

2014

GEHR

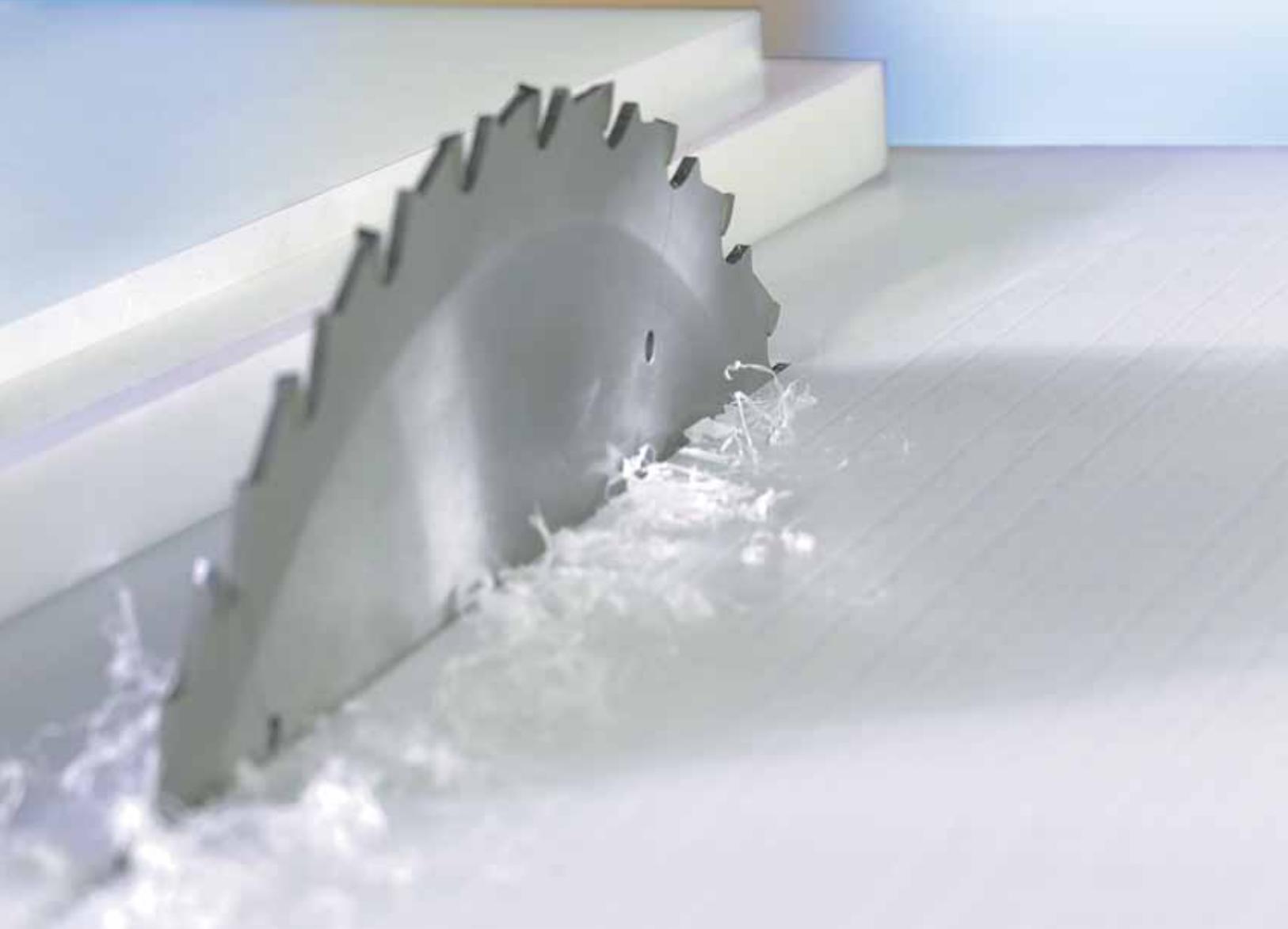


Technical Plastics
and Engineering Materials

Stock Shapes



- **Cut to size**
sheets and rods
- **Centerless grinding**
rods





Plastics from GEHR

Founded in 1932 and family-owned ever since, GEHR Plastics is a leading worldwide manufacturer of semi-finished thermoplastics, primarily in rods and sheets. GEHR is headquartered in Mannheim, Germany approximately 50 miles from Frankfurt in southwestern Germany. For 25 years GEHR has had an American subsidiary and production facility in Boothwyn, PA. GEHR also operates several sales offices in France, Italy, PR China and Hongkong.

GEHR remains committed to these important principles:

Long-term independence

The independence of this third-generation, family-owned company, as well as its focus on solid, long-term planning and development remains of essential importance to us.

Partnership

We view ourselves as a loyal partner with our customers, and we live the values of reliability and fairness with regards to our customers, suppliers and employees. Correspondingly, our friendly and competent service is acknowledged in our industry, assisted by the longstanding personal relationships that exist between our customers and their longterm contacts here at GEHR. A wide range of seminars, workshops and symposiums enhances our service as well.

Quality leadership

GEHR is certified ISO 9001, and we continue to strive for excellence in product quality by generally exceeding our customers' requirements.

Over time, our products will receive additional approvals and certifications, as exemplified by the recent approval by the German Water Quality Regulation for PVC-U.

Versatility

We continue to expand our product range for extruded rods, sheets, profiles and tubes, extending our position as one of the leading worldwide companies for semi-finished plastics, which are used in countless global applications, with rods in large diameters being among our specialties. Of course, we will continue to produce custom products on demand.

Innovation

Sustainability is not just a buzz word for us. Together with Fraunhofer Institut, we are exploring the possibility of extruding wood along with other organic materials. At present, we are extruding biopolymers into semi-finished products (PLA-L). Our R & D substantially benefits from our know-how as a supplier of high quality tubes for the pen and cosmetic industry, as well as the medical industry.

New developments are taking place all the time. In addition to this catalogue, we recommend that you regularly visit our website for updates, as well as subscribe to our quarterly newsletter, where you will also be informed of all the latest news from our company.

www.gehrplastics.com

 = **Stock item**

(standard product in stock)

 = **Available in stock Germany**

(standard product in stock Germany)

 = **Custom extrusion on request**

(product can be produced at customer's request and based on minimum order quantity)

All weights specified are based on average production weights.

Tolerances which are not mentioned can be offered on request.

The current version of our General terms and conditions can be found on our homepage
www.gehrplastics.com

Data provided are approximate values and may change, if exact information is needed
please contact a GEHR representative directly. Values are dependent on the diameters and can deviate.
Modifications and mistakes will be reserved.

GEHR makes no representations or warranties regarding the technical statements in this brochure.
Desired capability characteristics are only binding if there is an explicit agreement when the contract is concluded.

Contents



		Page	
Round Rods Sheets	ECOGEHR PLA-LF™ ECOGEHR WPC-30PP™ ECOGEHR PA 6.10™ ECOGEHR CL™	6 - 7	ECOGEHR
Round Rods Hollow Bars, Hexagonal Bars U-Channels, Angles Square Bars, Square Tubes	GEHR PVC-Type I™, GEHR PVC-Type II™ GEHR CPVC™ GEHR PVC-Type I™ centerless ground	8 - 11	PVC
Round Rods	GEHR HDPE™	12 - 13	PE
Round Rods Standard Profiles	GEHR PP-C™ (Co-Polymer Polypropylene) GEHR PP-H™ (Homo-Polymer Polypropylene) GEHR PP-H 30GF™ Polypropylene	14 - 15	PP
Round Rods	GEHR PMMA xt™ (Acrylic)	16 - 17	Acrylic
Round Rods Sheets	GEHR ABS™ GEHR PPO™ (Noryl®) GEHR PPO-30 GF™ (Noryl®)	18 - 19	ABS / Noryl
Round Rods	GEHR PA 6.10™ (Nylon) GEHR PA 12 TR™ (Nylon)	20 - 21	Nylon
Round Rods Sheets	GEHR Acetal™ GEHR Acetal ELS™ GEHR Acetal ESd™ GEHR Acetal 10 PE™	22 - 25	Acetal
Round Rods Sheets	GEHR PVDF™ (Kynar®)	26 - 27	PVDF
Round Rods	GEHR E-CTFE™ (Halar®)	28 - 29	E-CTFE
Round Rods	GEHR PSU™	30 - 31	PSU
Round Rods	GEHR PPSU™		PPSU
Round Rods	GEHR PEI™ (ULTRAM® 1000) GEHR PEI-30GF™ (ULTRAM® 2300)	32 - 33	PEI
Round Rods	GEHR PPS™ GEHR PPS-40GF™	34 - 35	PPS
Round Rods Sheets	GEHR PEEK™ GEHR PEEK-30GF™ GEHR PEEK mod™	36 - 37	PEEK
Weight Overview, Approvals, Machining Recommendations Comparison of the technical data Chemical Properties Technical Properties		38 - 65	TECH INFO

**ECOGEHR PA 6.10™**

is obtained from the oil of the castor oil seed and is therefore based over more than 60 % on renewable resources.

Characteristics:

- low water absorption
- high dimensional stability
- good chemical resistance

ECOGEHR WPC-30PP™

Wood Plastic Compounds – these materials composites of standard polymers and wood fibres. The excellent binding of the wood fibres to the polymer gives the materials extremely high mechanical strength. The materials are weather-resistant and can optionally be given anti-bacterial, fungicidal and UV-resistant properties.

Characteristics:

- good mechanical strength
- weatherproof compared to wood
- antibacterial optional

ECOGEHR PLA-LF™

is a composite material of polylactide, a small amount of a petroleum-based polyester and wood fibres (up to 70%). It possesses high mechanical strength thanks to the excellent binding of the wood fibres and the polymer blend. This is comparable with standard fibre-reinforced polymers. It also displays good thermal insulation and conforms to the standards governing toys.

Characteristics:

- neutral in the CO₂ balance
- PLA-L is biodegradable
- waste disposal e.g. by composting respectively incineration
- good mechanical properties similar to ABS
- higher stiffness and a modulus of elasticity up to 2740 MPa
- good impact strength also at low temperatures up to -22 °F
- high resistance to polar solvents

Applications:

- electronic industry
- mechanical engineering
- medical industry
- food industry
- textile industry
- replacement of PET

Further technical data are available on request.

ECOGEHR CL™

is comprised of the wood components cellulose, natural fibres, lignin and fatty acids. It posses many interesting properties that together are very similar to natural wood. Consequently, this material is very pleasant to the touch, produces high-quality sound and is easily workable. it also has a high degree of rigidity (tensile module of elasticity up to 4248 MPa).

Characteristics:

Clearly, its advantages compared with grown wood lie in the material's homogeneity. Whereas wood displays density variations resulting from growth rings or imperfections (branches) ECOGEHR CL™ provides an isotropic material texture and reproducible properties. This 100 % renewable material is largely neutral in terms of its CO₂ balance, and like wood can be disposed of via decomposition or burning.

Ø	Tolerances		<i>ECOGEHR PA 6.10™</i>	<i>ECOGEHR WPC-30PP™</i>
			lbs/ft	lbs/ft
mm	min.	max.		
10 ¹⁾	+ 0.1	+ 0.6	0.085	
20 ¹⁾	+ 0.2	+ 1.0	0.340	0.390
25 ¹⁾	+ 0.2	+ 1.1	0.530 ◎	0.610 ◎
30 ¹⁾	+ 0.2	+ 1.2	0.760	0.880 ◎
40 ¹⁾	+ 0.2	+ 1.3	1.360	1.560
50 ¹⁾	+ 0.3	+ 1.7	2.120 ◎	2.430 ◎

Round Rods



Stock Lengths:

10 ft

Lengths are nominal

Color:

◎ natural

1) produced in metric

☒	Tolerances of thickness		<i>ECOGEHR PLA-LF™</i>	<i>ECOGEHR CL™</i>
			Width 1000 mm lbs/sft	Width 1000 mm lbs/sft
mm	min.	max.		
1.5 ¹⁾	+ 0.2	+ 0.9	2.040	2.040
2.0 ¹⁾	+ 0.2	+ 0.9	2.720 ◎	2.720 ◎
2.5 ¹⁾	+ 0.2	+ 0.9	3.390	3.390
3.0 ¹⁾	+ 0.2	+ 0.9	4.080	4.080
5.0 ¹⁾	+ 0.2	+ 0.9	6.080	6.080

Sheets



Color:

◎ natural

1) produced in metric

■ available in stock

■ Custom extrusion
– time of delivery on request




GEHR PVC Type I™

is a **rigid Polyvinylchloride** that is self-extinguishing and offers excellent chemical resistance versus other products in its class. GEHR PVC Type I™ also exhibits good mechanical and tensile strength and is a fabrication friendly product. GEHR PVC™ comes in a variety of colors, shapes and profiles.

Characteristics:

- **self-extinguishing**
- **excellent chemical resistance**
- **good mechanical strength**
- **good tensile strength**
- **easy to fabricate, glue, cement and bond**
- good insulative properties
- low water absorption
- good impact strength
- limited weather resistance
- **operating temperature range from +5 °F to +140 °F**

GEHR PVC Type II™

is a **rigid Polyvinylchloride** that has been enhanced to improve the impact strength. GEHR PVC Type II™ has many of the benefits of GEHR PVC Type I™ but also provides a wider operating temperature range especially in colder environments.

Characteristics:

- **excellent impact strength**
- softer material than GEHR PVC Type I™
- **operating temperature range from -40 °F to +140 °F**

GEHR CPVC™

is a **rigid homopolymer PVC** that has been subject to a chlorinated reaction. As the chlorine content is increased the upper temperature limit of the PVC also is improved significantly.

Characteristics:

- **improved upper temperature limit**
- tested but not listed to UL 94 V-0
- **limiting Oxygen Index (LOI) is 60**
- **operating temperature range from +5 °F to +185 °F**

Applications:

Pumps and valves, seals, pipe systems, bearings, brush industry, lamp housing, parts for the dental industry, chemical tanks.

Ø	Tol -0 inch	GEHR PVC Type I™	GEHR PVC Type II™	GEHR CPVC™	Tol -0 inch	GEHR PVC Type I™ centerless Ground
		lbs/ft	lbs/ft	lbs/ft		lbs/ft
1/4	0.250	+ 0.008	0.030 ●●○	0.030	0.033 ●	+ 0.005
5/16	0.312	+ 0.009	0.052	0.052	0.053 ●	+ 0.005
3/8	0.375	+ 0.011	0.068 ●●○	0.068 ●	0.079 ●	+ 0.005
7/16	0.437	+ 0.013	0.093	0.093	0.104	+ 0.005
1/2	0.500	+ 0.015	0.122 ●●○	0.122 ●	0.135 ●	+ 0.005
9/16	0.562	+ 0.017	0.155	0.155	0.172	+ 0.005
5/8	0.625	+ 0.019	0.190 ●●○	0.190	0.218 ●	+ 0.005
3/4	0.750	+ 0.022	0.274 ●●○	0.274 ●	0.305 ●	+ 0.005
7/8	0.875	+ 0.026	0.372 ●	0.372 ●	0.415 ●	+ 0.005
1	1.000	+ 0.030	0.488 ●●○	0.488 ●	0.586 ●	+ 0.005
1 1/16	1.062	+ 0.032	0.548	0.548	0.675	+ 0.005
1 1/8	1.125	+ 0.034	0.611 ●●	0.611	0.688 ●	+ 0.005
1 1/4	1.250	+ 0.038	0.755 ●●○	0.755 ●	0.842 ●	+ 0.005
1 3/8	1.375	+ 0.041	0.914 ●	0.914 ●	1.030 ●	+ 0.005
1 1/2	1.500	+ 0.045	1.087 ●●○	1.087 ●	1.231 ●	+ 0.005
1 5/8	1.625	+ 0.049	1.276 ●●○	1.276 ●	1.485	+ 0.005
1 3/4	1.750	+ 0.052	1.480 ●●○	1.480 ●	1.677 ●	+ 0.005
1 7/8	1.875	+ 0.056	1.699 ●	1.699	1.930 ●	+ 0.005
2	2.000	+ 0.060	1.924 ●●○	1.924 ●	2.193 ●	+ 0.005
2 1/8	2.125	+ 0.064	2.181 ●	2.181	2.454	+ 0.005
2 1/4	2.250	+ 0.068	2.447 ●●○	2.447 ●	2.793 ●	+ 0.005
2 3/8	2.375	+ 0.071	2.727 ●	2.727	3.230 ●	+ 0.005
2 1/2	2.500	+ 0.075	3.017 ●●○	3.017 ●	3.496 ●	+ 0.005
2 3/4	2.750	+ 0.082	3.653 ●○	3.653	4.143 ●	
3	3.000	+ 0.090	4.400 ●●○	4.400 ●	4.930 ●	
3 1/4	3.250	+ 0.097	5.105 ●●○	5.105 ●	5.782 ●	
3 1/2	3.500	+ 0.105	5.921 ●●○	5.921 ●	6.712 ●	
3 3/4	3.750	+ 0.113	6.799 ●	6.799	7.640	
4	4.000	+ 0.120	7.736 ●●○	7.736 ●	8.767 ●	
4 1/8	4.125	+ 0.124	8.224	8.224	9.240	
4 1/2	4.500	+ 0.135	9.785 ●●○	9.785 ●	11.210 ●	
5	5.000	+ 0.150	12.083 ●○	12.083 ●	14.010 ●	
5 1/8	5.125	+ 0.154	12.500	12.500	14.220	
5 1/4	5.250	+ 0.157	13.324 ●	13.324	14.900	
5 1/2	5.500	+ 0.165	14.624 ●	14.624	16.575	
6	6.000	+ 0.180	17.407 ●○	17.407 ●	20.400 ●	
6 1/2	6.500	+ 0.195	20.500 ●		22.950	
7	7.000	+ 0.210	24.200 ●		26.800	
8	8.000	+ 0.240	31.500 ●			
9 ¹⁾	9.000	+ 0.315	39.600 ●			
10 ¹⁾	10.000	+ 0.345	47.600 ●			
11 ¹⁾	11.000	+ 0.393	60.600 ●			
12 ¹⁾	12.000	+ 0.393	71.750 ●			
14 ¹⁾	14.000	+ 0.551	93.500 ●			
16 ¹⁾	16.000	+ 0.787	120.000 ●			

Round Rods



PVC

Stock Lengths:

1/4" - 2" = 10 ft
2 1/8" - 8" = 5 ft
≥ 9" - 16" = 2 ft

CPVC

Stock Lengths:

1/4" - 2" = 10 ft
2 1/8" - 4 1/2" = 5 ft
5" - 7" = 4 ft

Lengths are nominal

Standard Colors:

- gray
- black
- white

Custom Colors:

- yellow
- orange
- red
- green
- blue
- purple

1) produced in metric

available in stock

Custom extrusion – time of delivery on request



Our gray GEHR-PVC Type I rods 1/4" - 7" are NSF listed:
NSF/ANSI STANDARD 51
Food Equipment Materials.
NSF/ANSI STANDARD 61
available up to 7" GEHR-PVC Type/gray

Hollow Bars

Stock Lengths:
10 ft

Standard Colors:
● gray

Lengths are nominal

Tolerances on request

 available in stock

 Custom extrusion
– time of delivery on
request

D D x d inch	GEHR PVC Type I™
	lbs/ft
1.625 x 0.562	1.154
1.900 x 0.562	1.647 ●
1.900 x 0.906	1.410 ●
2.000 x 1.250	1.285 ●
2.125 x 0.750	2.010
2.250 x 1.125	2.025
2.250 x 1.500	1.625
2.375 x 1.000	2.393
2.500 x 1.000	2.680 ●
2.500 x 1.500	2.209 ●
2.625 x 1.500	2.511
2.750 x 1.000	3.299
2.875 x 1.500	3.976
3.000 x 1.000	3.770
3.000 x 1.250	3.375
3.000 x 1.500	2.798



**GEHR HDPE™**

is a High Density Polyethylene that offers resistance to almost all acids and bases, detergents and hot water. GEHR HDPE™ has good insulative properties and is easy to fabricate and weld as well as excellent low temperature properties below freezing.

Characteristics:

- **excellent resistance to acids, bases and detergents**
- **good insulation properties**
- very good chemical resistance
- very good electrical and dielectric properties
- excellent toughness and elongation
- very low water absorption
- light weight
- food safe
- **operating temperature range from -58 °F to +175 °F**

Applications:

Pumps and valves, seals, idler sprockets, medical industry, food processing industry and sewage industry.

Ø		Tol -0 inch	GEHR HDPE™
			lbs/ft
1/4	0.250	+ 0.010	0.021
3/8	0.375	+ 0.015	0.047
1/2	0.500	+ 0.020	0.084 ◎
5/8	0.625	+ 0.025	0.131 ◎
3/4	0.750	+ 0.030	0.189 ◎
7/8	0.875	+ 0.035	0.258 ◎
1	1.000	+ 0.040	0.337 ◎
1 1/8	1.125	+ 0.045	0.426 ◎
1 1/4	1.250	+ 0.050	0.527 ◎
1 3/8	1.375	+ 0.055	0.637
1 1/2	1.500	+ 0.060	0.758 ◎
1 5/8	1.625	+ 0.065	0.890
1 3/4	1.750	+ 0.070	1.033 ◎
1 7/8	1.875	+ 0.075	1.185
2	2.000	+ 0.080	1.349 ◎
2 1/8	2.125	+ 0.085	1.521
2 1/4	2.250	+ 0.090	1.706
2 3/8	2.375	+ 0.095	1.901
2 1/2	2.500	+ 0.100	2.108 ◎
2 3/4	2.750	+ 0.110	2.549
3	3.000	+ 0.120	3.035 ◎
3 1/4	3.250	+ 0.130	3.560
3 1/2	3.500	+ 0.140	4.132 ◎
3 3/4	3.750	+ 0.150	4.740
4	4.000	+ 0.160	5.397 ◎
4 1/4	4.250	+ 0.170	6.090
4 1/2	4.500	+ 0.180	6.830 ◎
5	5.000	+ 0.200	8.433
5 1/2	5.500	+ 0.220	10.203
6	6.000	+ 0.240	12.143
7	7.000	+ 0.280	16.528
8 ¹⁾	8.000	+ 0.320	21.588
9 ¹⁾	9.000	+ 0.360	27.322
10 ¹⁾	10.000	+ 0.400	34.732
12 ¹⁾	12.000	+ 0.480	48.524
14 ¹⁾	14.000	+ 0.560	66.114

Round Rods



Stock Lengths:

1/4" - 2" = 8 ft
2 1/8" - 14" = 4 ft

Colors:

◎ natural

Lengths are nominal

1) produced in metric

available in stock

Custom extrusion
– time of delivery on
request



GEHR PP-C™ Co-polymer

is a **Co-Polymer Polypropylene** that offers excellent impact and chemical resistance as well as high mechanical and tensile strength. GEHR PP-C has good notched impact strength, is easy to weld and has an excellent resistance to stress cracking.

Characteristics:

- excellent impact strength
- high mechanical strength
- high tensile strength
- good notched impact strength
- easy to fabricate and weld
- excellent resistance to stress cracking
- very good chemical resistance
- food safe
- USP Class VI
- excellent dielectric properties
- poor resistance to UV
- low abrasion resistance
- operating temperature range from +41 °F to +180 °F

GEHR PP-H™ Homo-polymer

is a **Homopolymer Polypropylene** that offers slightly improved chemical resistance and upper temperature resistance as well as tensile strength and is a higher density than GEHR PP-C.

Characteristics:

- excellent chemical resistance
- improved upper temperature range
- improved tensile strength
- higher density
- operating temperature range from +41F to +190F

GEHR PP-H-30GF™

is a **Homopolymer Polypropylene** that is reinforced with 30% glass fiber which greatly enhances mechanical properties as well as the temperature profile.

Characteristics:

- very high dimensional stability
- very high tensile strength
- high temperature resistance
- heat deflection temperature of +284 °F

Applications:

Pumps, valves, seals, toys, bushings.

∅ inch	Tol -0 inch	GEHR PP-C™	GEHR PP-H™	GEHR PP-H30GF™ ¹⁾
		lbs/ft	lbs/ft	lbs/ft
1/4	0.250	+ 0.010	0.019 ⊖	0.019
3/8	0.375	+ 0.015	0.044 ⊖	0.044 ●
1/2	0.500	+ 0.020	0.079 ⊖	0.079 ○●
5/8	0.625	+ 0.025	0.124 ⊖	0.124 ●
3/4	0.750	+ 0.030	0.179 ⊖	0.179 ●
7/8	0.875	+ 0.035	0.244 ⊖	0.244
1	1.000	+ 0.040	0.319 ⊖	0.319 ○●
1 1/8	1.125	+ 0.045	0.403 ⊖	0.388 ●
1 1/4	1.250	+ 0.050	0.498 ⊖	0.498 ●
1 3/8	1.375	+ 0.055	0.603 ⊖	0.603 ●
1 1/2	1.500	+ 0.060	0.718 ⊖	0.718 ○●
1 5/8	1.625	+ 0.065	0.809	0.809
1 3/4	1.750	+ 0.070	0.976 ⊖	0.976 ○●
1 7/8	1.875	+ 0.075	1.121 ⊖	1.121
2	2.000	+ 0.080	1.277 ⊖	1.277 ○●
2 1/8	2.125	+ 0.085	1.439	1.383
2 1/4	2.250	+ 0.090	1.615 ⊖	1.615 ○●
2 3/8	2.375	+ 0.095	1.800	1.732
2 1/2	2.500	+ 0.100	1.995 ⊖	1.995 ○●
2 3/4	2.750	+ 0.110	2.414 ⊖	2.414 ●
3	3.000	+ 0.120	2.873 ⊖	2.873 ○●
3 1/4	3.250	+ 0.130	3.372 ⊖	3.372
3 1/2	3.500	+ 0.140	3.911 ⊖	3.911
3 3/4	3.750	+ 0.150	4.489 ⊖	4.489
4	4.000	+ 0.160	5.103 ⊖	4.900 ○●
4 1/4	4.250	+ 0.170	5.760	5.760
4 1/2	4.500	+ 0.180	6.465 ⊖	6.465 ○
5	5.000	+ 0.200	7.981 ⊖	7.981 ○●
5 1/2	5.500	+ 0.220	9.658 ⊖	9.658
6	6.000	+ 0.240	11.626 ⊖	11.626 ○
7	7.000	+ 0.280	15.644 ⊖	15.644 ○●
8 ¹⁾	8.000	+ 0.320	21.428 ⊖	21.428 ○
9 ¹⁾	9.000	+ 0.360	26.714 ⊖	26.714 ○
10 ¹⁾	10.000	+ 0.400	32.400 ⊖	32.400 ○
12 ¹⁾	12.000	+ 0.480	46.427 ⊖	46.427 ○
14 ¹⁾	14.000	+ 0.560	63.000 ⊖	63.000 ○

Round Rods



Stock Lengths:

1/4" - 2" = 8 ft
2 1/8" - 14" = 4 ft

Lengths are nominal

Colors:

- ⊖ natural
- black
- euro gray

Black available in PP-C upon request.

Natural available in PP-H upon request.

1) produced in metric

available in stock

Custom extrusion – time of delivery on request

GEHR PP-H™			
Angle-Profiles			
A	B	C	lbs/ft
2	2	1/4	0.275 ⊖

GEHR PP-H™			
U-Channels			
A	B	C	lbs/ft
2 1/2	2 1/4	3/16	0.500 ⊖
2 1/2	3 1/4	3/16	0.650 ⊖
3 1/2	6	3/16	1.040

Standard Profiles

Stock Lengths:

10 ft

Colors:

- ⊖ natural



GEHR PMMA xt™ (Acrylic)

is a Polymethylemethacrylate that offers excellent clarity, UV stability and good mechanical and tensile strength. GEHR PMMA™ xt is a hard material that polishes to the finish of glass either by the use of a flame or chemical.

Characteristics:

- superior clarity and UV stability
- high mechanical and tensile strength
- easy to polish
- easy to glue or adhesive bond
- low impact and chemical resistance
- operating temperature range from -40 °F to 167 °F

Applications:

Display, advertisement, point of sale, tubes for lamps, food industry, furniture industry.

Ø		Tol -0	GEHR PMMA xt™
mm	inch	inch	lbs/ft
50	2.000	+ 0.060	1.558 \oplus
60	2.362	+ 0.071	2.401 \oplus
70	2.756	+ 0.083	3.256 \oplus
75	2.953	+ 0.089	3.771 \oplus
80	3.150	+ 0.095	4.104 \oplus
90	3.543	+ 0.106	5.149 \oplus
100	3.937	+ 0.118	6.352 \oplus
120	4.724	+ 0.142	9.094 \oplus
150	5.906	+ 0.177	14.042 \oplus
180 ¹⁾	7.087	+ 0.213	24.741 \oplus
200 ¹⁾	7.874	+ 0.236	25.643 \oplus

Rods



Stock Lengths:
 $\leq 5.9"$ = 2 meter
 $\geq 6"$ = 1 meter¹⁾

Lengths are nominal

Color:
 \oplus clear

 available in stock

**GEHR ABS™**

is an **Acrylnitrile Butadiene Styrene** that offers high impact properties and has good thermal, dimensional stability and good scratch resistance.

Characteristics:

- **high impact properties**
- **good thermal and dimensional stability**
- **good scratch resistance**
- good electrical insulative properties
- **Maximum operating temperature 170 °F**

Applications:

Parts with a high impact strength, spacers, rollers, prototypes, electronic industry.

GEHR PPO™ (Noryl®)

is a **Polyphenylenether** that offers high impact strength very high dimensional stability. GEHR PPO also displays excellent electrical properties that will not be influenced by surrounding frequencies and therefore is the material of choice for electrical applications.

Characteristics:

- **high impact properties**
- **very high dimensional stability**
- **excellent electrical insulative properties**
- self-extinguishing
- high impact strength
- high resistance to hydrolysis
- low tendency to creep
- high thermo stability
- **operating temperature range -58 °F to +302 °F**

Applications:

Parts for electrical engineering and household utensils, shafts, gear wheels, spacers, etc.

GEHR PPO-30GF

is a Polyphenylenether that is reinforced with 30% glass fiber which greatly enhances mechanical properties as well as the temperature profile. This product excels in electrical applications that require superior dimensional stability.

∅		Tol -0 inch	GEHR ABS™	GEHR PPO™	GEHR PPO-30GF™
			lbs/ft	lbs/ft	lbs/ft
1/4	0.250	+ 0.010	0.023 ◎●	0.023	0.028
3/8	0.375	+ 0.015	0.051 ◎●	0.053 ●	0.064
1/2	0.500	+ 0.020	0.092 ◎●	0.093 ●	0.114 ◎
5/8	0.625	+ 0.025	0.144 ◎●	0.145 ●	0.177
3/4	0.750	+ 0.030	0.206 ◎●	0.209 ●	0.256 ◎
7/8	0.875	+ 0.035	0.281	0.284 ●	0.345 ◎
1	1.000	+ 0.040	0.368 ◎●	0.371 ●	0.450 ◎
1 1/4	1.250	+ 0.050	0.575 ◎●	0.590 ●	0.716 ◎
1 3/8	1.375	+ 0.055	0.695 ◎	0.714	0.868
1 1/2	1.500	+ 0.060	0.828 ◎●	0.851 ●	1.032 ◎
1 5/8	1.625	+ 0.065	0.972	0.998	1.212
1 3/4	1.750	+ 0.070	1.127 ◎●	1.160 ●	1.406
1 7/8	1.875	+ 0.075	1.294	1.329	1.615
2	2.000	+ 0.080	1.477 ◎●	1.514 ●	1.836 ◎
2 1/8	2.125	+ 0.085	1.662	1.708	2.072
2 1/4	2.250	+ 0.090	1.956	1.914	2.321
2 1/2	2.500	+ 0.100	2.300 ◎●	2.360 ●	2.689 ◎
2 3/4	2.750	+ 0.110	2.784 ●	2.860	3.470
3	3.000	+ 0.120	3.313 ◎●	3.404 ●	4.133
3 1/4	3.250	+ 0.130	3.888	3.992	4.848
3 1/2	3.500	+ 0.140	4.509 ◎●	4.636 ●	5.624 ◎
3 3/4	3.750	+ 0.150	5.077	5.322	6.457
4	4.000	+ 0.160	5.890 ◎●	6.057 ●	7.348
4 1/4	4.250	+ 0.170	6.649	6.832	8.288
4 1/2	4.500	+ 0.180	7.454	7.661 ●	9.301
5	5.000	+ 0.200	9.200 ●	9.460 ●	11.482
5 1/2	5.500	+ 0.220	11.136	11.441	13.888
6	6.000	+ 0.240	13.253 ◎	13.520	16.531

Round Rods



Stock Lengths:

1/4" - 2" = 8 ft
2 1/8" - 6" = 4 ft

Lengths are nominal

Colors:

◎ natural
● black

available in stock

Custom extrusion
– time of delivery on request

☒		Tol max. inch	GEHR ABS™ 24" width
		inch	lbs/sft
3/8	0.375	+ 0.025	2.223
1/2	0.500	+ 0.025	2.910
5/8	0.625	+ 0.025	3.651
3/4	0.750	+ 0.102	4.459 ◎●
1	1.000	+ 0.106	5.831 ◎●
1 1/4	1.250	+ 0.118	7.386 ◎●
1 1/2	1.500	+ 0.196	8.824 ◎●
1 3/4	1.750	+ 0.196	10.197 ◎●
2	2.000	+ 0.196	11.377 ◎●
2 1/4	2.250	+ 0.196	12.943
2 1/2	2.500	+ 0.196	14.315 ◎●
2 3/4	2.750	+ 0.196	15.688
3	3.000	+ 0.196	17.061 ◎●
3 1/4	3.250	+ 0.196	18.433
3 1/2	3.500	+ 0.196	19.807 ◎
3 3/4	3.750	+ 0.196	21.306
4	4.000	+ 0.196	22.679 ◎●

Sheets



Stock Lengths:

48"

Width and Lengths
are nominal

Colors:

◎ natural
● black

available in stock

Custom extrusion
– time of delivery on request

GEHR PA 12 TR™



ECOGEHR PA 6.10™

GEHR Bio Based Polyamide contains 60% sebacic acid derived from organic oils.

GEHR PA 6.10™ offers low water absorption characteristics which result in good dimensional stability. When compared to other polyamides, it has lower density, good cold impact strength and good chemical resistance to organic solvents

Characteristics:

- **high service temperature**
- **high dimensional stability**
- low water absorption
- **high impact strength**
- high chemical resistance to organic solvents

Applications:

- pump parts
- toothed gears
- carriage rails

GEHR PA 12 TR™

GEHR Transparent Polyamide offers a high thermo stability, stiffness and good surface hardness. This tough material also exhibits excellent UV characteristics and will not weather poorly like other transparent materials. Typical to Polyamides, GEHR Nylon 12 TR is hygroscopic; conditioning the material to the applications level of humidity is important. This "conditioning" effect happens normally when kept in stock for a longer period of time and is important for the best mechanical performance and tolerances to be achieved.e.

Characteristics:

- **high transparency**
- **high dynamic stiffness**
- high chemical resistance
- high stress cracking resistance
- low water absorption
- high toughness
- **good weather resistance**
- **excellent UV resistance**

Based on the high transparency of GEHR PA 12 TR™ coupled with the excellent physical properties Polyamides provide typical applications may include:

Applications:

- IR sensor housings
- Fixtures and handles
- Parts for milking machines
- Filtration systems
- Inspection glasses
- Protective shields

Ø mm	Tol -0 inch		GEHR PA 12 TR™	ECC GEHR PA 6.10™
	min.	max.	lbs/ft	lbs/ft
10	+ 0.1	+ 0.5		0.085
20	+ 0.2	+ 0.7	0.339	0.340
22	+ 0.2	+ 0.9	0.413	
25	+ 0.2	+ 0.9	0.531	0.530 ◎
28	+ 0.2	+ 0.9	0.661	
30	+ 0.2	+ 0.9	0.759	0.760
32	+ 0.2	+ 1.1	0.866	
36	+ 0.2	+ 1.1	1.089	
40	+ 0.2	+ 1.1	1.339 ⊕	1.360
45	+ 0.3	+ 1.3	1.705	
50	+ 0.3	+ 1.3	2.098	2.120 ◎
56	+ 0.3	+ 1.3	2.616	
60	+ 0.3	+ 1.6	3.018	
65	+ 0.3	+ 1.6	3.527	
70	+ 0.3	+ 1.6	4.143	
75	+ 0.4	+ 2.0	4.732	
80	+ 0.4	+ 2.0	5.402 ⊕	
85	+ 0.5	+ 2.2	6.116	
90	+ 0.5	+ 2.2	6.848	
100	+ 0.6	+ 2.5	8.438 ⊕	

Round Rods



Stock Lengths:

3 m

Lengths are nominal

Colors:

- ◎ natural
- ⊕ transparent

produced in metric

 available in stock

 Custom extrusion
– time of delivery on request



GEHR Acetal™, Co-Polymer (POM-C)

is a **Polyoxymethylene (POM)** that offers excellent surface strength and wear and sliding properties due to the materials smooth surface. GEHR Acetal™ also has a very low resistance to stress cracking, exhibits good thermal stability and a good resistance to chemical attack.

Characteristics:

- excellent surface strength
- very good wear and sliding properties
- low resistance to stress cracking
- good thermal stability
- good resistance to chemical attack
- low micro porosity
- good electrical insulative properties
- low resistance to acids
- high resistance to solvents
- operation temperature range -58 °F to 212 °F

Applications:

Bearings, gear wheels, parts for pumps, screws, ornamental mountings and fittings, parts for the textile industry, stand offs, bushings, food processing industry.

GEHR Acetal ELS™ (electrically conductive)

is a enhanced **Polyoxymethylene (POM)** that offers improved electrical conductivity (electrically conductive) above and beyond that of GEHR Acetal ESd™. Volume resistivity $\leq 10^1 \Omega$, Surface resistivity $\leq 10^4 \Omega$.

GEHR Acetal ESd™ (antistatic)

is a enhanced **Polyoxymethylene (POM)** that offers improved electrical conductivity (antistatic) above and beyond that of GEHR Acetal™, Surface resistivity $\leq 10^{12} \Omega$.

GEHR Acetal 10PE™

is a enhanced **Polyoxymethylene (POM)** that offers a substantially improvement for the coefficient of friction over GEHR Acetal™. Because of this, GEHR Acetal 10PE™ provides good sliding properties and high resistance to wear and tear because of high strength and smooth surface. It offers excellent machining characteristics and has a very low risk of stress cracking during machining. GEHR Acetal 10PE™ is mainly used for tri-biological applications where high abrasion or friction is likely. These applications may include

Characteristics:

- very good sliding properties
- FDA compliant
- very high resistance to stress cracking
- high dimension stability
- high strength
- no microporosity
- high toughness (up to -40 °F)
- high heat deflection temperature
- low water absorption
- good electrical insulating properties
- high resistance to solvents
- difficult to glue and paint

Applications:

- pump parts
- valve seat
- plate support



Acetal Co-Polymer / Acetal ELS / Acetal ESd / Acetal 10PE

Ø inch	Tol -0 inch	GEHR Acetal™ Co-polymer	GEHR Acetal™ ELS*	GEHR Acetal™ ESd*	GEHR Acetal™ 10PE*
		lbs/ft	lbs/ft	lbs/ft	lbs/ft
3/16	0.187	+ 0.002	0.017	0.017	0.017
1/4	0.250	+ 0.002	0.030 ◎●	0.030	0.029
5/16	0.312	+ 0.002	0.048	0.048	0.046
3/8	0.375	+ 0.002	0.069 ◎●	0.069	0.066
7/16	0.438	+ 0.002	0.093	0.093	0.090
1/2	0.500	+ 0.002	0.122 ◎●	0.122	0.117
9/16	0.563	+ 0.002	0.154	0.154	0.149
5/8	0.625	+ 0.002	0.190 ◎●	0.190	0.183
3/4	0.750	+ 0.002	0.274 ◎●	0.274	0.264
7/8	0.875	+ 0.002	0.373 ◎●	0.373	0.360
1	1.000	+ 0.002	0.487 ◎●	0.487	0.470 ●
1 1/8	1.125	+ 0.005	0.617 ◎●	0.617 ●	0.646
1 1/4	1.250	+ 0.005	0.761 ◎●	0.761	0.734
1 3/8	1.375	+ 0.005	0.921 ◎●	0.921	0.888
1 1/2	1.500	+ 0.005	1.096 ◎●	1.096	1.057
1 5/8	1.625	+ 0.005	1.287 ◎●	1.287	1.240
1 3/4	1.750	+ 0.005	1.493 ◎●	1.493	1.438
1 7/8	1.875	+ 0.005	1.713 ◎●	1.713	1.651
2	2.000	+ 0.005	1.949 ◎●	1.949 ●	2.042
2 1/8	2.125	+ 0.030	2.200 ◎●	2.200	2.121
2 1/4	2.250	+ 0.030	2.466 ◎●	2.466	2.377
2 3/8	2.375	+ 0.030	2.748 ◎●	2.748	2.649
2 1/2	2.500	+ 0.030	3.045 ◎●	3.045	2.935 ●
2 5/8	2.625	+ 0.030	3.356	3.356	3.236
2 3/4	2.750	+ 0.030	3.684 ◎●	3.684	3.860
2 7/8	2.875	+ 0.030	4.027	4.027	4.219
3	3.000	+ 0.120	4.385 ◎●	4.385 ●	4.594
3 1/4	3.250	+ 0.130	5.144 ◎●	5.144	5.392
3 1/2	3.500	+ 0.140	5.968 ◎●	5.968	6.253
3 3/4	3.750	+ 0.150	6.852 ◎●	6.852	7.178
4	4.000	+ 0.160	7.796 ◎●	7.796	8.167
4 1/4	4.250	+ 0.170	8.800 ◎●		
4 1/2	4.500	+ 0.180	9.860 ◎●		
4 3/4	4.750	+ 0.190	10.987 ◎		
5	5.000	+ 0.200	12.181 ◎●		
5 1/2	5.500	+ 0.220	14.738 ◎●		
6	6.000	+ 0.240	17.540 ◎●		
6 1/2	6.500	+ 0.260	20.584 ◎●		
7	7.000	+ 0.330	23.875 ◎●		
7 1/2	7.500	+ 0.300	27.405		
8	8.000	+ 0.320	31.183 ◎●		
9 ¹⁾	9.000	+ 0.360	39.475 ◎		
10 ¹⁾	10.000	± 0.400	48.723 ◎		
12 ¹⁾	12.000	± 0.480	70.162 ◎		
14 ¹⁾	14.000	± 0.560	96.100 ◎		
16 ¹⁾	16.000	± 0.640	125.200 ◎		
20 ¹⁾	20.000	± 0.800	194.894 ◎		

Round Rods



Stock Lengths:

1/4" - 4 3/4" = 8/10 ft
 4 3/4" - 8" = 4/5 ft
 9" - 20" = 1 meter

Lengths are nominal

Colors:

- ◎ natural
- black
- light blue

1) produced in metric

available in stock

Custom extrusion
– time of delivery on request

Sheets



Stock Lengths:
48" and 96"

Lengths are nominal

Colors:

- natural
- black
- ⊗ natural / ivory

1) produced in metric
2) tolerances on request

available in stock

Custom extrusion – time of delivery on request

inch	Tol -0 inch	GEHR Acetal™ Co-polymer 24" width	GEHR Acetal™ Co-polymer 48" width
		lbs/sft	lbs/sft
1/4	0.250	+ 0.025	1.862
3/8	0.375	+ 0.025	2.810 ○●
1/2	0.500	+ 0.025	3.818 ○●
5/8	0.625	+ 0.025	4.746 ○●
3/4	0.750	+ 0.025	5.709 ○●
7/8	0.875	+ 0.025	6.636 ○●
1	1.000	+ 0.025	7.563 ○●
1 1/4	1.250	+ 0.050	9.491 ○●
1 1/2	1.500	+ 0.050	11.345 ○●
1 3/4	1.750	+ 0.050	13.198 ○●
2	2.000	+ 0.050	15.052 ○●
2 1/4	2.250	+ 0.150	17.054 ○●
2 1/2	2.500	+ 0.150	18.908 ○
2 3/4	2.750	+ 0.150	20.761 ○●
3 ¹⁾	3.000	+ 0.150	22.615 ○●
3 1/4 ¹⁾	3.250	+ 0.200	24.469
3 1/2 ¹⁾	3.500	+ 0.200	26.320 ○●
3 3/4 ¹⁾	3.750	+ 0.200	28.176
4 ¹⁾	4.000	+ 0.200	30.014 ○●
4 1/2 ¹⁾	4.500	+ 0.400	33.803 ○
5 ¹⁾	5.000	+ 0.400	37.239 ○
6 ¹⁾	6.000	+ 0.400	44.963 ○
7 ¹⁾	7.000	+ 0.400	52.646 ○
8 ¹⁾	8.000	+ 0.400	60.061 ○
10 ¹⁾⁽²⁾	10.000		75.000 ○

Stock Lengths:

3 m

Lengths are nominal

Colors:

- black
- ⊗ natural / ivory

1) produced in metric

inch	Tol -0 inch	GEHR Acetal ELS™ 24" width	GEHR Acetal ESd™ 24" width	GEHR Acetal 10PE™ 24" width
		lbs/sft	lbs/sft	lbs/sft
3/4 ¹⁾	0.750	+ 0.050	5.585 ●	5.585 ⊗
1 ¹⁾	1.500	+ 0.050	6.870 ●	6.870
1 1/8 ¹⁾	1.125	+ 0.050	8.400 ●	8.400 ⊗
2 ¹⁾	2.000	+ 0.050	14.896	14.896
4 ¹⁾	4.000	+ 0.200	29.791	29.791





GEHR PVDF™

is a **Polyvinylidene Fluoride** that offers very good tensile strength, pressure resistance, dimensional stability and chemical resistance. GEHR PVDF™ also displays good mechanical strength and toughness especially at low temperatures and is self-extinguishing.

Characteristics:

- **very good tensile strength**
- **very good pressure resistance**
- **very good dimensional stability**
- **excellent chemical resistance**
- **good mechanical strength**
- **good toughness, especially in low temperatures**
- low water absorption good friction and wear values
- excellent UV resistance
- high CLTE
- FDA compliant
- excellent radiation resistance
- excellent barrier properties
- material of choice for high purity fluid handling
- **operating temperature range -22 °F to +302 °F**

Applications:

Pumps, rotation disks, valves, fittings, glide tracks, cog wheels, chemical processing, high purity, pulp, paper

Ø		Tol -0 inch	GEHR PVDF™
			lbs/ft
1/4	0.250	+ 0.010	0.039
3/8	0.375	+ 0.015	0.087 ◎
1/2	0.500	+ 0.020	0.155 ◎
5/8	0.625	+ 0.025	0.243 ◎
3/4	0.750	+ 0.030	0.349 ◎
7/8	0.875	+ 0.035	0.477 ◎
1	1.000	+ 0.040	0.624 ◎
1 1/8	1.125	+ 0.045	0.789 ◎
1 1/4	1.250	+ 0.050	0.974 ◎
1 1/2	1.500	+ 0.060	1.403 ◎
1 5/8	1.625	+ 0.065	1.644
1 3/4	1.750	+ 0.070	1.910 ◎
1 7/8	1.875	+ 0.075	2.191 ◎
2	2.000	+ 0.080	2.495 ◎
2 1/4	2.250	+ 0.090	3.158 ◎
2 3/8	2.375	+ 0.030	3.519
2 1/2	2.500	+ 0.100	3.894 ◎
2 3/4	2.750	+ 0.110	4.714 ◎
3	3.000	+ 0.120	5.615 ◎
3 1/4	3.250	+ 0.130	6.587
3 1/2	3.500	+ 0.140	7.641 ◎
3 3/4	3.750	+ 0.150	8.770 ◎
4	4.000	+ 0.160	9.982 ◎
4 1/4	4.250	+ 0.170	11.260
4 1/2	4.500	+ 0.180	12.626 ◎
5	5.000	+ 0.200	15.598 ◎
6	6.000	+ 0.240	22.461 ◎
7	7.000	+ 0.280	30.572 ◎
8	8.000	+ 0.320	39.931 ◎
10 ¹⁾	10.000	+ 0.400	63.000 ◎
12 ¹⁾	12.000	+ 0.500	90.141

☒		Tol -0 inch	GEHR PVDF™ 24" width
			lbs/sft
1/4	0.250	+ 0.025	2.390
3/8	0.375	+ 0.025	3.570
1/2	0.500	+ 0.025	4.719 ◎
5/8	0.625	+ 0.025	5.854
3/4	0.750	+ 0.025	7.032 ◎
7/8	0.875	+ 0.025	8.189
1	1.000	+ 0.025	9.390 ◎
1 1/4	1.250	+ 0.050	11.660
1 1/2	1.500	+ 0.050	14.018 ◎
1 3/4	1.750	+ 0.050	16.286
2	2.000	+ 0.150	18.645
2 1/4	2.250	+ 0.150	20.958
2 1/2	2.500	+ 0.150	23.273
2 3/4	2.750	+ 0.150	25.485
3	3.000	+ 0.150	27.944
3 1/4	3.250	+ 0.200	30.212
3 1/2	3.500	+ 0.200	32.618
3 3/4	3.750	+ 0.200	34.884
4	4.000	+ 0.200	37.198

Round Rods



Stock Lengths:

1/4" - 2" = 8 ft
 2 1/8" - 8" = 4 ft
 10" and above = 1 meter

Lengths and width are nominal

Colors:

◎ natural

1) produced in metric

available in stock

Custom extrusion
– time of delivery on request

Sheets



Stock Lengths:

48"

Lengths are nominal

Colors:

◎ natural

**GEHR E-CTFE™**

is an **Ethylene Chlorotrifluoroethylene** that exhibits extremely high impact strength. GEHR E-CTFE™ is a very pure product with a smooth surface and is highly chemical resistant. This unique product has excellent barrier properties to oxygen, carbon dioxide, chlorine gas and hydrochloric acid.

Characteristics:

- **extremely high impact strength**
- **excellent barrier material**
- **excellent resistance to chemicals**
- **good sliding properties**
- high resistance to radiation
- very good UV resistance
- self extinguishing
- food safe
- very low moisture absorption (<.1%)
- **operating temperature range -104 °F to 302 °F**

Applications:

Parts which come in contact with aggressive materials (machinery building industry), lining of tanks, pumps, flanges, fittings, parts in centrifuges and control engineering industry.

Ø		Tol -0 inch	GEHR E-CTFE™
			lbs/ft
1/2	0.500	+ 0.015	0.148 ◎
3/4	0.750	+ 0.023	0.337 ◎
1	1.000	+ 0.030	0.600 ◎
1 1/4	1.250	+ 0.037	0.938 ◎
1 1/2	1.500	+ 0.045	1.351 ◎
1 3/4	1.750	+ 0.052	1.838
2	2.000	+ 0.060	2.402 ◎
2 1/4	2.250	+ 0.067	3.039 ◎
2 1/2	2.500	+ 0.080	3.753 ◎
3	3.000	+ 0.090	5.405 ◎
3 1/2	3.500	+ 0.105	7.350
4	4.000	+ 0.120	9.608 ◎
5	5.000	+ 0.135	15.080 ◎
6	6.000	+ 0.150	21.619

Round Rods



Stock Lengths:

1/2" - 5" = 4 ft

Colors:

◎ natural

 available in stock

 Custom extrusion
– time of delivery on request



GEHR PSU™ (Polysulfone)

is a **Polysulfone** that offers very good thermal stability through a wide temperature range. GEHR PSU™ possesses a high mechanical strength, very good dielectric properties and is self-extinguishing. This unique product also provides excellent hydrolysis and radiation resistance properties.

Characteristics:

- very good thermal stability
- high mechanical strength
- very good dielectric properties
- self-extinguishing
- excellent hydrolysis resistance
- high radiation resistance
- high rigidity
- low smoke emissions
- performs very well after repeated sterilization
- operating temperature range -148 °F to 320 °F

Applications:

Parts for microwave ovens, blow-dryers, food industry, pump wheels, insulators, medical industry.

GEHR PPSU™

is a **Polyphenylensulfone** with superior impact strength and hydrolysis resistance when compared to GEHR PSU™. This high performance industrial plastic also exhibit excellent notched impact strength even at elevated temperatures.

Characteristics:

- superior impact strength
- excellent hydrolysis resistance
- excellent notched izod impact
- high rigidity
- excellent chemical resistance
- excellent resistance to radiation
- performs very well after repeated sterilization
- max operating temperature 360F

Applications:

same as GEHR PSU but in applications that may require higher chemical resistance and temperature profile.

Ø		Tol -0 inch	GEHR PSU™
			lbs/ft
1/4	0.250	+0.010	0.027
3/8	0.375	+0.015	0.061 ◎
1/2	0.500	+0.020	0.109 ◎
5/8	0.625	+0.025	0.167 ◎
3/4	0.750	+0.030	0.240 ◎
7/8	0.875	+0.035	0.320
1	1.000	+0.040	0.426 ◎
1 1/4	1.250	+0.050	0.678 ◎
1 1/2	1.500	+0.060	0.990 ◎
1 5/8	1.625	+0.065	1.140
1 3/4	1.750	+0.070	1.290
2	2.000	+0.080	1.738 ◎
2 1/4	2.250	+0.090	2.197 ◎
2 1/2	2.500	+0.100	2.713 ◎
2 3/4	2.750	+0.110	3.284 ◎
3	3.000	+0.120	3.909 ◎
3 1/4	3.250	+0.130	4.591
3 1/2	3.500	+0.140	5.322 ◎
4	4.000	+0.160	6.750
4 1/2	4.500	+0.180	8.839 ◎
5	5.000	+0.200	10.540
6	6.000	+0.240	15.180

Round Rods



Stock Lengths:

1/4" - 2" = 8 ft
2 1/8" - 6" = 4 ft

Lengths are nominal

Colors:

- ◎ natural
- black

available in stock

Custom extrusion
– time of delivery on request

Ø		GEHR PPSU™ 1)
inch		lbs/ft
1/4	0.250	0.028
3/8	0.375	0.063
1/2	0.500	0.113
5/8	0.625	0.174
3/4	0.750	0.250 ●
7/8	0.875	0.333
1	1.000	0.443
1 1/4	1.250	0.705 ●
1 1/2	1.500	1.030 ●
1 5/8	1.625	1.186
1 3/4	1.750	1.342
2	2.000	1.807
2 1/4	2.250	2.285
2 1/2	2.500	2.822
2 3/4	2.750	3.415
3	3.000	4.065
3 1/4	3.250	4.775
3 1/2	3.500	5.535
4	4.000	7.020
4 1/2	4.500	9.193
5	5.000	10.961
6	6.000	15.787

1) tolerances on request

**GEHR PEI™ (ULTEM® 1000)**

is a Polyetherimide that offers excellent mechanical strength in coordination with good chemical and heat resistance. GEHR PEI™ also provides good dimensional stability and excellent creep resistance.

Characteristics:

- excellent mechanical strength
- good chemical resistance
- good heat resistance
- good dimensional stability
- excellent creep resistance
- very good weatherability
- self-extinguishing
- maximum operating temperature 338 °F

Applications:

Parts for electrical engineering, food industry and in the aircraft construction, medical industry, etc.

GEHR PEI-30GF™ (ULTEM® 2300)

is a Polyetherimide that is reinforced with 30% glass fiber and offers improved mechanical and temperature properties when compared to GEHR PEI™.

Characteristics:

- very high thermal profile
- excellent mechanical strength
- superior stiffness

Ø		Tol -0 inch	GEHR PEI™ (Ultem® 1000)	GEHR PEI-30GF™ (Ultem® 2300)
			lbs/ft	lbs/ft
1/4	0.250	+ 0.010	0.028 ◎	0.033
5/16	0.313	+ 0.012	0.044 ●	0.052
3/8	0.375	+ 0.015	0.062 ◎	0.074 ◎
1/2	0.500	+ 0.020	0.110 ◎	0.131 ◎
5/8	0.625	+ 0.025	0.171 ◎	0.204 ◎
3/4	0.750	+ 0.030	0.246 ◎	0.293 ◎
7/8	0.875	+ 0.035	0.334	0.398
1	1.000	+ 0.040	0.442 ◎	0.519 ◎
1 1/4	1.250	+ 0.050	0.695 ◎●	0.826 ◎
1 1/2	1.500	+ 0.060	1.001 ◎	1.190 ◎
1 3/4	1.750	+ 0.070	1.362 ◎	1.620
2	2.000	+ 0.080	1.780 ◎●	2.117
2 1/4	2.250	+ 0.090	2.250 ●	2.675
2 1/2	2.500	+ 0.100	2.779	3.304
2 3/4	2.750	+ 0.110	3.363	3.999
3	3.000	+ 0.120	4.006 ◎	4.763
3 1/2	3.500	+ 0.140	5.452 ◎	6.482
4	4.000	+ 0.160	7.123	8.468
4 1/2	4.500	+ 0.180	9.008	10.711
5	5.000	+ 0.200	11.125	13.227
6	6.000	+ 0.240	16.026	19.055

Round Rods



Stock Lengths:

1/4" - 2" = 8 ft
2 1/8" - 6" = 4 ft

Lengths are nominal

Colors:

◎ natural
● black

available in stock

Custom extrusion – time of delivery on request

**GEHR PPS™**

is a Polyphenylensulfide that offers a very high mechanical capacity, thermal and chemical resistance at elevated temperatures. GEHR PPS™ also is very dimensionally stable with excellent creep properties coupled with superior flammability properties offering one of the lowest LOI values of 40.

Characteristics:

- **excellent mechanical strength**
- **excellent chemical resistance**
- **very good thermostability**
- **very good dimensional stability**
- **excellent creep properties**
- very good insulating properties
- high resistance to hydrolysis
- very low moisture absorption
- **maximum operating temperature +425 °F**

Applications:

Components in the machine-making, pump parts, fan parts, impellers, parts in the fuel and automotive sector.

GEHR PPS-40GF™

is a Polyphenylensulfide that is 40% glass fiber reinforced and offers improved mechanical and temperature properties when compared to GEHR PPS™.

Characteristics:

- very high thermal profile
- excellent mechanical strength
- superior stiffness
- **maximum operating temperature +450 °F**

Ø mm	Tolerances mm		GEHR PPS™	GEHR PPS-40GF™
	min.	max.	lbs/ft	lbs/ft
10	+ 0.1	+ 0.5	0.074	0.089
20	+ 0.2	+ 0.9	0.289	0.351 ●
25	+ 0.2	+ 0.9	0.452	0.549
30	+ 0.2	+ 1.2	0.646	0.787 ●
35	+ 0.2	+ 1.8	0.873	1.059
40	+ 0.2	+ 1.8	1.250 ○	1.389 ●
50	+ 0.3	+ 2.0	1.786 ○	2.169 ●
60	+ 0.3	+ 2.5	2.573	3.123
70	+ 0.3	+ 2.5	3.481	4.352

Round Rods



Stock Lengths:

1 / 3 m

Lengths are nominal

Produced in metric

Colors:

- natural
- black

Produced in metric sizes only

mm	Tolerances of thickness mm		GEHR PPS™ 620 mm width	GEHR PPS-40GF™ 620 mm width
	min.	max.	lbs/sft	lbs/sft
10	+ 0.2	+ 0.9	9.280	11.330
16	+ 0.3	+ 1.5	14.780	18.060
20	+ 0.3	+ 1.5	18.270	22.330
25	+ 0.3	+ 1.5	22.650	27.680
30	+ 0.5	+ 2.5	27.540 ○	33.660
40	+ 0.5	+ 2.5	36.290	44.350
50	+ 0.5	+ 2.5	45.030	55.040

Sheets



Stock Lengths:

1 m

Lengths are nominal

Produced in metric

available in stock Germany

Custom extrusion
– time of delivery on
request



GEHR PEEK™

is a **Polyetheretherketone** that offer exceptional mechanical strength, toughness, hardness, flexural strength and torsional strength. GEHR PEEK™ also performs extremely well in applications associated with chemicals and has very good dielectrics properties.

Characteristics:

- exceptional mechanical strength
- excellent toughness
- excellent flexural strength
- very good hardness
- excellent torsional strength
- very good chemical resistance
- very good dielectric properties
- self-extinguishing
- very good wear resistance at high temperature
- very high radiation resistance
- maximum operating temperature +480 °F

Applications:

Bearing shells, piston rings, valve seats, gears, seals, aviation, pump vanes, plug connectors, wafer carriers, rider rings, bearings, wear rings, pump throat bushings.

GEHR PEEK 30GF™

is a **Polyetheretherketone** that is 30 % glass fiber reinforced and offers improved mechanical and temperature properties when compared to GEHR PEEK™.

Characteristics:

- superior thermal profile
- superior mechanical strength
- superior stiffness
- excellent hardness
- maximum operating temperature +500 °F

GEHR PEEK-mod®

is a **Polyetheretherketone** that is reinforced with 10% of PTFE, graphite and carbonfiber and offers additional to GEHR PEEK™ excellent friction, wear and tear properties.

Characteristics:

- very good coefficient of friction
- excellent wear properties
- excellent tear properties
- exceptional mechanical strength
- excellent toughness
- excellent flexural strength
- very good hardness
- excellent torsional strength
- maximum operating temperature +480 °F

	2 3/8	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/2	6	6 1/2	7	8	9	10	11	12	14	16		
	2.727	3.017	3.653	4.400	5.105	5.921	6.799	7.736		9.785		12.083	14.624	17.407	20.500	24.200	31.500	39.600	47.600	60.600	71.500	93.500	120.000		
		3.017		4.400	5.105	5.921		7.736		9.785		12.083		17.407											
		2.030		2.920		3.760		5.200		6.580															
		1.995	2.414	2.873	3.372	3.911	4.489	5.103		6.465		7.981	9.658	11.626		15.644	21.428	26.714	32.400		46.427				
		1.995	2.414	2.873				5.103				7.981				15.644									
		1.995						4.900		6.465		7.981		11.626		15.644	21.428	26.714	32.400		46.427	63.000			
		2.497		3.596				6.393																	
		2.300		3.313		4.509		5.890					13.253												
		2.300	2.784	3.313		4.509		5.890				9.200													
		2.360		3.404		4.636		6.057		7.661		9.460													
		2.890				5.624																			
	2.748	3.045	3.684	4.385	5.144	5.968	6.852	7.796	8.800	9.860	10.987	12.181	14.738	17.540	20.584	23.875	31.183								
				4.385																					
		2.935		4.226																					
		3.894	4.714	5.615		7.641	8.550	9.982		12.626		15.598		22.461		30.000	40.000								
		3.753		5.405				9.608				11.460													
		2.713	3.284	3.909		5.322				8.839															
			4.006		5.452																				

65	70	80	90	100	120	125	150	180	200	
	3.256	4.104	5.149	6.352	9.094		14.042	24.741	25.643	
		5.402		8.438						
	3.071	3.645	4.698	5.940	7.323		11.428	16.605	23.828	29.363
		5.488		8.235						
		5.468								

GEHR® Sheets (lbs/sft)

inch	width	color	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
GEHR ABS	24"	black					4.459		5.831		7.386	8.824	10.297	11.377		14.315
GEHR ABS	24"	natural					4.459		5.831		7.386	8.824	10.297	11.377		14.315
GEHR ACETAL	24"	black	0.030	2.810	3.818	4.746	5.709	6.636	7.563		9.491	11.345	13.198	15.052	17.054	
GEHR ACETAL	24"	natural	0.030	2.810	3.818	4.746	5.709	6.636	7.563		9.491	11.345	13.198	15.052	17.054	18.908
GEHR ACETAL	48"	black	0.030	2.810	3.818	4.746	5.709	6.636	7.563		9.491	11.345	13.198	15.052		
GEHR ACETAL	48"	natural	0.030	2.810	3.818	4.746	5.709	6.636	7.563		9.491	11.345	13.198	15.052		
GEHR ACETALELS	24"	black					5.585		6.870	8.400						
GEHR ACETAL ESd	24"	natural					5.585			8.400						
GEHR PVDF	24"	natural			4.630		6.950		9.260			14.020				

mm			2.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0	30.0	36.0	40.0	45.0	50.0
ECOGEHR PLA-LF	1000mm	natural	2.720													
ECOGEHR CL	1000mm	natural	2.720													
GEHR PEEK	24"	natural		1.434	1.706	2.325	2.828	3.420	4.480	5.540	6.976	8.344	9.875	11.000	12.340	13.660

	2 3/4	3	3 1/2	4	4 3/4	5	6	7	8	10
	17.061									
	17.061	19.807	22.679							
20.482	22.615	26.320	30.014							
20.482	22.615	26.320	30.014	33.803	37.239	44.963	52.646	60.061	75.000	

	60.0	80.0	100.0	120.0
16.687	22.000	27.310	33.125	

	D EU	EU 2002/72/EC 1935/2004/EC	EU 10/2011/EC 1935/2004/EC	USA FDA	EU USA	USA	USA
	Trinkwasser Drinking water	Lebensmittel Food approval	Lebensmittel Food approval	Lebensmittel Food approval	Med-Technik Medical	NSF 51	NSF 61
ECOGEHR PLA-LF® ○	-	<input checked="" type="checkbox"/>	-	177.1616	-	-	-
GEHR PVC-U® ●	<input checked="" type="checkbox"/> ++	-	<input checked="" type="checkbox"/> ++	+*	-	<input checked="" type="checkbox"/> ++	-
GEHR PVC-C® ●	-	-	-	-	-	-	-
GEHR PE-HD® ○	KTW	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.1520	-	-	-
GEHR PE-HD® ●	-	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	-	-	-	-
GEHR PE-ELS®	-	-	-	-	-	-	-
GEHR PE-UHMW® ○●	-	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.1520	-	-	-
GEHR PP® ○	-	-	<input checked="" type="checkbox"/>	177.1520	-	-	-
GEHR PP® ●	-	-	<input checked="" type="checkbox"/>	177.1520	-	-	-
GEHR PP-30GF® ●	-	-	-	-	-	-	-
GEHR ABS® ○	-	-	-	181.32	-	-	-
GEHR PMMA® Rohre, Tubes, Tubes ○	-	-	<input checked="" type="checkbox"/>	177.1010	-	-	-
GEHR PMMA® Stäbe, rods, jons ○	-	-	-	177.1010	-	-	-
GEHR PA 6 C® ○	-	-	<input checked="" type="checkbox"/>	177.1500	-	-	-
GEHR PA 6 C® ●	-	-	-	-	-	-	-
GEHR PA 6® ○	-	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/> **	177.1500	-	-	-
GEHR PA 6® ●	-	-	-	-	-	-	-
GEHR PA 6.6® ○	-	-	<input checked="" type="checkbox"/>	177.1500	-	-	-
GEHR PA 6.6® ●	-	-	-	-	-	-	-
GEHR PA 6.6-30GF® ●	-	-	-	-	-	-	-
GEHR PA 12 TR® ○	KTW* WRAS*	-	<input checked="" type="checkbox"/>	177.1500 176.170	-	-	<input checked="" type="checkbox"/> *
GEHR PA 6.10® ○	-	-	-	-	-	-	-
GEHR POM-C® ○	KTW* WRAS*	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.2470	-	-	<input checked="" type="checkbox"/> *
GEHR POM-C® ●	-	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.2470	-	-	<input checked="" type="checkbox"/> *
GEHR POM-C® ○	-	<input checked="" type="checkbox"/>	-	177.2480 178.3297	-	-	-
GEHR POM-10PE® ○	-	-	<input checked="" type="checkbox"/>	177.2470 / 177.1520, 178.2010	-	-	-
GEHR POM-ELS® ●	-	-	-	-	-	-	-
GEHR POM-ESD® ○	-	-	-	-	-	-	-
GEHR POM-ESD-FC® ○	-	<input checked="" type="checkbox"/>	-	177.2470	-	-	-
GEHR PET® ○	-	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.1630	-	-	-
GEHR PET® ●	-	-	-	-	-	-	-
GEHR PC® ○	-	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.1580	-	-	-
GEHR PVDF® ○	-	-	<input checked="" type="checkbox"/> **	177.2510	USP Class VI	-	<input checked="" type="checkbox"/> *
GEHR PVDF-ELS® ●	-	-	-	+	-	-	-
GEHR E-CTFE® ○	-	-	-	-	-	-	-
GEHR PSU® ○	-	-	-	177.1655	-	-	-
GEHR PPSU® ●	-	<input checked="" type="checkbox"/>	-	177.1560 178.3297	-	-	-
GEHR PEI® ○	WRAS	<input checked="" type="checkbox"/>	-	177.1559	-	<input checked="" type="checkbox"/>	-
GEHR PPS® ○	-	<input checked="" type="checkbox"/>	-	++*	-	-	-
GEHR PPS-40GF® ●	-	-	-	++*	-	-	-
GEHR PEEK® ○	BS 6920	-	<input checked="" type="checkbox"/> / <input checked="" type="checkbox"/>	177.2415	ISO 10993-5 USP Class VI	-	-
GEHR PEEK-mod® ●	-	-	-	177.2415	-	-	-
GEHR PEEK-30GF® ○	-	-	-	-	-	-	-

+	does comply with the guidelines of the above-mentioned directives
-	does not comply with the guidelines of the above-mentioned guidelines or has not been tested correspondingly
+*	Plastics and additives comply with the guidelines of the above-mentioned directives. However the formulation at large has not been tested.
+**	The utilized type of plastic complies with the Food Compliance Norm (FCN) e.g. Number 40 "PPS" or 0083 for "PPSU" of the FDA acceptance approval for Food Contact Substances (FCS)
*	available on request
**	currently being tested
BfR	German Institute for Risk Assessment
90/128/EC	Guideline for materials and objects which get in contact with food (1990)
2002/72/EC	Guideline for materials and objects which get in contact with food (2002)
10/2011/EC	Guideline for materials and objects which get in contact with food (2011)
Leitlinie 2005	Drinking water approval of the Federal Environment Agency in Germany (former KTW)
KTW	Plastics and drinking water in Germany
DVGW-W270	Reproduction of micro-organisms on materials for the drinking water sector . Testing and evaluation
NSF-14	National Science Foundation. Guideline for Plastic pipeline systems
NSF-51	National Science Foundation. Guideline for materials and objects which get in contact with food
NSF-61	National Science Foundation. Guideline for materials and objects which get in contact with drinking water
1935/2004/EC*	Our semi-finished materials also comply with this regulation

This table shows a list of regulations that GEHR semi-finished products are complying with at present, evaluation of the composition of materials compared with the corresponding positive lists and migration regulations. The suitability of above-mentioned regulations (e.g. regarding global migration) has to be checked on the finished part by the convertor or the distributor . The convertor or distributor takes the full responsibility. For a detailed statement regarding the topic "Physiology" please ask our Application Engineering Division at GEHR GmbH.

Colors

- grey
- black
- blue
- natural

Machining Recommendations

Turning	Milling
<p> α Setting Angle ° γ Rake Angle ° x Recessing Angle ° v Cutting Speed m/mN s Feed mm/U </p>	<p> α Setting Angle ° γ Rake Angle ° v Cutting Speed m/mN </p>
Peak Radius r to be min. 0,5 mm	Allow feed up to 0,5 mm/tooth

	α	γ	X	v	s	α	γ	v
PVC	8 - 10	0 - 5	50 - 60	200 - 750	0,3 - 0,5	5 - 10	0 - 15	300 - 1000
PE-HD	6 - 10	0 - 5	45 - 60	250 - 500	0,1 - 0,5	10 - 20	5 - 15	250 - 500
PP	6 - 10	0 - 5	45 - 60	250 - 500	0,1 - 0,5	10 - 20	5 - 15	250 - 500
ABS	5 - 15	25 - 30	15	200 - 500	0,2 - 0,5	5 - 10	0 - 10	300 - 500
PMMA	5 - 10	0 - 4	15	200 - 300	0,1 - 0,2	2 - 10	2 - 10	2000
PA	6 - 10	0 - 5	45 - 60	200 - 500	0,1 - 0,4	10 - 20	5 - 15	250 - 500
Acetal	6 - 8	0 - 5	45 - 60	300 - 600	0,1 - 0,4	5 - 15	5 - 15	250 - 500
PET	5 - 15	0 - 15	45 - 60	200 - 500	0,1 - 0,5	5 - 15	0 - 15	250 - 500
PC	5 - 12	6 - 8	45 - 60	200 - 350	0,1 - 0,5	5 - 20	5 - 15	250 - 350
PVDF	5 - 12	5 - 15	10	150 - 500	0,1 - 0,3	5 - 15	5 - 15	250 - 500
E-CTFE	6 - 10	0 - 5	45 - 60	250 - 500	0,1 - 0,5	10 - 20	5 - 15	250 - 500
PSU	5 - 10	0 - 5	45 - 60	250 - 400	0,2 - 0,3	5 - 15	0 - 10	250 - 500
PPSU	5 - 10	0 - 5	45 - 60	250 - 400	0,2 - 0,3	5 - 15	0 - 10	250 - 500
PEI	5 - 10	0 - 10	45 - 60	300 - 400	0,2 - 0,3	5 - 15	0 - 10	200 - 400
PPS	5 - 10	0 - 5	45 - 60	200 - 500	0,1 - 0,5	5 - 15	5 - 10	200 - 500
PEEK	5 - 10	3 - 8	45 - 60	200 - 500	0,1 - 0,4	5 - 15	5 - 15	180 - 450
PEEK GF / mod	6 - 8	2 - 8	45 - 60	150 - 200	0,1 - 0,5	15 - 30	6 - 10	80 - 100

It is recommended to use only sharpened HSS tools (High Speed Steel).

Due to the danger of stress cracking we don't recommend the use of cooling agents which are based on oil (or to clean the parts well after machining). Amorphous materials should be annealed during machining.

To avoid treatment problems we recommend a heating up of the materials on approx. 120 °C. Use only sharpened tools with small feed.

With these materials we should be paid attention to a good exhaust of the machining area.

Drilling					Belt saw				Circular saw			
α Setting Angle ° γ Rake Angle ° ϕ Peak Angle ° v Cutting Speed m/mN s Feed mm/U					α Setting Angle ° γ Rake Angle ° v Cutting Speed m/mN t Tooth Pitch mm				α Setting Angle ° γ Rake Angle ° v Cutting Speed m/mN t Tooth Pitch mm			
Twisting Angle β to be ca. 12° bis 16°												
α	γ	ϕ	v	s	α	γ	v	t	α	γ	v	t
5 - 10	3 - 5	60 - 100	30 - 120	0,1 - 0,5	30 - 40	0 - 5	1200	3	5 - 10	0	3000 - 4000	3 - 5
5 - 15	10 - 20	60 - 90	50 - 150	0,1 - 0,3	20 - 30	2 - 5	500	3 - 8	20 - 30	6 - 10	2000	3 - 8
5 - 15	10 - 20	60 - 90	50 - 150	0,1 - 0,3	20 - 30	2 - 5	500	3 - 8	20 - 30	6 - 10	2000	3 - 8
8 - 12	10 - 30	60 - 90	50 - 200	0,2 - 0,3	15 - 30	0 - 5	300	2 - 8	5 - 10	0 - 5	1000	2 - 5
3 - 8	0 - 4	60 - 90	20 - 60	0,1 - 0,5	30 - 40	0 - 5	1200	3	5 - 10	0	1500 - 2000	3 - 5
5 - 15	10 - 25	90	50 - 150	0,1 - 0,3	15 - 30	0 - 5	300 - 500	2 - 8	15 - 30	0 - 8	1800 - 2500	2 - 8
5 - 10	5 - 30	90	50 - 200	0,1 - 0,3	20 - 30	0 - 5	500 - 800	2 - 5	5 - 10	0 - 10	1000 - 2500	2 - 5
5 - 16	10 - 30	90 - 110	50 - 100	0,1 - 0,3	15 - 40	0 - 8	300	2 - 8	10 - 15	0 - 15	bis 3000	2 - 5
8 - 10	10 - 20	90	50 - 100	0,1 - 0,3	15 - 30	5 - 8	300 - 500	2 - 8	15 - 30	5 - 8	1800 - 2500	2 - 8
10 - 16	5 - 20	110 - 130	150 - 300	0,1 - 0,3	20 - 30	5 - 8	300 - 500	2 - 5	5 - 10	0 - 10	1000 - 2500	2 - 5
5 - 15	10 - 20	60 - 90	50 - 150	0,1 - 0,3	20 - 30	2 - 8	500	3 - 8	20 - 30	6 - 10	2000	3 - 8
5 - 15	10 - 20	60 - 90	30 - 90	0,1 - 0,3	15 - 30	0 - 4	500	2 - 5	15 - 30	0 - 15	2000	2 - 5
5 - 15	10 - 20	60 - 90	30 - 90	0,1 - 0,3	15 - 30	0 - 4	500	2 - 5	15 - 30	0 - 15	2000	2 - 5
5 - 15	10 - 20	60 - 90	30 - 90	0,1 - 0,4	15 - 30	0 - 4	500	2 - 5	15 - 25	0 - 15	2000	2 - 5
5 - 10	10 - 30	90	50 - 200	0,1 - 0,3	15 - 30	0 - 5	500 - 800	3 - 5	15 - 30	0 - 10	1800 - 2500	2 - 5
5 - 15	10 - 25	90 - 120	70 - 200	0,1 - 0,3	15 - 30	0 - 5	500 - 800	3 - 5	15 - 30	0 - 10	1800 - 2500	2 - 5
6	5 - 10	90 - 120	80 - 100	0,1 - 0,3	15 - 30	10 - 15	200 - 300	3 - 5	15 - 30	10 - 15	500 - 1500	20 - 30

Annealing recommendations of thermoplastics

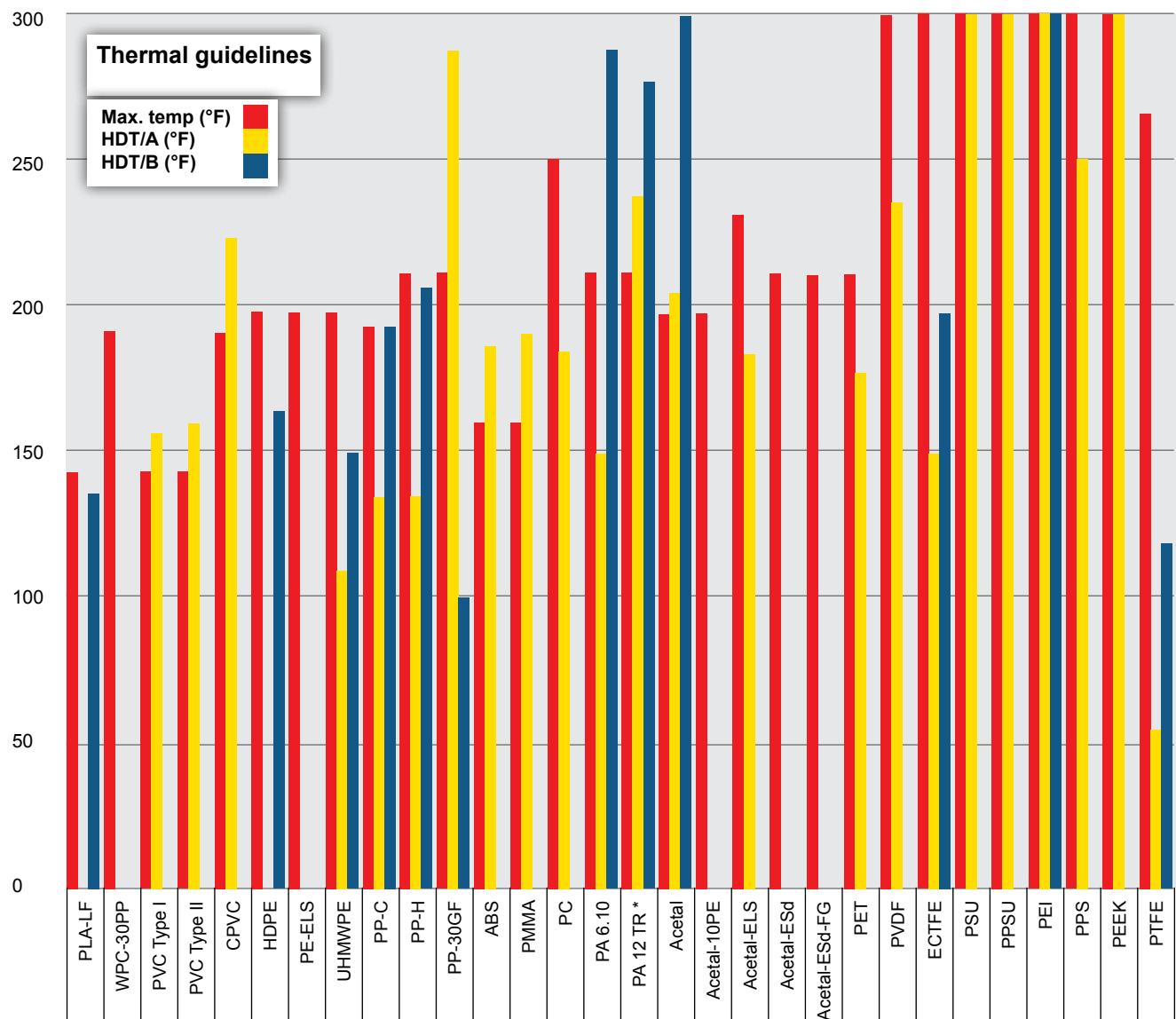
	Heating rate beginning from (50 °F/h)	Annealing guideline (°F)	Cooling rate up to (°F)
GEHR PVC-U™	-	140	-
GEHR PVC-C™	-	194	-
GEHR PE-HD™	-	194	-
GEHR PP-H™	-	212	-
GEHR PP-30GF™	194	302	194
GEHR ABS™	-	158	-
GEHR PMMA™	122	176	122
GEHR PA™	194	302	194
GEHR Acetal	194	302	194
GEHR PET™	194	302	194
GEHR PC™	194	284	194
GEHR PVDF™	194	302	194
GEHR E-CTFE™	176	221	176
GEHR PSU™	293	329	293
GEHR PPSU™	284	392	284
GEHR PEI™	284	392	284
GEHR PPS™	302	392	302
GEHR PEEK™	284	392	284

Calculation

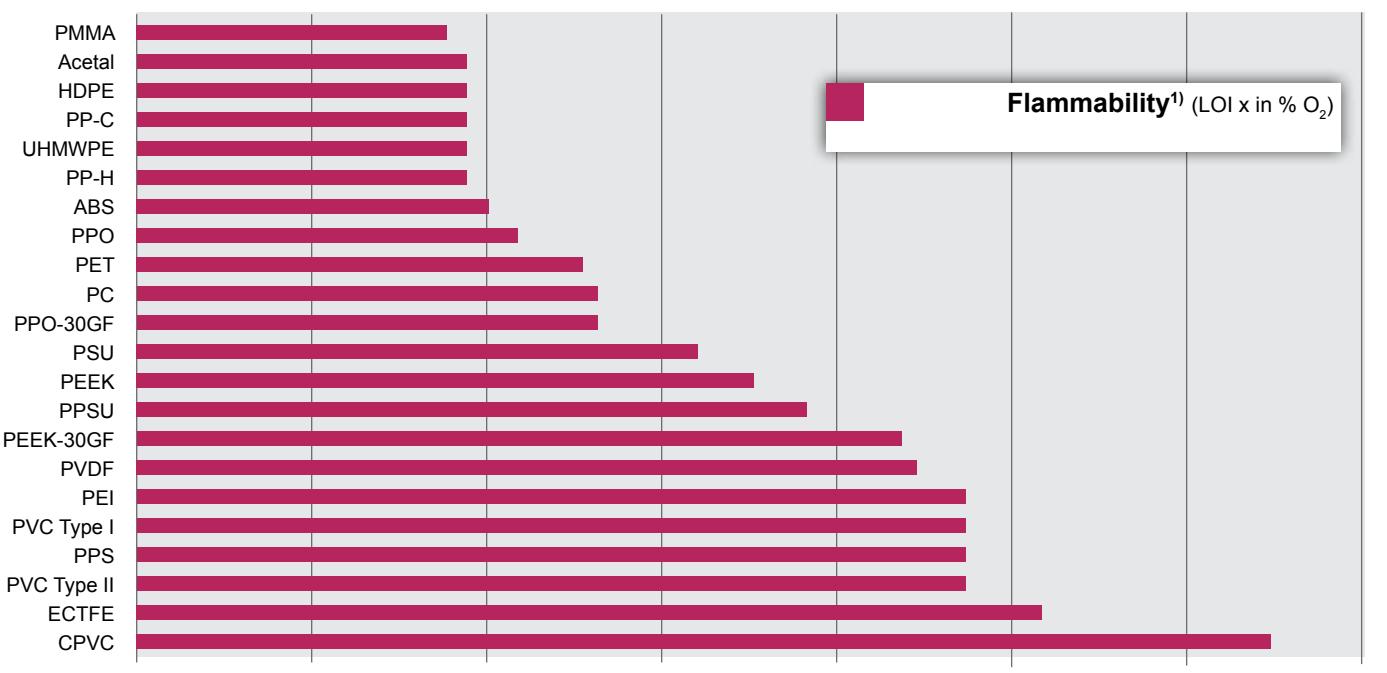
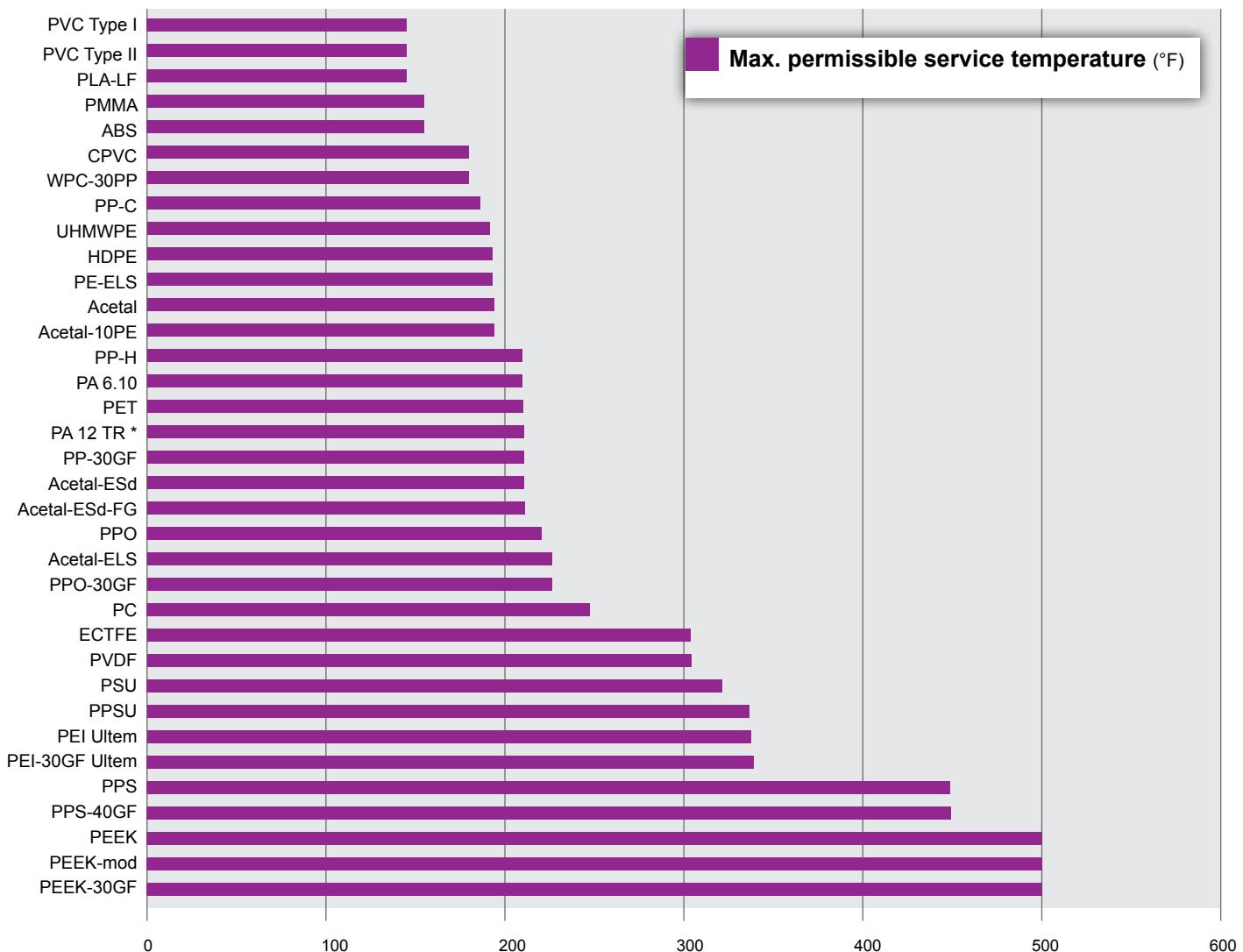
$${}^{\circ}\text{F} = \left(\frac{9}{5} \times {}^{\circ}\text{C} \right) + 32$$

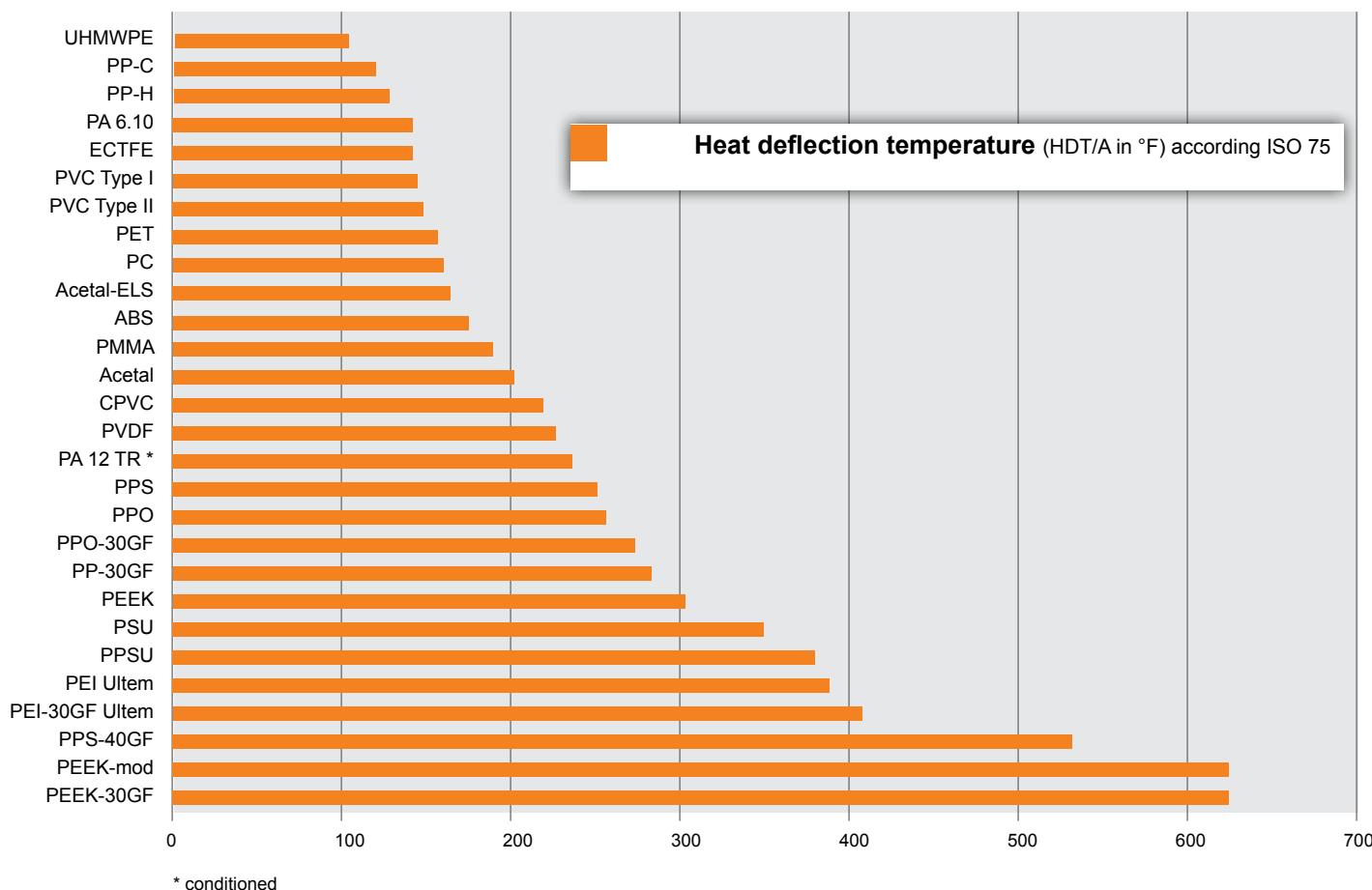
$${}^{\circ}\text{C} = \frac{5}{9} \times ({}^{\circ}\text{F} - 32)$$

Despite all precautionary measures an uneven cooling speed in the production process of the semi-finished material might be inevitable; in this case internal tensions might occur. Likewise tensions can be conferred into the part by the machining process into the part. These tensions can lead to the distortion and in the worst case even to the breaking of the part. To reduce the danger from distortion or breaking an annealing e.g. in air or in nitrogen is recommended, with an annealing time of min. 2 hours (4 hours are better) for each 10 mm wall thickness. To avoid additional tensions while heating or/and cooling down the material, these processes should be carried out very slowly. We recommend to use 3-times as much time for the cooling down as for the heating. The time these processes has to be added to the regular annealing time.

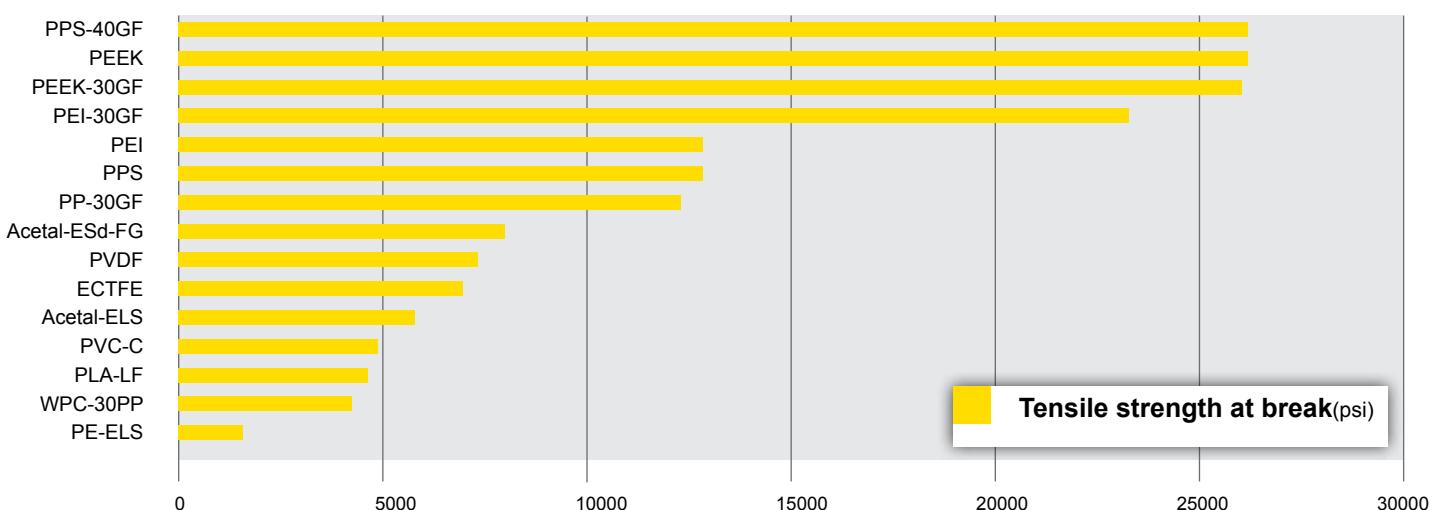
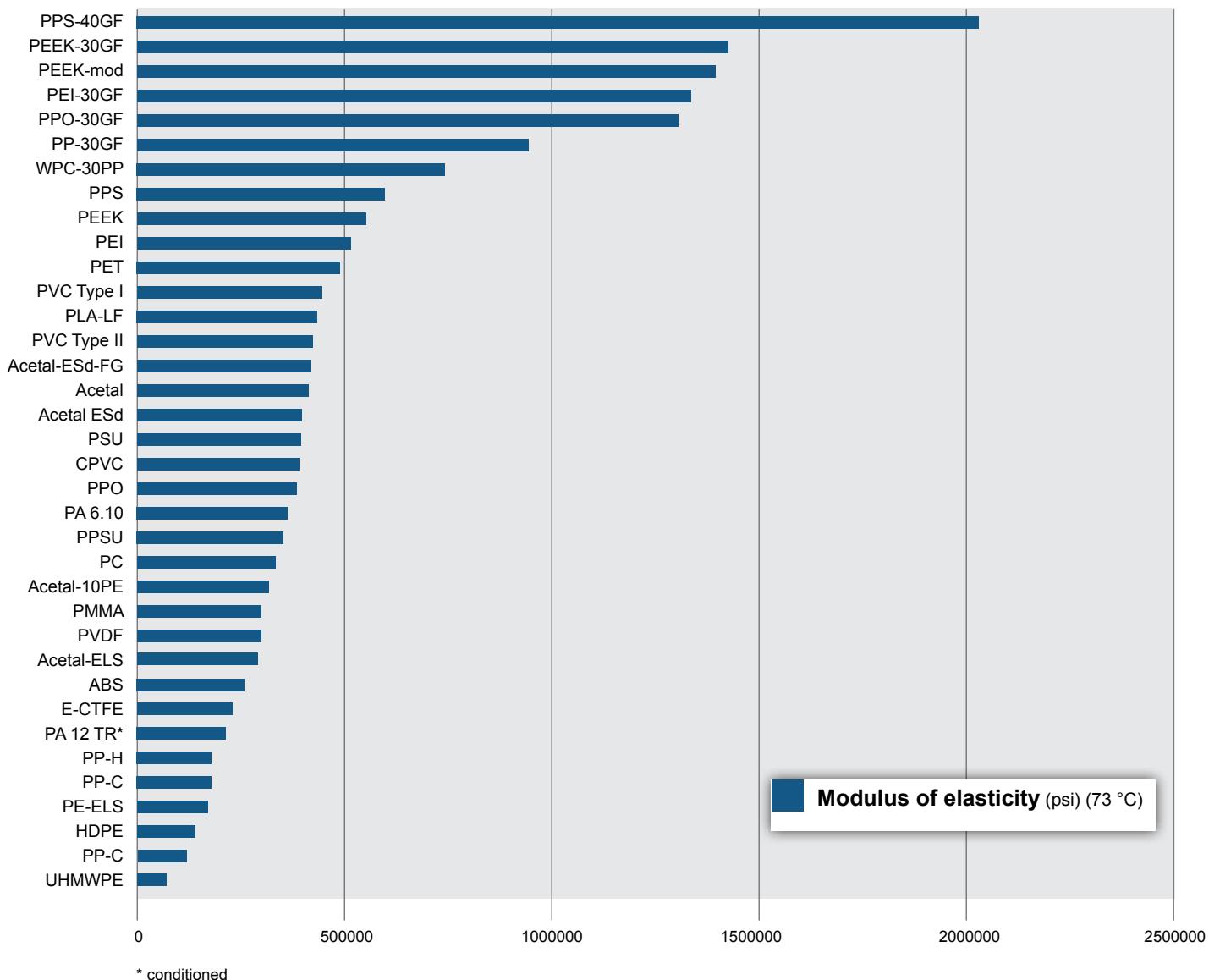


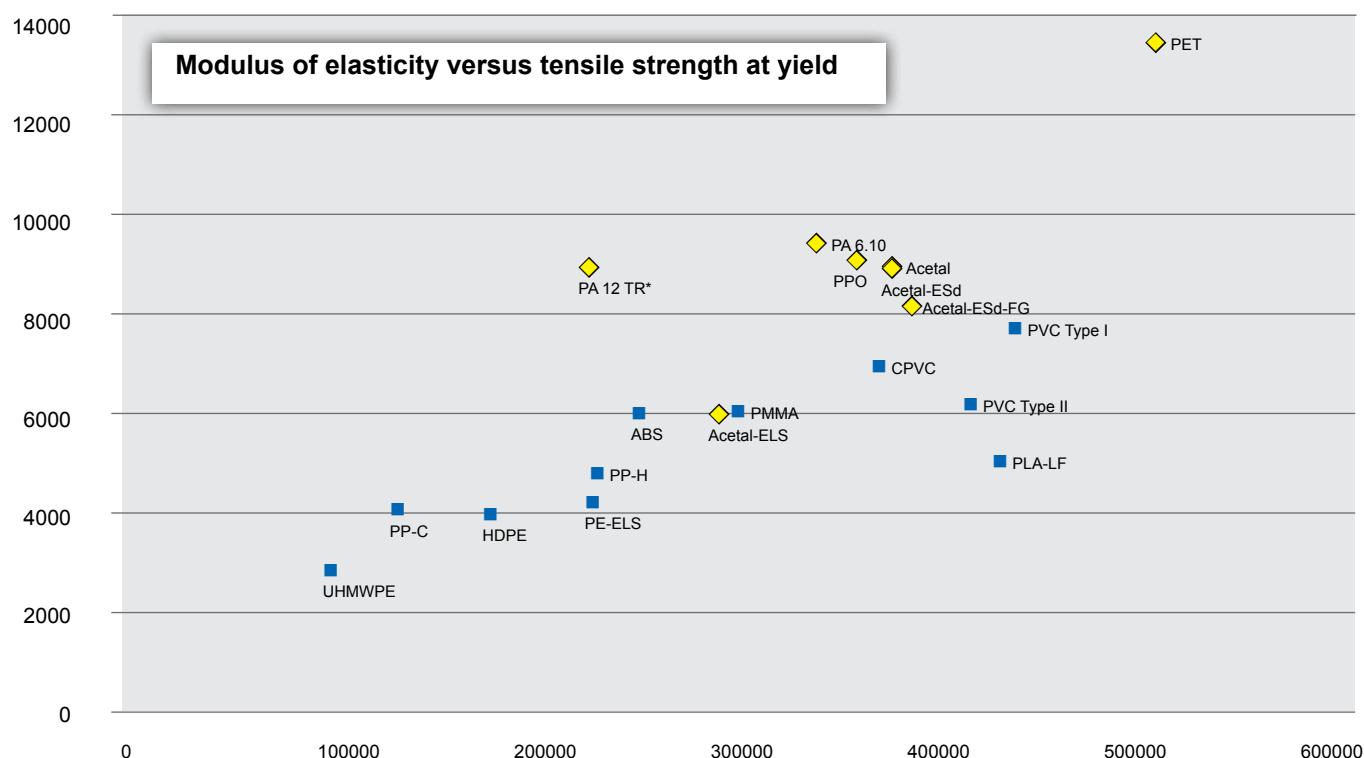
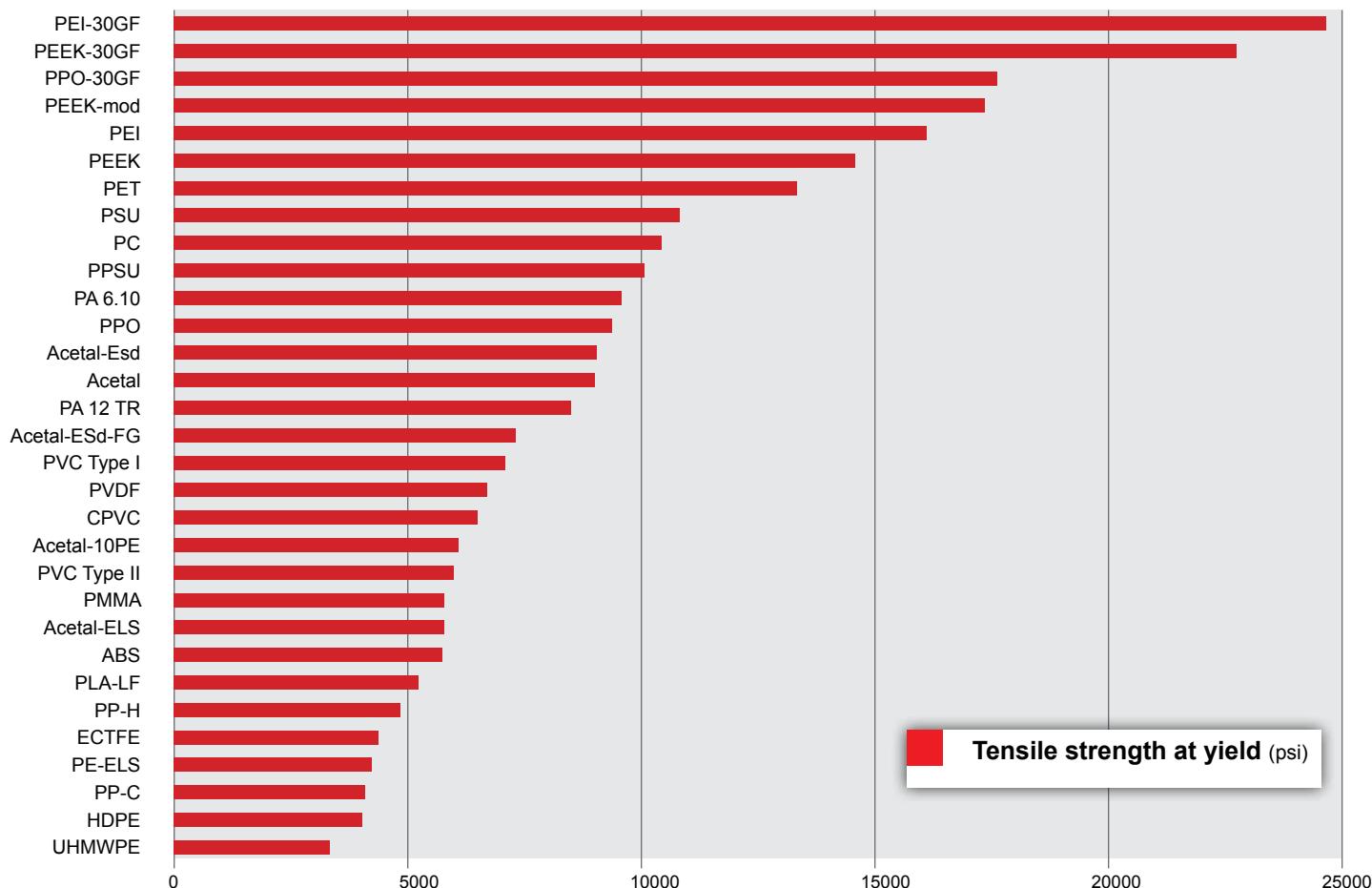
Comparison of plastics' technical data



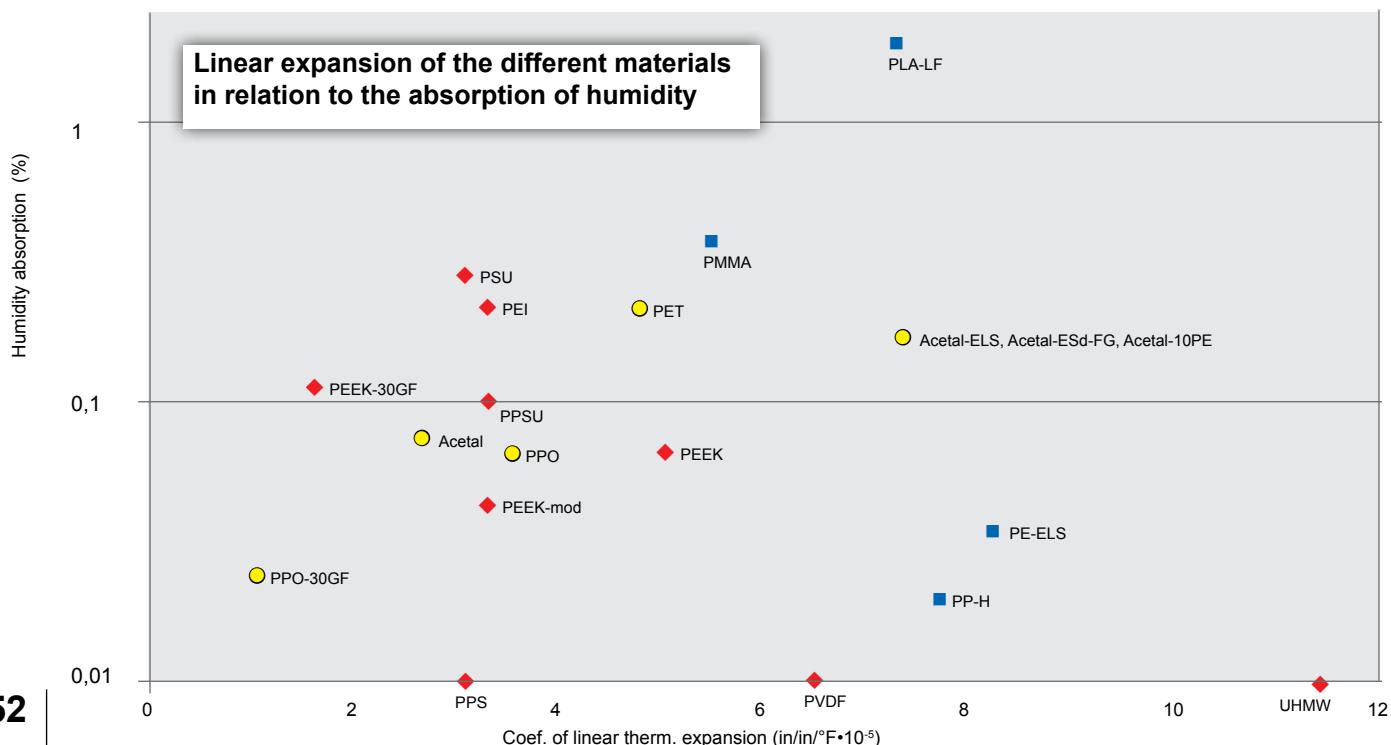
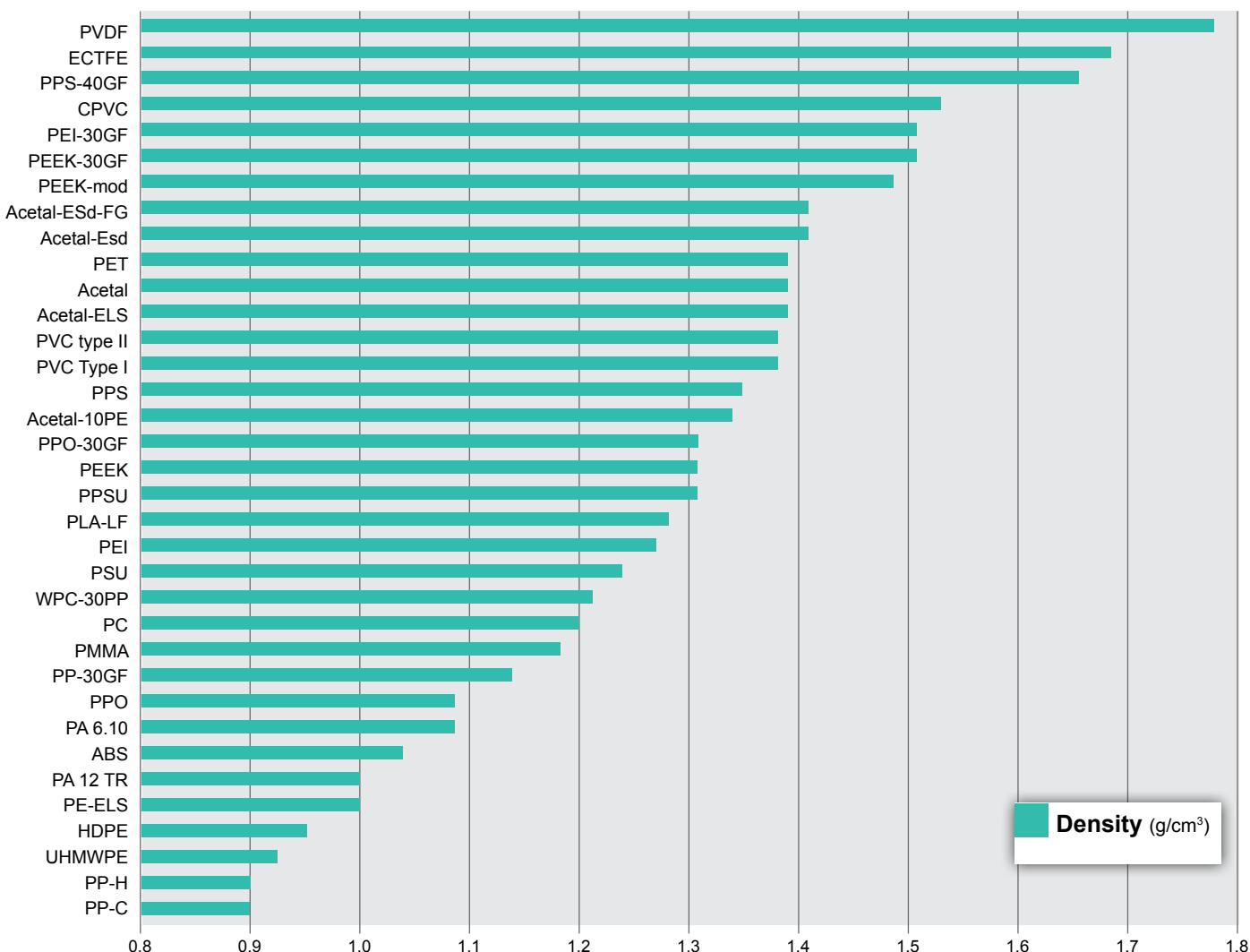
¹⁾ Raw material measurement

Comparison of plastics' technical data

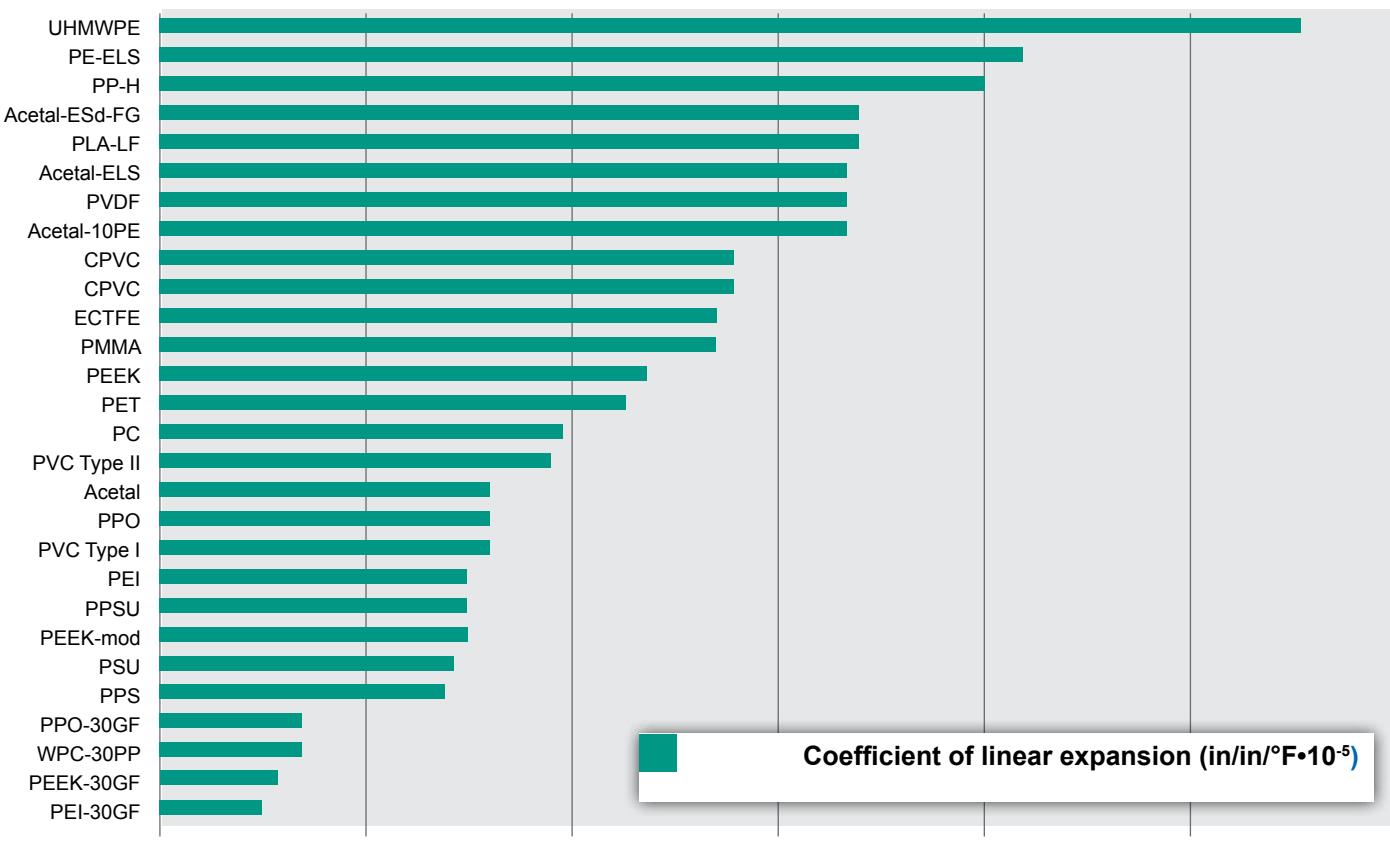




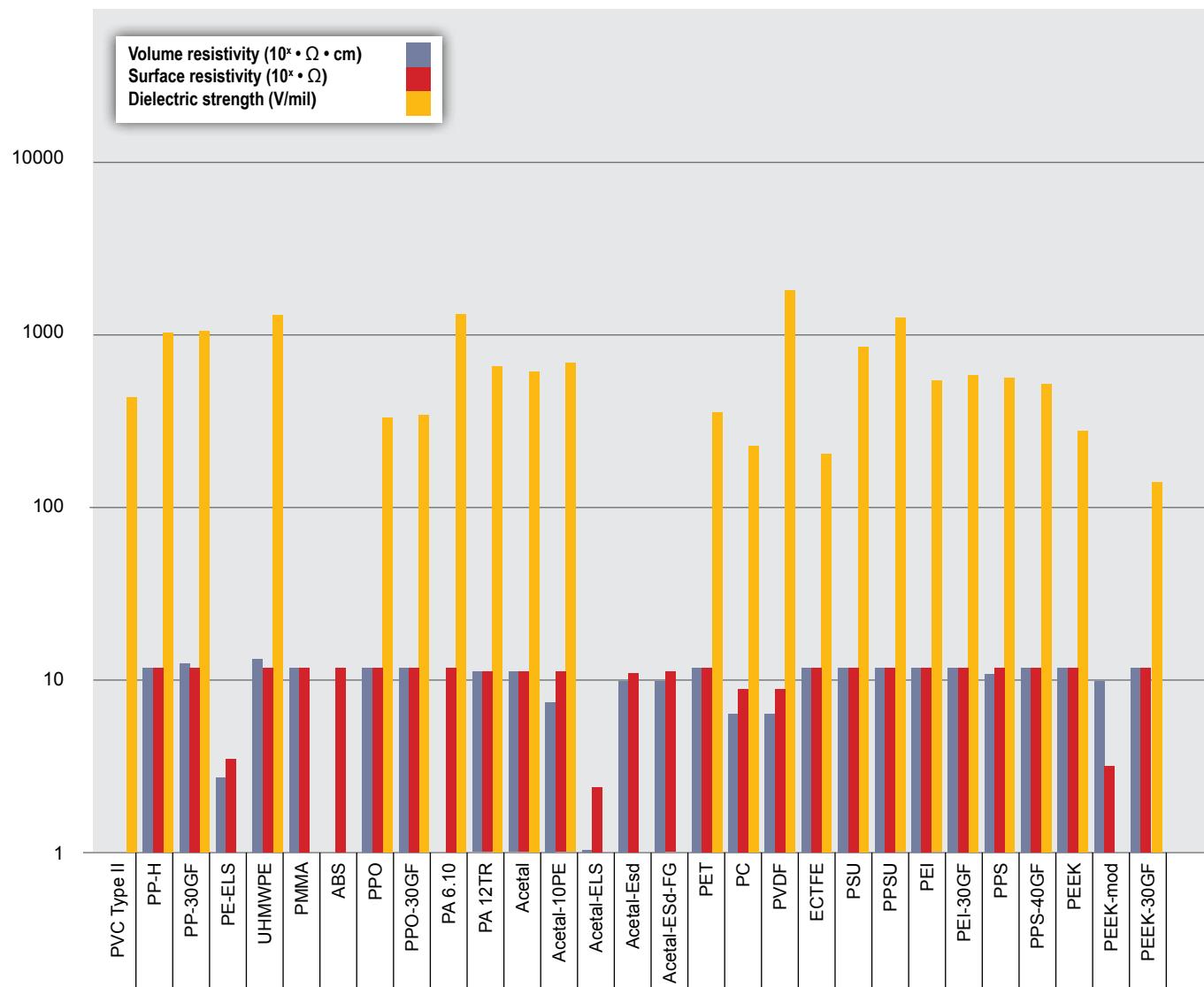
Comparison of plastics' technical data



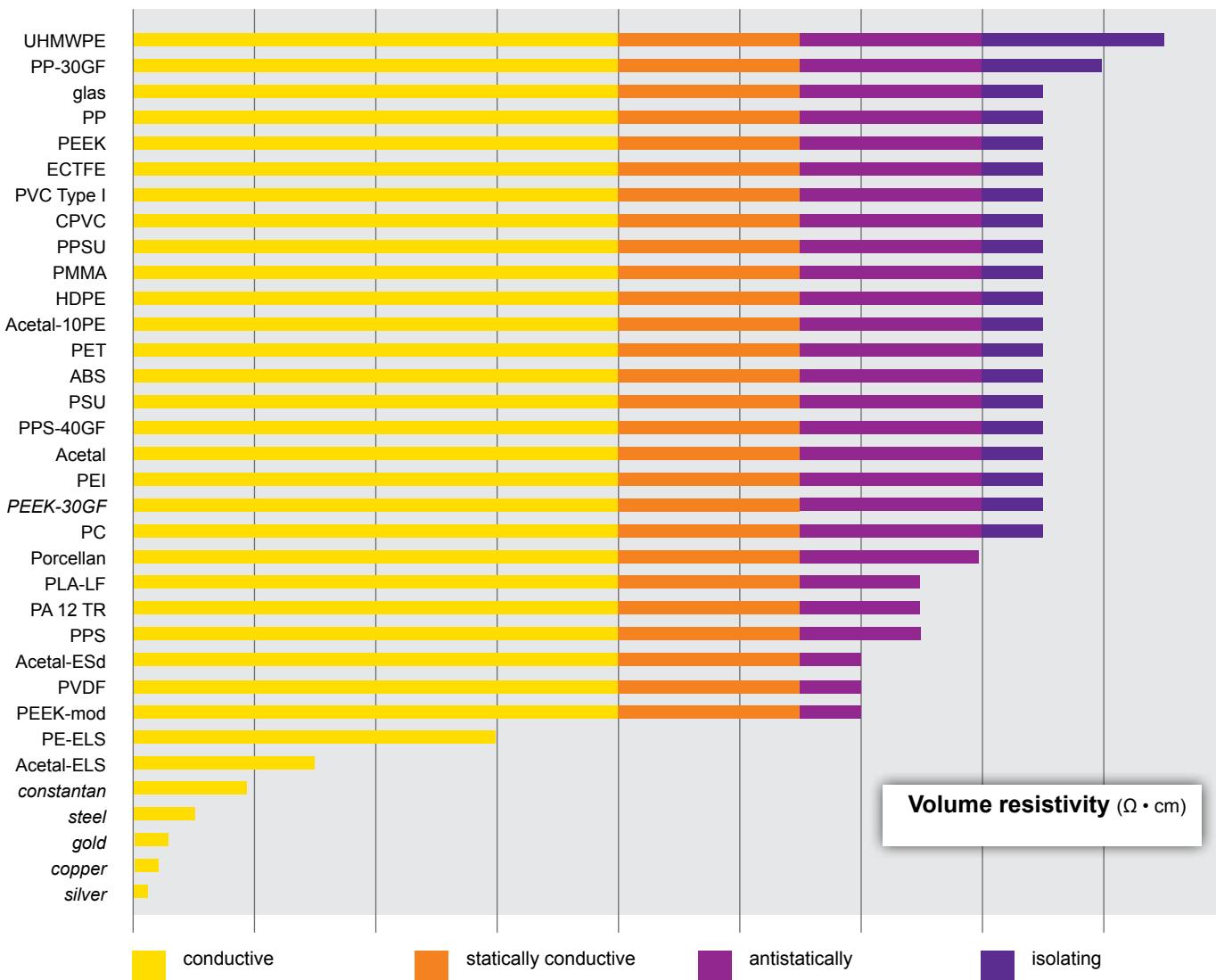
Influence parameter at production of precision parts



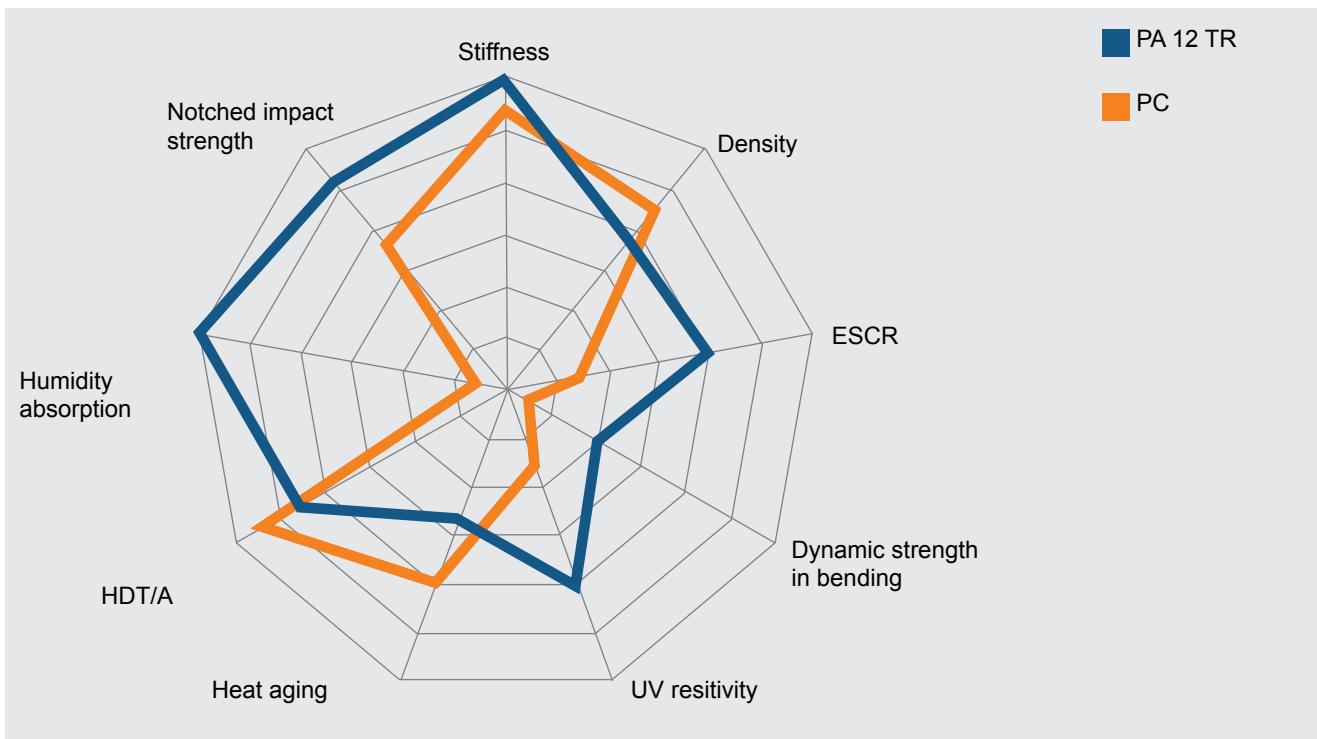
Data Comparison of electrical properties



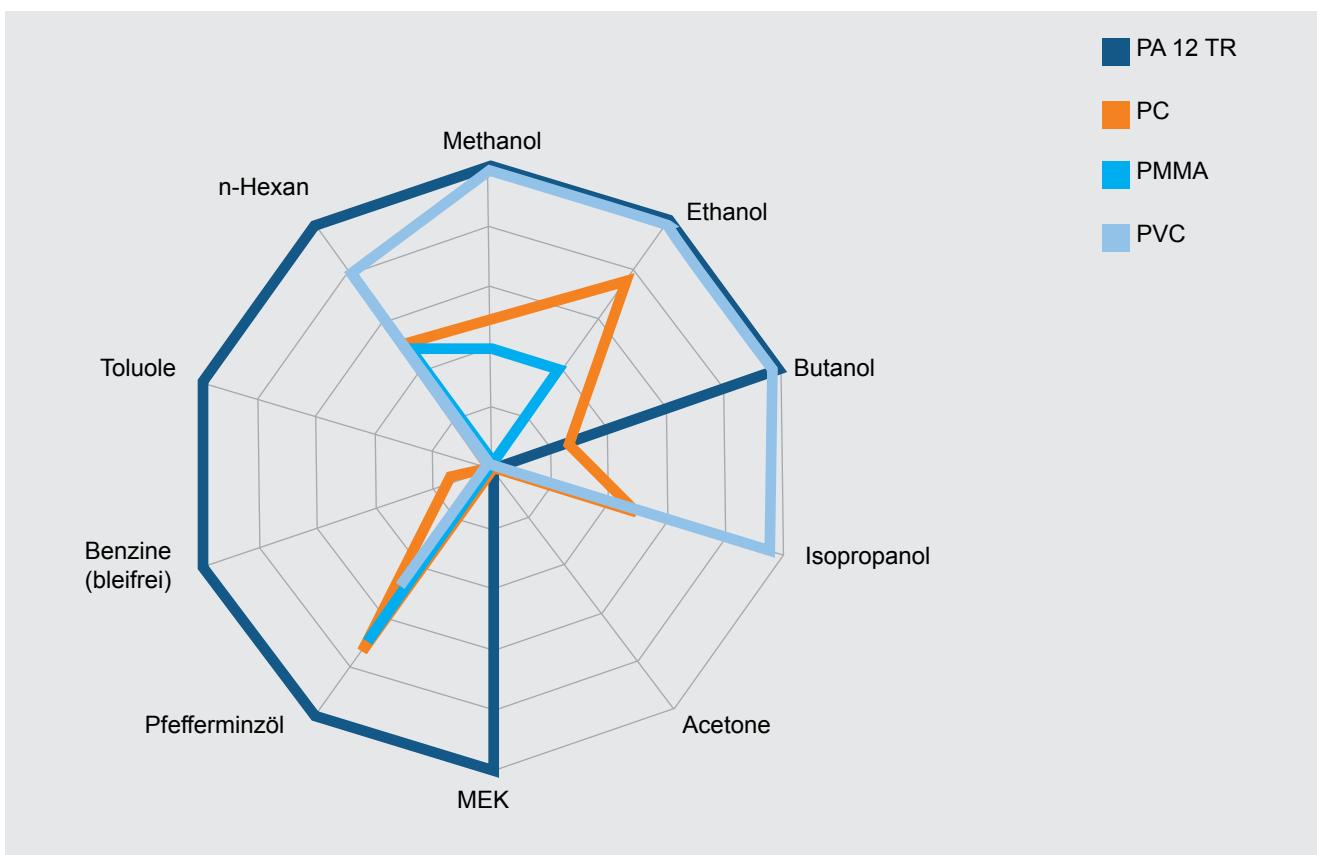
¹⁾Raw material measurement



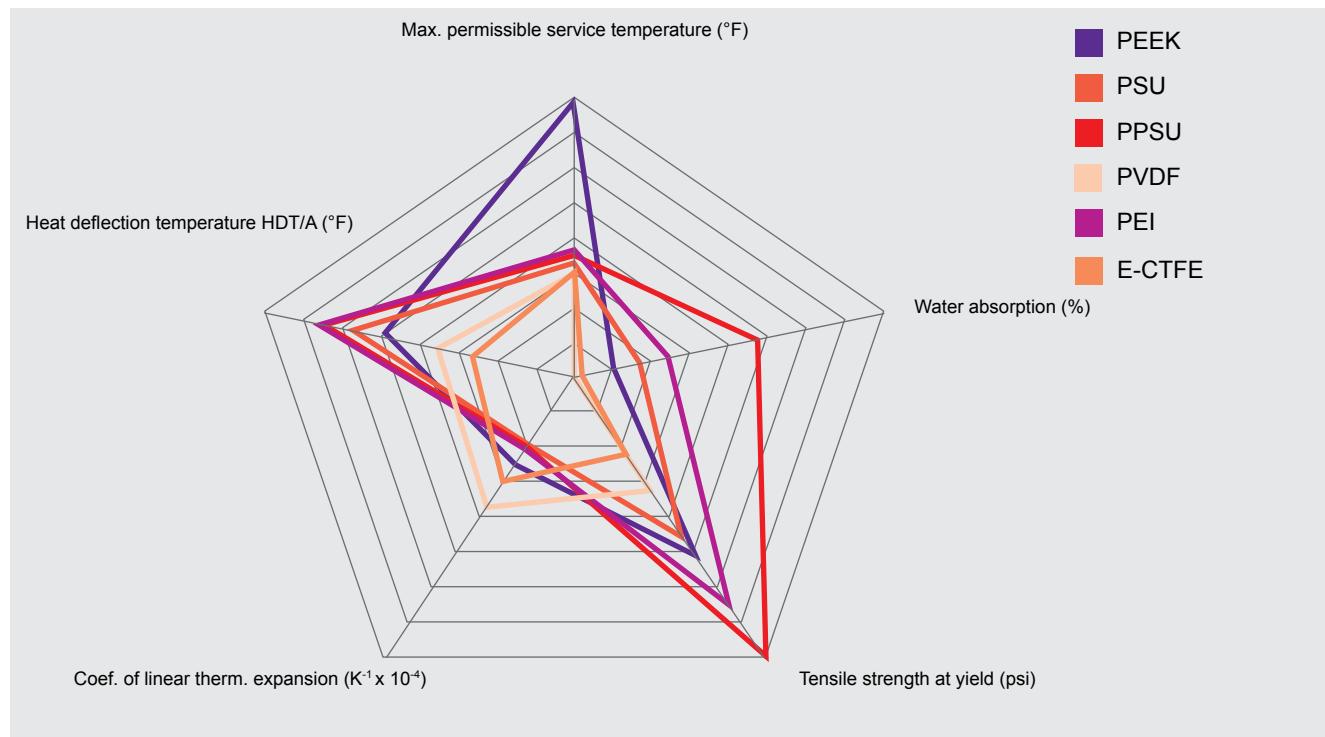
Data comparison of transparent material



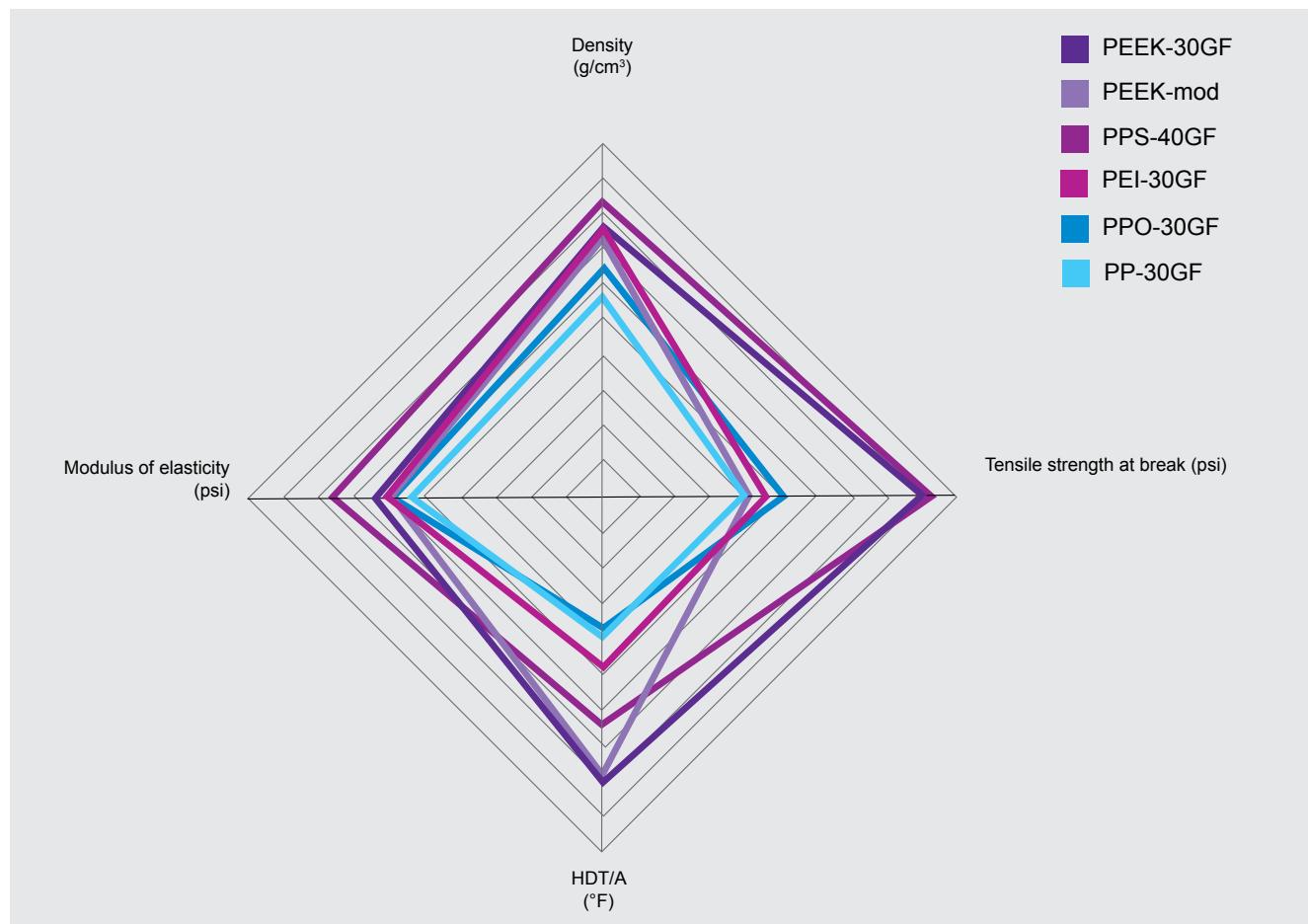
Chemical resistance of transparent material



Data comparison of High Performance Materials



Data comparison of fibre reinforced thermoplastics



GEHR Technical Properties for Stock Shapes



Attribute of the used raw materials ¹⁾	Norm	Unit i.e.	PLA-LF	WPC-PP	PA 6.10	PVC Type I	PVC Type II	CPVC
			natural	natural	natural	grey	transparent	light grey
I. Physical Properties								
1. Specific gravity (ρ)	ASTM F792	g/cm ³	1,28	1,21	1,08	1,38	1,38	1,53
2a. Water absorption (saturation)	ASTM D570	%	2	-	3,6	-	-	-
2b. Humidity absorption (saturation)	ASTM D570	%	2	-	1,4	-	-	-
3a. Max. permissible service temperature	UL 746B	°F	140	185	212	140	140	185
3b. Lower permissible service temperature		°F	-	-	-	5	-40	5
II. Mechanical Properties								
1. Tensile strength at yield (σ_s)	ASTM D638	psi	5365	-	9425	7800	6200	7090
2. Elongation at yield (ϵ_s)	ASTM D638	%	2	-	4,5	-	-	2,3
3. Tensile strength at break (σ_R)	ASTM D638	psi	4785	4350	-	-	-	4910
4. Elongation at break (ϵ_R)	ASTM D638	%	3	1,6	-	-	-	23
5. Impact strength (a_i)	ASTM D256	ft-lb/in	7,1	3,7	n.b.	-	-	-
6. Notch impact strength (a_n)	ASTM D256	ft-lb/in	1,4	-	1,5	2,2	17	3,4
7. Ball indentation hardn. (H_k /Rockwell	ASTM D785	R-Scale	105 / -	-	-	-	111	-
8. Shore-D	ASTM D2240	-	77	75	80	80	78	-
9. Flexural strength ($\sigma_{B,35\%}$)	ASTM D790	psi	-	-	12325	11000	11000	10600
10. Modulus of elasticity (E)	ASTM D790	psi	406032	751160	348000	440000	390000	372000
III. Thermal Properties								
1. Vicat softening temp. VST/B/50	ASTM D1525	°F	135	-	-	-	-	-
VST/A/50		°F	-	-	-	-	-	-
2. Heat deflection temperature HDT/B	ASTM D648	°F	133	-	284	-	-	-
HDT/A		°F	-	-	149	158	163	221
3. Coef. of linear therm. expansion (α)	ASTM D696	in/in/°F•10 ⁻⁵	6,7	1,4	-	3,3	3,7	5,7
4. Thermal conductivity at 20 °C (λ)	ASTM C177	BTU/hr-ft•°F	-	-	-	-	-	-
5. Glass transition temperature (T_g)	ASTM D3418	°F	248	-	-	-	176	-
6. Melting temperature (T_m)	ASTM D3418	°F	248	302	428	385	176	-
IV. Electrical Properties								
1. Volume resistivity (ρ_v) ⁸⁾	ASTM D257	Ω•cm	-	-	-	-	-	-
2. Surface resistivity (R_s) ⁸⁾	ASTM D257	Ω/SQ	-	-	≥ 10 ¹³	-	-	-
3. Dielectric constant at 1 MHz (ϵ_r)	ASTM D150	-	-	-	-	-	-	-
4. Dielectric loss factor at 1 MHz ($\tan\delta$)	ASTM D150	-	-	-	-	-	-	-
5. Dielectric strength	ASTM D149	V/mil	-	-	1116	-	690	-
6. Tracking resistance	IEC 60112	Grade	-	-	CTI 600	-	-	-
V. Additional Data								
1. Bondability			+	-		+	+	+
2. Physiological indifference according ⁵⁾	NSF	-	+	-		+	+	-
FDA		-	+	-		+	-	-
3. Flammability	UL 94	-	-	-		V-0 ⁷⁾	V-0 ⁷⁾	V-0
4. Limiting Oxygen Index (LOI)	ASTM D2863	%	-	-		47	-	65
5. UV stabilisation ⁶⁾	-	-	-	-		0	-	-

1) The physical data contained in this table are typical values and reflect the current state of our knowledge. The data are arithmetic average values which are tested by test specimens made out of rods (ø 40-60 mm). These has to be understood as guidelines, and shall not be used for specification purposes for finished parts. Missing data are completed by data of the raw materials.

O.B. =
+ = yes
o = limited
- = no

2) Pretreatment necessary

3) 65 (rods 160 - 200 mm Ø) 57 (rods 220 - 300 mm Ø)

4) 59 (rods 160 - 200 mm Ø), 51 (rods 220 - 300 mm Ø)

5) Physiological indifferences are valid for nature colored materials on the raw material side. There are also approvals for our semi-finished products available or in preparation. Please check this separately with us.

6) Valid for nature colored materials. An additional UV protection can taken over by special pigments e.g. carbon black.

7) Test data without UL registration

8) Data measured on natural colored Products

* Self-assessment without test report

HDPE	PE-ELS	UHMWPE	PP-C	PP-H	PP-30GF	PMMA	ABS	PPO	PPO-30GF	PA 6.10	PA 12 TR *	Acetal	Acetal-10PE	Acetal-ELS
natural	black	natural	natural	grey	black	transparent	natural	grey	natural	natural	transparent	natural	light blue	black
0,95	1,00	0,93	0,9	0,9	1,14	1,18	1,04	1,08	1,31	1,08	1,00	1,39	1,34	1,39
-	0,5	0,01	-	0,2	-	2,1	-	-	-	3,6	3	0,8	0,8	0,8
-	0,04	0,01	-	0,02	-	0,4	-	0,07	0,06	1,4	1,5	0,2	0,2	0,2
194	194	194	190	212	212	158	158	221	230	212	212	195	195	230
-58	-	-238	-22	41	41	-	-58	-	-	-	-	-40	-40	-58
4000	4205	3100	4060	4900	-	6090	5960	9200	17500	9425	8700	9135	6300	6050
-	13	20	11	9	-	-	-	-	5	4,5	6	15	9	11
-	1450	-	-	-	12300	-	-	-	-	-	-	-	-	5365
500	55	350	-	70	3	35	-	25	-	-	50	30	30	13
-	n.b.	38,7	-	n.b.	6,5	-	-	-	-	n.b.	n.b.	-	-	-
-	2,4	-	n.b.	1,3	1,8	0,86	8,3	3,5	2,2	1,5	2,7	1,5	2,5	1,9
-	55	-	80	-	16000	110	98	119	89	-	-	120	85	-
69	66	63	-	76	85	-	70	86	25000	80	83	85	80	84
4600	3480	-	-	-	17400	9430	7800	14400	25000	12325	-	10800	-	-
176000	197215	102000	162000	200000	943000	290000	255000	370000	1330000	348000	232000	380000	319000	283000
261	181	176	-	194	320	221	201	-	289	-	-	-	-	-
-	-	-	-	302	266	-	-	-	-	-	-	-	-	-
167	-	149	190	205	311	-	-	-	285	284	275	308	-	-
-	-	108	124	130	284	189	180	254	275	149	239	205	-	179
-	8,3	11	-	8	-	5,6	-	3,3	1,4	-	-	3,3	6,6	6,6
-	-	2,8	-	-	1,9	-	-	-	-	-	-	-	2,1	-
-165	-	-	-	50	-	220	280	280	280	-	311	-85	-76	-74
265	374	271	-	329	-	220	280	280	280	428	311	330	325	330
-	$\leq 10^4$	$> 10^{15}$	-	$\geq 10^{13}$	$> 10^{14}$	$\geq 10^{13}$	-	$\geq 10^{13}$	$\geq 10^{13}$	-	$\geq 10^{11}$	$\geq 10^{13}$	$\geq 10^{13}$	$\leq 10^1$
-	$\leq 10^5$	$\geq 10^{13}$	-	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\geq 10^{13}$	$\leq 10^4$
-	-	3	-	-	2,6	-	-	-	-	-	-	3,8	-	-
-	-	0,001	-	-	-	-	-	-	-	-	-	0,005	-	-
-	-	1100	-	1015	1015	-	-	500	530	1116	860	800	870	-
-	-	CTI 600	-	-	CTI 600	-	-	-	-	CTI 600	CTI 600	CTI 600	CTI 600	-
+	+	+	+	+	-	+	+	+	+	+	+	+	+	-
+	+	-	+	-	+	-	+	+	+	+	-	-	+	+
+	+	-	+	-	+	+	+	+	o	+	-	-	NSF	+
HB	HB	HB	HB	HB	HB ⁷⁾	HB	HB	HB	HB	HB	HB	-	HB	HB
18	18	-	18	-	18	20	17	23	-	27	-	-	-	18
o	o	o	o	o	-	-	+	-	-	-	+	-	+	-

Acetal-ESd	Acetal-ESd-FG	PET	PC	PVDF	ECTFE	PSU	PPSU	PEI Ultem	PEI-30GF Ultem	PPS	PPS-40GF	PEEK	PEEK-mod	PEEK-30GF
ivory	ivory	natural	transparent	natural	natural	natural	black	natural	natural	natural	black	natural	black	natural
1,41	1,41	1,39	1,2	1,77	1,68	1,23	1,31	1,27	1,51	1,35	1,65	1,31	1,48	1,51
0,8	0,8	0,5	0,4	0,04	0,1	0,8	0,4	1,3	0,9	0,03	0,02	0,4	0,3	0,5
0,2	0,2	0,25	0,15	0,01	-	0,3	0,1	0,25	0,16	0,01	0,01	0,07	0,04	0,11
212	212	212	250	302	302	320	338	338	340	446	446	500	500	500
-	-	-5	-	-22	-	-	-58	-58	-58	-58	-58	-40	-	-
9140	8120	13000	10500	7300	4350	10900	10100	16000	24500	-	-	14500	17300	22800
10	20	4	-	-	5	5,7	7,2	7	-	3	-	-	-	-
-	7830	-	-	7300	6820	-	-	-	23000	12800	26800	26800	-	26500
30	25	15	100	50	250	-	60	60	3	15	1,9	45	2,5	2,2
53	86	n.b.	n.b.	50	-	n.b.	n.b.	25	8	59	-	n.b.	-	9,5
1,8	2,9	0,6	1,6	3	n.b.	1,6	13	1	1,6	-	3	2,1	3,2	2,4
-	-	-	-	-	90	-	-	-	-	-	125	-	-	-
82	82	84	83	80	75	-	86	82	-	-	-	-	85	90
-	-	-	13000	10000	6820	-	15500	24000	33000	20500	40600	23900	30000	33800
380000	387180	500000	320000	290000	240000	377000	333500	520000	1350000	580000	2030000	537000	1394000	1406000
-	-	-	-	-	-	-	-	-	442	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	194	-	-	410	414	-	-	-	-	-
-	-	176	176	230	149	347	385	394	410	250	540	306	622	622
-	6,7	4,4	3,9	6,6	5,6	2,9	3,1	3,1	1,1	2,8	-	4,7	3,1	1,2
-	-	2	1,29	1,32	-	-	1,7	1,5	1,5	2	2,1	2	-	3
-74	-76	208	302	-40	185	374	424	422	410	194	194	289	295	296
331	334	473	302	340	437	374	424	422	410	527	536	649	646	646
$\leq 10^{10}$	$\leq 10^{10}$	$\geq 10^{13}$	$\geq 10^{11}$	$\geq 10^{13}$	$\geq 10^{13}$	$\leq 10^{10}$	$\geq 10^{13}$							
$\leq 10^{12}$	$\leq 10^{12}$	$\geq 10^{13}$	$\leq 10^5$	$\geq 10^{13}$										
-	-	3,2	3,17	4,5	2,57	3,1	3,7	3,15	3,7	3	4	3,2	-	-
-	-	0,014	0,0009	-	-	0,006	0,0089	0,0015	0,0015	0,0013	0,004	0,004	-	-
-	-	560	398	1700	360	940	1100	710	770	760	710	580	-	175
-	-	CTI 600	-	-	-	CTI 125	CTI 150	CTI 150	-	CTI 125	CTI 125	CTI 150	-	-
-	-	-	-	+	+	o 2)	o 2)	o 2)	+	+	+	+	+	+
+	-	-	+	+	+	-	-	-	+	+	+	+	+	+
+	-	-	+	+	+	+	-	-	+	-	+	+	+	+
HB	-	HB 7)	HB 7)	HB	HB	V-0	-	V-0						
-	-	-	-	25	26	44	-	52	32	38	47	47	-	35
-	-	-	-	o/-	-	+	+	+	-	+	+	o	o	o

In comparison*

PAI	PI	Steel	Alu	Unit i.e.	Norm	Attribute of the used raw materials ¹⁾
natural	natural	natural	natural			
I. Physical Properties						
1,41	1,43	7,85	2,7	g/cm ³	ASTM F792	1. Specific gravity (ρ)
2,5	3	0	0	%	ASTM D570	2a. Water absorption (saturation)
	0,32			%	ASTM D570	2b. Humidity absorption (saturation)
482	572	1112	212	°F	UL 746B	3a. Max. permissible service temperature
-58	-	-	-	°F		3b. Lower permissible service temperature
II. Mechanical Properties						
21751	-	26827	12325	psi	ASTM D638	1. Tensile strength at yield (σ_s)
-	-	-	35	%	ASTM D638	2. Elongation at yield (ϵ_s)
-	12470	44953	-	psi	ASTM D638	3. Tensile strength at break (σ_R)
20	7,5	18	14	%	ASTM D638	4. Elongation at break (ϵ_R)
o.B.	-	-	-	ft-lb/in	ASTM D256	5. Impact strength (a_n)
15	-	-	-	ft-lb/in	ASTM D256	6. Notch impact strength (a_k)
200 / M 120	-	-	-	R-Scale	ASTM D785	7. Ball indentation hardn. (H_c) /Rockwell
-	-	-	-	-	ASTM D2240	8. Shore-D
-	-	15951	-	psi	ASTM D790	9. Flexural strength ($\sigma_{B,3,5\%}$)
609048	474912	30452436	10150812	psi	ASTM D790	10. Modulus of elasticity (E_v)
III. Thermal Properties						
-	-	-	-	°F	ASTM D1525	1. Vicat softening temp. VST/B/50
-	-	-	-	°F		VST/A/50
-	-	-	-	°F	ASTM D648	2. Heat deflection temperature HDT/B
536	680	-	-	°F		HDT/A
1,7	3	0,7	1,3	in/in/°F•10 ⁻⁵	ASTM D696	3. Coef. of linear therm. expansion (α)
1,8	2,4	280	970	BTU/hr-ft•°F	ASTM C177	4. Thermal conductivity at 20 °C (λ)
-	-	-	-	°F	ASTM D3418	5. Glass transition temperature (T_g)
-	-	-	-	°F	ASTM D3418	6. Melting temperature (T_m)
IV. Electrical Properties						
≥10 ¹³	≥10 ¹³	-	-	Ω•cm	ASTM D257	1. Volume resistivity (ρ_v) ⁸⁾
≥10 ¹³	≥10 ¹³	-	-	Ω/SQ	ASTM D257	2. Surface resistivity (R_s) ⁸⁾
3,9	3,55	-	-	-	ASTM D150	3. Dielectric constant at 1 MHz (ϵ_r)
0,031	0,003	-	-	-	ASTM D150	4. Diel. loss factor at 1 MHz (tanδ)
24	22	-	-	V/mil	ASTM D149	5. Dielectric strength
-	-	-	-	Grade	IEC 60112	6. Tracking resistance
V. Additional Data						
+	+	-	-			1. Bondability
		-	-	-	NSF	2. Physiological indifference
		-	-	-	FDA	
V-0	V-0	-	-	-	UL 94	3. Flammability
-	-	-	-	%	ASTM D2863	4. Limiting Oxygen Index (LOI)
+	+			-	-	5. UV stabilisation







GEHR Plastics, Inc.

Naamans Creek Center
24 Creek Circle
Boothwyn, PA 19061

USA

T: +1 - 610 - 497 - 8941
F: +1 - 610 - 497 - 8901
T: +1 - 800 - 782 - GEHR

info@gehrplastics.com
www.gehrplastics.com

GEHR GmbH

Casterfeldstraße 172
68219 Mannheim

Germany

T: +49 - 621-87 89 - 0
F: +49 - 621-87 89 - 200

info@gehr.de
www.gehr.de

GEHR Plastics PR China

Rm 1003, No. 7
New Phoenix Town Ginza
51 Feng cheng road
200093 Shanghai

China

T: +86 - 21 - 51 69 28 72
F: +86 - 21 - 60 91 93 03

info@gehr.cn
www.gehr.cn

GEHR Plastics Hong Kong

Unit 2, 11/F,
Fonda Industrial Building,
37-39 Au Pui Wan Street
Fotan, Shatin
Hong Kong

T: +852 - 6977 - 33 18
F: +852 - 3013 - 9544
info@gehr.hk
www.gehr.hk

GEHR Plastics France

9, allée Claude Debussy
93160 Paris - Noisy-le-Grand

France

T: +33 - 7 - 86 48 38 04
F: +49 - 621 - 87 89 - 200

info@gehr.fr
www.gehr.fr

GEHR Plastics Italia

DIPRO
Via Alessandria 55
10152 Torino

Italy

T: +39 - 011-24 89 507
F: +39 - 011-24 85 733

info@gehr.it
www.gehr.it



GEHR makes no representations and warranties with respect to any of the technical specifications described in this brochure. Technical specifications shall only be binding on GEHR if and to the extent that they have been expressly contractually agreed upon at the time of order.

All information in this brochure, including technical specifications are subject to change.