Plásticos técnicos 2

SUMINISTROS INDUSTRIALES DEL TAJO, S.A.

Suministros Industriales del Tajo S.A. C/ del Río Jarama 52 - 45007, Toledo - Spain
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Index

Polymer Name	*Ensinger Name*	*Raw material group*	page	page	page
ABS	TECARAN ABS	Acrylonitrile-butadiene-styrene-graft copolymer	64	65	
E/CTFE	TECAFLON ECTFE	Ethylene/Chlorotrifluorethylene			
E/TFE	TECAFLON ETFE	Ethylene Tetrafluoroethylen copolymer	40		
PA 6	TECAM 6 MO	Polyamide 6, with MoS_2 (black)	21	23	
PA 6	TECAMID 6	Polyamide 6	21	23, 81	25
PA 6 GF30	TECAMID 6 GF30 black	Polyamide 6, glass fibre (black)	22	24	
PA 6-3	TECAMID TR	Polyamide 6-3 (transparent)			
PA 6 C	TECAST T	Cast Polyamide 6	27	28	30, 31
PA 6 C	TECAST TM	Cast Polyamide 6, MoS_2 (black)	27	28	
PA 6 C	TECAST L	Cast Polyamide 6, oil	27	28	
PA 6 C	TECAGLIDE	Cast Polyamide 6, lubricated	27	28	
PA 6 C	TECAST GX	Cast Polyamide 6, lubricated	27	28	
PA 6 C	TECARIM 1500	Cast Polyamide 6, Elastomer	29	29	
PA 11	TECAMID 11	Polyamide 11			
PA 12	TECAMID 12	Polyamide 12	21	23	
PA 46	TECAMID 46 redbrown	Polyamide 46		24	
PA 66	TECAMID 66	Polyamide 66	21	23, 81	
PA 66	TECAMID 66 HI	Polyamide 66, heat-stabilized	21	23	
PA 66 GF30	TECAMID 66 GF30 black	Polyamide 66, glass fibre (black)	22	24	
PA 66 CF20	TECAMID 66 CF20	Polyamide 66, carbon fibre (black)	22	24	
PA 66 SF20	TECAMID 66 SF20	Polyamide 66, aramide fibre			
PA 66	TECAMID 66 LA	Polyamide 66, solid lubricant	21	23	
PA 66	TECAMID 66 MH	Polyamide 66, with MoS_2 (black)	21	23	
PA 66 GF	TECAMID 66/XGF50 black	Polyamide-copolymer, glass fibre (black)			
PA 610	TECAMID 610	Polyamide 610			
PA 612	TECAMID 612	Polyamide 612			
PAI	TECATOR, TECASINT	Polyamide-imide	56	56, 62	
PAI	TECATOR 5031 PVX	Polyamide-imide + CS TF	56	56	
PBT	TECADUR PBT	Polybutylene terephthalate			
PBT GF30	TECADUR PBT GF30	Polybutylene terephthalate, glass fibre	34	35	
PC	TECANAT	Polycarbonate (transparent)	37	38, 81	
PC GF30	TECANAT GF30	Polycarbonate, glass fibre	37	38	
PCTFE	TECAFLON PCTFE	Polychloro-trifluoroethylene			
PE-HD	TECAFINE PE	High density polyethylene (natural)			
PE-HD	TECAFINE PE black	High density polyethylene (black)			
PE-HMW	TECAFINE PE 5	High-molecular weight polyethylene			
PE-UHMW	TECAFINE PE 10	Ultra-high-molecular weight polyethylene			
PEK	TECAPEEK HT	Polyetheretherketone	49	51	
PEKEKK	TECAPEEK ST	Polyetherketoneetherketoneketone	49	51	
PEEK	TECAPEEK	Polyetheretherketone	49	51	52
PEEK	TECAPEEK black	Polyetheretherketone (black)	49		
PEEK	TECAPEEK bright red	Polyetheretherketone (bright red)	54	54	
PEEK GF30	TECAPEEK GF30	Polyetheretherketone, glass fibre	50	51	
PEEK CF30	TECAPEEK CF30	Polyetheretherketone, carbon fibre (black)	50	51	
PEEK	TECAPEEK PVX	Polyetheretherketone, carbon fibre, PTFE, graphite (black)	50	51	53
PEEK	TECAPEEK ELS nano	Polyetheretherketone, approved for medical engineering, CNT	54	54	
PEEK TF10	TECAPEEK TF10	Polyetheretherketone, PTFE	54, 74	54	
PEEK	TECAPEEK CMF	Polyetheretherketone, PTFE, ceramics	54	54	
PEEK	TECAPEEK TS	Polyetheretherketone, PTFE, mineral filler	54	54	
PEEK	TECAPEEK ID blue	Polyetheretherketone, PTFE, detectable filler	74	75	
PEEK	TECAPEEK MT	Polyetheretherketone, approved for medical engineering	68	71	
PEEK	TECAPEEK PNT	Polyetheretherketone, PTFE, glass fibre, CNT	54	54	
PEEK CF30	TECAPEEK CF30 MT	Polyetheretherketone, PTFE, carbon fibre (black), approved for medical engineering	69	71	
PEEK	TECAPEEK CLASSIX	Polyetheretherketone, PTFE, approved for medical engineering	69		
PEEK	TECAPEEK CLASSIX XRO20	Polyetheretherketone, PTFE, approved for medical engineering, contrast agent	69		
PEEK	TECAPEEK PEEK CW50	Polyetheretherketone, carbon fibre, composite, approved for medical engineering			
PEKK	TECAPEEK PEKK CW60	Polyetherketoneketone, carbon fibre, composite, approved for medical engineering			

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Polymer Name	*Ensinger Name*	*Raw material group*	page	page	page
PEI	TECAPEI	Polyetherimide	43	44	
PEI	TECAPEI MT	Polyetherimide, approved for medical engineering			
PEI GF30	TECAPEI GF30	Polyetherimide, glass fibre	43	44	
PES	TECASON E	Polyethersulphone	43	44	
PES GF30	TECASON E GF30	Polyethersulphone, glass fibre			
PET	TECAPET	Polyethylene terephthalate	33	35	
PET	TECAPET black	Polyethylene terephthalate, black	33	35	
PET	TECAPET TF	Polyethylene terephthalate, PTFE	33	35	
PET	TECADUR PET	Polyethylene terephthalate		81	
PI	TECASINT	Polyimide	59, 60	61, 62	
PI CS15	TECASINT 1021	Polyimide, graphite	59	61	
PI GF	TECASINT 1051	Polyimide, glass fibre	59	61	
PI	TECASINT 1041	Polyimide, MoS_2	59	61	
PI	TECASINT 1611	Polyimide, PTFE	59	61	
PI	TECASINT 1432	Polyimide, graphite + PTFE			
PMMA	TECACRYL	Polymethyl methacrylate (transparent)			
PMP	TECAFINE PMP	Polymethyl pentene (transparent)	64	65	
POM-C	TECAFORM AH black	Polyoxymethylene copolymer (black)	15	17, 18	
POM-C	TECAFORM AH	Polyoxymethylene copolymer	15, 74	17, 18 75, 81	19
POM-C	TECAFORM AH GF25	Polyoxymethylene copolymer, glass fibre	16	17, 18	
POM-C	TECAFORM AH LA blue	Polyoxymethylene copolymer, solid lubricant			
POM-C	TECAFORM AH ELS	Polyoxymethylene copolymer, conductive carbon	15	17, 18	
POM-C	TECAFORM AH SD	Polyoxymethylene copolymer, antistatic agent		18	
POM-C	TECAFORM AH ID	Polyoxymethylene copolymer, detectable filler	74	75	
POM-C	TECAFORM AH MT	Polyoxymethylene copolymer, approved for medical engineering	70		
POM-C	TECAFORM AH SAN	Polyoxymethylene, antimicrobic	74		
POM-H	TECAFORM AX	Polyoxymethylene copolymer	74	75	
POM-H	TECAFORM AD	Polyoxymethylene homopolymer	15	17, 18	
POM-H	TECAFORM AD black	Polyoxymethylene homopolymer (black)	15	17, 18	
POM-H	TECAFORM AD AF	Polyoxymethylene homopolymer, PTFE	15	17, 18	
PP	TECAFINE PP	Polypropylene homopolymer (natural, grey)			
PP GF30	TECAFINE PP GF30	Polypropylene homopolymer, glass fibre			
PP	TECAPRO MT	Polyphenylene, approved for medical engineering		71	
PP	TECAPRO SAN	Polyphenylene, antimicrobic		75	
PPE	TECANYL	Polyphenylene ether	64	65	
PPE GF30	TECANYL GF30	Polyphenylene ether, glass fibre	64	65	
PPE	TECANYL MT	Polyphenylene ether, approved for medical engineering	70		
PPS	TECATRON	Polyphenylene sulphide	46	47	
PPS GF40	TECATRON GF40	Polyphenylene sulphide, glass fibre	46	47	
PPS	TECATRON PVX	Polyphenylene sulphide, carbon fibre, PTFE, graphite (black)	46	47	
PPSU	TECASON P	Polyphenylene sulphone	43	44	
PPSU	TECASON P MT	Polyphenylene sulphone, approved for medical engineering	69	71	
PPSU	TECASON P MT XRO	Polyphenylene sulphone, approved for medical engineering, contrast agent	70		
PSU	TECASON S	Polysulphone	43	44	
PSU GF30	TECASON S GF30	Polysulphone, glass fibre			
PTFE	TECAFLON PTFE	Polytetrafluoroethylene	40	41	
PTFE GF25	TECAFLON PTFE GF25	Polytetrafluoroethylene, glass fibre			
PTFE + PI	TECASINT 8001	Polytetrafluoroethylene + Polyimide			
PVDF	TECAFLON PVDF	Polyvinylidene fluoride	40	41	
PVDF CF8	TECAFLON PVDF CF8	Polyvinylidene fluoride, carbon fibre			
PVDF	TECAFLON PVDF ELS	Polyvinylidene fluoride, conductive carbon			

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TECAFORM

Polyoxymethylene (POM) – TECAFORM – is a semi-crystalline thermoplastic offering high strength and rigidity. The polymer has good sliding properties and wear resistance, as well as low moisture absorption. Its good level of dimensional stability and particularly good fatigue strength, as well as its outstanding machining properties make POM a versatile engineering material for complex components. A distinction is drawn between homopolymers (POM-H) – TECAFORM AD – and copolymers (POM-C) TECAFORM AH.

Overview of types

TECAFORM AH
(POM-C)
Good chemical resistance
High resilience.

TECAFORM AH black
(POM-C)
Good UV stability.
Very good machining properties.

TECAFORM AH GF25
(POM-C GF)
Glass fibre reinforced polyacetal with very high strength.
High thermal dimensional stability.

TECAFORM AH MT
(POM-C)
→ p. 66

TECAFORM AH ID
(POM-C, detectable filler)
→ p. 72

TECAFORM AX
(POM-C)
→ p. 72

TECAFORM AH ELS
(POM-C, conductive carbon)
→ p. 76

TECAFORM AH SD
(POM-C, antistatic)
→ p.76

TECAFORM AD
(POM-H)
High mechanical strength.
Very good machining properties.

TECAFORM AD AF
(POM-H TF)
Very good slide friction properties due to PTFE component.
Low water absorption.

On request:

TECAFORM AH LA blue
(POM-C, solid lubricant)
Very good sliding and abrasion values.
Low water absorption.

TECAFORM AD GF20
(POM-H GF)
Highly abrasion resistant.
Easily weldable.

Application examples

Sealing plug
TECAFORM AH (POM-C)
High dimensional stability.
Good sliding properties.
Resistant to oil and grease.

Conveyor chain elements
TECAFORM AD (POM-H)
Good strength.
Good sliding properties.
Good machining capability.

Sealing piston
TECAFORM AH black (POM-C)
Good resilience.
Good strength.
High dimensional stability.

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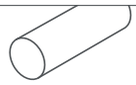
TECAFORM Rods



	TECAFORM AH	TECAFORM AH black	TECAFORM AH ELS	TECAFORM AD	TECAFORM AD black	TECAFORM AD AF	
Chemical designation	POM-C	POM-C	POM-C	POM-H	POM-H	POM-H	
Density [g/cm³]	1,41	1,41	1,41	1,43	1,43	1,49	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
3	0,013	0,013		0,013	0,013		+0,10/+0,60
4	0,021	0,021		0,022	0,022		
5	0,032	0,032		0,033	0,033		
6	0,046	0,046	0,046	0,046	0,046	0,048	
8	0,080	0,080	0,080	0,081	0,081	0,084	+0,10/+0,70
10	0,122	0,122	0,122	0,124	0,124	0,129	
12	0,176	0,176	0,176	0,179	0,179	0,187	+0,20/+0,80
14	0,237	0,237	0,237	0,241	0,241	0,251	
15	0,271	0,271	0,271	0,275	0,275	0,287	
16	0,308	0,308	0,308	0,312	0,312	0,325	
18	0,387	0,387	0,387	0,392	0,392	0,409	
20	0,475	0,475	0,475	0,481	0,481	0,502	
22	0,577	0,577	0,577	0,585	0,585	0,610	+0,20/+1,00
25	0,740	0,740	0,740	0,751	0,751	0,782	
28	0,924	0,924	0,924	0,937	0,937	0,976	
30	1,06	1,06	1,06	1,07	1,07	1,12	
32	1,21	1,21	1,21	1,22	1,22	1,28	+0,20/+1,20
36	1,52	1,52	1,52	1,54	1,54	1,61	
40	1,87	1,87	1,87	1,90	1,90	1,98	
45	2,37	2,37	2,37	2,40	2,40	2,50	+0,30/+1,30
50	2,91	2,91	2,91	2,96	2,96	3,08	
56	3,64	3,64	3,64	3,70	3,70	3,85	
60	4,20	4,20	4,20	4,26	4,26	4,43	+0,30/+1,60
65	4,91	4,91	4,91	4,98	4,98	5,19	
70	5,69	5,69	5,69	5,77	5,77	6,01	
75	6,56	6,56	6,56	6,65	6,65	6,93	+0,40/+2,00
80	7,45	7,45	7,45	7,55	7,55	7,87	
85	8,42	8,42	8,42	8,54	8,54	8,90	+0,50/+2,20
90	9,43	9,43	9,43	9,56	9,56	9,96	
95	10,53	10,53	10,53	10,68	10,68	11,13	+0,60/+2,50
100	11,65	11,65	11,65	11,81	11,81	12,31	
110	14,13	14,13		14,33	14,33	14,93	+0,70/+3,00
120	16,85	16,85		17,09	17,09	17,81	+0,80/+3,50
125	18,26	18,26		18,52	18,52	19,30	
130	19,79	19,79		20,07	20,07	20,91	+0,90/+3,80
135	21,31	21,31		21,61	21,61	22,52	
140	22,89	22,89		23,21	23,21	24,19	
150	26,3	26,3		26,7	26,7	27,8	+1,00/+4,20
160	29,9	29,9		30,4			+1,10/+4,50
165	31,9	31,9		32,4			+1,20/+5,00
180	37,9	37,9		38,4			
200	46,7	46,7		47,4			+1,30/+5,50
210	51,5	51,5					+1,30/+5,80
230	61,8	61,8					+1,50/+6,20
250	72,8	72,8					

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available ground. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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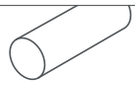
TECAFORM Rods



TECAFORM AH GF25

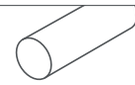
Chemical designation	POM-C
Density [g/cm³]	1,59

Diameter [mm]	[kg/m]	Tolerance [mm]
6	0,052	+0,10/+0,70
8	0,091	+0,10/+0,80
10	0,139	
12	0,201	+0,20/+0,90
14	0,270	
15	0,308	
16	0,349	
18	0,438	
20	0,538	
22	0,656	+0,20/+1,20
25	0,841	
28	1,05	
30	1,20	
32	1,36	
36	1,73	+0,20/+1,60
40	2,13	
45	2,71	+0,30/+2,00
50	3,33	
56	4,16	
60	4,80	+0,30/+2,50
65	5,62	
70	6,49	
75	7,49	+0,40/+3,00
80	8,50	
85	9,63	+0,50/+3,40
90	10,77	
95	12,03	+0,60/+3,80
100	13,30	

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

TECAFORM Rods



TECAFORM AH GF20

Chemical designation	POM-C
Density [g/cm³]	1,55

Diameter [mm]	[kg/m]	Tolerance [mm]
110	15,70	+0,70/+4,20
120	18,69	+0,80/+4,60
125	20,25	
135	23,70	+0,90/+5,40
140	25,4	
150	29,2	+1,00/+5,80
160	33,3	+1,10/+6,30

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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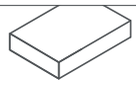
TECAFORM Plates



Dimensions [mm]	TECAFORM AH [kg/m]	TECAFORM AH black [kg/m]	TECAFORM AH GF25 [kg/m]	TECAFORM AH ELS [kg/m]	TECAFORM AD [kg/m]	TECAFORM AD black [kg/m]	TECAFORM AD AF [kg/m]	Tolerance [mm]
Chemical designation	POM-C	POM-C	POM-C	POM-C	POM-H	POM-H	POM-H	
Density [g/cm³]	1,41	1,41	1,59	1,41	1,43	1,43	1,49	
5 x 500	4,04	4,04			4,09	4,09	4,27	+0,20/+0,70
6 x 500	4,78	4,78			4,85	4,85	5,05	
8 x 500	6,41	6,41	7,22	6,41	6,50	6,50	6,77	+0,20/+1,10
8 x 620	7,90	7,90	8,91	7,90	8,01	8,01	8,35	
10 x 500	7,89	7,89	8,90	7,89	8,00	8,00	8,34	
10 x 620	9,73	9,73	10,97	9,73	9,86	9,86	10,28	
10 x 1.000**	15,55	15,55			15,62	15,77		
12 x 500	9,55	9,55	10,77	9,55	9,69	9,69	10,10	+0,30/+1,50
12 x 620	11,78	11,78	13,28	11,78	11,95	11,95	12,45	
12 x 1.000**	18,83	18,83			19,10	19,10		
15 x 500	11,78	11,78	13,28	11,78	11,94	11,94	12,44	
15 x 620	14,52	14,52	16,37	14,52	14,73	14,73	15,34	
15 x 620	14,52	14,52	16,37	14,52	14,73	14,73	15,34	
16 x 500	12,52	12,52	14,12	12,52	12,69	12,69	13,23	
16 x 1.000**	24,67	24,67			25,0	25,0		
18 x 500	14,00	14,00	15,79	14,00	14,20	14,20	14,79	
18 x 620		17,26	19,46	17,26	17,51	17,51	18,24	
18 x 1.000**	27,6	27,6			28,0	28,0		
20 x 500	15,48	15,48	17,46	15,48	15,70	15,70	16,36	
20 x 620	19,09	19,09	21,52	19,09	19,36	19,36	20,17	
20 x 1.000**	30,5	30,5			30,9	30,9		
22 x 500	16,96	16,96	19,13	16,96	17,20	17,20	17,92	
22 x 620	20,91	20,91	23,58	20,91	21,21	21,21	22,10	
22 x 1.000**	33,4	33,4			33,9	33,9		
25 x 500	19,18	19,18	21,63	19,18	19,46	19,46	20,27	
25 x 620	23,65	23,65	26,7	23,65	23,99	23,99	25,0	
25 x 1.000**	37,8	37,8			38,3	38,3		
30 x 500	23,33	23,33	26,3	23,33	23,66	23,66	24,65	+0,50/+2,50
30 x 620	28,8	28,8	32,4	28,8	29,2	29,2	30,4	
30 x 1.000**	46,0	46,0			46,6	46,6		
35 x 500	27,0	27,0	30,5	27,0	27,4	27,4	28,6	
35 x 620	33,3	33,3	37,6	33,3	33,8	33,8	35,2	
35 x 1.000**	53,3	53,3			54,0	54,0		
40 x 500	30,7	30,7	34,7	30,7	31,2	31,2	32,5	
40 x 620	37,9	37,9	42,7	37,9	38,4	38,4	40,0	
40 x 1.000**	60,6	60,6			61,4	61,4		
45 x 500	34,4	34,4	38,8	34,4	34,9	34,9	36,4	
45 x 620	42,5	42,5	47,9	42,5	43,1	43,1	44,9	
45 x 1.000**	67,9	67,9			68,8	68,8		
50 x 500	38,1	38,1	43,0	38,1	38,7	38,7	40,3	
50 x 620	47,0	47,0	53,0	47,0	47,7	47,7	49,7	
50 x 1.000**	75,2	75,2			76,2	76,2		

Tolerances according to DIN:
length 0 / +3 %
width + 5 / + 25 mm

Stock lengths 3.000 mm

* 20% glass fibre content (density 1,55 g/cm³)
** Stock length 2.000 mm.

Continued on next page

Stock item
Non-stock item – special production

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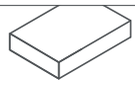
TECAFORM Plates

Continuation



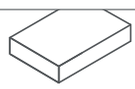
Dimensions [mm]	TECAFORM AH [kg/m]	TECAFORM AH black [kg/m]	TECAFORM AH GF25 [kg/m]	TECAFORM AH ELS [kg/m]	TECAFORM AD [kg/m]	TECAFORM AD black [kg/m]	TECAFORM AD AF [kg/m]	Tolerance [mm]
Chemical designation	POM-C	POM-C	POM-C	POM-C	POM-H	POM-H	POM-H	
Density [g/cm³]	1,41	1,41	1,59	1,41	1,43	1,43	1,49	
60 x 500	45,9	45,9	50,5*		46,6	46,6		+0,50/+3,50
60 x 620	56,6	56,6	62,2*		57,4	57,4		
60 x 1.000**	90,5	90,5			91,8	91,8		
70 x 500	53,3	53,3			54,1	54,1		
70 x 620	65,8	65,8			66,7	66,7		
70 x 1.000**	105,1	106,2			106,5	106,5		
80 x 500	61,3	61,3			62,2	62,2		+0,50/+5,00
80 x 620	75,6	75,6			76,6	76,6		
80 x 1.000**	120,8	120,8			122,5	122,5		
90 x 500	68,7	68,7			69,7	69,7		
90 x 620	84,7	84,7			85,9	85,9		
90 x 1.000**	135,4	135,4						
100 x 500	76,1	76,1			77,2	77,2		
100 x 620	93,8	93,8			95,2	95,2		
100 x 1.000**	150,0	150,0						
110 x 620**	103,4	103,4						+0,50/+6,00
120 x 620**	112,6	112,6						
130 x 620**	121,7	121,7						
140 x 620**	131,3	131,3						+0,50/+7,00
150 x 620**	140,4	140,4						

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

* 20% glass fibre content (density 1,55 g/cm³)
** Stock length 2.000 mm

TECAFORM Plates



Dimensions [mm]	TECAFORM AH SD [kg/m]	Tolerance [mm]
Chemical designation	POM-C	
Density [g/cm³]	1,35	
12,7 x 610	10,91	+0,00/+0,64
19,1 x 610	16,28	
25,4 x 610	21,56	
38,1 x 610	32,2	
44,4 x 610	37,5	
50,8 x 610	42,9	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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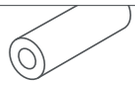
TECAFORM Tubes



TECAFORM AH natural
Chemical designation: POM-C
Density [g/cm³]: 1,41

Outside diameter [mm] →	20	25	30	32	36	40	45	50	56	60	65	70	75	80	85	90	100	110
Inside diameter [mm] ↓	[kg/m]																	
10	0,390	0,652																
15		0,520	0,839	1,04														
17					1,29													
18		0,413																
20			0,649		1,18	1,53		2,58										
22				0,769														
25				0,618	0,937	1,29	1,79	2,34	3,15	3,69	4,45	5,24	6,08	6,97				
30						0,996		2,04	2,86	3,39	4,16	4,95	5,79	6,68	7,82			
32										3,26		4,82	5,66	6,55			10,91	13,34
36							1,06	1,61	2,43	2,97	3,74	4,53	5,37	6,26	7,42		10,64	
40								1,28	2,11	2,64	3,42	4,20	5,04	5,94	7,11	8,12	10,32	12,75
45									1,65		2,96	3,74	4,58	5,48	6,66	7,68	9,88	12,31
50										1,67	2,44	3,23	4,07	4,96	6,16	7,18	9,38	11,81
60														3,76	5,00	6,01	8,21	10,64
70																4,62	6,82	9,25
75																	6,04	8,46
80																	5,20	7,63
90																		5,78
Tolerance outside [mm]			+0,40 +1,10					+0,60 +2,00		+0,80 +2,50				+0,80 +3,00				+1,20 +3,60
Tolerance inside [mm]			-1,10 -0,40					-2,00 -0,60		-2,80 -0,80				-3,00 -0,80				-5,00 -1,60

Outside diameter [mm] →	120	125	130	135	140	150	165	180	200	210	230	250	280	300	320	435	505
Inside diameter [mm] ↓	[kg/m]																
40		17,06	18,54		21,65	25,0											
45		16,63			21,22	24,57											
50	14,72	16,14	17,62	19,15	20,73	24,08											
60	13,58	15,00	16,47	18	19,59	22,93											
70	12,21	13,62	15,10	16,63		21,56											
75		12,85	14,33														
80	10,61	12,03	13,50	15,03	16,62	19,96	25,7	31,7	40,7								
90	8,78	10,20		13,21	14,79	18,14	23,92	29,9	38,9		55,2	66,3					
100	6,73	8,15	9,62	11,16	12,74	16,09	21,88	27,8	36,9	41,6	53,2	64,4	83,2	96,6			
110				8,88	10,47	13,81	19,62	25,6	34,7	39,4	51,0	62,2	81,0	94,4			
125						9,97	15,80	21,77	30,9	35,6	47,3	58,4	77,3	90,7			
130						8,58	14,42	20,38	29,5	34,2							
150								14,28	23,42	28,1	40,0	51,1	70,0	83,4			
180											29,3	40,4	59,4	72,8			
200											21,05	32,2	51,2	64,6			
240															60,4		
270															43,7		
300																126,5	
390																	136,0
Tolerance outside [mm]						+1,50 +4,50		+1,80 +5,40		+2,00 +6,00		+3,00 +9,00		+3,00 +10,00	+3,00 +11,00	+3,00 +13,00	+3,00 +15,00
Tolerance inside [mm]						-6,50 -2,00		-7,50 -2,20		-8,50 -2,50		-12,00 -3,00		-13,00 -3,50	-14,00 -3,50	-16,00 -3,50	-18,00 -3,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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TECAMID

Polyamides (PA) are semi-crystalline polymers with very good mechanical properties, extreme toughness and excellent sliding and wear properties. The properties vary here from hard, tough PA 66 to soft, flexible PA 12. Depending on the type, polyamides absorb different amounts of moisture, so influencing the mechanical properties and dimensional accuracy. TECAMID is the family of extruded polyamides.

Overview of types

TECAMID 66
(PA 66)
Good adhesion.
Easily welded.
Electrically insulating, good machining properties.

TECAMID 66 MH
(PA 66 MoS_2)
Good UV resistance.
Low abrasion.

TECAMID 66 GF30 black
(PA 66 GF)
Glass fibre reinforced. Very high strength. Good UV stability. Improved thermal dimensional stability.

TECAMID 66 CF20
(PA 66 CF)
Elevated service temperature.
Carbon fibre reinforced.
Very high strength.

TECAMID 66 HI
(PA 66, heat stabilizer)
High level of hardness and dimensional stability. Heat stabilized stock shapes.

TECAMID 66 LA
(PA 66, solid lubricant)
Very good sliding and abrasion properties with soft mating surfaces.
Tough with good strength.

TECAMID 6
(PA 6)
Extreme toughness and impact resistance.
Good chemical resistance.

TECAM 6 MO
(PA 6 MoS_2)
Good UV resistance and surface hardness. Good machining properties and dimensional stability.

TECAMID 6 GF30 black
(PA 6 GF)
Glass fibre-reinforced. Very high strength. Good UV stability and raised thermal dimensional stability.

TECAMID 46 (PA 46)
High thermal-mechanical load. High rigidity.
Good creep strength.

On request:

TECAMID 11
(PA 11)
High degree of toughness.
Good sliding friction properties. Minimal moisture absorption.
Bio-based.

TECAMID 12
(PA 12)
Very good impact strength.
Minimal moisture absorption.

TECAMID TR
(PA 6-3)
Transparent.
Electrically insulating.

TECAMID 66 / X GF50 black
(PA 66 GF)
Glass fibre reinforced with extremely high strength.
High long-term service temperature and dimensional stability.

Application examples

Valve flange
TECAMID 6 (PA 6)
Minimal thermal expansion.
Good chemical resistance.
High impact strength.
Good electrical properties.

Bushing
TECAMID 66 MH
(PA 66 MoS_2)
Low abrasion.
Good UV resistance.
Increased surface hardness.

Gear
TECAMID 6 MH
(PA 6 MoS_2)
Good toughness and strength.
Resistant to oil and grease.
High impact strength.

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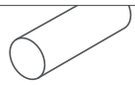
TECAMID Rods



	TECAMID 6	TECAM 6 MO	TECAMID 66	TECAMID 66 MH	TECAMID 66 HI	TECAMID 66 LA	TECAMID 12	
Chemical designation	PA 6	PA 6	PA 66	PA 66	PA 66	PA 66	PA 12	
Density [g/cm³]	1,14	1,14	1,15	1,15	1,15	1,11	1,02	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
4	0,017	0,017	0,017	0,017			0,015	+0,10/+0,60
5	0,026	0,026	0,026	0,026			0,023	
6	0,037	0,037	0,037	0,037			0,033	
8	0,064	0,064	0,065	0,065	0,065	0,063	0,058	+0,10/+0,70
10	0,099	0,099	0,100	0,100	0,100	0,096	0,088	
12	0,143	0,143	0,144	0,144	0,144	0,139	0,128	+0,20/+0,80
14	0,192	0,192	0,194	0,194	0,194	0,187	0,172	
15	0,219	0,219	0,221	0,221	0,221	0,214	0,196	
16	0,249	0,249	0,251	0,251	0,251	0,242	0,222	
18	0,313	0,313	0,315	0,315	0,315	0,304	0,280	
20	0,384	0,384	0,387	0,387	0,387	0,374	0,343	
22	0,466	0,466	0,471	0,471	0,471	0,454	0,417	+0,20/+1,00
25	0,599	0,599	0,604	0,604	0,604	0,583	0,536	
28	0,747	0,747	0,754	0,754	0,754	0,727	0,668	
30	0,855	0,855	0,863	0,863	0,863	0,833	0,765	
32	0,977	0,977	0,985	0,985	0,985	0,951	0,874	+0,20/+1,20
36	1,23	1,23	1,24	1,24	1,24	1,20	1,10	
40	1,51	1,51	1,53	1,53	1,53	1,47	1,35	
45	1,92	1,92	1,93	1,93	1,93	1,87	1,71	+0,30/+1,30
50	2,36	2,36	2,38	2,38	2,38	2,29	2,11	
56	2,95	2,95	2,97	2,97	2,97	2,87	2,64	
60	3,39	3,39	3,42	3,42	3,42	3,30	3,04	+0,30/+1,60
65	3,97	3,97	4,01	4,01	4,01	3,87	3,55	
70	4,60	4,60	4,64	4,64	4,64	4,48	4,11	
75	5,30	5,30	5,35	5,35	5,35	5,16	4,74	+0,40/+2,00
80	6,02	6,02	6,07	6,07	6,07	5,86	5,39	
85	6,81	6,81	6,87	6,87	6,87	6,63	6,09	+0,50/+2,20
90	7,62	7,62	7,69	7,69	7,69	7,42	6,82	
100	9,42	9,42	9,50	9,50	9,50	9,17	8,43	+0,60/+2,50
110	11,43	11,43	11,53	11,53	11,53	11,12	10,22	+0,70/+3,00
120	13,63	13,63	13,75	13,75	13,75	13,27	12,19	+0,80/+3,50
125	14,76	14,76	14,89	14,89	14,89	14,38	13,21	
130	16,00	16,00	16,14	16,14	16,14	15,58	14,31	+0,90/+3,80
135	17,23	17,23	17,38	17,38	17,38	16,78	15,42	
140	18,51	18,51	18,67	18,67	18,67	18,02	16,56	
150	21,27	21,27	21,45	21,45	21,45	20,71	19,03	+1,00/+4,20
160	24,20		24,40	24,40			21,66	+1,10/+4,50
165	25,8		26,0	26,0			23,09	+1,20/+5,00
180	30,6		30,9	30,9			27,4	
200	37,8		38,1	38,1			33,8	+1,30/+5,50
210	41,6							+1,30/+5,80
220	45,6							
230	49,9							+1,50/+6,20
250	58,9							

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Alternative diameters for TECAMID 6 and TECAM 6 MO may be found in the TECAST section.

Stock item
Non-stock item – special production

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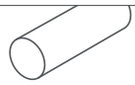
TECAMID Rods



	TECAMID 6 GF30 black	TECAMID 66 GF30 black	TECAMID 66 CF20	
Chemical designation	PA 6 GF30	PA 66 GF30	PA 66 CF20	
Density [g/cm³]	1,36	1,34	1,23	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
4	0,021			+0,10/+0,70
5	0,032			
6	0,045			
8	0,078	0,077	0,070	+0,10/+0,80
10	0,119	0,117	0,108	
12	0,172	0,169	0,155	+0,20/+0,90
14	0,231	0,227	0,209	
15	0,263	0,260	0,238	
16	0,298	0,294	0,270	
18	0,375	0,369	0,339	
20	0,460	0,453	0,416	
22	0,561	0,553	0,508	+0,20/+1,20
25	0,720	0,709	0,651	
28	0,897	0,884	0,812	
30	1,03	1,01	0,929	
32	1,16	1,15	1,05	
36	1,48	1,46	1,34	+0,20/+1,60
40	1,82	1,80	1,65	
45	2,32	2,29	2,10	+0,30/+2,00
50	2,85	2,81	2,58	
56	3,56	3,51	3,22	
60	4,11	4,05	3,71	+0,30/+2,50
65	4,80	4,73	4,34	
70	5,55	5,47	5,02	
75	6,41	6,32		+0,40/+3,00
80	7,27	7,17		
85	8,24	8,12		+0,50/+3,40
90	9,21	9,08		
100	11,38	11,21		+0,60/+3,80
110	13,78	13,57		+0,70/+4,20
120	16,40	16,16		+0,80/+4,60
125	17,77*	17,51		
130	19,32*	19,03		+0,90/+5,40
135	20,79*	20,49		
140	22,33*	22,00		
150	25,6*	25,3		+1,00/+5,80
160	28,6**			+1,10/+6,30
165	30,5**			+1,20/+7,40
180	36,2**			
200	44,7**			+1,30/+8,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

* Stock length 1.000 mm

** 25% glass fibre content (denisity 1,30 g/cm³), stock length 1.000 mm

Stock item

Non-stock item – special production

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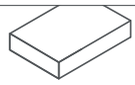
TECAMID Plates



	TECAMID 6	TECAM 6 MO*	TECAMID 66	TECAMID 66 MH	TECAMID 66 HI	TECAMID 66 LA	TECAMID 12	
Chemical designation	PA 6	PA 6	PA 66	PA 66	PA 66	PA 66	PA 12	
Density [g/cm³]	1,14	1,14	1,15	1,15	1,15	1,11	1,02	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5 x 500	3,26	3,26	3,29	3,29	3,29	3,18	2,92	+0,20/+0,70
6 x 500	3,86	3,86	3,90	3,90	3,90	3,76	3,46	
8 x 500	5,18	5,18	5,23	5,23	5,23	5,04	4,63	+0,20/+1,10
10 x 500	6,38	6,38	6,43	6,43	6,43	6,21	5,71	
10 x 620	7,86	7,86	7,93	7,93	7,93	7,66	7,04	
12 x 500	7,73	7,73	7,79	7,79	7,79	7,52	6,91	+0,30/+1,50
12 x 620	9,53	9,53	9,61	9,61	9,61	9,27	8,52	
12 x 1.000**	15,23	15,23	15,36		15,36	14,82		
16 x 500	10,12	10,12	10,21	10,21	10,21	9,85	9,06	
16 x 620	12,48	12,48	12,59	12,59	12,59	12,15	11,17	
16 x 1.000**	19,95	19,95	20,12		20,12	19,42		
18 x 500	11,32	11,32	11,42	11,42	11,42	11,02	10,13	
18 x 1.000**	22,31	22,31	22,50		22,50	21,72		
20 x 500	12,52	12,52	12,63	12,63	12,63	12,19	11,20	
20 x 620	15,43	15,43	15,57	15,57	15,57	15,03		
20 x 1.000**	24,67	24,67	24,88		24,88	24,02		
22 x 500	13,71	13,71	13,83	13,83	13,83	13,35	12,27	
22 x 1.000**	27,0	27,0	27,3		27,3	26,3		
25 x 500	15,51	15,51	15,65	15,65	15,65	15,10	13,88	
25 x 620	19,12	19,12	19,29	19,29	19,29	18,62	17,11	
25 x 1.000**	30,6	30,6	30,8		30,8	29,8		
30 x 500	18,86	18,86	19,03	19,03	19,03	18,37	16,88	+0,50/+2,50
30 x 620	23,26	23,26	23,46	23,46	23,46	22,65	20,81	
30 x 1.000**	37,2	37,2	37,5		37,5	36,2		
35 x 500	21,86	21,86	22,05	22,05	22,05	21,28	19,56	
35 x 620	27,0	27,0	27,2	27,2	27,2	26,2	24,11	
35 x 1.000**	43,1	43,1	43,5		43,5	41,9		
40 x 500	24,85	24,85	25,1	25,1	25,1	24,20	22,24	
40 x 620	30,6	30,6	30,9	30,9	30,9	29,8	27,4	
40 x 1.000**	49,0	49,0	49,4		49,4	47,7		
45 x 500	27,8	27,8	28,1	28,1	28,1	27,1	24,91	
45 x 620	34,3	34,3	34,6	34,6	34,6	33,4	30,7	
45 x 1.000**	54,9	54,9			55,4	53,4		
50 x 500	30,8	30,8	31,1	31,1	31,1	30,0	27,6	
50 x 620	38,0	38,0	38,4	38,4	38,4	37,0	34,0	
50 x 1.000**	60,8	60,8	61,3		61,3	59,2		
60 x 500	37,1		37,5		37,5	36,2		+0,50/+3,50
60 x 620	45,8		46,2		46,2	44,6		
60 x 1.000**	73,2		73,8		73,8	71,2		
70 x 500	43,1		43,5		43,5	42,0		
70 x 620	53,2		53,6		53,6	51,8		
70 x 1.000**	85,0				85,7			
80 x 300			30,6		30,6			+0,50/+5,00
80 x 500	49,6		50,0		50,0	48,3		
80 x 620	61,1							
80 x 1.000**	97,7							
90 x 300			34,3		34,3			
90 x 500	55,5		56,0		56,0	54,1		
100 x 300			38,0		38,0			
100 x 500	61,5		62,1		62,1	59,9		
100 x 1.000**	121,3							

Tolerances according to DIN:
length 0 / +3 % width +5 / +25 mm
Stock lengths 3.000 mm

* alternatively, see also TECAST TM (page 27)
** Stock length 2.000 mm

Stock item
Non-stock item – special production

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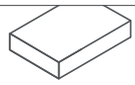
TECAMID Plates

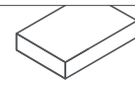


Dimensions [mm]	TECAMID 6 GF30 black [kg/m]	TECAMID 66 GF30 black [kg/m]	Tolerance [mm]
Chemical designation	PA 6	PA 66	
Density [g/cm³]	1,36	1,34	
5 x 500	3,89	3,84	+0,20/+0,70
6 x 500	4,61	4,54	
8 x 500	6,18	6,09	+0,20/+1,10
10 x 500	7,61	7,50	
10 x 620	9,38	9,24	
12 x 500	9,22	9,08	+0,30/+1,50
12 x 620	11,36	11,20	
16 x 500	12,07	11,90	
16 x 620	14,89	14,67	
18 x 500	13,50	13,30	
20 x 500	14,93	14,71	
20 x 620	18,41	18,14	
22 x 500	16,36	16,12	
25 x 500	18,50	18,23	
25 x 620	22,81	22,48	
30 x 500	22,50	22,17	+0,50/+2,50
30 x 620	27,7	27,3	
35 x 500	26,1	25,7	
35 x 620	32,2	31,7	
40 x 500	29,6	29,2	
40 x 620	36,6	36,0	
45 x 500	33,2	32,7	
45 x 620	41,0	40,4	
50 x 500	36,8	36,3	
50 x 620	45,4	44,7	
60 x 500	44,3	43,6	+0,50/+3,50
60 x 620	54,6	53,8	
70 x 500	51,4	50,7	
70 x 620	63,4	62,5	
80 x 300		35,6	+0,50/+5,00
80 x 500	59,1	58,2	
80 x 620	72,9		
90 x 300		39,9	
90 x 500	66,3	65,3	
100 x 300	44,9	44,2	
100 x 500	73,4	72,3	
100 x 620	90,5		

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

TECAMID Plates

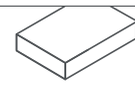


Dimensions [mm]	TECAMID 66 CF20 [kg/m]	Tolerance [mm]
Chemical designation	PA 66	
Density [g/cm³]	1,15	
5 x 500	3,29	+0,20/+0,70
6 x 500	3,90	
8 x 500	5,23	+0,20/+1,10
10 x 500	6,43	
10 x 620	7,93	
12 x 500	7,79	+0,30/+1,50
12 x 620	9,61	
16 x 500	10,21	
16 x 620	12,59	
18 x 500	11,42	
20 x 500	12,63	
20 x 620	15,57	
22 x 500	13,83	
25 x 500	15,65	
25 x 620	19,29	
30 x 500	19,03	+0,50/+2,50
30 x 620	23,46	
35 x 500	22,05	
35 x 620	27,2	
40 x 500	25,1	
40 x 620	30,9	
45 x 500	28,1	
45 x 620	34,6	
50 x 500	31,1	
50 x 620	38,4	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

TECAMID Plates



Dimensions [mm]	TECAMID 46 redbrown [kg/m]	Tolerance [mm]
Chemical designation	PA 46	
Density [g/cm³]	1,19	
10 x 620	8,21	+0,20/+1,10
12 x 620	9,94	+0,30/+1,50
16 x 620	13,03	
20 x 620	16,11	
25 x 620	19,96	
30 x 620	24,28	+0,50/+2,50

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 2.000 mm

Stock item
Non-stock item – special production

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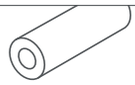

TECAMID 6
Chemical designation: PA 6
Density [g/cm³]: 1,14

Outside diameter [mm] →	25	30	32	36	40	45	50	56	60	65	70	75	80	85	90	100	110
Inside diameter [mm] ↓	[kg/m]																
18	0,334																
20		0,525	0,693	0,951	1,24												
22		0,451	0,621	0,879	1,17												
25			0,500	0,758	1,04	1,44	1,89	2,54	2,98	3,60	4,23	4,91	5,64				
30					0,805		1,65	2,31	2,74	3,37	4,00	4,68	5,40	6,33	7,15		
32									2,64		3,89	4,57	5,30		7,04	8,82	10,79
35						0,921	1,37	2,03	2,46	3,09	3,72	4,40	5,13	6,06	6,88	8,66	10,62
36						0,858	1,30	1,97	2,40	3,03	3,66	4,34	5,06	6,00	6,82	8,60	10,56
40							1,04	1,70	2,14	2,76	3,40	4,07	4,80	5,75	6,57	8,35	10,31
45								1,33		2,39	3,02	3,70		5,39	6,21	7,99	9,95
50									1,35	1,97	2,61	3,29	4,01	4,98	5,81	7,58	9,55
54												2,92	3,65	4,63		7,23	9,19
60													3,04	4,04	4,86	6,64	8,60
70															3,73	5,51	7,47
75																4,88	6,84
80																4,20	6,17
90																	4,67
Tolerance outside [mm]		+0,40 +1,10					+0,60 +2,00		+0,80 +2,50				+0,80 +3,00				+1,20 +3,60
Tolerance inside [mm]		-1,10 -0,40					-2,00 -0,60		-2,80 -0,80				-3,00 -0,80				-5,00 -1,60

Outside diameter [mm] →	120	125	130	135	140	150	165	180	200	210	230	250	280	300
Inside diameter [mm] ↓	[kg/m]													
32		14,26												
35		14,10												
36		14,04												
40	12,65	13,80	14,99											
45		13,45	14,64		17,16	19,86								
50	11,91	13,05	14,24	15,48	16,76	19,47								
54		12,70		15,13	16,41	19,12								
60	10,98	12,12	13,32	14,55	15,84	18,54								
70	9,87	11,01	12,21	13,44	14,73	17,43								
75	9,25	10,39	11,58											
80	8,58	9,72	10,91	12,15	13,43	16,14	20,80	25,6	32,9					
90	7,10	8,25	9,44	10,68	11,96	14,66	19,34	24,16	31,5		44,6	53,6		
100	5,44	6,59	7,78	9,02	10,30	13,01	17,69	22,52	29,9	33,7	43,1	52,0	67,3	78,1
110				7,18	8,46	11,17	15,86	20,69	28,0	31,9	41,3	50,3	65,5	76,3
125						8,06	12,78	17,60	24,96	28,8	38,3	47,2	62,5	73,3
130						6,94	11,66	16,48	23,85	27,7				
150								11,54	18,94	22,75	32,3	41,3	56,6	67,4
175									11,77					
180											23,69	32,7	48,0	58,9
200											17,02	26,0	41,4	52,2
Tolerance outside [mm]						+1,50 +4,50		+1,80 +5,40		+2,00 +6,00		+3,00 +9,00		+3,00 +10,00
Tolerance inside [mm]						-6,50 -2,00		-7,50 -2,20		-8,50 -2,50		-12,00 -3,00		-13,00 -3,50

Tolerances according to DIN:
length 0 / +3 %
Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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TECAST TECARIM

Using the casting method, polyamide stock shapes with large diameters and a high degree of crystallinity (mechanical strength) can be produced. TECAST is the family of cast polyamides, TECARIM is the trade name given by Ensinger to the product group of tough, highly load-resistant polyamide 6 block copolymers manufactured using the reaction injection moulding method. Due to the pressureless manufacturing processes both polyamide materials are almost stress free.

Overview of types

TECAST T
(PA 6 C)
Good damping properties.
Good sliding properties.
High degree of toughness.
High strength.
Electrically insulating.

TECAST TM
(PA 6 C MoS_2)
Good damping properties.
Good sliding properties, also in dry running conditions.
High degree of toughness.
High strength.
Improved surface hardness.
UV / weather resistant.
Not electrically insulating.

TECAST L
(PA 6 C, oil)
Good sliding properties, also in dry running conditions.
Good slip-stick behaviour.
Tough.
Good thermal resistance.
Good electrical insulation.

TECAGLIDE green
(PA 6 C, solid lubricant)
Good sliding properties, also in dry running conditions.
Good slip-stick behaviour.
Tough.
Electrically insulating.

TECAST GX grey
(PA 6 C, solid lubricant)
Good sliding properties, also in dry running conditions.
Good slip-stick behaviour.
Tough.
Electrically insulating.

TECARIM 1500
(PA 6 C, Elastomere)
Very high level of toughness.
Good low temperature impact strength.
No brittle fracture.
Good shock absorption.
Electrically insulating.

Application examples

Pulley (part component)
TECAST T (PA 6 C)
Good toughness and strength.
Good damping properties.
High abrasion resistance.
High mechanical load capacity.

Spring release block
TECARIM 1500
(PA 6 C, Elastomere)
Capable of deformation without fracture.
Very good impact strength.
High mechanical load properties.

Sliding element with steel inlay
TECAST T (PA 6 C)
Good sliding properties.
Good wear resistance.
High mechanical load properties.

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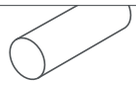

	TECAST T	TECAST TM	TECAST L	TECAST L yellow	TECAST L black	TECAGLIDE green	TECAST GX grey	
Chemical designation	PA 6 C	PA 6 C	PA 6 C	PA 6 C	PA 6 C	PA 6 C	PA 6 C	
Density [g/cm³]	1,15	1,15	1,13	1,14	1,14	1,13	1,13	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
50	2,41	2,41	2,36	2,38	2,38	2,36	2,36	+0,30/+1,90
60	3,47	3,47	3,41	3,44	3,44	3,41	3,41	+0,30/+2,50
65	4,06	4,06	3,99	4,03	4,03	3,99	3,99	
70	4,70	4,70	4,61	4,66	4,66	4,61	4,61	
75	5,41	5,41	5,31	5,36	5,36	5,31	5,31	+0,40/+2,80
80	6,13	6,13	6,03	6,08	6,08	6,03	6,03	
85	6,95	6,95	6,83	6,89	6,89	6,83	6,83	+0,50/+3,20
90	7,77	7,77	7,64	7,70	7,70	7,64	7,64	
95	8,68	8,68	8,53	8,60	8,60	8,53	8,53	+0,60/+3,50
100	9,59	9,59	9,43	9,51	9,51	9,43	9,43	
110	11,62	11,62	11,42	11,52	11,52	11,42	11,42	+0,70/+3,90
120	13,84	13,84	13,60	13,72	13,72	13,60	13,60	+0,80/+4,30
125	14,99	14,99	14,73	14,86	14,86	14,73	14,73	
130	16,27	16,27	15,99	16,13	16,13	15,99	15,99	+0,80/+5,00
135	17,52	17,52	17,21	17,37	17,37	17,21	17,21	
140	18,81	18,81	18,49	18,65	18,65	18,49	18,49	
150	21,58	21,58	21,20	21,39	21,39	21,20	21,20	+0,80/+5,30
160	24,60	24,60	24,17	24,38	24,38	24,17	24,17	+0,80/+6,00
170	27,8	27,8	27,3	27,6	27,6	27,3	27,3	+1,00/+6,50
180	31,1	31,1	30,6	30,8	30,8	30,6	30,6	
190	34,8	34,8	34,2	34,5	34,5	34,2	34,2	+1,00/+7,50
200	38,4	38,4	37,8	38,1	38,1	37,8	37,8	
220	46,5	46,5	45,7	46,1	46,1	45,7	45,7	+1,00/+8,50
230	51,0	51,0	50,1	50,5	50,5	50,1	50,1	+1,00/+9,50
250	60,0	60,0	59,0	59,5	59,5	59,0	59,0	
280	75,4	75,4	74,0	74,7	74,7	74,0	74,0	+1,00/+11,00
300	86,7	86,7	85,2	85,9	85,9	85,2	85,2	+1,50/+12,00
320	98,4	98,4	96,6	97,5	97,5	96,6	96,6	
330	104,9	104,9	103,1	104,0	104,0	103,1	103,1	+1,50/+13,50
350	117,7	117,7	115,7	116,7	116,7	115,7	115,7	
360	124,4	124,4	122,3	123,3	123,3	122,3	122,3	
370	131,8	131,8	129,5	130,7	130,7	129,5	129,5	+1,50/+15,00
400	153,5	153,5	150,9	152,2	152,2	150,9	150,9	
450	194,1	194,1	190,7	192,4	192,4	190,7	190,7	+1,50/+16,50
500	239,4	239,4	235,2	237,3	237,3	235,2	235,2	+1,50/+18,00
600	345,1	345,1	339,1	342,1	342,1	339,1	339,1	+3,00/+21,00
710	482,9	482,9	474,5	478,7	478,7	474,5	474,5	+3,00/+25,00
800	610,4	610,4	599,8	605,1	605,1	599,8	599,8	

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 2.000 mm

Stock item
Non-stock item – special production

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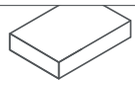
TECAST / TECARIM Plates



	TECAST T	**TECAST TM**	**TECAST L**	**TECAST L** yellow	**TECAST L** black	**TECAGLIDE** green	**TECAST GX** grey	
Chemical designation	PA 6 C	PA 6 C	PA 6 C	PA 6 C	PA 6 C	PA 6 C	PA 6 C	
Density [g/cm³]	1,15	1,15	1,13	1,14	1,14	1,13	1,13	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
8 x 1.000	10,54	10,54	10,35	10,45	10,45	10,35	10,35	+0,20/+1,50
10 x 1.000	12,92	12,92	12,69	12,81	12,81	12,69	12,69	
12 x 1.000	15,95	15,95	15,68	15,82	15,82	15,68	15,68	+0,30/+2,50
16 x 1.000	20,72	20,72	20,36	20,54	20,54	20,36	20,36	
20 x 1.000	25,5	25,5	25,0	25,3	25,3	25,0	25,0	
25 x 1.000	31,4	31,4	30,9	31,2	31,2	30,9	30,9	
30 x 1.000	38,1	38,1	37,4	37,8	37,8	37,4	37,4	+0,50/+3,50
35 x 1.000	44,1	44,1	43,3	43,7	43,7	43,3	43,3	
40 x 1.000	50,0	50,0	49,1	49,6	49,6	49,1	49,1	
45 x 1.000	56,0	56,0	55,0	55,5	55,5	55,0	55,0	
50 x 1.000	61,9	61,9	60,8	61,4	61,4	60,8	60,8	
55 x 1.000	68,8	68,8	67,6	68,2	68,2	67,6	67,6	+0,50/+5,00
60 x 1.000	74,7	74,7	73,4	74,1	74,1	73,4	73,4	
65 x 1.000	80,7	80,7	79,3	80,0	80,0	79,3	79,3	
70 x 1.000	86,6	86,6	85,1	85,9	85,9	85,1	85,1	
75 x 1.000	93,8	93,8	92,1	92,9	92,9	92,1	92,1	+0,50/+7,00
80 x 1.000	99,7	99,7	98,0	98,8	98,8	98,0	98,0	
90 x 1.000	111,6	111,6	109,7	110,6	110,6	109,7	109,7	
100 x 1.000	123,5	123,5	121,4	122,5	122,5	121,4	121,4	
110 x 1.000	136,6	136,6	134,2	135,4	135,4	134,2	134,2	+0,50/+9,00
120 x 1.000	148,5	148,5	145,9	147,2	147,2	145,9	145,9	
130 x 1.000	160,4	160,4	157,6	159,0	159,0	157,6	157,6	
160 x 700	138,6	138,6	136,2	137,4	137,4	136,2	136,2	+0,50/+10,00
200 x 650	160,1	160,1	157,3	158,7	158,7	157,3	157,3	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 2.000 mm

Alternative length 3.000 mm
on request.

Stock item
Non-stock item – special production

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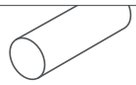
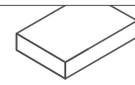
TECAST / TECARIM Rods



	TECARIM 1500	
Chemical designation	PA 6 C	
Density [g/cm³]	1,11	
Diameter [mm]	[kg/m]	Tolerance [mm]
30	0,844	+0,20/+1,40
40	1,48	
50	2,32	+0,30/+1,90
65	3,92	+0,30/+2,50
79	5,78	+0,40/+2,80
100	9,26	+0,60/+3,50
110	11,21	+0,70/+3,90
150	20,83	+0,80/+5,30

Tolerances according to DIN:
length 0 / +3 %

TECAST / TECARIM Plates



	TECARIM 1500	
Chemical designation	PA 6 C	
Density [g/cm³]	1,11	
Dimensions [mm]	[kg/m]	Tolerance [mm]
10 x 580	7,17	+0,20/+1,50
30 x 300	11,19	+0,50/+3,50
50 x 300	18,18	
60 x 300	22,38	+0,50/+5,00
80 x 300	29,9	+0,50/+7,00
100 x 300	37,0	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock item
Non-stock item – special production

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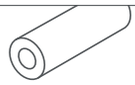

TECAST T
Chemical designation: PA 6 C
Density [g/cm³]: 1,15

Outside diameter [mm] →	50	60	70	80	90	100	110	120	130	140	150	160	170	180
Inside diameter [mm] ↓	[kg/m]													
30	1,78	2,83	4,01											
35	1,50	2,55	3,71	5,14										
40		2,23	3,37	4,80	6,74	8,55								
45		1,86	2,98	4,41	6,38	8,19								
50			2,54	3,97	5,98	7,78	9,77	12,32	14,70					
55			2,06	3,49	5,52	7,33	9,32							
60				2,96	5,03	6,83	8,82	11,38	13,77					
65				2,39	4,48	6,29	8,28	10,85	13,23	15,80	18,55			
70					3,89	5,70	7,69	10,27	12,65	15,22	17,97	21,36		
75						5,06	7,05	9,64	12,03	14,59	17,34	20,74		
80						4,38	6,37	8,97	11,35	13,92	16,67	20,08	23,22	26,5
85							5,64	8,25	10,63	13,20	15,95	19,37	22,51	25,8
90							4,87	7,49	9,87	12,44	15,19	18,61	21,75	25,1
95								6,68	9,06	11,62	14,37	17,81	20,95	
100								5,82	8,20	10,77	13,52	16,96	20,10	23,42
105									7,30	9,86	12,61	16,06		
110									6,35	8,92	11,67	15,12	18,26	21,59
115									5,36	7,92	10,67	14,14		
120										6,88	9,63	13,10	16,24	19,57
130											7,41	10,90	14,04	17,36
140												8,51	11,65	14,98
150														12,40
Tolerance outside [mm]		+0,80 +3,00		+0,80 +4,00			+1,00 +5,00				+1,50 +7,00			+1,80 +9,00
Tolerance inside [mm]		-4,00 -0,80		+0,40 -0,80			-6,00 -1,00				-7,50 -1,50			-9,00 -1,80

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 2.000 mm

Stock item
Non-stock item – special production

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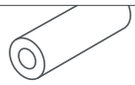

TECAST T
Chemical designation: PA 6 C
Density [g/cm³]: 1,15

Outside diameter [mm] →	**190**	**200**	**210**	**220**	**250**	**280**	**300**	**325**	**350**	**400**	**450**	**500**	**550**	**600**
Inside diameter [mm] ↓	[kg/m]													
90	29,1													
95														
100	27,5	31,2	35,1	39,2	53,2	69,3								
105														
110	25,7	29,4	33,3	37,4	51,4	67,5								
115														
120	23,70	27,4	31,3	35,4	49,4	65,6								
130	21,52	25,2	29,1	33,2	47,3	63,5								
140	19,15	22,87	26,8	30,8	44,9									
150	16,60	20,31	24,21	28,3	42,4		69,6	85,6	101,6					
160		17,58	21,47	25,6	39,7	55,9	67,0	82,9	98,9					
170			18,55	22,64	36,8	53,1	64,1	80,0						
180				19,53	33,7	50,0	61,0	77,0	93,0					
190				16,08	30,4	46,8	57,8	73,8						
200					26,9	43,3	54,4	70,4	86,4	121,9	163,5			
225						34,0	45,0	61,1	77,1	112,6	154,2			
250							34,5	50,6	66,6	102,1	143,8		241,7	
275								39,0	55,0	90,5	132,2	177,1	230,3	
300									42,2	77,7	119,5	164,4	217,7	272,0
325										63,8	105,7	150,5	203,9	258,2
350											90,7	135,5	189,0	243,3
375											74,5	119,3	173,0	227,3
400												102,0	155,8	210,1
425												83,5	137,4	191,7
450													117,9	172,2
475													96,3	151,5
500														129,7
Tolerance outside [mm]				+2,00 +11,00	+2,50 +12,50		+3,00 +15,00			+3,00 +17,50		+3,00 +20,00		+3,00 +25,00
Tolerance inside [mm]				-11,00 -2,00	-12,50 -2,50		-15,00 -3,00			-17,50 -3,00		-20,00 -3,00		-25,00 -3,00

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 2.000 mm

Stock item
Non-stock item – special production

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TECADUR
TECAPET

Semi-crystalline polyesters have a very high level of hardness, rigidity and strength coupled with excellent sliding characteristics and low sliding abrasion. Due to their good creep resistance, low moisture absorption and excellent dimensional stability, TECAPET or TECADUR PBT GF30 are perfectly suited for use with complex parts with extreme dimensional stability and surface quality requirements, as well as offering very good machining properties.

Overview of types

TECAPET
(PET)
Very good machining properties.
High creep and abrasion resistance.

TECAPET black
(PET)
Good UV resistance.
Very good machining properties.

TECAPET TF
(PET TF)
High abrasion resistance.
Excellent sliding properties.

TECADUR PET
(PET)
Good machining properties.
High strength.

TECADUR PBT GF30
(PBT GF)
Glass fibre reinforced polyester with very high strength.
High thermal dimensional stability.
Minimal thermal expansion.

Application examples

Piston
TECADUR PET (PET)
High strength.
Good creep resistance.
High dimensional stability.

Flow valve
TECAPET (PET)
High strength.
Good dimensional stability.
Good resistance to oils and greases.

Roller
TECAPET (PET)
High degree of stability.
High creep resistance.
Good mechanical properties.

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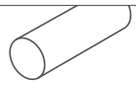
TECADUR / TECAPET Rods



	TECAPET	TECAPET black	TECAPET TF	
Chemical designation	PET	PET	PET	
Density [g/cm³]	1,36	1,39	1,43	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10	0,118	0,120	0,124	+0,10/+0,70
12	0,170	0,174	0,179	+0,20/+0,80
14	0,229	0,234	0,241	
15	0,262	0,268	0,275	
16	0,297	0,303	0,312	
18	0,373	0,381	0,392	
20	0,458	0,468	0,481	
22	0,556	0,569	0,585	+0,20/+1,00
25	0,714	0,730	0,751	
28	0,891	0,911	0,937	
30	1,02	1,04	1,07	
32	1,16	1,19	1,22	+0,20/+1,20
36	1,47	1,50	1,54	
40	1,80	1,84	1,90	
45	2,29	2,34	2,40	+0,30/+1,30
50	2,81	2,87	2,96	
56	3,52	3,59	3,70	
60	4,05	4,14	4,26	+0,30/+1,60
65	4,74	4,84	4,98	
70	5,48	5,61	5,77	
75	6,33	6,47	6,65	+0,40/+2,00
80	7,18	7,34	7,55	
90	9,09	9,29		+0,50/+2,20
100	11,24	11,48		+0,60/+2,50
110	13,63	13,93		+0,70/+3,00
120	16,26	16,61		+0,80/+3,50
125	17,61	18,00		
130	19,08	19,51		+0,90/+3,80
135	20,55	21,01		
140	22,08	22,56		
150	25,4	25,9		+1,00/+4,20
160	28,9			+1,00/+4,50
165	30,8			+1,20/+5,00
180	36,5			

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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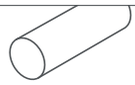
TECADUR / TECAPET Rods



TECADUR PBT GF30

Chemical designation	PBT
Density [g/cm³]	1,46

Diameter [mm]	[kg/m]	Tolerance [mm]
10	0,128	+0,10/+0,80
12	0,184	+0,20/+0,90
14	0,248	
15	0,283	
16	0,320	
18	0,402	
20	0,494	
22	0,603	+0,20/+1,20
25	0,773	
28	0,963	
30	1,10	
32	1,25	
36	1,59	+0,20/+1,60
40	1,96	
45	2,49	+0,30/+2,00
50	3,06	
56	3,82	
60	4,41	+0,30/+2,50
65	5,16	
70	5,96	
75	6,88	+0,40/+3,00
80	7,81	
90	9,89	+0,50/+3,40
100	12,22	+0,60/+3,80

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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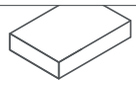
TECADUR / TECAPET Plates



	TECAPET	TECAPET black	TECAPET TF	TECADUR PBT GF30	
Chemical designation	PET	PET	PET	PBT	
Density [g/cm³]	1,36	1,39	1,43	1,46	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
8 x 500	6,18		6,50	6,63	+0,20/+1,10
10 x 500	7,61	7,78	8,00	8,17	
10 x 620	9,38	9,59			
12 x 500	9,22	9,42	9,69	9,89	+0,30/+1,50
12 x 620	11,36	11,61			
15 x 500	11,36	11,61	11,94		
15 x 620	14,01	14,31			
16 x 500	12,07	11,98	12,69	12,96	
16 x 620	14,89	15,22			
16 x 1.000**	23,80	24,32			
18 x 500	13,50	13,40	14,20	14,50	
20 x 500	14,93	14,82	15,70	16,03	
20 x 620	18,41	18,82			
20 x 1.000**	29,4	30,1			
22 x 500	16,36	16,23	17,20	17,56	
25 x 500	18,50	18,36	19,46	19,86	
25 x 620	22,81	23,32			
25 x 1.000**	36,5	36,7			
30 x 500	22,50	22,33	23,66	24,16	+0,50/+2,50
30 x 620	27,8	28,4			
30 x 1.000**	44,4	44,7			
35 x 500	26,1	26,6	27,4	28,0	
35 x 620	32,1	32,9			
35 x 1.000**	51,4	52,5			
40 x 500	29,6	29,4	31,2	31,8	
40 x 620	36,6	37,4			
40 x 1.000**	58,4	59,7			
45 x 500	33,2	34,0	34,9	35,7	
45 x 620	41,0	41,9			
45 x 1.000**	65,5	66,9			
50 x 500	36,8	36,5	38,7	39,5	
50 x 620	45,4	46,4			
50 x 1.000**	72,5	74,1			
60 x 500	44,3	45,3		47,5	+0,50/+3,50
60 x 620	54,6	55,8			
60 x 1.000**	87,3				
70 x 500	51,4	52,6		55,2	
70 x 620	63,4	64,8			
80 x 300				38,8	+0,50/+5,00
80 x 500	59,1	60,4			
80 x 620	72,9	74,5			
90 x 300	40,5	41,4			
90 x 500	66,3	67,7			
90 x 620	81,7	83,5			
100 x 300	44,9	43,7			
100 x 500	73,4	72,8			
100 x 620	90,5				

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

** Stock length 2.000 mm

Stock item
Non-stock item – special production

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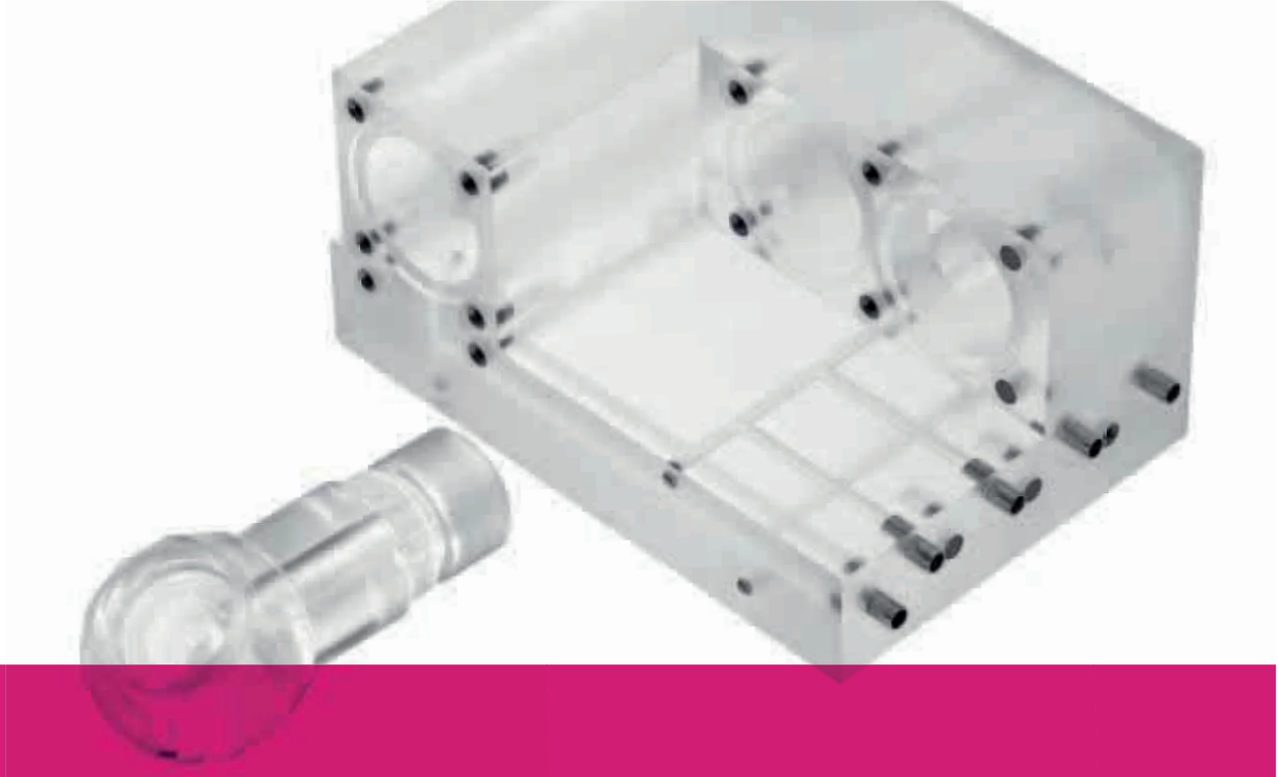


TECANAT

Polycarbonate (PC) is an amorphous polymer with a high level of transparency. PC is characterized by high strength, rigidity and hardness. TECANAT also offers good impact strength. It is very resistant to external influences such as weather and UV-radiation.

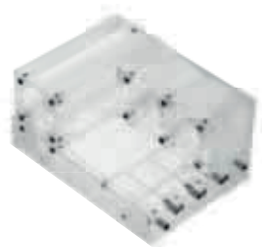
Overview of types

TECANAT
(PC)
Highly tough and transparent.
High service temperature.

TECANAT GF30
(PC GF)
Glass fibre reinforced polycarbonate with very high strength.
Low water absorption.

Application examples

Distributor block for analytical system
TECANAT (PC)
High purity.
Excellent toughness.
High dimensional accuracy.



Shower head
TECANAT (PC)
High degree of transparency.
Good impact strength.
High dimensional stability.

Fluid medium container
TECANAT (PC)
Physiologically harmless.
High level of dimensional stability.
Low water absorption.
High degree of transparency.

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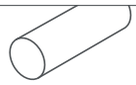
TECANAT Rods



	TECANAT	TECANAT black	TECANAT GF30	
Chemical designation	PC	PC	PC	
Density [g/cm³]	1,19	1,19	1,42	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
3	0,011	0,011		+0,10/+0,70
4	0,018	0,018		
5	0,028	0,028		
6	0,039	0,039		
8	0,068	0,068		+0,10/+0,80
10	0,104	0,104	0,124	
12	0,150	0,150	0,179	+0,20/+0,90
14	0,202	0,202	0,241	
16	0,261	0,261	0,312	
18	0,328	0,328	0,391	
20	0,403	0,403	0,480	
22	0,491	0,491	0,586	+0,20/+1,20
25	0,630	0,630	0,751	
28	0,785	0,785	0,937	
30	0,898	0,898	1,07	
32	1,02	1,02	1,22	
36	1,30	1,30	1,55	+0,20/+1,60
40	1,59	1,59	1,90	
45	2,03	2,03	2,42	+0,30/+2,00
50	2,49	2,49	2,98	
56	3,11	3,11	3,72	
60	3,59	3,59	4,29	+0,30/+2,50
65	4,20	4,20	5,02	
70	4,86	4,86	5,80	
75	5,61	5,61	6,69	+0,40/+3,00
80	6,36	6,36	7,59	
90	8,06	8,06	9,62	+0,50/+3,40
100	9,96	9,96	11,88	+0,60/+3,80
110	12,05	12,05	14,38	+0,70/+4,20
120	14,35	14,35	17,13	+0,80/+4,60
125	15,55	15,55	18,55	
130	16,90	16,90	20,17	+0,90/+5,40
135	18,19	18,19	21,71	
140	19,54	19,54	23,31	
150	22,43	22,43	26,8	+1,00/+5,80
165	27,3	27,3		+1,20/+7,40
180	32,4	32,4		
200	40,0	40,0		+1,30/+8,50
210	44,1	44,1		+1,30/+9,00
230	52,9	52,9		+1,50/+9,50
250	62,2	62,2		

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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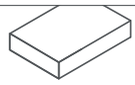
TECANAT Plates



	TECANAT	TECANAT black	TECANAT GF30	
Chemical designation	PC	PC	PC	
Density [g/cm³]	1,19	1,19	1,42	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10 x 500	6,66	6,66	7,94	+0,20/+1,10
10 x 620	8,21	8,21	9,80	
12 x 500	8,06	8,06	9,62	+0,30/+1,50
12 x 620	9,94	9,94	11,86	
16 x 500	10,56	10,56	12,61	
16 x 620	13,03	13,03	15,54	
18 x 500	11,81	11,81	14,10	
18 x 620	14,57	14,57	17,38	
20 x 500	13,06	13,06	15,59	
20 x 620	16,11	16,11	19,22	
22 x 500	14,31	14,31	17,08	
22 x 620	17,65	17,65	21,06	
25 x 500	16,19	16,19	19,32	
25 x 620	19,96	19,96	23,82	
30 x 500	19,69	19,69	23,50	+0,50/+2,50
30 x 620	24,28	24,28	29,0	
36 x 500	23,44	23,44	28,0	
36 x 620	28,9	28,9	34,5	
40 x 500	25,9	25,9	31,0	
40 x 620	32,0	32,0	38,2	
45 x 500	29,1	29,1	34,7	
45 x 620	35,8	35,8	42,8	
50 x 500	32,2	32,2	38,4	
50 x 620	39,7	39,7	47,4	
60 x 500	38,8	38,8	46,2	+0,50/+3,50
60 x 620	47,8	47,8	57,0	
70 x 500	45,0	45,0	53,7	
70 x 620	55,5	55,5	66,2	
80 x 500	51,7	51,7	61,7	+0,50/+5,00
80 x 620	63,8	63,8	76,1	
90 x 500	58,0	58,0		
90 x 620	71,5	71,5		
100 x 300	39,3	39,3		
100 x 500	64,2	64,2		

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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TECAFLON

Fluoropolymers have excellent, almost universal resistance to chemicals. They can be used both at high and very low temperatures (–260 to +260 °C). In addition, TECAFLON PVDF and TECAFLON PTFE possess outstanding resistance to weathering (UV resistance). Due to the low coefficient of friction, they are often used as sliding materials or as corresponding additives in other high-performance plastics.

Overview of types

TECAFLON PVDF
(PVDF)
Good chemical resistance and high level of strength.
Very good welding properties.

TECAFLON PTFE
(PTFE)
Exceptional chemical resistance.
Particularly low coefficient of friction.
Ideally suited for soft mating partners.

On request:

TECAFLON PVDF ELS
(PVDF, conductive carbon)
→ p. 76

TECAFLON PVDF CF8
(PVDF CF)
Very good chemical resistance.
Good sliding / friction properties.
Highly abrasion resistant.

TECAFLON PTFE GF25
(PTFE GF)
Glass fibre-reinforced stock shapes with improved strength.
Good machining properties.

TECAFLON ETFE
(E/TFE)
Minimal moisture absorption.
High service temperature.

Application examples

Support
TECAFLON PTFE (PTFE)
Very good UV resistance.
Good electrical properties.
High degree of toughness.

Die
TECAFLON PTFE (PTFE)
Excellent chemical resistance.
Low coefficient of friction.
No slip-stick effect.

Valve body
TECAFLON PVDF (PVDF)
Good chemical resistance.
High degree of toughness.

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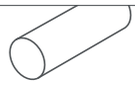
TECAFLON Rods



	TECAFLON PTFE	
Chemical designation	PTFE	
Density [g/cm³]	2,18	
Diameter [mm]	[kg/m]	Tolerance [mm]
4	0,030	+0,00/+0,30
5	0,046	
6	0,067	+0,00/+0,40
8	0,117	
10	0,182	
12	0,269	+0,00/+0,80
14	0,362	
15	0,414	
16	0,470	
18	0,591	
20	0,727	
22	0,892	+0,00/+1,20
25	1,14	
28	1,43	
30	1,66	+0,00/+1,60
32	1,88	
35	2,24	
40	2,94	+0,00/+2,00
45	3,70	
50	4,54	
55	5,54	+0,00/+2,60
60	6,56	
65	7,70	+0,00/+2,80
70	8,90	
75	10,25	+0,00/+3,20
80	11,63	
90	14,65	
100	18,17	+0,00/+4,00
110	21,91	
120	26,0	
130	30,4	
140	35,7	+0,00/+6,00
150	40,9	
160	46,4	

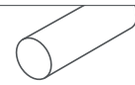
Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Tolerance based on GKV according to manufacturer's specifications.

GF25 and CF25 available on request.

TECAFLON Rods



	TECAFLON PVDF	TECAFLON ETFE	
Chemical designation	PVDF	E/TFE	
Density [g/cm³]	1,78	1,73	
Diameter [mm]	[kg/m]	[kg/m]	Tolerance [mm]
4	0,027	0,026	+0,10/+0,60
5	0,041	0,040	
6	0,057	0,056	
8	0,101	0,098	+0,10/+0,70
9	0,126	0,122	
10	0,154	0,150	
12	0,223	0,217	+0,20/+0,80
15	0,343	0,333	
16	0,388	0,377	
18	0,488	0,474	
20	0,599	0,582	
22	0,728	0,708	+0,20/+1,00
25	0,935	0,908	
28	1,17	1,13	
30	1,34	1,30	
32	1,52	1,48	+0,20/+1,20
35	1,82	1,77	
40	2,36	2,30	
45	2,99	2,91	+0,30/+1,30
50	3,68	3,58	
56	4,60	4,47	
60	5,30	5,15	+0,30/+1,60
65	6,20	6,03	
70	7,18	6,98	
75	8,28	8,05	+0,40/+2,00
80	9,40	9,14	
90	11,90	11,57	+0,50/+2,20
100	14,71	14,29	+0,60/+2,50
110	17,84	17,34	+0,70/+3,00
120	21,28	20,68	+0,80/+3,50
125	23,05	22,41	
130	24,98	24,28	+0,90/+3,80
135	26,9	26,1	
140	28,9	28,1	
150	33,2	32,3	+1,00/+4,20
160	37,8	36,7	+1,10/+4,50
165	40,3		+1,20/+5,00
180	47,8		
200	59,0		+1,30/+5,50
210*	65,0		+1,30/+5,80
230*	78,0		+1,50/+6,20
250*	91,9		
280*	115,1		+1,50/+6,60
300*	132,2		+1,50/+7,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

* Stock length 1.000 mm

Stock item
Non-stock item – special production

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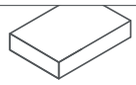
TECAFLON Plates



TECAFLON PTFE

Chemical designation	PTFE
Density [g/cm³]	2,18

Dimensions [mm]	[kg/m]	Tolerance [mm]
1 x 1.200*	2,78	+0,00/+0,05
2 x 1.200*	5,70	+0,00/+0,20
3 x 1.200*	9,22	+0,00/+0,80
4 x 1.200*	11,94	
5 x 1.200*	14,65	
6 x 1.200*	17,36	
8 x 1.200*	23,33	+0,00/+1,20
10 x 1.200*	28,8	
12 x 1.200*	35,3	+0,00/+2,00
15 x 1.200*	43,4	
20 x 1.200*	57,0	
25 x 1.200*	70,5	
30 x 1.200*	85,5	+0,00/+3,00
40 x 1.200*	112,5	
50 x 1.200*	139,7	
60 x 1.200*	166,8	
70 x 1.200*	193,9	
80 x 1.200*	221,0	
90 x 1.200*	250,9	+0,00/+5,00
100 x 1.200*	278,0	

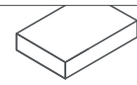
Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Tolerance based on GKV according to manufacturer's specifications.

GF30 available on request.

* Stock length 1.200 mm

TECAFLON Plates



TECAFLON PVDF

Chemical designation	PVDF
Density [g/cm³]	1,78

Dimensions [mm]	[kg/m]	Tolerance [mm]
10 x 500	9,96	+0,20/+1,10
10 x 620	12,28	
10 x 1.000*	19,63	
15 x 500	14,87	+0,30/+1,50
15 x 620	18,33	
15 x 1.000**	29,3	
20 x 500	19,54	
20 x 620	24,10	
20 x 1.000**	38,5	
25 x 500	24,22	
25 x 620	29,9	
25 x 1.000*	47,7	
30 x 500	29,4	+0,50/+2,50
30 x 620	36,3	
30 x 1.000**	58,0	
36 x 500	35,1	
36 x 620	43,2	
36 x 1.000*	69,1	
40 x 500	38,8	
40 x 620	47,9	
40 x 1.000*	76,5	
45 x 500	43,5	
45 x 620	53,6	
50 x 500	48,1	
50 x 620	59,4	
60 x 300	35,5	+0,50/+3,50
60 x 500	58,0	
70 x 300	41,2	
70 x 500	67,3	
80 x 300	47,3	+0,50/+5,00
80 x 500	77,4	
90 x 300	53,0	
90 x 500	86,7	
100 x 300	58,8	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

* Stock length 2.000 mm

Stock item
Non-stock item – special production

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TECASON
TECAPEI

Polyarylsulphones (PSU, PPSU) are a family of thermoplastic, amorphous and polar polymers. Even at high temperatures, TECASON P MT, TECASON E or TECASON S demonstrate high strength and stability. Polyetherimide (PEI), an amorphous thermoplastic from the polyimide group, is very similar to polysulphones. It is frequently used in the electrotechnical industry.

Overview of types

TECASON S
(PSU)
High frequency resistant plastic.
Translucent.
Suitable for contact with food.

TECASON E
(PES)
Good electrical insulating properties.
Translucent.
Hydrolysis-resistant.

TECASON P
(PPSU)
Material suitable for super heated steam sterilization.
Suitable for medical technology applications.
High thermal dimensional stability.

TECASON P MT coloured
(PPSU)
→ p. 66

TECASON P MT XRO
(PPSU)
→ p. 66

TECAPEI
(PEI)
Long-term service temperature up to 170 °C.
Resistance to high-energy radiation.

TECAPEI GF30
(PEI GF)
High thermal and mechanical load capacity.
Resistance to high-energy radiation.

TECAPEI MT
(PEI)
→ p. 66

Application examples

Control panel for dialysis system
TECASON E (PES)
Good sterilization resistance.
Free from surface burrs.
High degree of transparency.

Dispensing plunger for water analysis
TECASON S (PSU)
High transparency for optical control.
Good dimensional stability.
Resistance to disinfectant and cleaning agents.

Valve plunger
TECASON E (PES)
Translucent, dimensionally stable.
Suitable for contact with food.
Resistance to disinfectant and cleaning agents.

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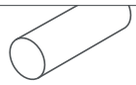
TECASON / TECAPEI Rods



	TECASON S	TECASON E	TECASON P	TECAPEI	TECAPEI GF30	
Chemical designation	PSU	PES	PPSU	PEI	PEI	
Density [g/cm³]	1,24	1,37	1,29	1,28	1,51	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
8	0,071	0,078	0,074	0,073		+0,10/+0,80
10	0,108	0,120	0,113	0,112		
12	0,156	0,173	0,163	0,162		+0,20/+0,90
16	0,272	0,301	0,283	0,281		
20	0,420	0,463	0,436	0,433	0,511	
22	0,512	0,566	0,533	0,528	0,623	+0,20/+1,20
25	0,656	0,725	0,683	0,677	0,799	
30	0,936	1,03	0,974	0,966	1,14	
32	1,06	1,17	1,11	1,10	1,29	
36	1,35	1,49	1,41	1,40	1,65	+0,20/+1,60
40	1,66	1,84	1,73	1,72	2,02	
45	2,12	2,34	2,20	2,18	2,58	+0,30/+2,00
50	2,60	2,87	2,70	2,68	3,16	
56	3,24	3,58	3,38	3,35		
60	3,74	4,14	3,90	3,87	4,56	+0,30/+2,50
70	5,06	5,60	5,27	5,23		
80	6,63	7,33	6,90	6,84		+0,40/+3,00
90	8,40	9,28	8,74	8,67		+0,50/+3,40
100	10,38	11,46	10,79	10,71		+0,60/+3,80
110	12,56	13,88	13,07	12,97		+0,70/+4,20
120	14,96	16,52	15,56	15,44		+0,80/+4,60
125	16,20	17,90	16,85	16,72		
135	18,96	20,95	19,72	19,57		+0,90/+5,40
140	20,36	22,49	21,18	21,01		
150	23,38	25,8	24,32	24,13		+1,00/+5,80

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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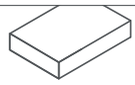
TECASON / TECAPEI Plates



	TECASON S	TECASON E	TECASON P	TECAPEI	TECAPEI GF30	
Chemical designation	PSU	PES	PPSU	PEI	PEI	
Density [g/cm³]	1,24	1,37	1,29	1,28	1,51	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10 x 300	4,24	4,69	4,41	4,38		+0,20/+1,10
10 x 500	6,94	7,66	7,22			
10 x 620	8,55	9,45	8,90	8,83		
12 x 300	5,14	5,68	5,35	5,31		+0,30/+1,50
12 x 500	8,40	9,28	8,74	8,67		
12 x 620	10,36	11,45	10,78	10,69		
16 x 300	6,73	7,44	7,00	6,95		
16 x 500	11,01	12,16	11,45	11,36		
16 x 620	13,57	15,00	14,12	14,01		
20 x 300	8,33	9,20	8,66	8,60		
20 x 500	13,61	15,04	14,16	14,05	16,58	
20 x 620	16,79	18,55	17,46	17,33		
25 x 300	10,32	11,40	10,73	10,65		
25 x 500	16,87	18,64	17,55	17,41	20,54	
25 x 620	20,80	22,98	21,64	21,47		
30 x 300	12,55	13,87	13,06	12,95		+0,50/+2,50
30 x 500	20,52	22,67	21,35	21,18	24,99	
30 x 620	25,3	27,9	26,3	26,1		
36 x 300	14,94	16,51	15,54	15,42		
36 x 500	24,43	27,0	25,4	25,2	29,8	
36 x 620	30,1	33,3	31,3	31,1		
40 x 300	16,53	18,27	17,20	17,07		
40 x 500	27,0	29,9	28,1	27,9	32,9	
40 x 620	33,3	36,8	34,7	34,4		
50 x 300	20,52	22,67	21,35	21,18		
50 x 500	33,5	37,1	34,9	34,6		
50 x 620	41,4	45,7	43,0	42,7		
60 x 300	24,70	27,3	25,7	25,5		+0,50/+3,50
60 x 500	40,4	44,6	42,0	41,7		
70 x 300	28,7	31,7	29,8	29,6		
80 x 300	33,0	36,4	34,3	34,0		+0,50/+5,00

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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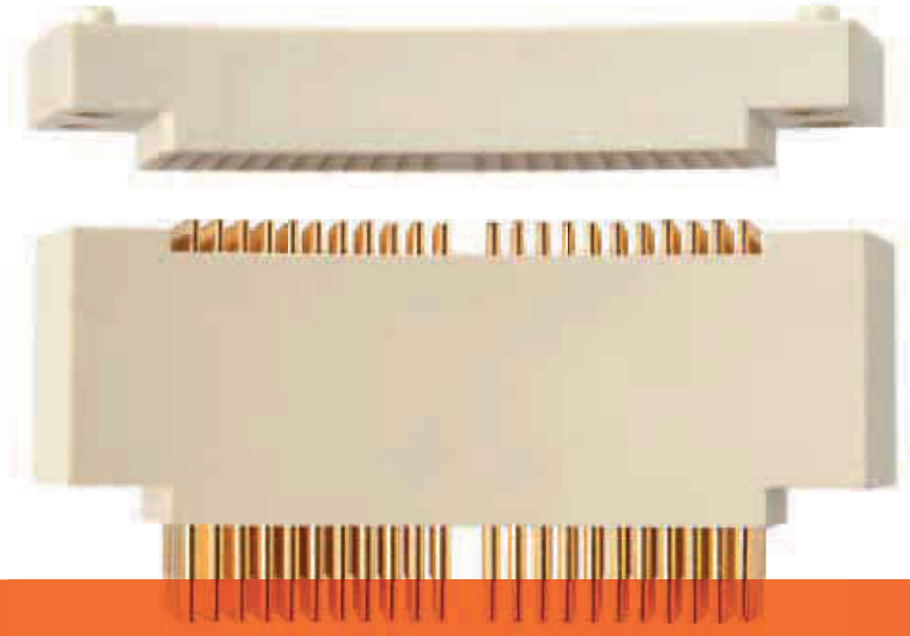

TECATRON

Polyphenylenesulphide (PPS) is a semi-crystalline, high temperature thermoplastic polymer. Due to its chemical structure, PPS is a very resistant polymer with excellent mechanical strength, even at temperatures above 200 °C. In addition to low water absorption, PPS also has good dimensional stability and excellent electrical properties. PPS is chemically very stable even at high temperatures.

Overview of types

TECATRON
(PPS)
Low water absorption.
Very good electrical insulation.

TECATRON GF40
(PPS GF)
Extremely high strength due to glass fibre reinforcement.
Very good chemical resistance.

TECATRON PVX
(PPS CF CS TF)
Very good sliding and friction values.
Suitable for bearings under high levels of stress.

Application examples

Fluid valve
TECATRON GF40
(PPS GF)
Good chemical resistance.
Dimensionally stable.
Narrow tolerances possible.

End plate of a fuel cell
TECATRON GF40 black
(PPS GF)
Very good rigidity and strength
(even at high temperatures).
High thermal stability.
High dimensional stability.
Good chemical resistance.

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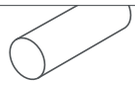
TECATRON Rods

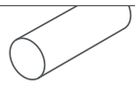


	TECATRON	
Chemical designation	PPS	
Density [g/cm³]	1,36	
Diameter [mm]	[kg/m]	Tolerance [mm]
10	0,118	+0,10/+0,70
12	0,170	+0,20/+0,80
16	0,297	
20	0,458	
22	0,556	+0,20/+1,00
25	0,714	
30	1,02	
32	1,16	+0,20/+1,20
36	1,47	
40	1,80	
45	2,29	+0,30/+1,30
50	2,81	
56	3,52	
60	4,05	+0,30/+1,60

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

TECATRON Rods



	TECATRON GF40	TECATRON GF40 black	TECATRON PVX	
Chemical designation	PPS	PPS	PPS	
Density [g/cm³]	1,63	1,63	1,44	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10	0,143	0,143	0,126	+0,10/+0,80
12	0,206	0,206	0,182	+0,20/+0,90
16	0,358	0,358	0,316	
20	0,551	0,551	0,487	
22	0,673	0,673	0,594	+0,20/+1,20
25	0,862	0,862	0,762	
30	1,23	1,23	1,09	
32	1,40	1,40	1,23	
36	1,78	1,78	1,57	+0,20/+1,60
40	2,18	2,18	1,93	
45	2,78	2,78		+0,30/+2,00
50	3,42	3,42		
56	4,26	4,26		
60	4,92	4,92		+0,30/+2,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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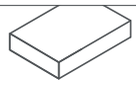
TECATRON *Plates*



	TECATRON	TECATRON GF40	TECATRON GF40 black	TECATRON PVX	
Chemical designation	PPS	PPS	PPS	PPS	
Density [g/cm³]	1,36	1,63	1,63	1,44	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10 x 500	7,61	9,12	9,12	8,06	+0,20/+1,10
12 x 500	9,22	11,05	11,05	9,76	+0,30/+1,50
16 x 500	12,07	14,47	14,47	12,78	
18 x 500	13,50	16,18	16,18	14,30	
20 x 500	14,93	17,90	17,90	15,81	
25 x 500	18,50	22,18	22,18	19,59	
30 x 500	22,50	27,0	27,0	23,83	+0,50/+2,50
36 x 500	26,8	32,1	32,1	28,4	
40 x 500	29,6	35,5	35,5	31,4	
50 x 300	22,50	27,0	27,0	23,83	
50 x 500	36,8	44,1	44,1		
60 x 300	27,1	32,5	32,5		+0,50/+3,50
70 x 300	31,5	37,7	37,7		

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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TECAPEEK

Polyaryletherketones (PAEK, e.g. PEEK, PEK, PEKEKK) are high temperature-resistant thermoplastics with unusual characteristics. The high strength of the semi-crystalline aromatic polymers is maintained even at high temperatures. In addition, PAEK materials demonstrate very good impact strength at low temperatures, high mechanical fatigue strength, a very low tendency to creep as well as good sliding and wear properties. Their chemical resistance is also very good. Due to their unusual characteristics, TECAPEEK is used for particularly demanding applications.

Overview of types

TECAPEEK
(PEEK)
Long-term service temperatures of up to +260 °C. Excellent mechanical properties. Suitable for food contact.

TECAPEEK bright red
(PEEK)
Bright signal colour.

TECAPEEK GF30
(PEEK GF)
Glass fibre-reinforced with increased strength. Excellent chemical resistance.

TECAPEEK CF30
(PEEK CF)
Very high strength values due to the addition of carbon fibre. Extremely abrasion resistant.

TECAPEEK PNT
(PEEK GF CNT)
Reinforced. Static dissapative for explosion prevention.

TECAPEEK PVX
(PEEK CF CS TF)
Very good sliding values. Suitable for bearings under high levels of stress.

TECAPEEK ST
(PEKEKK)
Excellent mechanical properties at high temperatures. High level of thermal dimensional stability. Good machining properties.

TECAPEEK HT
(PEK)
Good abrasion and wear resistance. High loading capacity under static and dynamic stress. Excellent chemical resistance.

TECAPEEK TF10
(PEEK TF)
Very good sliding properties. Free of carbon. Electrically insulating

TECAPEEK TF10 blue
(PEEK TF)
→ p. 72

TECAPEEK ID blue
(PEEK, detectable filler)
→ p. 72

TECAPEEK CMF white / grey
(PEEK, ceramic)
Very high dimensional stability. Minimal water absorption. Extreme rigidity and toughness.

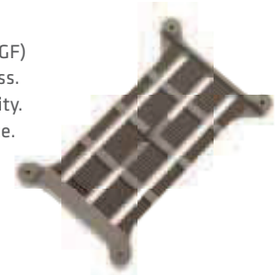
TECAPEEK TS
(PEEK, mineral)
Very high hardness and rigidity. Low thermal expansion. Very high dimensional stability.

TECAPEEK ELS nano
(PEEK, CNT)
→ p. 76

TECAPEEK MT coloured
TECAPEEK CF30 MT
(PEEK / PEEK CF)
→ p. 66

Application examples

Support comb
TECAPEEK GF30 (PEEK GF)
High degree of toughness. High dimensional stability. Good chemical resistance. Electrically insulating.



Valve cover
TECAPEEK (PEEK)
Good thermal formability. Good resistance to oil and grease even at high temperatures.

Gear rack
TECAPEEK PVX
(PEEK CF CS TF)
Good tribological properties. Good dimensional stability. High strength and rigidity.

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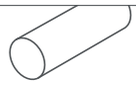
TECAPEEK Rods



	TECAPEEK	TECAPEEK black	TECAPEEK HT black	TECAPEEK ST	
Chemical designation	PEEK	PEEK	PEK	PEKEKK	
Density [g/cm³]	1,31	1,31	1,31	1,32	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
3	0,012	0,012	0,012	0,012	+0,10/+0,60
4	0,020	0,020	0,020	0,020	
5	0,030	0,030	0,030	0,030	
6	0,042	0,042	0,042	0,043	
8	0,074	0,074	0,074	0,075	+0,10/+0,70
10	0,114	0,114	0,114	0,114	
12	0,164	0,164	0,164	0,165	+0,20/+0,80
15	0,252	0,252	0,252	0,254	
16	0,286	0,286	0,286	0,288	
18	0,359	0,359	0,359	0,362	
20	0,441	0,441	0,441	0,444	
22	0,536	0,536	0,536	0,540	+0,20/+1,00
25	0,688	0,688	0,688	0,693	
28	0,858	0,858	0,858	0,865	
30	0,983	0,983	0,983	0,990	
32	1,12	1,12	1,12	1,13	+0,20/+1,20
36	1,41	1,41	1,41	1,42	
40	1,74	1,74	1,74	1,75	
45	2,20	2,20	2,20	2,22	+0,30/+1,30
50	2,71	2,71	2,71	2,73	
56	3,39	3,39	3,39	3,41	
60	3,90	3,90	3,90	3,93	+0,30/+1,60
65	4,56	4,56	4,56	4,60	
70	5,28	5,28	5,28	5,32	
80	6,92	6,92	6,92	6,97	+0,40/+2,00
90	8,76	8,76	8,76	8,82	+0,50/+2,20
100	10,82	10,82	10,82	10,90	+0,60/+2,50
110	13,13	13,13			+0,70/+3,00
120	15,66	15,66			+0,80/+3,50
125	16,97	16,97			
135	19,80	19,80			+0,90/+3,80
140	21,27	21,27			
150	24,44	24,44			+1,00/+4,20
160	27,8				+1,10/+4,50
165	29,7				+1,20/+5,00
180	35,2				
200	43,4				+1,30/+5,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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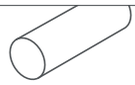
TECAPEEK Rods



	TECAPEEK CF30	TECAPEEK GF30	TECAPEEK PVX	
Chemical designation	PEEK	PEEK	PEEK	
Density [g/cm³]	1,38	1,53	1,44	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
3	0,013	0,014	0,013	+0,10/+0,70
4	0,021	0,024	0,022	
5	0,032	0,036	0,034	
6	0,045	0,050	0,047	
8	0,079	0,088	0,082	+0,10/+0,80
10	0,121	0,134	0,126	
12	0,174	0,193	0,182	+0,20/+0,90
15	0,267	0,296	0,279	
16	0,303	0,336	0,316	
18	0,380	0,422	0,397	
20	0,467	0,518	0,487	
22	0,570	0,632	0,594	+0,20/+1,20
25	0,730	0,810	0,762	
28	0,911	1,01	0,950	
30	1,04	1,16	1,09	
32	1,18	1,31	1,23	
36	1,51	1,67	1,57	+0,20/+1,60
40	1,85	2,05	1,93	
45	2,35	2,61	2,46	+0,30/+2,00
50	2,89	3,21	3,02	
56	3,61	4,00	3,77	
60	4,17	4,62	4,35	+0,30/+2,50
65	4,87	5,40	5,09	
70	5,64	6,25	5,88	
80	7,38	8,18	7,70	+0,40/+3,00
90	9,35	10,36	9,75	+0,50/+3,40
100		12,80	12,05	+0,60/+3,80
110		15,50		+0,70/+4,20

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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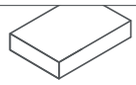
TECAPEEK *Plates*



	TECAPEEK	TECAPEEK black	TECAPEEK GF30	TECAPEEK CF30	TECAPEEK PVX	TECAPEEK ST	TECAPEEK HT black	
Chemical designation	PEEK	PEEK	PEEK	PEEK	PEEK	PEKEKK	PEK	
Density [g/cm³]	1,31	1,31	1,53	1,38	1,44	1,32	1,31	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5 x 300	2,29	2,29	2,68	2,42	2,52	2,31	2,29	+0,20/+0,70
5 x 500	3,75	3,75	4,38	3,95	4,12	3,78	3,75	
6 x 300	2,71	2,71	3,17	2,86	2,98	2,74	2,71	
6 x 500	4,44	4,44	5,18	4,68	4,88	4,47	4,44	
8 x 300	3,64	3,64	4,25	3,84	4,00	3,67	3,64	+0,20/+1,10
8 x 500	5,95	5,95	6,95	6,27	6,54	6,00	5,95	
10 x 300	4,48	4,48	5,24	4,72	4,93	4,52	4,48	
10 x 500	7,33	7,33	8,56	7,72	8,06	7,38	7,33	
10 x 620	9,04	9,04	10,55	9,52	9,93	9,11	9,04	
12 x 500	8,88	8,88	10,37	9,35	9,76	8,94	8,88	+0,30/+1,50
12 x 620	10,95	10,95	12,78	11,53	12,03	11,03	10,95	
16 x 500	11,63	11,63	13,58	12,25	12,78	11,72	11,63	
16 x 620	14,34	14,34	16,75	15,11	15,76	14,45	14,34	
18 x 500	13,01	13,01	15,19	13,70	14,30	13,11	13,01	
18 x 620	16,04	16,04	18,73	16,89	17,63	16,16	16,04	
20 x 500	14,38	14,38	16,80	15,15	15,81	14,49	14,38	
20 x 620	17,73	17,73	20,71	18,68	19,49	17,87	17,73	
22 x 500	15,76	15,76	18,40	16,60	17,32	15,88	15,76	
25 x 500	17,82	17,82	20,82	18,78	19,59	17,96	17,82	
30 x 500	21,68	21,68	25,3	22,83	23,83	21,84	21,68	+0,50/+2,50
30 x 620	26,7	26,7	31,2	28,2	29,4	26,9	26,7	
32 x 500	23,05	23,05	26,9	24,28	25,3	23,23	23,05	
36 x 500	25,8	25,8	30,1	27,2	28,4	26,0	25,8	
40 x 300	17,47	17,47	20,40	18,40	19,20	17,60	17,47	
40 x 500	28,6	28,6	33,4	30,1	31,4	28,8	28,6	
40 x 620	35,2	35,2	41,1	37,1	38,7	35,5	35,2	
45 x 500	32,0	32,0	37,4	33,7	35,2	32,2	32,0	
45 x 620	39,5	39,5	46,1	41,6	43,4	39,8	39,5	
50 x 300	21,68	21,68	25,3	22,83	23,83	21,84	21,68	
50 x 500	35,4	35,4	41,4	37,3	39,0	35,7	35,4	
50 x 620	43,7	43,7	51,0	46,0	48,0	44,0	43,7	
60 x 300	26,1	26,1	30,5					+0,50/+3,50
60 x 500	42,7	42,7	49,8					
70 x 300	30,3	30,3	35,4					
80 x 300	34,8		40,7					+0,50/+5,00
80 x 500	56,9							
100 x 300	43,2							

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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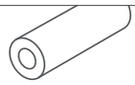

TECAPEEK
Chemical designation: PEEK
Density [g/cm³]: 1,31

Outside diameter [mm] →	40	45	50	56	60	65	70	75	80	85	90	100	110
Inside diameter [mm] ↓	[kg/m]												
25	1,20	1,66	2,17	2,92	3,42	4,14	4,87	5,65					
30			1,90	2,64	3,15	3,87	4,60	5,38	6,21				
36			1,50	2,25	2,75	3,48	4,20	4,99	5,82	6,89	7,84	9,88	
40				1,94	2,45	3,17	3,90	4,68	5,52	6,60	7,55	9,59	
45					2,02	2,75	3,48	4,26	5,09	6,19	7,14	9,18	
50							3,00	3,78	4,61	5,73	6,67	8,72	10,97
54								3,36	4,19	5,32	6,26	8,31	10,56
60									3,50	4,64	5,59	7,63	9,88
70											4,29	6,34	8,59
80												4,83	7,08
90													5,37
Tolerance outside [mm]			+0,60 +2,00		+0,80 +2,50				+0,80 +3,00				+1,20 +3,60
Tolerance inside [mm]			-2,00 -0,60		-2,50 -0,80				-3,00 -0,80				-5,00 -1,60

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Outside diameter [mm] →	125	135	140	150	165	180	185	190	200	210	230	250	280	300	360
Inside diameter [mm] ↓	[kg/m]														
50	15,0	17,79	19,26	22,37											
54	14,60	17,39	18,86	21,97											
60	13,93	16,72	18,20	21,30											
70	12,66	15,45	16,92	20,03											
80	11,17	13,96	15,44	18,54	23,90	29,4	31,7	33,7	37,8						
90	9,48	12,27	13,74	16,85	22,22	27,8	30,0	32,0	36,2						
100	7,57	10,36	11,84	14,95	20,33	25,9	28,1	30,1	34,3	38,7	49,5	59,8			
110		8,25	9,72	12,83	18,23	23,77	26,0	28,0	32,2	36,6	47,4	57,8			
125				9,26	14,68	20,23	22,50	24,51	28,7	33,1	44,0	54,3			
130				7,97	13,39	18,94	21,22	23,23	27,4	31,8					
140					10,66	16,21	18,50	20,51	24,69	29,1					
150						13,27	15,57	17,58	21,76	26,1	37,1	47,5	65,1	77,5	
160							12,44	14,45	18,62	23,01					
175									13,52	17,91					
180											27,2	37,5	55,2	67,6	
200											19,56	29,9	47,6	60,0	
290															58,3
Tolerance outside [mm]	+1,50 +4,50				+1,80 +5,40		+2,00 +6,00				+3,00 +9,00		+3,00 +10,00		+3,00 +11,00
Tolerance inside [mm]	-6,50 -2,00				-7,50 -2,20		-8,50 -2,50				-12,00 -3,00		-13,00 -3,50		-14,00 -3,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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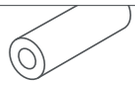

TECAPEEK PVX
Chemical designation: PEEK
Density [g/cm³]: 1,44

Outside diameter [mm] →	40	45	50	56	60	65	70	75	78	80	85	90	100	110
Inside diameter [mm] ↓	[kg/m]													
25	1,32	1,82	2,39	3,21	3,76									
30			2,09	2,91	3,46	4,25	5,05							
36			1,65	2,47	3,02	3,82	4,62	5,48	6,02	6,40				
40				2,14	2,69	3,49	4,29	5,15	5,69	6,06	7,26			
45						3,02	3,82	4,68	5,22	5,59	6,81	7,84		
50							3,29	4,15	4,70	5,07	6,30	7,33	9,58	12,06
54								3,69	4,23	4,61	5,85		9,13	11,61
60										3,84	5,10	6,14	8,39	10,87
70												4,72	6,96	9,44
75													6,17	8,64
80													5,31	7,79
90														5,90
Tolerance outside [mm]			+0,60 +2,00		+0,80 +2,50					+0,80 +3,00				+1,20 +3,60
Tolerance inside [mm]			-2,00 -0,60		-2,50 -0,80					-3,00 -0,80				-5,00 -1,60

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Outside diameter [mm] →	125	135	140	150	165	180	185	190	200	210	230	250
Inside diameter [mm] ↓	[kg/m]											
50	16,49											
54	16,05											
60	15,32											
70	13,91											
75	13,13											
80	12,28	15,35	16,97	20,39			34,8	37,0				
90	10,42	13,49	15,11	18,52			33,0	35,2				
100	8,32	11,39	13,01	16,43	22,35	28,4	30,9	33,1				
110		9,07	10,69	14,10	20,04	26,1	28,6	30,8	35,4			
125				10,18	16,14	22,23	24,73	26,9	31,5			
130				8,76	14,72	20,82	23,33	25,5	30,1	34,9		
140					11,72	17,82	20,34	22,55	27,1	32,0		
150						14,58	17,12	19,33	23,92	28,7	40,8	52,2
160							13,67	15,88	20,47	25,3		
175									14,86			
180											29,9	41,3
200											21,50	32,9
Tolerance outside [mm]				+1,50 +4,50		+1,80 +5,40				+2,00 +6,00		+3,00 +9,00
Tolerance inside [mm]				-6,50 -2,00		-7,50 -2,20				-8,50 -2,50		-12,00 -3,00

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available ground. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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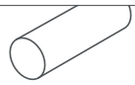
TECAPEEK Rods

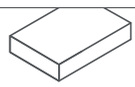


	TECAPEEK CMF	**TECAPEEK CMF** grey	**TECAPEEK TS**	**TECAPEEK ELS nano**	**TECAPEEK TF10**	**TECAPEEK PNT**	**TECAPEEK** bright red	
Chemical designation	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	
Density [g/cm³]	1,65	1,65	1,49	1,36	1,35	1,38	1,36	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10	0,143	0,143	0,129	0,118	0,117	0,120	0,118	+0,10/+0,70
20	0,555	0,555	0,502	0,458	0,454	0,465	0,458	+0,20/+0,80
30	1,24	1,24	1,12	1,02	1,01	1,04	1,02	+0,20/+1,00
40	2,19	2,19	1,98	1,80	1,79	1,83	1,80	+0,20/+1,20
50	3,41	3,41	3,08	2,81	2,79	2,85	2,81	+0,30/+1,30
60	4,91	4,91	4,43	4,05	4,02	4,11	4,05	+0,30/+1,60
70				5,48	5,44	5,57	5,48	
80				7,18	7,13	7,29	7,18	+0,40/+2,00
90				9,09		9,23	9,09	+0,50/+2,20
100				11,24		11,40	11,24	+0,60/+2,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

TECAPEEK Plates



	TECAPEEK CMF	**TECAPEEK CMF** grey	**TECAPEEK TS**	**TECAPEEK ELS nano**	**TECAPEEK TF10**	**TECAPEEK PNT**	**TECAPEEK** bright red	
Chemical designation	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	
Density [g/cm³]	1,65	1,65	1,49	1,36	1,35	1,38	1,36	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5 x 500	4,72	4,72	4,27	3,89	3,86	3,95	3,89	+0,20/+0,70
6 x 500	5,59	5,59	5,05	4,61	4,57	4,68	4,61	
10 x 500	9,23	9,23	8,34	7,61	7,55	7,72	7,61	+0,20/+1,10
12 x 500	11,18	11,18	10,10	9,22	9,15	9,35	9,22	+0,30/+1,50
15 x 500	13,78	13,78	12,44	11,36	11,28	11,53	11,36	
20 x 500	18,11	18,11	16,36	14,93	14,82	15,15	14,93	
25 x 500	22,45	22,45	20,27	18,50	18,37	18,78	18,50	
30 x 500	27,3	27,3	24,65	22,50	22,34	22,83	22,50	+0,50/+2,50
40 x 500	36,0	36,0	32,5	29,6	29,4	30,1	29,6	
50 x 500				36,8	36,5	37,3		

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available ground respectively planed. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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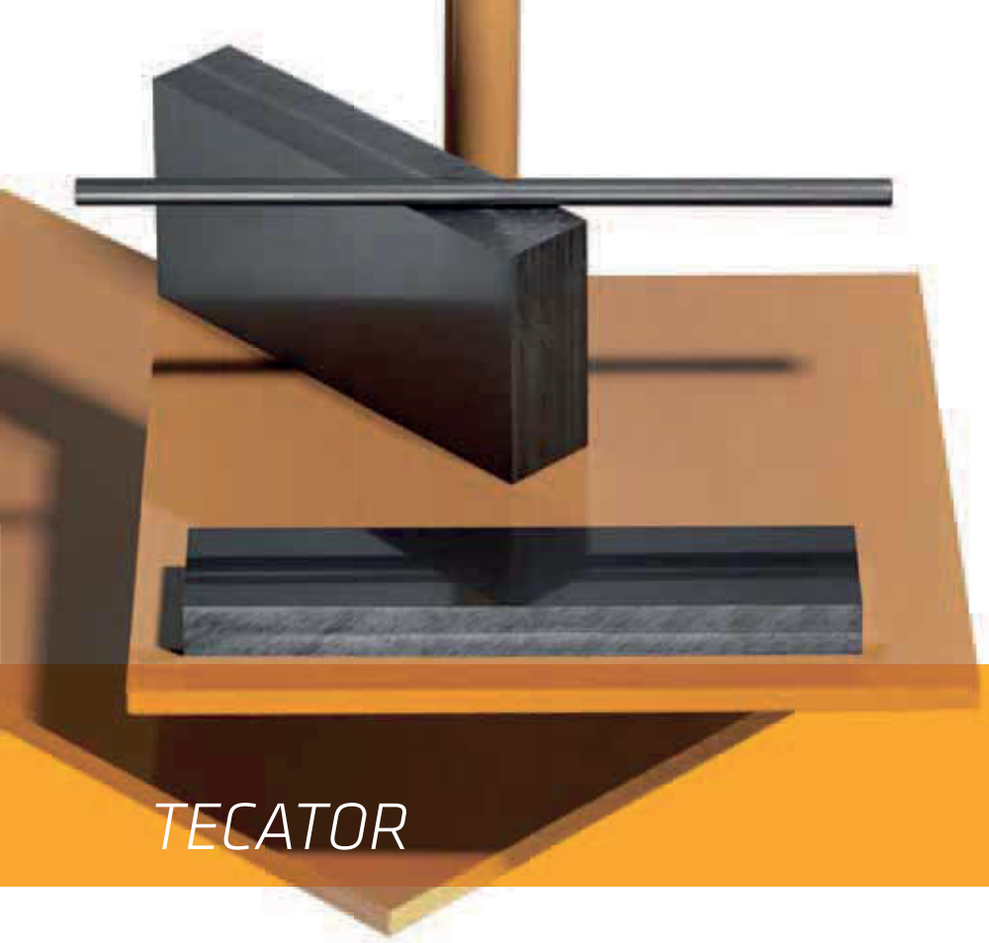

TECATOR

The use of materials in the highest performance categories is often determined by subtle property nuances. TECATOR (PAI) is a high-performance thermoplastic characterized by outstanding loading capacity also in the cryogenic range. Compared to metal components, TECATOR parts with comparable properties are lighter and are used where weight saving is a key issue.

Properties

→ Thermally resilient from the cryogenic range up to 270 °C.
→ High rigidity, high strength coupled with toughness.
→ High long-term stability and high fatigue strength.
→ Extremely high creep resistance.
→ Good chemical resistance towards wide-ranging conventional solvents and lubricants, fuels and acids.
→ High resistance to high-energy radiation
→ Self-extinguishing according to UL 94 V-0.
→ Good machining capability using conventional tools and machinery.

Fields of application

Cryotechnics, electrical and electronic engineering, precision mechanics, mechanical engineering, medical technology, vacuum technology, aerospace, semi-conductor technology, automotive engineering.

Applications

Switches and plug components, valve seats, bearing and valve balls, bearing bushes and plates, piston rings, sliding rails, rollers, insulating parts, burn-in holders, test sockets for semi-conductors, rotors, housing components, support rings, structural components subject to high mechanical and thermal stress.

Application examples

Insulating bodies for plugs
TECATOR 5013 (PAI)
High thermal stability.
Very good electrical insulation.
Very low long-term thermal stability.
Very good mechanical properties (> 200 °C).

Throw-over switch
TECATOR 5013 (PAI)
High thermal stability.
Highly abrasion resistant.
Very good creep resistance.
High long-term stability.

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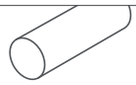
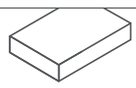
TECATOR *Rods*



	TECATOR 5013	TECATOR 5031 PVX	
Chemical designation	PAI	PAI CS TF	
Density [g/cm³]	1,40	1,46	
Diameter [mm]			Tolerance [mm]
5	●	○	+0,0/+1,2
6,25	●	●	
7,5	●	○	
10	●	●	+0,0/+1,5
12,5	●	●	
15	●	●	
20	●	●	+0,0/+1,7
25	●	●	
30	●	○	
40	○	○	+0,0/+1,8
50	○	○	
60	○	○	
80	○		
100	○		+0,0/+2,0

Standard lengths 1220 mm, Tolerance length +1,0 / +25,0 mm

TECATOR *Plates*



	TECATOR 5013	TECATOR 5031 PVX			
Chemical designation	PAI	PAI CS TF			
Density [g/cm³]	1,40	1,46			
Thickness [mm]			Width [mm]	Tolerance thickness [mm]	Tolerance Width [mm]
1	○	○	150	+0,0/+0,8	+0,0/+5,0
2	○	○			
5	●	○	300	+0,0/+1,2	+0,0/+5,0
6,25	●	●			
7,5	○	○			
10	●	●			
12,5	●	●			
15	●	○			
20	●	●			
25	●	○			
30	●	○			
40	○	○			

Standard lengths 1220 mm, Tolerance length +1,0 / +25,0 mm

● Standard products (from stock or delivery at short notice)
○ Non-standard products (produced to order)

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TECASINT

Sintered TECASINT stock shapes and direct formed parts have excellent long-term thermal stability. The broad temperature application spectrum of these materials ranges from –270 °C to +300 °C. Even when heated briefly to 350 °C, TECASINT materials will not melt or soften. Strength, dimensional stability and creep strength remain high under mechanical stress even during long-term usage.

Properties

→ High strength over a wide temperature range from –270 °C to +300 °C.
→ Long-term thermal stability 300 °C.
→ Glass transition temperature up to > 400 °C.
→ Good cryogenic properties.
→ High pressure and creep strength.
→ High radiation resistance.
→ High purity, low outgassing in vacuum in accordance with ESA regulation ECSS-Q-70-02.
→ Minimal thermal expansion.
→ Minimal thermal conductivity.
→ Excellent friction and abrasion properties – even when not lubricated.
→ Good chemical resistance to acids, fats and solvents.
→ Excellent electrical insulation properties.
→ Inherently flame resistant (UL 94 V0).

Fields of application

The fields of application are many and varied: The mechanical engineering, automotive and gear manufacturing industries appreciate the outstanding sliding properties of the graphite / PTFE-modified TECASINT product types. In aerospace or vacuum technology, unreinforced or MoS_2-modified product types (for sliding applications) are used.

Important fields of application are found in the glass industry. Components made of TECASINT are frequently used for the careful handling of hot glass. Its good thermal and electrical insulating effect also makes TECASINT ideally suited for applications in welding torches and the electrical and electronics industry. TECASINT has a very low ion content and is used in particular for applications in the semi-conductor industry, for example in the production of wafers.

Forms of delivery and production processes

TECASINT is available as:
Stock shapes (rods, plates, short pipes, disks),
Parts for machining to drawing,
Volume production parts using the direct forming process.

Precision components made of TECASINT are produced in small production runs using machining processes in accordance with customer drawing. For larger piece numbers (from appr. 1000 pcs.) components can be manufactured at low cost using the direct forming (DF) method.

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SITASA

Product families

TECASINT 1000
Highest modulus.
Highest rigidity and hardness.
Previous designation SINTIMID.

TECASINT 2000
Very high modulus, high rigidity and hardness.
Compared to TECASINT 1000, significantly reduced moisture absorption.
Higher toughness and improved machining capability.
Ideally suited for direct forming components.

TECASINT 4000
Compared to the other TECASINT materials, TECASINT 4000 is characterized by the following properties:
Minimal water absorption.
Highest stability against oxidation in air.
Low friction.
Optimum chemical resistance.
HDT up to 470 °C.
Different types available with high fracture strain and toughness or with high flexural modulus.

TECASINT 5000
Non-melting high-temperature polyamidimide (PAI).
Extremely good dimensional stability and load capacity up to 300 °C.

TECASINT 8000
Matrix of PTFE reinforced with PI powder.
Reduced creep under load.
Excellent sliding and friction properties.
Ideally suited for soft mating partners (stainless steel, aluminium, brass, bronze).
Extreme chemical resistance and simple machining properties.

Modifications

Unfilled
Maximum strength and elongation.
Highest modulus.
Minimal thermal and electrical conductivity.
High purity.
Low outgassing in accordance with ESA regulation ECSS-Q-70-20.

+ 15 % graphite
Enhanced wear resistance and thermal ageing.
Self lubricating, for lubricated and dry applications.

+ 40 % graphite
Reduced thermal elongation.
Maximum creep strength and resistance to thermal ageing.
Improved self-lubrication.
Reduced strength.

+ 15 % graphite
+ 10 % PTFE
Extremely low static friction and low coefficient of friction due to PTFE modification.
Good properties also in dry running conditions due to self lubrication.
For applications involving low friction and wear characteristics at medium temperatures and loads (< 200 °C).

+ 15 % MoS_2
Best friction and abrasion properties in vacuum.
Frequently used in aerospace applications, in vacuum or in inert gases (techn. dry).
Low outgassing in accordance with ESA regulation ECSS-Q-70-20.

+ 30 % glass fibres
Reduced thermal elongation.
High thermal-mechanical load properties.
Good electrical insulation.

SD
Static dissipative / antistatic, permanently migration free.
Surface resistance $10^{9\text{-}11}$ Ω or $10^{7\text{-}9}$ Ω.
For explosion-proof equipment and in semi-conductor technology (test sockets).

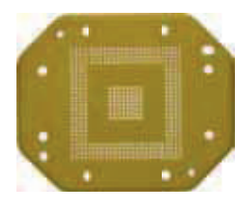
Overview of modifications

	1000	*2000*	*4000*	*4100*	*5000*
Pure	1011	2011	4011	4111	5011
15 % graphite	1021	2021	4021	4121	–
40 % graphite	1031	2031	–	–	–
15 % graphite / 10 % PTFE	1061	2061	–	–	–
15 % MoS_2	1391	2391	4391	–	–
30 % MoS_2	1041	–	4041	–	–
30 % PTFE	1611	–	–	–	–
30 % GF	1051	–	4051	–	5051
SD static dissipative	–	–	4201	–	5201

Application examples

Machined Parts
TECASINT 1000 – 4000 (PI)
Very high thermal resistance.
High strength even at high temperatures.

Test socket
TECASINT 4051 (PI)
Low water absorption.
High dimensional stability and thermal stability.
Good chemical resistance.



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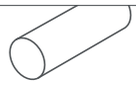
TECASINT 1000 **Rods**



	TECASINT 1011 (SINTIMID PUR HT)	**TECASINT 1021** (SINTIMID 15 G)	**TECASINT 1031** (SINTIMID 40 G)	**TECASINT 1041** (SINTIMID 30 M)	**TECASINT 1061** (SINTIMID PVX)	**TECASINT 1611** (SINTIMID 30 P)	
Chemical designation	PI	PI CS15	PI CS40	PI MO	PI mod	PI TF	
Density [g/cm³]	1,34	1,42	1,57	1,67	1,48	1,51	
Diameter [mm]							Tolerance [mm]
6	●	●	●	○	●	○	+0,1/+0,6
6,3 (1/4")	●	●	○	○	○	○	
8	○	○	○	○	○	○	
9,5 (3/8")	●	●	○	○	○	○	
10	●	●	●	○	●	○	
12	●	●	●	○	●	○	
12,7 (1/2")	●	●	○	○	○	○	
15	●	●	●	○	●	○	
15,8 (5/8")	●	●	○	○	○	○	
19,1 (3/4")	●	●	○	○	○	○	
25	●	●	●	○	●	○	+0,2/+0,8
25,4 (1")	●	●	○	○	○	○	
30	●	●	○	○	○	○	
35	○	○	○	○	○	○	
38,1 (1 1/2")	○	○	○	○	○	○	
40	●	●	●	○	●	○	
45	○	○	○	○	○	○	
50	●	●	●	○	●	○	+0,2/+1
50,8 (2")	●	●	●	○	●	○	
55	○	○	○	○	○	○	
60	○	○	○	○	○	○	
65	○	○	○	○	○	○	
70	○	○			○	○	
75	○	○			○	○	
80	○	○			○	○	
85	○						
90	○						
95	○						
100	○						

● Standard products (from stock or delivery at short notice)
○ Non-standard products (produced to order)

TECASINT 1000 Standard lengths [mm]	250	395	500	750	1000
Ø 6 – 15	•	•			
Ø 15,8 – 19,1	•	•	•	•	•
ab Ø 20	•		•	•	•

Also available ground.
Other diameters on request.
All information without guarantee.

TECASINT 4000 **Rods**

TECASINT Type	**4011 / 4021 / 4051 / 4201 / 4391**	**4111 / 4121**
Diameter	5 – 60 mm	5 – 60 mm
Standard lengths [mm]	250, 500, 750, 1000 mm	250, 500 mm

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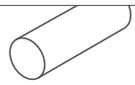
TECASINT 2000 / 8000 Rods



	TECASINT 2011 *new!*	TECASINT 2021 *new!*	TECASINT 2031 *new!*	TECASINT 2061 *new!*	TECASINT 2391 *new!*	TECASINT 8001 (SINTIMID 8000)	
Chemical designation	PI	PI CS15	PI CS40	PI mod	PI MoS_2 15	TF PI	
Density [g/cm³]	1,38	1,45	1,59	1,52	1,54	1,88	
Diameter [mm]							Tolerance [mm]
6	●	●	●	●	○	●	+0,1/+0,6
6,3 (1/4")	●	●	○	○	○	○	
8	○	○	○	○	○	○	
9,5 (3/8")	●	●	○	○	○	○	
10	●	●	●	●	○	●	
12	●	●	●	●	○	○	
12,7 (1/2")	●	●	○	○	○	○	
15	●	●	●	●	○	○	
15,8 (5/8")	●	●	○	○	○	○	
19,1 (3/4")	●	●	○	○	○	●	
25	●	●	●	●	○	●	+0,2/+0,8
25,4 (1")	●	●	○	○	○	○	
30	●	●	○	○	○	○	
35	○	○	○	○	○	○	
38,1 (1 1/2")	○	○	○	○	○	○	
40	●	●	●	●	○	●	
45	○	○	○	○	○	○	
50	●	●	●	●	○	●	+0,2/+1
50,8 (2")	●	●	●	●	○	●	
55	○	○	○	○	○	○	
60	○	○	○	○	○	○	
65	○	○		○	○	○	
70	○	○		○	○		
75							
80							
85							
90							
95							
100							

● Standard products (from stock or delivery at short notice)
○ Non-standard products (produced to order)

TECASINT 2000

Standard lengths [mm]	250	395	500	750	1000
Ø 6 – 15	•	•			
Ø 15,8 – 19,1	•	•	•	•	•
ab Ø 20	•		•	•	•

TECASINT 8001

Standard lengths [mm]	240	385	490	740	990
Ø 6 – 15	•	•			
Ø 15,88 – 20	•	•	•	•	•
ab Ø 21	•		•	•	•

Also available ground.
Other diameters on request.
All information without guarantee.

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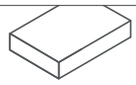
TECASINT 1000 **Plates**



	TECASINT 1011 (SINTIMID PUR HT)	**TECASINT 1021** (SINTIMID 15 G)	**TECASINT 1031** (SINTIMID 40 G)	**TECASINT 1041** (SINTIMID 30 M)	**TECASINT 1061** (SINTIMID PVX)	**TECASINT 1611** (SINTIMID 30 P)	
Chemical designation	PI	PI CS15	PI CS40	PI MO	PI mod	PI TF	
Density [g/cm³]	1,34	1,42	1,57	1,67	1,48	1,51	
Thickness [mm]							Tolerance [mm]
5	●	●	●	○	●	○	0/+0,8
6	●	●	○	○	○	○	
8	○	○	○	○	○	○	
10	●	●	○	○	○	○	
12	●	●	●	○	●	○	
12,7 (1/2")	●	●	●	○	●	○	
15	●	●	○	○	○	○	
20	●	●	●	○	●	○	
25	●	●	○	○	○	○	0/+1,0
25,4 (1")	●	●	○	○	○	○	
30	●	●	●	○	●	○	
35	●	●	○	○	○	○	
40	●	●	○	○	○	○	
45	○	○	○	○	○	○	
50	○	○	○	○	○	○	
50,8 (2")	●	●	●	○	●	○	
55	○	○	○	○	○	○	
60	●	●	●	○	●	○	
65	●	●	●	○	●	○	0/+1,5
70	○	○	○	○	○	○	
75	○	○	○	○	○	○	
80	○	○	○	○	○	○	
85	○	○			○	○	
90	○	○			○	○	
95	○	○			○	○	
100	○						

● Standard products (from stock or delivery at short notice)
○ Non-standard products (produced to order)

TECASINT 1000 Shipping dimensions [mm]	300 × 250	300 × 500	300 × 750	300 × 1000	195 × 195	195 × 395	395 × 395	395 × 795
5 – 9,5	•	•	•	•	•			
10 – 50,8	•	•	•	•	•	•	•	•
55 – 100	•	•	•	•				

On request: Intermediate thickness dimensions.
All information without guarantee.

TECASINT 4000 **Plates**

TECASINT Type	**4011 / 4021 / 4051 / 4201 / 4391**	**4111 / 4121**
Maximum size	300 x 1000 mm	300 x 500 mm
Thickness	5 – 65 mm	5 – 65 mm
Standard lengths	250, 500, 750, 1000 mm	250, 500 mm

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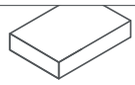
TECASINT 2000 / 5000 / 8000 **Plates**



	TECASINT 2011	TECASINT 2021	TECASINT 2031	TECASINT 2061	TECASINT 2391 *new!*	TECASINT 5011 (SINTIMID PAI PUR)	TECASINT 5051 (SINTIMID PAI GF30)	TECASINT 8001 (SINTIMID 8000)	
Chemical designation	PI	PI CS15	PI CS40	PI mod	PI MoS_2 15	PAI	PAI GF30	TF PI	
Density [g/cm³]	1,38	1,45	1,59	1,52	1,54	1,38	1,57	1,88	
Thickness [mm]									Tolerance [mm]
5	○	○	○	○	○	○	○	○	0/+0,8
6			○	○	○	○	○	○	
8	○	○	○	○	○	○	○	○	
10	●	●	●	●	○	●	●	●	
12	●	●	○	○	○	○	○	○	
12,7 (1/2")	●	●	○	○	○	○	○	○	
15	●	●	○	○	○	●	●	○	
20	●	●	●	●	○	●	●	●	
25	●	●	●	●	○	●	●	●	0/+1,0
25,4 (1")	●	●	○	○	○	○	○	○	
30	●	●	●	●	○	●	●	●	
35	○	○	○	○	○	○	○	○	
40	●	●	●	●	○	●	●	●	
45	○	○	○	○	○	○	○	○	
50	●	●	●	●	○	○	○	○	
50,8 (2")	●	●	○	○	○	○	○	○	
55	○	○	○	○	○	○	○	○	
60	○	○	○	○	○	○	○	○	
65	○	○		○	○	○	○	○	0/+1,5
70	○	○		○					
75									
80									
85									
90									
95									
100									

● Standard products (from stock or delivery at short notice)
○ Non-standard products (produced to order)

TECASINT 2000 / 5000 Shipping dimensions [mm]	300 × 250	300 × 500	300 × 750	300 × 1000	195 × 195	195 × 395	395 × 395	395 × 795
5 – 9,5	•	•	•	•	•			
10 – 50,8	•	•	•	•	•	•	•	•
55 – 100	•	•	•	•				

TECASINT 8001 Shipping dimensions [mm]	185 × 185	185 × 385	290 × 240	290 × 490	290 × 740	290 × 990	385 × 385	385 × 785
5 – 9,5			•	•	•	•		
10 – 50,8	•	•	•	•	•	•	•	•
55 – 100			•	•	•	•		

On request: Intermediate thickness dimensions.
All information without guarantee.

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TECAFINE TECANYL TECARAN

Polyolefins such as polyethylene (TECAFINE PE) and polypropylene (TECAFINE PP) are semi-crystalline thermoplastics from the group of standard polymers. Alongside their minimal density, they are characterized primarily by good chemical resistance, low water absorption and good electrical insulating properties. Acrylonitrile-butadiene-styrene graft copolymer (TECARAN ABS) is an amorphous thermoplastic which has a high impact strength even at low temperatures, as well as low moisture absorption. PPE (TECANYL) is used predominantly for components in which high heat deflection temperature, dimensional stability and dimensional accuracy are key.

Overview of types

TECAFINE PE10
(PE-UHMW)
Very good sliding friction properties.
Very good electrical insulation.
Tough at low temperatures.

TECAFINE PE5
(PE-HMW)
Good sliding properties, abrasion resistant.

TECAFINE PE
(PE-HD)
Very low moisture absorption.
Easily weldable.

TECAFINE PP
(PP)
Very low moisture absorption, very good electrical insulation.

TECAFINE PP GF30
(PP GF)
Very low moisture absorption, high dimensional accuracy.

TECAFINE PMP
(PMP)
Transparent, also in the UV range.
Very good electrical insulation.

TECAPRO MT
(PP)
→ p. 66

TECAPRO SAN
(PP)
→ p. 72

TECANYL
(PPE)
Good strength.
Very good electrical insulation.

TECANYL GF30
(PPE GF)
Very high rigidity, good welding and adhesion capability.

TECANYL MT
(PPE)
→ p. 66

TECARAN ABS
(ABS)
Extreme rigidity and toughness.
Very good electrical insulation.

Application examples

Grip handle for kitchen appliances
TECARAN (ABS)
Easy machinability and toughness.
High impact strength.
Minimal weight.
Easily bonded.

Stripper
TECAFINE PE (PE)
Good sliding properties.
Food conformity.
Resistant to cleaning agents.
High degree of toughness.

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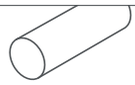
OTHERS Rods



	TECAFINE PMP	**TECANYL 731** grey	**TECANYL GF30**	**TECARAN ABS** grey	
Chemical designation	PMP	PPE	PPE	ABS	
Density [g/cm³]	0,83	1,10	1,30	1,04	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10	0,073	0,096	0,114	0,091	+0,10/+0,80
12	0,105	0,139	0,164	0,131	+0,20/+0,90
14	0,141	0,187	0,220	0,176	
15	0,161	0,213	0,252	0,201	
16	0,182	0,241	0,285	0,228	
18	0,229	0,303	0,358	0,287	
20	0,281	0,372	0,440	0,352	
22	0,343	0,454	0,537	0,429	+0,20/+1,20
25	0,439	0,582	0,688	0,550	
28	0,500	0,726	0,858	0,686	
30	0,627	0,831	0,982	0,785	
32	0,711	0,942	1,11	0,891	
36	0,905	1,20	1,42	1,13	+0,20/+1,60
40	1,11	1,47	1,74	1,39	
45	1,42	1,88	2,22	1,77	+0,30/+2,00
50	1,74	2,31	2,72	2,18	
56	2,17	2,88	3,40	2,72	
60	2,51	3,32	3,93	3,14	+0,30/+2,50
65	2,93	3,89	4,59	3,67	
70	3,39	4,49	5,31	4,25	
75	3,91	5,18	6,13	4,90	+0,40/+3,00
80	4,44	5,88	6,95	5,56	
90	5,62	7,45	8,81	7,04	+0,50/+3,40
100	6,94	9,20	10,88	8,70	+0,60/+3,80
110	8,41	11,14	13,17	10,54	+0,70/+4,20
120	10,01	13,27	15,68	12,54	+0,80/+4,60
125	10,84	14,37	16,98	13,59	
135	12,69	16,82	19,88	15,90	+0,90/+5,40
140	13,63	18,06	21,34	17,07	
150	15,65	20,74	24,51	19,61	+1,00/+5,80
160	17,82	23,61	27,9	22,33	+1,10/+6,30
165	19,06	25,3	29,9	23,88	+1,20/+7,40
180	22,58	29,9	35,4	28,3	
200	27,9	37,0	43,7	35,0	+1,30/+8,50

Tolerances according to DIN:
length 0 / +3 %

Stock length 3.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available ground. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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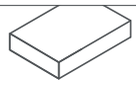
OTHERS Plates



	TECAFINE PMP	TECANYL 731 grey	TECANYL GF30	TECARAN ABS grey	
Chemical designation	PMP	PPE	PPE	ABS	
Density [g/cm³]	0,83	1,10	1,30	1,04	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5 x 500		3,15	3,72		+0,20/+0,70
6 x 500		3,73	4,40		
8 x 500		5,00	5,91		+0,20/+1,10
10 x 500	4,64	6,15	7,27	5,82	
10 x 620	5,73	7,59	8,97	7,17	
12 x 500	5,62	7,45	8,81	7,05	+0,30/+1,50
12 x 620	6,93	9,19	10,86	8,69	
15 x 500	6,93	9,19	10,86	8,69	
15 x 620	8,55	11,33	13,39	10,71	
16 x 500	7,37	9,77	11,54	9,23	
16 x 620	9,09	12,04	14,23	11,38	
18 x 500	8,24	10,92	12,91	10,33	
18 x 620	10,16	13,47	15,91	12,73	
20 x 500	9,11	12,08	14,27	11,42	
20 x 620	11,24	14,89	17,60	14,08	
20 x 1.000*		23,80	28,1		
25 x 500	11,29	14,97	17,69	14,15	
25 x 620	13,92	18,45	21,81	17,45	
25 x 1.000*		29,5	34,9		
30 x 500	13,73	18,20	21,51	17,21	+0,50/+2,50
30 x 620	16,93	22,44	26,5	21,22	
30 x 1.000*		35,9	42,4		
35 x 500	15,91	21,09	24,93	19,94	
35 x 620	19,62	26,0	30,7	24,59	
35 x 1.000*		41,6	49,1		
40 x 500	18,09	23,98	28,3	22,67	
40 x 620	22,31	29,6	34,9	27,9	
40 x 1.000*		47,3	55,9		
45 x 500	20,27	26,9	31,8	25,4	
45 x 620	25,0	33,1	39,1	31,3	
45 x 1.000*		53,0	62,6		
50 x 500	22,45	29,8	35,2	28,1	
50 x 620	27,7	36,7	43,4	34,7	
50 x 1.000*		58,6	69,3		
60 x 500	27,0	35,8	42,3	33,9	+0,50/+3,50
60 x 620	33,3	44,2	52,2	41,8	
60 x 1.000*		70,6	83,5		
70 x 500	31,4			39,3	
80 x 500	36,1			45,2	+0,50/+5,00
90 x 500	40,4			50,7	
100 x 500	44,8			56,1	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

* Stock length 2.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available planed. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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Medical technology

The biocompatibility of a material is a prerequisite for its use in medical applications with direct tissue contact, such as short-term implants, medical appliances or drugs. Materials or assemblies designated as biocompatible are those which do not exert any negative impact on life forms in their environment.

Ensinger develops and produces stock shapes, components and profiles made of thermoplastics whose excellent properties ensure compliance with the stringent requirements imposed in the field of medical technology:

- → Physiological harmlessness in compliance with application conditions due to biocompatibility
- → Very good resistance to cleaning agents and disinfectants as well as a large number of solvents, customary sterilization methods including hot steam, ethylene oxide, hot air or gamma radiation
- → Modified electrical properties: Good electrical insulation for high-frequency surgery
- → Precision and strength of finished parts and components

The combination of these different attributes allows high-quality devices to be used intensively over long periods.

Ensinger quality in the world of medical technology

The demands made on quality, product documentation and product approvals are particularly stringent in the field of medical technology. Ensinger is certified in accordance with the quality standards set out in EN ISO 13485 in the fields of compounding, stock shape and industrial profile production, as well as injection moulding and machining. Ensinger consequently fulfils a special duty of care when it comes to traceability. For our customers, using pre-tested materials simplifies the process of obtaining approvals for their own medical technology products. Ensinger materials suitable for medical applications (MT grade materials) comply with requirements relating to direct contact with human tissue over a period of up to 24 hours. Special materials such as TECAPEEK Classix™ are approved for longer contact periods.

Diversity re-packaged

Ensinger offers high-performance plastics for medical applications in a wide variety of colours. New individual packaging simplifies the process of material storage. Up until they are processed, these high-grade stock shapes are protected by a transparent film, eliminating the need for labour-intensive cleaning. A handy perforation makes for ease of opening.

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Overview of types

TECAPEEK CLASSIX™
(PEEK)
Tissue contact for up to 30 days. Extension of up to 180 days possible. Seamless cytotoxicity testing from the raw material to the stock shape.

TECAPEEK CLASSIX™ XRO20
(PEEK, contrast medium)
Same characteristics as TECAPEEK CLASSIX™. Contrast medium permits visibility under X-ray illumination and radiation.

TECAPEEK MT
(PEEK)
Very good resistance to chemicals and sterilization. High radiation resistance. Available in a variety of colours.

TECAPEEK CF30 MT
(PEEK CF)
Very good resistance to chemicals and sterilization. High radiation resistance.

TECASON P MT
(PPSU)
High strength, hardness and rigidity. Excellent thermal dimensional stability. Autoclavable. Available in a variety of colours.

TECASON P MT XRO
(PPSU, opacifier medium)
Same properties as TECASON P MT. Contrast agent permits visibility under X-ray illumination and radiation.

TECAPEI MT
(PEI)
Very good mechanical and electrical properties. Available in a variety of colours.

TECANYL MT
(PPE)
Sterilization resistant and dimensionally stable. High impact strength. Low density. Available in a variety of colours.

TECAFORM AH MT
(POM-C)
Very good sliding and abrasion behaviour. Resistant to organic solvents. Available in a variety of colours.

TECAPRO MT
(PP)
Sterilization resistant and dimensionally stable. Good machining properties.

TECATEC Composite
Available on request.

Application examples

Spring in support orthosis
TECAPEEK MT (PEEK)
High flexibility. Good strength. Easy formability. Light weight and "warm" to the touch.

Storage container
TECAPRO MT PP (PP)
Good strength. Resistant to sterilization. Low weight.

Dental healing cap
TECAPEEK CLASSIX™ (PEEK)
Temporary implant. Tissue contact for up to 30 days.

Test implant for knee implant
TECASON P MT (PPSU)
Capable of steam sterilization. Biocompatible.

PercuTwist dilator for tracheotomy
TECAPEEK MT (PEEK)
Good chemical resistance. Very good resistance to sterilization. High precision for a sharp-edged, burr-free thread.

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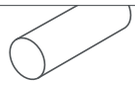
MEDICAL Rods



	TECAPEEK MT	**TECAPEEK MT** black	**TECAPEEK MT** blue	**TECAPEEK MT** green	**TECAPEEK MT** yellow	**TECAPEEK MT** ivory	**TECAPEEK MT** bright red	
Chemical designation	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	
Density [g/cm³]	1,31	1,31	1,34	1,32	1,38	1,42	1,36	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5	0,030	0,030						+0,10/+0,60
6	0,042	0,042						
8	0,074	0,074	0,076	0,075	0,078	0,080	0,077	+0,10/+0,70
10	0,114	0,114	0,116	0,114	0,120	0,123	0,118	
12	0,164	0,164	0,168	0,165	0,173	0,178	0,170	+0,20/+0,80
15	0,252	0,252	0,258	0,254	0,266	0,273	0,262	
16	0,286	0,286	0,292	0,288	0,301	0,310	0,297	
18	0,359	0,359	0,367	0,362	0,378	0,389	0,373	
20	0,441	0,441	0,451	0,444	0,465	0,478	0,458	
22	0,536	0,536	0,548	0,540	0,565	0,581	0,556	+0,20/+1,00
25	0,688	0,688	0,704	0,693	0,725	0,746	0,714	
28	0,858	0,858	0,878	0,865	0,904	0,930	0,891	
30	0,983	0,983	1,01	0,990	1,04	1,07	1,02	
32	1,12	1,12	1,15	1,13	1,18	1,22	1,16	+0,20/+1,20
36	1,41	1,41	1,45	1,42	1,49	1,53	1,47	
40	1,74	1,74	1,78	1,75	1,83	1,88	1,80	
45	2,20	2,20	2,25	2,22	2,32	2,39	2,29	+0,30/+1,30
50	2,71	2,71	2,77	2,73	2,85	2,94	2,81	
56	3,39	3,39	3,46	3,41	3,57	3,67	3,52	
60	3,90	3,90	3,99	3,93	4,11	4,23	4,05	+0,30/+1,60
65	4,56	4,56	4,67	4,60	4,81	4,95	4,74	
70	5,28	5,28	5,40	5,32	5,57	5,73	5,48	
80	6,92	6,92	7,08	6,97	7,29	7,50	7,18	+0,40/+2,00
90	8,76	8,76						+0,50/+2,20
100	10,82	10,82						+0,60/+2,50
110	13,13							+0,70/+3,00
120	15,66							+0,80/+3,50
150	24,44							+1,00/+4,20
160	27,8							+1,10/+4,50
180	35,2							+1,20/+5,00
200	43,4							+1,30/+5,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available ground. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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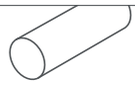
MEDICAL Rods

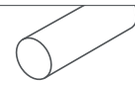


	TECAPEEK CF30 MT	
Chemical designation	PEEK	
Density [g/cm³]	1,42	
Diameter [mm]	[kg/m]	Tolerance [mm]
10	0,124	+0,10/+0,80
12	0,179	+0,20/+0,90
15	0,275	
16	0,312	
18	0,391	
20	0,480	
22	0,586	+0,20/+1,20
25	0,751	
28	0,937	
30	1,07	
32	1,22	
36	1,55	+0,20/+1,60
40	1,90	
45	2,42	+0,30/+2,00
50	2,98	

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

MEDICAL Rods



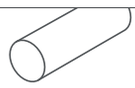
	TECAPEEK CLASSIX white	TECAPEEK CLASSIX XRO20	
Chemical designation	PEEK	PEEK	
Density [g/cm³]	1,40	1,65	
Diameter [mm]	[kg/m]	[kg/m]	Tolerance [mm]
6	0,040*	0,047*	-0,03/+0,00
8	0,071*	0,084*	-0,04/+0,00
10	0,112*	0,132*	
20	0,447*	0,527*	-0,05/+0,00
30	1,01*	1,19*	
40	1,87	2,21	+0,20/+1,50
45	2,37	2,80	+0,30/+1,70

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

* Oberfläche geschliffen

MEDICAL Rods



	TECASON P MT black	TECASON P MT blue	TECASON P MT green	TECASON P MT red	TECASON P MT yellow	TECASON P MT ivory	TECASON P MT grey	
Chemical designation	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	
Density [g/cm³]	1,31	1,31	1,31	1,31	1,31	1,31	1,31	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
19,05	0,403	0,403	0,403	0,403	0,403	0,403	0,403	+0,20/+0,90
25,40	0,715	0,715	0,715	0,715	0,715	0,715	0,715	+0,20/+1,20
31,75	1,11	1,11	1,11	1,11	1,11	1,11	1,11	
38,10	1,60	1,60	1,60	1,60	1,60	1,60	1,60	+0,20/+1,60
44,45	2,18	2,18	2,18	2,18	2,18	2,18	2,18	+0,30/+2,00
50,80	2,83	2,83	2,83	2,83	2,83	2,83	2,83	
57,15	3,60	3,60	3,60	3,60	3,60	3,60	3,60	+0,30/+2,50
63,50	4,42	4,42	4,42	4,42	4,42	4,42	4,42	
69,85	5,33	5,33	5,33	5,33	5,33	5,33	5,33	
76,20	6,37	6,37	6,37	6,37	6,37	6,37	6,37	+0,40/+3,00
88,90	8,66	8,66	8,66	8,66	8,66	8,66	8,66	+0,50/+3,40

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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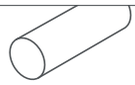
MEDICAL Rods

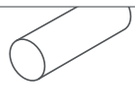


	TECASON P MT XRO black	**TECASON P MT XRO** blue	**TECASON P MT XRO** green	**TECASON P MT XRO** red	**TECASON P MT XRO** yellow	**TECASON P MT XRO** ivory	**TECASON P MT XRO** brown	
Chemical designation	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	
Density [g/cm³]	1,31	1,31	1,31	1,31	1,31	1,31	1,31	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
25,4	0,715	0,715	0,715	0,715	0,715	0,715	0,715	+0,20/+1,20
38,1	1,60	1,60	1,60	1,60	1,60	1,60	1,60	+0,20/+1,60
50,8	2,83	2,83	2,83	2,83	2,83	2,83	2,83	+0,30/+2,00
63,5	4,42	4,42	4,42	4,42	4,42	4,42	4,42	+0,30/+2,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 2.440 mm

MEDICAL Rods

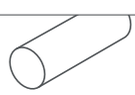


	TECAFORM AH MT black	**TECAFORM AH MT** blue	**TECAFORM AH MT** green	**TECAFORM AH MT** red	**TECAFORM AH MT** yellow	**TECAFORM AH MT** grey	**TECAFORM AH MT** brown	**TECAFORM AH MT** rust	**TECAFORM AH MT** **light** blue	
Chemical designation	POM-C	POM-C	POM-C	POM-C	POM-C	POM-C	POM-C	POM-C	POM-C	
Density [g/cm³]	1,41	1,41	1,41	1,41	1,41	1,41	1,41	1,41	1,41	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
25,4	0,732	0,732	0,732	0,732	0,732	0,732	0,732	0,732	0,732	+0,00/+0,13
38,1	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	1,65	
50,8	2,92	2,92	2,92	2,92	2,92	2,92	2,92	2,92	2,92	
63,5	4,61	4,61	4,61	4,61	4,61	4,61	4,61	4,61	4,61	+0,00/+0,76
76,2	6,62	6,62	6,62	6,62	6,62	6,62	6,62	6,62	6,62	
88,9	9,00	9,00	9,00	9,00	9,00	9,00	9,00	9,00	9,00	

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 2.440 mm

MEDICAL Rods



	TECANYL MT black	**TECANYL MT** blue	**TECANYL MT** green	**TECANYL MT** yellow	**TECANYL MT** grey	**TECANYL MT** brown	
Chemical designation	PPE	PPE	PPE	PPE	PPE	PPE	
Density [g/cm³]	1,05	1,08	1,09	1,05	1,10	1,08	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
38,1	1,28	1,32	1,33	1,28	1,34	1,32	+0,20/+1,60

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 2.440 mm

Stock item
Non-stock item – special production

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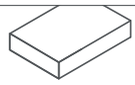
MEDICAL Plates

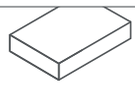


	TECAPRO MT white	TECAPRO MT black	
Chemical designation	PP	PP	
Density [g/cm³]	0,93	0,92	
Dimensions [mm]	[kg/m]	[kg/m]	Tolerance [mm]
12,7 x 610	7,52	7,44	+0,00/+0,64
25,4 x 610	14,85	14,69	
38,1 x 610	22,19	21,95	
50,8 x 610	29,5	29,2	
63,5 x 610	36,9	36,5	

Tolerances according to DIN:
length 0 / +12,7 mm
width 0 / +6,35 mm

Stock lengths 1.220 mm

MEDICAL Plates



	TECAPEEK MT	TECAPEEK MT black	TECAPEEK CF30 MT	TECASON P MT black	
Chemical designation	PEEK	PEEK	PEEK	PPSU	
Density [g/cm³]	1,31	1,31	1,42	1,31	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5 x 500	3,75	3,75		3,75	+0,20/+0,70
10 x 500	7,33	7,33	7,94	7,33	+0,20/+1,10
20 x 500	14,38	14,38	15,59	14,38	+0,30/+1,50
25 x 500	17,82	17,82	19,32		
30 x 500	21,68	21,68	23,50	21,68	+0,50/+2,50
40 x 500	28,6	28,6	31,0	28,6	
50 x 500	35,4	35,4	38,4	35,4	
60 x 500	42,7	42,7		42,7	+0,50/+3,50
70 x 300	30,3	30,3		30,3	
80 x 300	30,6	34,8		34,8	+0,50/+5,00

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

Stock item
Non-stock item – special production

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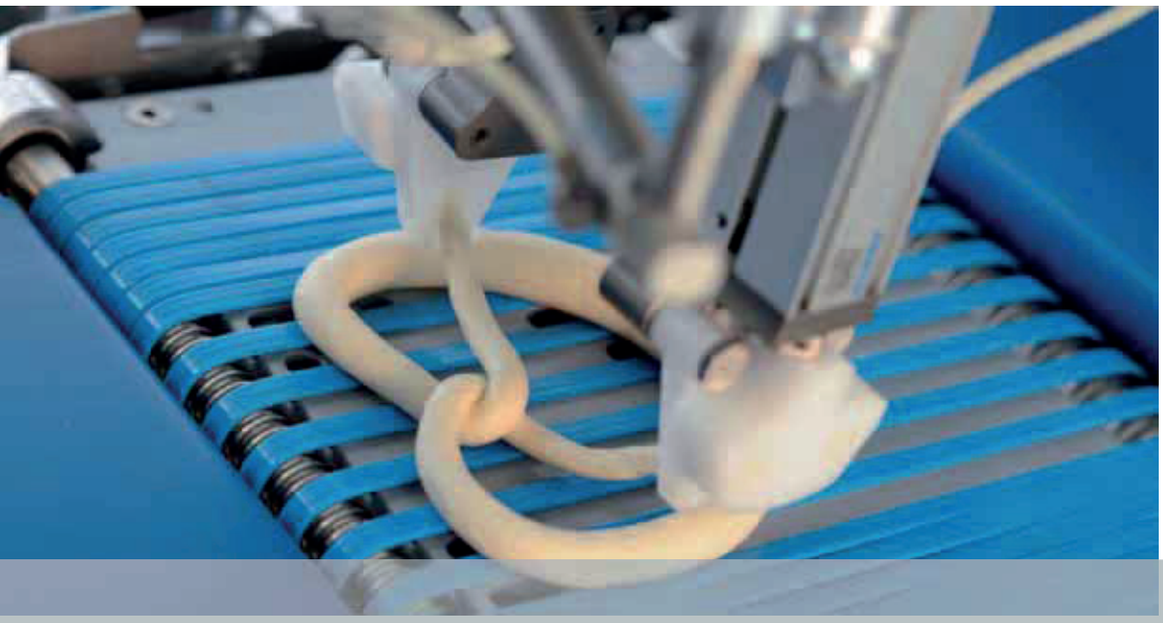

Food technology

Plastics also have a wide range of benefits to offer over metallic materials in the field of food processing. Polymers demonstrate no corrosion, and are highly resistant to chemicals. Their properties can be optimized for certain applications (e.g. sliding properties, detectability). These benefits permit substantial reductions in terms of cleaning, maintenance and material costs.

There are widely varied application possibilities for technical plastics in plant and machinery for meat, fish and poultry processing. Materials from Ensinger enhance production speed and safety in the manufacture of dairy produce, baked goods and confectionery production. They are frequently used in this type of application as gears, bearing bushes or in the form of other machine components. Plastics can also come into direct contact with foodstuffs, for example in filling, mixing and portioning systems.

Product safety first

Materials which come into direct contact with foodstuffs may not under normal or foreseeable applications give off any constituent parts into food in quantities which could endanger human health. This stipulation is defined in food regulatory standards and safeguarded by means of tests, controls and stipulations. Ensinger offers a broad portfolio of plastics which comply with the requirements for direct food contact as stipulated by BfR, FDA and EU regulations (such as VO 10/2011). These are certified by Ensinger on an order-specific basis. Product safety takes number one priority at Ensinger. Alongside proof of physiological harmlessness, the special care we take is reflected in product-specific certificates of conformity and in seamless traceability.

Ensinger quality in the world of food technology

Our Quality Management is in step with international standards and is firmly rooted in our corporate procedures. Our products are manufactured in compliance with the requirements of EU Regulation 2023/2006 on good manufacturing practice (GMP) for materials and articles intended to come into contact with food.

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Ensinger materials for food technology:

TECAPEEK ID blue
(PEEK, detectable filler)
Suitable for permanent utilization at up to 260 °C. Excellent chemical resistance. Inductively detectable. Conforms with food regulations.

TECAFORM AH ID
(POM-C, detectable filler)
Very good machining properties. Minimal water absorption. Inductively detectable. Conforms with food regulations. Available in blue and grey.

TECAFORM AX
(POM-C)
Very good chemical resistance. Very good mechanical properties. Excellent machining capability. Conforms with food regulations.

TECAPEEK TF10 blue
(PEEK TF)
Very good sliding properties. Excellent chemical resistance. Conforms with food regulations.

TECAFORM AH SAN
(POM C)
Good chemical resistance. High resiliance. Antimicrobial effect.

TECAPRO SAN
(PP)
Very low moisture absorpion. Antimicrobial effect.

Additional materials conforming to food regulations are available from the standard portfolio.

TECAFINE PE / PP
TECANYL
TECAFORM AH
TECAFORM AH SAN
TECAMID 6
TECAMID 66
TECAPET
TECANAT
TECAFLON PVDF
TECASON P
TECASON S
TECAPEI
TECAPEEK
TECAPRO SAN

The above specified materials are also available in blue on request.

Application examples

Scraper
TECAFORM AH ID
(POM-C, detectable filler)
Inductively detectable.
Good toughness and strength.
Good resistance to cleaning agents.

Piston
TECADUR PET (PET)
High strength.
Good creep resistance.
High dimensional stability.

Conveyor screw
TECAGLIDE (PA 6 C)
Low sliding coefficient.
Good abrasion behaviour.
Good machining capability.
For applications without food contact.

Throughfeed filler
TECAMID 6 (PA 6)
High degree of toughness.
Resistant to oils, greases and fuels.
Good abrasion resistance.
MAJA-Maschinenfabrik Hermann Schill GmbH & Co KG

Object slide
TECAFORM AD (POM-H)
High strength.
Good chemical resistance.
Good machinability.
Schreyer Sondermaschinen GmbH

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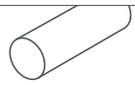
FOOD Rods



	TECAFORM AH ID	TECAFORM AH ID blue	TECAFORM AH blue	TECAFORM AX	TECAFORM AH SAN	TECAPEEK TF10 blue	TECAPEEK ID blue	
Chemical designation	POM-C	POM-C	POM-C	POM-C	POM -C	PEEK	PEEK	
Density [g/cm³]	1,49	1,49	1,41	1,42	1,41	1,38	1,49	
Diameter [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
10	0,129	0,129	0,122	0,123	0,122	0,120	0,129	+0,10/+0,70
12	0,187	0,187	0,176	0,178	0,176	0,173	0,187	+0,20/+0,80
14	0,251	0,251	0,237	0,239	0,237	0,232	0,251	
15	0,287	0,287	0,271	0,273	0,271	0,266	0,287	
16	0,325	0,325	0,308	0,310	0,308	0,301	0,325	
18	0,409	0,409	0,387	0,389	0,387	0,378	0,409	
20	0,502	0,502	0,475	0,478	0,475	0,465	0,502	
22	0,610	0,610	0,577	0,581	0,577	0,565	0,610	+0,20/+1,00
25	0,782	0,782	0,740	0,746	0,740	0,725	0,782	
28	0,976	0,976	0,924	0,930	0,924	0,904	0,976	
30	1,12	1,12	1,06	1,07	1,06	1,04	1,12	
32	1,28	1,28	1,21	1,22	1,21	1,18	1,28	+0,20/+1,20
36	1,61	1,61	1,52	1,53	1,52	1,49	1,61	
40	1,98	1,98	1,87	1,88	1,87	1,83	1,98	
45	2,50	2,50	2,37	2,39	2,37	2,32	2,50	+0,30/+1,30
50	3,08	3,08	2,91	2,94	2,91	2,85	3,08	
56	3,85	3,85	3,64	3,67	3,64	3,57	3,85	
60	4,43	4,43	4,20	4,23	4,20	4,11	4,43	+0,30/+1,60
65	5,19	5,19	4,91	4,95	4,91	4,81	5,19	
70	6,01	6,01	5,69	5,73	5,69	5,57	6,01	
75	6,93	6,93	6,56	6,61	6,56	6,42	6,93	+0,40/+2,00
80	7,87	7,87	7,45	7,50	7,45	7,29	7,87	
85	8,90	8,90	8,42	8,48	8,42	8,24	8,90	+0,50/+2,20
90	9,96	9,96	9,43	9,49	9,43	9,23	9,96	
95	11,13	11,13	10,53	10,60	10,53	10,31	11,13	+0,60/+2,50
100	12,31	12,31	11,65	11,73	11,65	11,40		
110	14,93	14,93	14,13	14,23				+0,70/+3,00
120	17,81	17,81	16,85	16,97				+0,80/+3,50
125	19,30	19,30	18,26	18,39				
130	20,91	20,91	19,79	19,93				+0,90/+3,80
135	22,52	22,52	21,31	21,46				
140	24,19	24,19	22,89	23,05				
150	27,8	27,8	26,3	26,5				+1,00/+4,20
160			29,9	30,1				+1,10/+4,50
165			31,9	32,1				+1,20/+5,00
180			37,9	38,1				
200			46,7	47,1				+1,30/+5,50

Tolerances according to DIN:
length 0 / +3 %

Stock lengths 3.000 mm

Special materials

Stock item
Non-stock item – special production

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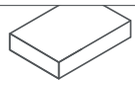
FOOD Plates

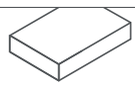


	TECAFORM AH ID	TECAFORM AH ID blue	TECAFORM AH blue	TECAFORM AX	TECAPEEK ID blue	
Chemical designation	POM-C	POM-C	POM-C	POM-C	PEEK	
Density [g/cm³]	1,49	1,49	1,41	1,42	1,49	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
5 x 500			4,04	4,07		+0,20/+0,70
6 x 500			4,78	4,81		
8 x 500			6,41	6,45		+0,20/+1,10
10 x 500	8,34	8,34	7,89	7,94	8,34	
12 x 500	10,10	10,10	9,55	9,62	10,10	+0,30/+1,50
15 x 500	12,44	12,44	11,78	11,86	12,44	
16 x 500	13,23	13,23	12,52	12,61	13,23	
18 x 500	14,79	14,79	14,00	14,10	14,79	
20 x 500	16,36	16,36	15,48	15,59	16,36	
22 x 500	17,92	17,92	16,96	17,08	17,92	
25 x 500	20,27	20,27	19,18	19,32	20,27	
30 x 500	24,65	24,65	23,33	23,50	24,65	+0,50/+2,50
35 x 500	28,6	28,6	27,0	27,2	28,6	
40 x 500	32,5	32,5	30,7	31,0	32,5	
45 x 500	36,4	36,4	34,4	34,7		
50 x 500	40,3	40,3	38,1	38,4		
60 x 500	48,5	48,5	45,9	46,2		+0,50/+3,50
70 x 500	56,4	56,4	53,3	53,7		
80 x 500	64,8	64,8	61,3	61,7		+0,50/+5,00
90 x 500			68,7	69,2		
100 x 500			76,1	76,6		

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 3.000 mm

FOOD Plates



	TECAPRO SAN	
Chemical designation	PP	
Density [g/cm³]	0,92	
Dimensions [mm]	[kg/m]	Tolerance [mm]
12,7 x 610	7,44	+0,00/+0,64
25,4 x 610	14,69	
38,1 x 610	21,95	
50,8 x 610	29,2	
63,5 x 610	36,5	

Tolerance length : 0 / +12,7 mm
Tolerance width: 0 / +6,35 mm

Stock lengths 1.220 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible, also available planed. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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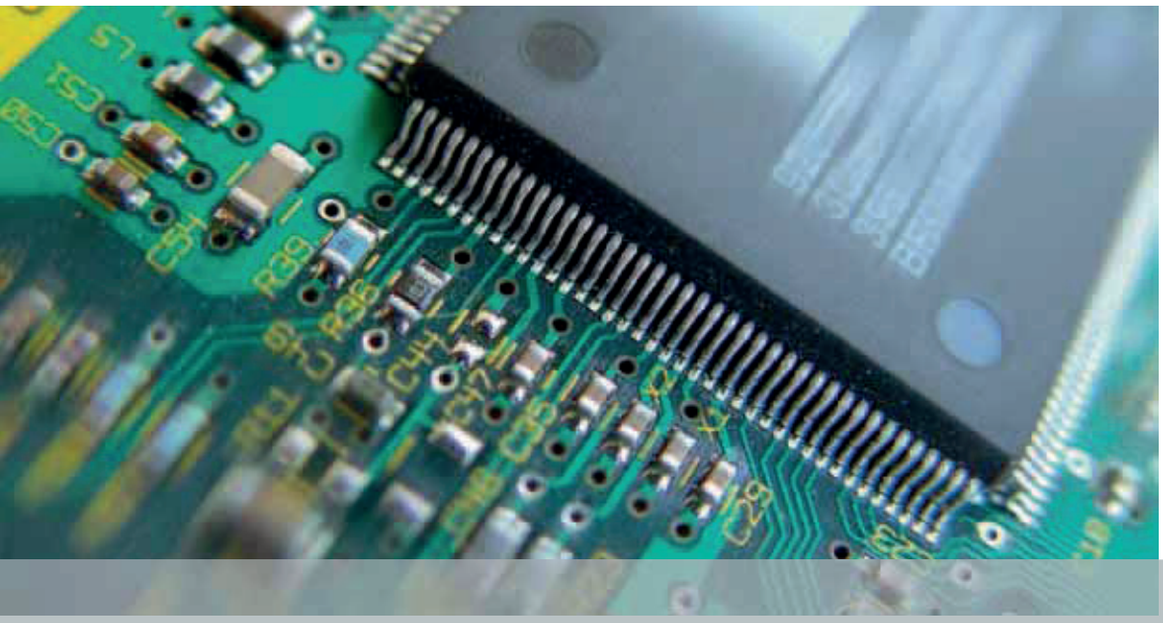


Electronics and semi-conductor technology

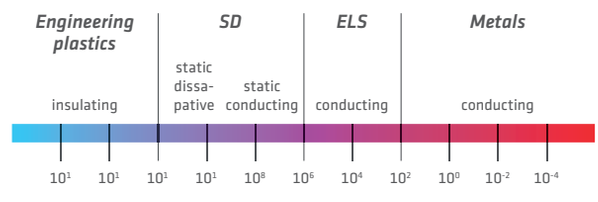
With excellent electrical properties ranging from fully insulating to electrically conductive, plastics are an essential material in the electrotechnical industry.

Plastics, which when unmodified are generally electrically insulating, can be adjusted to provide properties ranging from antistatic to conductive by modification with conductivity additives. At the same time, the basic polymers can be selected for their inherent suitability to the application in question. This opens up extensive material diversity and consequently a broad range of possible applications in the electronic, semi-conductor and mechanical engineering industries.

The wide range of different electrotechnical applications is reflected in the diverse requirements imposed on the plastics used: In the field of semi-conductor technology, parts such as retaining rings for wafer processing (CMP process) are made using materials with excellent chemical and abrasion resistance. Another type of component used in the field of semi-conductor technology are test sockets, which also require a high degree of dimensional stability over a broad temperature range, and excellent machining properties to permit even the smallest boreholes to be produced. To ensure the reliable handling of highly sensitive electronic components, statically dissipating materials may also have to be used.

This allows damage or destruction of the components to be significantly reduced during production. Electrically active materials are also used in the mechanical engineering industry, in conveyor technology and in the field of explosion protection. In these applications, the ability to selectively dissipate electrical charges is a decisive factor in the prevention of explosive discharges. Plastics with modified conductivity also have a range of benefits to offer over metal when used in electrical components or when exposed to the effects of weather or damp. Consequently some of these materials have good resistance to weathering, provide protection against thermomechanical stress and are only minimally susceptible to corrosion. Because of these properties, they enjoy increasing use in automotive applications and in the field of renewable energies.

Depending on the required degree of conductivity, Ensinger has a variety of materials to offer in the field of engineering or high-performance plastics.



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Ensinger materials for the electronics and semi-conductor industry:

Electronics

TECASINT 5201
(PAI)
High thermal-mechanical load properties, statically dissipating.

TECAPEEK ELS nano
(PEEK, CNT)
Electrically conductive, excellent chemical resistance, good machining properties.
→ p. 54

TECAFLON PVDF ELS
(PVDF, conductive soot)
Very good chemical resistance, thermal applications up to 150 °C, electrically conductive.

TECAFORM AH SD
(POM-C, antistatic)
Statically dissipating, carbon-free, inherently active, permanently non-contaminating antistatic.
→ p. 18

TECAFORM AH ELS
(POM-C, conductive soot)
Electrically conductive with special carbon black for general applications.
→ p. 18

Semi-conductor technology / CMP

TECAPEEK
(PEEK)
Excellent chemical resistance, electrically insulating and abrasion-resistant.
Low level of ionic contamination.

TECATRON
(PPS)
Very good chemical resistance, high level of hardness, electrically insulating and abrasion-resistant.
Low level of ionic contamination.

TECANAT
(PC)
Good abrasion resistance.
Low level of ionic contamination.

All dimensions on request.

Test socket applications

TECASINT 5051
(PAI)
Reduced thermal expansion, high thermal-mechanical load properties, good electrical insulation.
→ p. 62

TECAPEEK TS
(PEEK, mineral)
Very high hardness and rigidity, low thermal expansion, very high dimensional stability.
→ p. 54

TECAPEEK CMF white / grey
(PEEK, ceramic)
Very high dimensional stability,
low water absorption,
excellent rigidity.
→ p. 54

TECATOR 5013
(PAI)
Very tough,
high thermal stability.
→ p. 56

Application examples

Contact plate
TECAPEEK CMF
(PEEK, ceramic)
Dimensionally stable.
Excellent hardness and rigidity.
Good electrical insulation.
High abrasion resistance.

Workpiece holder
TECAPEEK CMF
(PEEK, ceramic)
Dimensionally stable.
Excellent hardness and rigidity.
Good electrical insulation.
High abrasion resistance.

Fibre guide
TECAFORM AH ELS
(POM-C, conductive soot)
Dissipation of electrostatic charging.
Good toughness and strength.
Good sliding friction properties.

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Sliding applications

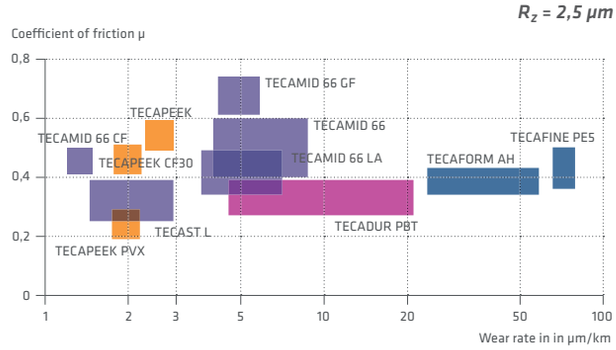
Sliding bearings, gears, guide elements and rollers frequently call for materials with good tribological characteristics.

Ensinger has extensive experience in the field of sliding applications, and offers a wide portfolio of tribological materials. A range of different additives to improve sliding properties can be used in order to ensure optimum compliance with requirements depending on the application. Together with the individual properties of plastics, these offer a range of possibilities for wide-ranging tribological applications.

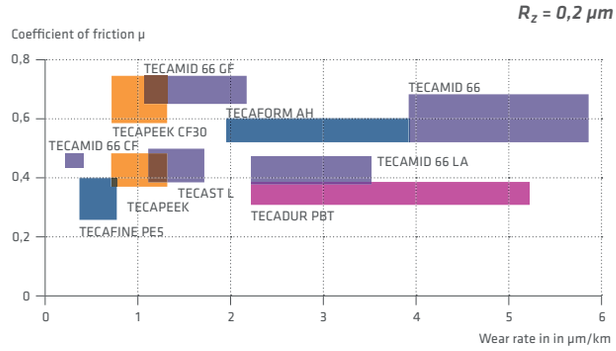
However, selection of a suitable material depends not only on the thermal or mechanical requirements of the application. To allow suitable material recommendations to be made, a range of other system conditions such as pressure, relative sliding velocity, the structural design and the properties of the mating partner (surface roughness) are determining factors.

With the aid of calculation modules, our application technicians will be pleased to help you with the material selection process to ensure that you find the most suitable material for the construction of your sliding application.

Conditions:
Load: 1 MPa,
Speed: 0,5 m/s,
against steel with
R_z = 2,5 µm



Conditions:
Load: 1 MPa,
Speed: 0,5 m/s,
against steel with
R_z = 0,2 µm



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Ensinger materials for slide-friction applications:

TECAFORM AH LA blue
(POM-C, solid lubricant)
Very good sliding and wear values.
Low water absorption.

TECAFORM AD AF
(POM-H, TF)
Very good sliding properties due to PTFE component.
Low water absorption.
→ p. 17, 18

TECAMID 66 MH
(PA 66 MoS_2)
Good UV resistance.
Low abrasion.
→ p. 21, 23

TECAMID 66 LA
(PA 66, solid lubricant)
Very good sliding and wear properties with soft contact surfaces.
Tough with good strength.
→ p. 21, 23

TECAM 6 MO
(PA 6 MoS_2)
Good UV resistance and surface hardness.
Good machining properties and dimensional stability.
→ p. 21, 23

TECAST TM
(PA 66 MoS_2)
Good UV stability.
High surface hardness.
→ p. 27, 28

TECAST L natural
(PA 6 C, oil)
Good sliding properties, also in dry running conditions. Good stick-slip behaviour. Tough.
Good thermal stability.
Good electrical insulation.
→ p. 27, 28

TECAGLIDE
(PA 6 C, solid lubricant)
Low coefficient of friction.
Polymer lubricants (no silicon additives).
→ p. 27, 28

TECAST GX
(PA 6 C, solid lubricant)
Good sliding properties, also in dry running conditions. Good stick-slip behaviour. Tough.
Electrically insulating.
→ p. 27, 28

TECAPET TF
(PET TF)
High abrasion resistance.
Excellent sliding friction properties.
→ p. 33, 34

TECAFLON PTFE
(PTFE)
Exceptional chemical resistance.
Particularly low coefficient of friction, suitable for soft sliding surfaces.
→ p. 40, 41

TECAPEEK PVX black
(PEEK CF CS TF)
Very good sliding values.
Suitable for bearings under high levels of stress.
→ p. 50, 51

TECAPEEK TF10
(PEEK TF)
Very good sliding properties.
Electrically insulating, free of carbon.

Also possible in sliding applications:
TECAFORM AH
TECAFORM AD
TECAMID 66
TECAMID 6
TECAMID 66 CF20
TECAPET
TECAPEEK
TECASINT

Application examples

Trolley
TECAFORM AH (POM-C)
Good sliding properties.
Good strength.
Minimal moisture absorption.
Good dimensional stability.

Guide rails
TECAPET TF (PET TF)
Good sliding properties.
High dimensional stability.
Low wear.
High strength.

Gear
TECAFORM AH black (POM-C)
Good strength.
Good sliding properties.
Minimal moisture absorption.
Good dimensional stability.

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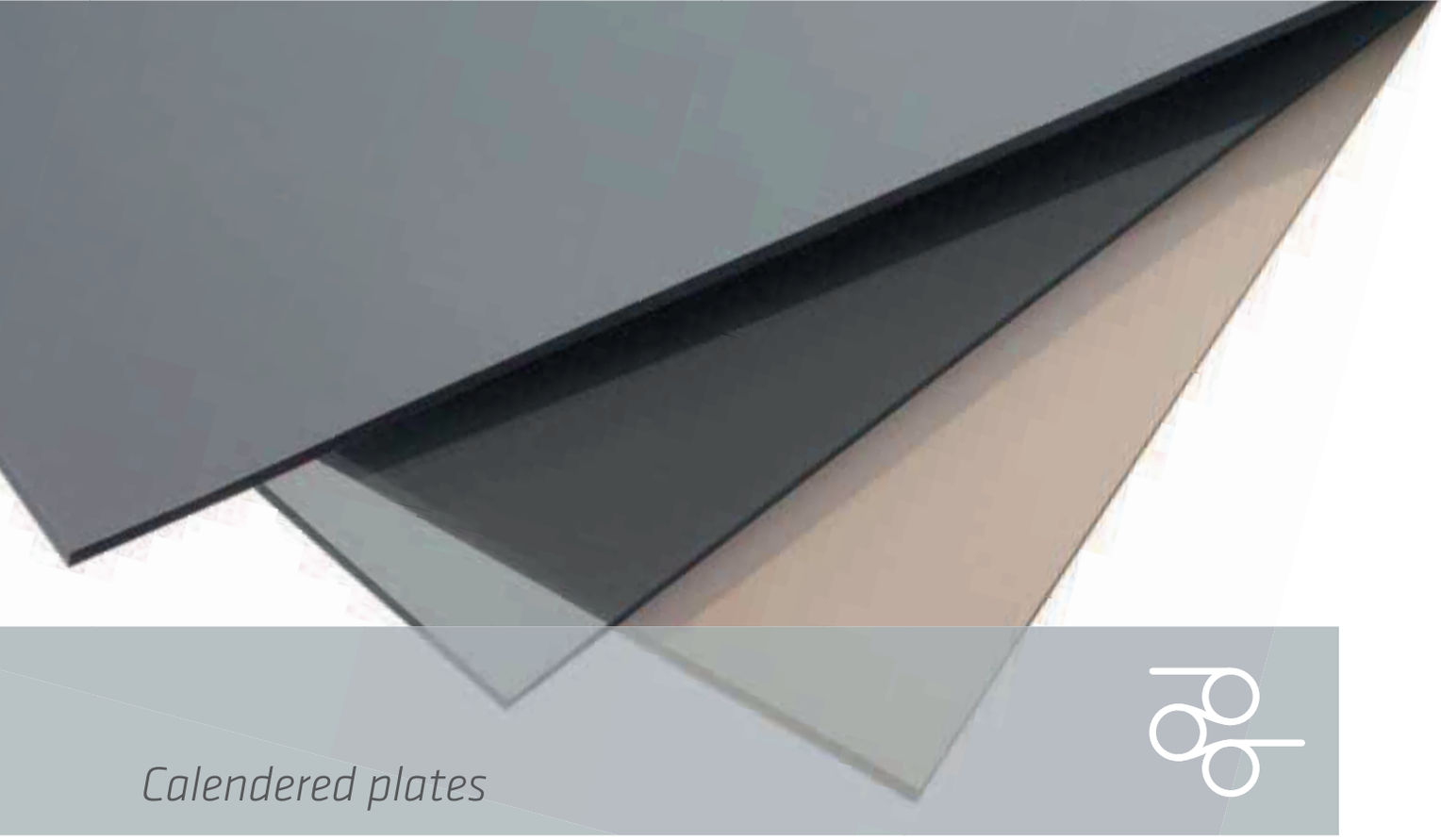

Calendered plates

Thin plates in the range of just a few millimetres and below with a relatively large width are manufactured using calendering technology. This process permits close tolerances to be achieved. These plates are used as the starting material for punching processes (seals) or also in a special version for thermoforming.

Overview of types

TECAFORM AH
(POM-C)
Good chemical resistance.
High resilience.

TECAMID 6
(PA 6)
Extreme toughness and impact resistance.
Good chemical resistance.

TECAMID 66
(PA 66)
Good adhesion and welding properties.
Electrically insulating,
Good machining properties.

TECADUR PET
(PET)
Good machining properties.
High strength.

TECANAT
(PC)
High toughness and transparency.
High service temperature.

TECAMID 6 GF12 VF
(PA 6 GF)
Glass fibre reinforced polyamide with very high strength.
Thermoformable.
Good chemical resistance.

TECASON P VF
(PPSU)
Thermoformable PPSU.
Excellent thermal dimensional stability.
Good sterilization resistance.

TECAPEEK VF
(PEEK)
Thermoformable PEEK.
Long-term service temperature up to 260 °C.
Excellent chemical resistance.

Application examples

Housing cover
TECAPEEK VF (PEEK)
Good thermoformability.
High level of thermal stability.
Good resistance to oil and grease even at high temperatures.
Electrically insulating.

Engine cover
TECAMID 6 GF12 VF
(PA 6 GF)
High strength.
Resistant to oil and grease.
Good thermal formability.
Good vibration strength.

Sterilization container
TECASON P VF (PPSU)
Good thermal formability.
Good sterilization resistance.
Minimal weight.
High rigidity.

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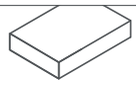
CALENDERED Plates

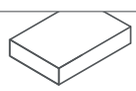


	TECAFORM AH	TECAMID 6	TECAMID 66	TECADUR PET	
Chemical designation	POM-C	PA 6	PA 66	PET	
Density [g/cm³]	1,41	1,14	1,15	1,39	
Dimensions [mm]	[kg/m]	[kg/m]	[kg/m]	[kg/m]	Tolerance [mm]
0,5 x 1.000	0,730	0,590			-0,05/+0,05
1 x 1.000	1,46	1,18			-0,10/+0,10
2 x 1.000	2,92	2,36	2,36	2,88	-0,15/+0,15
3 x 1.000	4,38	3,54	3,54	4,32	-0,20/+0,20
4 x 1.000	5,84	4,72	4,72	5,76	
5 x 1.000	7,30	5,90	5,90	7,20	-0,25/+0,25
6 x 1.000	8,76	7,08	7,08	8,63	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 2.000 mm

CALENDERED Plates



	TECANAT	
Chemical designation	PC	
Density [g/cm³]	1,19	
Dimensions [mm]	[kg/m]	Tolerance [mm]
1 x 1.250	1,55	-0,10/+0,10
2 x 1.250	3,10	-0,15/+0,15
3 x 1.250	4,65	-0,20/+0,20
4 x 1.250	6,19	
5 x 1.250	7,68	-0,25/+0,25
6 x 1.250	9,21	

Tolerances according to DIN:
length 0 / +3 %
width +5 / +25 mm

Stock lengths 2.000 mm

Stock item
Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible. Modifications in colour and diameter on request. All figures given without obligation. Please find the latest information at www.ensinger-online.com.

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Compression moulding

Compression moulding is a processing method for the manufacture of stock shapes or finished and semi-finished components which may require further processing.

The compression moulding process is primarily suited for finished parts in medium piece numbers, as the tooling costs are generally lower than other processes such as injection moulding. For stock shapes, this process allows larger dimensions to be achieved than is the case for extrusion. The benefits of compression moulded components and stock shapes:

→ Semi-finished part geometries close to finished measurement
→ Extreme economy due to material savings
→ Low tendency to warp due to almost isotropic characteristics
→ Extremely low intrinsic stress levels
→ Consequently also easier to machine

However, the costs of producing stock shapes are higher compared to extrusion due to the discontinuous production process.

Application examples

Piston rings
TECASINT 2022 (PI)
Very good
sliding properties.
Low wear.
High strength.

Slide bush
TECASINT 2021 (PI)
Very high toughness.
High strength.
Very good thermal
resistance.
Good sliding properties.

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Polyphenylensulphide (PPS)
May be modified with glass fibres, carbon fibres, PTFE and graphite and combinations of these materials.
e. g. TECATRON GF40 CM (XP-86), TECATRON GF15 GR10 TF10 CM (XP-88)

Polyetheretherketone (PEEK)
Unfilled or in modifications with glass fibres, carbon fibres, PTFE and graphite and combinations of these materials, also static dissapative available.
e. g. TECAPEEK CM (XP-96), TECAPEEK GF30 CM (XP-91), TECAPEEK GR15 TF10 CM (XP-101), TECAPEEK CF10 GR10 TF10 CM (XP-100)

Polytetrafluorethylene (PTFE)
Available as modification with mica.

Polyimide (PI)
Available unfilled or modified with glass fibres, carbon fibres, PTFE and graphite and combinations of these materials.
→ p. 57

Polyamidimide (PAI)
Available unfilled or modified with glass fibres, carbon fibres, PTFE and graphite and combinations of these materials.

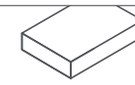
Polyvinylidenfluoride (PVDF)
Available unfilled.

Perfluoralkoxylalkane (PFA)
Available unfilled.

Polychlortrifluorethylene (PCTFE)
Available unfilled.

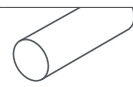
Many other modifications on request.

Plates

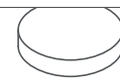


Basic polymers	Dimensions [mm]	Width x Length [mm]
PAI	6,3 – 50,8	254,0 x 254,0
	6,3 – 50,8	330,2 x 330,2
	6,3 – 38,1	304,8 x 381
	9,5 – 38,1	381,0 x 762,0
	9,5 – 38,1	609,6 x 609,6
PEEK (unfilled / filled)	6,3 – 76,2	254,0 x 254,0
	6,3 – 63,5	330,2 x 330,2
	6,3 – 50,8	304,8 x 381,0
	6,3 – 63,5	381,0 x 762,0
	9,5 – 63,5	609,6 x 609,6
PPS / PEI	6,3 – 76,2	254,0 x 254,0
	6,3 – 63,5	330,2 x 330,2
	6,3 – 50,8	304,8 x 381,0
	6,3 – 63,5	381,0 x 762,0
	9,5 – 63,5	609,6 x 609,6
PCTFE / PFA	6,3 – 76,2	254,0 x 254,0
	6,3 – 63,5	330,2 x 330,2
	6,3 – 50,8	304,8 x 381,0
	6,3 – 63,5	381,0 x 762,0
	9,5 – 63,5	609,6 x 609,6

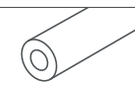
Rods



Discs



Tubes



Basic polymers	Rods Diameter [mm]	Rods Length [mm]	Discs Diameter [mm]	Discs Length [mm]	Tubes Outer diameter [mm]	Tubes Length [mm]
PAI	25,4 – 79,4	76,2 – 152,4	82,6 – 508,0	12,7 – 50,8	38,1 – 2070,1	76,2 – 152,4
PEEK (unfilled)	25,4 – 79,4	76,2 – 152,4	82,6 – 660,4	12,7 – 76,2	38,1 – 2070,1	76,2 – 152,4
PEEK (filled)	25,4 – 79,4	76,2 – 152,4	82,6 – 660,4	12,7 – 76,2	38,1 – 203,2 209,6 – 2070,1	76,2 – 203,2 76,2 – 152,4
PPS / PEI	25,4 – 101,6	76,2 – 304,8	107,9 – 660,4	12,7 – 88,9	38,1 – 203,2 209,6 – 2070,1	76,2 – 304,8 76,2 – 152,4
PCTFE / PFA	25,4 – 63,5	76,2 – 152,4	69,8 – 660,4	12,7 – 63,5	38,1 – 2070,1	76,2 – 152,4

Technical data for Compression Moulding Products may differ from the data on pages 88 – 97 and the data sheets at ensinger-online.com. Please contact the Ensinger technical service for more information.

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Product handling

Ensinger plastics are used as the raw material for a wide range of high-quality components and end products in fields such as the food industry and medical technology, as well as mechanical and automotive engineering, semiconductor technology and in the aerospace industry. To ensure the high standard of quality and functionality in our materials for these applications, and also over extended storage periods, certain factors must be taken into consideration in the storage, treatment and handling of Ensinger stock shapes. By taking these precautions, it is possible to ensure that external influences are unable to significantly diminish the material properties. In the case of finished parts, the manufacturer or user is required to individually submit a statement of this, as conditions can differ considerably depending on the storage or utilization period.

1. Storage and handling should take place in such a way that the material designations and product numbers (batch number) are clearly recognizable on the semi-finished products and can be maintained. This allows clear identification and traceability of products in the event of a possible complaint, allowing the possible root cause of the problem to be determined.

2. Weathering effects can impact on the properties of plastics. As result of the impact of solar radiation (UV radiation), atmospheric oxygen and moisture (precipitation, humidity) can exert a lasting negative impact on material characteristics. These influences can result in colour changes, oxidation of surfaces, swelling, warping, brittleness or even a change in mechanical properties. For this reason, semi-finished products should not be exposed to direct sunlight or the effects of weather over protracted periods. Ideally, the semi-finished products should be stored in closed rooms under normal climatic conditions (23 °C / 50 %rH).

The following materials in particular should be protected against the influence of the weather:

→ TECAPEEK (PEEK)*
→ TECATRON (PPS)*
→ TECASON P (PPSU)*
→ TECASON S (PSU)*
→ TECASON E (PES)*
→ TECAFORM AH, AD (POM-C, POM-H)**
→ TECAPET (PET)**
→ TECAMID 6, 66, 11, 12, 46 (PA 6, 66, 11, 12, 46)**
→ TECAST (PA 6 C)**
→ TECAFINE (PE, PP)**
→ TECARAN ABS (ABS)*

* All varieties should be generally protected
** Varieties not black in colour should be protected

3. Wherever possible, plastics should not be exposed to low temperatures over long periods. In particular, marked fluctuations in temperature should be avoided, as this can cause stock shapes to warp or become brittle. Where this type of partially reversible brittleness occurs in stock shapes which have been stored at temperatures below freezing, careful handling is required. Hard knocks caused by throwing or dropping should be avoided, as otherwise cracks and fracture damage can occur. In addition, semi-finished products stored in cold conditions should be allowed sufficient time to acclimatize to room temperature before processing. This can help to prevent defects such as cavities occurring during processing. It will also help to compensate for shrinkage or also elongation after exposure to hot atmospheres caused by the high coefficient of linear thermal expansion of plastics.

4. Semi-finished products made of plastic should consequently always be stored flat or on a suitable support (in the case of rods and tubes) and with the greatest possible surface contact in order to avoid deformation through their own intrinsic weight or heat.

5. When handling plastic semi-finished products, ensure that suitable warehousing equipment is used. Ensure that storage facilities, lifting gear, slings and other lifting equipment are stable and secure. Stock shapes must also be stored and stacked so as to eliminate any danger of tipping or falling. Bear in mind here that plastics often have a relatively low coefficient of friction and are consequently easily able to slip out of load suspension devices, with the possibility of serious injury to staff members.

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6. Avoid the effects of high-energy radiation such as gamma or X rays wherever possible due to possible microstructure damage through molecular breakdown.

7. Plastic stock shapes should be kept away from all kinds of chemicals and water in order to prevent possible chemical attack or the absorption of moisture. Contact with chemicals or water can result in swelling, chemical decomposition or stress cracking.

8. Plastics are organic substances and consequently combustible. The combustion or decomposition products may have a toxic or corrosive effect. If correctly stored, plastics themselves do not pose a fire risk. However, they should not be stored together with other combustible substances. On this subject, observe the product handling information sheets for the individual materials.

9. Under normal conditions, plastic semi-finished or finished products do not release any toxic constituents and permit risk-free surface contact. Tobacco products should not be allowed in the vicinity when handling and machining plastics, as particles of some plastics (in particular fluoropolymers) can release strong toxic gases in some cases during pyrolization of the smouldering tobacco. In respect of health protection, please also note the product handling information sheets for the individual materials.

10. If the above recommendations are adhered to, it may be assumed that no significant changes to typical properties will occur during the storage period. It is possible that minimal surface discolouration may occur due to environmental influences. However, this does not represent any significant deterioration of material properties, as the surface is generally only affected down to a few microns in depth.

11. Plastic waste and chips can be processed and recycled by professional recycling companies. However, it is also possible to send the waste for thermal processing to generate energy by a professional company in a combustion plant with a suitable emission control in place. This applies in particular to applications where the plastic waste produced is contaminated, e.g. in the case of machining swarf contaminated with oil.

In order to store finished and semi-finished products for high levels of manufacturing precision, we consequently recommend storage under constant conditions in a normal climate (23 °C/50 %rH). This allows external influences to be minimized and dimensional stability to be maintained over long periods.

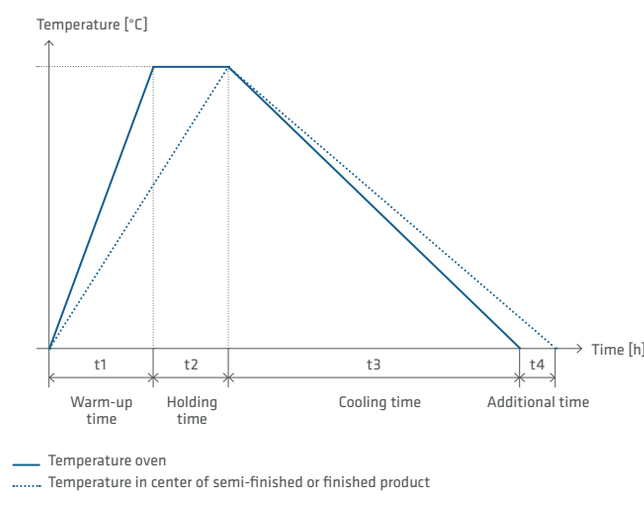
It is not possible to specify a maximum storage period, as this depends heavily on the materials, storage conditions and external influences.

These recommendations should always be adjusted in line with individual requirements and circumstances. They do not replace the fundamentally applicable statutory regulations, or exonerate customers using the products from their responsibility or individuals from their duty of care. These are merely intended as recommendations drawn up on the basis of current knowledge. They do not constitute any generally applicable assurance.

Annealing

Ensinger stock shapes are always subjected in principle to a special annealing process after production to reduce the internal tension created during manufacture. Annealing is carried out in a special recirculating air oven, but can also take place in an oven with circulating nitrogen or in an oil bath. Annealing results in increased crystallinity, as well as improved strength and chemical resistance. It also brings about a reduction of inner tension as described above and increases dimensional stability over a wide temperature range.

Typical annealing cycle



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Processing of plastics

General information*

Non-reinforced thermoplastic polymers can be machined using high speed steel tools. For reinforced materials, carbide-tipped tools are necessary. In all cases, only correctly sharpened tools should be used. Due to the poor thermal conductivity of plastics, good heat dissipation must be ensured. The best form of cooling is heat dissipation via the chip.

Dimensional stability

Dimensionally accurate parts presuppose the use of stress relieved semi-finished products. Heat from machining will otherwise result in the release of machining stresses and distortion of the part. If large amounts of material are to be removed, an interstage annealing may be necessary after rough machining to relieve the resulting thermal stresses. For temperatures and times please contact the Ensinger technical service. Materials with high moisture absorption (e.g. polyamides) may have to be conditioned in water before machining. Plastics require higher production tolerances than metals. Furthermore, the very much higher thermal expansion needs to be taken into consideration.

Machining methods

1. Turning Guide values for tool geometry are given in the table. For surfaces with particularly high quality demands, the tool must be designed as a wide smoothing tool as shown in Figure 1. For parting off, the lathe tool should be ground as shown in Figure 2 to prevent the formation of burrs. For thin-walled and particularly flexible workpieces, on the other hand, it is better to work with tools that are ground to a knife-like cutting geometry (Figure 3).

Figure 1
Wide smoothing tool

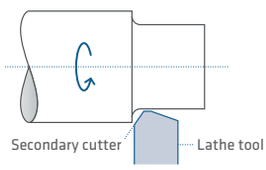


Figure 2
Grinding prevents burr formation

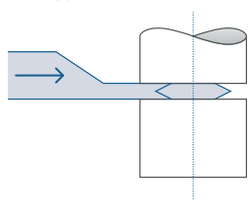
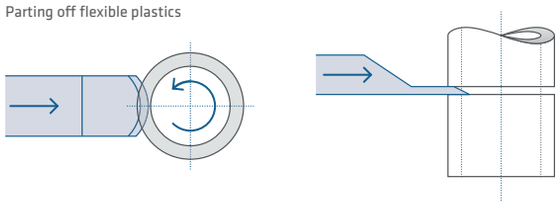
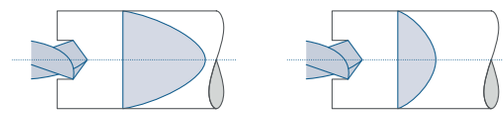


Figure 3
Parting off flexible plastics



2. Milling For planed surfaces, face milling is more economical than peripheral milling. For peripheral and profiling milling, the tools should not have more than two cutters so that vibrations caused by the number of cutters are kept low and the gaps between the chips are sufficiently large. Optimum cutting performances and surface finishes are obtained with single-cutter tools.

3. Drilling Twist drills can generally be used. These should have a twist angle of 12° to 16° and very smooth spiral grooves for good chip removal. Larger diameters should be predrilled or should be produced using hollow drills or by cutting out. Particular attention should be paid to properly sharpened drills when drilling into solid material, as otherwise the resulting compressive stresses can increase to the extent that the material splits.



Stress development with blunt drill

Stress development with sharp drill

Reinforced plastics have higher residual processing stresses and a lower impact resistance than non-reinforced plastics and are therefore particularly susceptible to cracking. Where possible, they should be heated to around 120° C before drilling. (Heating time approx. 1 hour per 10 mm cross-section). This method is also to be recommended for polyamide 66, polyester and large diameter cast nylon.

4. Sawing Unnecessary heat generation caused by friction must be avoided, as thick-walled parts are generally cut with relatively thin tools during sawing. Well sharpened sawblades with large tooth offsets are therefore expedient.

5. Thread cutting Threads are best cut using thread chasers. Burr formation can be avoided by using twin-toothed chasers. Die nuts are not to be recommended as post-cutting must be anticipated during removal of the nut. A machining allowance (dependent on material and diameter; guide value: 0.1 mm) must frequently be made when using tap drills.

6. Safety precautions Failure to observe the machining guidelines can result in localised overheating which can lead to material degradation. Released decomposition products, e.g. from PTFE fillers, must be removed using extraction facilities. In this context, tobacco products must be kept out of the production area due to the risk of polymer flu fever.

* Our applications advice, both written and oral, is intended to help you in your work. It must be regarded as a recommendation without obligation, also with respect to possible third-party property rights. We can assume no liability for any damage occurring during machining.

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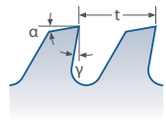
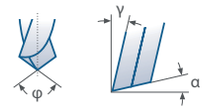
Machining guidelines

Sawing



α Clearance angle [°]
γ Rake angle [°]
V Cutting speed [m/min]
t Pitch [mm]

Drilling



α Clearance angle [°]
γ Rake angle [°]
φ Point angle [°]
V Cutting speed [m/min]
S Feed [mm/U]

The twist angle β of the drill bit should be approx. 12° to 16°

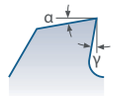
	Sawing					Drilling					
	α	γ	V	t		α	γ	φ	V	S	
TECAFINE PE, PP, PMP	20 – 30	2 – 5	500	3 – 8		5 – 15	10 – 20	90	50 – 150	0,1 – 0,3	
TECARAN ABS	15 – 30	0 – 5	300	2 – 8		8 – 12	10 – 30	90	50 – 200	0,2 – 0,3	
TECANYL	15 – 30	5 – 8	300	3 – 8	●	8 – 10	10 – 20	90	50 – 100	0,2 – 0,3	●
TECAFORM AH, AD	20 – 30	0 – 5	500 – 800	2 – 5		5 – 10	15 – 30	90	50 – 200	0,1 – 0,3	
TECAMID / TECARIM / TECAST	20 – 30	2 – 5	500	3 – 8	●	5 – 15	10 – 20	90	50 – 150	0,1 – 0,3	●
TECAMID TR	15 – 30	5 – 8	300	3 – 8	●	8 – 10	10 – 20	90	50 – 100	0,2 – 0,3	●
TECADUR PBT / TECAPET	15 – 30	5 – 8	300	3 – 8	●	5 – 10	10 – 20	90	50 – 100	0,2 – 0,3	●
TECANAT	15 – 30	5 – 8	300	3 – 8	●	8 – 10	10 – 20	90	50 – 100	0,2 – 0,3	●
TECAFLON ETFE, PVDF, PTFE	20 – 30	5 – 8	300	2 – 5		10 – 16	5 – 20	130	150 – 200	0,1 – 0,3	
TECAPEI	15 – 30	0 – 4	500	2 – 5	●	3 – 10	10 – 20	90	20 – 80	0,1 – 0,3	●
TECASON S, P, E	15 – 30	0 – 4	500	2 – 5	●	3 – 10	10 – 20	90	20 – 80	0,1 – 0,3	●
TECATRON	15 – 30	0 – 5	500 – 800	3 – 5		5 – 10	10 – 30	90	50 – 200	0,1 – 0,3	
TECAPEEK	15 – 30	0 – 5	500 – 800	3 – 5		5 – 10	10 – 30	90	50 – 200	0,1 – 0,3	
TECASINT, TECATOR	5 – 10	0 – 3	800 – 900	10 – 14	●	5 – 10	5 – 10	120	80 – 100	0,02 – 0,1	
Reinforced/filled TECA products*	15 – 30	10 – 15	200 – 300	3 – 5	● ●	6	5 – 10	120	80 – 100	0,1 – 0,3	● ●

* Reinforcing agents/fillers:
Glass fibres, glass beads, carbon fibres, graphite, mica, talcum, etc.

Heat before sawing:
from Ø 60 mm TECAPEEK GF/PVX, TECATRON GF/PVX
from Ø 80 mm TECAMID 66 GF, TECAPET, TECADUR PBT GF 30
from Ø 100 mm TECAMID 6 GF, 66, 66 MH

Heat before drilling in the centre:
from Ø 60 mm TECAPEEK GF/PVX, TECATRON GF/PVX
from Ø 80 mm TECAMID 66 MH, 66 GF, TECAPET, TECADUR PBT GF 30
from Ø 100 mm TECAMID 6 GF, 66, TECAM 6 MO, TECANYL GF

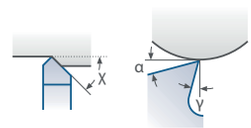
Milling



α Clearance angle [°]
γ Rake angle [°]
V Cutting speed [m/min]

The feed can be up to 0.5 mm/tooth

Turning



α Clearance angle [°]
γ Rake angle [°]
χ Side angle [°]
V Cutting speed [m/min]
S Feed [mm/rpm]

The nose radius r must be at least 0.5 mm

	Milling				Turning					
	α	γ	V		α	γ	χ	V	S	
TECAFINE PE, PP, PMP	10 – 20	5 – 15	250 – 500		6 – 10	0 – 5	45 – 60	250 – 500	0,1 – 0,5	
TECARAN ABS	5 – 10	0 – 10	300 – 500		5 – 15	25 – 30	15	200 – 500	0,2 – 0,5	
TECANYL	10 – 20	5 – 15	300	●	5 – 10	6 – 8	45 – 60	300	0,1 – 0,5	●
TECAFORM AH, AD	5 – 15	5 – 15	250 – 500		6 – 8	0 – 5	45 – 60	300 – 600	0,1 – 0,4	
TECAMID / TECARIM / TECAST	10 – 20	5 – 15	250 – 500		6 – 10	0 – 5	45 – 60	250 – 500	0,1 – 0,5	
TECAMID TR	10 – 20	5 – 15	300	●	5 – 10	6 – 8	45 – 60	300	0,1 – 0,5	●
TECADUR PBT / TECAPET	5 – 15	5 – 15	300		5 – 10	0 – 5	45 – 60	300 – 400	0,2 – 0,4	
TECANAT	10 – 20	5 – 15	300	●	5 – 10	6 – 8	45 – 60	300	0,1 – 0,5	●
TECAFLON ETFE, PVDF, PTFE	5 – 15	5 – 15	250 – 500		10	5 – 8	10	150 – 500	0,1 – 0,3	
TECAPEI	2 – 10	1 – 5	250 – 500	●	6	0	45 – 60	350 – 400	0,1 – 0,3	●
TECASON S, P, E	2 – 10	1 – 5	250 – 500	●	6	0	45 – 60	350 – 400	0,1 – 0,3	●
TECATRON	5 – 15	6 – 10	250 – 500		6 – 8	0 – 5	45 – 60	250 – 500	0,1 – 0,5	
TECAPEEK	5 – 15	6 – 10	250 – 500		6 – 8	0 – 5	45 – 60	250 – 500	0,1 – 0,5	
TECASINT, TECATOR	2 – 5	0 – 5	90 – 100	●	2 – 5	0 – 5	7 – 10	100 – 120	0,05 – 0,08	●
Reinforced/filled TECA products*	15 – 30	6 – 10	80 – 100	●	6 – 8	2 – 8	45 – 60	150 – 200	0,1 – 0,5	●

* Reinforcing agents/fillers:
Glass fibres, glass beads, carbon fibres, graphite, mica, talcum, etc.

- ● Preheat material to 120 °C
- ● Caution when using coolants: susceptible to stress cracking
- ● Use carbide-tipped tools

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Material standard values

Material		TECASINT 1011	TECASINT 1021	TECASINT 2011	TECASINT 2021	TECASINT 4011	TECASINT 4021	TECASINT 4111	TECASINT 4121	TECASINT 5011	TECASINT 5051
Chemical Designation		PI	PI	PI	PI	PI	PI	PI	PI	PAI	PAI
Fillers			15% graphite		15% graphite		15% graphite		15% graphite		30% glass fibres
Density (DIN EN ISO 1183)	[g/cm³]	1,34	1,42	1,38	1,45	1,41	1,49	1,46	1,53	1,38	1,57
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	4000	4000	3700	4400	4000	4943	7000	6600	4500	5800
Tensile strength (DIN EN ISO 527-2)	[MPa]	116	97	118	101	130	93	100	34	110	94
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]										
Elongation at yield (DIN EN ISO 527-2)	[%]										
Elongation at break (DIN EN ISO 527-2)	[%]	9	2,8	4,5	3,7	4,5	3	1,7	0,5	5,5	3,4
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	3448	4000	3600	4300	4300	4930	6100	6100	4240	6625
Flexural strength (DIN EN ISO 178)	[MPa]	210	150	177	145	180	131	160	113	162	163
Compression modulus (EN ISO 604)	[MPa]	4000	1880	1713	1900	2100	2067	2500	2200		2590
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	556	210	486	300	40	208	250	200	474	260
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	75,8	35,1	87,9	20,6	87	24,4	24	11	37,4	27,3
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]	3,3	4,8	9,3	1,6	9,6	4,8	1,1	1,4		5,1
Ball intendation hardness (ISO 2039-1)	[MPa]										
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	368	330	370	370	260 (a)	260 (a)	n.a. (a)	n.a. (a)	340	340
Melting temperature (DIN 53765)	[°C]										
Service temperature, short term	[°C]										
Service temperature, long term	[°C]	300	300	300	300					300	300
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]										
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]										
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,04	1,13	0,95		1,04					
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,22 (b)	0,53 (b)	0,22 (b)		0,4 (b)		0,35 (b)			
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{16}	10^{7}	10^{15}		10^{16} (d)		10^{16} (d)		10^{15}	10^{14}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]										
Resistance to hot water / bases											
Resistance to weathering											
Flammability (UL94) (DIN IEC 60695-11-10;)		V0	V0	V0	V0	V0	V0	V0	V0	V0	V0

Data generated directly after machining (standard climate Germany). For polyamides the values strongly depend on the humidity content.

Test specimen to DIN EN ISO 527-2

+ good resistance
(+) limited resistance
– poor resistance (depending on concentration, time and temperature)
n.b. not broken
n.a. not applicable

(a) Glass transition temperature testing according to DIN EN ISO 11357
(b) Thermal conductivity testing according to ISO 8302
(c) Thermal conductivity testing according to ASTM E1530
(d) Surface resistance testing according to ASTM D 257

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Material		**TECASINT 5201 SD**	**TECASINT 5211 SD**	**TECASINT 8001**	**TECASINT 8061**	**TECATOR 5013**	**TECATOR 5031 PVX**	**TECAPEEK**	**TECAPEEK** black	**TECAPEEK** bright red	**TECAPEEK CF30**
Chemical Designation		PAI	PAI	PTFE	PTFE	PAI	PAI	PEEK	PEEK	PEEK	PEEK
Fillers		carbon fibres, glass fibres	carbon fibres, glass fibres	20% polyimide	40% polyimide		graphite, PTFE				carbon fibres
Density (DIN EN ISO 1183)	[g/cm³]	1,54	1,36	1,88	1,68	1,40	1,46	1,31	1,31	1,36	1,38
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	4500				3800	5900	4200	4200	4200	6800
Tensile strength (DIN EN ISO 527-2)	[MPa]	85		15	13	151	135	116	116	108	122
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]					151	135	116	116	108	122
Elongation at yield (DIN EN ISO 527-2)	[%]							5	5	4	7
Elongation at break (DIN EN ISO 527-2)	[%]	4	2,8	200	4	21	7	15	15	6	7
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	4200	4600			3900	6200	4200	4200	4500	6800
Flexural strength (DIN EN ISO 178)	[MPa]	135	132		29			175	175	177	193
Compression modulus (EN ISO 604)	[MPa]		2230					3400	3400	3500	5000
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	240	361		60			23 / 43	23 / 43	22 / 40	20 / 45
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	17,8			5,4		87	n.b.	n.b.	50	62
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]	2,8			2,5	13,2	5,6	4	4		
Ball intendation hardness (ISO 2039-1)	[MPa]					240	228	253	253	244	355
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	340	340	20 (a)	20 (a)	280	280	150	150	151	147
Melting temperature (DIN 53765)	[°C]					n.a.	n.a.	341	341	341	341
Service temperature, short term	[°C]					270	270	300	300	300	300
Service temperature, long term	[°C]	300	300	250	270	250	250	260	260	260	260
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]							5	5	5	4
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]							5	5	5	4
Specific heat (ISO 22007-4:2008)	[J/(g*K)]			1	1			1,1	1,1	1,1	1,2
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]			0,25 (b)	0,25 (b)	0,29 (c)	0,60 (c)	0,27	0,27	0,27	0,66
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{11}	10^{9}			10^{18} (d)	10^{17} (d)	10^{14}	10^{14}	10^{14}	10^{8}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]							0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03
Resistance to hot water / bases						–	–	+	+	+	+
Resistance to weathering								–	–	–	–
Flammability (UL94) (DIN IEC 60695-11-10;)		V0	V0	V0	V0	V0	V0	V0	V0	V0	V0

The corresponding values and information are no minimum or maximum values, but guideline values that can be used primarily for comparison purposes for material selection. These values are within the normal tolerance range of product properties and do not represent guaranteed property values. Therefore they shall not be used for specification purposes. Unless otherwise noted, these values were determined by tests at reference dimensions (typically rods with diameter 40-60 mm according to DIN EN 15860) on extruded, cast, compression moulded and machined specimens. As the properties depend on the dimensions of the semi-finished products and the orientation in the component (esp. in reinforced grades), the material may not be used without separate testing under individual circumstances.

Data sheet values are subject to periodic review, the most recent update can be found at www.ensinger-online.com. Technical changes reserved.

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Material standard values

Material		**TECAPEEK ELS nano**	**TECAPEEK GF30**	**TECAPEEK PVX**	**TECAPEEK HT** black	**TECAPEEK ST** black	**TECAPEEK CF30 MT**	**TECAPEEK CLASSIX** white	**TECAPEEK MT**	**TECAPEEK MT** black	**TECAPEEK MT** yellow
Chemical Designation		PEEK	PEEK	PEEK	PEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK
Fillers		CNT	glass fibres	carbon fibres, PTFE, graphite			carbon fibres				
Density (DIN EN ISO 1183)	[g/cm³]	1,36	1,53	1,44	1,31	1,32	1,42	1,40	1,31	1,31	1,38
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	4800	6400	5500	4600	4600	6000	4700	4200	4200	4400
Tensile strength (DIN EN ISO 527-2)	[MPa]	106	105	84	120	134	115	117	116	114	113
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	106	105	84	120	134	115	117	116	114	113
Elongation at yield (DIN EN ISO 527-2)	[%]	4	3	3	4	5	5	5	5	5	5
Elongation at break (DIN EN ISO 527-2)	[%]	4	3	3	5	13	5	11	15	13	10
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	4700	6600	6000	4600	4600	6000	4400	4200	4100	4300
Flexural strength (DIN EN ISO 178)	[MPa]	178	164	142	192	193	188	177	175	171	169
Compression modulus (EN ISO 604)	[MPa]	3600	4800	4000	3500	3500	4500	3500	3400	3400	3400
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	27 / 47	29 / 52	23 / 44	25 / 45	24 / 42	23 / 44	25 / 45	23 / 43	23 / 44	17 / 35
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	58	33	28	n.b.	n.b.	58	n.b.	n.b.	n.b.	n.b.
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]				4	4		5	4	5	5
Ball intendation hardness (ISO 2039-1)	[MPa]	253	316	250	282	275	318	263	253	243	257
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	147	147	146	160	165	146	150	150	151	151
Melting temperature (DIN 53765)	[°C]	341	341	341	375	384	341	341	342	341	341
Service temperature, short term	[°C]	300	300	300	300	300	300	300	300	300	300
Service temperature, long term	[°C]	260	260	260	260	260	260	260	260	260	260
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	5	4	3	5	5	5	5	5	5	5
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	5	4	3	5	5	5	5	5	5	5
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,1	1	1,1			1,7	1	1,1	1,1	1,1
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,46	0,35	0,82			0,59	0,3	0,27	0,3	0,28
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^4	10^{14}	10^8	10^{12}	10^9	10^8	10^{14}	10^{14}	10^{12}	10^{14}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,04	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03
Resistance to hot water / bases		+	+	+	+	+	+	+	+	+	+
Resistance to weathering		(+)	–	–	(+)	(+)	–	–	–	–	–
Flammability (UL94) (DIN IEC 60695-11-10;)		V0	V0	V0	V0	V0	V0	V0	V0	V0	V0

Data generated directly after machining (standard climate Germany). For polyamides the values strongly depend on the humidity content.

Test specimen to DIN EN ISO 527-2

+ good resistance
(+) limited resistance
– poor resistance (depending on concentration, time and temperature)
n.b. not broken
n.a. not applicable

(a) Glass transition temperature testing according to DIN EN ISO 11357
(b) Thermal conductivity testing according to ISO 8302
(c) Thermal conductivity testing according to ASTM E1530
(d) Surface resistance testing according to ASTM D 257

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Material		**TECAPEEK MT** green	**TECAPEEK MT** blue	**TECAPEEK MT** ivory	**TECAPEEK ID**	**TECAPEEK TF10**	**TECAPEEK TS**	**TECATEC PEEK CW50**	**TECATEC PEKK CW60**	**TECATRON**	**TECATRON GF40**
Chemical Designation		PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEEK	PEKK	PPS	PPS
Fillers						PTFE	mineral filler				glass fibres
Density (DIN EN ISO 1183)	[g/cm³]	1,32	1,34	1,42	1,49	1,35	1,49	1,49	1,61	1,36	1,63
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	4100	4300	4400	4600	3600	5700	53200	54300	4100	6500
Tensile strength (DIN EN ISO 527-2)	[MPa]	116	113	114	111	96	110	491	585	102	83
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	116	113	114	111	96	110			100	83
Elongation at yield (DIN EN ISO 527-2)	[%]	5	5	4	4	5	4			4	3
Elongation at break (DIN EN ISO 527-2)	[%]	17	11	12	6	7	4			4	3
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	4200	4300	4400	3700	3700	5900	48900	50900	4000	6600
Flexural strength (DIN EN ISO 178)	[MPa]	172	173	171	166	146	175	813	960	151	145
Compression modulus (EN ISO 604)	[MPa]	3400	3400	3400	4800	2900	4300	4050	5100	3300	4600
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	17 / 35	17 / 35	24 / 44	25 / 46	22 / 40	17 / 34		51 / 509	20 / 38	21 / 41
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	n.b.	n.b.	n.b.	72	46	n.b.			29	24
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]	4	7	4			7				
Ball intendation hardness (ISO 2039-1)	[MPa]	250	248	250	260	205	290				
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	151	151	150	150	147	151	143	165	97	93
Melting temperature (DIN 53765)	[°C]	341	341	340	341	340	339	343	380	281	280
Service temperature, short term	[°C]	300	300	300	300	300	300			260	260
Service temperature, long term	[°C]	260	260	260	260	260	260	260	260	230	230
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	5	5	5	5	6	4			6	4
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	5	5	5	5	6	4			7	5
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,1	1,1		1,1					1	1
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,28	0,28		0,27					0,25	0,35
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{14}	10^{14}	10^{14}	10^{13}	10^{14}	10^{13}			10^{14}	10^{14}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03	0,02 / 0,03			<0,01 / 0,01	<0,01 / 0,01
Resistance to hot water / bases		+	+	+	+	+	+	+	+	+	+
Resistance to weathering		–	–	–	–	–	–	–	–	–	–
Flammability (UL94) (DIN IEC 60695-11-10;)		V0	V0	V0	V0	V0	V0	V0	V0	V0	V0

The corresponding values and information are no minimum or maximum values, but guideline values that can be used primarily for comparison purposes for material selection. These values are within the normal tolerance range of product properties and do not represent guaranteed property values. Therefore they shall not be used for specification purposes. Unless otherwise noted, these values were determined by tests at reference dimensions (typically rods with diameter 40-60 mm according to DIN EN 15860) on extruded, cast, compression moulded and machined specimens. As the properties depend on the dimensions of the semi-finished products and the orientation in the component (esp. in reinforced grades), the material may not be used without separate testing under individual circumstances.

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Material standard values

Material		**TECATRON GF40** black	**TECATRON PVX**	**TECASON P MT** coloured	**TECASON S**	**TECAPEI**	**TECAFLON PVDF**	**TECANAT**	**TECANAT GF30**	**TECAPET**	**TECAPET** black
Chemical Designation		PPS	PPS	PPSU	PSU	PEI	PVDF	PC	PC	PET	PET
Fillers		glass fibres	carbon fibres, PTFE, graphite						glass fibres		
Density (DIN EN ISO 1183)	[g/cm³]	1,63	1,44	1,31	1,24	1,28	1,78	1,19	1,42	1,36	1,39
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	6500	5100	2300	2700	3200	2200	2200	4400	3100	3400
Tensile strength (DIN EN ISO 527-2)	[MPa]	83	55	81	89	127	62	69	85	79	91
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	83	55	81	89	127	62	69	87	79	91
Elongation at yield (DIN EN ISO 527-2)	[%]	3	2	7	5	7	8	6	4	5	4
Elongation at break (DIN EN ISO 527-2)	[%]	3	2	50	15	35	17	90	6	10	15
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	6600	4800	2300	2600	3300	2100	2300	4500	3200	3400
Flexural strength (DIN EN ISO 178)	[MPa]	145	91	107	122	164	77	97	138	121	134
Compression modulus (EN ISO 604)	[MPa]	4600	3300	2000	2300	2800	1900	2000	3300	2700	2800
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	21 / 41	19 / 36	18 / 30	15 / 28	23 / 41	16 / 28	16 / 29	21 / 39	19 / 35	19 / 36
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	24	14	n.b.	175	113	150	n.b.	71	81	27
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]			13	4			14		4	
Ball intendation hardness (ISO 2039-1)	[MPa]		238	143	167	225	129	128	190	175	195
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	93	94	218	188	216	–40	149	147	81	81
Melting temperature (DIN 53765)	[°C]	280	281	n.a.	n.a.	n.a.	171	n.a.	n.a.	244	244
Service temperature, short term	[°C]	260	260	190	180	200	150	140	140	170	170
Service temperature, long term	[°C]	230	230	170	160	170	150	120	120	110	110
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	4	5	6	6	5	16	8	5	8	8
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	5	6	6	6	5	18	8	5	10	10
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	0,9	0,9	1,1	1,2	1,2	1,3	1,3	1,1		
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,33	0,58	0,25	0,21	0,21	0,25	0,25	0,32		
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{12}	10^{8}	10^{12}	10^{14}	10^{14}	10^{14}	10^{14}	10^{14}	10^{14}	10^{12}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	<0,01 / 0,01	<0,01/<0,01	0,1 / 0,2	0,06 / 0,1	0,05 / 0,1	<0,01/<0,01	0,03 / 0,06	0,03 / 0,05	0,02 / 0,03	0,02 / 0,03
Resistance to hot water / bases		+	+	+	+	+	+	–	–	–	–
Resistance to weathering		(+)	(+)	–	–	–	+	–	–	–	(+)
Flammability (UL94) (DIN IEC 60695-11-10;)		V0	V0	V0	V0	V0	V0	HB	HB	HB	HB

Data generated directly after machining (standard climate Germany). For polyamides the values strongly depend on the humidity content.

Test specimen to DIN EN ISO 527-2

+ good resistance
(+) limited resistance
– poor resistance (depending on concentration, time and temperature)
n.b. not broken
n.a. not applicable

(a) Glass transition temperature testing according to DIN EN ISO 11357
(b) Thermal conductivity testing according to ISO 8302
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Material		TECAPET TF	TECADUR PET	TECADUR PBT GF30	TECAM 6 MO	TECAMID 6	TECAMID 6 GF25 black	TECAMID 6 GF30 black	TECAMID 66	TECAMID 66 CF20	TECAMID 66 GF30 black
Chemical Designation		PET	PET	PBT	PA 6	PA 6	PA 6	PA 6	PA 66	PA 66	PA 66
Fillers		solid lubricant		glass fibres	molyb-denum disulfide		glass fibres	glass fibres		carbon fibres	glass fibres
Density (DIN EN ISO 1183)	[g/cm³]	1,43	1,39	1,46	1,14	1,14	1,33	1,36	1,15	1,23	1,34
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	3200	3300	3400	3300	3300	5100	5700	3500	5100	5500
Tensile strength (DIN EN ISO 527-2)	[MPa]	78	91	46	84	79	96	98	85	104	91
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	78	91	46	82	78	96	98	84	104	91
Elongation at yield (DIN EN ISO 527-2)	[%]	4	4	5	5	4	9	4	7	12	8
Elongation at break (DIN EN ISO 527-2)	[%]	6	14	6	37	130	11	5	70	13	14
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	3300	3400	3400	3100	2900	4900	5200	3100	4300	4700
Flexural strength (DIN EN ISO 178)	[MPa]	119	134	78	110	100	143	140	110	135	135
Compression modulus (EN ISO 604)	[MPa]	2700	2800	2800	2900	2700	3900	4200	2700	3800	4100
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	21 / 38	21 / 38	20 / 38	17 / 32	24 / 41	21 / 42	21 / 42	20 / 35	16 / 33	25 / 46
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	42	150	37	n.b.	n.b.	78	60	n.b.	116	97
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]				5	7			5		
Ball intendation hardness (ISO 2039-1)	[MPa]	183	194	190	160	155	230	232	175	200	216
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	82	81		51	45	49	49	47	48	48
Melting temperature (DIN 53765)	[°C]	249	244	224	220	221	217	218	258	251	254
Service temperature, short term	[°C]	170	170	200	160	160	180	180	170	170	170
Service temperature, long term	[°C]	110	110	110	100	100	100	100	100	100	110
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	8	8	8	8	12	7	6	11	9	5
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	10	10	10	8	13	8	6	12	10	5
Specific heat (ISO 22007-4:2008)	[J/(g*K)]			1,2	1,6	1,6	1,4	1,3	1,5	1,4	1,2
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]			0,33	0,37	0,37	0,4	0,41	0,36	0,72	0,39
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{14}	10^{14}	10^{14}	10^{12}	10^{14}	10^{12}	10^{12}	10^{14}	10^{8}	10^{12}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,02 / 0,03	0,02 / 0,03	0,02 / 0,04	0,3 / 0,6	0,3 / 0,6	0,2 / 0,3	0,2 / 0,3	0,2 / 0,4	0,1 / 0,3	0,1 / 0,2
Resistance to hot water / bases		–	–	–	(+)	(+)	(+)	(+)	(+)	(+)	(+)
Resistance to weathering		–	–	–	(+)	–	(+)	(+)	–	(+)	(+)
Flammability (UL94) (DIN IEC 60695-11-10;)		HB	HB	HB	HB	HB	HB	HB	HB	HB	HB

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Material standard values

Material		**TECAMID 66 HI**	**TECAMID 66 LA**	**TECAMID 66 MH**	**TECAMID 66/X GF50** black	**TECAMID TR**	**TECAMID 12**	**TECAMID 46** redbrown	**TECAGLIDE** green	**TECAST L**	**TECAST L** black
Chemical Designation		PA 66	PA 66	PA 66	PA 66	PA 6-3-T	PA 12	PA 46	PA 6 C	PA 6 C	PA 6 C
Fillers		heat stabilized	lubricant	molyb-denum disulfide	glass fibres				solid lubricant	lubricant	lubricant
Density (DIN EN ISO 1183)	[g/cm³]	1,15	1,11	1,15	1,61	1,12	1,02	1,19	1,13	1,13	1,14
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	3400	3100	3200	8700	2800	1800	3300	3200	2900	3100
Tensile strength (DIN EN ISO 527-2)	[MPa]	89	76	84	115	93	53	106	76	69	70
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	72	76	83	115	93	54	106	76	66	68
Elongation at yield (DIN EN ISO 527-2)	[%]	7	11	10	2	7	9	21	14	8	4
Elongation at break (DIN EN ISO 527-2)	[%]	25	14	40	2	49	200	32	18	50	50
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	3300	2800	3100	9000	2800	1700	3300	3100	2900	2900
Flexural strength (DIN EN ISO 178)	[MPa]	112	102	114	200	117	68	132	103	95	95
Compression modulus (EN ISO 604)	[MPa]	2900	2400	2700	6200	2400	1600	2800	2500	2700	2700
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	14 / 29	20 / 35	20 / 38	28 / 56	21 / 37	13 / 24	20 / 35	18 / 34	19 / 35	21 / 37
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	n.b.	37	n.b.		n.b.	n.b.	n.b.	n.b.	n.b.	n.b.
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]	5		5		7	7	9	4	5	5
Ball intendation hardness (ISO 2039-1)	[MPa]	191	145	168		150	105	187	159	150	150
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	57	54	52	78	148	37	72	45	48	42
Melting temperature (DIN 53765)	[°C]	263	261	253	256	n.a.	180	299	218	218	216
Service temperature, short term	[°C]	180	120	170	200	120	150	220	130	170	170
Service temperature, long term	[°C]	115	90	100	130	100	110	130	100	100	100
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	12	11	10		12	15	13	11	13	13
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	12	12	10		12	16	13	12	13	13
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,5	1,6	1,5		1,6	1,8	1,7	1,7	1,7	1,7
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,36	0,36	0,36		0,36	0,3	0,37	0,38	0,37	0,37
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{14}	10^{14}	10^{12}	10^{12}	10^{14}	10^{14}	10^{13}	10^{14}	10^{14}	10^{12}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,2 / 0,3	0,2 / 0,4	0,2 / 0,4	0,1 / 0,2	0,3 / 0,6	0,04 / 0,07	0,4 / 0,7	0,2 / 0,3	0,2 / 0,4	0,2 / 0,4
Resistance to hot water / bases		(+)	(+)	(+)	–	(+)	+	(+)	(+)	(+)	(+)
Resistance to weathering		–	–	(+)	(+)	–	–	–	–	–	(+)
Flammability (UL94) (DIN IEC 60695-11-10;)		HB	HB	HB	HB	V2	HB	V2	HB	HB	HB

Data generated directly after machining (standard climate Germany). For polyamides the values strongly depend on the humidity content.

Test specimen to DIN EN ISO 527-2

+ good resistance
(+) limited resistance
– poor resistance (depending on concentration, time and temperature)
n.b. not broken
n.a. not applicable

(a) Glass transition temperature testing according to DIN EN ISO 11357
(b) Thermal conductivity testing according to ISO 8302
(c) Thermal conductivity testing according to ASTM E1530
(d) Surface resistance testing according to ASTM D 257

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Material		TECAST L yellow	TECAST T	TECAST TM	TECARIM 1500 yellow	TECAFORM AD	TECAFORM AD black	TECAFORM AD AF	TECAFORM AH natural	TECAFORM AH black	TECAFORM AH ELS
Chemical Designation		PA 6 C	PA 6 C	PA 6 C	PA 6 C	POM-H	POM-H	POM-H	POM-C	POM-C	POM-C
Fillers		lubricant		molyb-denum disulfide	elastomer			PTFE			conductive carbon black
Density (DIN EN ISO 1183)	[g/cm³]	1,14	1,15	1,15	1,11	1,43	1,43	1,49	1,41	1,41	1,41
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	3100	3500	3200	2200	3400	3600	3000	2800	2800	1800
Tensile strength (DIN EN ISO 527-2)	[MPa]	70	83	82	53	79	80	53	67	67	42
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	68	80	80	53	80	80	53	67	67	42
Elongation at yield (DIN EN ISO 527-2)	[%]	4	4	4	13	37	32	8	9	9	11
Elongation at break (DIN EN ISO 527-2)	[%]	50	55	55	58	45	43	8	32	32	11
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	2900	3200	3000	2200	3600	3600	3000	2600	2600	1500
Flexural strength (DIN EN ISO 178)	[MPa]	95	109	102	73	106	106	85	91	91	56
Compression modulus (EN ISO 604)	[MPa]	2700	2900	2800	2100	2700	2800	2400	2300	2300	1500
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	21 / 37	19 / 36	22 / 38	14 / 26	19 / 33	22 / 38	19 / 33	20 / 35	20 / 35	16 / 25
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	n.b.	n.b.	n.b.	n.b.	n.b.	n.b.	n.b.	n.b.	150	74
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]	6	4	4	16	15	14	25	8	6	
Ball intendation hardness (ISO 2039-1)	[MPa]	150	170	170	95	185	185	166	165	165	96
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	42	40	43	53	–60	–60	–60	–60	–60	–60
Melting temperature (DIN 53765)	[°C]	216	215	217	216	182	182	179	166	166	169
Service temperature, short term	[°C]	170	170	170	160	150	150	150	140	140	140
Service temperature, long term	[°C]	100	100	100	95	110	110	110	100	100	100
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	13	12	11	13	12	11	12	13	13	13
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	13	12	11	13	13	11	13	14	14	14
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,7	1,7	1,6	1,7	1,3	1,3	1,3	1,4	1,4	1,3
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,37	0,38	0,33	0,32	0,43	0,43	0,46	0,39	0,39	0,46
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{14}	10^{14}	10^{12}	10^{14}	10^{14}	10^{12}	10^{14}	10^{14}	10^{12}	10^{4}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,2 / 0,4	0,2 / 0,4	0,2 / 0,5	0,6 / 1,2	0,05 / 0,1	0,05 / 0,1	0,05 / 0,1	0,05 / 0,1	0,05 / 0,1	0,05 / 0,2
Resistance to hot water / bases		(+)	(+)	(+)	(+)	–	–	–	(+)	(+)	(+)
Resistance to weathering		–	–	(+)	–	–	–	–	–	(+)	(+)
Flammability (UL94) (DIN IEC 60695-11-10;)		HB	HB	HB	HB	HB	HB	HB	HB	HB	HB

The corresponding values and information are no minimum or maximum values, but guideline values that can be used primarily for comparison purposes for material selection. These values are within the normal tolerance range of product properties and do not represent guaranteed property values. Therefore they shall not be used for specification purposes. Unless otherwise noted, these values were determined by tests at reference dimensions (typically rods with diameter 40-60 mm according to DIN EN 15860) on extruded, cast, compression moulded and machined specimens. As the properties depend on the dimensions of the semi-finished products and the orientation in the component (esp. in reinforced grades), the material may not be used without separate testing under individual circumstances.

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Material standard values

Material		**TECAFORM AH GF25**	**TECAFORM AH ID**	**TECAFORM AH ID** blue	**TECAFORM AH LA** blue	**TECAFORM AH MT** coloured	**TECAFORM AH SAN**	**TECAFORM AH SD**	**TECAPRO MT**	**TECAFINE PMP**	**TECANYL 731** grey
Chemical Designation		POM-C	POM-C	POM-C	POM-C	POM-C	POM-C	POM-C	PP	PMP	PPE
Fillers		glass fibres	detectable filler	detectable filler	solid lubricant		anti-microbic	antistatic agent	heat stabilized		
Density (DIN EN ISO 1183)	[g/cm³]	1,59	1,49	1,49	1,36	1,41	1,41	1,35	0,92	0,83	1,10
Mechanical properties											
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	4200	3200	3200	2100	2800	2900	1300	2000	1000	2400
Tensile strength (DIN EN ISO 527-2)	[MPa]	51	68	68	48	69	67	39	37	26	57
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	51	68	68	48	70	69	39	37	26	57
Elongation at yield (DIN EN ISO 527-2)	[%]	9	8	8	9	15	7	23	5	6	15
Elongation at break (DIN EN ISO 527-2)	[%]	12	10	10	9	30	18	23	34	67	22
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	4100	3100	3100	2000	2800	2800	1200	2000	800	2500
Flexural strength (DIN EN ISO 178)	[MPa]	88	100	100	70	94	93	46	56	31	85
Compression modulus (EN ISO 604)	[MPa]	3600	2400	2400	1800	2200	2200	1100	1600	1000	2100
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	23 / 39	17 / 31	17 / 31	16 / 27	18 / 32	18 / 31	12 / 19	16 / 26	11 / 19	18 / 33
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	36	59	59	27	n.b.	102	n.b.	160	17	69
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]		11	4		9		9	5		
Ball intendation hardness (ISO 2039-1)	[MPa]	180	174	174	120	158	163	74	100	58	146
Thermal properties											
Glass transition temperature (DIN 53765)	[°C]	–60	–60	–60	–60	–60	–60	–60	–10		145
Melting temperature (DIN 53765)	[°C]	170	169	169	166	169	166	165	161		n.a.
Service temperature, short term	[°C]	140	140	140	140	140	140	140	140	170	110
Service temperature, long term	[°C]	100	100	100	100	100	100	100	100	120	85
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	8	13	13	13	13	13	16	13		8
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	8	14	14	14	14	14	17	14		8
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,2	1,3	1,3	1,4	1,4	1,4	1,6			1,3
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,47	0,39	0,39	0,39	0,39	0,39	0,3			0,21
Electrical properties											
Surface resistance (DIN IEC 60093)	[Ω]	10^{14}	10^{13}	10^{13}	10^{14}	10^{12}		10^{11}	10^{12}		10^{13}
Miscellaneous data											
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,07 / 0,2	0,05 / 0,1	0,05 / 0,1	0,05 / 0,1	0,05 / 0,1	0,05 / 0,1	0,9 / 1,8	0,01 / 0,02	<0,01/<0,01	0,02 / 0,04
Resistance to hot water / bases		(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(+)
Resistance to weathering		–	–	–	–	–	–	–	(+)	–	–
Flammability (UL94) (DIN IEC 60695-11-10;)		HB	HB	HB	HB	HB	HB	HB	HB	HB	HB

Data generated directly after machining (standard climate Germany). For polyamides the values strongly depend on the humidity content.

Test specimen to DIN EN ISO 527-2

+ good resistance
(+) limited resistance
– poor resistance (depending on concentration, time and temperature)
n.b. not broken
n.a. not applicable

(a) Glass transition temperature testing according to DIN EN ISO 11357
(b) Thermal conductivity testing according to ISO 8302
(c) Thermal conductivity testing according to ASTM E1530
(d) Surface resistance testing according to ASTM D 257

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Material		**TECANYL GF30**	**TECANYL MT** coloured	**TECARAN ABS** grey
Chemical Designation		PPE	PPE	ABS
Fillers		glass fibres		
Density (DIN EN ISO 1183)	[g/cm³]	1,30	1,04 – 1,10	1,04
Mechanical properties				
Modulus of elasticity (tensile test) (DIN EN ISO 527-2)	[MPa]	4100	2400	1700
Tensile strength (DIN EN ISO 527-2)	[MPa]	73	65	32
Tensile strength at yield (DIN EN ISO 527-2)	[MPa]	73	67	32
Elongation at yield (DIN EN ISO 527-2)	[%]	5	4	3
Elongation at break (DIN EN ISO 527-2)	[%]	5	8	49
Modulus of elasticity (flexural test) (DIN EN ISO 178)	[MPa]	3900	2400	1600
Flexural strength (DIN EN ISO 178)	[MPa]	116	95	49
Compression modulus (EN ISO 604)	[MPa]	3300	2100	1400
Compressive strength (1% / 2%) (EN ISO 604)	[MPa]	23 / 41	17 / 30	15 / 26
Impact strength (Charpy) (DIN EN ISO 179-1eU)	[kJ/m²]	37	70	n.b.
Notched impact strength (Charpy) (DIN EN ISO 179-1eA)	[kJ/m²]			34
Ball intendation hardness (ISO 2039-1)	[MPa]	205	140	74
Thermal properties				
Glass transition temperature (DIN 53765)	[°C]	150	171	104
Melting temperature (DIN 53765)	[°C]	n.a.	n.a.	
Service temperature, short term	[°C]	110	110	100
Service temperature, long term	[°C]	85	95	75
Thermal expansion (CLTE), 23 – 60 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	4	8	
Thermal expansion (CLTE), 23 – 100 °C (DIN EN ISO 11359-1;2)	[10^{-5} K^{-1}]	4	8	
Specific heat (ISO 22007-4:2008)	[J/(g*K)]	1,2	1,3	
Thermal conductivity (ISO 22007-4:2008)	[W/(m*K)]	0,28	0,21	
Electrical properties				
Surface resistance (DIN IEC 60093)	[Ω]	10^{14}	10^{13}	
Miscellaneous data				
Water absorption 24h / 96h (23 °C) (DIN EN ISO 62)	[%]	0,01 / 0,02	0,02 / 0,04	0,07 / 0,2
Resistance to hot water / bases		(+)	(+)	–
Resistance to weathering		–	–	–
Flammability (UL94) (DIN IEC 60695-11-10;)		HB	HB	HB

The corresponding values and information are no minimum or maximum values, but guideline values that can be used primarily for comparison purposes for material selection. These values are within the normal tolerance range of product properties and do not represent guaranteed property values. Therefore they shall not be used for specification purposes. Unless otherwise noted, these values were determined by tests at reference dimensions (typically rods with diameter 40-60 mm according to DIN EN 15860) on extruded, cast, compression moulded and machined specimens. As the properties depend on the dimensions of the semi-finished products and the orientation in the component (esp. in reinforced grades), the material may not be used without separate testing under individual circumstances.

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Chemical resistance

Important criteria for testing chemical resistance are temperature, the concentration of the agents, the residence time and the mechanical load. The resistance against various chemicals is listed in the following table. These details correspond to the present state of our knowledge and are meant to provide information about our products and their applications. They do not mean that the chemical resistance of products or their suitability for a particular purpose is guaranteed in a legally binding way. Any existing commercial proprietary rights are to be taken into account. For specific applications it is recommended that suitability is first established. Standard testing is performed in normal climatic conditions 23/50 according to DIN 50 014.

	TECASINT (PI)	TECAPEEK HT, ST (PEK, PEKEKK)	TECAPEEK (PEEK)	TECATRON (PPS)	TECAPEI (PEI)	TECASON E (PES)	TECASON P (PPSU)	TECASON S (PSU)	TECAFLON PTFE (TF)	TECAFLON PVDF (PVDF)	TECAMID 6 (PA6)	TECAMID 46, 66 (PA46, 66)	TECAMID 11, 12 (PA11, 12)	TECARIM (PA6 C + elastomer)	TECANAT (PC)	TECAPET (PET), TECADUR PBT (PBT)	TECAFORM AH (POM-C)	TECAFORM AD (POM-H)	TECAFINE PP (PP)	TECAFINE PE (PE)	TECARAN ABS (ABS)	TECANYL (PPE)
Acetamide 50%			+						+	+	+	+	+	+			+	+		+	+	
Acetone	+	+	+	+	–	–	–	–	+	o	+	+	o	+	–	o	+	+	+	+	–	–
Formic acid, aqueous solution 10%	+	+	+	+	+	+	+	+	+	+	–	–	–	–	–	o	–	–	+	+	+	+
Ammonia solution 10%	–	+	+	+	–	o		o	+	+	o	o	o	o	–	–	+	o	+	+	+	+
Anone						–			+	o	+	+	+	+	–			+	+	o		
Benzine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+	+	o	o	o	–
Benzene	+		+	o	–	+	–	–	+	o	+	+	+	+	–	o	+	+	–	–	–	–
Bitumen	+		+						+		+	+	o		–		+	+	o	+		
Boric acid, aqueous solution 10%		+	o			+		o	+	+	–	–	–	–	+	–	–	–	+	+	+	
Butyl acetate	+		+	+	–	–	–	–	+	–	+	+	+	+	–	–	+	+	o	o	–	
Calcium chloride, solution 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	+	+	
Chlorbenzene	+		+	o	o	–	–	–	+	o	+	+	+	+	–	–	+	+	o	–	–	
Chloroform	+		+	+	–	–	–	–	+	+	–	–	–	–	–	–	–	–	o	–	–	–
Cyclohexane	+		+	+	+	+	+	o	+	+	+	+	+	+	–	+	+	+	+	+	+	+
Cyclohexanone	+		+	+		–	–	–	+	o	+	+	+	+	–	–	+	+	+	+	–	+
Diesel oil	+		+	+	+	+	+	+	+	+	+	+	+	+	o	+	+	+	o	+	+	+
Dimethyl formamide	o		+	+		–	–	–	+	–	+	+	o	+	–	+	+	o	+	+	–	
Diocthyl phthalate			+	+	o	+	+	o	+	o	+	+	+	+	o	+	+	+	+	+		+
Dioxane	+		+	+	+	o	–	–	+	+	+	+	+	+	–	o	o	o	+	+		o
Acetic acid, concentrated	o		o	+	–	+	+	–	+	o	–	–	–	–	–	–	–	–	o	o	–	+
Acetic acid, aqueous solution 10%	+		+	+	+	+	+	+	+	+	–	–	o	–	+	o	+	o	+	+	+	+
Acetic acid, aqueous solution 5%	+		+	+	+	+	+	+	+	+	+	+	o	+	+	+	+	o	+	+	+	+
Etanolo 96%	+	+	+	+	+	+	+	+	+	+	o	o	o	o	o	+	+	+	+	+	+	+
Etilacetato	+		+	+	o	–	o	–	+	o	+	+	+	+	–	o	+	+	+	+		+
Etiletere	+		+	+	+	+	+	+	+	+	+	+	+	+	–	+	+	+	+			
Cloruro di etilene	+				+				+		+	+	o	+	–	–	–	–	+	o	–	
Hydrofluoric acid, 40%			–	o	–	–	–	–	o	+	–	–	–		–	–	–	–	+	+	o	+
Formaldehyde, aqueous solution 30%		+	+	+	+	+	+	+	+	+	o	o	o	o	+		+	+	+	+	+	+
Formamide			+						+		+	+	o	+		+	+	o		o		
Freon, Frigen, liquid	+	–	–	+		+		+	+		+	+	+	+	–	+		+	–	o	o	+
Fruit juices	+	+	+	+	+	+	+	+	+	+	+	+	+	+	o	+	+	o	+	+	+	+
Glykol	+	+	+	+	o	+	+	+	+	+	+	+	+	+	+	o	o	o	+	+	+	+
Glysantin, aqueous solution 40%	+	+	+	+		+		+	+	+	+	+	+		+	+	+	+	+	+		+
Glycerine	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+	+	+	+	+	+
Urea, aqueous solution	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Heating oil	+	+	+	+		+	+	o	+	+	+	+	+	+	o	+	+	+	o	+	+	+
Heptane, Hexane	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	–	+	+
Iso-octane	+		+		+	+	+	o	+		+	+	+					+	+	+	+	+
Isopropanol	+		+	+	+	+	+	o	+	+	+	+	o	+	–	o	+	+	+	+	o	+
Iodine solution, alcohol solution	+		o				+	o	+	+	–	–	–	–	–			o	+	+	o	+
Potassium lye, aqueous 50%	–	+	+	+		+	+	o	+	o	o	o	o	o	–	–	+	–	+	+	+	+
Potassium lye, aqueous 10%	o		+	+	o	+	+	+	+	o	+	+	+	+	–	–	+	–	+	+	+	+
Potassium dichromate, aqueous solution 10%	–								+	+	+	+	o		+	+	+	o	+	+	+	+

+ resistant o limited resistance – not resistant (also dependent on concentration, time and temperature)

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	TECASINT (PI)	TECAPEEK HT, ST (PEK, PEKEKK)	TECAPEEK (PEEK)	TECATRON (PPS)	TECAPEI (PEI)	TECASON E (PES)	TECASON P (PPSU)	TECASON S (PSU)	TECAFLON PTFE (TF)	TECAFLON PVDF (PVDF)	TECAMID 6 (PA6)	TECAMID 46, 66 (PA46, 66)	TECAMID 11, 12 (PA11, 12)	TECARIM (PA6 C + elastomer)	TECANAT (PC)	TECAPET (PET), TECADUR PBT (PBT)	TECAFORM AH (POM-C)	TECAFORM AD (POM-H)	TECAFINE PP (PP)	TECAFINE PE (PE)	TECARAN ABS (ABS)	TECANYL (PPE)
Potassium permaganate, aqueous solution 1%	+	+	+	+	+		+	+	+	+	–	–	–	–	+	+	+	+	+	+	0	+
Cupric sulphate, 10%	+	+	+	+		+	+	+	+	+	+	+	+	+	+		+	–	+	+	+	+
Linseed oil	+		+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Methanol	+		+	+	0	+	0	0	+	0	+	+	0	+	–	+	+	+	+	+	0	+
Methyl ethyl ketone	+	+	+	+	–	–	0	–	+	0	+	+	+	+	–	0	0	0	0	0	–	–
Methylene chloride	+		+	0		–	–	–	+	+	0	0	–	0	–	–	0	0	–	0	–	
Milk	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lactic acid, aqueous solution 90%	+		+	+	+	0			+	+	–	–	0	–	+		+	–	+	+	–	–
Lactic acid, aqueous solution 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	+	+
Sodium bisulphite, aqueous solution 10%	0	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	+	+
Sodium carbonate, aqueous solution 10%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sodium chloride, aqueous solution 10%	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	–	–	+	+	+	
Sodium nitrate, aqueous solution 10%	+		+	+					+	+	+	+	+	+	0	+	+	+	+	+	+	
Sodium thiosulphate 10%	+		+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Soda lye, aqueous 5%	0		+	+	0	+	+	+	+	0	+	+	+	+	–	0	+	–	+	+		+
Soda lye, aqueous 50%	–	+	+	+	–	+	+	+	0	0	0	0	0	0	–	–	+	–	+	+	+	+
Nitrobenzene	+		0	0		–			+	0	–	–	–	–	–	0	0	0	+	+	–	
Oxalic acid, aqueous solution 10%	+	+	+	+		+	+	+	+	+	0	0	0	0	+	+	–		+	+	+	+
Ozone	0		+				+	+	+	+	–	–	–	–	+	0	–	–		0		
Paraffin oil	+		+	+	+	+	+		+	+	+	+	+	+	–	+	+	+	+	+	+	+
Perchlorethylene	+		+	+	+	–	0	–	+	+	0	0	–	0	–	0	0	0	–	–	0	
Petroleum	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+
Phenol, aqueous solution	+		0	+		–	–	–	+	+	–	–	–	–	–	–	–	–	+	+	0	
Phosphoric acid, concentrated	0	+	+	+				+	+	+	–	–	–	–		+			+	+	+	
Phosphoric acid, aqueous solution 10%	0	+	+	+	+		+	+	+	+	–	–	–	–	+	+	0	–	+	+	+	+
Propanol	+		+		+		+	+	+	+	+	+	–	+	+	+	+	+	+	+	+	+
Pyridine	–		+	0	–	–			+	0	+	+	0	+	–		0	0	0	0	–	
Salicylc acid	+		–						+	+	+	+	+	+		0		–		+	+	
Nitric acid, aqueous solution 2%	+	+	+	+	+	+	+	+	+	+	–	–	–	–	0	+	–	–	+	+	+	–
Hydrochloric acid, aqueous solution 2%	+	+	+	+	+	+	+	+	+	+	–	–	0	–	+	+	–	–	+	+	+	+
Hydrochloric acid, aqueous solution 36%	–	+	+	0	+	+	+	0		+	–	–	–	–	0	–	–	–	+	+	+	+
Sulphur dioxide	+		+	+		0			+	+	+	+	+	+	–	+	+	+	0	0	–	
Sulphuric acid, concentrated 98%	–	–	–	+	–	–	–	–	+	0	–	–	–	–	–	–	–	–	+	0	–	–
Sulphuric acid, aqueous solution 2%	+	+	+	+	+	+	+	+	+	+	–	–	–	–	+	+	–	+	+	+	+	+
Hydrogen sulphide, saturated		+	+	+		+	+	+	+	+	+	+	+	+	+	+	+		+	+	–	+
Soap solution, aqueous solution	0	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+
Silicone oils	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Soda solution, aqueous solution 10%	0								+	+	+	+	+		+	+		+	+	+	+	
Edible fats, Edible oils	+	+	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+	+	+			+
Styrene	+		+						+	0	+	+	+	+	–	0	+	+	0	0		–
Tar	+		+		+	+	+		+		0	0	0	0		+	+	+				
Carbon tetrachloride	+		+	+	+	+	0	–	+	+	+	+	–	+	–	+	0	0	–	–	–	–
Tetrahydrofurane	+		+	+	+	–	–		+	0	+	+	+	+	–	0	0	0	0	0	–	
Tetralin	+		+						+		+	+	+	+	–	+	0			0	–	
Toluene	+	+	+	0	–	–	0	–	+	+	+	+	+	+	–	0	+	0	+	0	–	
Transformer oil	+			+		+	+	+	+	+	+	+	+	+		+	+	+	0	+		+
Triethanolamine	–		0	0					+	0	+	+	+	+	–	+	+	–	+	+	+	
Trichlorethylene	+	+	+	0	–	–	–	–	+	+	0	0	0	0	–	–	–	–	0	0	–	–
Vaseline	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	
Wax, molten	+	+	+		+	+			+	+	+	+	+	+	+	+	+	+	0	0		+
Water, cold	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Water, warm	–	+	+	+	+	+	+	+	+	+	0	0	0	0	0	–	0	–	0	0	+	+
Hydrogen peroxide, aqueous solution 30%	–	0		0		+	+	+	+	0	–	–	–	–	+	+	–	–	+	+		+
Hydrogen peroxide, aqueous solution 0,5%	+		+	+		+	+	+	+	+	–	–	–	–	+	+	+	0	+	+	+	+
Wine, Brandy	+		+			+	+	+	+	+	0	0	0	0	+	+	+	+	+	+	+	+
Tartaric acid	+	+	+			+			+	+	+	+	+		+	+	0	0	+	+	+	+
Xylene	+	+	+	+	–	0	0	–	+	+	+	+	0	+	–	0	+	+	–	–	–	–
Zink chloride, aqueous solution 10%	+	+	+	+	+	+	+	+	+	+	0	0	0	0	+	+	+	–	+	+	+	+
Citric acid, aqueous solution 10%	+	+	+		+	+	+	0	+	+	0	0	0	0	+	+	0	–	+	+	+	+

+ resistant o limited resistance – not resistant (also dependent on concentration, time and temperature)

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