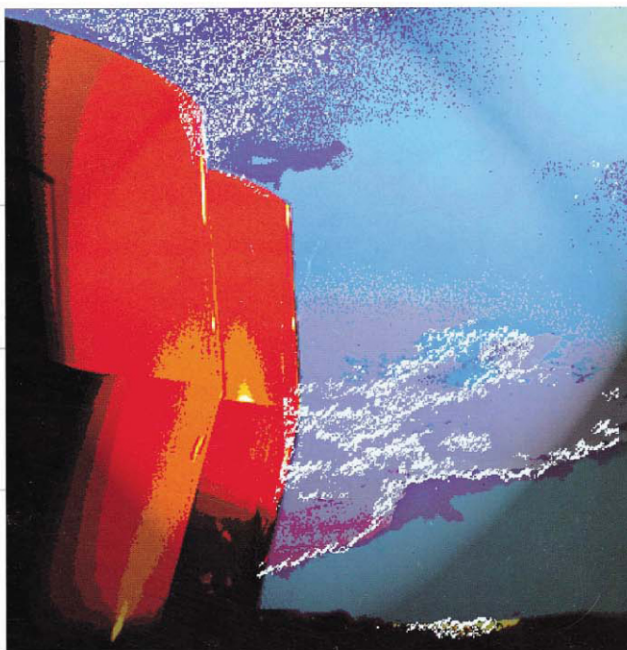




Semifinished  
Thermoplastic Products

Semiproductos  
termoplásticos

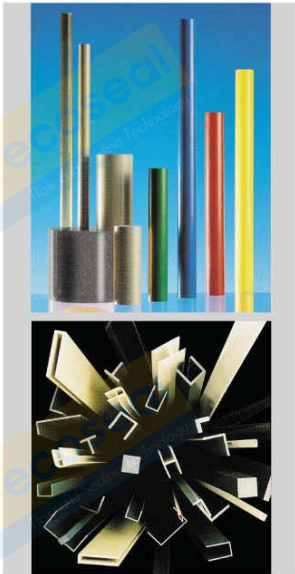
热塑塑料  
工程型材



The GEHR Programme

La gama de productos GEHR

GEHR 产品目录



**PVC-U**  
**Polyvinyl chloride** is rated self-extinguishing, has an exceptional chemical resistance and is easy to machine. PVC-U shows high mechanical strengths, tensile strength and can be used in applications ranging in temperature from -15 °C to +60 °C. It can also be easily solvent cemented and welded.

- Advantages:**
- high mechanical strength, tensile strength and hardness
  - good insulation properties
  - high chemical resistance
  - self-extinguishing
  - low water absorption
  - easy to varnish and glue

- Disadvantages:**
- low impact strength
  - limited weather resistance

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

**PVC-U clear**  
 higher impact strength, good transparency.

**PVC-C (Corzan®)**  
 good mechanical properties at higher temperatures (+85 °C).

**PVC-HI**  
 higher impact strength at low temperatures (-40 °C).

**PVC-U electrically conductive (ESD)**  
 PVC-type with improved electrical conductivity. Volume resistivity ca. 10<sup>3</sup> Ω x cm, surface resistivity ca. 10<sup>6</sup> Ω.

Ø mm	Toleranzen Tolerances Tolérances mm	PVC-U				PVC-C CORZAN	PVC-HI	PVC-ESD
		kg/m				kg/m	kg/m	kg/m
3	+0,3	0,013			0,014	0,013		
4		0,019			0,021	0,019		
5*	+0,1	0,029 ●			0,033	0,029		
6*	+0,4	0,043 ●			0,048	0,043		
8*	+0,5	0,076 ● ●			0,084	0,076		
10*	+0,6	0,118 ● ● ● ● ● ● ● ●			0,136 ○	0,118		
12*	+0,7	0,170 ● ● ● ● ● ● ● ● ● ●			0,188	0,170		
15*	+0,8	0,263 ● ● ● ● ● ● ● ● ● ● ● ●			0,304 ○	0,263		
16*		0,299 ●			0,331	0,299		
18	+0,9	0,378 ● ● ● ● ● ● ● ● ● ● ● ●			0,491	0,378		
20	+1,0	0,468 ● ● ● ● ● ● ● ● ● ● ● ● ● ●			0,537 ○	0,467 ○	0,488 ●	
22	+0,2	0,525 ●			0,624	0,564		
25	+1,1	0,723 ● ● ● ● ● ● ● ● ● ● ● ● ● ●			0,824 ○	0,723		
28		0,890 ●			1,003	0,906		
30	+1,2	1,040 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			1,190 ○	1,036 ○	1,085 ●	
32		1,163 ●			1,305	1,179		
35	+1,3	1,350 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			1,568	1,416		
36		1,485 ●			1,644	1,485		
40	+1,5	1,840 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			2,110 ○	1,835 ○		
45	+1,7	2,330 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			2,576	2,327		
50		2,880 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			3,300 ○	2,877	3,003 ●	
55	+2,0	3,438 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			3,869	3,495		
56	+0,3	3,591 ●			3,976	3,591		
60	+2,3	4,140 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			4,740 ○	4,132		
65		4,713 ●			5,404			
70		5,610 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			6,390 ○			
75	+2,5	6,475 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			7,186			
80	+0,4	7,300 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			8,320 ○			
85		8,063 ●			9,241			
90	+0,5	9,240 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			10,530 ○			
100	+0,6	11,390 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			12,980 ○			
110	+0,7	13,760 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			15,230 ○			
120	+3,5	16,390 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			18,975			
125	+0,8	17,790 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			19,760 ○			
130	+4,0	19,260 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
140	+0,9	22,310 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
150	+1,0	25,630 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			32,250**○			
160	+1,1	28,300 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
180	+1,2	38,000 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			43,300**○			
200	+1,3	47,300 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
225	+8,0	59,900 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
250		71,300 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
280		92,000 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
300	+1,5	106,000 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
350	+15,0	142,000 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
400	+20,0	185,000 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						
500**		280,400 ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●						



**PP**  
**Polypropylene** shows a high mechanical strength, tensile strength, but a low notched impact strength, PP resists stress cracking and it is easy to weld. At minus temperatures it can get brittle. The chemical and electrical properties are very good. The temperature ranges between +5 °C and +100 °C.

- Advantages:**
- low density
  - good heat resistance
  - high tensile strength, high surface strength
  - high chemical resistance
  - food safe

- Disadvantages:**
- low oxidation resistance
  - low abrasion resistance
  - HF-welding not possible
  - difficult to varnish and glue
  - not weather resistant

**Applications:**  
 pumps, valves, seals, toys, bearings.

**PP-30GF (HiPro®), 30% GF reinforced**

- high dimension stability
- high tensile strength
- high temperature resistance

**PP electrically conductive (ESD)**  
 PP-type with improved electrical conductivity. Volume resistivity ca. 50 Ω x cm, surface resistivity ca. 10<sup>6</sup> Ω.  
 Higher mechanical strength compared to standard PP.

**PE-HD (High Density Polyethylene)**  
 These two Polyolefins offer resistance to almost all acids and bases, detergents and hot water. PE has good insulation properties and is easy to weld. The operating temperature of PE-HD is from -50 °C to +90 °C, and PE-UHMW between -150 °C and +90 °C.

- Advantages:**
- light weight
  - high toughness (also at low temperature)
  - high elongation
  - very good electrical and dielectric properties
  - very low water absorption
  - low steam permeability
  - high chemical resistance
  - good protection against stress cracking
  - food safe

- Disadvantages:**
- soft surface (low tensile strength)
  - HF welding not recommended
  - difficult to varnish and glue
  - not weather resistant

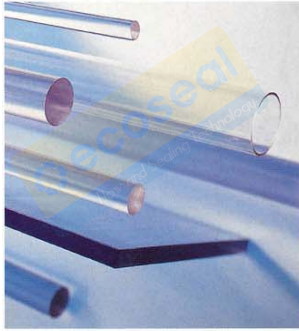
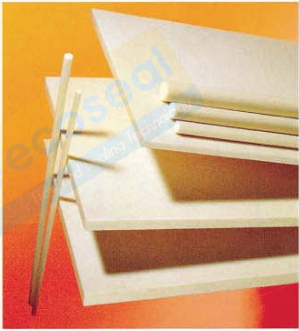
**Applications:**  
 Sewage industry, pumps and valves, seals, medical industry.

**PE-UHMW (Ultra High Molecular Weight Polyethylene)**  
 Very low friction.

Ø mm	Toleranzen Tolerances Tolérances mm	PP		PP-30GF (HiPro)	PP-ESD	PE-HD	PE-UHMW
		kg/m		kg/m	kg/m	kg/m	kg/m
10*	+0,1	+0,6	0,078 ○ ○			0,082 ● ●	0,080
12*	+0,7		0,114 ○ ○			0,119 ● ●	0,115
15*	+0,8		0,176 ○ ○			0,184 ● ●	0,179
16	+0,2		0,195			0,203	0,197
20	+1,0		0,312 ○ ○	0,380 ●	0,327 ●	0,327 ● ●	0,317 ● ● ●
25	+1,1		0,484 ○ ○	0,610 ●		0,506 ● ●	0,491 ● ● ●
30	+1,2		0,694 ○ ○ ● ●	0,844 ● ●	0,720 ● ●	0,720 ● ● ● ●	0,703 ● ● ● ●
32	+0,5	+1,1	0,767 ○			0,800	0,776
35	+0,2	+1,3	0,947 ○ ○			0,988 ● ●	0,970
40	+1,5		1,230 ○ ○ ● ●	1,494 ● ●		1,280 ● ● ● ●	1,240 ● ● ● ●
45	+1,7		1,560 ○ ○			1,620 ● ● ● ●	1,570
50	+2,0		1,930 ○ ○ ● ●	2,340 ● ●	2,010 ● ●	2,010 ● ● ● ●	1,950 ● ● ● ●
55			2,300 ○ ○			2,360 ● ● ● ●	2,289
60	+0,3	+2,3	2,770 ○ ○ ● ●	3,490 ● ●		2,880 ● ● ● ● ● ●	2,800 ● ● ● ● ● ●
65			3,170 ○ ○			3,370 ● ● ● ●	3,269
70	+2,5		3,750 ○ ○			3,910 ● ● ● ●	3,800 ● ● ● ● ● ●
75			4,230 ○ ○			4,490 ● ● ● ●	4,355
80	+0,4	+3,0	4,880 ○ ○	5,920 ● ●		5,100 ● ● ● ●	4,947 ● ● ● ●
90	+0,5	+3,4	6,180 ○ ○			6,450 ● ● ● ●	6,264 ● ● ● ● ● ●
100	+0,6	+3,8	7,620 ○ ○	9,250 ● ●	7,960 ● ●	7,960 ● ● ● ●	7,728 ● ● ● ● ● ●
110	+0,7	+4,2	9,210 ○ ○			9,610 ● ● ● ●	9,330 ● ● ● ● ● ●
120			10,910 ○ ○	13,670 ● ●		11,380 ● ● ● ●	11,230 ● ● ● ● ● ●
125	+0,8	+4,6	11,900 ○ ○			12,410 ● ● ● ●	12,050
130			12,750 ○ ○			13,320 ● ● ● ●	13,130 ● ● ● ● ● ●
140	+0,9	+5,4	14,940 ○ ○			15,580 ● ● ● ●	15,130
150	+1,0	+5,8	17,140 ○ ○	21,480 ● ●		17,900 ● ● ● ●	17,380 ● ● ● ● ● ●
160	+1,1	+6,3	19,500 ○ ○			20,350 ● ● ● ●	19,760 ● ● ● ● ● ●
165			20,330 ○ ○			21,220	20,589
180	+1,2	+7,4	24,660 ○ ○			25,700 ● ● ● ●	24,990 ● ● ● ● ● ●
200			30,890 ○ ○			32,200 ● ● ● ● ● ●	31,110 ● ● ● ● ● ● ● ●
225	+8,5		38,400 ○ ○			42,000 ● ● ● ●	
250	+9,0		47,900 ○ ○			50,000 ● ● ● ● ● ●	
280	+9,5		58,200 ○ ○			60,740	
300	+10,0		68,700 ○ ○			71,800 ● ● ● ●	
350	+1,3		93,000 ○ ○			98,000 ● ● ● ●	
400	+12,0		122,700 ○ ○			127,000 ● ● ● ●	
500			189,000 ○ ○			197,000 ● ● ● ●	
600	+20,0		270,500 ○ ○			290,000 ● ● ● ●	
700			365,700 ○ ○			395,000 ● ● ● ●	

*Alle angegebenen Gewichte sind mittlere Produktionsgewichte.  
 All indicated weights basis on average production weights.  
 Tous les poids indiqués sont des poids moyens de production.*

- \* Verpackungseinheit ca. 5 kg
- \* Packing Unit ea. 5 kg
- \* Conditionnement env. 5 kg



**ABS**  
**Acrylnitril butadiene Styrene copolymer** has a good thermal and dimensional stability and scratch resistance. **ABS** can be used in temperatures ranging from -50 °C to +70 °C.

**Advantages:**

- good mechanical strength
- resists scratching
- high surface strength
- high impact strength
- high dimensional stability

**Applications:**

Parts with a high impact strength also in the cooling.

**PC**  
**Polycarbonate** shows an extreme impact strength and rigidity and the temperature ranges from -150 °C to 120 °C.

**Advantages:**

- extremely high impact strength
- high mechanical strength
- high dimensional stability
- high temperature resistance
- good insulating properties
- high resistance to radiation

**Applications:**

Piping systems, parts with a required high impact strength, etc...

**PPE, PPE-30 GF (PPO, Noryl®)**

**Polyphenylenether** belongs to the group of the amorphous materials and can be used in temperatures ranging from -50 – +105 °C. PPE exhibits a high impact strength and a very high dimensional stability. The electrical properties will not be influenced by the surrounding frequencies and therefore can be used in a lot of applications in electrical engineering.

**Advantages:**

- high dimensional stability
- low tendency to creep
- high thermostability
- high impact strength
- good electrical characteristics over a far frequency range
- high resistance to hydrolysis
- self-extinguishing

**Applications:**

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

**PPE-30 GF**

Reinforced with 30% glassfibre.

Ø mm	Toleranzen Tolerances Tolérances mm		ABS		PC		PPE	PPE-30 GF
	min.	max.	kg/m		kg/m	kg/m	kg/m	
10	+ 1,1		<b>0,09</b> ⊙	+ 0,1	+ 0,5	<b>0,100</b> ⊙	0,090	0,110
12			0,14			<b>0,148</b> ⊙	0,140	0,160
15	+ 1,5		<b>0,20</b> ⊙		+ 0,9	0,224	0,218	0,252
16			0,25			<b>0,258</b> ⊙	0,250	0,290
20	+ 1,6		<b>0,36</b> ⊙		+ 0,2	<b>0,398</b> ⊙	<b>0,370</b> ⊙	<b>0,430</b> ⊙
25			0,57		+ 1,2	<b>0,622</b> ⊙	<b>0,580</b> ⊙	<b>0,650</b> ⊙
30	+ 0,1		<b>0,82</b> ⊙			<b>0,888</b> ⊙	<b>0,810</b> ⊙	<b>0,960</b> ⊙
36			1,18		+ 1,6	<b>1,283</b> ⊙	1,180	1,299
40	+ 1,9		<b>1,45</b> ⊙			<b>1,576</b> ⊙	<b>1,400</b> ⊙	<b>1,720</b> ⊙
50	+ 2,5		<b>2,27</b> ⊙		+ 2,0	<b>2,466</b> ⊙	<b>2,299</b> ⊙	<b>2,700</b> ⊙
60	+ 3,0		<b>3,27</b> ⊙		+ 2,5	<b>3,550</b> ⊙	<b>3,399</b> ⊙	<b>3,800</b> ⊙
70			4,45		+ 3,0	<b>4,850</b> ⊙	<b>4,399</b> ⊙	<b>5,200</b> ⊙
80	+ 4,2		<b>5,81</b> ⊙		+ 3,0	<b>6,290</b> ⊙	<b>5,899</b> ⊙	<b>6,900</b> ⊙
90	+ 0,2	+ 5,2	7,35	+ 0,5	+ 3,4	7,970	7,399	8,520
100			<b>9,07</b> ⊙	+ 0,6	+ 3,8	<b>9,840</b> ⊙	<b>8,900</b> ⊙	10,700
120			<b>12,65</b> ⊙					
125				+ 0,8	+ 4,6	15,370	14,099	16,500
140	+ 0,3	+ 5,3		+ 0,9	+ 5,4	19,310	17,230	20,640
150			<b>19,80</b> ⊙	+ 1,0	+ 5,8	22,180	20,399	24,100
180				+ 1,2	+ 7,4	<b>32,010</b> ⊙		
200				+ 1,3	+ 8,5	39,570		

Ø	Wandstärke Wall Thickness Épaisseur		PC
	mm	mm	
12 x 10	1	0,045	
16 x 12	2	0,114	
20 x 16	2	0,150	
30 x 24	3	0,330	
36 x 30	3	0,400	
40 x 36	2	0,310	
50 x 44	3	0,575	
60 x 54	3	0,697	
80 x 74	3	0,942	
100 x 94	3	1,186	
110x 104	3	1,309	

Alle angegebenen Gewichte sind mittlere Produktionsgewichte.  
All indicated weights base on average production weights.  
Tous les poids indiqués sont des poids moyens de production.



**PVDF (Kynar®)**

**Polyvinylidene fluoride** shows a higher tensile strength, pressure resistance and dimensional stability than the related PTFE, but friction and insulation properties are lower. PVDF has a high mechanical strength and toughness at lower temperature and it's self-extinguishing. The temperature ranges from -60 °C to +150 °C.

**Advantages:**

- high tensile strength
- high mechanical strength
- high chemical resistance
- low water absorption
- good friction and wear and tear values
- self-extinguishing
- high UV-resistance

**Disadvantages:**

- toxic fumes when burned
- can not be solvent cemented

**Applications:**

Pumps, rotation disks, valves, fittings, glide tracks, cogwheels, chemical processing.

**E-CTFE (Halar®)**

**Ethylen-Chlortrifluorethylene** exhibits an extraordinary impact strength at temperatures ranging from -40 °C to +150 °C. A great part of the product properties attributes to the very smooth surface and differentiates HALAR® from other fluoropolymers. Due to the fact that E-CTFE is very pure, this material is being used to process chemicals and ultrapure water for the semiconductor industry. Also the permeation resistance to oxygen, carbon dioxide, chlorine gas and hydrochloric acid is 10 to 100 times better than PTFE.

**Advantages:**

- extremely high impact strength (up to -40 °C)
- good insulation properties
- very good weather resistance
- high resistance to radiation
- very high chemical resistance
- self-extinguishing
- very good sliding properties
- food safe

**Disadvantages:**

- high density
- limited protection against stress cracking at temperatures > 140 °C

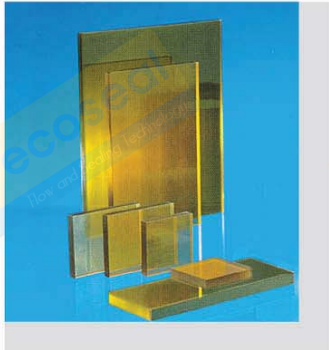
**Applications:**

Parts which come in contact with aggressive materials (e.g. machine-making industry), lining of tanks, pumps, flanges, fittings, parts in centrifuges and control engineering industry etc...

Ø mm	Toleranzen Tolerances Tolérances mm		PVDF kg/m	Ø		Toleranzen Tolerances Tolérances mm		E-CTFE kg/m
	min.	max.		mm	inch	min.	max.	
10	+ 0,1	+ 0,5	0,150	6,4	1/4			0,050
12			<b>0,220</b> ⊙	9,5	3/8		+ 0,4	0,120
16		+ 0,7	<b>0,380</b> ⊙ ●	12,7	1/2			0,210
20			<b>0,590</b> ⊙ ●	15,9	5/8			0,330
25	+ 0,2		<b>0,920</b> ⊙ ●	19,1	3/4		+ 0,7	0,480
30		+ 0,9	<b>1,320</b> ⊙ ●	22,2	7/8			0,650
35		+ 1,1	<b>1,800</b> ⊙ ●	25,4	1			<b>0,850</b> ⊙
40			<b>2,340</b> ⊙ ●	28,6	1 1/8		+ 1,0	1,080
50		+ 1,3	<b>3,690</b> ⊙ ●	31,8	1 1/4			<b>1,330</b> ⊙
56			4,510	38,1	1 1/2			1,920
60	+ 0,3		<b>5,270</b> ⊙	41,3	1 5/8		+ 1,4	2,250
63		+ 1,6	5,700	44,5	1 3/4			2,610
70			<b>7,150</b> ⊙	47,6	1 7/8			2,990
80	+ 0,4	+ 2,0	<b>9,220</b> ⊙	50,8	2	+ 0		<b>3,410</b> ⊙
90	+ 0,5	+ 2,2	<b>11,720</b> ⊙	54,0	2 1/8		+ 1,7	3,840
95			13,570	57,2	2 1/4			4,310
100	+ 0,6	+ 2,5	<b>14,580</b> ⊙	63,5	2 1/2		+ 2,1	<b>5,320</b> ⊙
110	+ 0,7	+ 3,0	<b>17,600</b> ⊙	69,9	2 3/4		+ 2,5	<b>6,440</b> ⊙
125	+ 0,8	+ 3,5	<b>22,600</b> ⊙	76,2	3		+ 2,9	<b>7,660</b> ⊙
140	+ 0,9	+ 3,8	<b>28,500</b> ⊙	82,3	3 1/4			8,990
150	+ 1,0	+ 4,2	<b>32,600</b> ⊙	88,9	3 1/2		+ 3,3	13,620
165	+ 1,1	+ 4,5	<b>39,280</b> ⊙	95,3	3 3/4			11,970
180	+ 1,2	+ 5,0	<b>46,870</b> ⊙	101,6	4		+ 3,8	17,240
200		+ 5,5	<b>58,700</b> ⊙	108,0	4 1/4			15,380
225	+ 1,3	+ 5,8	76,110	114,3	4 1/2		+ 4,6	<b>21,280</b> ⊙
250	+ 1,5	+ 6,2	<b>90,200</b> ⊙	127,0	5			30,650
				152,4	6			

Ø mm	Dickentoleranzen Toler. of thickness Tolér. d'épaisseur mm		PVDF Breite Width Largeur 620 mm		PVDF Breite Width Largeur 1000 mm	
	min.	max.	kg/m	kg/m	kg/m	kg/m
10	+ 0,2	+ 0,9	<b>12,880</b> ⊙	<b>19,520</b> ⊙		
12			<b>14,910</b> ⊙	<b>23,660</b> ⊙		
16			<b>19,520</b> ⊙	<b>31,000</b> ⊙		
20	+ 0,3	+ 1,5	<b>24,150</b> ⊙	<b>38,320</b> ⊙		
22			26,570	42,150		
25			<b>29,940</b> ⊙	<b>47,500</b> ⊙		
30			<b>36,400</b> ⊙	<b>57,760</b> ⊙		
35			42,470	67,400		
40		+ 2,5	<b>47,950</b> ⊙	<b>77,300</b> ⊙		
45	+ 0,5		53,950	86,640		
50			<b>59,520</b> ⊙	<b>96,640</b> ⊙		
60		+ 3,5	<b>71,640</b> ⊙	<b>115,970</b> ⊙		
80		+ 5,0	94,960	153,280		

Alle angegebenen Gewichte sind mittlere Produktionsgewichte.  
All indicated weights base on average production weights.  
Tous les poids indiqués sont des poids moyens de production.



**PSU:**  
**Polysulfone** show great thermal stability (from -100 to +160 °C). PSU possess a high mechanical strength, very good dielectric properties and hydrolysis resistance, high radiation resistance and self-extinguishing. PSU has a low notch impact strength.

- Advantages:**
- high strength and rigidity
  - high impact strength (also at low temperatures)
  - very good dimensional stability
  - high chemical resistance
  - high resistance to all kinds of radiation
  - self-extinguishing
  - low smoke emission
  - repeated sterilization

**Applications:**  
 Parts for microwave ovens, blow-dryers, food-industry, pump wheels, insulators, medical industry, etc....

**PPSU:**  
**Polyphenylensulfon** is an amorphous material, with improved impact – and hydrolysis resistance compared to PSU. The usual operating temperature is with approx. 180 °C. The extremely high notched impact strength remains also after a heat aging.

- Advantages:**
- high strength and rigidity
  - very high impact strength (also at low temperatures)
  - very good dimensional stability
  - very high chemical resistance
  - high resistance to all kinds of radiation
  - self-extinguishing
  - repeated sterilization

**Applications:**  
 as with PSU but with higher chemical resistance.

**PEI, PEI-30 GF**  
**Polyetherimide** has a high mechanical strength in coordination with a good chemical and heat resistance (up to +170 °C), good dimensional stability and creep resistance. Its under the thermoplastics singular torque strength permits the economical substitution of machining fabricated small parts from steel.

- Advantages:**
- very high strength and rigidity
  - high torque strength and hardness
  - high thermostability
  - high weatherability
  - high radiation resistance
  - self-extinguishing

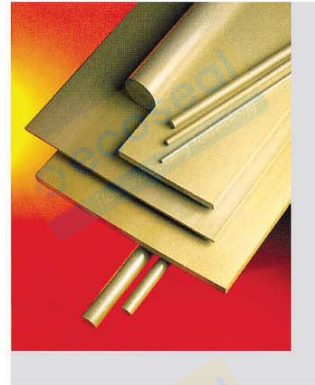
**Applications:**  
 Parts for electrical engineering, food industry and in the aircraft construction, etc....

**PEI-30 GF**  
 30% glass fibre reinforced.

Ø mm	Toleranzen Tolerances Tolérances mm		PSU kg/m	PPSU kg/m
	min.	max.		
20	+ 0,2	+ 1,5	0,420 ◊	0,443 ●
30			0,945 ◊	0,985 ●
40			1,670 ◊	1,750 ●
50	+ 0,3	+ 2,8	2,660 ◊	2,730
60			3,770 ◊	3,940
80	+ 0,4	+ 3,5	6,667 ◊	6,970
100	+ 0,5	+ 5,0	10,450 ◊	10,900 ●

Ø mm	inch	Toleranzen Tolerances Tolérances mm		PEI kg/m	PEI-30 GF kg/m
		min.	max.		
19,1	3/4	+ 0,6	+ 0,8	0,365	0,432 ◊
25,4	1			0,648 ◊	0,759 ◊
31,8	1 1/4			1,012	1,191 ◊
38,1	1 1/2	+ 1,0	+ 1,5	1,459 ◊	1,726
50,8	2			2,594 ◊	3,051 ◊
63,5	2 1/2	+ 1,9	+ 6,5	4,053	4,777 ◊
76,2	3			5,834 ◊	6,875
82,3	3 1/4			6,948	8,185 ◊
101,6	4			10,369 ◊	12,218 ◊

Ø mm	Dickentoleranzen Tol. of thickness Tolér. d'épaisseur mm		PSU Breite Width Largeur 620 mm	PPSU Breite Width Largeur 620 mm	PEI Breite Width Largeur 620 mm
	min.	max.	kg/m	kg/m	kg/m
10	+ 0,2	+ 0,9	8,300	8,950	8,540
12	+ 0,3	+ 1,5	10,450	11,000	10,850
16			13,290	14,350	14,200
20			16,950	17,700	17,500
22	+ 0,5	+ 2,5	18,100	19,000	18,790
25			20,760	21,850	21,600
30			25,600	26,700	25,610
35			29,040	30,490	29,900
40			33,170	35,050	34,140
45			37,390	39,250	38,580
50			41,550	43,400	42,900
60					
70	+ 3,0				57,870
80					



**PEEK**  
**Polyether etherketone** can be used at very high temperatures (+260 °C) and it shows an extraordinary mechanical strength, toughness, hardness, flexural strength, torsional strength. PEEK exhibits excellent chemical resistance, very good dielectric properties up to +260 °C and a very good resistance to all kinds of radiation. Importantly it is self-extinguishing according to UL 94.

- Advantages:**
- very high mechanical strength
  - very high rigidity
  - very high thermal stability
  - very high dimensional stability
  - very high radiation resistance
  - very high hydrolysis resistance

**Disadvantages:**

- notched impact strength relatively low
- low resistance to acetone

**Application:**  
 Bearing shells, piston rings, valve seats, gears, seals, aviation, pump vanes, plug connectors, wafer carriers.

**PEEK**  
 virgin PEEK.

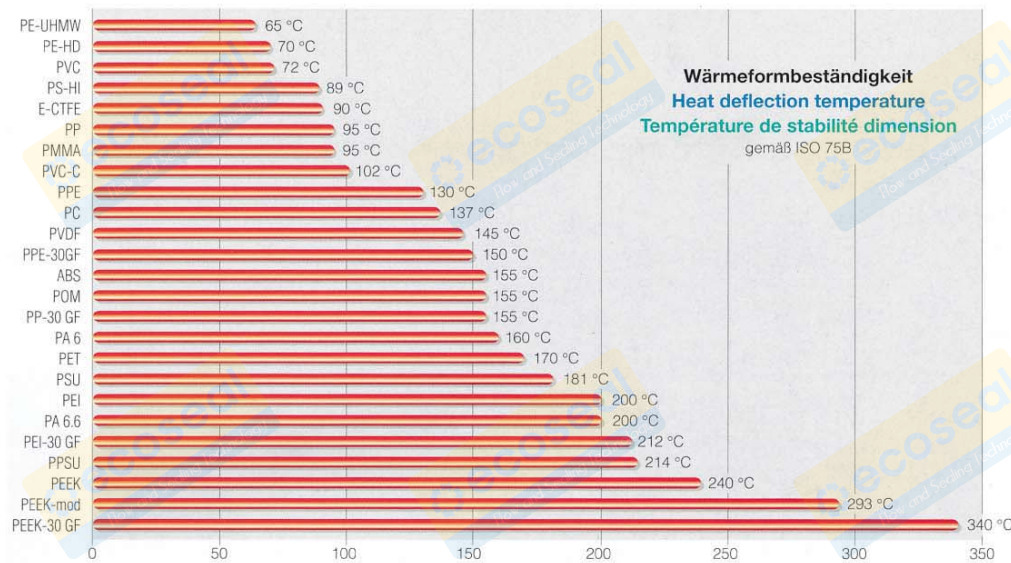
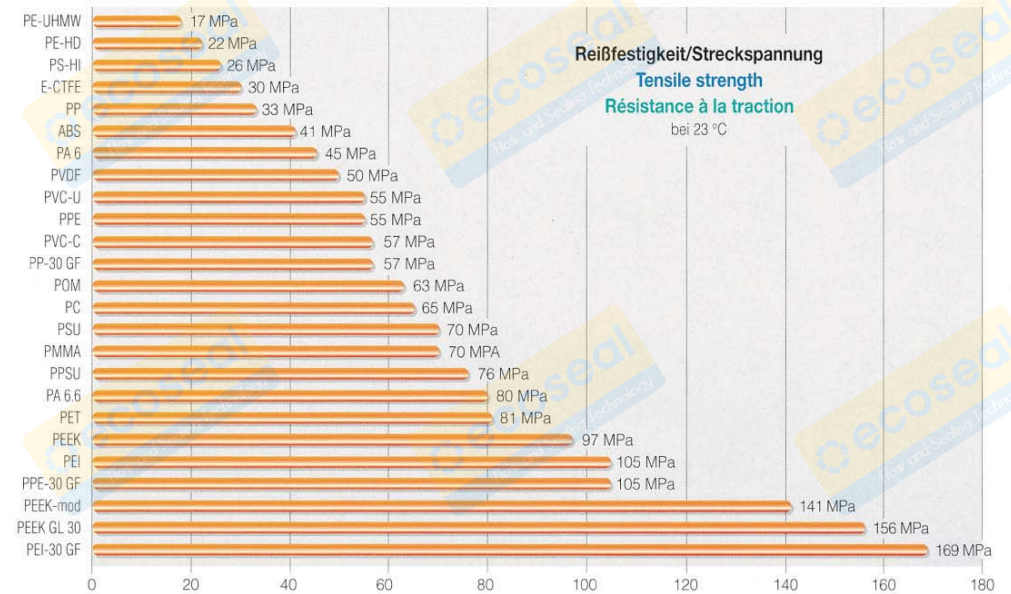
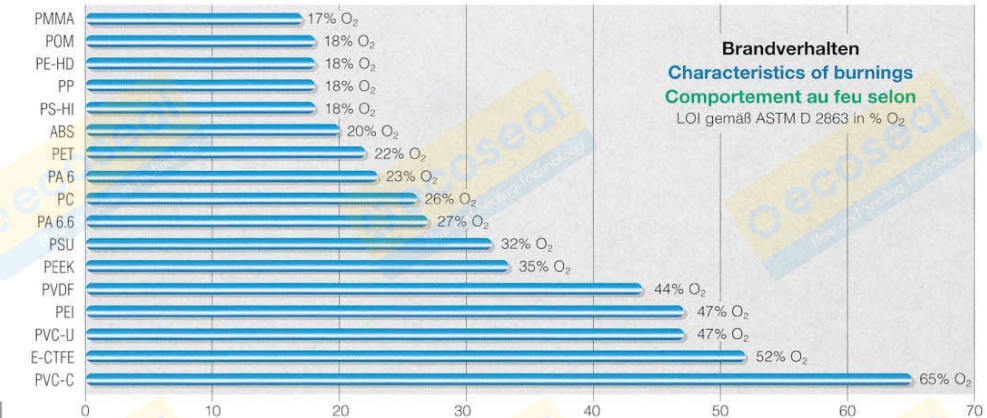
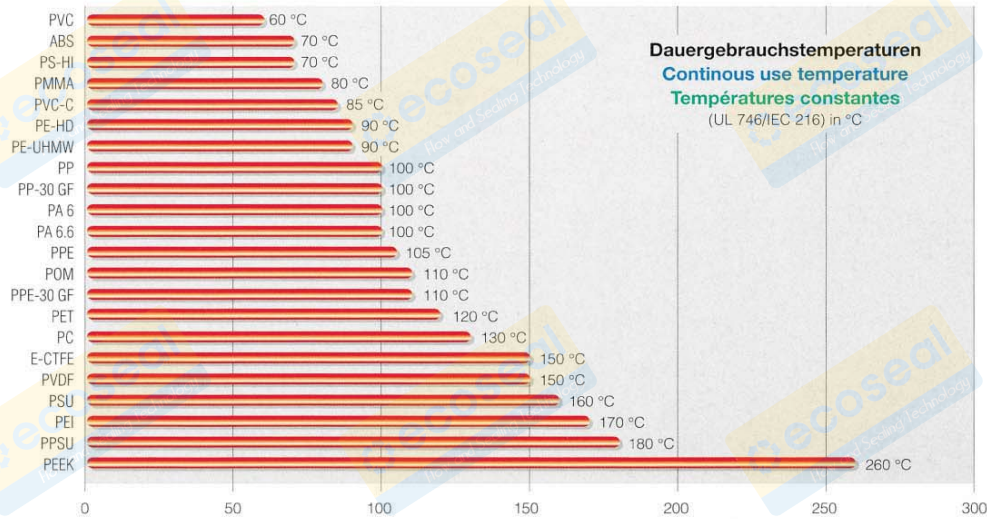
**PEEK-mod**  
 Reinforced with 10% of each PTFE, graphite and carbonfibre. Very good friction and wear and tear properties.

**PEEK-30 GF**  
 Reinforced with 30% glassfibre.

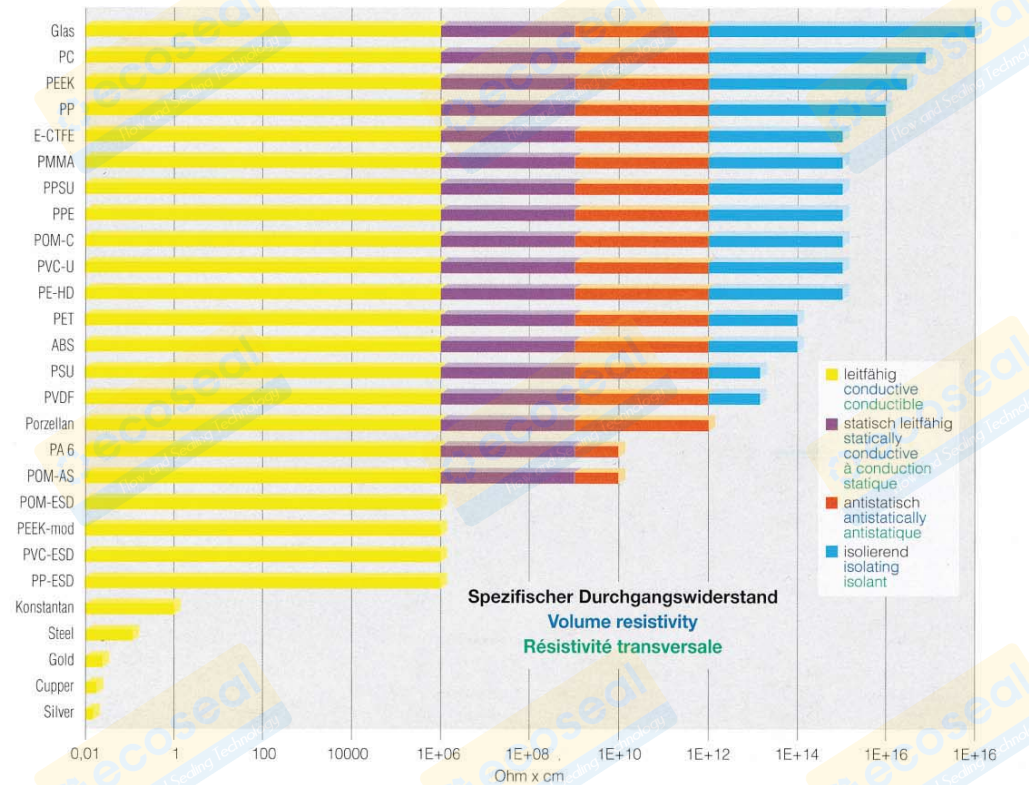
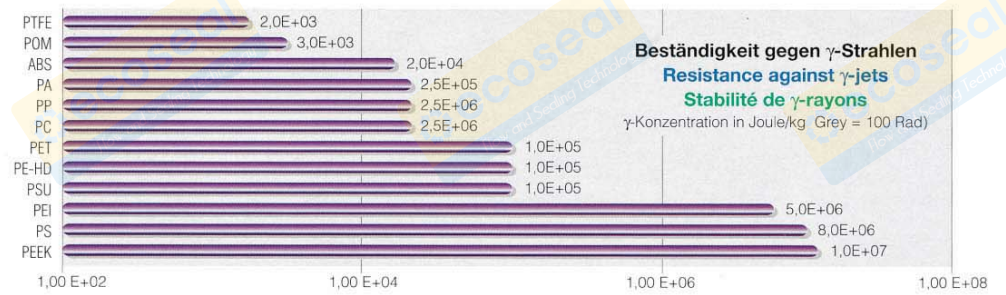
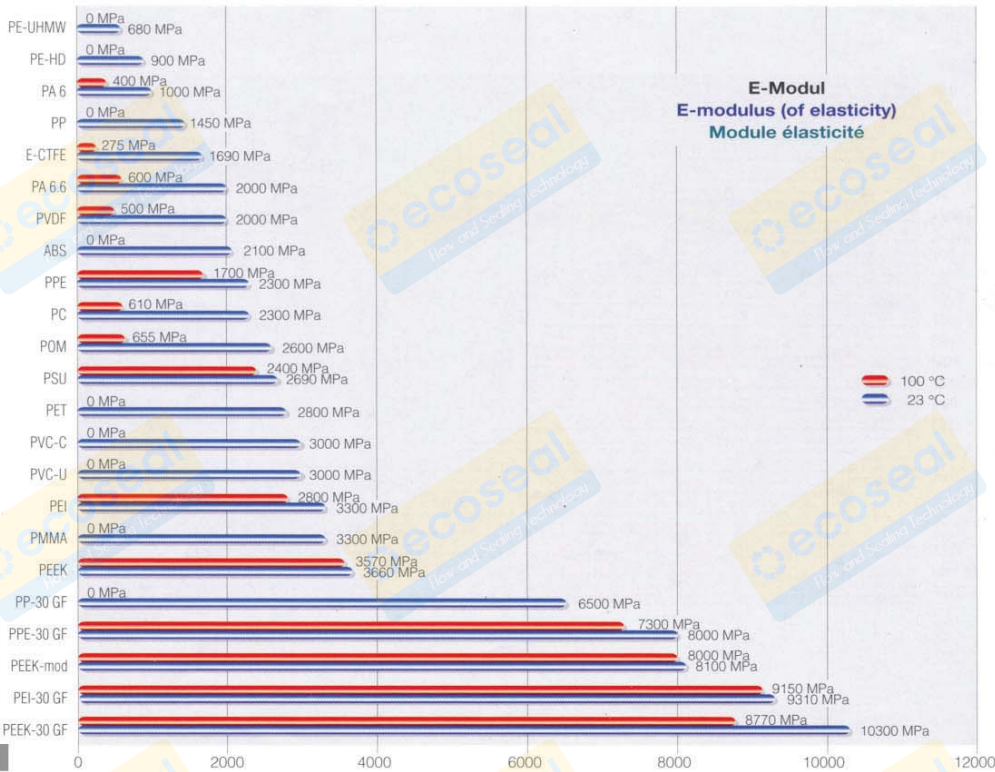
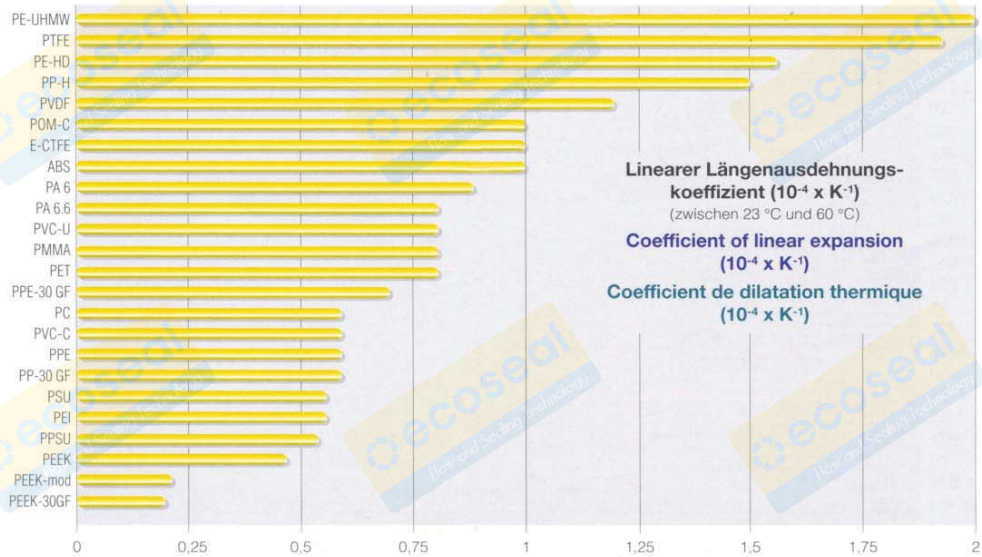
Ø mm	Toleranzen Tolerances Tolérances mm		PEEK kg/m	PEEK-mod kg/m	PEEK-30 GF kg/m
	min.	max.	kg/m	kg/m	kg/m
6	+ 0,1	+ 0,4	0,040	0,046	0,045
8			0,072 ◊	0,080	0,081
10			0,110 ◊	0,130 ●	0,131 ◊
12	+ 1,2		0,164 ◊	0,180	0,182
14			0,220	0,240	0,242
15			0,252	0,277	0,279
16			0,285 ◊	0,320	0,323
18			0,360	0,400	0,400
20			0,439 ◊	0,510 ●	0,512 ◊
22	+ 0,2		0,535	0,600	0,603
25			0,685 ◊	0,760	0,763
28			0,850	0,950	0,954
30	+ 1,5		1,000 ◊	1,110 ●	1,115 ◊
32			1,110 ◊	1,250	1,255
36			1,430 ◊	1,490	1,495
40			1,740 ◊	1,940 ●	1,946 ◊
45	+ 2,0		2,220 ◊	2,470	2,480
50			2,770 ◊	3,130 ●	3,140 ◊
56	+ 0,3		3,400	3,780	3,790
60			3,920 ◊	4,400 ●	4,420 ◊
65			4,550	5,100	5,120
70	+ 2,8		5,400 ◊	5,900	5,930
75			6,100	6,810	6,830
80	+ 0,4	+ 3,5	6,960 ◊	8,100 ●	8,130 ◊
90			8,800 ◊	9,790	9,800
100	+ 0,5	+ 3,8	10,850 ◊	12,100	12,200 ◊
110			13,000		
120			15,610		
125	+ 0,8		16,930 ◊		
140			21,300		
150	+ 1,0	+ 6,0	24,600 ◊		
180			35,300 ◊		
200	+ 1,3	+ 8,5	43,530 ◊		

Ø mm	Dickentoleranzen Tol. of thickness Tolér. d'épaisseur mm		PEEK			PEEK-mod	PEEK-30 GF
	min.	max.	Breite Width Largeur		Largueur		
			500 mm kg/m	620 mm kg/m	1000 mm kg/m	500 mm kg/m	500 mm kg/m
8	+ 0,2	+ 0,9	6,00 ◊	7,24		6,52	6,56
10			7,25 ◊	8,90		8,30 ●	8,20
12			8,80 ◊	10,95		9,83	9,95
13	+ 0,8	+ 1,5	10,00	13,10			
15			10,85	13,95			
16	+ 0,3	+ 1,5	11,70 ◊	14,25	24,60	12,88	
20			14,50 ◊	17,60	28,50	16,60 ●	17,10
22			16,10	19,40	32,50	17,45	
25			18,00 ◊	21,75	34,50	19,74	
30			21,65 ◊	26,55	42,50	24,50	25,20
36			25,50 ◊	31,70	51,00		
40	+ 0,5	+ 2,5	28,70 ◊	34,85	57,90	33,50	32,30
45			32,00	39,00	64,00	36,10	
50			35,60 ◊	43,15	71,50	41,05	

Datenvergleich der einzelnen Kunststoffe  
Comparison of plastics' technical data  
Comparaison de valeur technique de différentes matières plastiques



Datenvergleich der einzelnen Kunststoffe  
Comparison of plastics' technical data  
Comparaison de valeur technique de différentes matières plastiques





GEHR Technical Properties GEHR Valores técnicos GEHR

Attribute of the used raw materials <sup>1)</sup>			PVC-U	PVC-C	PVC-HI	PVC-ESD	PP	HiPro® PP-30 GF	PP-ESD	PE-HD	PE-UHMW	PVDF	E-CTFE	PMMA	ABS	PC	PPE	PPE- 30 GF	PET	POM	POM- ESD	PSU	PPSU	PEI	PEI- 30 GF	PEEK	PEEK- mod	PEEK- 30 GF		
Norm Norma	Unit Unidad p.e)	Unit Unidad p.e)																												
<b>I. Physical Properties</b>																														
1. Specific gravity (ρ)	ISO 1183	g/cm <sup>3</sup>	1,36	1,55	1,38	1,41	0,9	1,14	0,95	0,95	0,93																			
2. Water absorption	DIN 53495	%	0,2	0,2	0,2	-	0,01	-	0,1	0,01	0,01																			
3. Chemical resistance			DIN 8061	DIN 8061	DIN 8061	-	-	-	-	DIN 8075	DIN 8075																			
4. Max. permissible service temperature (no stronger mech. stress involved)																														
upper temperature limit		°C	60	85	60	60	100	100	100	90	90																			
lower temperature limit		°C	-15	-15	-40	-15	5	5	5	-50	-150																			
<b>II. Mechanical Properties</b>																														
1. Tensile strength at yield (σ <sub>S</sub> )	ISO 527	MPa	55	57	49	40	33	57	38	24	17																			
2. Elongation at yield (ε <sub>S</sub> )	ISO 527	%	3	3	10	4	14	-	4	11	20																			
3. Tensile strength at break (σ <sub>B</sub> )	ISO 527	MPa	30	80	30	36	-	85	-	34	40																			
4. Elongation at break (ε <sub>B</sub> )	ISO 527	%	33	15	30	20	> 50	3	-	> 600	> 350																			
5. Impact strength (a <sub>0</sub> )	ISO 179	kJ/m <sup>2</sup>	o.B.	o.B.	o.B.	-	o.B.	22	o.B.	o.B.	o.B.																			
6. Notch impact strength (a <sub>0</sub> )	ISO 179	kJ/m <sup>2</sup>	3	8	10	5	13	6	o.B.	20	o.B.																			
7. Ball indentation hardn. (H <sub>k</sub> ) /Rockwell	ISO 2039-1	MPa	120	150	100	-	71	110	-	40	36																			
8. Shore-D	DIN 53505		82	90	78	83	70	85	80	62	62																			
9. Flexural strength (σ <sub>B 3,5%</sub> )	ISO 178	MPa	90	90	80	-	-	120	-	30	27																			
10. Modulus of elasticity (E <sub>t</sub> )	ISO 527	MPa	3000	3000	2600	3000	1450	6500	2200	950	680																			
<b>III. Thermal Properties</b>																														
1. Vicat softening temp. VST/B/50 VST/A/50	ISO 306	°C	75 <sup>3)</sup>	105	78	-	154	130	-	74	80																			
2. Heat deflection temperature HDT/B HDT/A	ISO 75	°C	72 <sup>4)</sup>	102	69	-	103	155	-	70	65																			
3. Coef. of linear therm. expansion (α)	DIN 53752	K <sup>-1</sup> x 10 <sup>-4</sup>	0,8	0,6	0,8	-	1,5	0,7	-	1,55	2																			
4. Thermal conductivity at 20 °C (λ)	DIN 52612	W/(m x K)	0,14	0,14	0,17	-	0,22	0,27	-	0,43	0,42																			
<b>IV. Electrical Properties</b>																														
1. Volume resistivity (ρ <sub>D</sub> )	VDE 0303	Ω x cm	> 10 <sup>15</sup>	> 10 <sup>15</sup>	> 10 <sup>15</sup>	3 x 10 <sup>3</sup>	> 10 <sup>16</sup>	> 10 <sup>14</sup>	50	> 10 <sup>15</sup>	> 10 <sup>14</sup>																			
2. Surface resistivity (ρ <sub>S</sub> )	VDE 0303	Ω	≥ 10 <sup>13</sup>	≥ 10 <sup>13</sup>	≥ 10 <sup>13</sup>	≤ 10 <sup>9</sup>	≥ 10 <sup>13</sup>	≥ 5 x 10 <sup>13</sup>	≤ 10 <sup>9</sup>	≥ 10 <sup>16</sup>	≥ 10 <sup>12</sup>																			
3. Dielectric constant at 1 MHz (ε <sub>r</sub> )	DIN 53483		3	3	3	-	2,3	2,64	-	2,3	3																			
4. Diel. loss factor at 1 MHz (tanδ)	DIN 53483		0,01	0,01	0,01	-	-	-	-	0,0002	0,0001																			
5. Dielectric strength	VDE 0303	kV/mm	20-40	20-40	20-40	-	-	40	-	17	45																			
6. Tracking resistance	DIN 53480		KB 600	KB 600	KB 600	-	KB >600	KB >600	-	KB >600	KB >600																			
<b>V. Additional Data</b>																														
1. Bondability			+	+	+	+	0	0	0	0	-																			
2. Physiological indifference according	EEC 90/128 FDA		+ <sup>5)</sup>	-	-	-	+	-	-	+	+																			
3. Friction coefficient	DIN 53375		0,6	0,6	0,6	0,6	0,3	-	-	0,3	0,25																			
4. Flammability	UL 94		V-0	V-0	V-0	V-0	HB	HB	HB	HB	HB																			
5. UV stabilisation			0	-	0	-	0	0	0	0	-																			
<b>VI. Chemical Properties</b>																														
1. Acid resistance			+	+	+	+	+	+	+	+	+																			
2. Hydroxid resistance (de/ute)			+	+	+	+	+	+	+	+	+																			
3. Hydrocarbonat resistance			+	+	+	+	+	+	+	+	+																			
4. CKW resistance			-	-	-	-	0	0	0	-	-																			
5. Aromatic resistance			0	0	0	0	-	-	-	0	0																			
6. Ketone resistance			-	-	-	-	+	+	+	+	+																			
7. Resistance against hot water			-	0	-	-	+	+	+	+	+																			

1) The physical data contained in this table are typical values. They are obtained on the test specimens under specific conditions and represent average values of a large number of tests. The results obtained on this test specimens cannot be applied to finished parts without reservations, as behavior is influenced by processing and shaping. Reproduction only with our declared permission.  
 2) Corresponding.  
 3) 65 (solid rod 160 - 200 mm ø) 57 (solid rod 220 - 300 mm ø)  
 4) 59 (solid rod 160 - 200 mm ø) 51 (solid rod 220 - 300 mm ø)  
 5) For rods up to 160 mm ø, tubes and profiles on request.  
 6) The materials PE-HD and PP are admitted by DIBt.

o.B. = no break + = yes 0 = limited - = no