quality sealing and engineering plastics solutions

ECONOMOS®

Engineered Plastic Parts

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Engineered Plastic Parts (EPP)
Advanced Engineered Plastic Parts (AEPP)

We produce a wide range of gasket types, engineered plastic parts (EPP) and advanced engineered plastic products (AEPP). Therefore - in combination with our R&D department - we can offer tailormade engineered plastic solutions to our customers. Furthermore we are able to produce any standard and special seal in a wide range of materials in any diameter (up to 4.000 mm).

ECONOMOS® worldwide / Technaplast ECONOMOS®

In 2001, the ECONOMOS® group took a strategic decision to expand its plastics and elastomer seal machining expertise by acquiring Technaplast N.V in Belgium, a leading company in the machining of standard and advanced engineered plastics. Now with the strong support of Technaplast ECONOMOS®, all companies in the ECONOMOS® Group can offer a complete service to their local customers in the design and production of parts in standard and advanced engineered plastics.
In addition, all ECONOMOS® companies can offer tailor-made solutions to their customers and therefore become a single source supplier for the complete spectrum of polymeric and elastomeric products in the field of mechanical engineering for all industries.

Plastics - the world of the future

Hardly any invention has changed the world like that of Plastics. More than 100 years ago this success story began with the transformation of natural materials into artificial substances, for example the development of Celluloid.

For many years Plastics were considered inexpensive substitutes for wood or metal, particularly in consumer goods, while in mechanical engineering their characteristics were not understood or considered as suitable replacements for other materials.
All that has changed during the last 40 years. Since this time the variety of plastics suitable for engineering use has grown tremendously, the quantity and quality of plastics materials is astonishing.
Special and high performance materials have been developed, many exceed conventional materials in performance. The advantages of Plastics such as weight saving, chemical and corrosion resistance, maintenance free operation and economical processing has convinced many users to go down the Plastics route.
We offer our customers finished components manufactured from the widest range of quality materials available anywhere, from standard thermoplastic and thermosetting polymers to high performance in-house elastomers and polymers, from modified plastics to the ultra high performance advanced plastics materials.

ECONOMOS® added value

Our dedicated staff have built up a wide customer based experience and are extremely knowledgeable of engineered plastics and elastomers materials.
We deliver parts made out the widest range of engineered plastics and elastomers. We rely on both our own materials as well on our cooperation with world leading producers like Quadrant.
CAD, CAM and CNC equipment as well as injection moulding are installed to ensure quality parts to optimise the performance of your applications. Our technicians fulfil requirements that call for standard or tight tolerance in general engineered or advanced engineered plastics, in small or large quantities.

Our staff serve a wide customer base in many industrial sectors. We specialise in developing applications by utilising the complete potential of engineered plastics.
The use of industrial thermoplastics has multiplied at a tremendous rate over the last decade. Technical plastic parts are in operation saving money, speeding operations, reducing downtime and simplifying maintenance wherever in the industry.

Range of ECONOMOS® EPP and AEPP parts & services

Finished parts
- machined
- moulded
- form-cast

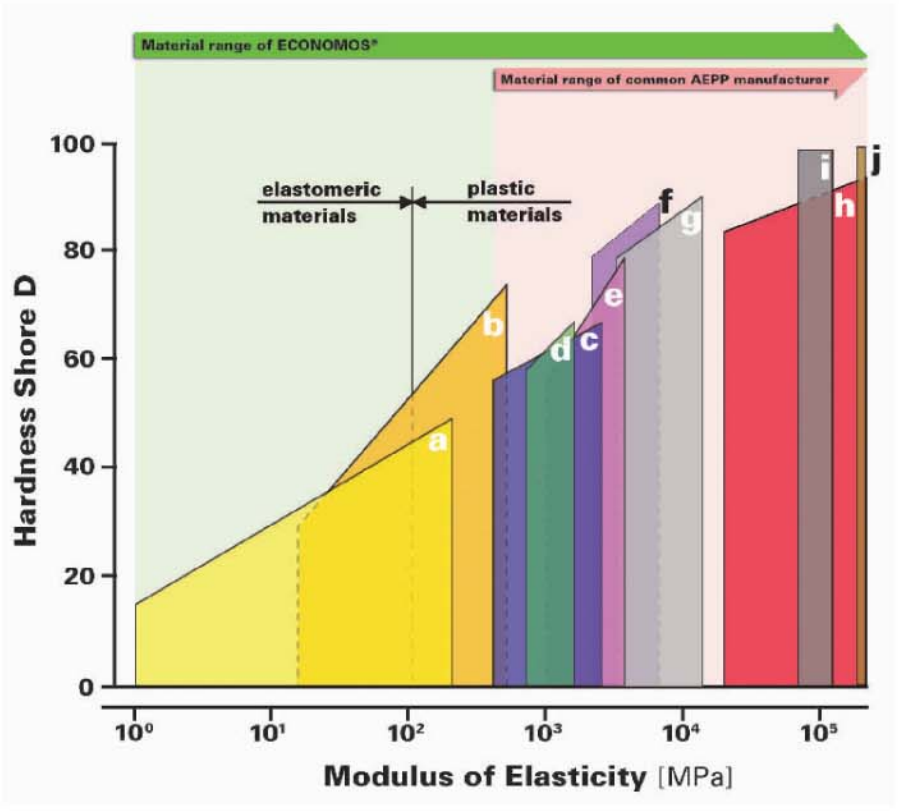

Fig.: Range of hardness as a function of modulus of elasticity for various AEPP material groups

EPP and AEPP - Material range comparison

The figure above shows the wide range of AEPP materials ECONOMOS® is offering to our customers. The figure describes the hardness of the materials in the Shore D scale (maximum hardness in Shore D is 100, which would be covered by steel, stone and crystals for example) as a function of the modulus of elasticity (the modulus of elasticity is a physical constant describing the stiffness of a material or the resistance of the material against deformation). Compared to common AEPP manufacturers, that are mainly working in a modulus range above 200 to 300 MPa (which means the materials must have a minimum hardness because of machining properties of the parts), ECONOMOS® can also offer parts made of lower modulus and hardness. This is due to the fact that ECONOMOS® has over 15 years experience in treating elastomeric materials with a hardness below 50 Shore D by manufacturing sealing elements. We are also able to produce technical parts made of such materials by milling and complex machining techniques.

production tools materials

Technical service / Application development support

Wherever EPP or AEPP parts are an issue, that is where we do our business. At ECONOMOS®, we offer innovative solutions that make us the first call when engineered plastic parts are needed. We provide a comprehensive technical service and are committed to supplying complete solutions best suited to our customers needs.
Our world-wide network of subsidiaries and partners allows us to meet these needs any time, anywhere, around the globe.

Manufacturing concept

ECONOMOS® has invested in the specialist equipment necessary to manufacture components to the highest quality standards. Our skilled team of engineers can assist and advise in the initial design stage or where process improvement is required. We are constantly improving our manufacturing methods with the aim of further increasing our legendary reputation for service and delivery.

5-axis milling machine

Seal-Jet NG 40

Production tolerances

The machining tolerances required for thermoplastic parts are generally considerably larger than those normally applied to metal parts. This is because of - depending on the material - the higher coefficient of thermal expansion, eventual swelling due to moisture absorption and possible deformations caused by internal stress-relieving during and after machining.
The latter phenomenon mainly occurs on parts where machining causes asymmetric and/or heavy section changes. In these cases, a thermal treatment (stress relieving) after premachining and prior to final machining of the part might be necessary.
As a rule of thumb for turned or milled parts, a machining tolerance of 0,1% to 0,2% of the nominal size can be applied without taking special precautions (min. tolerance for small sizes being 0,05 mm). In this respect, the ISO 2768, the DIN 7168, as well as the Swiss VKI-recommendations and tolerances for machined plastic parts can be used as a guide.

Machining tools

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Quality makes the difference

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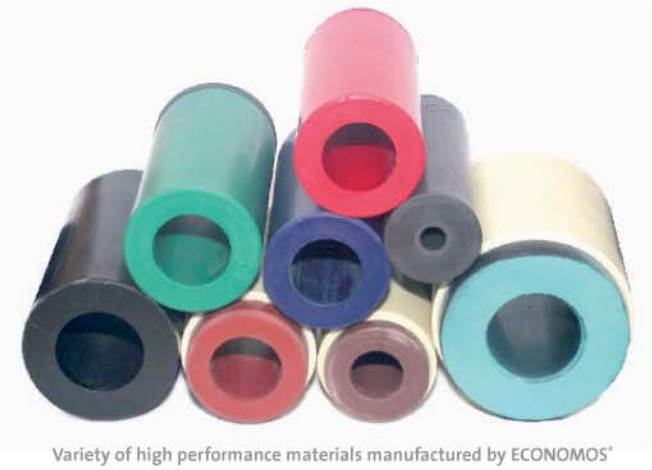
Quality makes the difference

Quality is at the core of everything we do. We make every effort to deliver highest quality EPP or AEPP products that meet our customer´s needs. At ECONOMOS®, we are constantly striving to enforce and improve our quality standards, since customers demand the highest quality engineered plastics solutions to compete in their highly competitive markets and thereby gain a competitive edge on their competitors.

Materials general information

Only high performance materials can meet the demands of the marketplace today and tomorrow. For this reason, we have invested in a state-of-the-art R&D centre at our Austrian group headquarters to constantly improve our materials. Next to our own range of engineered plastics, tailor made compounds and elastomers we use Quadrant as a preferred supplier to offer the widest range of parts to answer your application needs.
The ECONOMOS® family of polyurethanes for instance, is renowned throughout the world. This in-house expertise in the field of polymer science, combined with close co-operation with universities, has given us a truly world class range of materials.



Variety of high performance materials manufactured by ECONOMOS®

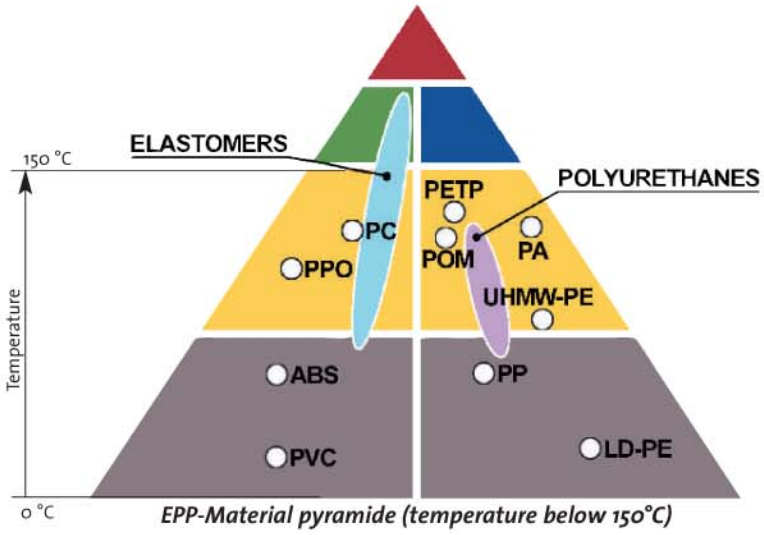
EPP materials and re

Polyamides (PA)

Polyamides (PA) are partially crystalline thermoplastics with good mechanical strength as well as high wear and abrasion resistance. Other physical properties such as impact strength, stiffness or hardness also depend on the moisture content and the PA type respectively. In general polyamides exhibit particularly good resistance to chemicals and high-energy radiation. The differences between the various PA types are mainly determined by the chemical composition and the structure of the molecular chains as well as the crystallinity. By adding modifiers and/or fillers the basic properties of polyamides can be strongly improved to suit specific applications.
The production of the semi-finished products can take place in various procedures: Extruding (E), Casting (G) and Injection moulding.

Bottle clamps

Applications:
Polyamides are used in a wide range of industrial components both for Original Equipment Manufacturing (OEM) and Maintenance Repair and Overhaul (MRO).
Some examples: sleeve and slide bearings, wear pads, support and guide wheels, conveyor rollers, tension rollers, sleeves for wheels and rollers, gear wheels, feed screws, star wheels, insulators, etc.
Bearings and parts also for the use in water equipment (PA 12)



EPP-Material pyramide (temperature below 150°C)

ECOMID 6 E natural (white) / black
[PA 6 E]
Balanced mechanical properties
Good impact resistance down to -40°C
High chemical resistance
Suitable for food and beverage applications
Maximum working temperature: 90°C

ECOMID 6 G natural / black
[PA 6 G]
High mechanical strength, stiffness and creep strength
Good impact resistance in conjunction with high hardness
Good dimensional stability due to low internal stress level
Maximum working temperature: 100°C

ECOMID 6 G oil green
[PA 6 G + oil] (ERTALON® LFX)
Low coefficient of friction
Suitable for applications without lubrication
Maximum working temperature: 100°C

ECOMID 6 G - Mo grey-black
[PA 6 G + MoS2] (NYLATRON® GSM)
Improved sliding properties
Improved wear and abrasion resistance
Maximum working temperature: 100°C

commendations

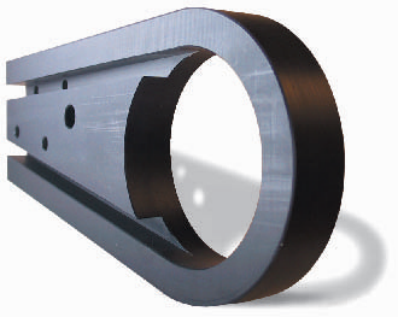
Polyamides (PA)

ECOMID 6 G-SL grey
[PA 6 G + Solid lubricant] (NYLATRON® NSM)
Contains solid lubricant additives which give this material self-lubricity, excellent frictional properties, superior wear resistance and outstanding pressure-velocity capabilities (up to 5 times higher than standard Ecomid).
This grade is particularly suited for higher velocity and unlubricated moving parts applications.


Chain guides

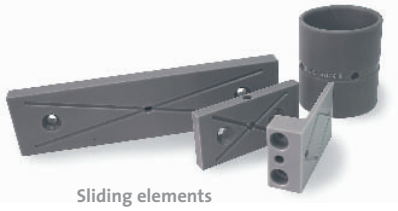
ECOMID 6.6 E natural (cream) / black
[PA 6.6 E]
Physical properties similar to PA 6 E
Better hardness, stiffness, as well as heat resistance
Suitable for food and beverage applications
Maximum working temperature: 110°C

ECOMID 6.6 E - GF black
[PA 6.6 E + 30% glass fibre]
Physical properties similar to PA 6 E - GF
Improved tensile properties, higher elongation at break and lower water absorption
Maximum working temperature: 130°C


Chain guide

ECOMID 6.6 E - Mo grey-black
[PA 6.6 E + MoS2]
The addition of MoS2 renders this material somewhat stiffer, harder and dimensionally more stable than Ecomid 6.6 E.
The nucleating effect of MoS2 results in an improved crystalline structure enhancing bearing and wear properties

ECOMID 4.6 E reddish brown / natural coloured
[PA 4.6 E]
Material with exceptional mechanical properties that nearly belongs to the group of high performance plastics (HPP)
Good stiffness and creep strength even at high temperatures
Better heat ageing resistance in comparison to PA 6 E and PA 6.6 E
Maximum working temperature: 150°C


Sliding elements

ECOMID 12 black
[PA 12]
Better impact strength as well as lower mechanical strength, stiffness and hardness in comparison to PA 6 E and PA 6.6 E
Good dimensional stability due to low water absorption
Better resistance to chemicals than PA 6 and PA 6.6
Maximum working temperature: 80°C

EPP materials and re

Polyacetals (POM)

Polyacetals (POM) are partially crystalline thermoplastics with good mechanical strength, stiffness and hardness, as well as high wear and abrasion resistance. In comparison to the unfilled polyamides, they offer good dimensional stability due to their low water absorption. Moreover, they exhibit good impact strength, creep strength and chemical resistance.
For the manufacturing of semi-finished products both pure homopolymeric raw materials (POM-H - exhibits higher hardness and stiffness as well as better abrasion resistance) and copolymeric raw materials (POM-C - exhibits higher impact strength as well as better chemical and thermal resistance) are used.

Wheels for overhead conveyor

Applications:
Polyacetals are very well suited for machining on automatic lathes and are particularly recommended for mechanical precision parts.
Some examples: gear wheels with small stiffness, cams, heavily loaded bearings and rollers, bearings and bears with small clearances, valve seats, snapfit assemblies, insulating components for electrical engineering, etc.
Parts which operate continuously in water of 60-80°C (POM-C).

Screw conveyor

ECOTAL natural (white) / black
[POM-C]
Balanced mechanical properties
Good chemical resistance
Good resistance to environmental stress cracking
Suitable for food and beverage applications
Maximum working temperature: 110°C

ECOTAL H natural (white) / black
[POM-H]
Better mechanical properties in comparison to POM-C
Good electrical properties
Good resistance to environmental stress cracking
Suitable for food and beverage applications
Maximum working temperature: 110°C

Washer bushing

ECOTAL - GF black
[POM-C + 30% glass fibre]
Improved mechanical strength, stiffness and heat resistance, hydrolysis resistant
Maximum working temperature: 110°C

ECOTAL - SL natural (white) / blue
[POM-C + PE]
Outstanding sliding properties (incorporation of PE acts as a dry lubricant)
Low coefficient of friction
Good Stick-Slip properties
Maximum working temperature: 100°C

Polyethylene terephthalate (PET)

ECOPET polyethylene terephthalate (PET) is a partially crystalline, thermoplastic polyester which exhibits good mechanical strength, stiffness and hardness as well as high wear resistance and very good sliding and friction properties. In comparison to POM materials, ECOPET shows better dimensional stability and creep resistance. Furthermore, ECOPET exhibits good electrical insulating properties and a better resistance to acids than PA and POM.

Valve housing

Applications:
Some examples: heavily loaded bearings (bushings, thrust washers, wear parts, guiding elements, etc.), dimensionally stable parts for precision parts and insulating components for electrical engineering.

ECOPET natural (white) / black
[PET]
Outstanding abrasion resistance as well as good sliding properties
Low coefficient of thermal expansion
Outstanding resistance to environmental stress cracking
Suitable for food and beverage applications
Maximum working temperature: 110°C

ECOPET - SL pale grey
[PET + additives]
Excellent wear and abrasion resistance
Lower coefficient of friction than unmodified PET
Maximum working temperature: 110°C

Source: Quadrant EPP Belgium NV

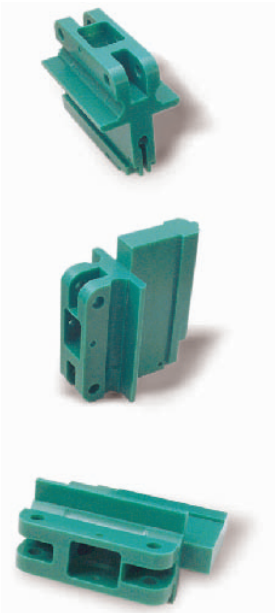
Virgin crystalline PET parts

Polyolefins (PE, PP)

The group of Polyolefins includes Polypropylene (PP) and Polyethylene (PE) in various forms and of course for technical and wear applications the most interesting group are UHMWPE's.
Polyolefins are partially crystalline thermoplastics with excellent electrical insulating properties and good chemical resistance. The low specific density (<1g/cm³), their self-lubricating properties as well as their susceptibility to environmental stress cracking are also characteristic to both materials.

Applications:
Some examples: gears, bearings, wear plates, support-, tension- and deflecting rollers, rope pulleys, chain sprockets, guide strips for conveyor belts and chains, bumpers, scraper blades, piston rings and packings, seals, valves, conveyor screws, star wheels and blends, pumps, filter plates, electroplating drums, pickers, beater caps, linings for bunkers, silos, punching plates, etc.

ECO-WEAR (UHMWPE)
Main Characteristics:
Good wear and abrasion resistance
High impact strength, even at low temperatures
Excellent chemical resistance
Low coefficient of friction
Excellent release properties
Very low water absorption
Moderate mechanical strength, stiffness and creep resistance
Very good electrical insulating and dielectric properties
Physiologically inert (most grades are suitable for food contact)
Good resistance against high energy radiation (gamma- and X-rays)
Not self-extinguishing



Source: Quadrant EPP Belgium NV

Sliding parts

ECO-WEAR 1000 natural-white, green, black, yellow, etc.
molecular weight of about 4.500,000 g/mol, best-balanced properties of all UHMWPE grades, excellent wear and abrasion resistance down to -200°C; good pressure and extrusion resistance; applications in mechanical engineering, bottling applications and packaging machinery; chemical and electroplating industry; cryogenic equipment, etc.

ECO-WEAR 500 natural-white, green, red-brown, black, yellow, etc.
molecular weight of about 500,000 g/mol, compared to ECOWEAR 1000 reduced friction and wear properties but offers better mechanical characteristics as ECO-PEHD. Applications in food industry and for mechanical, chemical and electrical applications

ECOWEAR - ASTL grey-black
[additivated UHMWPE]
modified with self lubricating additives for best frictions properties and also anti-static properties; UV-stabilised for outdoor use.

Recommendations

Polyolefins (PE, PP)

ECO-PEHD natural (white) / black
[PE-HD]
Good impact resistance
Outstanding electrical insulating properties
Suitable for food and beverage applications
Maximum working temperature: 70°C
Processing by welding techniques is possible

Distance washer

ECO-PP natural (white) /grey
[PP-H]
Better mechanical strength, stiffness and hardness as well as lower impact resistance in comparison to PE-HD
Suitable for food and beverage applications
Maximum working temperature: 100°C

Electrical connector housing

AEPP materials and rec

Amorphous materials (PVC, PMMA, ABS, PC)

This group of amorphous materials includes both standard polymers such as PVC and technical polymers like PMMA, ABS and PC. For their use as engineering plastic parts (EPP) amorphous materials are in general limited due to their poor resistance to environmental stress cracking and dynamic loads particularly at elevated temperatures.
Contrary to the partially crystalline materials amorphous materials are transparent due to their molecular structure (without fillers and additives).


Bearing block

Applications:
Some examples: fittings, devices for the chemical industry, housing of electrical tools (PVC-U, ABS), components for precision engineering, safety glazing, insulating parts of electrical engineering, parts in contact with foodstuffs, components for medical and pharmaceutical devices (PMMA, PC).

ECOPVC grey
[Polyvinyl chloride - PVC-U]
Good mechanical strength, stiffness and hardness as well as low impact strength
Good chemical resistance
Susceptibility to environmental stress cracking
Maximum working temperature: 70°C
Processing by gluing and welding techniques are possible

ECOPMMA clear translucent
[Polymethyl methacrylate - PMMA]
Good mechanical strength, stiffness and hardness as well as low impact strength
Good weathering resistance
Susceptibility to environmental stress cracking
Suitable for food and beverage applications
Maximum working temperature: 90°C

ECOPC natural (clear translucent)
[Polycarbonate - PC]
High mechanical strength and impact resistance
Good heat resistance
Good electrical properties
Susceptibility to environmental stress cracking
Suitable for food and beverage applications
Maximum working temperature: 120°C

Recommendations

Fluoropolymers (PTFE, PVDF)

Fluoropolymers are partially crystalline thermoplastics made of fluorinated monomers. To this group of materials belong the not meltable Polytetrafluoroethylene (PTFE) with its compounds and modifications as well as the thermoplastic processable polymers PVDF and PCTFE.
Fluoropolymers exhibit very good electrical and thermal properties combined with excellent chemical resistance. Other physical properties like mechanical strength as well as wear and abrasion resistance depend on the fluorine content or the fillers respectively.


Valve block

Applications:
Suitable for applications in the petro-chemical, chemical, pharmaceutical, food, paper, textile, metallurgical and nuclear industries.
Some examples: static and dynamic seals, piston rings, fittings, gear wheels, fixing elements, pump elements, automobile parts, connector terminals, laboratory requisites, etc.

ECOFLON 1 white
[PTFE virgin]
Outstanding chemical resistance
Poor mechanical strength, hardness and creep resistance
Poor wear and abrasion resistance
Suitable for food and beverage applications
Maximum working temperature: 260°C


Bellow

ECOFLON 2 dark grey
[PTFE + 15% glass fibre + 5% MoS2]
Improved compression strength and stiffness
Improved sliding properties
Maximum working temperature: 260°C

ECOFLON 3 bronze-coloured
[PTFE + 40% bronze]
Improved compression strength and improved sliding properties
Improved thermal conductivity
Maximum working temperature: 260°C

ECOFLON 4 black
[PTFE + 25% carbon]
Improved mechanical strength, stiffness and hardness
Improved sliding properties
Maximum working temperature: 260°C

Fluoropolymers (PTFE, PVDF)

Semifinished products of ECOFLON 1 and ECOFLON 2

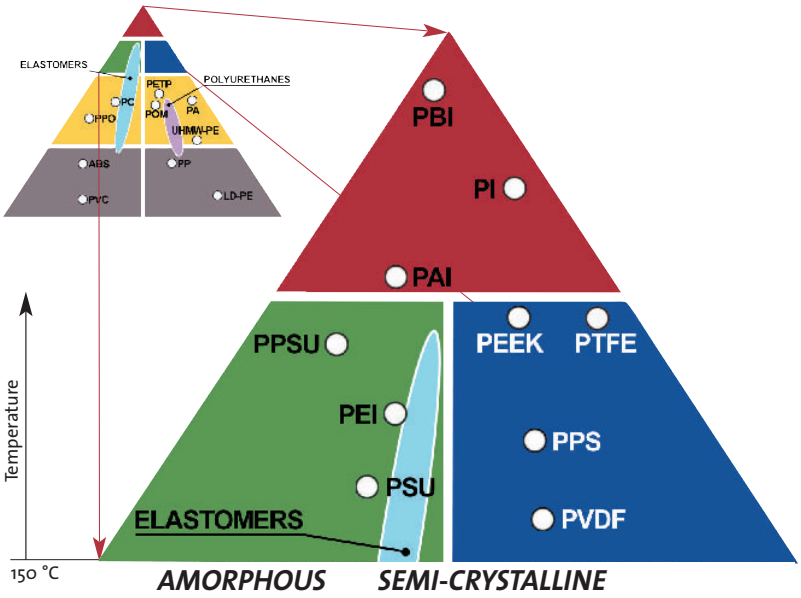
Distance ring

ECOFLON 5 white
[PTFE modified]
Improved wear and abrasion resistance
Suitable for food and beverage applications
Maximum working temperature: 260°C

ECONOMOS® has extensive in-house capabilities for processing PTFE + compounds. Therefore a wide range of various PTFE-compounds, each suited to a particular type of application, are available at ECONOMOS®.
Especially the modification of PTFE with high performance plastics (HPP) such as Polyphenylene sulphide (PPS), Polyaryletherketone (PEEK), etc. create compounds with exceptional properties.

Further popular compounds are:
PTFE + glass
PTFE + graphite
PTFE + 60% bronze
PTFE + EKONOL
PTFE + PI
PTFE + PEEK
etc.

For further information or your inquiries please contact our sales or technical departments.



AEPP-Material pyramide *(temperature above 150°C)*

ECOPVDF natural
[Polyvinylidene fluoride - PVDF]
Good resistance to UV-radiation
Suitable for food and beverage applications
Maximum working temperature: 155°C

ECOPCTFE natural
[Polychlorotrifluoroethylene - PCTFE]
Low coefficient of thermal expansion
Highest hardness and modulus of all fluoropolymers
Maximum working temperature: 160°C

Recommendations

High performance materials (PSU, PES, PPS, PPSU, PEI, PAI, PBI, PI, PEEK)

This group of high performance plastics includes thermoplastics, which are superior to the technical polymers in various respects. However, the main difference is the continuous working temperature. High performance plastics are suitable at temperatures above +150°C without a substantial change of their mechanical properties.
Furthermore a differentiation between standard high performance plastics (maximum operating temperature up to +250°C) and special high performance plastics (developed for extreme applications with temperatures above +250°C) can be made. Theoretically the fluoropolymers also belong to this group of high performance plastics, however they are listed in an own group due to their particularly properties.

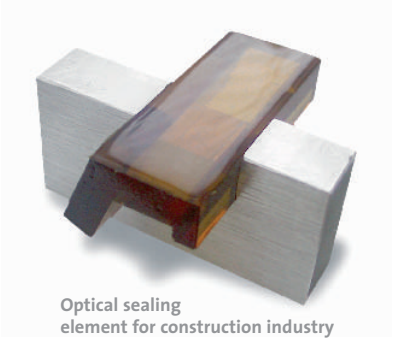
In general the amorphous grades except the outstanding polymers PI and PBI - are not really the best solutions to work correctly in dynamic and tribological applications such as wear plates etc., but offer excellent characteristics for applications in the electronic, medical, food and chemical industry. The semicrystalline grades of AEPP normally offer the best combination of high temperature resistance, excellent wear, abrasive and dynamical properties and chemical resistance. Therefore this material category can be used in wear-applications at high mechanical loading as well as temperature.
The high performance plastics are separated in two categories, the amorphous and the semicrystalline grades.

Source: Quadrant EPP Belgium NV

Amorphous PSU parts

AMORPHOUS GRADES

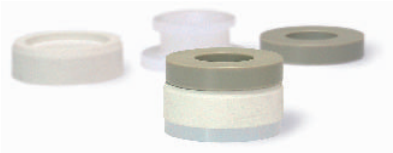
ECOPSU natural colored - yellow translucent
[Polysulphone - PSU]
High mechanical strength and stiffness over a wide temperature range
Good chemical and hydrolysis resistance
Susceptibility to environmental stress cracking
Suitable for food and beverage applications
Maximum working temperature: 160°C
Applications:
Used in food processing equipment (pumps, valves, filtration plates, heat exchangers) and for medical components subject to repeated cleaning and sterilisation.



Optical sealing
element for construction industry

ECOPES natural colored - yellow translucent
[Polyether sulphone - PES]
High mechanical strength and stiffness over a wide temperature range
Good chemical and hydrolysis resistance
High flame resistance
Susceptibility to environmental stress cracking
Maximum working temperature: 190°C
Applications:
Used as sleeve and slide bearings, housings, connector terminals, etc.

High performance materials (PSU, PES, PPS, PPSU, PEI, PAI, PBI, PI, PEEK)



High pressure seal

ECOPPSU black, brown translucent
[Polyphenylsulphone - PPSU]
Better impact strength and chemical resistance than PSU and PEI
Outstanding chemical and hydrolysis resistance. Suitable for food and beverage applications
Maximum working temperature: 190°C
Applications:
Used in medical and pharmaceutical industries e.g. for medical devices which are subjected to repeated steam autoclaving.

ECOPEI natural colored - yellow translucent
[Polyetherimide - PEI]
Outstanding mechanical, thermal and electrical properties
High flame and chemical resistance. Susceptibility to environmental stress cracking.
Suitable for food and beverage applications
Maximum working temperature: 170°C
Applications:
Suitable for electrical/electronic insulators and a variety of structural components.

Special parts according to customer design

ECOPI ochre
[Polyimide - PI] (VESPEL-SP®)
Excellent mechanical strength, stiffness and creep strength
Excellent wear and abrasion resistance as well as good sliding properties. Very low coefficient of thermal expansion. Excellent resistance to high energy radiation
Maximum working temperature: 280°C
Applications:
Used as valve seats, seals, insulators, etc.

ECOPBI black
[Polybenzimidazole - PBI] (CELAZOLE®)
Highest temperature resistance and best mechanical property retention of all unfilled thermoplastics. Excellent wear and abrasion resistance. Extremely low coefficient of thermal expansion
Maximum working temperature: 320°C
Applications:
Suitable for applications in high-tech industries e.g. semiconductor and aerospace industries.

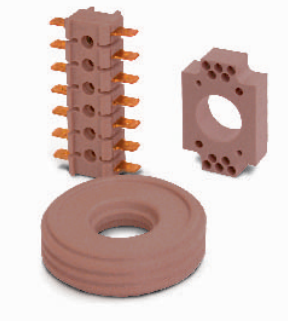
Source: Quadrant EPP Belgium NV

Special parts according to customer design

ECOPAI yellow-ochre
[Polyamideimide - PAI] (TORLON®)
Excellent mechanical strength, stiffness and creep resistance
Very low coefficient of thermal expansion. Excellent wear and friction properties
Outstanding flame resistance
Maximum working temperature: 260°C
Applications:
Suitable for precision parts in high-tech equipment as well as in the field of elec-

Recommendations

High performance materials (PSU, PES, PPS, PPSU, PEI, PAI, PBI, PI, PEEK)



Electrical connector and parts according to customer design

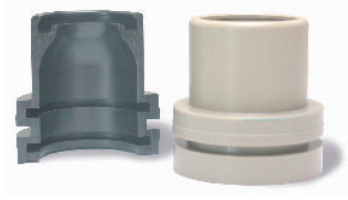
trical components

SEMICRYSTALLINE GRADES

ECOPPS brown
[Polyphenylene sulphide - PPS]
Outstanding chemical and hydrolysis resistance. Outstanding electrical insulating properties. Maximum working temperature: 230°C
Applications:
Suitable for all kinds of industrial equipment such as industrial drying and food processing ovens, chemical process equipment and electrical insulating equipment.

ECOPPS - GF brown
[Polyphenylene sulphide - PPS + 40% glass fibre]
Improved mechanical strength and stiffness in comparison to the unfilled type
Outstanding wear and abrasion resistance
Maximum working temperature: 240°C

TECHTRON® HPV PPS dark blue
Polyphenylene sulphide + lubricants)
Internally lubricated semicrystalline polymer based on PPS which offers excellent wear and friction properties combined with food temperature characteristics at a reasonable price level.



Bottle filling heads

ECOPAEK (KETRON® PEEK 1000) cream
[Polyaryletherketone - PEEK]
High mechanical strength, stiffness and hardness. Excellent wear and friction behaviour. Excellent resistance to high energy radiation. High chemical resistance. Suitable for food and beverage applications
Maximum working temperature: 260°C
Applications:
Used in the medical, pharmaceutical and food processing industries.

ECOPAEK - GF (KETRON® PEEK - GF 30) cream
[Polyaryletherketone - PEEK + 30% glass fibre]
Higher stiffness and creep resistance as well as better dimensional stability in comparison to the unfilled type
Maximum working temperature: 260°C

ECOPAEK - CF (KETRON® PEEK - CA 30) black
[Polyaryletherketone - PEEK + 30% carbon fibre]
Improved mechanical properties (mechanical strength and creep resistance) than PEEK - GF30. Optimum wear behaviour
Maximum working temperature: 260°C

Special parts according to customer design

ECOPAEK - SL (KETRON® PEEK - HPV) black
[Polyaryletherketone - PEEK + various solid lubricants]
Outstanding sliding properties. Low coefficient of friction. Good Stick-Slip pro-

Elastomers (NBR, H-NBR, FKM)

perties. Maximum working temperature: 260°C

The material name ECORUBBER designate rubber grades made of crosslinked synthetic materials by ECONOMOS®.

In general elastomers (vulcanized rubbers) show high elasticity as well as low modulus of elasticity values in comparison to thermoplastic materials. Elastomers are not processable like thermoplastics because they cannot be melted without deterioration due to their crosslinked structure.

Applications:

Some examples: sealing elements, gaskets, damping elements, AEPP for automotive applications, elastomeric springs, scrapers for industry, rollers, sieves, parts for couplings, etc.

Special sealing element

ECORUBBER 1 85 Shore A black
[Acrylonitrile butadiene rubber - NBR]
Good dynamic fatigue resistance
Good wear and abrasion resistance
Outstanding resistance to mineral oils
Maximum working temperature: 100°C

ECORUBBER-H 85 Shore A black
[Hydrogenated acrylonitrile butadiene rubber - H-NBR]
Improved strength properties such as tensile strength and elongation in comparison to ECORUBBER 1 (NBR)
Good low temperature properties
Good resistance to high energy radiation
Excellent ozone and heat resistance
Maximum working temperature: 150°C

Spindle wiper and bushing

ECORUBBER 2 83 Shore A brown
[Fluorocarbon rubber - FKM]
Outstanding chemical resistance as well as mineral oil resistance
High resistance to ozone and weathering
Excellent heat resistance
Very good flame resistance
Maximum working temperature: 200°C

Materials recommendations

Elastomers (EPDM, MVQ, TFE/P)

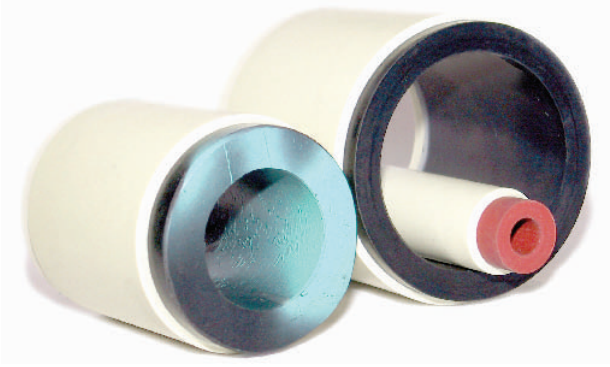
ECORUBBER 3 85 Shore A black
[Ethylene propylene diene rubber - EPDM]
Lowest specific gravity of all rubber grades
Very good mechanical properties such as stress strain behaviour
Good chemical resistance
Excellent resistance to weathering as well as moisture and steam
Good resistance to heat
Maximum working temperature: 150°C

ECOSIL 85 Shore A reddish brown
[Silicone rubber - MVQ]
Very good low temperature stability and flexibility
Excellent resistance to oxygen, ozone and UV-radiation
Good electrical insulating properties
Excellent heat resistance
Suitable for food and beverage applications
Maximum working temperature: 200°C

Special tube sealing element

ECOFLAS 83 Shore A black
[Tetrafluoroethylene propylene rubber - TFE/P]
Better mechanical properties such as tensile strength in comparison to ECORUBBER 2
Outstanding resistance to hot water and hot steam
Good resistance to high energy radiation
Maximum working temperature: 200°C

In addition, many special elastomeric grades, also suitable for food applications, are available on request. Please contact our sales department.



Semifinished products:
ECORUBBER-H, ECOFLAS, ECOSIL

Polyurethanes (TPU)

ECOPUR® is the name of a group of thermoplastic polyurethane elastomers developed by ECONOMOS®. Thermoplastic elastomers like TPU´s are in a sense intermediate between elastomers and thermoplastics. They exhibit properties similar to those of elastomers, also they are processable like thermoplastics.
Materials of this group combine good mechanical properties with generally good wear and abrasion resistance.

Applications:
Some examples: sealing elements, gaskets, damping elements, AEPP for automotive applications, elastomeric springs, scrapers for industry, rollers, sieves, parts for couplings, etc.


Tool holder

ECOPUR® green
[TPU]
Good mechanical properties as well as high wear and abrasion resistance
Good resistance to mineral oils
Good ozone, weather and temperature resistance
Low gas permeability
Very good resistance to high energy radiation
Maximum working temperature: 110°C


Bellows

H-ECOPUR® red
[Hydrolysis resistant TPU]
Mechanical properties similar to ECOPUR
High hydrolysis stability and high chemical resistance
Very low gas permeability
Suitable for food and beverage applications
Maximum working temperature: 110°C

S-ECOPUR® grey/black
[TPU + solid lubricants]
Outstanding sliding properties as well as excellent wear and abrasion resistance
Maximum working temperature: 110°C


Worm gear

T-ECOPUR® blue
[Low temperature TPU]
Very good elasticity even at temperatures up to -50°C
Maximum working temperature: 110°C

G-ECOPUR® red
[Cast TPU]
Mechanical and chemical characteristics similar to H-ECOPUR
Applications with dimensions up to 4000 mm and large cross sections
Maximum working temperature: 110°C

Materials recommendations

X-ECOPUR® grades

X-ECOPUR® grades are special polyurethanes developed by ECONOMOS® with higher hardness compared to the ECOPUR® grades and therefore better machinability. They also offer a higher pressure resistance and excellent wear and sliding properties. Therefore, they are commonly used when parts with outstanding tribological properties in combination with good elasticity and low stiffness compared to plastics are needed.

Gripper parts

X-ECOPUR® - 57D dark green
[TPU]
Good mechanical properties as well as very good wear and abrasion resistance
Good resistance to mineral oils
Good ozone, weather and temperature resistance
Low gas permeability
Very good resistance to high energy radiation
Maximum working temperature: 110°C

XH-ECOPUR® - 60D dark red
[Hydrolysis resistant TPU]
Mechanical properties similar to ECOPUR
High hydrolysis stability and high chemical resistance
Very low gas permeability
Maximum working temperature: 110°C

XS-ECOPUR® - 57D grey/black
[TPU + solid lubricants]
Outstanding sliding properties as well as excellent wear and abrasion resistance
Maximum working temperature: 110°C

Semifinished products manufactured by ECONOMOS®:
X-ECOPUR®-57D, XH-ECOPUR®-60D, XS-ECOPUR®-57D

EPP material specs (physical properties)

PROPERTIES		METHODS ISO (IEC)	UNIT	ECOMID 6 E	ECOMID 6 G	ECOMID 6 G Oil	ECOMID 6 G-Mo	ECOMID 6 G-SL	ECOMID 6.6 E	ECOMID 6.6 E-GF	ECOMID 6.6 E-Mo	ECOMID 4.6 E	ECOMID 12	ECOTAL	ECOTAL H	ECOTAL GF	ECOTAL SL	ECOPET	ECOPET SL	ECOWEAR 1000	ECOWEAR 500	ECOWEAR ASTL	ECOPEHD	ECOPP	ECOPVC	ECOPMMA	ECOPC
				PA 6 E	PA 6 G	PA 6 G	PA 6 G	PA 6 G	PA 6.6 E	PA 6.6 E	PA 6.6 E	PA 4.6 E	PA 12	POM-C	POM-H	POM-C	POM-C + PE	PET	PET	PE-UHMW	PE - HMW	PE - UHMW	PE-HD	PP - H	PVC - U	PMMA	PC
Colour		-	-	natural(white)/black	black	green	grey-black	grey	natural(cream)/black	black	grey-black	reddish brown	black	natural(white)/black	natural(white)/black	black	natural(white)/blue	natural(white)/black	pale grey	white, etc.	white, etc.	black	natural(white)/black	beige/grey	grey	clear translucent	nat. (clear, translucent)
Density		1183	g/cm³	1,14	1,15	1,135	1,16	1,15	1,14	1,29	1,15	1,18	1,01	1,41	1,43	1,6	1,34	1,39	1,44	0,93	0,96	0,95	0,95	0,91	1,39	1,18	1,2
Average molar mass (average molecular weight) (1)		-	10³ g/mol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.5	0,5	7	0,3	-	-	-	-
Water absorption:																											
- after 24 / 96 h immersion in water of 23°C (2)		62	mg	86 / 168	44 / 83	44 / 83	52 / 98	40 / 76	40 / 76	30 / 56	46 / 85	90 / 180	-	20 / 37	18 / 36	-	-	6 / 13	5 / 11	-	-	-	-	-	14 - 18	-	13 / 23
		62	%	1,28 / 2,50	0,65 / 1,22	0,66 / 1,24	0,76 / 1,43	0,59 / 1,12	0,60 / 1,13	0,39 / 0,74	0,68 / 1,25	1,30 / 2,60	-	0,24 / 0,45	0,21 / 0,43	-	-	0,07 / 0,16	0,06 / 0,13	-	-	-	-	-	-	-	0,18 / 0,33
- at saturation in air of 23°C / 50% RH		-	%	2,6	2,2	2	2,4	2	2,4	1,7	2,3	2,8	0,8	0,2	0,2	0,2	0,2	0,25	0,23	-	-	-	-	-	0,05	0,65	0,15
- at saturation in water of 23°C		-	%	9	6,5	6,3	6,7	6,3	8	5,5	7,8	9,5	1,5	0,85	0,85	0,6	0,8	0,5	0,47	0,01	0,01	0,05	0,02	0,2	-	1,95	0,35
Thermal Properties (3)																											
Melting temperature		-	°C	220	220	220	220	220	255	255	255	295	180	165	175	165	165	255	255	130 - 135	130 - 135	130 - 135	126 - 136	160 - 168	-	-	-
Glass transition temperature (4)		-	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	105	150
Thermal conductivity at 23°C		-	W/(K•m)	0,28	0,29	0,28	0,30	0,29	0,28	0,30	0,29	0,30	0,23	0,31	-	-	-	0,29	0,29	0,40	0,40	0,40	0,35 - 0,51	0,22	0,16	0,19	0,21
Coefficient of linear thermal expansion:																											
- average value between 23 and 60°C		-	m/(m•K)	90 • 10⁻⁶	80 • 10⁻⁶	80 • 10⁻⁶	80 • 10⁻⁶	80 • 10⁻⁶	80 • 10⁻⁶	50 • 10⁻⁶	80 • 10⁻⁶	80 • 10⁻⁶	150 • 10⁻⁶	110 • 10⁻⁶	95 • 10⁻⁶	30 • 10⁻⁶	140 • 10⁻⁶	60 • 10⁻⁶	65 • 10⁻⁶	-	-	-	-	-	80 • 10⁻⁶	70 • 10⁻⁶	65 • 10⁻⁶
- average value between 23 and 100°C		-	m/(m•K)	105 • 10⁻⁶	90 • 10⁻⁶	90 • 10⁻⁶	90 • 10⁻⁶	95 • 10⁻⁶	95 • 10⁻⁶	60 • 10⁻⁶	90 • 10⁻⁶	90 • 10⁻⁶	-	125 • 10⁻⁶	110 • 10⁻⁶	50 • 10⁻⁶	-	80 • 10⁻⁶	85 • 10⁻⁶	200 • 10⁻⁶	200 • 10⁻⁶	200 • 10⁻⁶	180 • 10⁻⁶	160 • 10⁻⁶	-	-	65 • 10⁻⁶
Temperature of deflection under load																											
- method A: 1,8 MPa	+	75	°C	70	80	75	80	75	85	150	85	160	50	105	115	153	88	75	75	42	44	42	40 - 57	60 - 70	60 - 72	90 - 105	130
Vicat softening temperature - VST / B50		306	°C	-	-	-	-	-	-	-	-	-	136	-	-	-	142	-	-	80	80	83	120 - 135	154	70	-	-
Max. allowable service temperature in air:																											
- for short periods (5)		-	°C	160	170	165	170	165	180	240	180	200	150	140	150	140	140	160	160	120	120	120	120	140	80	95	135
- continuously: for 5.000 / 20.000 h (6)		-	°C	85 / 70	105 / 90	105 / 90	105 / 90	105/90	95 / 80	120 / 110	95 / 80	155 / 135	80 / 70	115 / 100	105 / 90	115 / 100	100 / 80	115 / 100	115 / 100	- / 80	- / 80	- / 80	100 / 80	110 / 100	70 / 60	90 / 80	125 / 115
Min. service temperature (7)		-	°C	-40	-30	-20	-30	-30	-30	-20	-20	-40	-70	-50	-50	-	-50	-20	-20	-200	-100	-150	-40	0	0	-40	-60
Flammability (8)																											
- "Oxygen Index"		4589	%	25	25	-	25	-	26	-	26	24	-	15	15	-	-	25	25	< 20	< 20	< 20	17	-	-	-	25
- according to UL 94 (thickness 1,5 / 3 / 6 mm)		-	-	- / HB / HB	- / HB / HB	- / HB / HB	- / HB / HB	- / HB / HB	- / HB / V-2	- / HB / HB	- / HB / HB	- / HB / HB	- / HB / -	- / HB / HB	- / HB / HB	- / HB / -	-	- / HB / HB	- / HB / HB	HB / - / -	HB / - / -	HB / - / -	- / HB / -	- / B2 / -	- / B1 / -	- / B2 / -	- / HB / HB
Mechanical Properties at 23°C (9)																											
Tensile test (10)																											
- tensile stress at yield / tensile stress at break (11)	+	527	MPa	76 / -	85 / -	70 / -	78 / -	76 / -	90 / -	- / 100	92 / -	100 / -	46 / -	68 / -	78 / -	- / 125	45 / -	90 / -	- / 76	19 / -	28 / -	20 / -	20 - 28 / 25 - 32	30 - 35 / 30 - 35	55 - 70 / -	80 / -	70 / -
	++	527	MPa	45 / -	55 / -	45 / -	50 / -	50 / -	55 / -	- / 75	55 / -	55 / -	36 / -	68 / -	78 / -	- / 125	45 / -	90 / -	- / 76	19 / -	28 / -	20 / -	20 - 28 / 25 - 32	30 - 35 / 30 - 35	55 - 70 / -	80 / -	70 / -
- tensile strain at yield / tensile strain at break (11)	+	527	%	- / > 50	- / 25	- / 25	- / 25	- / 25	- / 40	- / 5	- / 20	- / 25	- / 280	- / 35	- / 35	- / 3	- / 10	- / 15	- / 7	15 / > 50	10 / > 50	15 / > 50	8 - 12 / 600 - 900	- / > 400	- / 8 - 20	- / 5,5	- / > 50
	++	527	%	- / > 100	- / > 50	- / > 50	- / > 50	- / > 50	- / > 100	- / 12	- / > 50	- / > 100	- / 250	- / 35	- / 35	- / 3	- / 10	- / 15	- / 7	15 / > 50	10 / > 50	15 / > 50	8 - 12 / 600 - 900	- / > 400	- / 8 - 20	- / 5,5	- / > 50
- tensile modulus of elasticity (12)	+	527	MPa	3.250	3.500	3.000	3.300	3.100	3.450	5.900	3.500	3.300	1.500	3.100	3.600	9.000	2.300	3.700	3.450	750	1350	770	700 - 1.200	1.400 - 1.600	2.800 - 3.300	3.300	2.400
	++	527	MPa	1.400	1.700	1.450	1.600	1.500	1.650	3.200	1.675	1.300	1.100	3.100	3.600	9.000	2.300	3.700	3.450	750	1350	770	700 - 1.200	1.400 - 1.600	2.800 - 3.300	3.300	2.400
Compression test (13)																											
- compressive stress at 1 / 2 / 5 % nominal strain (12)	+	604	MPa	24 / 46 / 80	26 / 51 / 92	22 / 43 / 79	25 / 49 / 88	23 / 44 / 81	25 / 49 / 92	28 / 55 / 90	25 / 49 / 92	23 / 45 / 94	-	19 / 35 / 67	22 / 40 / 75	-	-	26 / 51 / 103	24 / 47 / 95	4,5 / 8 / 14	9 / 15 / 23	5 / 9 / 15	-	-	-	-	18 / 35 / 72
Creep test in tension (10)																											
- stress to produce 1 % strain in 1.000 h (s1/1.000)	+	899	MPa	18	22	18	21	18	20	26	21	22	-	13	15	-	-	26	23	-	-	-	3	4	-	-	17
	++	899	MPa	7	10	8	9	8	8	18	9	7,5	-	13	15	-	-	26	23	-	-	-	3	4	-	-	17
Charpy impact strength - Unnotched (14)	+	179 / 1eU	kJ/m²	no break	no break	> 50	no break	100	no break	> 50	no break	no break	no break	> 150	> 200	30	30	> 50	30	no break	no break	no break	no break	no break	no break	12	no break
Charpy impact strength - Notched (15)	+	179 / 1eU	kJ/m²	5,5	3,5	4	3,5	4	4,5	6	4	8	8	7	10	-	3	2	2,5	-	-	-	-	2,5 - 5	> 2	2	9
Izod impact strength - Notched	+	180 / 2A	kJ/m²	5,5	3,5	4	3,5	4	4,5	6	4	8	8	7	10	-	3	2	2,5	-	-	-	-	-	-	-	9
	++	180 / 2A	kJ/m²	15	7	7	7	7	11	11	9	25	-	7	10	-	3	2	2,5	-	-	-	-	-	-	-	9
Ball indentation hardness (16)	+	2039 - 1	N/mm²	150	165	145	160	150	160	165	165	165	95	140	160	-	110	170	160	36	45	37	35 - 55	78 - 90	120 - 140	200	120
Rockwell hardness (16)	+	2039 - 2	-	M 85	M 88	M 82	M 84	M 81	M 88	M 76	M 88	M 92	-	M 84	M 88	-	-	M 96	M 94	-	-	-	-	-	-	M90	M 75
Electrical Properties at 23°C (3)																											
Electric strength (17)	+	(60243)	kV/mm	25	25	22	24	25	27	30	26	25	27	20	20	50	35	22	21	45	45	-	50	35 - 40	40 - 50	30	28
	++	(60243)	kV/mm	16	17	14	16	17	18	20	17	15	-	20	20	50	35	22	21	45	45	-	50	35 - 40	40 - 50	30	28
Volume resistivity (18)	+	(60093)	Ω•cm	> 10¹⁴	> 10¹⁴	> 10¹⁵	> 10¹⁵	> 10¹⁴	> 10¹⁴	> 10¹⁴	> 10¹⁴	> 10¹⁴	10¹⁵	> 10¹⁵	> 10¹⁴	10¹⁵	10¹⁶	> 10¹⁵	> 10¹⁵	> 10¹⁴	> 10¹⁴	< 10¹⁶	> 10¹⁷	> 10¹⁶	> 10¹⁵	> 10¹⁵	> 10¹⁵
	++	(60093)	Ω•cm	> 10¹⁵	> 10¹⁵	> 10¹⁵	> 10¹⁵	> 10¹⁵	> 10¹⁵	> 10¹⁵	> 10¹⁵	> 10¹⁵	-	> 10¹⁵	> 10¹⁴	10¹⁵	10¹⁶	> 10¹⁵	> 10¹⁵	> 10¹⁴	> 10¹⁴	< 10¹⁶	> 10¹⁷	> 10¹⁶	> 10¹⁵	> 10¹⁵	> 10¹⁵
Surface resistivity	+	(60093)	Ω	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	10¹⁴	> 10¹³	> 10¹³	-	10¹⁴	> 10¹⁴	> 10¹⁴	> 10¹³	> 10¹³	< 10¹⁶	> 10¹³	> 10¹³	10¹⁴	> 10¹³	> 10¹⁵
	++	(60093)	Ω	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	> 10¹³	-	> 10¹³	> 10¹³	-	10¹⁴	> 10¹⁴	> 10¹⁴	> 10¹³	> 10¹³	< 10¹⁶	> 10¹³	> 10¹³	10¹⁴	> 10¹³	> 10¹⁵
Relative permittivity er																											
- at 100 Hz	+	(60250)	-	3,9	3,6	3,5	3,6	3,6	3,8	3,9	3,8	3,8	-	3,8	3,8	-	3,8	3,4	3,4	2,1	2,4	-	-	2,3	-	-	3
	++	(60250)	-	7,4	6,6	6,5	6,6	6,6	7,4	6,9	7,4	7,4	-	3,8	3,8	-	3,8	3,4	3,4	2,1	2,4	-	-	2,3	-	-	3
- at 1 MHz	+	(60250)	-	3,3	3,2	3,1	3,2	3,2	3,3	3,6	3,3	3,4	2,5	3,8	3,8	4,8	3,8	3,2	3,2	3	2,4	-	2,4	-	2,9 - 3,2	2,9	3
	++	(60250)	-	3,8	3,7	3,6	3,7	3,7	3,8	3,9	3,8	3,8	-	3,8	3,8	4,8	3,8	3,2	3,2	3	2,4	-	2,4	-	2,9 - 3,2	2,9	3
Dielectric dissipation factor tan d																											
- at 100 Hz	+	(60250)	-	0,019	0,012	0,015	0,012	0,012	0,013	0,012	0,013	0,009	-	0,003	0,003	-	-	0,001	0,001	0,0004	0,0002	-	-	-	-	-	0,001
	++	(60250)	-	0,13	0,14	0,15	0,14	0,14	0,13	0,19	0,13	0,13	-	0,003	0,003	-	-	0,001	0,001	0,0004	0,0002	-	-	-	-	-	0,001
- at 1 MHz	+	(60250)	-	0,021	0,016	0,016	0,016	0,016	0,020	0,014	0,020	0,019	0,031	0,008	0,008	0,005	0,007	0,014	0,014	0,001	0,0002	-	0,0002	0,0002	0,015	0,030	0,008
	++	(60250)	-	0,06	0,05	0,05	0,05	0,05	0,060	0,040	0,06	0,060	-	0,008	0,008	0,005	0,007	0,014	0,014	0,001	0,0002	-	0,0002	0,0002	0,015	0,030	0,008
Comparative tracking index (CTI)	+	(60112)	-	600	600	600	600	600	600	475	600	400	600	600	600	-	600	600	600	600	600	-	600	600	300 - 600	-	350 (225)
	++	(60112)	-	600	600	600	600	600	600	475	600	400	600	600	600	-	600	600	600	600	600	-	600	600	300 - 600	-	350 (225)
Chemical & Environmental Resistance (19)																											
Acids, diluted		-	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	-	A	A	-	A	A	A	B	A
Acids, concentrated		-	-	C	C	C	C	C	C	C	C	C	B - C	C	C	C	C	B	-	A	A	-	A	A	B	B	B
Alkalis, diluted		-	-	A	A	A	A	A	A	A	A	A	A	A	B	A	A	B	-	A	A	-	A	A	A	B	B - C
Alkalis, concentrated		-	-	B - C	B - C	B - C	B - C	B - C	B - C	B - C	B - C	B - C	B - C	A	C	A	A	C	-	A	A	-	A	A	A	B	C
Hot water / water vapour		-	-	B	B	B	B	B	B	B	B	B	A	A	B	A	B	B	-	B	B	-	B	B	B	B	A
UV Radiation		-	-	B / A	B / A	B	A	A	B / A	A	A	B	B	C / B	B	B	B	A	-	B / A	B / A	-	B / A	-	C	B	B
Gamma Radiation		-	log (gray)	6,5	6,0	6,0	6,0	-	6,5	6,5	-	-	-	4,0	4,0	-	-	6,0	-	6,0	6,0	-	-	-	-	-	5,5
Food contact		-	-	+	-	-	-	-	+	-	-	-	-	+	+	-	-	+	-	+	+	-	+	+	-	+	+

CAPTION

+ values referring to dry material.

++ values referring to material in equilibrium with the standard atmosphere 23°C / 50% RH (mostly derived from literature).

(1) Calculated by means of the Margolies-equation M= 5.37 x 104 x [h] 1,49, with [h] being the Staudinger index derived from a viscosity measurement using decahydronaphtalene as a solvent.

(2) Tests were done on discs with Dia 50 x 3 mm, for Polyolefins on discs with Dia 50 x 1 mm.

(3) The figures given for these properties are for the most part derived from raw material supplier data and other publications.

(4) Values for this property are only given here for amorphous materials and not for semicrystalline ones.

(5) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.

(6) Temperature resistance over a period of 5.000 / 20.000 hours. After these periods of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature values given here are thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that, as far all thermoplastics, the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.

(7) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The values given here are based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limits.

(8) These estimated ratings, derived from raw material supplier data, are not intended to reflect hazards presented by the materials under actual fire conditions. There are no UL-yellow cards available for these stock shapes.

(9) The figures given for these properties are for the most part average values of tests run on test specimens machined out of rods of 40 - 60 mm as well as 20 mm thick plates.

(10) Test specimens: Type 1 B.

(11) Test speed: 20 mm/min (50 mm/min for Polefins, 5 mm/min for glass fibre reinforced thermoplastics).

(12) Test speed: 1 mm/min.

(13) Test specimens: cylinders with Dia 12 x 30 mm.

(14) Pendulum used: 15 J.

(15) Pendulum used: 5 J.

(16) 10 mm thick test specimens.

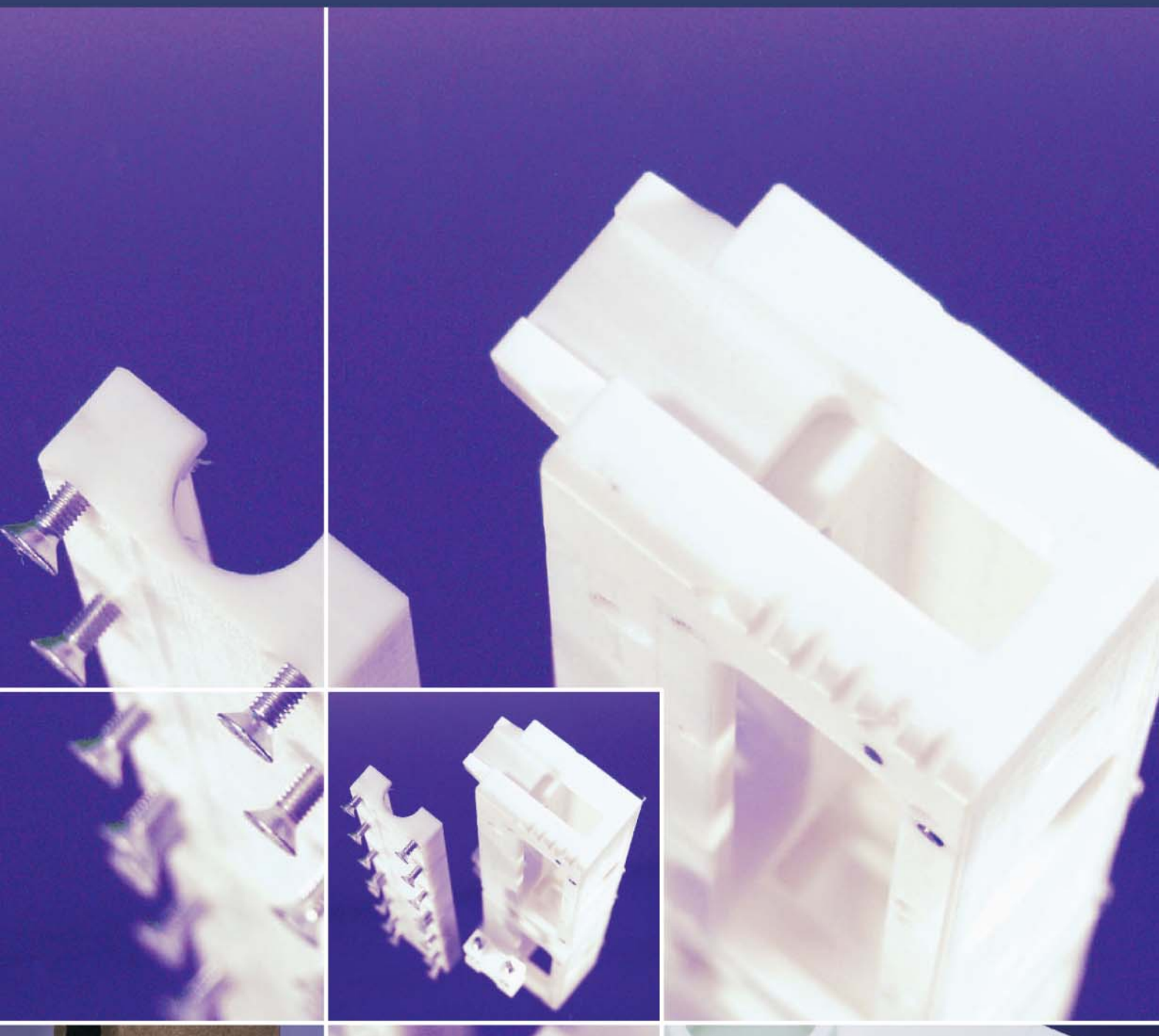
(17) Electrode configuration: Dia 25 / Dia 75 mm coaxial cylinders; in transformer oil according to IEC 60296; 1 mm thick natural coloured test specimens. It is important to know that the electric strength of black extruded material can be as low as 50% of the value for natural material. Possible microporosity in the centre of polyacetal stock shapes also significantly reduces the electric strength.

(18) For the black version of ECOWEAR 1000 and ECOWEAR 500 the electrical properties regarding surface resistivity can be < 10¹⁰ Ω.

(19) Symbolic rating:
- **A** Excellent
- **B** Good / fair
- **C** Poor
- **+** Suitable for food-stuff applications
- **-** No data available, not suitable for food and beverage applications

This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.

It has to be noted that glass fibre reinforced thermoplastics are anisotropic materials (properties differ when measured parallel and perpendicular to the extrusion direction).



AEPP material specs (physical properties)

PROPERTIES	METHODS ISO (IEC)	UNIT	ECOFLON 1	ECOFLON 2	ECOFLON 3	ECOFLON 4	ECOFLON 5	ECOPVDF	ECOPCTFE	ECOPSU	ECOPES	ECOPPSU	ECOPEI	ECOPI	ECOPBI	ECOPAI	ECOPPS	ECOPPS GF	TECHTRON HPV	ECOPAEK	ECOPAEK GF	ECOPAEK CA	ECOPAEK SL
			PTFE	PTFE (+ 15% glass fiber + 5% MoS2)	PTFE (+ 40% Bronze)	PTFE (+ 25% Carbon)	PTFE modified	PVDF	PCTFE	PSU	PES	PPSU	PEI	PI	PBI	PAI	PPS	PPS (+ 40% glass fiber)	PPS (+ lubricants)	PEEK	PEEK (+ 30% glass fiber)	PEEK (+ 30% carbon fiber)	PEEK (+ various solid lubricants)
Colour	-	-	white	dark grey	bronze	black	white	natural (white)	natural (white)	nat. (yellow,translucent)	nat. (yellow,translucent)	black	nat. (amber,translucent)	natural (chestnut)	black	yellow - ochre	beige	brown-beige	dark blue	cream/black	natural (brownish grey)	black	black
Density	1183	g/cm³	2,17	2,25	3,0	2,1	2,16	1,79	2,13	1,24	1,27	1,29	1,27	1,43	1,3	1,41	1,35	1,64	1,43	1,32	1,51	1,41	1,45
Water absorption:																							
- after 24 / 96 h immersion in water of 23°C (1)	62	mg	-	-	-	-	-	1 / 3	-	23 / 44	-	26 / 55	20 / 41	20 / 39	38 / 81	29 / -	-	-	-	5 / 10	-	-	-
	62	%	-	-	-	-	-	0,01 / 0,03	-	0,32 / 0,61	-	0,35 / 0,72	0,26 / 0,54	0,24 / 0,46	0,5 / 1,06	0,35 / -	-	0,05 / -	0,01 / 0,03	0,06 / 0,12	-	-	0,05 / 0,11
- at saturation in air of 23°C / 50% RH	-	%	< 0,01	0,02	-	-	-	0,05	< 0,01	0,4	0,7	0,6	0,75	1,2	-	2,5	-	-	0,03	0,2	0,14	0,14	0,14
- at saturation in water of 23°C	-	%	< 0,02	< 0,15	-	-	-	0,05	-	0,85	2,1	1,2	1,35	2,5	1,4	4,4	0,01	1	0,09	0,45	0,3	0,3	0,3
Thermal Properties (2)																							
Melting temperature	-	°C	327	327	327	327	327	175	212	-	-	-	-	not applicable	not applicable	not applicable	280	285	280	340	340	340	340
Glass transition temperature (3)	-	°C	-	-	-	-	-	-	-	190	225	220	215	not applicable	-	425	280	-	-	-	-	-	-
Thermal conductivity at 23°C	-	W/(K•m)	0,23	0,48	-	0,60	0,35	0,19	0,20	0,26	0,17	0,35	0,22	0,35	0,40	0,26	0,30	0,30	0,30	0,25	0,43	0,92	0,24
Coefficient of linear thermal expansion:																							
- average value between 23 and 100°C	-	m/(m•K)	-	-	-	-	-	130 • 10⁻⁶	70 • 10⁻⁶	60 • 10⁻⁶	55 • 10⁻⁶	55 • 10⁻⁶	45 • 10⁻⁶	45 • 10⁻⁶	25 • 10⁻⁶	30 • 10⁻⁶	50 • 10⁻⁶	25 • 10⁻⁶	50 • 10⁻⁶	50 • 10⁻⁶	30 • 10⁻⁶	25 • 10⁻⁶	30 • 10⁻⁶
- average value between 23 and 150°C	-	m/(m•K)	160 • 10⁻⁶	110 • 10⁻⁶	60 • 10⁻⁶	90 • 10⁻⁶	120 • 10⁻⁶	145 • 10⁻⁶	70 • 10⁻⁶	60 • 10⁻⁶	55 • 10⁻⁶	55 • 10⁻⁶	45 • 10⁻⁶	50 • 10⁻⁶	25 • 10⁻⁶	30 • 10⁻⁶	60 • 10⁻⁶	30 • 10⁻⁶	60 • 10⁻⁶	50 • 10⁻⁶	30 • 10⁻⁶	25 • 10⁻⁶	30 • 10⁻⁶
- average value above 150°C	-	m/(m•K)	160 • 10⁻⁶	110 • 10⁻⁶	60 • 10⁻⁶	90 • 10⁻⁶	120 • 10⁻⁶	-	-	-	-	55 • 10⁻⁶	45 • 10⁻⁶	55 • 10⁻⁶	25 • 10⁻⁶	30 • 10⁻⁶	80 • 10⁻⁶	30 • 10⁻⁶	80 • 10⁻⁶	110 • 10⁻⁶	65 • 10⁻⁶	55 • 10⁻⁶	65 • 10⁻⁶
Temperature of deflection under load																							
- method A: 1,8 MPa	75	°C	50	-	-	-	-	105	75	170	195	200	190	360	425	280	115	230	115	160	230	230	195
Vicat softening temperature - VST / B50	306	°C	-	-	-	-	-	-	-	-	215	-	-	-	-	-	-	-	-	-	-	-	-
Max. allowable service temperature in air:																							
- for short periods (4)	-	°C	300	300	300	300	300	160	205	180	220	210	200	450	500	270	260	260	260	310	310	310	310
- continuously: for min. 20.000 h (5)	-	°C	- / 260	- / 260	- / 260	- / 260	- / 260	- / 150	- / 150	- / 150	- / 170	- / 180	- / 170	- / 240	- / 310	- / 250	- / 220	- / 230	- / 220	- / 250	- / 250	- / 250	- / 250
Min. service temperature (6)	-	°C	-200	-200	-200	-200	-200	-50	-	-50	-100	-20	-50	-	-	-200	-20	-	-	-60	-20	-	-60
Flammability (7)																							
- "Oxygen Index"	4589	%	95	95	-	-	-	44	-	30	37	44	47	53	58	45	-	-	47	35	40	40	43
- according to UL 94 (thickness 1,5 / 3 mm)	-	-	V-0 / -	V-0 / -	-	-	-	V-0 / V-0	V-0 / V-0	HB / HB	V-0 / -	V-0 / V-0	V-0 / V-0	V-0 / V-0	V-0 / V-0	V-0 / V-0	V-0 / -	- / V-0	V-0 / V-0	V-0 / V-0	V-0 / V-0	V-0 / V-0	V-0 / V-0
Mechanical Properties at 23°C																							
Tensile test (8)																							
- tensile stress at yield / tensile stress at break (9)	527	MPa	- / 27	- / 18	- / 22	- / 15	- / 30	50 / -	36 / -	80 / -	90 / -	76 / -	105 / -	- / 86	- / 160	120 / -	95 / -	- / 130	- / 75	110 / -	- / 90	- / 130	- / 75
- tensile strain at break (9)	527	%	300	200	280	180	360	> 20	150	10	15	30	10	7,5	3	10	15	~ 1	5	20	5	5	5
- tensile modulus of elasticity (10)	527	MPa	400 - 700	-	-	-	-	2.300	1.400	2.700	2.800	2.500	3.400	2.200	5.800	4.500	3.450	6.000 - 13.000	3700	4.400	6.300	7.700	5.900
Compression test (11)																							
- compressive stress at 1% nominal strain (10)	604	MPa	-	-	-	-	-	17	-	20	-	18	25	23	42	27	-	-	28	29	41	49	34
- compressive stress at 2% nominal strain (10)	604	MPa	8	14	-	-	-	32	-	39	-	35	49	43	82	53	-	-	55	57	81	97	67
Charpy impact strength - Unnotched (12)	179 / 1eU	kJ/m²	no break	-	-	-	no break	no break	-	no break	no break	no break	no break	no break	-	no break	-	12 - 13	25	no break	35	35	25
Charpy impact strength - Notched (13)	179 / 1eU	kJ/m²	-	-	-	-	-	10	-	4	6	10	3,5	3,5	3,5	10	-	6 - 7	3,5	3,5	4	4	2,5
Izod impact strength - Notched	180 / 2A	kJ/m²	16	12	-	-	-	-	5	-	7	-	-	-	-	-	-	-	-	6	7	-	-
Ball indentation hardness (14)	2039 - 1	N/mm²	-	-	-	-	-	110	-	155	152	-	170	170	375	200	-	-	180	230	270	325	215
Rockwell hardness (14)	2039 - 2	-	-	-	-	-	-	M 75	-	M 91	-	M 80	M 114	M 100	E 104	E 80	M 95	R 123	M 84	M 105	M 99	M 102	M 85
Hardness Shore D (a / 15 sec.)	868	-	57 / -	60 / -	64 / -	65 / -	59 / -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Properties at 23°C (2)																							
Electric strength (15)	(60243)	kV/mm	> 20	13	-	-	-	18	-	30	45	-	27	28	22	24	60	20	24	24	24	-	-
Volume resistivity	(60093)	Ω•cm	> 10¹⁸	10¹⁷	-	-	-	10¹⁵	10¹⁸	10¹⁷	10¹⁷	10¹⁵	10¹⁸	10¹⁶	> 10¹⁴	10¹⁷	10¹⁶	10¹⁵	10¹⁵	10¹⁵	10¹⁶	10¹⁵	-
Surface resistivity	(60093)	Ω	> 10¹⁷	10¹⁶	-	-	-	10¹⁶	-	10¹⁷	10¹⁵	10¹⁵	10¹⁷	10¹⁵	> 10¹³	10¹⁸	-	> 10¹⁸	10¹⁵	10¹⁵	10¹⁵	-	-
Relative permittivity er											-				3,3								
- at 100 Hz	(60250)	-	2,1	2,6	-	-	-	7,4	-	3	3,5	3,4	3	3,6	3,3	4,2	-	-	3,3	3,2	3,2	-	-
- at 1 MHz	(60250)	-	2,1	2,6	-	-	-	6	-	3	-	3,5	3	3,6	-	3,9	3	4	3,3	3,2	3,6	-	-
Dielectric dissipation factor tan d											-				0,001								
- at 100 Hz	(60250)	-	< 0,0003	< 0,003	-	-	-	0,025	-	0,001	0,011	0,001	0,002	0,002	-	0,026	-	-	0,003	0,001	0,001	-	-
- at 1 MHz	(60250)	-	< 0,0003	< 0,003	-	-	-	0,165	-	0,003	150	0,005	0,002	0,003	-	0,031	0,0013	0,004	0,003	0,002	0,002	-	-
Comparative tracking index (CTI)	(60112)	-	600	-	-	-	-	600	-	150	-	-	175	-	-	-	-	-	100	150	175	-	-
Chemical & Environmental Resistance (16)											A - B				B								
Acids, diluted	-	-	A	A	A	A	A	A	-	A - B	B	A	A	B - C	C	A	A	A	A	A	A	A	A
Acids, concentrated	-	-	A	A	A	A	A	A	-	B	A	B	A	B - C	B	A	A	A	A	A - B	A - B	A - B	A - B
Alkalis, diluted	-	-	A	A	A	A	A	A	-	A	A - B	A	A	C	C	B	A	A	A	A	A	A	A
Alkalis, concentrated	-	-	A	A	A	A	A	B	-	A - B	A	B	C	C	-	C	A - B	A - B	A - B	A	A - B	A	A
Hot water / water vapour	-	-	A	A	A	A	A	A	-	A	C	A	A	B	B	B	A	A	A	A	A	A	A
UV Radiation	-	-	A	A	A	A	A	A	-	B	-	A	A	B	7,0	A	B	B	B	A - B	A	A	A - B
Gamma Radiation	-	-	3,5	-	-	-	-	5,0	-	6,0	-	-	6,0	7,5	-	7,5	7,0	-	-	7,0	-	-	-
Food contact	-	-	+	-	-	-	-	+	-	+		+	+	-		-	-	-	-	+	-	-	-

CAPTION

(1) Tests were done on discs Dia 50 x 3 mm.

(2) The figures given for these properties are for the most part derived from raw material supplier data and other publications.

(3) Values for this property are only given here for amorphous materials and not for semi-crystalline ones.

(4) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.

(5) Temperature resistance over a period of min. 20.000 hours. After this period of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature values given here are thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that, as far all thermoplastics, the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.

(6) Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. Thevalues given here are based on unfavourable impact conditionsand may consequently not be considered as being the absolute practical limits.

(7) These estimated ratings, derived from raw material supplier data,are not intended to reflect hazards presented by the materialsunder actual fire conditions. There are no UL-yellow cards available for these stock shapes.

(8) Test specimens: Type 1 B.

(9) Test speed: 5 mm/min

(10) Test speed: 1 mm/min.

(11) Test specimens: cylinders with Dia 12 x 30 mm.

(12) Pendulum used: 4 J.

(13) Pendulum used: 5 J.

(14) 10 mm thick test specimens.

(15) Electrode configuration: Dia 25 / Dia 75 mm coaxial cylinders; in transformer oil according to IEC 60296; 1 mm thick natural coloured test specimens. It is important to know that the electric strength of black material can be as low as 50% of the value for natural material.

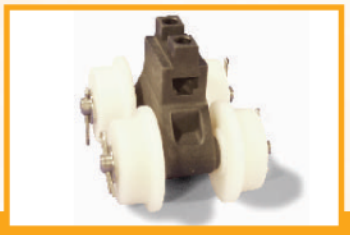
(16) Symbolic rating:

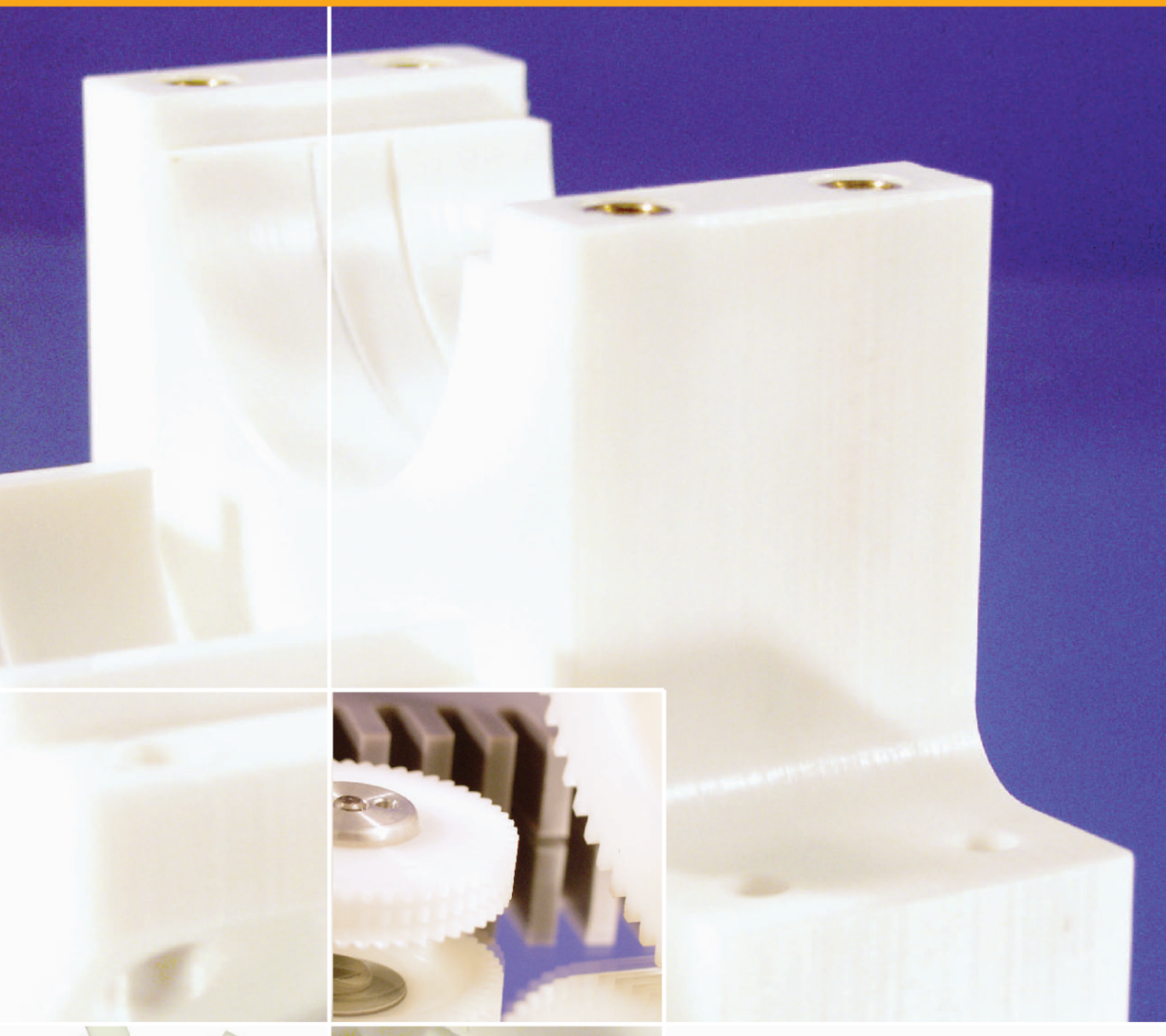
A	Excellent
B	Good / fair
C	Poor
+	Suitable for food-stuff applications
-	No data available, not suitable for food-stuff applications

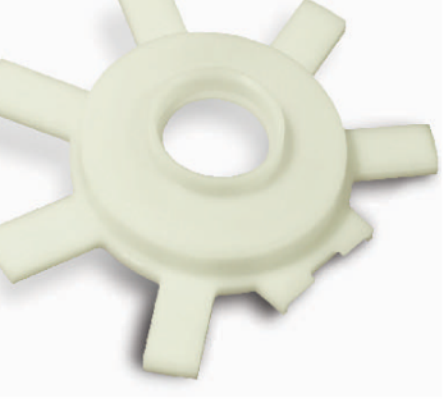
Modification & misprints reserved

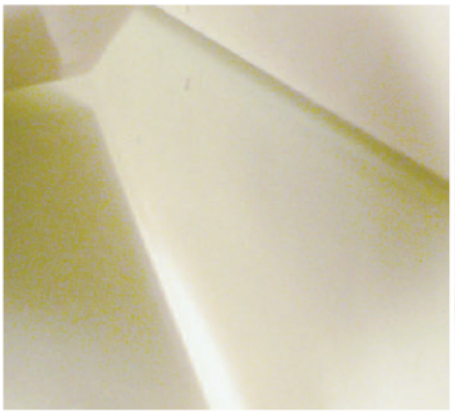
This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties of dry material. However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.

It has to be noted that plenty of the products listed in this table fibre reinforced and/or filled, and consequently they are anisotropic materials (properties differ when measured parallel and perpendicular to the extrusion direction).









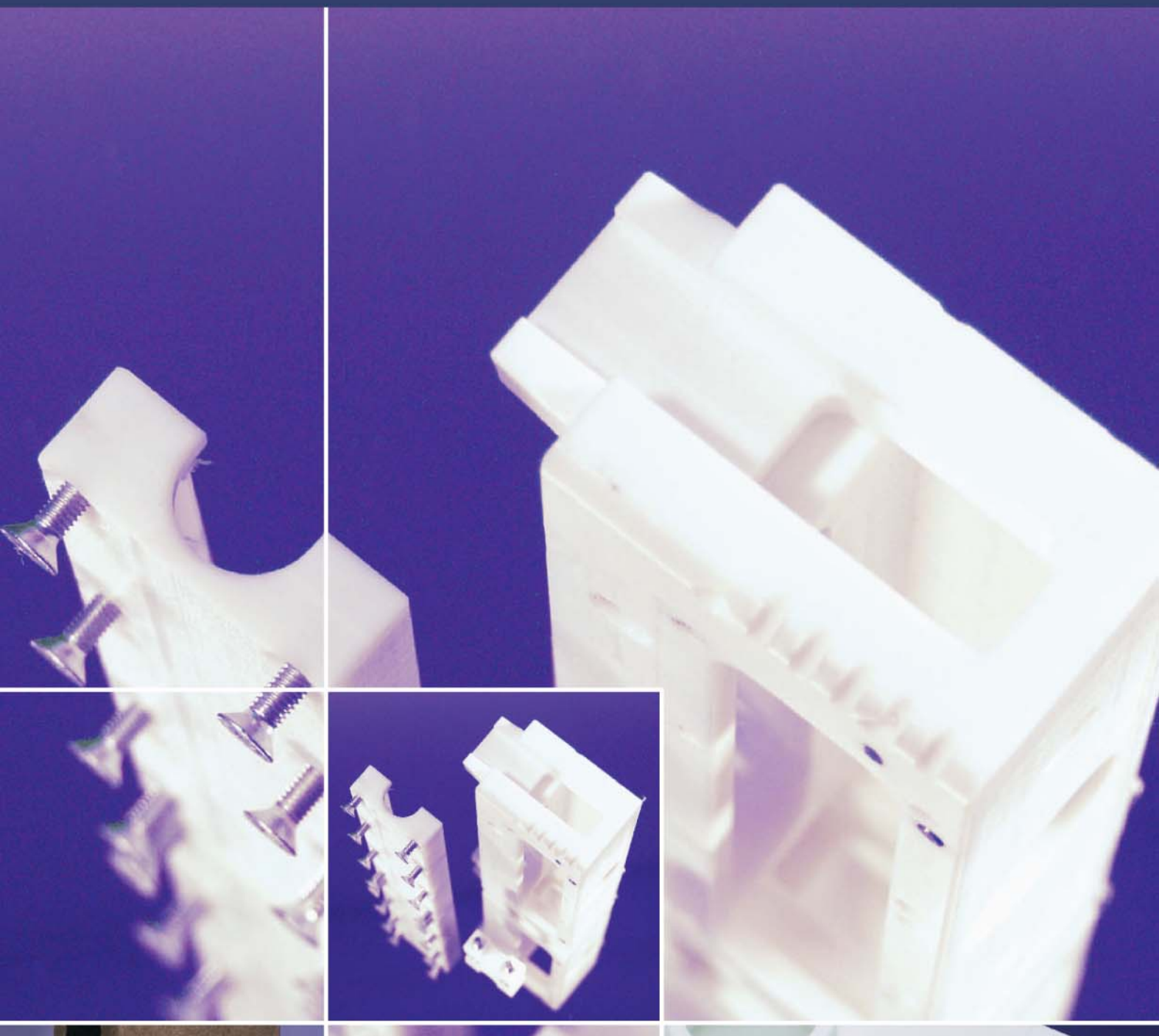
Elastomere / TPU specs (material properties)

PROPERTIES	METHODS DIN (IEC)	UNIT	ECORUBBER 1	ECORUBBER-H	ECORUBBER 2	ECORUBBER 3	ECOSIL	ECOFLAS	ECOPUR®	H-ECOPUR®	S-ECOPUR®	T-ECOPUR®	G-ECOPUR®	X-ECOPUR® 57D	XH-ECOPUR® 60D	XS-ECOPUR® 57D
			NBR	H-NBR	FKM	EPDM	MVQ	TFE/P	TPU	(hydrolysis resistant) TPU	(+ solid lubricants) TPU	(low temperature) TPU	(casted) TPU	TPU	(hydrolysis resistant) TPU	(+ solid lubricants) TPU
Colour	-	-	black	black	brown	black	reddish brown	black	green	red	grey / black	blue	red	dark green	bordoux red	grey / black
Density	53479	g/cmΔ	1,31	1,22	2,3	1,22	1,52	1,6	1,2	1,2	1,24	1,17	1,2	1,21	1,22	1,26
Thermal Properties																
Melting temperature		°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glass transition temperature (1)	-	°C	-24	-26	-12	-48	-	-	-	-	-	-42	-			
Max. service temperature	-	°C	100	150	200	150	200	200	110	110	110	110	110	110	110	110
Min. service temperature	-	°C	-30	-25	-20	-50	-60	-10	-30	-20	-20	-50	-30	-30	-20	-20
Heat resistance in air (70h / 150°C):																
- change in durometer hardness Shore A	53505	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-
- change in tensile strength	53504	%	-	-	-	-15	-	-	-	-	-	-	-	-	-	-
- change in elongation at break	53504	%	-	-	-	-22	-	-	-	-	-	-	-	-	-	-
Heat resistance in air (168h / 100°C):																
- change in durometer hardness Shore A	53505	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
- volume change	53521	%	-0,5	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat resistance in air (168h / 225°C):																
- change in durometer hardness Shore A	53505	-	-	-	3	-	3	-	-	-	-	-	-	-	-	-
- change in tensile strength	53504	%	-	-	24	-	-10	-	-	-	-	-	-	-	-	-
- change in elongation at break	53504	%	-	-	-24	-	-40	-	-	-	-	-	-	-	-	-
Mechanical Properties																
Tensile test (2)																
- tensile strength (3)	53504	MPa	16	18	8	12	7	13	40	50	50	50	45	50	53	45
- elongation at break (3)	53504	%	130	180	200	110	130	220	430	330	380	450	280	380	350	350
- 100% modulus (3)	53504	MPa	11	10	5	9	5	8	12	13	17	12	11	18	20	24
Compression set (4)																
- after 22h at 100°C	53517	%	15	22	-	15	-	-	-	-	-	-	-	-	-	-
- after 22h at 175°C	53517	%	-	-	20	-	15	29	-	-	-	-	-	-	-	-
- after 24h at 70°C	-	%	-	-	-	-	-	-	30	27	25	-	30	27	26	24
- after 24h at 100°C	-	%	-	-	-	-	-	-	35	33	30	-	40	33	30	30
- after 70h at 70°C	53517	%	-	-	-	-	-	-	20	20	-	20	20	-	-	-
Tear strength	53515	N/mm	20	30	21	15	8	19	100	100	120	80	40	120	140	160
Rebound resilience	53512	%	28	29	7	38	44	-	42	29	-	50	43	-	-	-
Abrasion	53516	mmΔ	90	90	150	120	-	110	18	17	17	15	25	20	20	20
Durometer hardness Shore A (5)	53505	-	85	85	83	85	85	83	95	95	95	95	95	97	97	96
Durometer hardness Shore D (5)	53505	-	-	-	-	-	-	-	48	48	48	48	47	57	60	57
Electrical Properties																
Electric strength (6)	(60243)	kV/mm	-	-	20	-	-	-	-	-	-	-	-	-	-	-
Volume resistivity	(60093)	Ω·cm	> 10^{10}	-	> 10^{13}	> 10^{16}	> 10^{15}	> 10^{16}	> 10^{10}	> 10^{10}	> 10^{10}	> 10^{10}	> 10^{10}	> 10^{10}	> 10^{10}	> 10^{10}
Surface resistivity	(60093)	Ω	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Relative permittivity er																
- at 50 Hz	(60250)	-	20	-	-	2,5	2,8	2,5	15	-	-	-	-	15	-	-
- at 1 MHz	(60250)	-	-	-	-	2,5	-	2,6	-	-	-	-	-	-	-	-
Dielectric dissipation factor tan d																
- at 50 Hz	(60250)	-	0,2	-	-	-	0,001	-	-	-	-	-	-	-	-	-
- at 1 MHz	(60250)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemical & Environmental Resistance (7)																
Acids, diluted	-	-	B	B	A - B	A	B	A	B	B	A - B	B	B	B	B	B
Acids, concentrated	-	-	B	B	A - B	A	B - C	B	C	C	C	C	C	C	C	C
Alkalis, diluted	-	-	B	B	B	A	B - C	A	B	B	A - B	B	B	B	B	B
Alkalis, concentrated	-	-	B - C	B - C	C	A	B - C	A	C	C	C	C	C	C	C	C
Hot water / water vapour	-	-	C	B	B	A	B	A	C	B	B	C	C	C	A - B	A - B
UV Radiation	-	-	C	C	A - B	A	A	-	A	A	A	A	A	A	A	A
Gamma Radiation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Food contact	-	-	-	+	+	+	+	-	-	+	-	-	-	-	+	-

CAPTION

(1) Values for this property are derived from DMA-analysis and are defined as the maximum of the loss modulus curves.
(2) Test specimens: Type S 2.
(3) Test speed: 200 mm/min.
(4) Tests were done on discs Dia 13 x 6,3 mm. Compression rating 20 % (TPUs) as well as 15% (elastomers). Test specimens are stored at elevated temperature in an air circulating oven for defined periods. Compression set represents the percent of deflection that did not return.
(5) 6,3 mm thick test specimens.
(6) Electrode configuration: Dia 25 / Dia 75 mm coaxial cylinders; in transformer oil according to IEC 60296; 1 mm thick test specimens (natural coloured). It is important to know that the electric strength of black material can be as low as 50% of the value of natural material.
(7) Symbolic of the rating:
A Excellent
B Good / fair
C Poor
\+ Suitable for food-stuff applications
\- No data available, not suitable for food-stuff applications

This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties. However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.



Trade mark [TM] - information

All trade names used in this catalogue are trade names of ECONOMOS® except the following trade marks.
NYLATRON®, ERTALON®, TECHTRON® and KETRON® are trade marks of Quadrant, TORLON® is a trade mark of Amoco Polymers Inc., CELAZOLE® of Hoechst Celanese Corporation and VESPEL® of Du Pont.
The ECOPUR® family is a registered trade mark of ECONOMOS®.

ECONOMOS® branding program integrates our own products under a unified set of trade names all over the world. This provides a clear and consistent identification of all our materials and makes them available through all fabricator partners worldwide. All other trade names noted in this brochure are the property of their respective owners.

ECONOMOS® production capabilities for semi finished materials (rods, tubes and plates) are mainly based on injection-moulding and casting techniques and therefore cover a wide range of different dimensions and sizes.
Beside our in-house production capabilities of AEPP materials, we have completed our product range with extruded products as well as special manufactured by uncommon techniques.
Therefore we have selected reliable suppliers for high quality stock shapes of which Quadrant is one preferred supplier.

Material availability

ECONOMOS® is mainly using machining and milling techniques for producing engineered plastic parts. In special cases and for very soft materials like soft rubber and foams, ECONOMOS® is also able to use water jet cutting.
Most of the materials mentioned before are available as rods, tubes and plates or sheets in a wide range of dimensions. Some special materials are available up to a diameter of 2000 mm.
For further information please contact our engineering department.

According to our production philosophy and our manufacturing equipment, ECONOMOS® is able produce all the seals and plastic parts as a single piece, small quantity up to a couple of thousand by machining or milling techniques.
Due to our experience in manufacturing "difficult" materials like polyurethanes and high performance thermoplastics like polyetherether ketone (PEEK), larger quantity and high volume business can be produced by injection-moulding.

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