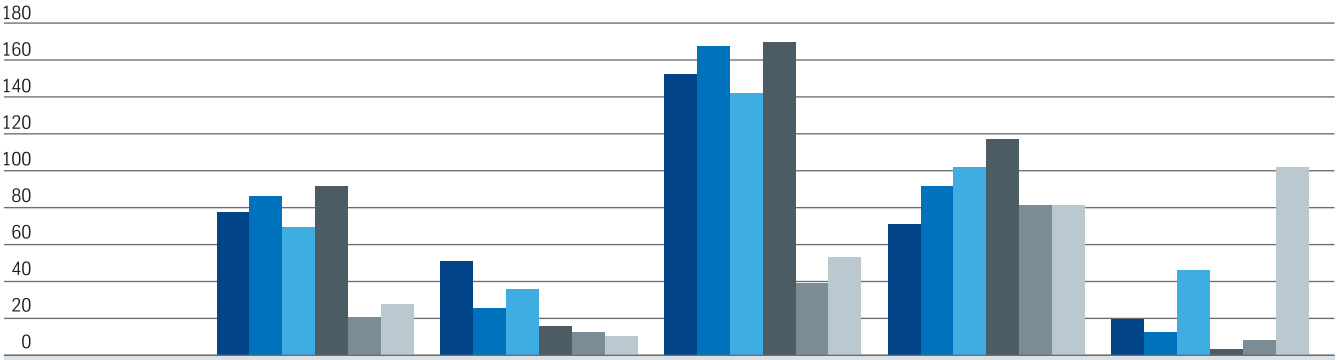
the most popular areas of application include: food industry (mainly meat and fish processing), machinery, chemical and electric industry

Engineering plastic

parameters



Products	Density g/cm³	Elastic modulus GPa	Moisture absorption (saturation) %
PA6	1,14	3,3	9
PA6G	1,15	3,6	6,5
POMC	1,41	2,8	0,8
PET	1,39	3,5	0,6
PE 1000	0,94	0,68	0,01
PE 500	0,98	1,2	0,01



Products	Yield strength MPa	Elongation at break %	Hardness ball impression MPa	Max. temperature at long-term operation °C	Susceptibility to abrasion µm/km
PA6	76	50	150	70	19
PA6G	85	25	165	90	12
POMC	68	35	140	100	45
PET	90	15	170	115	3
PE 1000	20	12	38	80	8
PE 500	27	10	52	80	100

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Materials Poland

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MANAGEMENT SYSTEM CERTIFICATION
DNV
ISO 9001 • ISO 45001

08/2022 - 500 pcs. (ECHO)