

Semi-Finished Engineering Plastic Products.

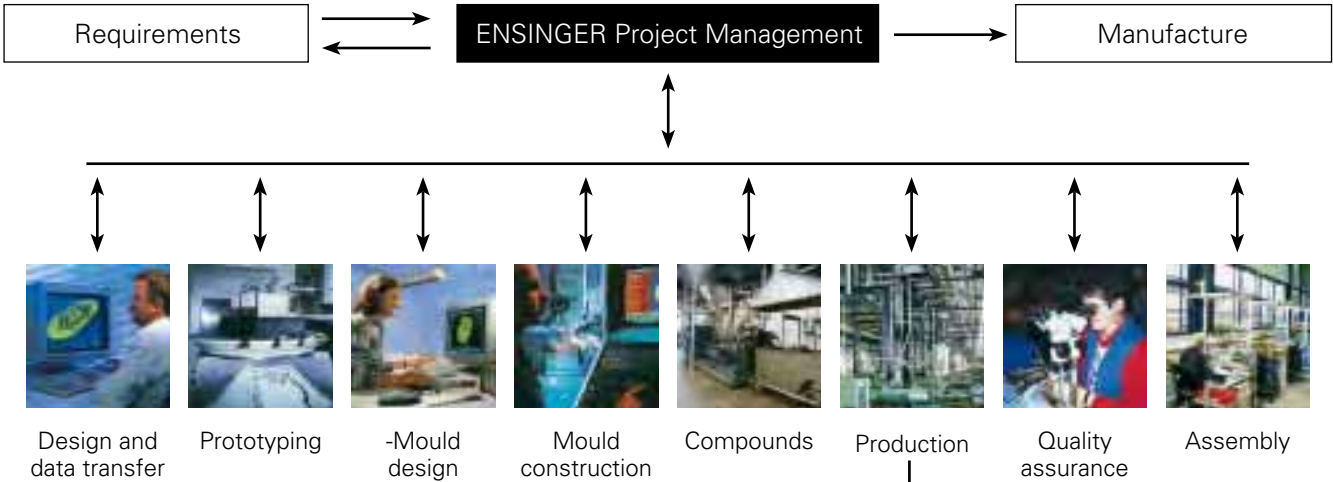


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ENSINGER Project Management.
Total expertise in engineering plastics.



Your project benefits from our know-how. We can call on our many years of experience in a vast array of industrial sectors to find the optimum solution for your specific application. We design and manufacture semi-finished and finished products as well as complete assemblies tailored exactly to your individual requirements.

Our experts combine the optimum material for your application with the most suitable manufacturing method, selecting from a whole range of process technologies.

Reliable functionality, environmental compatibility and cost-effectiveness are the key factors which decide the success of your project. They are all taken fully into consideration in every development from ENSINGER. Sectors which profit from our project work range from automotive engineering and medical technology, aviation and aerospace engineering through to mechanical engineering and electronics.

Semi-finished products



Injection moulding



Machining



Custom cast



Profiles



**Quality products are a matter of course.
ENSINGER offers you more.**

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I Service

ENSINGER service begins with comprehensive advice on the intended application. The ENSINGER experts then select the ideal material and the appropriate production technique to take account of all the requirements. Semi-finished products are adapted exactly and individually to suit the application. Close tolerances are guaranteed. We employ sawing, planing, grinding and contour planing to achieve a wide range of precise solutions.



I Quality

Any company with successful worldwide activities has to offer the highest quality standards. We invest continuously in research and development in order to meet the latest demands with new high-tech materials and processing techniques. This enables us to be a decisive step ahead in the market. Stringent CAQ guidelines cover every individual process starting with receipt of raw materials and continuing through to the finished product. It goes without saying that we are certified in accordance with DIN EN ISO 9001.



I Delivery reliability

Whether semi-finished products in standard basic versions or individually modified – our products reach you on time. Our subsidiaries and trading partners make use of the worldwide ENSINGER distribution network and its electronic planning systems. This, together with our highly efficient stock management system, ensures very large quantities or special requirements are delivered in the shortest possible time or 'just-in-time' – exactly when you need them.

Proven in Practice - ENSINGER High-temperature plastics.

Engineering Plastics				Engineering Plastics			
	Name	DIN-Abbr.	Page		Name	DIN-Abbr.	Page
60°C	TECAMID 11	PA 11	15	100°C	TECAM 6 MO	PA 6	15/17/19
	TECAMID 12	PA 12	15/17/19		TECAMID 6 GF 30 black	PA 6 GF 30	15/17/19
85°C	TECANYL	PPE	57/59/61	110°C	TECAMID 66	PA 66	15/16/18
	TECANYL GF 30	PPE GF 30	57/59/61		TECAMID 66 MH	PA 66	15/16/18
	TECARAN ABS grey	ABS	57/59/61		TECAMID 66 HI	PA 66	15/16/18
90°C	TECAFINE PPH grey	PP	60	TECAMID 66 GF 30 black	PA 66 GF 30	15/16/18	
	TECAFINE PPH	PP	60	TECAMID 66 CF 20	PA 66 CF 20	15/16/18	
	TECAFINE PPH GF 30	PP GF 30	60	TECADUR PET	PET	27-30	
	TECAFINE PE 5	PE-HMW	58/60	TECADUR PET black	PET	27/30	
	TECAFINE PE 10	PE-UHMW	58/60	TECAPET	PET	27/30	
	TECAFINE PE	PE-HD	58/60	TECAPET black	PET	27/30	
	TECAFINE PE black	PE-HD	58	TECAPET TF	PET	27/30	
	TECAMID 66 LA	PA 66	15/16/18	TECADUR PBT GF 30	PBT GF 30	27/30	
100°C	TECAFORM AH	POM-C	10-14	120°C	TECANAT	PC	31/32
	TECAFORM AH black	POM-C	10/11/14		TECANAT GF 30	PC GF 30	31/32
	TECAFORM AH GF 25	POM-C GF 25	11/14	130°C	TECAMID 46	PA 46	15
	TECAFORM AH LA blue	POM-C	10/11/14		TECAMID 66/X GF 50 black	PA 66+63 / 6T	15/18
	TECAFORM AH ELS	POM-C	10/11/14				
	TECAFORM AH TF	POM-C	10				
	TECAFORM AH MT	POM-C	62/65				
	TECAFORM AD	POM-H	10/11/14				
	TECAFORM AD AF	POM-H	10/11/14				
	TECAFORM AD GF 20	POM-H GF 20	10				
	TECAFORM AD CL	POM-H	10				
	TECAST T	PA 6 G	22-25				
	TECAST TM	PA 6 G	15/23				
	TECAGLIDE	PA 6 G	22/23				
	TECALUBE	PA 6 G	22/23				
	TECARIM	PA 6 G	23				
	TECAMID TR	PA 6-3-T	15/17/19				
	TECAMID 6	PA 6	15/17/19-21				

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Please refer to the following two pages for the raw material groups and examples of bought-in raw material.

High-temperature plastics			
	Name	DIN Abbr.	Page
150°C	TECAFLON PVDF	PVDF	33-35
	TECAFLON ETFE	E/TFE	33/34/36
	TECAFLON PVDF CF 8	PVDF CF 8	33
	TECAFLON PVDF AS	PVDF	57
160°C	TECASON S	PSU	36-38/40
170°C	TECASON P MT black	PPSU	36-38/40
	TECAPEI	PEI	36-38
	TECAPEI GF 30	PEI GF 30	36
	TECAPEI MT	PEI	57
180°C	TECASON E	PES	36-38/40
230°C	TECATRON	PPS	39/40
	TECATRON GF 40	PPS GF 40	39/40
	TECATRON PVX black	PPS	39/40
	TECATRON GF 40 black	PPS	40
260°C	TECAFLON PTFE	PTFE	33-35
	TECAFLON PTFE GF 30	PTFE GF 30	33
	TECAPEEK	PEEK	41-45
	TECAPEEK GF 30	PEEK GF 30	41-43
	TECAPEEK CF 30 black	PEEK C F 30	41-43
	TECAPEEK PVX black	PEEK	41-43/46/47
	TECAPEEK MT black	PEEK	41-43/62/63
	TECAPEEK MT coloured	PEEK	62/63
	TECAPEEK TF 10	PEEK	41-43
	TECAPEEK HT	PEK black	41-43
300°C	SINTIMID 8000	PTFE + PI	50-52
	SINTIMID PUR HT black	PI	50-52
	SINTIMID 15G anthracite	PI CS 15	50-52
	SINTIMID 40G anthracite	PI CS 40	50-52
	SINTIMID 30P	PI + PTFE	50-52
	SINTIMID PVX black	PI	50-52
	VESPEL® SP1	PI	53-55
	VESPEL® SP21	PI CS 15	53-55
	VESPEL® SP22	PI CS 40	53-55
	VESPEL® SP211	PI CS 15, PTFE	53-55
	VESPEL® SP3	PI	53-55

TECAFORM **Page 10**

Rods	Diameter:	3 – 250 mm
Plates	Thicknesses:	1 – 100 mm
Tubes	Outside diameter:	25 – 505 mm

TECAMID/TECAST **Page 15**

Rods	Diameter:	4 – 800 mm
Plates	Thicknesses:	1 – 200 mm
Tubes	Outside diameter:	25 – 710 mm

TECADUR/TECAPET **Page 26**

Rods	Diameter:	4 – 200 mm
Plates	Thicknesses:	1 – 100 mm
Tubes	Outside diameter:	25 – 300 mm

TECANAT **Page 31**

Rods	Diameter:	4 – 250 mm
Plates	Thicknesses:	1 – 100 mm

TECAFLON **Page 33**

Rods	Diameter:	4 – 300 mm
Plates	Thicknesses:	1 – 100 mm

TECASON/TECAPEI **Page 36**

Rods	Diameter:	4 – 200 mm
Plates	Thicknesses:	5 – 80 mm

TECATRON **Page 39**

Rods	Diameter:	4 – 60 mm
Plates	Thicknesses:	5 – 60 mm

TECAPEEK **Page 41**

Rods	Diameter:	5 – 200 mm
Plates	Thicknesses:	5 – 100 mm
Tubes	Outside diameter:	40 – 300 mm

TECATOR **Page 48**

Rods	Diameter:	5 – 50 mm
Plates	Thicknesses:	5 – 40 mm

SINTIMID/VESPEL® **Page 50/53**

Rods	Diameter:	6 – 70 mm
Plates	Thicknesses:	5 – 80 mm

COMPRESSION MOULDING **Page 56**

TECAFINE/TECARAN/TECANYL **Page 57**

Rods	Diameter:	4 – 300 mm
Plates	Thicknesses:	1 – 100 mm

Special Materials **Page 62**

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Sliding and Abrasive Applications	Page 70




Chemical resistance **Page 76**

Material standard values **Page 78**




Machining guidelines **Page 84**

Important processing instructions **Page 85**

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DIN-Abbreviation	Works-nomenclature	Raw material group	Trade Name			
ABS	TECARAN ABS	Acrylonitrile-butadiene-styrene-graft copolymer	Terluran, Novodur	59	61	
E/CTFE	TECAFLON ECTFE	Ethylene/Chlorotrifluoroethylene	Halar			
E/TFE	TECAFLON ETFE	Ethylene Tetrafluoroethylen copolymer	Tefzel, Hostaflon ET	36		
E/TFE GF 25	TECAFLON ETFE GF 25	Ethylene Tetrafluoroethylen copol., glass fibre	Tefzel			
FEP	TECAFLON FEP	Tetrafluoroethylen/Hexafluoropropylene, copol.	Teflon FEP			
PA 6	TECAM 6 MO	Polyamide 6, with MoS ₂ (black)	Grilon	17	19	
PA 6	TECAMID 6	Polyamide 6	Ultramid B, Akulon F, Durethan B	17	19	20/21
PA 6 GF 30	TECAMID 6 GF 30	Polyamide 6, glass fibre (black)	Akulon K, Ultramid B	17	19	
PA 6-3-TR	TECAMID TR	Polyamide 6 (transparent)	Trogamid T	17	19	
PA 6 G	TECAST HI	Cast Polyamide 6, heat-stabilized	Ultralon, Caprolactam			25
PA 6 G	TECAST R	Cast Polyamide 6	Ultralon, Caprolactam			25
PA 6 G	TECAST R blue	Cast Polyamide 6 (blue)	Ultralon, Caprolactam			25
PA 6 G	TECAST T	Cast Polyamide 6, tough	Ultralon, Caprolactam	22	23	25
PA 6 G	TECAST T blue	Cast Polyamide 6, tough (blue)	Ultralon, Caprolactam			25
PA 6 G	TECAST ST	Cast Polyamide 6, super tough	Ultralon, Caprolactam			25
PA 6 G	TECAST M	Cast Polyamide 6, with MoS ₂ (charcoal-grey)	Ultralon, Caprolactam			25
PA 6 G	TECAST TM	Cast Polyamide 6, MoS ₂ , tough (black)	Ultralon, Caprolactam	22	23	25
PA 6 G	TECAST L	Cast Polyamide 6, lubricated	Ultralon, Caprolactam			25
PA 6 G	TECAST L black	Cast Polyamide 6, lubricated (black)	Ultralon, Caprolactam			25
PA 11	TECAMID 11	Polyamide 11 – also with MoS ₂	Rilsan B	15	15	15
PA 11 GF 30	TECAMID 11 GF 30	Polyamide 11, glass fibre	Rilsan B			
PA 12	TECAMID 12	Polyamide 12	Rilsan A, Vestamid	17	19	
PA 12	TECAMID 12 MO	Polyamide 12 (black)	Rilsan A, Vestamid			
PA 12 GF 30	TECAMID 12 GF 30	Polyamide 12, glass fibre	Vestamid GF			
PA 46	TECAMID 46	Polyamide 46	Stanyl	57	57	
PA 66	TECAMID 66	Polyamide 66	Ultramid A, Zytel, Akulon S, Durethan A	16	18	
PA 66	TECAMID 66 HI	Polyamide 66, heat-stabilized	Ultramid A, Akulon S	16	18	
PA 66 GF 30	TECAMID 66 GF 30	Polyamide 66, glass fibre (black)	Akulon S, Ultramid A, Durethan A	16	18	
PA 66 CF 20	TECAMID 66 CF 20	Polyamide 66, carbon fibre (black)	Akulon S, Ultramid A, Durethan A	16	18	
PA 66 SF 20	TECAMID 66 SF 20	Polyamide 66, aramide fibre (black)	Zytel			
PA 66	TECAMID 66 LA	Polyamide 66, PE, high pv-value	Ultramid A, Zytel, Akulon S, Durethan A	16	18	
PA 66	TECAMID 66 MH	Polyamide 66, with MoS ₂ (black)	Ultramid A	16	18	
PA 66+63/6T	TECAMID 66/XGF50black	Polyamide -copolymer, amorphous	Grivory		18	
PA 610	TECAMID 610	Polyamide 610	Ultramid S			
PA 612	TECAMID 612	Polyamide 612	Zytel			
PAI	TECATOR	Polyamide-imide	Torlon	49	49	
PBT	TECADUR PBT	Polybutylene terephthalate	Ultradur, Pocan			
PBT GF 30	TECADUR PBT GF 30	Polybutylene terephthalate, glass fibre	Ultradur, Arnite	29	32	
PC	TECANAT	Polycarbonate (transparent)	Lexan, Makrolon	32	32	
PC GF 30	TECANAT GF 30	Polycarbonate, glass fibre	Lexan GF, Makrolon GF	32	32	
PCTFE	TECAFLON PCTFE	Polychloro-trifluoroethylene	Daikin, Voltalef			
PE-HD	TECAFINE PE	High density polyethylene (natural)	Hostalen, Lupolen	58	60	
PE-HD	TECAFINE PE black	High density polyethylene (black)	Hostalen, Lupolen	58		
PEK	TECAPEEK HT	Polyetheretherketone	Victrex PEEK HT	42	47	
PEEK	TECAPEEK	Polyetheretherketone	Victrex PEEK	42	43	44/45
PEEK GF 30	TECAPEEK GF 30	Polyetheretherketone, glass fibre	Victrex PEEK	42	43	
PEEK CF 30	TECAPEEK CF 30	Polyetheretherketone, carbon fibre (black)	Victrex PEEK	42	43	
PEEK CF	TECAPEEK ELS	Polyetheretherketone, carbon fibre (black)	Victrex PEEK	42	43	
PEEK	TECAPEEK PVX	Polyetheretherketone with carbon fibre, PTFE, graphite (black)	Victrex PEEK	42	43	46/47
PEEK	TECAPEEK MT black	Polyetheretherketone (black) approved for medical engineering	Victrex PEEK	42	43	
PEEK TF 10	TECAPEEK TF 10	Polyetheretherketone, PTFE	Victrex PEEK			
PE-HMW	TECAFINE PE 5	High-molecular weight polyethylene	Hostalen, Lupolen	58	60	

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DIN-Abbreviation	Works-nomenclature	Raw material group	Trade Name			
PEI	TECAPEI	Polyetherimide	Ultem		38	
PEI	TECAPEI MT	Polyetherimide, approved for medical engineering	Ultem	37	38	36
PEI GF 30	TECAPEI GF 30	Polyetherimide, glass fibre	Ultem			
PES	TECASON E	Polyethersulphone	Radel A, Ultrason E	37	38	
PES GF 30	TECASON E GF 30	Polyethersulphone, glass fibre	Radel A, Ultrason E			
PET	TECADUR PET	Polyethylene terephthalate	Arnite, Crastin	27	31	
PET	TECADUR PET black	Polyethylene terephthalate, black	Arnite, Crastin	27	31	
PET	TECAPET	Polyethylene terephthalate	Arnite, Crastin	27	31	
PET	TECAPET black	Polyethylene terephthalate, black	Arnite, Crastin	27	31	
PET	TECAPET TF	Polyethylene terephthalate, PTFE	Arnite, Crastin	27	31	
PE-UHMW	TECAFINE PE 10	Ultra-high-molecular weight polyethylene	Hostalen GUR	58	60	
PI	SINTIMID H black	Polyimide	P84			
PI CS 15	SINTIMID 15 G	Polyimide, graphite (charcoal grey)	P84	51	52	
PI	SINTIMID PVX	Polyimide, graphite + PTFE	P84	51	52	
PI	VESPEL® SP1	Polyimide		54	54	55
PI CS 15	VESPEL® SP21	Polyimide, graphite				
PI CS 40	VESPEL® SP22	Polyimide, graphite				
PI CS 15, PTFE	VESPEL® SP211	Polyimide, graphite + PTFE				
PI	VESPEL® SP3	Polyimide, MoS ₂				
PMMA	TECACRYL	Polymethyl methacrylate (transparent)	Plexiglas, Resarit			
PMP	TECAFINE PMP	Polymethyl pentene (transparent)	TPX	58		
POM Copolymer	TECAFORM AH black	Polyoxymethylene copolymer (black)	Hostaform C, Ultraform	11	14	
POM Copolymer	TECAFORM AH	Polyoxymethylene copolymer	Hostaform C, Ultraform	11	14	12/13
POM Copolymer	TECAFORM AH GF 30	Polyoxymethylene copolymer, glass fibre	Hostaform C, Ultraform	11	14	
POM Copolymer	TECAFORM AH LA	Polyoxymethylene copol., polyethylene blue	Hostaform C, Ultraform	11	14	
POM Copolymer	TECAFORM AH ELS	Polyoxymethylene copolymer (black)	Hostaform C, Ultraform	11	14	
POM Copolymer	TECAFORM AH TF	Polyoxymethylene copolymer, PTFE	Hostaform C, Ultraform	57	57	57
POM Copolymer	TECAFORM AH MT ^{colours}	Polyoxymethylene copolymer, colour	Hostaform C, Ultraform	57	57	57
POM Homopolymer	TECAFORM AD	Polyoxymethylene homopolymer	Delrin	11	14	
POM Homopolymer	TECAFORM AD GF 20	Polyoxymethylene homopolymer, glass fibre	Delrin	57	57	57
POM Homopolymer	TECAFORM AD AF	Polyoxymethylene homopolymer, PTFE	Delrin AF	11	14	
POM Homopolymer	TECAFORM AD CL	Polyoxymethylene homopolymer, lubricated	Delrin	57	57	57
PP-H	TECAFINE PPH	Polypropylene homopolymer (natural, grey)	Hostalen PPH	58		
PP-H GF 30	TECAFINE PPH GF 30	Polypropylene homopolymer, glass fibre	Hostalen PPH		60	
PP	TECAPRO MT	Polypropylene homopolymer	PP		64	
PPE	TECANYL	Polyphenylene ether	Noryl	59	61	
PPE GF 30	TECANYL GF 30	Polyphenylene ether, glass fibre	Noryl GF	59	61	
PPS	TECATRON	Polyphenylene sulphide	Fortron	39	39	
PPS GF 40	TECATRON GF 40	Polyphenylene sulphide, glass fibre	Fortron	39	39	
PPS	TECATRON PVX	Polyphenylene sulphide, with carbon fibre, PTFE, graphite (black)	Fortron	39	39	
PPSU	TECASON P	Polyphenylene sulphone	Radel R			
PPSU	TECASON P MT	Polyphenylene sulphone, approved for medical engineering	Radel R	39	40	
PSU	TECASON S	Polysulphone	Udel, Ultrason S	37	37	
PSU GF 30	TECASON S GF 30	Polysulphone, glass fibre	Udel, Ultrason S			
PTFE	TECAFLON PTFE	Polytetrafluoroethylene	Hostaflon TF, Teflon PTFE	34	35	
PTFE + PI	SINTIMID 8000	Polytetrafluoroethylene + Polyimide	Hostaflon TF, Teflon PTFE+P84	51	52	
PVDF	TECAFLON PVDF	Polyvinylidene fluoride	Solef, Kynar	33		
PVDF CF 8	TECAFLON PVDF CF 8	Polyvinylidene fluoride, carbon fibre (black)	Solef, Kynar	33		
PVDF	TECAFLON PVDF AS	Polyvinylidene fluoride (black)	Solef, Kynar	33		
TPE	TECAPUR	Polyester elastomer	Hytrel, Arnitel	57	57	

TECAFORM. The versatile engineering plastic with high strength and dimensional stability.



TECAFORM is suitable for a wide range of applications. It is characterised by its resistance to organic solvents and outstanding machinability.

TECAFORM has good sliding and abrasion behaviour and low water absorption properties.

- | High strength and hardness
- | Low water absorption
- | Very good machinability
- | Good UV resistance of black grades
- | Low adhesion forces for good sliding properties

TECAFORM AH black

Good UV stability.
Very good machinability.

TECAFORM AH

Good chemical resistance.
High resilience.

TECAFORM AH GF 30

Glassfibre-reinforced acetal with very high strength and high heat resistance.

TECAFORM AH LA blue

Very good sliding and abrasion values. Low water absorption.

TECAFORM AH ELS black

Adjusted electrical conductivity.
Good UV resistance.

TECAFORM AD

High mechanical strength.
Very good machinability.

TECAFORM AD AF

Very good sliding properties thanks to the PTFE content. Low water absorption.

On request:

TECAFORM AH TF

Very good sliding and abrasion properties. Stiff and rigid. Good resistance to detergents and solvents.

TECAFORM AD GF 20

Very abrasion resistant. Good weldability.

TECAFORM AD CL

Very good sliding properties.
Abrasion resistant.

Bearing block TECAFORM AH:

Very good sliding properties, high strength, very good machinability.



Belt guide bushing TECAFORM AD:

Low water absorption, high strength.



Cam guide TECAFORM AD:

High dimensional stability, good sliding friction values.



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Rods



	Tolerance to DIN (mm)	TECAFORM AH	TECAFORM AH black	TECAFORM AH GF 25*	TECAFORM AH LA blue	TECAFORM AH ELS	TECAFORM AD	TECAFORM AD AF
DIN-Abbreviation		POM-C	POM-C	POM-C GF 25	POM-C	POM-C	POM-H	POM-H
Density (g/cm³)		1,41	1,41	1,58	1,35	1,45	1,42	1,54
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
3	+ 0,1	0,012	0,012		0,011		0,012	0,013
4	+ 0,3	0,020	0,020	0,022	0,019	0,020	0,020	0,022
5	+ 0,1	0,031	0,031	0,035	0,030	0,032	0,031	0,034
6	+ 0,4	0,044	0,044	0,049	0,042	0,045	0,044	0,048
8		0,078	0,078	0,087	0,075	0,080	0,078	0,085
9	+ 0,1	0,098	0,098	0,109	0,094	0,100	0,098	0,107
10	+ 0,5	0,120	0,120	0,134	0,115	0,123	0,121	0,131
11		0,148	0,148	0,166	0,142	0,152	0,149	0,162
12		0,175	0,175	0,196	0,168	0,180	0,176	0,191
13		0,204	0,204	0,229	0,196	0,210	0,206	0,223
14		0,236	0,236	0,264	0,226	0,243	0,238	0,258
15	+ 0,2	0,270	0,270	0,302	0,258	0,277	0,272	0,294
16	+ 0,7	0,306	0,306	0,343	0,293	0,314	0,308	0,334
18		0,384	0,384	0,431	0,368	0,395	0,387	0,42
19		0,427	0,427	0,479	0,409	0,439	0,430	0,467
20		0,472	0,472	0,529	0,452	0,486	0,476	0,516
22		0,574	0,574	0,644	0,550	0,591	0,578	0,627
25	+ 0,2	0,737	0,737	0,826	0,706	0,758	0,743	0,805
28	+ 0,9	0,921	0,921	1,03	0,882	0,947	0,927	1,01
30		1,05	1,05	1,18	1,01	1,08	1,06	1,15
32		1,20	1,20	1,35	1,15	1,24	1,21	1,32
36	+ 0,2	1,52	1,52	1,70	1,45	1,56	1,53	1,66
40	+ 1,1	1,87	1,87	2,09	1,79	1,92	1,88	2,04
45		2,37	2,37	2,66	2,27	2,44	2,39	2,59
50	+ 0,3	2,91	2,91	3,27	2,79	3,00	2,94	3,18
56	+ 1,3	3,64	3,64	4,08	3,49	3,75	3,67	3,98
60		4,20	4,20	4,70	4,02	4,32	4,23	4,58
65	+ 0,3	4,91	4,91	5,51	4,70	5,05	4,95	5,37
70	+ 1,6	5,69	5,69	6,37	5,44	5,85	5,73	6,21
75	+ 0,4	6,56	6,56	7,35	6,28	6,74	6,61	7,16
80	+ 2	7,45	7,45	8,35	7,13	7,66	7,50	8,13
85	+ 0,5	8,42	8,42	9,44			8,48	
90	+ 2,2	9,43	9,43	10,56	9,02	9,69	9,49	10,29
95	+ 0,6	10,53	10,53		10,08		10,60	11,5
100	+ 2,5	11,65	11,65	13,05	11,15	11,98	11,73	12,72
110	+ 0,7 + 3	14,13	14,13	15,83	13,53		14,23	15,43
120	+ 0,8	16,85	16,85	18,89	16,14		16,97	18,41
125	+ 3,5	18,26	18,26	20,46	17,48		18,39	19,94
130		19,79	19,79		18,94		19,93	21,61
135	+ 0,9	21,31	21,31	23,88	20,40		21,46	23,27
140	+ 3,8	22,89	22,89	25,6	21,91		23,05	25,0
150	+ 1 + 4,2	26,3	26,3	29,5	25,2		26,5	28,7
165	+ 1,2	31,9	31,9	35,8	30,6		32,1	
180	+ 5	37,9	37,9	42,4	36,3		38,1	
200	+ 1,3 + 5,5	46,7	46,7	52,4	44,7		47,1	
210	+ 1,3 + 5,8	51,5	51,5		49,3			
230	+ 1,5	61,8	61,8		59,1			
250	+ 6,2	72,8	72,8		69,7			

* From 110 mm diameter, 20% glassfibre content
 Tolerances according to DIN: length $\pm \frac{3}{100}$ %.
 TECAFORM AH and TECAFORM AH MT coloured available. Colours and dimensions on request.
 The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground.
 All figures given without obligation.

 = Stock item
 = Non-stock item – special production

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Tubes



TECAFORM AH

DIN-Abbreviation		POM-C																
Density (g/cm ³)		1,41																
Tolerance to DIN (mm)		Diameter Ø (mm)	10	15	18	20	22	25	30	32	35	36	40	45	50	54	60	
+ 0,4 + 1,1	- 0,4 - 1,1	20	0,390															
		25	0,652	0,520	0,413													
		30		0,839		0,649												
+ 0,6 + 2	- 0,6 - 2	32					0,769	0,618										
		36				1,18		0,937										
		40				1,53		1,29	1,00									
		45										1,06						
		50				2,58		2,34	2,04				1,61	1,28				
+ 0,8 + 2,5	- 0,8 - 2,5	56						3,14	2,85		2,50	2,42	2,09	1,63				
		60						3,68	3,39	3,25		2,96	2,63		1,65			
		65						4,45	4,16			3,74	3,42	2,96	2,44			
+ 0,8 + 3,0	- 0,8 - 3	70						5,24	4,95	4,82		4,53	4,20	3,74	3,23			
		75						6,08	5,79	5,66		5,37	5,04	4,58	4,07	3,61		
		80						6,97	6,68	6,55		6,26	5,94	5,48	4,96	4,51	3,76	
+ 1,2 + 3,6	- 1,6 - 5	85							7,82			7,42	7,11	6,66	6,16	5,72	5,00	
		90							8,84	8,71		8,44	8,12	7,68	7,18		6,01	
		100								10,91		10,64	10,32	9,88	9,38	8,94	8,21	
		110									13,34		13,06	12,75	12,31	11,81	11,37	10,64
		120												15,64		14,72		13,58
+ 1,5 + 4,5	- 2 - 6,5	125										17,37	17,06	16,63	16,14	15,71	15,00	
		130												18,54	18,10	17,62	16,47	
		135														19,15	18,72	18,00
		140												21,65	21,22	20,73	20,30	19,59
		150													25,0	24,57	24,08	23,65
+ 1,8 + 5,4	- 2,2 - 7,5	165																
		180																
+ 2 + 6	- 2,5 - 8,5	200																
		210																
+ 3 + 9	- 3 - 12	230																
		250																
		280																
		300																
+ 3 + 11 + 3 + 13	- 3,5 - 14 - 3,5 - 16	320																
		435																
		505																
			10	15	18	20	22	25	30	32	35	36	40	45	50	54	60	

= Outside
 = Inside

= Stock item
 = Non-stock item – special production

Tolerances according to DIN: length $\pm \frac{3}{100}$ %.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

TECAFORM AD tubes are available on request

Plastic & Metal Center, Inc.

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	70	75	80	90	100	110	125	130	150	175	180	200	240	270	300	390	Diameter Ø (mm)
																	20
																	25
																	30
																	32
																	36
																	40
																	45
																	50
																	56
																	60
																	65
																	70
																	75
																	80
																	85
	4,62																90
	6,82	6,04	5,20														100
	9,25	8,46	7,63	5,78													110
	12,21	11,43	10,61	8,78	6,73												120
	13,62	12,85	12,02	10,20	8,15												125
	15,10	14,33	13,50	11,67	9,62												130
	16,63		15,03	13,21	11,16	8,88											135
	18,21		16,62	14,79	12,74	10,47											140
	21,56		19,96	18,14	16,09	13,81	9,97	8,58									150
			25,7	23,92	21,88	19,62	15,80	14,42									165
			31,7	29,9	27,8	25,6	21,77	20,38	14,28								180
			40,7	38,9	36,9	34,7	30,9	29,5	23,42	14,55							200
					41,6	39,4	35,6	34,2	28,1								210
				55,2	53,2	51,0	47,3		40,0	29,3	21,05						230
				66,3	64,4	62,2	58,4		51,1	40,4	32,2						250
					82,7	80,5	76,8		69,5	58,8	50,5						280
					96,1	93,9	90,2		82,8	72,2	63,9						300
													60,4	40,7			320
															126,5		435
																133,9	505
	70	75	80	90	100	110	125	130	150	175	180	200	240	270	300	390	Diameter Ø (mm)

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Plates




	Tolerance to DIN (mm)	TECAFORM AH	TECAFORM AH black	TECAFORM AH GF 25*	TECAFORM AH LA blue	TECAFORM AH ELS	TECAFORM AD	TECAFORM AD AF
DIN-Abbreviation		POM-C	POM-C	POM-C GF 25	POM-C	POM-C	POM-H	POM-H
Density (g/cm³)		1,41	1,41	1,58	1,35	1,45	1,42	1,54
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
0,5 x 1000 ***	- 0,02 + 0,08	0,774						
1 x 1000 **	- 0,1 + 0,1	1,46						
2 x 1000 **	- 0,15 + 0,15	2,92						
3 x 1000 **	- 0,2 + 0,2	4,38						
3 x 1200 **		5,24						
4 x 1000 **		5,84						
5 x 500	+ 0,2 + 0,5	3,96	3,96	4,44	3,79	4,08	3,99	4,33
5 x 1000 **	- 0,25 + 0,25	7,30						
6 x 500	+ 0,2 + 0,75	4,80	4,80	5,37	4,59	4,93	4,83	5,24
6 x 1000 **	- 0,3 + 0,3	8,76						
8 x 500	+ 0,2 + 0,9	6,33	6,33	7,10	6,06	6,51	6,38	6,92
10 x 500		7,81	7,81	8,76	7,48	8,04	7,87	8,53
10 x 610		9,48						
10 x 1000 **		15,40	15,40		14,75	15,84		
12 x 500	+ 0,3 + 1,5	9,55	9,55	10,71	9,15	9,83	9,62	10,44
12 x 610		11,60						
12 x 1000 **		18,83	18,83				18,96	
15 x 500		11,78	11,78		11,28		11,86	12,86
15 x 610		14,29						
16 x 500		12,52	12,52	14,03	11,98	12,87	12,61	13,67
16 x 1000 **		24,67	24,67				24,85	
18 x 500		14,00	14,00	15,69	13,40	14,40	14,10	15,29
18 x 1000 **		27,6	27,6		26,4		27,80	30,10
20 x 500		15,48	15,48	17,35	14,82	15,92	15,59	16,91
20 x 610		18,79						
20 x 1000 **		30,5	30,5	34,2			30,7	
22 x 500		16,96	16,96	19,01	16,24	17,44	17,08	18,53
22 x 1000 **		33,4	33,4				33,70	36,5
25 x 500		19,18	19,18	21,50	18,37	19,73	19,32	
25 x 610		23,28						
25 x 1000 **		37,8	37,8				38,1	41,30
27 x 500	+ 0,5 + 2,5	21,1	21,11	23,65	20,21	21,71	21,26	
27 x 1000 **		41,6	41,6				41,9	45,4
30 x 500		23,3	23,33	26,1	22,34	23,99	23,50	25,50
30 x 610		28,3						
30 x 1000 **		46,0	46,0				46,3	
32 x 500		24,81	24,81	27,8	23,76	25,5	25,0	27,1
32 x 1000 **		48,9	48,9				49,2	
35 x 1000 **		53,3	53,3		51,0		53,7	58,2
36 x 500		27,8	27,8	31,1	26,6	28,6	28,0	30,3
40 x 500		30,7	30,7	34,4	29,4	31,6	31,0	33,6
40 x 610		37,3						
40 x 1000 **		60,6	60,6				61,0	
45 x 500		34,4	34,4	38,6	33,0		34,7	37,6
50 x 500		38,1	38,1	42,7	36,5	39,2	38,4	41,7
50 x 610		46,3						
50 x 1000 **		75,2	75,2				75,7	
60 x 500		+ 0,5 + 5	46,5	46,5	52,1	44,5	47,8	46,8
60 x 610	56,4		56,4		54,0		56,8	61,6
60 x 1000 **	91,6		91,6				92,3	
70 x 500	53,9		53,9		51,6		54,3	
70 x 610	65,4		53,9		62,6		65,9	71,4
75 x 610	69,9		69,9		66,9		70,4	76,3
80 x 500	61,3		61,3		58,7		61,7	
80 x 1000 **	120,8		120,8					
90 x 500	68,7		68,7		65,8		69,2	
100 x 500	76,1		76,1		72,9		76,6	
100 x 1000 **	150,0		150,0					

*From size 60 x 500 mm, 20% glass fibre content. **Length 2000 mm. ***Coils.
The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planed. All figures given without obligation.

Tolerances according to DIN: length $\pm \frac{3}{100}$ %.

width $\pm \frac{25}{1000}$ mm.

 = Stock item

 = Non-stock item – special production

TECAMID/TECAST. The tough engineering plastic with reliable wear resistance.



- I Good sliding properties with high wear resistance
- I Good chemical resistance to many oils, greases, petrol, etc.
- I Good machinability
- I Easily bonded and welded
- I Non-reinforced grades electrically insulating

TECAMID 66

Good bondability and weldability. Electrically insulating and very good machinability.

TECAMID 66 MH black

Good UV resistance. Very good sliding properties.

TECAMID 66 HI

High heat resistance and dimensional stability. Heat-stabilised semi-finished bearing product.

TECAMID 66 GF 30 black

Glassfibre-reinforced polyamide with very high strength. Good UV stability and increased heat resistance.

TECAMID 66/X GF 50 black

Glassfibre-reinforced polyamide with extremely high strength. High continuous operating temperature and dimensional stability.

TECAMID 66 CF 20 black

Elevated operating temperature. Carbon fibre-reinforced polyamide with very high strength.

TECAMID 66 LA

Very good sliding and abrasion properties with soft mating partners. Tough with good strength properties.

TECAM 6 MO black

Good UV resistance and surface hardness. Good machinability and dimensional stability.

TECAMID 6

Very tough and impact resistant. Good chemical resistance.

TECAMID 6 GF 30 black

Glassfibre-reinforced polyamide with very high strength. Good UV stability and increased heat resistance.

TECAMID TR transparent

Transparent. Electrically insulating semi-finished product.

TECAST T

Low-stress cast semi-finished product. Very good machinability.

TECAST TM black

Good UV stability. High surface hardness.

TECAST 12

Very high abrasion and wear resistance, very tough, high load-bearing capacity in static and dynamic conditions.

**Seal ring
TECAMID 6:**
Tough even at low temperatures.



**Valve flange
TECAMID 6:**
Low thermal expansion, good chemical resistance.



**Reducer bushing
TECAMID 66 MH:**
Good UV resistance, increased surface hardness.



On request:

TECAMID 11

High toughness. Good sliding and abrasion properties.

TECAMID 46

High thermal-mechanical resistance. Very rigid. Good creep resistance.

Rods




	Tolerance to DIN (mm)	TECAMID 66	TECAMID 66 MH black	TECAMID 66 GF 30 black	TECAMID 66 CF 20 black	TECAMID 66 HI	TECAMID 66 LA
DIN-Abbreviation		PA 66	PA 66	PA 66 GF 30**	PA 66 CF 20	PA 66	PA 66
Density (g/cm³)		1,14	1,14	1,35	1,23	1,14	1,11
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,016	0,016	0,019	0,017	0,016	0,016
5	+ 0,1	0,025	0,025	0,030	0,027	0,025	0,025
6	+ 0,4	0,036	0,036	0,042	0,038	0,036	0,035
8		0,063	0,063	0,075	0,068	0,063	0,061
9	+ 0,1	0,079	0,079	0,094	0,085	0,079	0,077
10	+ 0,5	0,097	0,097	0,115	0,105	0,097	0,094
11		0,120	0,120	0,142	0,129	0,120	0,117
12		0,142	0,142	0,168	0,153	0,142	0,138
13		0,165	0,165	0,196	0,178	0,165	0,161
14		0,191	0,191	0,226	0,206	0,191	0,186
15	+ 0,2	0,218	0,218	0,258	0,235	0,218	0,212
16	+ 0,7	0,247	0,247	0,293	0,267	0,247	0,241
18		0,311	0,311	0,368	0,335	0,311	0,303
19		0,345	0,345	0,409	0,373	0,345	0,336
20		0,382	0,382	0,452	0,412	0,382	0,372
22		0,464	0,464	0,550	0,501	0,464	0,452
25	+ 0,2	0,596	0,596	0,706	0,643	0,596	0,580
28	+ 0,9	0,744	0,744	0,882	0,803	0,744	0,725
30		0,852	0,852	1,01	0,920	0,852	0,830
32		0,974	0,974	1,15	1,05	0,974	0,948
36	+ 0,2	1,23	1,23	1,45	1,32	1,23	1,19
40	+ 1,1	1,51	1,51	1,79	1,63	1,51	1,47
45		1,92	1,92		2,07	1,92	
50	+ 0,3	2,36	2,36	2,79		2,36	2,29
56	+ 1,3	2,95	2,95	3,49	3,18	2,95	2,87
60		3,39	3,39	4,02	3,66	3,39	3,30
65	+ 0,3	3,97	3,97	4,70		3,97	3,87
70	+ 1,6	4,60	4,60	5,44		4,60	4,48
75	+ 0,4	5,30	5,30	6,28		5,30	5,16
80	+ 2	6,02	6,02	7,13	6,50	6,02	5,86
90	+ 0,5 + 2,2	7,62	7,62	9,02		7,62	7,42
100	+ 0,6 + 2,5	9,42	9,42	11,15		9,42	9,17
110	+ 0,7 + 3	11,42	11,42	13,53		11,42	11,12
120	+ 0,8	13,63	13,63	16,14		13,63	13,27
125	+ 3,5	14,76	14,76	17,48		14,76	14,38
130		16,00	16,00			16,00	15,58
135	+ 0,9	17,23	17,23	20,40		17,23	16,77
140	+ 3,8	18,51	18,51	21,91		18,51	18,02
150	+ 1,0 + 4,2	21,27	21,27	25,2		21,27	20,71
165	+ 1,2	25,8	25,8			25,8	
180	+ 5	30,6	30,6			30,6	
200	+ 1,3 + 5,5	37,8	37,8			37,8	

** From 125 mm diameter length 1000 mm.

Tolerances according to DIN: length $+ \frac{3}{10} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground.

 = Stock item

 = Non-stock item – special production

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Rods



	Tolerance to DIN (mm)	TECAMID 6*	TECAM 6 MO* black	TECAMID 6 GF 30 black**	TECAMID TR transparent	TECAMID 12
DIN-Abbreviation		PA 6	PA 6	PA 6 GF 30	PA 6-3-T	PA 12
Density (g/cm³)		1,13	1,14	1,35	1,12	1,02
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,016	0,016	0,020	0,016	0,014
5	+ 0,1	0,025	0,025	0,031	0,025	0,023
6	+ 0,4	0,035	0,036	0,043	0,035	0,032
8	+ 0,1 + 0,5	0,062	0,063	0,077	0,062	0,056
9		0,078	0,079	0,096	0,078	0,071
10		0,096	0,097	0,118	0,095	0,087
11	+ 0,2 + 0,7	0,119	0,120	0,146	0,118	0,107
12		0,140	0,142	0,173	0,139	0,127
13		0,164	0,165	0,201	0,162	0,148
14		0,189	0,191	0,232	0,187	0,171
15		0,216	0,218	0,266	0,214	0,195
16		0,245	0,247	0,301	0,243	0,221
18		0,308	0,311	0,379	0,305	0,278
19		0,342	0,345	0,421	0,339	0,309
20		0,379	0,382	0,466	0,375	0,342
22		+ 0,2 + 0,9	0,460	0,464	0,566	0,456
25	0,591		0,596	0,727		0,533
28	0,738		0,744	0,907	0,731	0,666
30	0,845		0,852	1,04	0,837	0,763
32	+ 0,2 + 1,1	0,965	0,974	1,19	0,956	0,871
36		1,22	1,23	1,50	1,21	1,10
40		1,50	1,51	1,84	1,48	1,35
45	+ 0,3 + 1,3	1,90	1,92	2,34	1,88	1,71
50		2,34	2,36	2,87	2,32	2,11
56		2,92	2,95	3,59	2,89	2,64
60	+ 0,3 + 1,6	3,36	3,39	4,14	3,33	3,04
65		3,94	3,97	4,84	3,90	3,55
70		4,56	4,60	5,60	4,52	4,11
75	+ 0,4 + 2	5,26	5,30	6,46	5,21	4,74
80		5,97	6,02	7,34	5,92	5,39
85	+ 0,5 + 2,2	6,75	6,81			6,09
90		7,55	7,62	9,29	7,49	6,82
100	+ 0,6 + 2,5	9,34	9,42	11,48	9,25	8,43
110	+ 0,7 + 3	11,32	11,42	13,93	11,22	10,22
120	+ 0,8	13,51	13,63	16,61	13,39	12,19
125	+ 3,5	14,63	14,76	18,00	14,51	13,20
130	+ 0,9 + 3,8	15,86	16,00	19,50	15,72	14,31
135		17,08	17,23	21,00	16,93	15,41
140		18,34	18,51	22,56	18,18	16,56
150	+ 1 + 4,2	21,08	21,27	25,9	20,89	19,03
165	+ 1,2 + 5	25,6	25,8	31,5	25,4	23,09
180		30,3	30,6	37,3	30,1	27,4
200	+ 1,3 + 5,5	37,5	37,8	46,1	37,1	33,8
210	+ 1,3 + 5,8	41,3	41,6			
230	+ 1,5	49,5	49,9			
250	+ 6,2	58,3	58,8			
280	+ 1,6 + 6,5	73,0	73,7			
300	+ 1,7 + 7	83,8	84,6			


* From 110 mm diameter, TECAST T/TECAST TM.

** From 135 mm diameter length, from Ø 165, 25% glass fibre content.

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above.

Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

 = Stock item

 = Non-stock item – special production

Plates



	Tolerance to DIN (mm)	TECAMID 66	TECAMID 66 MH black	TECAMID 66 GF 30 black	TECAMID 66 CF 20 black	TECAMID 66 HI brown	TECAMID 66 LA	TECAMID 66/X GF 50 black
DIN-Abbreviation		PA 66	PA 66	PA 66	PA 66 CF 20	PA 66	PA 66	PA 66 + 63/6T
Density (g/cm³)		1,14	1,14	1,35	1,23	1,14	1,11	1,56
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
5 x 500	+ 0,2 + 0,5	3,20	3,20	3,79		3,20	3,12	4,38
6 x 500	+ 0,2 + 0,75	3,88	3,88	4,59	4,18	3,88	3,78	5,31
8 x 500	+ 0,2 + 0,9	5,12	5,12	6,06	5,52	5,12	4,99	7,01
10 x 500		6,32	6,32	7,48	6,82	6,32	6,15	8,65
10 x 610		7,70	7,70					
12 x 500	+ 0,3 + 1,5	7,73	7,73	9,15	8,33	7,73	7,52	10,57
12 x 610		9,38	9,31					
12 x 1000 **		15,23	15,23	18,03		15,23	14,82	
16 x 500		10,12	10,12	11,98	10,92	10,12	9,85	13,85
16 x 1000 **		19,95	19,95	23,62		19,95	19,42	
18 x 500		11,32	11,32	13,40	12,21	11,32	11,02	15,49
18 x 1000 **			22,31		24,07		21,72	
20 x 500		12,52	12,52	14,82	13,50	12,52	12,19	17,13
20 x 610		15,19	15,19					
20 x 1000 **		24,67	24,67	29,2		24,67	24,02	
22 x 500		13,71	13,71	16,24	14,80	13,71	13,35	18,77
22 x 1000 **		27,0	27,0	32,0		27,0		
25 x 500		15,51	15,51	18,37	16,73	15,51	15,10	21,22
25 x 610		18,82	18,82					
25 x 1000 **		30,6	30,6	36,2		30,6	29,8	
27 x 500	+ 0,5 + 2,5	17,07	17,07	20,21	18,41	17,07	16,62	23,35
27 x 1000 **		33,6	33,6	39,8		33,6	32,8	
30 x 300		11,54	11,54	13,66	12,45	11,54	11,23	15,79
30 x 500		18,86	18,86	22,34	20,35	18,86	18,37	25,80
30 x 610		22,89	22,89					
30 x 1000 **		37,2	37,2	44,0		37,2	36,2	
32 x 300		12,27	12,27	14,53	13,24	12,27	11,95	16,79
32 x 500		20,06	20,06	23,76	21,64	20,06	19,53	27,50
32 x 1000 **		39,5	39,5	46,8		39,5	38,5	
35 x 1000 **		43,1	43,1			43,1	41,9	
36 x 500		22,46	22,46	26,60		22,46	21,87	
40 x 300		15,20	15,20	18,00	16,40	15,20	14,80	20,80
40 x 500		24,85	24,85	29,4	26,8	24,85	24,20	34,00
40 x 610		30,2	30,2					
40 x 1000 **		49,0	49,0	58,0		49,0	47,7	
45 x 500			27,8	33,0		27,8		38,1
50 x 300		18,86	18,86	22,3	20,35	18,9	18,4	25,8
50 x 500		30,8	30,8	36,5		30,8	30,0	42,2
50 x 610		37,4	37,4					
50 x 1000 **		60,8	60,8	72,0		60,8	59,2	
60 x 300	+ 0,5 + 5	23,0	23,0	27,2		23,0	21,9	
60 x 500		37,6	37,6	44,5		37,6	36,6	
60 x 610		45,6	45,6	54,0		45,6	44,4	
60 x 1000 **		74,1	74,1	87,7		74,1	72,1	
70 x 300		26,6	26,6	31,6		26,6	25,9	
70 x 500		43,6	43,6	51,6		43,6	42,4	
70 x 610		52,9	52,9	62,6		52,9	51,5	
75 x 610		56,5	56,5	66,9		56,5	55,0	
80 x 300		30,3	30,3	35,9		30,3	29,5	
80 x 500		49,6	49,6	58,7		49,6	48,3	
90 x 300		34,0	34,0	40,2		34,0	33,1	
90 x 500		55,5	55,5	65,8		55,5	54,1	
100 x 300		37,6	37,6	44,6		37,6	36,6	
100 x 500		61,5	61,5	72,9		61,5	59,9	

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5} \text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planned. All figures given without obligation.



= Stock item



= Non-stock item - special production

Plates



	Tolerance to DIN (mm)	TECAMID 6	TECAM 6 MO black	TECAMID 6 GF 30 black	TECAMID TR transparent	TECAMID 12
DIN-Abbreviation		PA 6	PA 6	PA GF 30	PA 6 CF 20	PA 12
Density (g/cm³)		1,13	1,14	1,35	1,12	1,02
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	kg/m
0,5 x 1000 ***	+ 0,08 + 0,02	0,628				
1 x 1000 **	+ 0,1 + 0,1	1,29				
2 x 1000 **	+ 0,15 + 0,15	2,52				
3 x 1000 **	+ 0,2	3,74				
4 x 1000 **	+ 0,2	4,91				
5 x 500	+ 0,2	3,18	3,20	3,79		2,87
5 x 600	+ 0,5	3,79	3,83	4,53	3,76	3,42
5 x 1000 **	+ 0,25 + 0,25	6,14				
6 x 500	+ 0,2 + 0,75	3,84	3,88	4,59		3,47
6 x 1000 **	+ 0,25 + 0,25	7,31				
8 x 500	+ 0,2 + 0,9	5,08	5,12	6,06	5,03	4,58
10 x 500		6,26	6,32	7,48	6,21	5,65
10 x 610		7,60				
12 x 500	+ 0,3 + 1,5	7,66	7,73	9,15	7,59	6,91
12 x 610		9,29				
12 x 1000 **		15,09	15,23			13,62
16 x 500		10,03	10,12	11,98	9,94	9,06
16 x 1000 **		19,77	19,95			17,85
18 x 500		11,22	11,32	13,40	11,12	10,13
18 x 1000 **		22,11	22,31			19,96
20 x 500		12,41	12,52	14,82	12,30	11,20
20 x 610		15,06				
20 x 1000 **		24,45	24,67	29,20		22,07
22 x 500		13,59	13,71	16,24	13,47	12,27
22 x 1000 **		26,8	27,0	32,0		24,18
25 x 500		15,37	15,51	18,37	15,24	13,88
25 x 610		18,66				
25 x 1000 **		30,3	30,6	36,2	30,0	27,4
27 x 500		16,92	17,07	20,21	16,77	15,27
27 x 1000 **		33,30	33,60	39,8		30,10
30 x 300	+ 0,5 + 2,5	11,44	11,54	13,66	11,34	10,32
30 x 500		18,70	18,86	22,34	18,53	16,88
30 x 610		22,69				
30 x 1000 **		36,9	37,2	44,0		33,3
32 x 300		12,16	12,27	14,53	12,06	10,98
32 x 500		19,89	20,06	23,76	19,71	17,95
32 x 1000 **		39,2	39,5	46,8		35,4
35 x 1000 **		42,7	43,1			38,5
36 x 500		22,26	22,46	26,6		20,09
40 x 300		15,07	15,20	18,00	14,93	13,60
40 x 500		24,63	24,85	29,4	24,42	22,24
40 x 610		29,9				
40 x 1000 **		48,6	49,0	58,0		43,8
45 x 500		27,6	27,8	33,0	27,4	24,91
50 x 300		18,70	18,86	22,34	18,53	16,88
50 x 500		30,6	30,8	36,5	30,3	27,6
50 x 610		37,1				
50 x 1000 **	60,2	60,8	72,0		54,4	
60 x 300	+ 0,5 + 5	22,78	22,98	27,2	22,58	20,56
60 x 500		37,2	37,6	44,5	36,9	33,6
60 x 610		45,2	45,6	54,0		40,8
60 x 1000 **		73,4	74,1	87,7		66,3
70 x 300		26,4	26,6	31,6		23,84
70 x 500		43,2	43,6	51,6		39,0
70 x 610		52,4	52,9	62,6		47,3
75 x 610		56,0	56,5	66,9		50,6
80 x 300		30,0	30,3	35,9		27,1
80 x 500		49,1	49,6	58,7		44,3
80 x 1000 **		96,8	97,7			
90 x 300		33,7	34,0	40,2		30,4
90 x 500		55,1	55,5	65,8		49,7
100 x 300		37,3	37,6	44,6		33,7
100 x 500		61,0	61,5			55,1
100 x 1000 **		120,2	121,3			

** Length 2000 mm
*** Coils


Tolerances according to DIN:


length $\pm \frac{3}{0} \%$

width $\pm \frac{25}{5}$ mm

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planned.

All figures given without obligation.

 = Stock item

 = Non-stock item – special production

Tubes



TECAMID 6

DIN-Abbreviation		PA 6													
Density (g/cm ³)		1,14													
Tolerance to DIN (mm)		Dia- meter Ø (mm)	18	20	22	25	30	32	35	36	40	45	50	54	
+ 0,4 + 1,1	- 0,4 - 1,1	25	0,331												
		30		0,521	0,447										
+ 0,6 + 2,0	- 0,6 - 2,0	32		0,635	0,562	0,439									
		36		0,943	0,872	0,751									
		40		1,23	1,16	1,04	0,800								
		45				1,43			0,910	0,850					
		50				1,87	1,64		1,35	1,29	1,03				
+ 2,5 + 0,8	- 2,5 - 0,8	56			2,51	2,28		2,00	1,94	1,68	1,31				
		60			2,95	2,71	2,61	2,43	2,37	2,11		1,32			
+ 0,8 + 3	- 0,8 - 3	65			3,57	3,34		3,06	3,00	2,74	2,37	1,96			
		70			4,20	3,96	3,86	3,69	3,69	3,37	3,00	2,59			
		75			4,87	4,64	4,53	4,36	4,30	4,04	3,67	3,26	2,90		
		80			5,59	5,36	5,25	5,08	5,02	4,76	4,39	3,98	3,61		
+ 1,2 + 3,6	- 1,6 - 5,0	85				6,27		6,01	5,95	5,70	5,34	4,94	4,59		
		90				7,08	6,98	6,82	6,76	6,51	6,15	5,75			
		100					8,75	8,58	8,52	8,27	7,92	7,52	7,17		
		110					10,69	10,53	10,47	10,22	9,86	9,46	9,11		
+ 1,5 + 4,5	- 2 - 6,5	120									12,54		11,80		
		125					14,13	13,98	13,92	13,67	13,33	12,94	12,59		
		130									14,86	14,51	14,12		
		135											15,34	15,00	
		140										17,0	16,6	16,3	
		150										19,7	19,3	19,0	
+ 1,8 + 5,4	- 2,2 - 7,5	165													
		180													
+ 2 + 6	- 2,5 - 8,5	200													
		210													
+ 3 + 9	- 3 - 12	230													
		250													
		280													
		300													
			18	20	22	25	30	32	35	36	40	45	50	54	

- = Outside
- = Stock item
- = Inside
- = Non-stock item – special production

Tolerances according to DIN: length $+^3_0$ %.
 The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

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	60	70	75	80	90	100	110	125	130	150	175	180	200	Dia- meter Ø (mm)
														25
														30
														32
														36
														40
														45
														50
														56
														60
														65
														70
														75
	3,02													80
	4,00													85
	4,82	3,70												90
	6,58	5,46	4,84	4,17										100
	8,53	7,41	6,78	6,11	4,63									110
	10,88	9,78	9,16	8,50	7,04	5,40								120
	12,02	10,92	10,30	9,64	8,18	6,53								125
	13,20	12,10	11,48	10,82	9,36	7,71								130
	14,43	13,33		12,04	10,58	8,94	7,12							135
	15,70	14,60		13,32	11,85	10,21	8,39							140
	18,38	17,28		16,00	14,53	12,89	11,07	7,99	6,88					150
				20,62	19,17	17,54	15,72	12,66	11,55					165
				25,4	23,95	23,95	20,51	17,45	16,34	11,44				180
				32,6	31,2	29,6	27,8	24,74	23,64	18,77	11,66			200
						33,4	31,6	28,5	27,4	22,55				210
					44,3	42,7	40,9	37,9		32,0		23,48	16,87	230
					53,2	51,6	49,8	46,8		40,9		32,4	25,8	250
						66,3	64,5	61,5		55,7		47,1	40,5	280
						77,0	75,3	72,3		66,4		57,8	51,2	300
	60	70	75	80	90	100	110	125	130	150	175	180	200	

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Rods




		Tolerance to DIN (mm)	TECAST T	TECAST TM black	TECAGLIDE light-green	TECALUBE black
Stock length (mm)	DIN-Abbreviation		PA 6 G	PA 6 G	PA 6 G	PA 6 G
	Density (g/cm³)		1,15	1,15	1,13	1,13
	Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m
2000/3000	20	+ 0,5	0,406	0,406	0,399	0,399
2000/3000	25	+ 1,5	0,623	0,623	0,612	0,612
2000/3000	30	+ 0,5	0,914	0,914	0,898	0,898
2000/3000	35	+ 2,5	1,23	1,23	1,21	1,21
2000/3000	40		1,63	1,63	1,60	1,60
2000/3000	45	+ 1	2,04	2,04	2,00	2,00
2000/3000	50	+ 3	2,49	2,49	2,45	2,45
2000/3000	56		3,10	3,10	3,05	3,05
2000/3000	60		3,60	3,60	3,54	3,54
2000	65		4,20	4,20	4,12	4,12
2000	70		4,84	4,84	4,76	4,76
2000	75		5,53	5,53	5,44	5,44
2000	80	+ 1	6,27	6,27	6,16	6,16
2000	85	+ 4	7,05	7,05	6,93	6,93
2000	90		7,88	7,88	7,75	7,75
2000	95		8,76	8,76	8,61	8,61
2000	100		9,68	9,68	9,51	9,51
2000	110		11,82	11,82	11,61	11,61
2000	120		13,99	13,99	13,75	13,75
2000	125	+ 1,5	15,15	15,15	14,89	14,89
2000	130	+ 5	16,36	16,36	16,07	16,07
2000	140		18,90	18,90	18,58	18,58
2000	150		21,64	21,64	21,26	21,26
2000	160		24,93	24,93	24,50	24,50
2000	170		28,1	28,1	27,6	27,6
2000	180	+ 2	31,4	31,4	30,8	30,8
2000	190	+ 7	34,9	34,9	34,2	34,2
2000	200		38,5	38,5	37,9	37,9
2000	220		47,1	47,1	46,2	46,2
2000	230		51,3	51,3	50,4	50,4
2000	250	+ 3	60,4	60,4	59,3	59,3
1000	280	+ 9	75,4	75,4	74,0	74,0
1000	300		86,3	86,3	84,8	84,8
1000	320		98,8	98,80	97,1	97,10
1000	330		104,9	104,9	103,1	103,1
1000	350	+ 4	117,7	117,7	115,7	115,7
1000	360	+ 11	124,4	124,4	122,3	122,30
1000	370		131,3	131,3	129,0	129,0
1000	400		153,0	153,0	150,3	150,3
1000	450	+ 1,5	192,6	192,6	189,3	189,3
1000	500	+ 13	237,0	237,0	232,9	232,9
1000	600		342,8	342,8	336,8	336,80
750	710	+ 5	477,6	477,6	469,3	469,3
200	800	+ 15	604,4	604,4	593,9	593,9

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. Larger diameters on request.

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

All figures given without obligation.

On request: TECAST ST, TECAST M, TECAST L.

 = Stock item

 = Non-stock item – special production

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Plates



		Tolerance to DIN (mm)	TECAST T	TECAST TM black	TECAGLIDE light-green	TECALUBE black
Stock length (mm)	DIN-Abbreviation		PA 6 G	PA 6 G	PA 6 G	PA 6 G
	Density (g/cm³)		1,15	1,15	1,13	1,13
	Diameter (mm)		kg/m	kg/m	kg/m	kg/m
2000	8 x 1000	+ 1 + 1,7	11,13	11,13	10,94	10,94
2000	10 x 1000		13,51	13,51	13,28	13,28
2000	12 x 1000		15,89	15,89	15,62	15,62
2000	16 x 1000	+ 1,2 + 2,5	21,25	21,25	20,88	20,88
2000	20 x 1000		26,0	26,0	25,6	25,6
2000	25 x 1000		32,0	32,0	31,4	31,4
2000	30 x 1000		37,9	37,9	37,3	37,3
2000	35 x 1000		43,9	43,9	43,1	43,1
2000	40 x 1000	+ 1,5 + 3,5	50,6	50,6	49,7	49,7
2000	50 x 1000		62,5	62,5	61,4	61,4
2000	55 x 1000		68,5	68,5	67,3	67,3
2000	60 x 1000	+ 2 + 5	75,6	75,6	74,3	74,3
2000	65 x 1000		81,6	81,6	80,1	80,1
2000	70 x 1000		87,5	87,5	86,0	86,0
2000	75 x 1000	+ 2 + 6	94,1	94,1	92,4	92,4
2000	80 x 1000		100,0	100,0	98,3	98,3
2000	90 x 1000		111,9	111,9	110,0	110,0
2000	100 x 1000		123,8	123,8	121,7	121,7
2000	110 x 1000		135,7	135,7	133,4	133,4
2000	120 x 1000		147,6	147,6	145,1	145,1
2000	130 x 1000		159,5	159,5	156,8	156,8
350	160 x 700	137,5	137,5	135,2	135,2	
1200	200 x 650	159,1	159,1	156,4	156,4	

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths as mentioned above, other delivery lengths possible, also available ground.
Tolerances according to DIN: length $+ \frac{3}{0} \%$. width $+ \frac{25}{5} \text{ mm}$. All figures given without obligation. On request: TECAST ST, TECAST M, TECAST L.

= Stock item
 = Non-stock item – special production

Plates – special sizes are available in all **TECAST** grades.

Thickness (mm)	Tolerance to DIN (mm)	Variable Width (mm)	Length (mm)
8	+ 1 + 1,7	800-1250	
10		800-1250	2500/3000
12		800-1250	2500/3000
16	+ 1,2 + 2,5	800-1250	2500/3000
20		800-1250	2500/3000
25		800-1250	2500/3000
30		800-1200	2500/3000
35		800-1200	3000

40	+ 1,5 + 3,5	800-1200	2500/3000
45		800-1200	3000
50		800-1200	2500/3000
55		800-1200	3000
60	+ 2 + 5	800-1100	3000

Further sizes on request.

Rods



	Tolerance to DIN (mm)	TECARIM 1500
DIN-Abbreviation		PA 6 G
Density (g/cm³)		1,15
Diameter Ø (mm)		kg/m
30	+ 3 + 0,2	0,896
40		1,55
50		2,39
65	+ 3 + 0,5	4,00
79	+ 1 - 1,5	5,56
100	+ 3 + 0,5	9,29
110		11,20
150	+ 3 + 0	20,59

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Delivery length 850 mm. Other delivery lengths possible, also available ground. All figures given without obligation.

= Stock item
 = Non-stock item – special production.

Plates



	Tolerance to DIN (mm)	TECARIM 1500
DIN-Abbreviation		PA 6 G
Density (g/cm³)		1,15
Diameter (mm)		kg/m
30 x 300	+ 2 - 0	10,71
50 x 300		17,61
60 x 300		21,07
80 x 300	+ 1 - 1	27,6
100 x 300	+ 2 - 0	34,9

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5} \text{ mm}$.

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. All figures given without obligation.

= Stock item
 = Non-stock item – special production.

Tubes



TECAST T

			PA 6 G															
			1,15															
Size Length (mm)	Tolerance		Dia-meter Ø (mm)	30	35	40	45	50	55	60	65	70	75	80	85	90		
3000	+ 1,0 + 5,0	- 1,0 - 5,0	50	1,95	1,69	1,38												
3000			60	2,90	2,84	2,54	2,18	1,78										
3000			70	3,90	4,06	3,76	3,40	3,00	2,56	2,06								
3000			80			4,70	4,91	4,51	4,07	3,58	3,04	2,45						
3000			90			6,87	6,53	6,15	5,72	5,24	4,71	4,14	3,52	2,86				
3000			100			8,30	8,24	7,86	7,43	6,95	6,42	5,85	5,23	4,57	3,86	3,10		
3000			110					9,99	9,56	9,08	8,55	7,98	7,36	6,70	5,99	5,23		
3000			120					11,80		11,42	10,89	10,32	9,70	9,04	8,33	7,57		
3000			130						13,90		13,73	13,21	12,64	12,02	11,35	10,64	9,88	
3000			140									15,54	14,88	14,26	13,60	12,89	12,13	
1000	+ 1,0 + 7,0	- 1,0 - 5,0	150								19,19	18,62	18,00	17,34	16,63	15,87		
1000			160										21,75		20,50		19,07	
1000			170												23,57		22,13	
1000			180													27,0		25,54
1000			190															28,8
						30	35	40	45	50	55	60	65	70	75	80	85	90

Size Length (mm)	Tolerance		Dia-meter Ø (mm)	40	50	60	70	80	90	100	110	120	130	140	150	160	170	
3000	+ 2,0 + 6,0	- 2,5 - 8,5	200	36,9	36,2	35,3	34,2	32,9	31,4	29,8	28,0	26,0	23,82	21,46	18,92	16,19	13,28	
2000			220	44,7	44,0	43,1	42,0	40,7	39,3	37,6	35,8	33,8	31,6	29,3	26,7	24,00	21,09	
2000	+ 3,0 + 9,0	- 3,0 - 12,0	250	58,8	58,1	57,3	56,2	55,0	53,6	52,0	50,2	48,2	46,1	43,8	41,3	38,6	35,7	
2000			280		73,0	72,1	71,1	69,8	68,4	66,8	65,0	63,1	60,9	58,6	56,1	53,4	50,5	
2000			300		83,8	82,9	81,9	80,6	79,2	77,6	75,8	73,9	71,7	69,4	66,9	64,2	61,3	
3000	+ 3,0 + 11,0	- 3,5 - 14,0	325			98,2	97,1	95,9	94,5	93,0	91,2	89,3	87,1	84,8	82,3	79,7	76,8	
2000			350				112,8	111,6	110,2	108,7	106,9	105,0	102,8	100,5	98,1	95,4	92,5	
2000			400					147,7	146,5	145,1	143,5	141,8	139,8	137,7	135,4	132,9	130,2	127,4
2100			450						186,8	185,5	183,9	182,2	180,3	178,2	175,9	173,4	170,8	167,9
3550	+ 3,0 + 13,0	- 3,5 - 16,0	500					230,9	229,5	228,0	226,2	224,3	222,2	219,9	217,5	214,8	212,0	
3000			550						278,2	276,6	274,9	272,9	270,8	268,6	266,1	263,4	260,6	
3500			600							331,3	329,8	328,0	326,1	324,0	321,7	319,3	316,6	313,8
2200			620															
3500			710															
				40	50	60	70	80	90	100	110	120	130	140	150	160	170	

Tolerances: length $+3_0\%$.

Tubes with an outside diameter in the range of 280 mm to 800 mm can be supplied in shorter lengths.

Please let us have your enquiries.

- = Outside
- = Stock item
- = Inside
- = Non-stock item – special production

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above.

On request:

TECAST T (also in blue), TECAST TM, TECAST R (also in blue), TECAST ST, TECAST M, TECAST HI, TECAST L, TECALUBE TECAGLIDE, TECAST 12.

Plastic & Metal Center, Inc.
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	95	100	105	110	115	120	125	130	135	140	150	160	170	180	Dia- meter Ø (mm)
															50
															60
															70
															80
															90
															100
	4,43	3,58													110
	6,77	5,92	5,02	4,08											120
	9,08	8,23	7,33	6,39	5,40	4,36									130
	11,32	10,47	9,58	8,63	7,64	6,61	5,53	4,40							140
	15,07	14,21	13,32	12,37	11,38	10,35	9,27	8,14	6,96	5,74					150
		17,45		15,65		13,66		11,48		9,12	6,58				160
		20,52		18,71		16,73		14,55		12,19	9,64	6,91			170
		23,93		22,12		20,13		17,96		15,60	13,05	10,32	7,40		180
		27,2		25,4		23,38		21,21		18,85	16,30	13,57	10,65	7,55	190
	95	100	105	110	115	120	125	130	135	140	150	160	170	180	

	180	190	200	225	250	275	300	325	350	375	400	425	450	475	500	Dia- meter Ø (mm)
																200
	17,99															220
	32,6	29,4	26,0													250
	47,5	44,2	40,8	31,5												280
	58,3	55,0	51,6	42,3	31,8											300
	73,8	70,6	67,2	57,9	47,5	35,9										325
	89,5	86,3	82,9	73,6	63,2	51,6	38,9									350
	124,4	121,1	117,7	108,4	98,0	86,4	73,7	59,9								400
	164,9	161,7	158,3	149,1	138,7	127,2	114,5	100,7	85,7	69,7						450
	209,0	205,8	202,4	193,1	182,8	171,2	158,6	144,8	129,8	113,7	96,5	78,1				500
	257,6	254,4	251,0	241,8	231,4	219,8	207,2	193,4	178,4	162,3	145,1	126,7	107,2			550
	310,8	307,6	304,2	294,9	284,6	273,0	260,4	246,6	231,6	215,5	198,3	179,9	160,4	139,8	118,0	600
	333,3	330,1	326,7	317,5	307,1	295,6	282,9	269,1	254,2	238,1	220,8	202,5	183,0	162,3	140,5	620
	443,8	440,6	437,3	428,0	417,6	406,1	393,4	379,6	364,7	348,6	331,3	313,0	293,5	272,8	251,0	710
	180	190	200	225	250	275	300	325	350	375	400	425	450	475	500	

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TECADUR/TECAPET. The excellent dimensionally stable engineering plastic with optimum electrical insulating properties.



TECADUR
TECAPET

On exposure to heat, TECADUR shows only low thermal expansion. It exhibits very good electrical insulating properties.

- I Low thermal expansion
- I High strength and hardness with good toughness
- I Good chemical resistance to acids
- I Easily bonded and welded
- I Wear resistant and good sliding properties
- I Very good electrical insulating properties
- I Good machinability

**Contact mounting
TECADUR PBT GF 30:**

Very good electrical insulation, low water absorption.



Roller

TECADUR PET:

Good sliding friction values, good machinability.



TECADUR PET

Low thermal expansion.
Very good sliding properties.

TECADUR PET black

Good UV resistance.
Good machinability.

TECADUR PBT GF 30

Glassfibre-reinforced polyester with very high strength. High heat resistance.

TECAPET

Very good machinability.
Creep resistant and non-abrasive.

TECAPET black

Good UV resistance.
Good machinability.

TECAPET TF

High abrasion resistance.
Very good sliding and friction properties.

**Insulating flange
TECADUR PET:**

Very good electrical properties, dimensionally stable.



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Rods



	Tolerance to DIN (mm)	TECADUR PET	TECADUR PET black	TECADUR PBT GF 30 *	TECAPET	TECAPET black	TECAPET TF
DIN-Abbreviation		PET	PET	PBT GF 30	PET	PET	PET
Density (g/cm³)		1,37	1,37	1,53	1,37	1,37	1,44
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,019	0,019	0,022	0,019	0,019	0,020
5	+ 0,1	0,030	0,030	0,034	0,030	0,030	0,032
6	+ 0,4	0,043	0,043	0,048	0,043	0,043	0,045
8		0,076	0,076	0,084	0,076	0,076	0,079
9	+ 0,1	0,095	0,095	0,106	0,095	0,095	0,100
10	+ 0,5	0,116	0,116	0,130	0,116	0,116	0,122
11		0,144	0,144	0,161	0,144	0,144	0,151
12		0,170	0,170	0,190	0,170	0,170	0,179
13		0,199	0,199	0,222	0,199	0,199	0,209
14		0,229	0,229		0,229	0,229	0,241
15	+ 0,2	0,262	0,262	0,293	0,262	0,262	0,275
16	+ 0,7	0,297	0,297	0,332	0,297	0,297	0,312
18		0,374	0,374	0,417	0,374	0,374	0,393
19		0,415	0,415		0,415	0,415	0,436
20		0,459	0,459	0,513	0,459	0,459	0,482
22		0,558	0,558	0,623	0,558	0,558	0,587
25	+ 0,2	0,716	0,716	0,800	0,716	0,716	0,753
28	+ 0,9	0,895	0,90		0,895	0,895	0,940
30		1,02	1,02	1,14	1,02	1,02	1,08
32		1,17	1,17	1,31	1,17	1,17	1,23
36	+ 0,2	1,47	1,47	1,65	1,47	1,47	1,55
40	+ 1,1	1,81	1,81	2,03	1,81	1,81	1,91
45		2,30	2,30	2,57	2,30	2,30	2,42
50	+ 0,3	2,83	2,83	3,16	2,83	2,83	2,98
56	+ 1,3	3,54	3,54	3,95	3,54	3,54	3,72
60		4,08	4,08	4,55	4,08	4,08	4,29
65	+ 0,3	4,77	4,77	5,33	4,77	4,77	5,02
70	+ 1,6	5,52	5,52	6,17	5,52	5,52	5,81
75	+ 0,4	6,37	6,37	7,12	6,37	6,37	6,70
80	+ 2	7,24	7,24	8,08	7,24	7,24	7,61
90	+ 0,5 + 2,2	9,16	9,16	10,2	9,16	9,16	9,63
100	+ 0,6 + 2,5	11,32	11,32	12,6	11,32	11,32	11,90
110	+ 0,7 + 3	13,73	13,73		13,73	13,73	14,43
120	+ 0,8	16,38	16,38		16,38	16,38	17,21
125	+ 3,5	17,74	17,74		17,74	17,74	18,65
130		19,22	19,22		19,22	19,22	20,21
135	+ 0,9	20,70	20,70		20,70	20,70	21,76
140	+ 3,8	22,24	22,24		22,24	22,24	23,38
150	+ 1	25,6	25,6		25,6	25,6	
165	+ 4,2	30,8	30,8		30,8	30,8	32,4
180	+ 1,2 + 5	36,8	36,8		36,8	36,8	38,7
200	+ 1,3 + 5,5	45,4	45,4		45,4	45,4	47,7

*From 110 mm diameter, 20% glass fibre content.
 Tolerances according to DIN: length $+ \frac{3}{0} \%$.
 The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground.
 All figures given without obligation.

-  = Stock item
-  = Non-stock item – special production

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TECADUR
TECAPET

Tubes



TECADUR PET

DIN-Abbreviation		PET												
Density (g/cm ³)		1,37												
Tolerance to DIN (mm)		Dia- meter Ø mm	18	20	25	30	32	36	40	45	50	54	60	
+1,1 +0,4	-0,4	25												
	-1,1	30												
+2,0 +0,6	-0,6 -2,0	36	0,39											
		40		0,62										
		45		1,12	0,89									
+2,5 +0,8	-0,8 -2,5	50			1,23	0,95								
		56			1,70			1,01						
+3,0 +0,8	-0,8 -3,0	60			2,23	1,95			1,54					
		65			2,99	2,71		2,31	1,99	1,55				
		70			3,50	3,22	3,10	2,82	2,51					
+3,6 +1,2	-1,6 -5,0	75			4,24	3,97		3,56	3,25	2,82				
		80			4,99	4,71	4,59	4,31	4,00	3,56	3,07			
		85			5,79	5,51	5,39	5,11	4,80	4,36	3,87	3,44		
		90			6,64	6,37	6,24	5,97	5,66	5,22	4,73	4,30	3,59	
+4,5 +1,5	-2,0 -6,5	100						7,07	6,77	6,35	5,87	5,45	4,76	
		110					8,30	8,04		7,32	6,84		5,73	
		120						10,13	9,83	9,41	8,94	8,52	7,82	
		125							12,14	11,72	11,25	10,83	10,13	
		130							14,90		14,03		12,93	
		135									15,38	14,97	14,28	
+5,4 +1,8	-2,2 -7,5	140								16,78		15,69		
		150								18,24	17,83	17,15		
		165								19,75	19,34	18,66		
+6,0 +2,0	-2,5 -8,5	180								22,94	22,52	21,84		
		200												
+9,0 +1,8	-3 -12,0	210												
		230												
		250												
			18	20	25	30	32	36	40	45	50	54	60	

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TECADUR
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	70	75	80	90	100	110	125	130	150	175	200	Diameter Ø mm
												25
												30
												36
												40
												45
												50
												56
												60
												65
												70
												75
												80
												85
	4,40											90
	6,50	5,75	4,95									100
	8,81	8,06	7,26	5,51								110
	11,63	10,89	10,10	8,37	6,41							120
	12,98	12,24	11,45	9,72	7,76							125
	14,38	13,65	12,86	11,12	9,17							130
	15,84		14,32	12,58	10,63	8,46						135
	17,35		15,83	14,09	12,14	9,97						140
	20,54		19,01	17,28	15,32	13,16	9,50	8,17				150
			24,51	22,78	20,84	18,69	15,05	13,73				165
			30,19	28,47	26,53	24,37	20,74	19,42	13,60			180
			38,81	37,10	35,17	33,03	29,41	28,10	22,31	13,87		200
				41,59	39,67	37,53	33,91	32,60				210
					50,72	48,62		43,78		29,74	20,06	230
					61,31	59,21		54,37		40,33	30,64	250
											48,14	280
											60,88	300
	70	75	80	90	100	110	125	130	150	175	200	

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Plates



	Tolerance to DIN (mm)	TECADUR PET	TECADUR PET black	TECADUR PBT GF 30	TECAPET	TECAPET black	TECAPET TF
DIN-Abbreviation		PET	PET	PBT GF 30	PET	PET	PET
Density (g/cm³)		1,37	1,37	1,53	1,37	1,37	1,44
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
4 x 1000 **	- 0,2 + 0,2	5,67					
5 x 500	+ 0,2 + 0,5	3,85	3,85	4,30	3,85	3,85	4,05
6 x 500	+ 0,2 + 0,75	4,66	4,66	5,20	4,66	4,66	4,90
8 x 500	+ 0,2 + 0,9	6,15	6,15	6,87	6,15	6,15	6,47
10 x 500		7,59	7,59	8,48	7,59	7,59	7,98
10 x 610		9,21			9,21		
12 x 500	+ 0,3 + 1,5	9,28	9,28	10,37	9,28	9,28	9,76
12 x 610		11,27			11,27		11,84
15 x 500		11,44	11,44		11,44	11,44	12,03
15 x 610		13,89			13,89		
16 x 500		12,16	12,16	13,58	12,16	12,16	12,78
18 x 500		13,60	13,60	15,19	13,60	13,60	14,30
20 x 500		15,04	15,04	16,80	15,04	15,04	15,81
20 x 610		18,25			18,25		
20 x 1000 **		29,60	29,60		29,60	29,60	
22 x 500		16,48	16,48	18,40	16,48	16,48	17,32
25 x 500		18,64	18,64	20,82	18,64	18,64	19,59
25 x 610		22,62			22,62		
25 x 1000 **		36,70	36,70		36,70	36,70	
27 x 500		+ 0,5 + 2,5	20,51	20,51	22,91	20,51	20,51
30 x 500	22,67		22,67	25,3	22,67	22,67	23,83
30 x 610	27,5				27,5		
30 x 1000 **	44,7		44,7		44,7	44,7	
32 x 500	24,11		24,11	26,9	24,11	24,11	25,30
36 x 500	27,0		27,0		27,0	27,0	
40 x 500	29,9		29,9	33,4	29,9	29,9	31,4
40 x 610	36,2				36,2		
40 x 1000 **	58,9		58,9		58,9	58,9	
45 x 500	33,5		33,5	37,4	33,5	33,5	35,2
50 x 300	22,67		22,67	25,3	22,67	22,67	23,8
50 x 500	37,1		37,1	41,4	37,1	37,1	39,0
50 x 610	45,0				45,0		
60 x 300	+ 0,5 + 5		27,6	27,6	30,8	27,6	27,6
60 x 500		45,2	45,2	50,4	45,2	45,2	47,5
70 x 300		32,0	32,0	35,8	32,0	32,0	33,7
70 x 500		52,4	52,4	58,5	52,4	52,4	55,0
80 x 300		36,4	36,4	40,7	36,4	36,4	38,3
80 x 500		59,6	59,6	66,5	59,6	59,6	62,6
90 x 300		40,8	40,8	45,6	40,8	40,8	42,9
100 x 300		45,2	45,2	50,5	45,2	45,2	47,5
100 x 500		73,9	73,9		73,9		77,7


**Length 2000 mm

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5} \text{ mm}$.

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All figures given without obligation.

 = Stock item

 = Non-stock item – special production

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TECANAT.

The transparent, dimensionally stable engineering plastic.



Extremely tough plastic with outstanding electrical insulation.

TECANAT can be bonded and welded during further processing.

- I Extremely tough
- I Transparent
- I Weldable and bondable
- I Good electrical insulating properties

TECANAT transparent

Extremely tough and transparent.
High operating temperature.

TECANAT GF 30

Glassfibre-reinforced polycarbonate with very high strength. Low water absorption.

Liquid media container TECANAT PC:

Safe for use with foodstuffs, dimensionally stable, low water absorption.



Distributor block TECANAT PC:

High purity, extremely tough, dimensionally precise.



Surface plug TECANAT PC:

Transparent, low water absorption.





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Rods



	Tolerance to DIN (mm)	TECANAT transparent	TECANAT GF 30 *
DIN-Abbreviation		PC	PC GF 30
Density (g/cm³)		1,20	1,42
Diameter Ø (mm)		kg/m	kg/m
4	+ 0,1 + 0,3	0,017	0,020
5	+ 0,1	0,026	0,031
6	+ 0,4	0,038	0,044
8		0,066	0,078
9	+ 0,1	0,083	0,098
10	+ 0,5	0,102	0,121
11		0,128	0,152
12		0,151	0,179
13		0,176	0,209
14		0,204	0,241
15	+ 0,2	0,232	0,275
16	+ 0,9	0,263	0,312
18		0,331	0,391
19		0,367	0,435
20		0,406	0,480
22		0,495	0,586
25		0,635	0,751
28	+ 0,2	0,792	0,937
30	+ 1,2	0,906	1,07
32		1,03	1,22
36	+ 0,2	1,31	1,55
40	+ 1,6	1,60	1,90
45		2,05	2,42
50	+ 0,2	2,52	2,98
56	+ 1,5	3,14	3,72
60		3,62	4,29
65	+ 0,3	4,24	
70	+ 2,5	4,90	5,80
75	+ 0,4	5,66	6,69
80	+ 3	6,42	7,59
90	+ 0,5 + 3,4	8,13	9,62
100	+ 0,6 + 3,8	10,04	11,88
110	+ 0,7 + 4,2	12,16	14,38
120		14,47	
125	+ 0,8 + 4,6	15,68	18,55
135	+ 0,9	18,35	21,71
140	+ 5,4	19,70	23,31
150	+ 1 + 5,8	22,6	26,8
165	+ 1,2	27,6	32,6
180	+ 7,4	32,7	38,6
200	+ 1,3 + 8,5	40,4	
210		43,63	
230	+ 1,3	52,11	
250	+ 9	61,36	

*From 110 mm diameter, 20% glass fibre content.
Tolerances according to DIN: length $+ \frac{3}{0} \%$.
The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground.
All figures given without obligation.



-  = Stock item
 = Non-stock item – special production

Plates

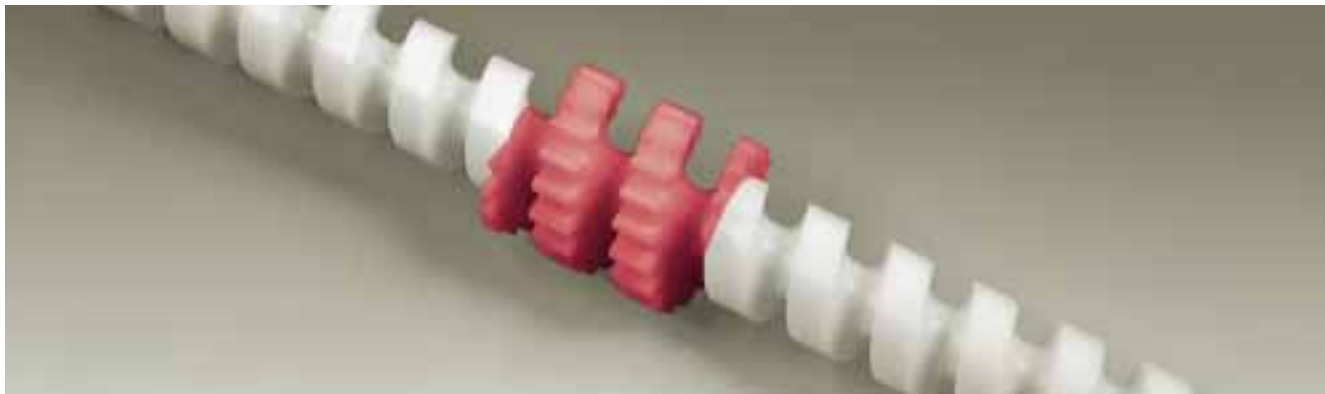


	Tolerance to DIN (mm)	TECANAT	TECANAT GF 30
DIN-Abbreviation		PC	PC GF 30
Density (g/cm³)		1,20	1,42
Diameter (mm)		kg/m	kg/m
1 x 1200 **	+ 0,1 + 0,1	1,64	
2 x 1250 **	-0,15 + 0,15	3,10	
3 x 1250 **	+ 0,2	4,95	
4 x 1250 **	+ 0,2	6,50	
5 x 300			2,49
5 x 500		3,44	4,07
5 x 1250	+ 0,2	8,44	
6 x 300	+ 0,7		2,94
6 x 500		4,07	4,81
6 x 1250		9,99	
8 x 300		3,30	3,90
8 x 500		5,39	6,38
8 x 1250	+ 0,2	13,24	
10 x 300	+ 0,9	4,07	4,81
10 x 500		6,65	7,87
12 x 300		4,97	5,89
12 x 500		8,13	9,62
16 x 300			7,71
16 x 500		10,65	12,61
18 x 500		11,91	14,10
20 x 300	+ 0,3	8,06	9,54
20 x 500	+ 1,5	13,17	15,59
22 x 300		8,83	10,45
22 x 500		14,44	17,08
25 x 300		9,99	11,82
25 x 500		16,33	19,32
27 x 300		10,99	13,00
27 x 500		17,97	21,26
30 x 300		12,15	14,37
30 x 500		19,86	23,50
32 x 300		12,92	15,28
32 x 500	+ 0,5	21,12	25,0
36 x 500	+ 2,5	23,64	28,0
40 x 300		16,00	18,93
40 x 500		26,2	31,0
45 x 500		29,3	34,7
50 x 300		19,86	23,5
50 x 500		32,5	38,4
60 x 300	+ 0,5	23,90	28,3
60 x 500	+ 3,5	39,1	46,2
70 x 300		28,0	33,2
70 x 500		45,9	54,3
80 x 300		31,9	37,8
80 x 500	+ 0,5	52,2	61,7
90 x 300	+ 5	34,9	42,3
90 x 500		58,5	
100 x 300		39,6	46,9
100 x 500		64,8	

**Length 2000 mm
Tolerances according to DIN: length $+ \frac{3}{0} \%$.
width $+ \frac{25}{5} \text{ mm}$.
The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planned.
All figures given without obligation.

-  = Stock item
 = Non-stock item – special production

TECAFLON. Chemically resistant high-temperature fluorine plastic with good UV stability.



TECAFLON is characterised by an exceptionally high resistance to chemicals. Very good sliding properties and electrical insulation, even for high-frequency applications, determine its broad fields of use.

- I Exceptionally high resistance to chemicals
- I High resistance to stress cracking
- I Suitable for use even at low temperatures
- I Very good sliding properties (no slip-stick effect with PTFE)
- I Outstanding electrical insulation, even for high-frequency applications
- I Very good UV resistance
- I Inherently self-extinguishing

TECAFLON PTFE

Exceptionally high resistance to chemicals. Very good sliding friction properties.

TECAFLON PTFE GF 25

Glassfibre-reinforced semi-finished product with enhanced strength. Good machinability.

TECAFLON ETFE

Low moisture absorption. High operating temperature.

TECAFLON PVDF

Good chemical resistance and enhanced strength. Very good weldability.

On request:

TECAFLON PVDF CF 8

Very good chemical resistance. Good sliding and friction properties. Very wear resistant

**Fixing flange
TECAFLON PVDF:**

Very good chemical resistance, UV-resistant, high compressive strength.



**Pump cover
TECAFLON PVDF:**

Good ultrasonic weldability, elastic properties.



**Funnel
TECAFLON PVDF:**

Good machinability, good resilience.



TECAFLON

Rods



	Tolerance (mm)	TECAFLON PTFE *
DIN-Abbreviation		PTFE
Density (g/cm³)		2,18
Diameter Ø (mm)		kg/m
4	+ 0,3	0,030
5	+ 0,0	0,046
6		0,067
8	+ 0,4	0,117
9	+ 0,0	0,148
10		0,182
11		0,227
12		0,269
13		0,314
14		0,362
15	+ 0,8	0,414
16	+ 0,0	0,470
18		0,591
19		0,657
20		0,727
22		0,892
25	+ 1,2	1,140
28	+ 0,0	1,430
30		1,640
32		1,88
35	+ 1,6	2,24
40	+ 0,0	2,91
45	+ 2,0	3,70
50	+ 0,0	4,54
56	+ 2,4	5,71
60	+ 0,0	6,54
65		7,75
70	+ 3,2	8,95
75	+ 0,0	10,25
80		11,63
90	+ 4,0	14,78
100	+ 0,0	18,17
110	+ 5,0	22,10
120	+ 0,0	26,2

* also available with glass fibres GF 25% oder CF 25%.

** Tolerance based on GKV according to manufacturer's specifications. Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5}$ mm.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. All figures given without obligation.

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Rods





	Tolerance to DIN (mm)	TECAFLON PVDF	TECAFLON ETFE
DIN-Abbreviation		PVDF	ETFE
Density (g/cm³)		1,78	1,70
Diameter Ø (mm)		kg/m	kg/m
4	+ 0,1 + 0,3	0,025	0,024
5	+ 0,1	0,039	0,038
6	+ 0,4	0,056	0,054
8		0,098	0,095
9	+ 0,1	0,123	0,120
10	+ 0,5	0,151	0,147
11		0,187	0,182
12		0,221	0,215
13		0,258	0,251
14		0,298	0,289
15	+ 0,2	0,340	0,331
16	+ 0,7	0,386	0,375
18		0,485	0,472
19		0,539	0,524
20		0,596	0,580
22		0,725	0,705
25	+ 0,2	0,931	0,905
28	+ 0,9	1,16	1,13
30		1,33	1,29
32		1,52	1,48
36	+ 0,2	1,92	1,86
40	+ 1,1	2,36	2,29
45		2,99	2,91
50	+ 0,3	3,68	3,58
56	+ 1,3	4,60	4,47
60		5,30	5,15
65	+ 0,3		6,03
70	+ 1,6	7,18	6,98
75		8,28	8,05
80	+ 2,0	9,40	9,14
90	+ 0,5 + 2,2	11,90	11,56
100	+ 0,6 + 2,5	14,70	14,29
110	+ 0,7 + 3,0	17,84	17,34
120	+ 0,8	21,28	20,68
125	+ 3,5	23,05	22,41
135	+ 0,9	26,9	26,1
140	+ 3,8	28,9	28,1
150	+ 1,0 + 4,2	33,2	32,3
165	+ 1,2	40,3	
180	+ 5,0	47,8	
200	+ 1,3 + 5,5	59,0	
210	+ 1,3 + 5,8	65,0	
230	+ 1,5 + 6,2	78,0	
250	+ 1,5	92,0	
280	+ 6,5	115,0	
300	+ 1,5 + 7	132,0	

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5}$ mm.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planed. All figures given without obligation.

 = Stock item

 = Non-stock item – special production

Plates



	Tolerance (mm)	TECAFLO PTFE ***
DIN-Abbreviation		PTFE
Density (g/cm³)		2,18
Diameter (mm)		kg/m
1 x 1000 **	+ 1	2,50
2 x 1000 **		5,00
3 x 1000 **		7,60
4 x 1000 **		9,90
5 x 1000 **		12,00
6 x 1000 **		14,40
8 x 1000 **	+ 1,2	19,30
10 x 1000 **	+ 1,5	24,10
12 x 1000 **	+ 15 %	28,90
15 x 1000 **		36,50
20 x 1000 **		47,50
25 x 1000 **		59,40
30 x 1000 **		71,30
40 x 1000 **		95,00
50 x 1000 **		118,70
60 x 1000 **		142,50
70 x 1000 **		168,20
80 x 600 *		116,17
90 x 600 *		130,67
100 x 600 *		145,17
110 x 600 *		159,67
120 x 600 *		174,17
130 x 600 *		189,17
140 x 600 *	203,17	
150 x 600 *	215,67	

**Length 600 mm

*Length 1000 mm, other delivery lengths and width possible, also available planed.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given.

***also available 30% glass fibre content.

All figures given without obligation.

Plates




	Tolerance to DIN (mm)	TECAFLO PVDF
DIN-Abbreviation		PVDF
Density (g/cm³)		1,78
Diameter (mm)		kg/m
5 x 300	+ 0,2	3,06
5 x 500	+ 0,5	5,00
6 x 300	+ 0,2	3,70
6 x 500	+ 0,75	6,05
8 x 300	+ 0,2 + 0,9	4,89
8 x 500		7,99
10 x 300		6,03
10 x 500		9,86
12 x 300	+ 0,3 + 1,5	7,38
12 x 500		12,06
15 x 500		14,87
15 x 1000 **		29,3
16 x 300		9,67
16 x 500		15,80
18 x 500		17,67
20 x 300		11,95
20 x 500		19,54
20 x 1000 **		38,5
22 x 300		13,10
22 x 500		21,41
25 x 300		14,81
25 x 500		24,22
25 x 1000 **		47,7
27 x 300	+ 0,3 + 2,5	16,24
27 x 500		26,6
30 x 300		17,96
30 x 500		29,4
30 x 1000 **		57,9
32 x 300		19,10
32 x 500		31,2
36 x 500		35,0
40 x 300		23,68
40 x 500		38,7
45 x 500	43,4	
50 x 300	29,4	
50 x 500	48,1	
60 x 300	+ 0,5	35,5
60 x 500	+ 3,5	58,0
70 x 300	+ 0,5 + 5	41,6
70 x 500		68,0
80 x 300		47,3
80 x 500		77,4
90 x 300		53,0
90 x 500		86,7
100 x 300		58,8
100 x 500		96,1


** Length 2000 mm

Tolerances according to DIN: length $+ \frac{3}{0}$ %.

width $+ \frac{25}{5}$ mm.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planed. All figures given without obligation.

 = Stock item

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TECASON/TECAPEI. Hydrolysis-resistant high-temperature plastics resistant even to high-energy radiation.



Medical technology benefits in particular from the outstanding properties of TECASON. It has a high strength, hardness and rigidity over a wide range of temperatures.

- | Continuous operating temperature up to 160° C
- | High hardness, strength and rigidity over a wide range of temperatures
- | Outstanding thermal stability and creep resistance
- | Hydrolysis-resistant
- | Good electrical insulating properties
- | Inherently self-extinguishing
- | High frequency-resistant
- | Transparent, translucent
- | Good weldability

TECASON E

Good electrical insulating properties. Translucent, hydrolysis-resistant semi-finished product.

TECASON P MT black

Autoclavable material with approvals for use in medical technology. High thermal stability.

TECASON S

High frequency-resistant plastic. Translucent plastic safe for use with foodstuffs.

TECAPEI

Continuous operating temperature up to 170 °C. High frequency-resistant. FDA conformity.

TECAPEI GF 30

High thermal mechanical resistance. Resistant to high energy radiation.

Cap TECASON S:

Low water absorption, resistance to microwaves, safe for use with foodstuffs.



Mounting arch TECASON S:

Transparent to X-rays, approvals for use in medical technology, dimensionally stable.



Valve plunger TECASON E:

Translucent, dimensionally stable, safe for use with foodstuffs, resistant to disinfectants.



Rods



	Tolerance to DIN (mm)	TECASON S	TECASON E	TECASON P MT black	TECAPEI
DIN-Abbreviation		PSU	PES	PPSU	PEI
Density (g/cm³)		1,24	1,37	1,29	1,27
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,018	0,019	0,018	0,018
5	+ 0,1	0,027	0,030	0,028	0,028
6	+ 0,4	0,039	0,043	0,040	0,040
8		0,068	0,076	0,071	0,070
9	+ 0,1	0,086	0,095	0,089	0,088
10	+ 0,5	0,105	0,116	0,110	0,108
11		0,133	0,146	0,138	0,136
12		0,156	0,173	0,163	0,160
13		0,182	0,202	0,190	0,187
14		0,210	0,232	0,219	0,215
15	+ 0,2	0,240	0,265	0,250	0,246
16	+ 0,9	0,272	0,301	0,283	0,279
18		0,342	0,378	0,356	0,350
19		0,380	0,419	0,395	0,389
20		0,419	0,463	0,436	0,430
22	+ 0,2 + 1,2	0,512	0,566	0,532	0,524
25,4	+ 0,00 + 0,13			0,649	
25		0,656	0,725	0,683	0,672
28	+ 0,2	0,818	0,904	0,851	0,838
30	+ 1,2	0,936	1,03	0,974	0,959
31,75	+ 0,00 + 0,13			1,06	
32	+ 0,2 + 1,2	1,06	1,17	1,11	1,09
36	+ 0,2 + 1,6	1,35	1,49	1,41	1,39
38,1	+ 0,00 + 0,13			1,51	
40	+ 0,2 + 1,6	1,66	1,84	1,73	1,70
44,45	+ 0,00 + 0,13			2,01	
45	+ 0,3	2,12	2,34	2,20	2,17
50	+ 2,0	2,60	2,87	2,70	2,66
50,8	+ 0,00 + 0,13			2,69	
56	+ 0,3 + 2,0	3,24	3,58	3,38	3,32
57,15	+ 0,00 + 0,76			3,40	
60	+ 0,3 + 2,5	3,74	4,14	3,90	3,84
63,5	+ 0,00 + 0,76			4,28	
65	+ 0,3 + 2,5	4,38	4,84	4,56	4,49
69,85	+ 0,00 + 0,76			5,12	
70	+ 0,3 + 2,5	5,06	5,59	5,27	5,19
75	+ 0,4 + 3	5,84	6,46	6,08	5,99
76,2	+ 0,00 + 0,76			6,03	
80	+ 0,4 + 3	6,63	7,33	6,90	6,79
88,9	+ 0,00 + 0,76			8,44	
90	+ 0,5 + 3,4	8,40	9,28	8,74	8,60
100	+ 0,6 + 3,8	10,38	11,46	10,79	10,63
110	+ 0,7 + 4,2	12,56	13,88	13,07	12,86
120	+ 0,8	14,96	16,52	15,56	15,32
125	+ 4,6	16,20	17,90	16,85	16,59
135	+ 0,9	18,96	20,95	19,72	19,42
140	+ 5,4	20,36	22,49	21,18	20,85
150	+ 1 + 5,8	23,37	25,8	24,32	23,94
165	+ 1,2	28,5			
180	+ 7,4	33,7			
200	+ 1,3 + 8,5	41,7			

TECASON
TECAPEI

For TECASON P MT colours please look on page 64.

Tolerances according to DIN: length $\pm \frac{3}{100}$ %.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

= Stock item

= Non-stock item – special production

Plates




	Tolerance to DIN (mm)	TECASON S	TECASON E	TECASON P MT black	TECAPEI	
DIN-Abbreviation		PSU	PES	PPSU	PEI	
Density (g/cm³)		1,24	1,37	1,29	1,27	
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	
5 x 300	+ 0,2	2,17	2,40	2,26	2,22	
6 x 300	+ 0,7	2,57	2,84	2,67	2,63	
8 x 300	+ 0,2	3,41	3,76	3,54	3,49	
10 x 300	+ 0,9	4,20	4,56	4,37	4,30	
12 x 300	+ 0,3 + 1,5	5,14	5,68	5,35	5,26	
12 x 500					8,61	
16 x 300		6,73	7,44	7,00	6,90	
20 x 300		8,33	9,20	8,66	8,53	
20 x 500					13,94	
25 x 300		10,32	11,40	10,73	10,57	
27 x 300		+ 0,5 + 2,5	11,35	12,55	11,81	11,63
30 x 300			12,55	13,87	13,06	12,85
30 x 500	20,52				21,01	
32 x 300	13,35		14,75	13,88	13,67	
40 x 300	16,53		18,27	17,20	16,93	
40 x 500	27,0		29,9		27,7	
50 x 300	20,5		22,67	21,35	21,01	
50 x 500	33,5		37,1		34,4	
60 x 300	+ 0,5	24,70	27,3	25,7	25,3	
60 x 500	+ 3,5				41,4	
70 x 300	+ 0,5	29,0	32,0	30,2	29,7	
80 x 300	+ 5	33,0	36,4	34,3	33,8	

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5} \text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planned. All figures given without obligation.

 = Stock item

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TECATRON. The high-temperature plastic with outstanding thermal and dimensional stability.



TECATRON is resistant to oxidation and hydrolysis. It can be continuously used at temperatures up to + 230 °C and briefly at up to + 260 °C.

Strength, rigidity and hardness of TECATRON are regarded as very good.

- | Continuous operating temperature up to + 230 °C and briefly up to + 260 °C
- | High strength, rigidity and hardness
- | Outstanding dimensional and thermal stability
- | Low water absorption
- | Very good resistance to chemicals
- | Hydrolysis-resistant
- | Inherently self-extinguishing

TECATRON

Low water absorption.
Very good electrical insulation.

TECATRON GF 40

Extremely high strength thanks to glassfibre reinforcement.
Very good resistance to chemicals.

TECATRON PVX black

Very good sliding and friction values.
Suitable for bearing parts subject to high loads.

**Housing flange
TECATRON GF 40:**

High dimensional stability, good electrical insulating properties.



**Liquid tap
TECATRON GF 40:**

Good resistance to chemicals, dimensionally stable, close tolerances possible.



**Switchgear housing
TECATRON GF 40:**

Electrically insulating, low distortion, low water absorption.



TECATRON

Rods



	Tolerance to DIN (mm)	TECATRON	TECATRON GF 40	TECATRON GF 40 black	TECATRON PVX black
DIN-Abbreviation		PPS	PPS GF 40	PPS GF 40	PPS
Density (g/cm³)		1,35	1,64	1,64	1,47
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,019	0,023	0,023	0,021
5	+ 0,1	0,030	0,036	0,036	0,032
6	+ 0,4	0,042			
8		0,075	0,091	0,091	0,081
9	+ 0,1	0,094			
10	+ 0,5	0,115	0,139	0,139	0,125
12		0,168	0,204	0,204	0,183
16	+ 0,2	0,293	0,356	0,356	0,319
18	+ 0,7	0,368	0,447	0,447	0,401
20		0,452	0,549	0,549	0,492
22		0,550	0,668	0,668	0,599
25	+ 0,2	0,706	0,858	0,858	0,769
28	+ 0,9	0,882	1,07	1,07	0,960
30		1,01	1,23	1,23	1,10
32		1,15	1,40	1,40	1,26
36	+ 0,2	1,45	1,76	1,76	1,58
40	+ 1,1		2,17	2,17	1,95
45		2,27			
50	+ 0,3	2,79	3,39	3,39	3,04
56	+ 1,3	3,49			
60	+ 0,3 + 1,6	4,02	4,88	4,88	4,37

Tolerances according to DIN:
length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

= Stock item

= Non-stock item – special production

Plates



	Tolerance to DIN (mm)	TECATRON	TECATRON GF 40	TECATRON GF 40 black	TECATRON PVX black
DIN-Abbreviation		PPS	PPS GF 40	PPS GF 40	PPS
Density (g/cm³)		1,35	1,64	1,64	1,47
Diameter (mm)		kg/m	kg/m	kg/m	kg/m
8 x 300		3,71	4,51	4,51	4,04
8 x 500	+ 0,2	6,06	7,37	7,37	6,60
10 x 500	+ 0,9	7,48	9,09	9,09	8,15
12 x 500		9,15	11,11	11,11	9,96
16 x 500		11,98	14,56	14,56	13,05
18 x 500		13,40	16,28	16,28	14,59
20 x 300	+ 0,3	9,07	11,01	11,01	9,87
20 x 500	+ 1,5	14,82	18,01	18,01	16,14
25 x 300		11,23	13,65	13,65	12,23
25 x 500		18,37	22,31	22,31	20,00
30 x 300		13,66	16,60	16,60	14,88
30 x 500		22,34	27,1	27,1	24,32
36 x 500			32,3	32,3	29,0
40 x 300	+ 0,5	18,00	21,87	21,87	19,60
40 x 500	+ 2,5	29,4	35,8	35,8	32,0
50 x 300		22,3	27,1	27,1	24,32
50 x 500		36,5	44,4	44,4	
70 x 300	+ 0,5 + 5		38,3	38,3	

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
width $+ \frac{25}{5} \text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

= Stock item

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TECAPEEK. The high-temperature plastic with outstanding mechanical properties.



The hydrolysis resistance of TECAPEEK extends to over 200° C. TECAPEEK insulates electrically even at high voltages.

Electrical engineering and medical technology as well as mechanical engineering and aerospace benefit from the outstanding load-bearing strength of TECAPEEK

- | Continuous operating temperature up to + 260° C and briefly even up to + 300° C
- | Outstanding mechanical properties even at high temperatures
- | Outstanding resistance to chemicals
- | Hydrolysis resistance even above + 200° C
- | Electrically insulating even with high voltages
- | Excellent sliding properties
- | Resistant to high-energy radiation

TECAPEEK

Continuous operating temperature up to + 260° C. Outstanding mechanical properties even at high temperatures.

TECAPEEK GF 30

Glassfibre-reinforced semi-finished product with enhanced strength. Excellent resistance to chemicals.

TECAPEEK CF 30 black

Very high strength values thanks to the addition of carbon fibres. Enhanced abrasion resistance.

TECAPEEK PVX black

Very good sliding and friction values. Suitable for bearing parts subject to high loads.

TECAPEEK MT black

Hydrolysis-resistant, autoclavable semi-finished product with approvals for medical technology.

TECAPEEK ELS nano

Electrically conductive, high strength, for use in semi-conductor technology and the electronics industry.

TECAPEEK HT

very high abrasion and wear resistance, high load-bearing capacity in static and dynamic conditions, excellent chemical resistance.

TECAPEEK TF 10

Very good sliding and friction properties, suitable for soft mating partners. Electrically insulating.

Gear wheel TECAPEEK:

Torque transmission, high-temperature application, high surface loads.



Cam guide TECAPEEK PVX:

Automation and robotics, very good sliding friction values, high resistance to chemicals.



Transport pinion TECAPEEK MT:

Suitable for use with foodstuffs, resistant to sterilisation, dimensionally stable.



TECAPEEK





Rods



	Tolerance (mm)	TECAPEEK	TECAPEEK GF 30	TECAPEEK CF 30 black	TECAPEEK PVX black	TECAPEEK MT black*	TECAPEEK ELS nano	TECAPEEK TF 10	TECAPEEK HT black
DIN-Abbreviation		PEEK	PEEK GF 30	PEEK CF 30	PEEK	PEEK	PEEK	PEEK TF 10	PEK
Density (g/cm³)		1,30	1,51	1,40	1,48	1,30	1,34	1,35	1,32
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
5	+ 0,1	0,029	0,033	0,031	0,033	0,029	0,030	0,030	0,029
6	+ 0,4	0,041	0,047	0,044	0,046	0,041	0,042	0,042	0,041
8		0,072	0,083	0,077	0,082	0,072	0,074	0,075	0,073
9	+ 0,1	0,090		0,097			0,093		0,091
10	+ 0,5	0,110	0,128	0,119	0,126	0,110	0,114	0,115	0,112
11		0,139		0,150			0,143		0,141
12		0,164	0,191	0,177	0,187	0,164	0,169	0,170	0,167
13		0,191							0,194
14		0,220							0,224
15	+ 0,2	0,252	0,292	0,271	0,287	0,252	0,260	0,262	0,256
16	+ 0,9	0,285	0,331	0,307	0,325	0,285	0,294	0,296	0,290
18		0,358	0,416	0,386	0,408	0,358	0,369	0,372	0,364
19		0,398	0,462	0,429	0,453	0,398	0,411		0,404
20	+ 0,2 + 1,1	0,444	0,516	0,478	0,506	0,444	0,458	0,461	0,451
22		0,537	0,623	0,578	0,611	0,537	0,553	0,557	0,545
25	+ 0,2	0,688	0,799	0,741	0,783	0,688	0,709	0,714	0,698
28	+ 1,2	0,858	0,996	0,924	0,977	0,858	0,884	0,891	0,871
30		0,982	1,14	1,06	1,12	0,982	1,01	1,02	0,997
32	+ 0,2	1,12	1,30	1,20	1,27	1,12	1,15	1,16	1,13
36	+ 1,3	1,41	1,63	1,51	1,60	1,41	1,45	1,46	1,43
40	+ 0,2 + 1,5	1,74	2,02	1,87	1,98	1,74	1,79	1,80	1,76
45	+ 0,3	2,20		2,37	2,51	2,20	2,27		2,24
50	+ 1,7	2,71	3,15	2,92	3,08	2,71	2,79	2,81	2,75
56	+ 0,3 + 2	3,40		3,66	3,87	3,40			3,45
60	+ 0,3	3,91	4,55	4,21	4,46	3,91	4,03	4,06	3,97
65	+ 2,3	4,58	5,32					4,75	4,65
70	+ 0,3 + 2,5	5,31	6,17	5,72	6,04	5,31	5,47	5,51	5,39
80	+ 0,4 + 3	6,95	8,07	7,49	7,91	6,95	7,17	7,22	7,06
90	+ 0,5 + 3,4	8,80	10,23	9,48	10,02		9,08	9,14	8,94
100	+ 0,6 + 3,8	10,88	12,63	11,71	12,38	10,88	11,21	11,30	11,04
110	+ 0,7 + 4,2	13,17	15,30			13,17			13,37
120	+ 0,8	15,68				15,68			15,92
125	+ 4,6	16,98				16,98			17,24
135	+ 0,9	19,88				19,88			20,18
140	+ 5,4					21,34			21,67
150	+ 1 + 5,8	24,51				24,51			24,88
165	+ 1,1 + 6,3	29,6							
180	+ 1,2 + 7,4	35,4							
200	+ 1,3 + 8,5	43,7							

*Also available in pigmented form.
 Tolerances according to DIN: length + 3/0 %.
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 = Stock item
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Plates



	Tolerance (mm)	TECAPEEK	TECAPEEK GF 30	TECAPEEK CF 30 black	TECAPEEK PVX black	TECAPEEK MT black*	TECAPEEK ELS nano	TECAPEEK TF 10	TECAPEEK HT black
DIN-Abbreviation		PEEK	PEEK GF 30	PEEK CF 30	PEEK	PEEK	PEEK	PEEK TF 10	PEK
Density (g/cm³)		1,30	1,51	1,40	1,48	1,30	1,34	1,35	1,32
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
5 x 300	+ 0,2 + 0,7	2,28			2,59	2,28			2,31
5 x 500		3,72							3,78
6 x 300		2,69	3,13		3,07	2,69		2,80	2,74
6 x 500		4,40	5,12	4,74	5,01	4,40	4,54	4,57	4,47
8 x 300	+ 0,2 + 0,9	3,57	4,15		4,07	3,57		3,71	3,63
8 x 500		5,84	6,78	6,29	6,65	5,84	6,02	6,06	5,93
10 x 300		4,41	5,12		5,02	4,41		4,58	4,47
10 x 500		7,20	8,37	7,76	8,20	7,20	7,43	7,48	7,32
12 x 300	+ 0,3 + 1,5	5,39	6,26		6,13	5,39		5,60	5,47
12 x 500		8,81	10,23	9,49	10,03	8,81	9,08	9,15	8,94
16 x 300		7,06	8,20		8,04	7,06		7,33	7,17
16 x 500		11,54	13,41	12,43	13,14	11,54	11,90	11,98	11,72
16 x 1000 **		22,75							
18 x 500		12,91	14,99	13,90	14,69	12,91	13,30	13,40	13,11
20 x 300		8,73	10,14		9,94	8,73		9,07	8,86
20 x 500		14,27	16,58	15,37	16,25	14,27	14,71	14,82	14,49
20 x 1000 **		28,1							
22 x 500		15,64	18,16	16,84	17,80	15,64	16,12	16,24	15,88
25 x 300		10,82	12,57		12,32	10,82		11,23	10,98
25 x 500		17,69	20,54	19,05	20,14	17,69	18,23	18,37	17,96
25 x 1000 **		34,9							
30 x 300		+ 0,5 + 2,5	13,16	15,28		14,98	13,16		13,66
30 x 500	21,51		24,99	23,17	24,49	21,51	22,17	22,34	21,84
30 x 1000 **	42,4								
32 x 500	22,88		26,6	24,64	26,0	22,88	23,58	23,76	23,23
36 x 500	25,6		29,7	27,6	29,2	25,6	26,4	26,6	26,0
40 x 300	17,33		20,13	18,67	19,73	17,33	17,87	18,00	17,60
40 x 500	28,3		32,9	30,5	32,3	28,3		29,4	28,8
40 x 1000 **	55,9								
45 x 500	31,8		36,9		36,2	31,8	35,7	33,0	32,2
50 x 300	21,51		24,99	23,17	24,49	21,51		22,34	21,84
50 x 500	35,2		40,8	37,9	40,0	35,2	36,3	36,5	35,7
60 x 300	+ 0,5 + 3,5	25,9	30,1			25,9		26,9	26,3
60 x 500		42,3			48,2	42,3			43,0
70 x 300		30,1	34,9					31,2	
80 x 300	+ 0,5 + 5	34,6	40,1					35,9	
80 x 500		56,5							
100 x 300		42,9							

*Also available in pigmented form, see page 63.

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5}$ mm.

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All figures given without obligation.



= Stock item



= Non-stock item – special production

TECAPEEK

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Tubes



		TECAPEEK										
DIN-Abbreviation		PEEK										
Density (g/cm ³)		1,30										
Tolerance to DIN (mm)		- 0,3 - 3,0		- 0,3 - 3,0		- 0,3 - 5,0			- 0,5 - 5,0			
	Diameter Ø (mm)	25	30	36	40	45	50	54	60	70	75	
+ 2,5 + 0,8	40	1,24										
	45	1,70										
	50	2,21	1,94	1,58								
	56	2,89	2,62	2,26	1,97							
	60	3,39	3,12	2,76	2,46							
+ 3 + 0,8	65	4,06	3,79	3,43	3,13	2,76						
	70	4,82	4,55	4,19	3,89	3,52	3,05					
	75	5,59	5,32	4,96	4,66	4,29	3,82	3,41				
	80		6,15	5,79	5,49	5,12	4,65	4,24	3,56			
+ 3,6 + 1,2	85			6,67	6,37	6,00	5,53	5,12	4,44			
	90			7,69	7,40	7,02	6,56	5,40	5,47	4,18		
	100			9,72	9,42	9,05	8,59	8,17	7,49	6,21		
+ 4,5 + 1,5	110					11,29	10,82	10,41	9,73	8,45		
	125						14,73	14,32	13,64	12,35		
	135						17,50	17,09	16,41	15,12		
+ 5,4 + 1,8	140						18,96	18,55	17,87	16,59		
	150						22,24	21,82	21,14	19,86		
	165											
	180											
+ 6 + 2	185											
	200											
	210											
	230											
	250											
	280											
	300											
	360											
	Diameter Ø (mm)	25	30	36	40	45	50	54	60	70	75	

- = Outside
- = Stock item
- = Inside
- = Non-stock item – special production

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
 The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

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TECAPEEK

	-0,5 -8,5						-2,5 -8,5					Tolerance
	80	90	100	110	125	130	150	175	180	200	290	Diameter Ø (mm)
												40
												45
												50
												56
												60
												65
												70
												75
												80
												85
												90
	4,98											100
	7,22	5,54										110
	11,13	9,45	7,56									125
	13,90	12,22	10,33	8,24								135
	15,36	13,68	11,80	9,70								140
	18,63	16,96	15,07	12,98	9,45	8,17						150
	23,67	21,99	20,11	18,01	14,48	13,20						165
	29,2	27,5	25,6	23,51	19,98	18,70	13,06					180
							15,00					185
	37,2	35,6	33,7	31,6	28,0	26,8	21,12	13,25				200
			38,2	36,1	32,6	31,3	25,6	17,77				210
			47,5	45,4	41,9		35,0		25,3	17,63		230
			57,7	55,6	52,1		45,1		35,5	27,8		250
							53,7		52,3	44,6		280
							70,3		64,5	56,8		300
											53,7	360
	80	90	100	110	125	130	150	175	180	200	290	

TECAPEEK

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Tubes



		TECAPEEK PVX											
DIN-Abbreviation		PEEK											
Density (g/cm ³)		1,48											
Tolerance (mm)		- 0,3 - 3,0		- 0,3 - 3,9		- 0,3 - 5,0				- 0,5 - 5,0			
Diameter Ø (mm)		25	30	36	40	45	50	54	60	70	75		
+ 2,5 + 0,8	40	1,41											
	45	1,93											
	50	2,52	2,21	1,80									
	56	3,29	2,99	2,58									
	60	3,86	3,55	3,14	2,80								
+ 3 + 0,8	65		4,31	3,90	3,56	3,14							
	70		5,18	4,77	4,43	4,00	3,47						
	75			5,65	5,31	4,88	4,35	3,88					
	78			6,21	5,87	5,44	4,91	4,44					
	80			6,59	6,25	5,83	5,29	4,83	4,05				
+ 3,6 + 1,2	85				7,25	6,83	6,30	5,83	5,05				
	90					7,94	7,46		6,22	4,76			
	100						9,77	9,31	8,53	7,07	6,24		
+ 4,5 + 1,5	110						12,32	11,85	11,08	9,62	8,79		
	125						16,77	16,30	15,53	14,06	13,24		
	135												
+ 5,4 + 1,8	140												
	150												
	165												
+ 6 + 2	180												
	185												
	200												
	210												
		25	30	36	40	45	50	54	60	70	75		

- = Outside
- = Stock item
- = Inside
- = Non-stock item – special production

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
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	- 0,5 - 5,8						- 2,5 - 8,5				
	80	90	100	110	125	130	150	175	180	200	Diameter Ø (mm)
											40
											45
											50
											56
											60
											65
											70
											75
											78
											80
											85
											90
	5,43										100
	7,98	6,04									110
	12,42	10,48	8,30								125
	15,58	13,64	11,46	9,38							135
	17,24	15,30	13,12	11,05							140
	20,75	18,81	16,63	14,56	10,54	9,08					150
			22,58	20,51	16,49	15,03					165
			28,8	26,8	22,75	21,29	14,87				180
							17,25				185
				36,1	32,1	30,7	24,24	15,28			200
						35,6	29,2				210
							39,8		28,8	20,07	230
							51,4		40,4	31,6	250
	80	90	100	110	125	130	150	175	180	200	

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Improved precision and performance with TECATOR



TECATOR (PAI) is a high performance polyamide-imide thermoplastic which excels particularly in cryogenic applications.

- | High thermal resilience at cryogenic temperatures and up to 270 °C
- | Very rigid, tough and strong
- | High long term stability and high fatigue strength
- | Extremely high creep resistance
- | Good chemical resistance to conventional solvents, lubricants, fuels and acids.
- | Very resistant to high energy radiation.
- | Self-extinguishing according to UL 94 V-0
- | Easily machined using conventional tools and machinery

Isolation plugs.

Electrically insulating and temperature resistant.



Transfer lever.

Thermal stable and wear resistant.



TECATOR 5013

Very tough.
High thermal resistance.

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Rods



	Tolerance to DIN (mm)	TECATOR 5013
DIN-Abbreviation		PAI
Density (g/cm³)		1,42
Diameter Ø (mm)		kg/m
5	+ 0,0	0,034
7,5	+ 1,0	0,072
10	+ 0,0	0,126
12,5	+ 1,1	0,192
15		0,273
20	+ 0,0	0,479
25	+ 1,2	0,740
30	+ 1,3 + 0,0	1,06
40	+ 0,0	1,88
50	+ 1,5	2,91

Tolerances according to DIN: + 1 + 2,5 mm.
 The specified kg/m weights are purely arithmetic figures.
 Weight on delivery will deviate from the figures given above.
 Stock lengths 1220 mm, other delivery lengths possible, also available ground. All figures given without obligation.



= Stock item



= Non-stock item – special production

Plates



	Tolerance to DIN (mm)	TECATOR 5013
DIN-Abbreviation		PAI
Density (g/cm³)		1,42
Size (mm)		kg/m
5 x 300		2,39
7,5 x 300		3,48
10 x 300		4,56
15 x 300	+ 0,0	6,73
20 x 300	+ 1,0	8,91
25 x 300		11,08
30 x 300		13,25
40 x 300		17,59

Tolerances according to DIN: + 1 + 2,5 mm.
 The specified kg/m weights are purely arithmetic figures.
 Weight on delivery will deviate from the figures given above.
 Stock lengths 1220 mm, other delivery lengths possible, also available ground. All figures given without obligation.



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SINTIMID.

The high-temperature plastic for extremely demanding requirements.



In continuous use, SINTIMID exhibits high strength and high creep resistance. Its strengths range from low thermal conductivity to outstanding sliding properties.

SINTIMID is used, for example, in mechanical engineering and gearbox construction, in vacuum technology and in the electronics industry.

- | Wide range of operating temperatures from -270 °C to +300 °C, unaffected by thermal shock conditions
- | Suitable for use briefly up to +350 °C
- | High strength and high creep resistance in continuous use
- | Outstanding sliding properties and wear resistance
- | Low thermal conductivity
- | Electrical insulating properties

Guide roller

SINTIMID 15 G:

Very high compressive strength, good sliding friction values.



Bearing bush

SINTIMID PVX:

High thermal strength, low friction due to sliding modifications.



Semi-finished products

SINTIMID:

Extremely high continuous operating temperature, good machinability.



SINTIMID PUR HT black

Highest mechanical strength. Best electrical insulation.

SINTIMID 15 G anthracite

Enhanced friction and wear properties. Self-lubricating.

SINTIMID 40 G

Extremely low wear values. Self-lubricating.

SINTIMID 30 P

Very low friction values. Self-lubricating.

SINTIMID PVX black

Low friction values, self-lubricating. Good UV resistance.

SINTIMID 8000



High chemical resistance. Good properties with soft mating partners.

Rods



	Tolerance to DIN (mm)	SINTIMID PUR HT black	SINTIMID 15 G charcoal-grey	SINTIMID 40 G charcoal-grey	SINTIMID 30 P PI + PTFE	SINTIMID PVX black	SINTIMID 8000 PTFE + PI
DIN-Abbreviation		PI	PI CS 15	PI CS 40	PI + PTFE	PI	PTFE + PI
Density (g/cm³)		1,34	1,42	1,58	1,51	1,48	1,88
Diameter Ø mm		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
6	+0,6 +0,1	0,04	0,04	0,04	0,04	0,04	0,05
7		0,05	0,05	0,06	0,06	0,06	0,07
8		0,07	0,07	0,08	0,08	0,07	0,09
9		0,09	0,09	0,10	0,10	0,09	0,12
10		0,11	0,11	0,12	0,12	0,12	0,15
12	+0,8 +0,2	0,15	0,16	0,18	0,17	0,17	0,21
14		0,21	0,22	0,24	0,23	0,23	0,29
16		0,27	0,29	0,31	0,30	0,30	0,38
18		0,34	0,36	0,40	0,38	0,38	0,48
20		0,42	0,45	0,49	0,47	0,46	0,59
22		0,51	0,54	0,59	0,57	0,56	0,71
24		0,61	0,64	0,71	0,68	0,67	0,85
25		0,66	0,70	0,77	0,74	0,73	0,92
26		0,71	0,75	0,83	0,80	0,79	1,00
28		0,83	0,87	0,96	0,93	0,91	1,16
30	0,95	1,00	1,10	1,07	1,05	1,33	
32	+1,0 +0,2	1,08	1,14	1,25	1,21	1,19	1,51
34		1,22	1,29	1,42	1,37	1,34	1,71
36		1,36	1,45	1,59	1,54	1,51	1,91
38		1,52	1,61	1,77	1,71	1,68	2,13
40		1,68	1,78	1,96	1,90	1,86	2,36
45		2,13	2,26	2,48	2,40	2,35	2,99
50		2,63	2,79	3,06	2,96	2,91	3,69
55		3,18	3,37	3,71	3,59	3,52	
60		3,79	4,01	4,41	4,27	4,18	
65		4,45	4,71	5,18	5,01	4,91	
70	5,16	5,46	6,00	5,81	5,70		
75	+1,0 +0,2	5,74	6,27	6,94		6,54	
80		6,75	7,14	7,90		7,44	
85		7,60	8,06	8,91		8,40	
90		8,53					
95		9,50					
100	10,52						

Delivery length up to 16 mm diameter: 395 mm
 from 20 mm diameter: 395 mm, 795 mm, 1000 mm.
 The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 1000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

-  = Stock item
-  = Non-stock item – special production



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Plates



	Tolerance to DIN (mm)	SINTIMID PUR HT black	SINTIMID 15 G charcoal-grey	SINTIMID 40 G charcoal-grey	SINTIMID 30 P	SINTIMID PVX black	SINTIMID 8000
DIN-Abbreviation		PI	PI CS 15	PI CS 40	PI + PTFE	PI	PTFE + PI
Density (g/cm³)		1,34	1,42	1,56	1,51	1,48	1,88
Diameter mm		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
5 x 395	+0,8 +0,1	2,65	2,80	3,08	2,98	2,92	3,71
6 x 395		3,18	3,37	3,70	3,58	3,51	4,46
7 x 395		3,71	3,93	4,31	4,18	4,09	5,20
8 x 395		4,23	4,49	4,93	4,77	4,68	5,94
9 x 395		4,76	5,05	5,55	5,37	5,26	6,68
10 x 395		5,29	5,61	6,16	5,96	5,85	7,43
12 x 395	+1,2 +0,2	6,35	6,73	7,39	7,16	7,02	8,91
14 x 395		7,41	7,85	8,63	8,35	8,18	10,40
16 x 395		8,47	8,97	9,86	9,54	9,35	11,88
18 x 395		9,53	10,10	11,09	10,74	10,52	13,37
20 x 395		10,59	11,22	12,32	11,93	11,69	14,85
22 x 395		11,64	12,34	13,56	13,12	12,86	16,34
24 x 395		12,70	13,46	14,79	14,31	14,03	17,82
25 x 395		13,23	14,02	15,41	14,91	14,62	18,57
26 x 395		13,76	14,58	16,02	15,51	15,20	19,31
28 x 395		14,82	15,71	17,25	16,70	16,37	20,79
30 x 395		15,88	16,83	18,49	17,89	17,54	22,28
32 x 395	+1,4 +0,2	16,94	17,95	19,72	19,09	18,71	23,76
34 x 395		18,00	19,07	20,95	20,28	19,88	25,25
36 x 395		19,05	20,19	22,18	21,47	21,05	26,73
38 x 395		20,11	21,31	23,42	22,67	22,21	28,22
40 x 395		21,17	22,44	24,65	23,86	23,38	29,70
45 x 395		23,82	25,24	27,73	26,84	26,31	33,42
50 x 395		26,47	28,05	30,81	29,82	29,23	37,13
52 x 395		27,52	29,17	32,04	31,02	30,40	38,62
55 x 300		22,12	23,43	25,90		24,42	
60 x 300		24,12	25,56	28,26		26,64	
65 x 300		26,13	27,70	30,62		28,90	
68 x 300		27,34	29,00	32,00		30,20	
70 x 300		28,14	29,84	33,00		31,10	
75 x 300		30,15	31,95	35,35		33,30	
80 x 300		32,17	34,10	37,68		35,52	
85 x 300		34,18	36,20	40,00		37,75	
90 x 300		36,20	38,35	42,40		40,00	
95 x 300		38,20	40,47	44,75		42,18	
100 x 300		40,20	42,60	47,10		44,40	

Note: All the above mentioned plate-thicknesses are additionally available in 300 x 1000 mm.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 795 mm, other delivery lengths possible, also available planed. All figures given without obligation.



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= Non-stock item – special production

SINTIMID

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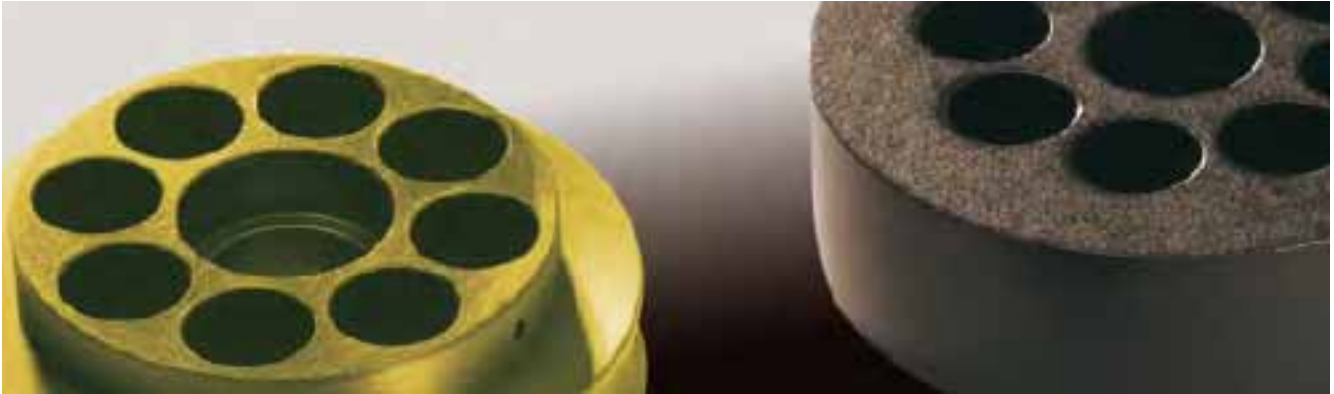
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VESPEL®.

The raw material for a new age.



Parts made of VESPEL® Polyimid prove themselves to be extremely stable in their dimensions. Heat resistance which many other plastics do not achieve. Even placed shortly in a temperature reaching 482 °C, VESPEL® parts do not melt or soften up.

- | very good wearing properties
- | electrically insulating
- | extreme heat resistance
- | good resistance against acids
- | high long-term strength as well as an excellent resistance to shocks
- | no corrosion
- | low gas exhalation
- | excellent resistance to radiation
- | easy machining without special equipment or methods
- | good adaption to forms but does not warp

SP1
Basic type without a filling.
Maximum strength and elasticity.
Optimal electrical properties.

SP21
Contains 15 weight % graphite.
Improved wear properties and heat resistance.

SP22
Contains 40 weight % graphite.
Minimum heat extension coefficient.
Maximum creep resistance.

SP211
Contains 15 weight % graphite and 10 % PTFE.
Low static friction.
For use in moderate temperatures .

SP3
Contains 15 weight % MoS₂.
For friction utilisation in vacuum or inert gases.

Insulation as a sensor protection made of **VESPEL® SP1** heat resistant.



Slugs for electrical insulating bodies in welding blowpipes made of **VESPEL® SP1**



Sealing rings in gear made of **VESPEL® SP21**



Rods



	Tolerance to DIN mm	VESPEL® SP-1	VESPEL® SP-21	VESPEL® SP-211	VESPEL® SP-22	VESPEL® SP-3
DIN-Abbreviation		PI	PI CS 15	PI CS 15, PTFE	PI CS 40	PI
Density (g/cm³)		1,43	1,51	1,55	1,65	1,6
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m
6,3	0 +0,25	●	●	●	●	○
9,5	0 +0,25	●	●	●	●	○
11,1	0 +0,25	●	●	●	●	○
12,7	0 +0,25	●	●	●	●	○
15,8	0 +0,25	●	●	●	●	○
19	0 +0,25	●	●	●	●	○
25,4	0 +0,25	●	●	●	●	○
31,7	0 +0,25	●	●	●	●	○
38,1	0 +0,25	●	●	●	○	○
50,8	0 +0,25	●	●	○	○	○
63,5	0 +0,25	●	●	○	○	○
82,5	0 +0,25	●	●	○	○	○

All figures given without obligation.

Standard lengths:

From Ø 6,3 mm to Ø 63,5 mm: 965, 720, 480, 238 mm

For Ø 82,5 mm: 685, 510, 338, 158 mm

All lengths indicated are minimum values.

- : Standard products (in stock or short-term delivery possible)
- : Non-standard products (manufacturing upon request)



= Stock item



= Non-stock item – special production

Plates



	Tolerance to DIN mm	VESPEL® SP-1	VESPEL® SP-21	VESPEL® SP-211	VESPEL® SP-22	VESPEL® SP-3
DIN-Abbreviation		PI	PI CS 15	PI CS 15, PTFE	PI CS 40	PI
Density (g/cm³)		1,43	1,51	1,55	1,65	1,6
Size (mm)		kg/m	kg/m	kg/m	kg/m	kg/m
1,6		●	○	-	-	-
3,2		●	●	-	-	-
4,8		●	●	-	-	-
6,3		●	●	○	○	○
12,7		●	●	○	○	○
25,4		●	●	○	○	○
38,1		●	●	○	○	○
50,8		●	●	○	○	○
50,8 (*)		○	○	○	○	○

All figures given without obligation.

For all thicknesses: 254 * 254 mm

For thicknesses over 6,3 mm: 254 * 127 mm and 127 * 127 mm

(*): For thickness 50,8 mm two additional dimensions are possible:
101 * 317,5 mm and 101 * 965 mm



= Stock item



= Non-stock item – special production

All lengths indicated are minimum values.

- : Standard products (in stock or short-term delivery possible)
- : Non-standard products (manufacturing upon request)
- (-): Not available

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Tubes



	VESPEL® SP-1	VESPEL® SP-21	VESPEL® SP-211	VESPEL® SP-22	VESPEL® SP-3
DIN-Abbreviation	PI	PI CS 15	PI CS 15, PTFE	PI CS 40	PI
Density (g/cm³)	1,43	1,51	1,55	1,65	1,6

Standardlength mm	Diameter Ø mm	27,90	35,50	48,2	66	86,8	109	119	142
165/330	40,6	○							
330	43,1		○						
838	78,7			○					
838	86,3				○				
838	94			○*		○			
838	101				○*				
838	109					○			
838	111			○					
838	119				○				
838	121						○		
838	124			○*		○**			
838	129				○*				
838	137					○**	○		
838	142							○	
838	144						○		
838	149							○	
838	154						○		
838	162								○
838	165						○**		
838	170							○**	○
838	180								○**

All figures given without obligation.

All diameters outside and lengths indicates are minimum values, all diameters inside are maximum values.

- Non-standard products (manufacturing upon request)
- (-) Not available

- * Also available length 203 mm
- ** Only SP 1 and SP 21 also in 203 mm



= Stock item



= Non-stock item – special production



= Outside

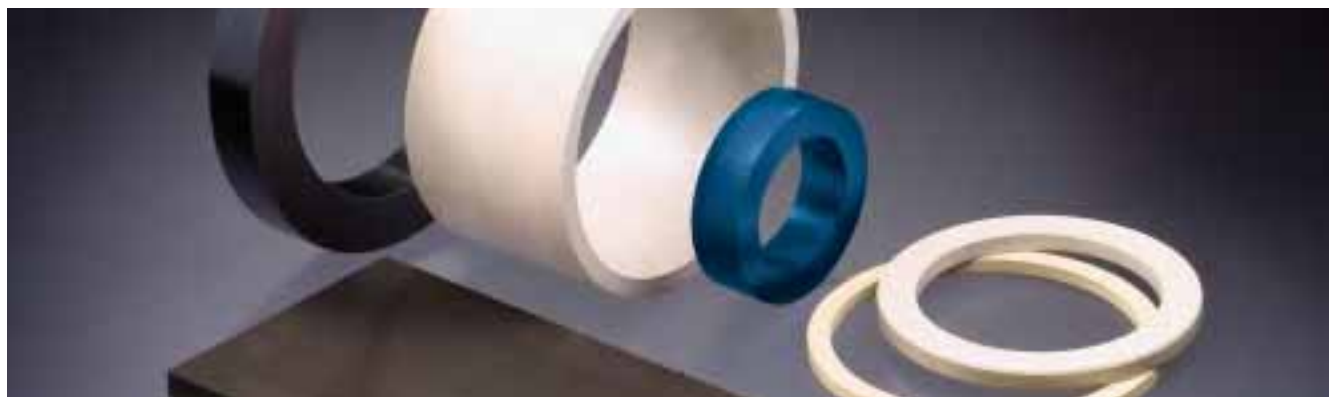


= Inside

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Compression Moulding.

Low stress and near to the desired size.






Sintered and compression moulded parts are especially used for applications demanding precision and high loads.

Cost and material saving because the geometry of the semi-finished part is very near to the final sizes of the finished part.

Small production runs.

Customized material modifications

Dimensionally stable and low stress, therefore low distortion and easily machinable.

		Rods 		Discs 		Tubes 	
	DIN-Abbreviation	Diameter Ø (mm)	Length (mm)	Diameter Ø (mm)	Length (mm)	Diameter AD Ø (mm)	Length (mm)
TECATOR GF 30	PAI	25,4 - 79,5	76,2 - 152,4	82,6 - 660,4	12,7 - 50,8	38,1 - 1676,4	76,2 - 152,4
TECAPEEK	PEEK	25,4 - 79,5	76,2 - 152,4	82,6 - 660,4	12,7 - 76,2	38,1 - 1676,4	76,2 - 152,4
TECAPEEK GF 30, CF 30, PVX	PEEK	25,4 - 79,5	76,2 - 152,4	82,6 - 660,4	12,7 - 76,2	38,1 - 1676,4 209,6 - 1676,4	76,2 - 304,8 76,2 - 152,4
TECATRON GF 40	PPS GF 40	25,4 - 101,6	76,2 - 304,8	108 - 660,4	12,7 - 88,9	38,1 - 1676,4 209,6 - 1676,4	76,2 - 304,8 76,2 - 152,4
TECAPEI	PEI	25,4 - 101,6	76,2 - 304,8	108 - 660,4	12,7 - 88,9	38,1 - 1676,4	76,2 - 152,4
TECAFLON PCTFE, PFA	PCTFE, PFA	25,4 - 63,5	76,2 - 152,4	69,9 - 1143,0	12,7 - 63,5	38,1 - 1676,4	76,2 - 152,4



Plates	DIN-Abbreviation	Size (mm)	Width x Length (mm)
TECATOR GF 30	PAI GF 30	6,2 - 38,1	203,2 x 406,4
		6,2 - 50,8	254 x 254 / 330,2 x 330,2
TECAPEEK natur	PEEK	6,2 - 57,2	203,2 x 406,4
TECAPEEK GF 30	PEEK GF 30	6,2 - 76,2	254 x 254
TECAPEEK CF 30	PEEK CF 30	6,2 - 63,5	330,2 x 330,2 / 381 x 762,
TECAPEEK PVX	PEEK PVX	9,5 - 63,5	609,6 x 609,6
TECATRON GF 40 TECAPEI	PPS GF 40 PEI	6,2 - 38,1	203,2 x 406,4
		6,2 - 88,9	254 x 254
		6,2 - 76,2	330 x 330
		6,2 - 50,8	381 x 762
TECAFLON PCTFE, TECAFLON PFA	PCTFE PFA	9,5 - 50,8	609,6 x 609,6
		6,2 - 38,1	203,2 x 406,4
		6,2 - 50,8	254 x 254 / 330,2 x 330,2 / 381 x 762
		9,5 - 50,8	609,6 x 609,6

Please find **VespeI (PI)** and **SINTIMID (PI)** on page 50 to 55. Many more modifications are available on request.

TECAFINE. TECANYL. TECARAN.

Standard plastics for lightweight and stable parts.



ENSINGER standard plastics include the semi-crystalline polyolefines TECAFINE (PE), and the amorphous TECANYL (PP) and TECARAN (ABS). They are used in all fields where low density and stability are requested, but no long term high temperatures are needed.

- | Low density
- | Low water absorption
- | Low abrasion (semi-crystalline materials)
- | High impact resistance
- | Good chemical resistance
- | Good machinability using standard tools
- | Good electrical insulation

TECAFINE PE 10 (PE-UHMW)

Very good tribological properties.
Very good electrical insulation. High toughness under cold conditions.

TECAFINE PE 5 (PE-HMW)

Good sliding properties, abrasion resistant.

TECAFINE PE (PE-HD)

Very low water absorption. Good weldability.

TECAFINE PP (PP)

Very low water absorption. Very good electrical insulation.

TECAFINE PP GF 30 (PP GF 30)

Very low water absorption. High dimensional stability.

TECAFINE PMP (PMP)

Translucent, also under UV-radiation.
Very good electrical insulation.

TECANYL (PPE)

Good strength. Very good electrical insulation.

TECANYL GF 30 (PPE GF 30)

High stiffness. Good weldability, easily bonded.

TECARAN ABS (ABS)

Very stiff and strong.
Very good electrical insulation.

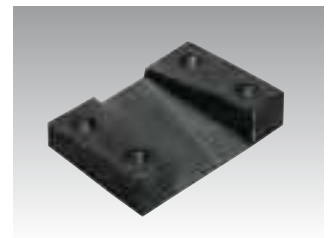
TECARAN ABS.

Stripper.
Impact resistant.



TECAFINE 5 black.

Sliding pad. Very abrasion resistant, impact resistant and UV-resistant.



TECAFINE PE.

Side plate. Light and flexible.




Rods



	Tolerance to DIN (mm)	TECAFINE PE 10	TECAFINE PE 5	TECAFINE PE	TECAFINE PE black	TECAFINE PP	TECAFINE PP grey	TECAFINE PMP translucent
DIN-Abbreviation		PE-UHMW	PE-HMW	PE-HD	PE-HD	PP	PP	PMP
Density (g/cm³)		0,93	0,95	0,96	0,96	0,91	0,91	0,83
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,013	0,013	0,014	0,014	0,013	0,013	0,012
5	+ 0,1	0,021	0,021	0,021	0,021	0,020	0,020	0,018
6	+ 0,4	0,029	0,030	0,030	0,030	0,028	0,028	0,026
8	+ 0,1 + 0,5	0,051	0,052	0,053	0,053	0,050	0,050	0,046
9	+ 0,1	0,065	0,067	0,067	0,067	0,064	0,064	0,058
10	+ 0,6	0,080	0,082	0,082	0,082	0,078	0,078	0,071
11	+ 0,2	0,098	0,100	0,101	0,101	0,096	0,096	0,087
12	+ 0,7	0,115	0,118	0,119	0,119	0,113	0,113	0,103
13		0,136	0,139	0,140	0,140	0,133	0,133	0,121
14	+ 0,2	0,157	0,160	0,162	0,162	0,153	0,153	0,140
15	+ 0,8	0,179	0,183	0,185	0,185	0,175	0,175	0,160
16		0,203	0,207	0,209	0,209	0,198	0,198	0,181
18	+ 0,2 + 0,9	0,256	0,262	0,265	0,265	0,251	0,251	0,229
19	+ 0,2	0,286	0,292	0,295	0,295	0,280	0,280	0,255
20	+ 1	0,316	0,323	0,326	0,326	0,309	0,309	0,282
22	+ 0,2	0,382	0,390	0,395	0,395	0,374	0,374	0,341
25	+ 1,1	0,490	0,501	0,506	0,506	0,480	0,480	0,437
28	+ 0,2	0,614	0,627	0,633	0,633	0,600	0,600	0,548
30	+ 1,2	0,702	0,717	0,73	0,73	0,687	0,687	0,627
32	+ 0,2	0,799	0,816	0,83	0,83			
36	+ 1,3	1,01	1,03	1,04	1,04	0,985	0,985	0,898
40	+ 0,2 + 1,5	1,24	1,27	1,28	1,28	1,22	1,22	1,11
45	+ 0,3 + 1,7	1,58	1,61	1,63	1,63	1,54	1,54	1,41
50	+ 0,3	1,95	1,99	2,01	2,01	1,91	1,91	1,74
56	+ 2	2,43	2,49	2,51	2,51	2,38	2,38	2,17
60	+ 0,3 + 2,3	2,80	2,86	2,9	2,9	2,74	2,74	2,50
65	+ 0,3	3,28	3,36	3,39	3,39	3,21	3,21	2,93
70	+ 2,5	3,80	3,88	3,9	3,9	3,72	3,72	3,39
75		4,38	4,48	4,52	4,52	4,29	4,29	3,91
80	+ 0,4 + 3	4,97	5,08	5,13	5,13	4,87	4,87	4,44
90	+ 0,5 + 3,4	6,30	6,43	6,50	6,50	6,16	6,16	5,62
100	+ 0,6 + 3,8	7,78	7,95	8,0	8,0	7,61	7,61	6,94
110	+ 0,7 + 4,2	9,42	9,62	9,72	9,72	9,22	9,22	8,41
120	+ 0,8	11,22	11,46	11,58	11,58	10,98	10,98	10,01
125	+ 4,6	12,15	12,41	12,54	12,54	11,89	11,89	10,84
135	+ 0,9	14,22	14,52	14,68	14,68	13,91	13,91	12,69
140	+ 5,4	15,27	15,59	15,76	15,76	14,94	14,94	13,63
150	+ 1 + 5,8	17,53	17,91	18,10	18,10	17,15	17,15	15,65
165	+ 1,2	21,35	21,81	22,04	22,04	20,89	20,89	19,06
180	+ 7,4	25,3	25,8	26,1	26,1	24,76	24,76	22,58
200	+ 1,3	31,3	32,0	32,3	32,3	30,6	30,6	27,9
210	+ 8,5	34,4	35,1	35,5	35,5	33,7	33,7	30,7
230	+ 1,3	41,2	42,1	42,5	42,5	40,3	40,3	36,8
250	+ 9	48,5	49,5	50,1	50,1	47,5	47,5	43,3
280	+ 1,3 + 9,5	60,7	62,0	62,6	62,6	59,4	59,4	
300	+ 1,3 + 10	69,6	71,1	71,8	71,8	68,1	68,1	

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
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Rods



	Tolerance to DIN (mm)	TECANYL grey	TECANYL GF 30	TECARAN ABS grey
DIN-Abbreviation		PPE	PPE GF 30	ABS
Density (g/cm³)		1,06	1,29	1,06
Diameter Ø (mm)		kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,015	0,018	0,015
5	+ 0,1	0,023	0,028	0,023
6	+ 0,4	0,033	0,040	0,033
8		0,058	0,071	0,058
9		0,073	0,089	0,073
10	+ 0,1	0,090	0,110	0,090
11	+ 0,5	0,108	0,132	0,108
12		0,128	0,156	0,128
13		0,156	0,190	0,156
14		0,180	0,219	0,180
15		0,205	0,250	0,205
16	+ 0,2	0,233	0,283	0,233
18	+ 0,9	0,292	0,356	0,292
19		0,325	0,395	0,325
20		0,359	0,436	0,359
22		0,438	0,532	0,438
24		0,518	0,630	0,518
25	+ 0,2	0,561	0,683	0,561
28	+ 1,2	0,689	0,851	0,699
30		0,800	0,974	0,800
32		0,908	1,11	0,908
36	+ 0,2	1,16	1,41	1,16
40	+ 1,6	1,42	1,73	1,42
45		1,81	2,20	1,81
50	+ 0,3	2,22	2,70	2,22
56	+ 2	2,77	3,38	2,77
60		3,20	3,90	3,20
65	+ 0,3	3,74	4,56	3,74
70	+ 2,5	4,33	5,27	4,33
75	+ 0,4	5,00	6,08	5,00
80	+ 3	5,67	6,90	5,67
90	+ 0,5 + 3,4	7,18	8,74	7,18
100	+ 0,6 + 3,8	8,87	10,79	8,87
110	+ 0,7 + 4,2	10,74	13,07	10,74
120	+ 0,8	12,78	15,56	12,78
125	+ 4,6	13,85	16,85	13,85
135	+ 0,9	16,21	19,72	16,21
140	+ 5,4	17,40	21,18	17,40
150	+ 1 + 5,8	19,98	24,32	19,98
160	+ 1,1 + 6,3	22,76	27,7	22,76
165	+ 1,2	24,34	29,6	24,34
180	+ 7,4	28,8	35,1	28,8
200		35,7	43,4	35,7
210	+ 1,3	39,2		39,2
230	+ 8,5	46,9		46,9

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
 The specified kg/m weights are purely arithmetic figures.
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Plates




	Tolerance*	TECAFINE PPH grey	TECAFINE PPH GF 30	TECAFINE PE 10	TECAFINE PE 5	TECAFINE PE
DIN-Abbreviation		PP	PP GF 30	PE-UHMW	PE-HMW	PE-HD
Density (g/cm³)		0,91	1,14	0,93	0,95	0,95
Diameter (mm)		kg/m	kg/m	kg/m	kg/m	kg/m
5 x 300		1,56	1,96	1,60	1,63	1,63
5 x 500		2,55	3,20	2,61	2,67	2,67
6 x 300		1,85	2,32	1,89	1,93	1,93
6 x 500		3,02	3,79	3,09	3,16	3,16
8 x 300		2,45	3,07	2,50	2,56	2,56
8 x 500		4,01	5,02	4,10	4,18	4,18
10 x 300		3,02	3,79	3,09	3,16	3,16
10 x 500		4,94	6,19	5,05	5,16	5,16
12 x 300		3,70	4,63	3,78	3,86	3,86
12 x 500		6,05	7,57	6,18	6,31	6,31
16 x 300		4,84	6,07	4,95	5,06	5,06
16 x 500		7,92	9,92	8,09	8,27	8,27
18 x 500		8,86	11,10	9,05	9,25	9,25
20 x 300		5,99	7,51	6,12	6,25	6,25
20 x 500		9,79	12,27	10,01	10,23	10,23
22 x 300		6,56	8,22	6,71	6,85	6,85
22 x 500		10,73	13,44	10,97	11,20	11,20
25 x 300		7,42	9,30	7,59	7,75	7,75
25 x 500		12,14	15,21	12,40	12,67	12,67
27 x 300		8,00	10,02	8,17	8,35	8,35
27 x 500		13,08	16,38	13,36	13,65	13,65
30 x 300		9,03	11,31	9,23	9,43	9,43
30 x 500		14,76	18,49	15,09	15,41	15,41
32 x 300		9,60	12,03	9,81	10,02	10,02
32 x 500		15,70	19,67	16,04	16,39	16,39
40 x 300		11,90	14,90	12,16	12,42	12,42
40 x 500		19,45	24,36	19,88	20,33	20,33
45 x 500		21,79	27,30	22,27	22,75	22,75
50 x 300		14,76	18,49	15,09	15,41	15,41
50 x 500		24,14	30,24	24,67	25,20	25,20
60 x 300		17,77	22,26	18,16	18,55	18,55
60 x 500		29,06	36,40	29,69	30,33	30,33
70 x 300		20,64	25,86	21,09	21,55	21,55
70 x 500		33,74	42,27	34,48	35,23	35,23
80 x 300		23,72	29,72	24,24	24,76	24,76
80 x 500		38,78	48,58	39,63	40,49	40,49
90 x 300		26,59	33,31	27,17	27,76	27,76
90 x 500		43,47	54,45	44,42	45,38	45,38
100 x 300		29,45	36,90	30,10	30,75	30,75
100 x 500		48,15	60,32	49,21	50,27	50,27

* Tolerance based on GKV according to manufacturer's specifications.

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Plates




	Tolerance to DIN (mm)	TECANYL grey	TECANYL GF 30	TECARAN ABS grey
DIN-Abbreviation		PPE	PPE GF 30	ABS
Density (g/cm³)		1,06	1,29	1,06
Diameter (mm)		kg/m	kg/m	kg/m
5 x 300		1,86	2,26	1,86
5 x 500	+ 0,2	3,03	3,69	3,03
6 x 300	+ 0,7	2,20	2,67	2,20
6 x 500		3,59	4,37	3,59
8 x 300		2,91	3,54	2,91
8 x 500	+ 0,2	4,76	5,79	4,76
10 x 300	+ 0,9	3,59	4,37	3,59
10 x 500		5,87	7,15	5,87
12 x 300		4,39	5,35	4,39
12 x 500		7,18	8,74	7,18
15 x 500		8,85	10,77	8,85
16 x 300		5,76	7,00	5,76
16 x 500		9,41	11,45	9,41
18 x 500	+ 0,3	10,52	12,81	10,52
20 x 300	+ 1,5	7,12	8,66	7,12
20 x 500		11,64	14,16	11,64
22 x 300		7,80	9,49	7,80
22 x 500		12,75	15,52	12,75
25 x 300		8,82	10,73	8,82
25 x 500		14,42	17,55	14,42
27 x 300		9,71	11,81	9,71
27 x 500		15,87	19,31	15,87
30 x 300		10,73	13,06	10,73
30 x 500		17,54	21,35	17,54
32 x 300		11,41	13,88	11,41
32 x 500	+ 0,5	18,65	22,70	18,65
40 x 300	+ 2,5	14,13	17,20	14,13
40 x 500		23,11	28,1	23,11
45 x 500		25,9	31,5	25,9
50 x 300		17,54	21,35	17,54
50 x 500		28,7	34,9	28,7
60 x 300		21,37	26,0	21,37
60 x 500		34,9	42,5	34,9
70 x 300		24,78	30,2	24,78
70 x 500		40,5	49,3	40,5
80 x 300	+ 0,5	28,2	34,3	28,2
80 x 500	+ 5	46,1	56,1	46,1
90 x 300		31,6		31,6
90 x 500		51,6		51,6
100 x 300		35,0		35,0
100 x 500		57,2		57,2

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
width $\pm \frac{25}{8}$ mm.

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Rods



	Tolerance to DIN (mm)	TECAPEEK CLASSIX™ white	TECAPEEK CLASSIX™ black
Color*			
DIN-Abbreviation		PEEK	PEEK
Density (g/cm³)		1,38	1,38
Diameter Ø (mm/“)		kg/m	kg/m
6	+ 0,036 + 0,00	0,040	0,040
8		0,071	0,071
10		0,111	0,111
20	0 - 0,056	0,443	0,443
30		0,997	0,997
45	0 - 0,062	2,24	2,24

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*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours. Please ask for samples.
Tolerances according to DIN: length $+ \frac{3}{0} \%$.
The specified kg/m weights are purely arithmetic figures.
Weight on delivery will deviate from the figures given above.
Stock lengths 3000 mm, other delivery lengths possible, also available ground.
All figures given without obligation.

 = Stock item


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Rods



	Tolerance to DIN (mm)	TECAPEEK MT black	TECAPEEK MT blue	TECAPEEK MT yellow	TECAPEEK MT red	TECAPEEK MT green
Color*						
DIN-Abbreviation		PEEK	PEEK	PEEK	PEEK	PEEK
Density (g/cm³)		1,30	1,30	1,30	1,30	1,30
Diameter Ø (mm/“)		kg/m	kg/m	kg/m	kg/m	kg/m
12	+ 0,2 + 0,9	0,164	0,164	0,164	0,164	0,164
15		0,252	0,252	0,252	0,252	0,252
16		0,285				
18		0,358				
19		0,398				
20	+ 0,2 + 1,1	0,444	0,444	0,444	0,444	0,444
22	+ 0,2 + 1,2	0,537				
25		0,688	0,688	0,688	0,688	0,688
28		0,858				
30		0,982				
32	+ 0,2 + 1,3	1,12	1,12	1,12	1,12	1,12
36		1,41	1,41	1,41	1,41	1,41
40	+ 0,2 + 1,5	1,74	1,74	1,74	1,74	1,74
45	+ 0,3 + 1,7	2,20				
50		2,71	2,71	2,71	2,71	2,71
56	+ 0,3 + 2	3,40				
60	+ 0,3 + 2,3	3,91	3,91	3,91	3,91	3,91

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours.
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Rods



	Tolerance to DIN (mm)	TECASON P MT black	TECASON P MT green	TECASON P MT red	TECASON P MT yellow	TECASON P MT blue	TECASON P MT ivory	TECASON P MT grey
Color*								
DIN-Abbreviation		PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU
Density (g/cm³)		1,29	1,29	1,29	1,29	1,29	1,29	1,29
Diameter Ø (mm / ")		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
20	+ 0,2 + 0,9	0,436						
22	+ 0,2 + 1,2	0,532						
25,4 / 1"	+ 0,0 + 0,13	0,670	0,670	0,670	0,670	0,670	0,670	0,670
25	+ 0,2 1,2	0,683						
28		0,851						
30		0,974						
31,75 / 1¼"	+ 0,0 + 0,13	1,05	1,05	1,05	1,05	1,05	1,05	1,05
32	+ 0,2 + 1,2	1,11						
36	+ 0,2 + 1,6	1,41						
38,1 / 1½"	+ 0,0 + 0,13	1,51	1,51	1,51	1,51	1,51	1,51	1,51
40	+ 0,2 + 1,6	1,73						
44,45 / 1¾"	+ 0,0 + 0,13	2,05	2,05	2,05	2,05	2,05	2,05	2,05
45	+ 0,3 2,0	2,20						
50		2,70						
50,8 / 2"	+ 0,0 + 0,13	2,67	2,67	2,67	2,67	2,67	2,67	2,67
56	+ 0,3 + 2,0	3,38						
57,15 / 2¼"	+ 0,0 + 0,76	3,42	3,42	3,42	3,42	3,42	3,42	3,42
60	+ 0,3 + 2,5	3,90						
63,5 / 2½"	+ 0,0 + 0,76	4,22	4,22	4,22	4,22	4,22	4,22	4,22
65	+ 0,3 + 2,5	4,56						
69,85 / 2¾"	+ 0,0 + 0,76	5,10	5,10	5,10	5,10	5,10	5,10	5,10
70	+ 0,3 + 2,5	5,27						
75	+ 0,4 + 3	6,08						
76,2 / 3"	+ 0,0 + 0,76	6,06	6,06	6,06	6,06	6,06	6,06	6,06
80	+ 0,4 + 3	6,90						
88,9 / 3½"	+ 0,0 + 0,76	8,24	8,24	8,24	8,24	8,24	8,24	8,24

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours. Please ask for samples.


Tolerances according to DIN: length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above.

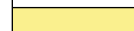





Stock lengths 2440 mm, other delivery lengths possible, also available ground.

All figures given without obligation.

 = Stock item

 = Non-stock item – special production

More colours on request:

TECASON P MT signal yellow	TECASON P MT deep orange	TECASON P MT raspberry red	TECASON P MT blue lila	TECASON P MT sky blue	TECASON P MT light green
					

	Toleranz nach DIN (mm)	TECASON P MT XRO black	TECASON P MT XRO green	TECASON P MT XRO red	TECASON P MT XRO yellow	TECASON P MT XRO blue	TECASON P MT XRO rust	TECASON P MT XRO brown	TECASON P MT XRO ivory
Color*									
DIN-Abbreviation		PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU	PPSU
Density (g/cm³)		1,30	1,30	1,30	1,30	1,30	1,30	1,30	1,30
Diameter Ø (mm / ")		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
25,4 / 1"	+ 0,0 + 0,13	0,675							
38,1 / 1½"	+ 0,0 + 0,13	1,52	1,52		1,52	1,52		1,52	1,52
50,8 / 2"	+ 0,0 + 0,13		2,69	2,69		2,69			
63,5 / 2½"	+ 0,0 + 0,76						4,25		

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours. Please ask for samples.


Tolerances according to DIN: length $+ \frac{3}{0} \%$.

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Stock lengths 2440 mm, other delivery lengths possible, also available ground.

All figures given without obligation.

 = Stock item

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Rods



	Tolerance to DIN (mm)	TECAFORM AH MT black	TECAFORM AH MT blue	TECAFORM AH MT yellow	TECAFORM AH MT red	TECAFORM AH MT green	TECAFORM AH MT brown	TECAFORM AH MT grey	TECAFORM AH MT light blue	TECAFORM AH MT rust
Color*										
DIN-Abbreviation		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 Ø (mm/“)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	kg/m	
25,4 / 1“		0,710	0,710	0,710	0,710	0,710	0,710	0,710		0,710
38,1 / 1½“	+ 0,00 + 0,13	1,64	1,64	1,64	1,64	1,64	1,64	1,64	1,64	1,64
50,8 / 2“		2,95	2,95	2,95	2,95	2,95	2,95	2,95	2,95	2,95
63,5 / 2½“		4,68	4,68	4,68	4,68	4,68	4,68	4,68	4,68	4,68
76,2 / 3“	+ 0,00 + 0,76	6,59	6,59	6,59	6,59	6,59	6,59	6,59	6,59	6,59
88,9 / 3½“		9,02	9,02	9,02	9,02	9,02	9,02	9,02	9,02	9,02

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours.

Please ask for samples.


Tolerances according to DIN: length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above.

Stock lengths 2440 mm, other delivery lengths possible, also available ground.

All figures given without obligation.

 = Stock item

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Rods



	Tolerance to DIN (mm)	TECAFORM AH MT SAN weiss
DIN-Abbreviation		POM-C
Density (g/cm³)		1,41
Diameter Ø (mm/“)		kg/m
60	+ 0,3 + 1,6	4,20

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours.

Please ask for samples.


Tolerances according to DIN: length $+ \frac{3}{0} \%$.

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Stock lengths 3000 mm, other delivery lengths possible, also available ground.

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Plates



	Tolerance (mm)	TECAPRO MT white	TECAPRO MT black
Color*			
DIN-Abbreviation		PP	PP
Density (g/cm³)		0,92	0,92
Size (mm/“)		kg/m	kg/m
12,7 x 610 (½“ x 24“)	+ 0,8 + 0	7,58	7,58
25,4 x 610 (1“ x 24“)		14,92	14,92
38,1 x 610 (1½“ x 24“)		22,23	22,27
50,8 x 610 (2“ x 24“)		29,6	29,6
63,5 x 610 (2½“ x 24“)		37,0	37,0

Plates



	Tolerance (mm)	TECAPRO MT SAN white
Color*		
DIN-Abbreviation		PP
Density (g/cm³)		0,92
Size (mm/“)		kg/m
25,4 x 610 (1“ x 24“)	+ 0,0 +0,8	14,92

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours.


Tolerances according to DIN: length $+ \frac{3}{0} \%$.

width $+ \frac{25}{5} \text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above.

Stock lengths 1220 mm, other delivery lengths possible, also available ground.

All figures given without obligation.

 = Stock item

 = Non-stock item – special production

Rods



	Tolerance (mm)	TECANYL MT black	TECANYL MT green	TECANYL MT brown	TECANYL MT yellow	TECANYL MT bleu	TECANYL MT gris
Color*							
DIN-Abbreviation		PPE	PPE	PPE	PPE	PPE	PPE
Density (g/cm³)		1,08	1,08	1,08	1,08	1,08	1,08
Diameter Ø (mm)		kg/m	kg/m	kg/m	kg/m	kg/m	kg/m
38,1	+0,013	1,26	1,26	1,26	1,26	1,26	1,26

*Note: The colour fields are only for comparison. We cannot guarantee the liability of the colours.


Please ask for samples.

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above.

Stock lengths 2440 mm, other delivery lengths possible, also available ground.

All figures given without obligation.

 = Stock item

 = Non-stock item – special production

Plastic & Metal Center, Inc.

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ENSINGER

Materials for Semicon and Electronics



- | High thermal-mechanical properties
- | Good electrical insulating properties
- | Low thermal expansion
- | High wear resistance
- | Good chemical resistance
- | Good plasma resistance
- | Low outgassing in vacuum
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TECAFORM AH SD

Antistatic dissipative. Carbon free, inherently active long-term, non-contaminating.

TECAFORM AH ELS

Electrically conductive POM with conductive carbon for many applications.

TECAFLON PVDF (Semicon)

Very good chemical resistance. Mechanically more stable than TFM.

TECATRON HP PPS

Very good chemical resistance. Electrically insulating, non-abrasive. Minimum ionic impurities.

TECAPEEK ELS nano

Electrical insulation, high toughness. For use in semiconductor and electronics.

Furthermore are used for semicon and electronics:

SINTIMID, VESPEL, TECAPEEK CF, TECAPEEK GF, TECAFLON PTFE, TECATRON GF, TECADUR

On request:

TECAPEI ESD 7

Antistatic dissipative. Rigid and hard, very dimensional stable. High heat distortion temperature, non-abrasive.

TECANAT ESD 7

Antistatic dissipative with nanotubes.

Material	DIN-Description	Specific volume resistance in $\Omega \cdot \text{cm}$	Surface resistance in Ω
SINTIMID PAI ESD	PAI	$10^9 - 10^{11}$	$10^9 - 10^{11}$
TECAPEI ESD 7	PEI	$10^5 - 10^8$	$10^5 - 10^{10}$
TECANAT ESD 7	PC	$10^7 - 10^9$	$10^5 - 10^{10}$
TECAFORM AH SD	POM-C	$10^9 - 10^{11}$	$10^9 - 10^{11}$
TECAPEEK ELS nano	PEEK	$10^2 - 10^4$	$10^1 - 10^3$
TECAPEEK CF 30	PEEK	$10^5 - 10^7$	$10^5 - 10^7$
TECAFLON PTFE C25	PTFE	10^3	10^3
TECAFLON PVDF AS	PVDF	$10^2 - 10^4$	$10^2 - 10^4$
TECAFLON PVDF CF 8	PVDF	$10^3 - 10^5$	$10^5 - 10^7$
TECAMID 66 CF 20	PA 66	$10^2 - 10^4$	$10^2 - 10^4$
TECAFORM AH ELS	POM-C	$10^2 - 10^4$	$10^2 - 10^4$
TECAFINE PP ELS	PP	$10^3 - 10^5$	$10^3 - 10^5$



Antistatic



Electrically conducting

Rods



DIN-Abbreviation	Tolerance to DIN (mm)	TECAFORM AH ELS
DIN-Abbreviation		POM-C
Density (g/cm ³)		1,45
Diameter Ø (mm)		kg/m
4	+ 0,3 + 0,1	0,020
5	+ 0,1	0,032
6	+ 0,4	0,045
8		0,080
9	+ 0,1	0,100
10	+ 0,5	0,123
11		0,152
12		0,180
13		0,210
14		0,243
15	+ 0,2	0,277
16	+ 0,7	0,314
18		0,395
19		0,439
20		0,486
22		0,591
25	+ 0,2	0,758
28	+ 0,9	0,947
30		1,08
32		1,24
36	+ 0,2	1,56
40	+ 1,1	1,92
45		2,44
50	+ 0,3	3,00
56	+ 1,3	3,75
60		4,32
65	+ 0,3	5,05
70	+ 1,6	5,85
75	+ 0,4	6,74
80	+ 2	7,66
90	+ 2,2 + 0,5	9,69
100	+ 2,5 + 0,6	11,98

Rods



DIN-Abbreviation	Tolerance (mm)	TECAPEEK ELS nano
DIN-Abbreviation		PEEK
Density (g/cm ³)		1,34
Diameter Ø (mm)		kg/m
5		0,030
6	+ 0,4 + 0,1	0,042
8		0,074
9	+ 0,1	0,093
10	+ 0,5	0,114
11		0,143
12		0,169
15	+ 0,2	0,260
16	+ 0,9	0,294
18		0,369
19		0,411
20	+ 0,2 + 1,1	0,458
22		0,553
25	+ 0,2	0,709
28	+ 1,2	0,884
30		1,01
32	+ 0,2	1,15
36	+ 1,3	1,45
40	+ 0,2 + 1,5	1,79
45	+ 0,3	2,37
50	+ 1,7	2,79
60	+ 0,3 + 2,3	4,03
70	+ 0,3 + 2,5	5,47
80	+ 0,4 + 3	7,17
90	+ 0,5 + 3,4	9,08
100	+ 0,6 + 3,8	11,21

Tolerances according to DIN: length $+ \frac{3}{0} \%$. The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

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= Non-stock item – special production

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Plates



DIN-Abbreviation	Tolerance (mm)	TECAFORM AH SD
DIN-Abbreviation		POM-C
Density (g/cm ³)		1,45
Diameter (mm)		kg/m
12,7 x 610*	+ 0,2 + 0,7	4,54
19,1 x 610*	+ 0,2	6,02
25,4 x 610*	+ 0,9	7,43
38,1 x 610*		9,08
44,4 x 610*	+ 0,3	11,90
50,8 x 610*	+ 1,5	13,30

*Length 1220 mm

**Length 2000 mm

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
width $\pm \frac{25}{8} \text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planed.

All figures given without obligation.

= Stock item

= Non-stock item – special production

Plates



DIN-Abbreviation	Tolerance to DIN (mm)	TECAFORM AH ELS
DIN-Abbreviation		POM-C
Density (g/cm ³)		1,45
Diameter (mm)		kg/m
5 x 500	- 0,2 + 0,2	4,08
6 x 500	+ 0,2 + 0,75	4,93
8 x 500		6,51
10 x 500	+ 0,2	8,04
10 x 1000 **	+ 0,9	15,84
12 x 500		9,83
16 x 500		12,87
18 x 500	+ 0,3	14,40
20 x 500	+ 1,5	15,92
22 x 500		17,44
25 x 500		19,73
27 x 500		21,71
30 x 500		23,99
32 x 500	+ 0,5	25,5
36 x 500	+ 2,5	28,6
40 x 500		31,6
50 x 500		39,2
60 x 500	+ 0,5 + 5	47,8

Plates





DIN-Abbreviation	Tolerance (mm)	TECAPEEK ELS nano
DIN-Abbreviation		PEEK
Density (g/cm ³)		1,34
Diameter (mm)		kg/m
6 x 500	+ 0,2 + 0,7	4,54
8 x 500		6,02
10 x 500	+ 0,2 + 0,9	7,43
12 x 500		9,08
16 x 500		11,90
18 x 500		13,30
20 x 500	+ 0,3 + 1,5	14,71
22 x 500		16,12
25 x 500		18,23
30 x 500		22,17
32 x 500		23,58
36 x 500	+ 0,5 + 2,5	26,4
40 x 300		17,87
45 x 500		35,7
50 x 500		36,3

Rods



	Tolerance to DIN (mm)	TECAFLON PVDF
DIN-Abbreviation		PVDF
Density (g/cm³)		1,78
Diameter Ø (mm)		kg/m
4	+ 0,1 + 0,3	0,025
5	+ 0,1	0,039
6	+ 0,4	0,056
8		0,098
9	+ 0,1	0,123
10	+ 0,5	0,151
11		0,187
12		0,221
13		0,258
14		0,298
15	+ 0,2	0,340
16	+ 0,7	0,386
18		0,485
19		0,539
20		0,596
22		0,725
25	+ 0,2	0,931
28	+ 0,9	1,16
30		1,33
32		1,52
36	+ 0,2	1,92
40	+ 1,1	2,36
45		2,99
50	+ 0,3	3,68
56	+ 1,3	4,60
60		5,30
65	+ 0,3	
70	+ 1,6	7,18
75	+ 0,4	8,28
80	+ 2,0	9,40
90	+ 0,5 + 2,2	11,90
100	+ 0,6 + 2,5	14,70
110	+ 0,7 + 3,0	17,84
120	+ 0,8	21,28
125	+ 3,5	23,05
135	+ 0,9	26,9
140	+ 3,8	28,9
150	+ 1,0 + 4,2	33,2
165	+ 1,2	40,3
180	+ 5,0	47,8
200	+ 1,3 + 5,5	59,0
210	+ 1,3 + 5,8	65,0
230	+ 1,5 + 6,2	78,0
250	+ 1,5	92,0
280	+ 6,5	115,0
300	+ 1,5 + 7	132,0

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
 The specified kg/m weights are purely arithmetic figures.
 Weight on delivery will deviate from the figures given above.
 Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.



-  = Stock item
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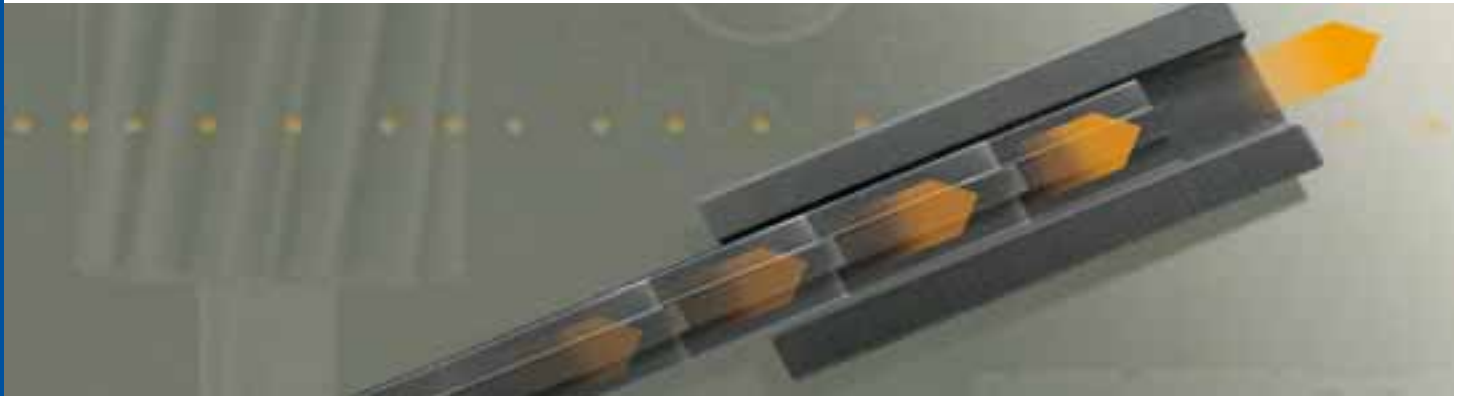
Plates



	Tolerance to DIN (mm)	TECAFLON PVDF
DIN-Abbreviation		PVDF
Density (g/cm³)		1,78
Diameter (mm)		kg/m
5 x 300	+ 0,2	3,06
5 x 500	+ 0,5	5,00
6 x 300	+ 0,2	3,70
6 x 500	+ 0,75	6,05
8 x 300		4,89
8 x 500	+ 0,2	7,99
10 x 300	+ 0,9	6,03
10 x 500		9,86
12 x 300		7,38
12 x 500		12,06
15 x 500		14,87
15 x 1000 **		29,3
16 x 300		9,67
16 x 500		15,80
18 x 500		17,67
20 x 300	+ 0,3	11,95
20 x 500	+ 1,5	19,54
20 x 1000 **		38,5
22 x 300		13,10
22 x 500		21,41
25 x 300		14,81
25 x 500		24,22
25 x 1000 **		47,7
27 x 300		16,24
27 x 500		26,6
30 x 300		17,96
30 x 500		29,4
30 x 1000 **		57,9
32 x 300		19,10
32 x 500	+ 0,3	31,2
36 x 500	+ 2,5	35,0
40 x 300		23,68
40 x 500		38,7
45 x 500		43,4
50 x 300		29,4
50 x 500		48,1
60 x 300	+ 0,5	35,5
60 x 500	+ 3,5	58,0
70 x 300		41,6
70 x 500		68,0
80 x 300		47,3
80 x 500	+ 0,5	77,4
90 x 300	+ 5	53,0
90 x 500		86,7
100 x 300		58,8
100 x 500		96,1

**Length 2000 mm
 Tolerances according to DIN: length $+ \frac{3}{0} \%$.
 width $+ \frac{25}{5} \text{ mm}$.
 The specified kg/m weights are purely arithmetic figures.
 Weight on delivery will deviate from the figures given above.
 Stock lengths 3000 mm, other delivery lengths possible, also available planed. All figures given without obligation.

-  = Stock item
-  = Non-stock item – special production



- I Good dry running properties
- I Silent running
- I Low maintenance
- I Good chemical resistance
- I Optimised friction behaviour with different additives

TECAFORM AH LA blue
Very good sliding and abrasion properties. Low water absorption.

TECAMID 66 MH black
Good UV resistance. Very good sliding properties.

TECAM 6 MO black
Good UV resistance and surface hardness. Easily machined and dimensionally stable.

TECAMID 66 LA
Very good sliding and abrasion properties against soft mating materials. Tough and strong.

TECAST TM black
Good UV stability. High surface hardness.

TECALUBE
Self extinguishing. Outstanding sliding and friction properties.

TECAGLIDE
Low friction coefficient. Polymer lubricant, no silicones.

TECAFLON PTFE
Exceptionally high chemical resistance. Very good sliding and friction properties.

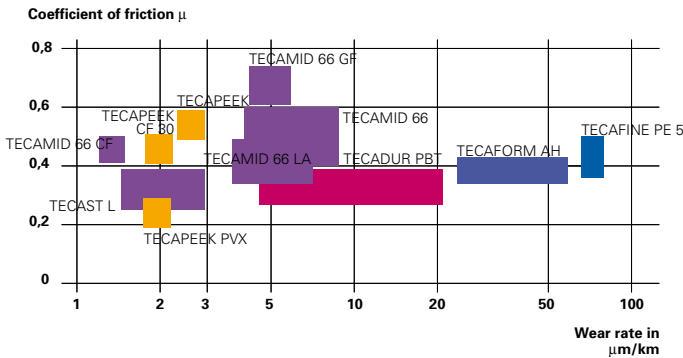
TECATRON PVX black
Very good sliding and friction values. Suitable for bearing parts subjected to high loads.

TECAPEEK PVX black
Very good sliding and friction values. Suitable for bearing parts subjected to high loads.

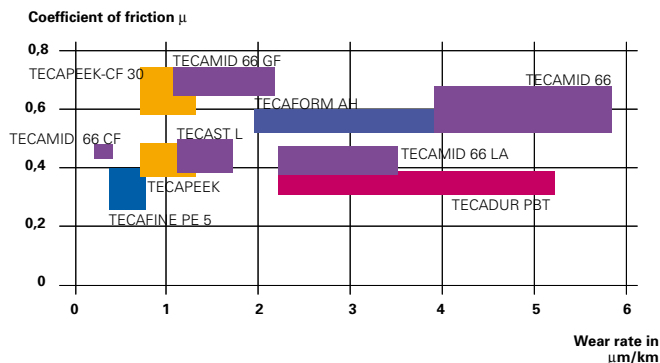
TECAPEEK TF 10
Very good sliding and friction properties, suitable for soft mating materials. Electrically insulating.

In addition the following materials are used in sliding-friction applications:

Sintimid, Vespel, TECAMID 66, TECAMID 6, TECAMID 66 CF, TECAFORM AH, TECAFORM AD, TECAFORM AD AF, TECADUR PET



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 = 2,5 μm

Rods



	Tolerance to DIN (mm)	TECAFORM AH LA blue
DIN-Abbreviation		POM-C
Density (g/cm³)		1,35
Diameter Ø (mm)		kg/m
3	+ 0,1	0,011
4	+ 0,3	0,019
5	+ 0,1	0,030
6	+ 0,4	0,042
8		0,075
9	+ 0,1	0,094
10	+ 0,5	0,115
11		0,142
12		0,168
13		0,196
14		0,226
15	+ 0,2	0,258
16	+ 0,7	0,293
18		0,368
19		0,409
20		0,452
22		0,550
25	+ 0,2	0,706
28	+ 0,9	0,882
30		1,01
32		1,15
36	+ 0,2	1,45
40	+ 1,1	1,79
45		2,27
50	+ 0,3	2,79
56	+ 1,3	3,49
60		4,02
65	+ 0,3	4,70
70	+ 1,6	5,44
75	+ 0,4	6,28
80	+ 2	7,13
90	+ 0,5 + 2,2	9,02
95	+ 0,6	10,08
100	+ 2,5	11,15
110	+ 0,7 + 3	13,53
120	+ 0,8	16,14
125	+ 3,5	17,48
130		18,94
135	+ 0,9	20,40
140	+ 3,8	21,91
150	+ 1 + 4,2	25,2
165	+ 1,2	30,6
180	+ 5	36,3
200	+ 1,3 + 5,5	44,7
210	+ 1,3 + 5,8	49,3
230	+ 1,5	59,1
250	+ 6,2	69,7

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

-  = Stock item
-  = Non-stock item – special production



Plates



	Tolerance to DIN (mm)	TECAFORM AH LA blue
DIN-Abbreviation		POM-C
Density (g/cm³)		1,35
Diameter (mm)		kg/m
5 x 500	- 0,2 + 0,2	3,79
6 x 500	+ 0,2 + 0,75	4,59
8 x 500		6,06
10 x 500	+ 0,2	7,48
10 x 1000 **	+ 0,9	14,75
12 x 500		9,15
15 x 500		11,28
16 x 500		11,98
18 x 500	+ 0,3	13,40
18 x 1000 **	+ 1,5	26,4
20 x 500		14,82
22 x 500		16,24
25 x 500		18,37
27 x 500		20,21
30 x 500		22,34
32 x 500		23,76
35 x 1000 **	+ 0,5	51,0
36 x 500	+ 2,5	26,6
40 x 500		29,4
45 x 500		33,0
50 x 500		36,5
60 x 500		44,5
60 x 610		54,0
70 x 500		51,6
70 x 610	+ 0,5 + 5	62,6
75 x 610		66,9
80 x 500		58,7
90 x 500		65,8
100 x 500		72,9

**Length 2000 mm
Tolerances according to DIN: length $+ \frac{3}{0} \%$.
width $+ \frac{25}{5} \text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planed. All figures given without obligation.

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Rods



	Tolerance to DIN (mm)	TECAM 6 MO	TECAMID 66 MH sw	TECAMID 66 LA
DIN-Abbreviation		PA 6	PA 66	PA 66
Density (g/cm³)		1,14	1,14	1,11
Diameter Ø (mm)		kg/m	kg/m	kg/m
4	+ 0,1 + 0,3	0,016	0,016	0,016
5	+ 0,1	0,025	0,025	0,025
6	+ 0,4	0,036	0,036	0,035
8		0,063	0,063	0,061
9	+ 0,1	0,079	0,079	0,077
10	+ 0,5	0,097	0,097	0,094
11		0,120	0,120	0,117
12		0,142	0,142	0,138
13		0,165	0,165	0,161
14		0,191	0,191	0,186
15	+ 0,2	0,218	0,218	0,212
16	+ 0,7	0,247	0,247	0,241
18		0,311	0,311	0,303
19		0,345	0,345	0,336
20		0,382	0,382	0,372
22		0,464	0,464	0,452
25	+ 0,2	0,596	0,596	0,580
28	+ 0,9	0,744	0,744	0,725
30		0,852	0,852	0,830
32		0,974	0,974	0,948
36	+ 0,2	1,23	1,23	1,19
40	+ 1,1	1,51	1,51	1,47
45		1,92	1,92	
50	+ 0,3	2,36	2,36	2,29
56	+ 1,3	2,95	2,95	2,87
60		3,39	3,39	3,30
65	+ 0,3	3,97	3,97	3,87
70	+ 1,6	4,60	4,60	4,48
75	+ 0,4	5,30	5,30	5,16
80	+ 2	6,02	6,02	5,86
85	+ 0,5	6,81		
90	+ 2,2	7,62	7,62	7,42
100	+ 0,6 + 2,5	9,42	9,42	9,17
110	+ 0,7 + 3	11,42	11,42	11,12
120	+ 0,8	13,63	13,63	13,27
125	+ 3,5	14,76	14,76	14,38
130		16,00	16,00	15,58
135	+ 0,9	17,23	17,23	16,77
140	+ 3,8	18,51	18,51	18,02
150	+ 1 + 4,2	21,27	21,27	20,71
165	+ 1,2 + 5	25,8	25,8	
180	+ 1,2 + 5	30,6	30,6	
200	+ 1,3 + 5,5	37,8	37,8	
210	+ 1,3 + 5,8	41,6		
230	+ 1,5	49,9		
250	+ 6,2	58,8		
280	+ 1,6 + 6,5	73,7		
300	+ 1,7 + 7	84,6		

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

 = Stock item

 = Non-stock item – special production

Plates



	Tolerance to DIN (mm)	TECAM 6 MO	TECAMID 66 MH sw	TECAMID 66 LA
DIN-Abbreviation		PA 6	PA 66	PA 66
Density (g/cm³)		1,14	1,14	1,11
Diameter (mm)		kg/m	kg/m	kg/m
5 x 500	+ 0,2	3,20	3,20	3,12
5 x 600	+ 0,5	3,83		
6 x 500	+ 0,2 + 0,75	3,88	3,88	3,78
8 x 500		5,12	5,12	4,99
10 x 500	+ 0,2	6,32	6,32	6,15
10 x 610	+ 0,9		7,70	
12 x 500	+ 0,9	7,73	7,73	7,52
12 x 610	+ 0,2		9,31	
12 x1000 **		15,23	15,23	14,82
16 x 500		10,12	10,12	9,85
16 x1000 **		19,95	19,95	19,42
18 x 500		11,32	11,32	11,02
18 x1000 **		22,31	22,31	21,72
20 x 500		12,52	12,52	12,19
20 x 610			15,19	
20 x1000 **	+ 0,3	24,67	24,67	24,02
22 x 500	+ 1,5	13,71	13,71	13,35
22 x1000 **		27,0	27,0	
25 x 500		15,51	15,51	15,10
25 x 610			18,82	
25 x1000 **		30,6	30,6	29,8
27 x 500		17,07	17,07	16,62
27 x1000 **		33,6	33,6	32,8
30 x 300		11,54	11,54	11,23
30 x 500		18,86	18,86	18,37
30 x 610			22,89	
30 x1000 **		37,2	37,2	36,2
32 x 300		12,27	12,27	11,95
32 x 500		20,06	20,06	19,53
32 x1000 **		39,5	39,5	38,5
35 x1000 **		43,1	43,1	41,9
36 x 500	+ 0,5	22,46	22,46	21,87
40 x 300	+ 2,5	15,20	15,20	14,80
40 x 500		24,85	24,85	24,20
40 x 610			30,2	
40 x1000 **		49,0	49,0	47,7
45 x 500		27,8	27,8	
50 x 300		18,86	18,86	18,37
50 x 500		30,8	30,8	30,0
50 x 610			37,4	
50 x1000 **		60,8	60,8	59,2
60 x 300		22,98	22,98	21,93
60 x 500		37,6	37,6	36,6
60 x 610		45,6	45,6	44,4
60 x1000 **		74,1	74,1	72,1
70 x 300		26,6	26,6	25,9
70 x 500		43,6	43,6	42,4
70 x 610		52,9	52,9	51,5
75 x 610	+ 0,5	56,5	56,5	55,0
80 x 300	+ 5	30,3	30,3	29,5
80 x 500		49,6	49,6	48,3
80 x1000 **		97,7		
90 x 300		34,0	34,0	33,1
90 x 500		55,5	55,5	54,1
100 x 300		37,6	37,6	36,6
100 x 500		61,5	61,5	59,9
100 x1000 **		121,3		

Rods



Cast Polyamide

		Tolerance to DIN (mm)	TECAST TM black	TECAGLIDE light-green	TECALUBE black
Stock length (mm)	DIN-Abbreviation		PA 6 G	PA 6 G	PA 6 G
	Density (g/cm³)		1,15	1,13	1,13
	Diameter Ø (mm)		kg/m	kg/m	kg/m
2000/3000	20	+ 0,5	0,406	0,399	0,399
2000/3000	25	+ 1,5	0,623	0,612	0,612
2000/3000	30	+ 0,5	0,914	0,898	0,898
2000/3000	35	+ 2,5	1,23	1,21	1,21
2000/3000	40		1,63	1,60	1,60
2000/3000	45	+ 1	2,04	2,00	2,00
2000/3000	50	+ 3	2,49	2,45	2,45
2000/3000	56		3,10	3,05	3,05
2000/3000	60		3,60	3,54	3,54
2000	65		4,20	4,12	4,12
2000	70		4,84	4,76	4,76
2000	75		5,53	5,44	5,44
2000	80	+ 1	6,27	6,16	6,16
2000	85	+ 4	7,05	6,93	6,93
2000	90		7,88	7,75	7,75
2000	95		8,76	8,61	8,61
2000	100		9,68	9,51	9,51
2000	110		11,82	11,61	11,61
2000	120		13,99	13,75	13,75
2000	125	+ 1,5	15,15	14,89	14,89
2000	130	+ 5	16,36	16,07	16,07
2000	140		18,90	18,58	18,58
2000	150		21,60	21,3	21,3
2000	160		24,93	24,50	24,50
2000	170	+ 2	28,1	27,6	27,6
2000	180	+ 7	31,4	30,8	30,8
2000	190		34,9	34,2	34,2
2000	200		38,5	37,9	37,9
2000	220		47,1	46,2	46,2
2000	230		51,3	50,4	50,4
2000	250	+ 3	60,4	59,3	59,3
1000	280	+ 9	75,4	74,0	74,0
1000	300		86,3	84,8	84,8
1000	320		98,80	97,1	97,10
1000	330		104,9	103,1	103,1
1000	350	+ 4	117,7	115,7	115,7
1000	360	+ 11	124,4	122,3	122,30
1000	370		131,3	129,0	129,0
1000	400		153,0	150,3	150,3
1000	450	+ 1,5	192,6	189,3	189,3
1000	500	+ 13	237,0	232,9	232,9
1000	600		342,8	336,8	336,80
750	710	+ 5	477,6	469,3	469,3
200	800	+ 15	604,4	593,9	593,9

Tolerances according to DIN: length $+ \frac{3}{0} \%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Other delivery lengths possible. All figures given without obligation.

- = Stock item
- = Non-stock item – special production

Plastic & Metal Center, Inc.

23162 La Cadena Drive

Laguna Hills, CA 92653

USA

Tel: 949-770-8230

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www.plastic-metal.com

Plates



		Tolerance to DIN (mm)	TECAST TM black	TECAGLIDE light-green	TECALUBE black
Stock length (mm)	DIN-Abbreviation		PA 6 G	PA 6 G	PA 6 G
	Density (g/cm³)		1,15	1,13	1,13
	Diameter (mm)		kg/m	kg/m	kg/m
2000	8 x 1000	+ 1 + 1,7	11,13	10,94	10,94
2000	10 x 1000		13,51	13,28	13,28
2000	12 x 1000		15,89	15,62	15,62
2000	16 x 1000	+ 1,2 + 2,5	21,25	20,88	20,88
2000	20 x 1000		26,0	25,6	25,6
2000	25 x 1000		32,0	31,4	31,4
2000	30 x 1000		37,9	37,3	37,3
2000	35 x 1000		43,9	43,1	43,1
2000	40 x 1000	+ 1,5 + 3,5	50,6	49,7	49,7
2000	50 x 1000		62,5	61,4	61,4
2000	55 x 1000		68,5	67,3	67,3
2000	60 x 1000	+ 2 + 5	75,6	74,3	74,3
2000	65 x 1000		81,6	80,1	80,1
2000	70 x 1000		87,5	86,0	86,0
2000	75 x 1000	+ 2 + 6	94,1	92,4	92,4
2000	80 x 1000		100,0	98,3	98,3
2000	90 x 1000		111,9	110,0	110,0
2000	100 x 1000		123,8	121,7	121,7
2000	110 x 1000		135,7	133,4	133,4
2000	120 x 1000		147,6	145,1	145,1
2000	130 x 1000		159,5	156,8	156,8
350	160 x 700		137,5	135,2	135,2
1200	200 x 650		159,1	156,4	156,4

Tolerances according to DIN: length $+ \frac{3}{0} \%$.
width $+ \frac{25}{5}$ mm.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths as mentioned above, other delivery lengths possible, also available ground. All figures given without obligation.



= Stock item



= Non-stock item – special production

Plates – special sizes are available in all **TECAST** grades.

Thickness (mm)	Tolerance to DIN (mm)	Variable Width (mm)	Length (mm)
8	+ 1 + 1,7	800-1250	
10		800-1250	2500/3000
12		800-1250	2500/3000
16	+ 1,2 + 2,5	800-1250	2500/3000
20		800-1250	2500/3000
25		800-1250	2500/3000
30		800-1200	2500/3000
35		800-1200	3000
40	+ 1,5 + 3,5	800-1200	2500/3000
45		800-1200	3000
50		800-1200	2500/3000
55		800-1200	3000
60		+ 2 + 5	800-1100

Further sizes on request.

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Rods



	Tolerance to DIN (mm)	TECATRON PVX black
DIN-Abbreviation		PPS
Density (g/cm³)		1,47
Diameter (mm)		kg/m
4	+ 0,1 + 0,3	0,021
5	+ 0,1 + 0,4	0,032
8	+ 0,1	0,081
10	+ 0,5	0,125
12		0,183
16		0,319
18	+ 0,2 + 0,7	0,401
20		0,492
22		0,599
25	+ 0,2	0,769
28	+ 0,9	0,960
30		1,10
32		1,26
36	+ 0,2 + 1,1	1,58
40		1,95
50	+ 0,3 + 1,3	3,04
60	+ 0,3 + 1,6	4,37

Plates



	Tolerance to DIN (mm)	TECATRON PVX black
DIN-Abbreviation		PPS
Density (g/cm³)		1,47
Diameter (mm)		kg/m
8 x 300		4,04
8 x 500	+ 0,2 + 0,9	6,60
10 x 500		8,15
12 x 500		9,96
16 x 500		13,05
18 x 500		14,59
20 x 300	+ 0,3 + 1,5	9,87
20 x 500		16,14
25 x 300		12,23
25 x 500		20,00
30 x 300		14,88
30 x 500		24,32
36 x 500	+ 0,5 + 2,5	29,0
40 x 300		19,60
40 x 500		32,0
50 x 300		24,32

Rods



	Tolerance (mm)	TECAPEEK PVX black	TECAPEEK TF 10
DIN-Abbreviation		PEEK	PEEK TF 10
Density (g/cm³)		1,48	1,35
Diameter Ø (mm)		kg/m	kg/m
5	+ 0,1	0,033	0,030
6	+ 0,4	0,046	0,042
8	+ 0,1	0,082	0,075
10	+ 0,5	0,126	0,115
12		0,187	0,170
15		0,287	0,262
16	+ 0,2 + 0,9	0,325	0,296
18		0,408	0,372
19		0,453	
20	+ 0,2 + 1,1	0,506	0,461
22		0,611	0,557
25	+ 0,2	0,783	0,714
28	+ 1,2	0,977	0,891
30		1,12	1,02
32	+ 0,2	1,27	1,16
36	+ 1,3	1,60	1,46
40	+ 0,2 + 1,5	1,98	1,80
45	+ 0,3	2,51	
50	+ 1,7	3,08	2,81
56	+ 0,3 + 2	3,87	
60	+ 0,3	4,46	4,06
65	+ 2,3		4,75
70	+ 0,3 + 2,5	6,04	5,51
80	+ 0,4 + 3	7,91	7,22
90	+ 0,5 + 3,4	10,02	9,14
100	+ 0,6 + 3,8	12,38	11,30

Tolerances according to DIN: length $+\frac{3}{0}\%$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available ground. All figures given without obligation.

= Stock item

= Non-stock item – special production

Plates



	Tolerance (mm)	TECAPEEK PVX black	TECAPEEK TF 10
DIN-Abbreviation		PEEK	PEEK TF 10
Density (g/cm³)		1,48	1,35
Diameter (mm)		kg/m	kg/m
5 x 300		2,59	
6 x 300	+ 0,2 + 0,7	3,07	2,80
6 x 500		5,01	4,57
8 x 300		4,07	3,71
8 x 500	+ 0,2 + 0,9	6,65	6,06
10 x 300		5,02	4,58
10 x 500		8,20	7,48
12 x 300		6,13	5,60
12 x 500		10,03	9,15
16 x 300		8,04	7,33
16 x 500		13,14	11,98
18 x 500		14,69	13,40
20 x 300	+ 0,3 + 1,5	9,94	9,07
20 x 500		16,25	14,82
22 x 500		17,80	16,24
25 x 300		12,32	11,23
25 x 500		20,14	18,37
30 x 300		14,98	13,66
30 x 500		24,49	22,34
32 x 500		26,0	23,76
36 x 500		29,2	26,6
40 x 300	+ 0,5 + 2,5	19,73	18,00
40 x 500		32,3	29,4
45 x 500		36,2	33,0
50 x 300		24,49	22,34
50 x 500		40,0	36,5
60 x 300			26,9
60 x 500	+ 0,5 + 3,5	48,2	
70 x 300			31,2
80 x 300	+ 0,5 + 5		35,9

Tolerances according to DIN: length $+\frac{3}{0}\%$ - width $+\frac{25}{5}\text{ mm}$.

The specified kg/m weights are purely arithmetic figures. Weight on delivery will deviate from the figures given above. Stock lengths 3000 mm, other delivery lengths possible, also available planed. All figures given without obligation.

= Stock item

= Non-stock item – special production

Chemical Resistance

Important criteria for testing chemical resistance are temperature, the concentration of the agents, the residence time as well as 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. We guarantee perfect quality within the scope of our general terms and conditions.

For specific applications it is recommended to establish suitability first. Standard testing is performed in normal climatic conditions 23/50 according to DIN 50 014.

	VESEL® SP1 (PI)	SINTIMID (PI)	TECAPEEK (PEEK)	TECAPEEK HT (PEEK)	TECAPEI (PEI)	TECATRON (PPS)	TECASON E (PES)	TECASON P (PPSU)	TECASON S (PSU)	TECARFON PTFE (PTFE)	TECARFON ETFE (ETFE)	TECARFON PVDF (PVDF)	TECARFON PCTFE (PCTFE)	TECAMID 6 (PA 6)	TECAMID 46, 66 (PA 46, 66)	TECAMID 11, 12 (PA 11, 12)	TECARIM (PA 6 G)	TECANAT (PC)	TECAFINE (PC)	TEAOUR PET PBT (PET, PBT)	TECAFINE PMP (PMP)	TECAFORM AH (POM-CH)	TECAFORM AD (POM-C)	TECAFINE PP (PP)	TECAFINE PE (PE)	TECARAN ABS (ABS)	TECANYL (PEE)		
Acetamide 50%																													
Acetone	+	+	+	+	+	+	-	-	-	+	+	(+)	+	(+)	(+)	(+)	(+)	(+)	(+)	-	(+)	-	+	+	+	(+)	-	-	
Formic acid, aqueous solution 10%	(+)	+	+	+	-	+	+			+	+	+	+	-	-	-	-	+	+	+	+	-	+	+	+	+	+	+	
Ammonia solution 10%	-	-	+	+	-	+	(+)		(+)	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	(+)	+	+	+	
Anone										+	+	(+)		+	+	+								+	+	(+)			
Benzine		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-		+	+	+	(+)	(+)	(+)	-	
Benzene	+	+				(+)	+	(+)	-	+	+	+	+	+	+	+	+			-	-	(+)	+	+	(+)	(+)	-	-	
Bitumen		+								+				(+)	(+)	(+)				-			+	+	(+)	(+)			
Boric acid, aqueous solution 10%	(+)		+	+			+			+	+		+	+	+	+	+	+	+				-	+	+	+	+	+	
Butyl acetate		+				+	(+)	+	(+)	+	+	+		+	+	+				-	-	+	+	+	(+)	(+)	-		
Calcium chloride, solution 10%	(+)	+	+	+	+	+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	(+)	+	+	+	
Chlorobenzene		+			+	(+)	-			+	+			+	+	+				-	-	-	+	+	+	-	-		
Chloroform	(+)	+				(+)	-		-	+	+	+	(+)	-	(+)	-				-	-	-	-	-	(+)	-	-	-	
Clophene A60, 50%										+	+	+	+	+	+	+							+	+	(+)		+		
Cyclohexane	+	+				+	+	+	+	+	+	+	+	+	+	+	+	+	+	-			+	+	+	+	+	+	
Cyclohexanone		+				+	-			+	+	(+)		+	+	+				(+)	(+)		+	+	+	+	-	+	
Decalin		+								+	+			+	+	+	+	+	+	(+)	(+)		+	+	+	+	-	+	
Diesel oil		+			+	+	+		+	+	+	+		+	+	+	+	+	+	(+)	(+)	+	+	+	+	(+)	+	+	
Dimethyl formamide		(+)				+	-			+	+			+	+	+	(+)	+	-	+		+	-	+	+	+	-		
Diocetyl phthalate						(+)	+		+	+				+	+	+				(+)	+		+	+	+	+		+	
Dioxane		+			+	+	(+)			+	+	+		+	+	+				-		(+)	(+)	+	+	(+)		(+)	
Acetic acid, concentrated		(+)			-	+	+		+	+	(+)			-	-	-	-	-	-	(+)	-	(+)	-	+	+	-	+		
Acetic acid, aqueous solution 10%	(+)	+		+	+	+	+	+	+	+	+		+	-	-	(+)	-	+	+	(+)	+	(+)	+	(+)	+	+	+	+	
Acetic acid, aqueous solution 5%		+		+		+	+	+	+	+	+		+	+	+	(+)	+	+	+	+	+	+	+	+	(+)	+	+	+	
Etanolo 96%		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	(+)	+	+	+	+	+	+	+	+	
Etilacetato	+	+			+		-		-	+	+	+		+	+	+	+	+	+	-	(+)	(+)	(+)	+	+	+		+	
Etiletere		+				+	+	+	+	+	+			+	+	+	+	+	+	-		+	+	+	+	+			
Cloruro di etilene	(+)	+			+					+	+			+	+	(+)	+	-		-	-	-	+	(+)	-		-		
Hydrofluoric acid, 40%									(+)	+	+		+	-	-	-				(+)		-	-	-	+	+	(+)	+	
Formaldehyde, aqueous solution 30%			+	+	+	+	+	+		+	+	+	(+)	+	+	(+)	+		+		+	+	+	+	+	+	+	+	
Formamide										+	+			+	+	(+)								(+)	+	(+)		+	
Freon, Frigen, liquid		+	-	-		+	+		+	+	+			+	+	+	+	-		+		+	-	(+)	(+)	+	+	+	
Fruit juices	(+)	+			+					+				+	+	+	+	-	+	+	+		+	+	+	+	+	+	
Glykol	+	+	+	+		+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Glyasantin, aqueous solution 40%		+	+	+		+	+		+	+	+	+		+	+	+				+		+	+	+	+	+	+	+	
Glycerine	+	+			+		+		+	+	+	+		+	+	+	+	+	+	(+)		+	+	+	+	+	+	+	
Urea, aqueous solution		+				+			+					+	+	+				+			+	+	+	+	+	+	
Heating oil		+				+	+			+	+	+		+	+	+	+	+	+	(+)		+	+	+	(+)	+	+	+	
Heptane, Hexane	+	+	+	+	+	+	+		+	+	+			+	+	+	+	+	+	-	+	+	+	+	+	-	+	+	
Iso-octane		+			+		+	+	+	+				+	+	+								+	+	+	+	+	
Isopropanol		+				+	+	+	(+)	+		+	+	+	+	+	(+)			(+)	+	+	+	+	+	+	+	(+)	+
Iodine solution, alcohol solution		+								+				-	-	-				(+)	+			(+)	+	+	(+)	+	
Potassium lye, aqueous 50% ¹⁾		-	+	+		+	+			+		-	+	+	+	+				-	+	-	+	-	+	+	+	+	
Potassium lye, aqueous 10%		(+)				+	+			+	+	(+)	+	+	+	+	+	+	+	-	+	-	+	-	+	+	+	+	
Potassium dichromate, aqueous solution 10%		-								+	+		+	+	+	(+)				+	+	+	+	(+)	+	+	+	+	
Potassium permanganate, aqueous solution 1%		+	+	+	+	+				+	+		-	-	-	-				+	+	+	+	(+)	+	+	(+)	+	
Cupric sulphate 10%		+	+	+		+	+			+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	

	VEPEL® SPI (PI)	SINTIMID (PI)	TECAPEEK HT (PEK)	TECAPEEK (PEK)	TECAPEI (PEI)	TECATRON (PPS)	TECASON E (PES)	TECASON P (PPSU)	TECASON S (PSU)	TECAFLON PTFE (PTFE)	TECAFLON ETFE (ETFE)	TECAFLON PVDF (PVDF)	TECAMID 6 (PA 6)	TECAMID 46, 66 (PA 46, 66)	TECAMID 11, 12 (PA 11, 12)	TECANAT (PC)	TECAFINE (PC)	TECADUR PET, PBT, TECAPET (PET, PBT)	TECAFORM AH (POM-C)	TECAFORM AD (POM-H)	TECAFINE PP (PP)	TECARAN ABS (ABS)	TECANYL (PEE)	
Linseed oil																								
Methanol																								
Methyl ethyl ketone																								
Methylene chloride																								
Milk																								
Lactic acid, aqueous solution 90%																								
Lactic acid, aqueous solution 10%																								
Sodium bisulphite, aqueous solution 10%																								
Sodium carbonate, aqueous solution 10%																								
Sodium chloride, aqueous solution 10%																								
Sodium nitrate, aqueous solution 10%																								
Sodium thiosulphate 10%																								
Soda lye, aqueous 50%																								
Soda lye, aqueous 5%																								
Nitrobenzene																								
Oxalic acid, aqueous solution 10%																								
Ozone																								
Paraffin oil																								
Perchloroethylene																								
Petroleum																								
Phenol, aqueous solution																								
Phosphoric acid, concentrated																								
Phosphoric acid, aqueous solution 10%																								
Propanol																								
Pyridine																								
Pyridine 3 solution, aqueous solution																								
Salicylic acid																								
Nitric acid, aqueous solution 2%																								
Hydrochloric acid, aqueous solution 36%																								
Hydrochloric acid, aqueous solution 2%																								
Sulphur dioxide																								
Sulphuric acid, concentrated 98%																								
Sulphuric acid, aqueous solution 2%																								
Hydrogen sulphide, saturated																								
Soap solution, aqueous solution																								
Silicone oils																								
Soda solution, aqueous solution 10%																								
Edible fats, Edible oils																								
Styrene																								
Tar																								
Carbon tetrachloride																								
Tetrahydrofurane																								
Tetralin																								
Ink																								
Toluene																								
Transformer oil																								
Triethanolamine																								
Trichlorethylene																								
Trilon B, aqueous solution 10%																								
Vaseline																								
Wax, molten																								
Water, cold																								
Water, warm																								
Hydrogen peroxide, aqueous solution 30%																								
Hydrogen peroxide, aqueous solution 0,5%																								
Wine, Brandy																								
Tartaric acid																								
Xylene																								
Zink chloride, aqueous solution 10%																								
Citric acid, aqueous solution 10%																								

+ = Resistant (+) = Limited resistance - = Not resistant (also dependent on concentration, time and temperature)

Please find the latest information at www.ensinger-online.com.

ENSINGER High temperature plastics. Material standard values.

Mechanical properties

Trade name	DIN-abbreviation	Additives and/or colour	Service temperature °C long term	ρ g/cm ³	σ _s MPa	σ _b MPa	ε _b %	E _t MPa	E _b MPa	H _t MPa	a kJ/m ²	σ _{B/1000} MPa	σ _{T/1000} MPa	μ -	V μ/km	Trade name	Mechanical properties									
																	Density (ASTM D 792, DIN EN ISO 1183)	Tensile strength at yield (ASTM D 638, DIN EN ISO 527)	Tensile strength at break (ASTM D 638, DIN EN ISO 527)	Elongation at break (ASTM D 638, DIN EN ISO 527)	Modulus of elasticity (ASTM D 638, DIN EN ISO 527)	Modulus of elasticity after tensile test (ASTM D 638, DIN EN ISO 527)	Impact resistance Charpy (ISO 2089/1, DIN EN ISO 179)	Impact resistance Izod (ASTM D 256, DIN EN ISO 179)	Impact resistance Izod (DIN EN ISO 180)	Creep resistance with static load (ISO 2089/1, DIN EN ISO 179)
VESPEL® SP1	PI	brown	300	1,43		86 (a)	7,5 (a)	3275	3100					0,35		VESPEL® SP1										
VESPEL® SP21	PI CS 15	black	300	1,51		66 (a)	4,5 (a)		3790					0,3		VESPEL® SP21										
VESPEL® SP3	PI	MoS ₂ , anthracite	300	1,6		59 (a)	4 (a)		3280							VESPEL® SP3										
SINTIMID PUR HT	PI	black	300	1,35		116	9	4000	4000		75 (c)		12	0,8		SINTIMID PUR HT										
SINTIMID 15 G	PI CS 15	15% graphite, black	300	1,42		97	2,8	4000	4000	88 (d)	26 (ai)			0,27		SINTIMID 15 G										
SINTIMID 30 P	PI TF 30	30% PTFE	260	1,51		82	4,1			84 (d)	23 (ai)			0,45		SINTIMID 30 P										
SINTIMID 40 G	PI CS 40	40% graphite, black	300	1,57		65	2,2			80 (d)						SINTIMID 40 G										
SINTIMID PVX	PI CS 15 TF 10	15% graphite, 10% PTFE, black	300	1,48		77	2,9			85 (d)	27 (i)			0,3		SINTIMID PVX										
SINTIMID 8000	PTFE + PI	PTFE	250	1,85		15	200			65 (d)	n. b. (c)			0,15-0,2		SINTIMID 8000										
TECATOR 5013	PAI	yellow-brown	260	1,42	147	137	21	3800	3750	E 86	142 (ai)					TECATOR 5013										
TECATOR 5031 PVX	PAI CS 12 TF 3	graphite, PTFE, black	260	1,46		125	4	5300	6100	E 72	63 (ai)					TECATOR 5031 PVX										
TECAPEEK HT	PEK	black	260	1,32	110		20	3800	4100	108 (r)	52 (ai)					TECAPEEK HT										
TECAPEEK CLASSIX™	PEEK	white	260	1,38	95		>25		4200		7,6 (d)					TECAPEEK CLASSIX™										
TECAPEEK	PEEK	natural, also black ^(k)	260	1,30	95		25	3000	4100	M99 (r)	n. b. (c)			0,30-0,38		TECAPEEK										
TECAPEEK GF 30	PEEK GF 30	30% glass fibre	260	1,51		180	2,5	9500	10000	M103 (r)	60 (c)	36		0,38-0,46		TECAPEEK GF 30										
TECAPEEK CF 30	PEEK CF 30	30% carbon fibre, black	260	1,40		215	1,5	18500	20000	256 ⁽²⁾	35 (c)					TECAPEEK CF 30										
TECAPEEK PVX	PEEK CF CS TF	10% carbon fibre, graphite, PTFE, black	260	1,48		130	1,5	9500	8100	208 ⁽²⁾	30 (c)			0,11		TECAPEEK PVX										
TECAPEEK MT	PEEK	coloured, also in black ^(k)	260	1,30	95		25	3000	4100	M99 (r)	n. b. (c)			0,30-0,38		TECAPEEK MT										
TECAPEEK ELS nano	PEEK CF	black	260	1,34		100	15	4100			50 (c)					TECAPEEK ELS nano										
TECAPEEK TF 10	PEEK TF 10	PTFE, natural	260	1,35	80		15	3000			n. b. (c)					TECAPEEK TF 10										
TECATRON	PPS	natural	230	1,35	75		4	3700	3600	190	50 (c)					TECATRON										
TECATRON MT sw	PPS	black	230	1,35	75		4	3700	3600	190	50 (c)					TECATRON MT sw										
TECATRON GF 40	PPS GF 40	40% glass fibre, natural	230	1,64		185	1,9	14000	13000	320	45 (c)					TECATRON GF 40										
TECATRON PVX	PPS CF 10	10% carbon fibre, graphite, PTFE, black	230	1,47		115	1,5	10000		203 ⁽²⁾	20 (c)			0,21	0,69	TECATRON PVX										
TECASON S	PSU	translucent	160	1,24	80	6	> 50	2600		147	n. b. (c)	42	22	0,4		TECASON S										
TECASON E	PES	translucent	180	1,37	90	6	40	2700		148	n. b. (c)		20			TECASON E										
TECASON P MT	PPSU	coloured	170	1,29	70		> 50	2350	2600							TECASON P MT										
TECAPEI	PEI	translucent	170	1,27	105		> 50	3200	3300	140	4 (c)					TECAPEI										
TECAPEI MT	PEI	translucent, coloured	170	1,27	105		> 50	3200	3300	140	4 (c)					TECAPEI MT										
TECAPEI GF 30	PEI GF 30	30% glass fibre	170	1,51		165	2	9500	9000	165	40 (c)					TECAPEI GF 30										

The information corresponds with current knowledge, and indicates our products and possible applications. We cannot give you a legally binding guarantee of the physical properties or the suitability for a specific application. Existing commercial patents are to be taken into account. A definite quality guarantee is given in our general conditions of sale. Tests are carried out in a standard atmosphere of 23 °C/50% r.h. according to DIN 50 014. We reserve the right to make technical alterations.

Remark: For polyamides the values strongly depend on the humidity contents.

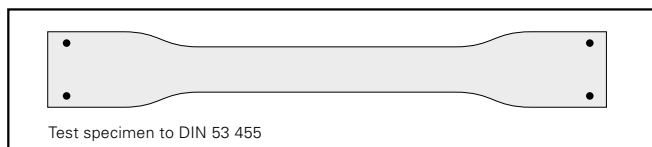
* humid, after storage in standard atmosphere 23 °C/50% r.h. (DIN 50 014) until saturation.

- (1) When plastics are listed under "additives and colour" as available "also in black", the electrical properties are not valid for the black variant. The black variants are resistant to weathering.
- (2) Testing of semi-finished products
- (3) Expected values.
- (4) Impact resistance is measured with different methods.

The values in the following tables are marked with the following letters:

- (c) Charpy: DIN EN ISO 179: a, kJ/m²
- (ai) Izod: ASTM D 256: a, J/m
- (di) Izod: DIN EN ISO 180, a, kJ/m²
- (k) Notch impact strength: DIN EN ISO 179: a, kJ/m²

Trade name	Thermal properties											Electrical properties ⁽¹⁾						Miscellaneous data		
	T _g °C	T _g °C	HDT/A °C	HDT/B °C	°C	λ W/(K·m)	c J/(g·K)	α 10 ⁻⁵ 1/K	ε _r	tan δ	ρ _s Ω·cm	R _o Ω	E _d kV/mm	Stufe	W(H ₂ O) %	W _s %	-	-	-	Trade name
	Melting point (DIN 53 765)	Glass transition temperature (DIN 53 755)	Heat distortion temperature (DIN EN ISO 75 method A)	Heat distortion temperature (DIN EN ISO 75 method B)	Service temperature short term	Thermal conductivity (23 °C)	Specific heat (23 °C)	Coefficient of linear thermal expansion (23 °C, ASTM D 695, DIN ISO 7599, ASTM E 831)	Dielectric constant (106 Hz, ASTM D 150, DIN ISO 7599, ASTM E 831)	Dielectric loss factor (106 Hz, ASTM D 150, DIN ISO 7599, ASTM E 831)	Surface volume resistance (ASTM D 257, IEC 93, DIN IEC 60093)	Surface resistance (ASTM D 257, IEC 93, DIN IEC 60093)	Dielectric strength (ASTM D 149, DIN EN 60093)	Resistance to tracking (DIN EN 60112, VDE 0302 part 1)	Moisture absorption to equilibrium 23 °C/50% rh, humidity (DIN EN ISO 62)	Water absorption at saturation (DIN EN ISO 62)	Resistance to hot water washing soda	Flammability acc. UL-Standard 94	Resistance to weathering ⁽²⁾	
VESPEL® SP1			360	360	360	0,35	1,13	5,4	3,55	0,0034	10 ¹⁴ -10 ¹⁵	10 ¹⁵ -10 ¹⁶	22		1,3			VO		VESPEL® SP1
VESPEL® SP21			360	360	360	0,87		4,9	13,4	0,01	10 ¹² -10 ¹³		9,84		1,1			VO		VESPEL® SP21
VESPEL® SP3																				VESPEL® SP3
SINTIMID PUR HT		360-375	368		350	0,22	1,04	4,9	3,1	0,003	10 ¹⁷	10 ¹⁶	20		2,6	3,6	(+)	VO	(+)	SINTIMID PUR HT
SINTIMID 15 G		330	300		350	0,53	1,13	3,8				10 ⁷			2,3		(+)	VO	+	SINTIMID 15 G
SINTIMID 30 P		330			330			5			10 ¹⁷	10 ¹⁶								SINTIMID 30 P
SINTIMID 40 G		330			350			3,1										VO	+	SINTIMID 40 G
SINTIMID PVX		330	330		350			5							2,3				+	SINTIMID PVX
SINTIMID 8000	327	-20			260	0,25	1	6	2,3		10 ¹⁸			0,5	0,7	(+)	VO	+	SINTIMID 8000	
TECATOR 5013		275	278		270	0,26	0,24	3,1	3,9	0,031	> 10 ¹⁸	> 10 ¹⁸	23,6		2,5	4,5	+	VO	-	TECATOR 5013
TECATOR 5031 PVX		275	279		270	0,54	0,24	2,5	5,4	0,042	8x10 ¹³	8x10 ¹³		1,9	3,5	+	VO	+	TECATOR 5031 PVX	
TECAPEEK HT	374	157	165		300			5,7	3,3	0,0035	10 ¹⁶							VO	-	TECAPEEK HT
TECAPEEK CLASSIX™		143			300															TECAPEEK CLASSIX™
TECAPEEK	343	143	140	182	300	0,25	0,32	5	3,2-3,3	0,001-0,004	10 ¹⁶	10 ¹⁵	20		0,1	0,5	+	VO	-	TECAPEEK
TECAPEEK GF 30	343	143	315		300	0,43		2		0,004	10 ¹⁵	10 ¹⁵	24,5		0,1	0,1	+	VO	-	TECAPEEK GF 30
TECAPEEK CF 30	343	143	315		300	0,92		1,5 ⁽²⁾			10 ⁻⁵ -10 ⁽²⁾	10 ⁻² -10 ⁽²⁾		0,1	0,1	+	VO	+	TECAPEEK CF 30	
TECAPEEK PVX	343	143	277		300	0,24		2,2			3x10 ⁶	5x10 ⁶		0,1	0,1	+	VO	+	TECAPEEK PVX	
TECAPEEK MT	343	143	140	182	300	0,25	0,32	5	3,2-3,3	0,001-0,004	10 ¹⁶	10 ¹⁵	20		0,1	0,5	+	VO	-	TECAPEEK MT
TECAPEEK ELS nano	343	143			300	0,8		1,9			10 ² -10 ⁴	10 ¹ -10 ³		0,1	0,2	+	VO	+	TECAPEEK ELS nano	
TECAPEEK TF 10	300	143			300									0,1		+	VO	-	TECAPEEK TF 10	
TECATRON	280	90	110		260	0,25		5			10 ¹³	10 ¹⁵		0,01		+	VO	-	TECATRON	
TECATRON MT sw	280	90	110		260	0,25		5			10 ¹³	10 ¹⁵		0,01		+	VO	+	TECATRON MT sw	
TECATRON GF 40	280	90	260		260	0,25	1,18	ca. 3	4	0,004	10 ¹³	10 ¹⁵	20	KC 175	0,02	1	+	VO	-	TECATRON GF 40
TECATRON PVX	280	90			260			3-4 ⁽²⁾			4x10 ⁶⁽²⁾	1x10 ⁶⁽²⁾			0,02		+	VO	+	TECATRON PVX
TECASON S		180	169	181	180	0,25	1	5,5	3,1	0,005	10 ¹⁶	10 ¹⁴	42	KA 1 KB 175	0,2	0,8	+	VO	-	TECASON S
TECASON E		225	204	214	220	0,18	1,12	5,5	3,5	0,005	10 ¹⁶	10 ¹⁴	40		0,7	2,1	+	VO	-	TECASON E
TECASON P MT		220	207	214	190	0,35		5,6	3,45		10 ¹⁵	10 ¹³	15		0,37	1,1	+	VO	+	TECASON P MT
TECAPEI		217	180	200	200	0,22		5	3,15	0,001	10 ¹⁵	10 ¹⁵	33		0,7	1,25	+	VO	-	TECAPEI
TECAPEI MT		217	180	200	200	0,22		5	3,15	0,001	10 ¹⁵	10 ¹⁵	33		0,7	1,25	+	VO	-	TECAPEI MT
TECAPEI GF 30		217	210	215	200	0,23		2	3,7	0,007	10 ¹⁵	10 ¹⁵	30		0,5	0,9	+	VO	-	TECAPEI GF 30



For VESPEL® see page 54.

+ = Resistant (+) = Limited resistance - = Not resistant (depending on concentration, time and temperature)

These values represent the average of a number of individual measurements. Unless otherwise stated the test results apply to injection moulded samples.

ENSINGER Engineering plastics. Material standard values

Mechanical properties

Trade name	DIN-abbreviation	Additives and/or colour	Service temperature °C long term	ρ g/cm³	σ _S MPa	σ _B MPa	ε _B %	E _T MPa	E _B MPa	H _K MPa	a kJ/m²	σ _{B/1000} MPa	σ _{T/1000} MPa	μ -	V μ/km	Trade name
TECAFLON PTFE	PTFE	natural	260	2,18	25		> 50	700		30	n. b. (c)	5	1,58	0,08-0,1	21	TECAFLON PTFE
TECAFLON ETFE	E/TFE		150	1,73	45		40	800		60 (d)	n. b. (c)			0,4		TECAFLON ETFE
TECAFLON PVDF	PVDF		150	1,78	50		> 30	2000	2000	80	n. b. (c)	34	3	0,3		TECAFLON PVDF
TECAMID 46	PA 46		130	1,18	100/65*		40/280*	3300/1200*		90 (d)	n. b. (c)			0,20-0,45		TECAMID 46
TECAMID 66/ X GF 50 sw	PA 66 + PA 63/ 6T	50% glass fibre, partly aromatic, black ⁽¹⁾	130	1,56		210	3	17000			85 (c)					TECAMID 66/ X GF 50 sw
TECAMID 66	PA 66		100	1,14	80/60*		40/150*	3100/2000*	2830	170/100*	n. b. (c)	55	8	0,35-0,42	0,9	TECAMID 66
TECAMID 66 HI	PA 66	heat stabilisator, brown	115	1,14	80/60*		50/150*	2700/1600*		170/100*	n. b. (c)		6			TECAMID 66 HI
TECAMID 66 GF 30	PA 66 GF 30	30% glass fibre, black	110	1,35		160/130*	3/5*	8000/7500*		175 ⁽²⁾	70 (c)		40	0,45-0,5		TECAMID 66 GF 30
TECAMID 66 CF 20	PA 66 CF 20	20% carbon fibre, black	110	1,23		190/150*	2,5/6*	13500/10000*		187/200*	45 (c)			0,16-0,2	0,7	TECAMID 66 CF 20
TECAMID 66 LA	PA 66	lubricant	90	1,11	60/50*		10/40*	2000/1600*		117/100*	50 (c)		3	0,18-0,20	0,08	TECAMID 66 LA
TECAMID 66 MH	PA 66	MoS ₂ , black ⁽¹⁾	100	1,14	75		> 25	2500		107 ⁽²⁾	n. b. (c)		8,5	0,20-0,25	0,08	TECAMID 66 MH
TECAST HI	PA 6 G	heat stabilizer, brown	115	1,15	80/60*		5/50*	4000/3300*		170						TECAST HI
TECAST ST	PA 6 G	toughness modifier	100	1,15	50		50/70*	2000		95						TECAST ST
TECAST R	PA 6 G		100	1,15	85/60*		5/50*	4000/3300*		170						TECAST R
TECAST T	PA 6 G	natural	100	1,15	85/60*		3/50*	3300/1700*		160/90*	n. b. (c)	50	5	0,4		TECAST T
TECAST M	PA 6 G	MoS ₂ , anthracite	100	1,15	90		5/30*	3500		175						TECAST M
TECAST TM	PA 6 G	MoS ₂ , anthracite	100	1,15	75		40/60*	2800		145						TECAST TM
TECAST L	PA 6 G	lubricant, natural	100	1,15	70		20/40*	2500		125						TECAST L
TECARIM 1500	PA 6 G	15% elastomere natural	95	1,12	54/44*		90/320*	2100/900*	2280/1100*	77/73*(d)	20/42*(k)					TECARIM 1500
TECARIM 4000	PA 6 G	40% elastomere natural	95	1,13	26/22*		420/420*	450/230*	500/240*	59/52*(d)						TECARIM 4000
TECAM 6 MO	PA 6	MoS ₂ , black	100	1,14	75		> 25	2700		107/85*(2)	n. b. (c)		5	0,32-0,37	0,16	TECAM 6 MO
TECAMID 6	PA 6	natural	100	1,13	85/60*		70/200*	3000/1800*		160/70*	n. b. (c)	45	4,5	0,38-0,45	0,23	TECAMID 6
TECAMID 6 GF 30	PA 6 GF 30	30% glass fibre, black	100	1,35		140/110*	2,5/5*	8500/6000*		147 ⁽²⁾	55 (c)		21-35	0,46-0,52		TECAMID 6 GF 30
TECAMID TR	PA 6-3-T	transparent	100	1,12	90		> 50	2800		100	n. b. (c)	50	12			TECAMID TR
TECAMID 12	PA 12	natural	112	1,02	40		240	1200		72 (d)	n. b. (c)	23	3,5	0,32-0,38	0,8	TECAMID 12
TECAMID 12 GF 30	PA 12 GF 30	30% glass fibre	112	1,24		105	6	5900		113 R (r)	70 (c)		28			TECAMID 12 GF 30
TECAMID 11	PA 11	natural	80	1,04	40/42*		230/280*	1000		90	n. b. (c)	23	3,5	0,32-0,38	0,8	TECAMID 11
TECAMID 11 GF 30	PA 11 GF 30	30% glass fibre	80	1,26		100/95*	6/4*	5000	3200	115 R (r)	70 (c)		28			TECAMID 11 GF 30

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Remark: For polyamides the values strongly depend on the humidity contents.

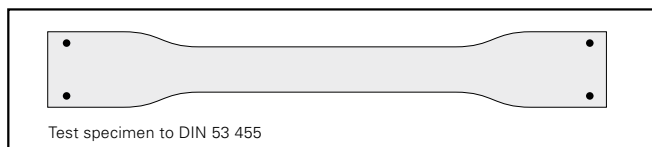
* humid, after storage in standard atmosphere 23 °C/50% r.h. (DIN 50 014) until saturation.

- (1) When plastics are listed under "additives and colour" as available "also in black", the electrical properties are not valid for the black variant. The black variants are resistant to weathering.
- (2) Testing of semi-finished products
- (3) Expected values.
- (4) Impact resistance is measured with different methods.

The values in the following tables are marked with the following letters:

- (c) Charpy: DIN EN ISO 179: a, kJ/m²
- (ai) Izod: ASTM D 256: a, J/m
- (di) Izod: DIN EN ISO 180, a, kJ/m²
- (k) Notch impact strength: DIN EN ISO 179: a, kJ/m²

Trade name	Thermal properties											Electrical properties						Miscellaneous data		
	Melting point (DIN 53 765)	Glass transition temperature (DIN 53 765)	Heat distortion temperature (DIN EN 150 75 method A)	Heat distortion temperature (DIN EN 150 75 method B)	Service temperature short term	Thermal conductivity (23 °C)	Specific heat (23 °C)	Coefficient of linear thermal expansion (23 °C, ASTM D 695, DIN ISO 7599, ASTM E 831)	Dielectric constant (100 Hz, ASTM D 150, DIN 53 483, IEC 250)	Dielectric loss factor (100 Hz, ASTM D 150, DIN 53 483, IEC 250)	Specific volume resistance (ASTM D 257, IEC 93, DIN IEC 60093)	Surface resistance (ASTM D 257, IEC 93, DIN IEC 60093)	Dielectric strength (ASTM D 149, DIN EN 60093)	Resistance to tracking (DIN EN 60112, VDE 0302 Teil 1)	Moisture absorption to equilibrium 23 °C/50% rel. humidity (DIN EN ISO 62)	Water absorption at saturation Resistance to hot water washing soda	Flammability acc. to UL-Standard 94	Resistance to weathering ⁶⁾		
TECAFLON PTFE	327	-20	55	121	260	0,25	1	12	2,1	0,0002	10 ¹⁶	10 ¹⁶	48	KA 3c KB>600	<0,05		+	V0	+	TECAFLON PTFE
TECAFLON ETFE	267	-100	71	105	150	0,24	0,9	13	2,6	0,001	>10 ¹⁶	>10 ¹⁶	40		<0,05	0,03	+	V0	+	TECAFLON ETFE
TECAFLON PVDF	172	-18	95	140	150	0,11	1,2	13	8	0,06	10 ¹⁴	10 ¹³	10-60	KA 1	<0,05	<0,05	+	V0	+	TECAFLON PVDF
TECAMID 46	295	75	160		220	0,3	2,1	8		0,21 0,35	10 ¹⁵	10 ¹⁶	25/15*	KC >425	3,7	14	(+)	V2	-	TECAMID 46
TECAMID s66/ X GF 50 sw	260				200			1,5			10 ¹²	10 ¹³			1,3		(+)		+	TECAMID 66/ X GF 50 sw
TECAMID 66	260	72/5*	100	>200	170	0,23	1,7	8	3,6-5	0,026- 0,200	10 ¹²	10 ¹⁶	28*/ 30	CTI 600	2,8	8,5	(+)	HB	-	TECAMID 66
TECAMID 66 HI	260	72/5*	100	200	180	0,23	1,7	8	3,2-5	0,025- 0,200	10 ¹²	10 ¹⁶	80*/ 100	KB>600 KC>600	2,8	8,5	(+)	HB	-	TECAMID 66 HI
TECAMID 66 GF 30	260	72/5*	250	250	170	0,27	1,5	2-3 ⁽²⁾			8x10 ¹³⁽²⁾	6x10 ¹³⁽²⁾			1,5	5,5	(+)	HB	+	TECAMID 66 GF 30
TECAMID 66 CF 20	260	72/5*	245	250	170	0,43	1,8	5,5 ⁽²⁾			10 ¹² - 10 ¹²⁽²⁾	10 ¹² - 10 ¹²⁽²⁾			2,2	6,5	(+)	HB	+	TECAMID 66 CF 20
TECAMID 66 LA	260	72/5*	85	185	120	0,23	1,7	15 ⁽²⁾	3,3	0,015	6x10 ¹³⁽²⁾	10 ¹⁴⁽²⁾	80*/ 120	CT >600	2,5	7,5	(+)	HB	-	TECAMID 66 LA
TECAMID 66 MH	260	72/5*	105	>200	170	0,23	1,8	12 ⁽²⁾			7x10 ¹³⁽²⁾	5x10 ¹³⁽²⁾			2,6	7	(+)	HB	+	TECAMID 66 MH
TECAST HI	220	40/5*			180			8	3,7	0,03		5x10 ¹²	50		2,5	7	(+)	HB	-	TECAST HI
TECAST ST	220	40/5*			150	0,24		10								5-6	(+)	HB	-	TECAST ST
TECAST R	220	40/5*			180	0,24		8							2,5	6-7	(+)	HB	-	TECAST R
TECAST T	220	40/5*	95	195	180	0,24	1,7	7,5/9,5*	3,7	0,03- 0,30	10 ¹² - 5x10 ¹⁴	5x10 ¹²	KA 3c KA 3b		2,5	6-7	(+)	HB	-	TECAST T
TECAST M	220	40/5*			180			8,5								6-7	(+)	HB	+	TECAST M
TECAST TM	210	40/5*			170			9,5							2,5	6	(+)	HB	+	TECAST TM
TECAST L	220	40/5*			180			9								6	(+)	HB	-	TECAST L
TECARIM 1500	214				160			ca. 7-8	4,2	0,1	5x10 ⁹	4x10 ⁹		500	2,5		(+)	HB		TECARIM 1500
TECARIM 4000	214							ca. 7-8	4,8	0,1	2x10 ⁹	2x10 ⁹		600	1,6		(+)	HB		TECARIM 4000
TECAM 6 MO	220	40	100	195	160	0,23	1,7	18 ⁽²⁾			6x10 ¹³⁽²⁾	3x10 ¹³⁽²⁾			3	8-9	(+)	HB	+	TECAM 6 MO
TECAMID 6	220	60/5*	75	190	160	0,23	1,7	8	3,7-7	0,031- 0,300	10 ¹³	10 ¹²	20*/50	CTI 600	3	9,5	(+)	HB		TECAMID 6
TECAMID 6 GF 30	220	60/5*	210	220	180	0,28	1,5	2-3 ⁽²⁾			9x10 ¹³⁽²⁾	5x10 ¹³⁽²⁾			2,1	6,6	(+)	HB	+	TECAMID 6 GF 30
TECAMID TR		150	130	140	120	0,23	1,45	5	3-4	0,02- 0,03	10 ¹⁵	10 ¹⁵	25	KC>600	3	5,6-6,4	(+)	HB	-	TECAMID TR
TECAMID 12		45	50	140	150	0,23	2,1	10	3,1-3,6	0,03- 0,04	10 ¹⁴	10 ¹⁴	24-30	KA 38 CTI 600	0,7	1,6	+	HB	-	TECAMID 12
TECAMID 12 GF 30	175	45	120	165	150	0,23	1,7	5	4	< 0,04	10 ¹³	10 ¹⁴	>45	KB 400 CTI 600	0,4	1	(+)	HB	-	TECAMID 12 GF 30
TECAMID 11	183	43	55	150	150	0,23	2,1	10	3,2-3,6	0,03- 0,08	10 ¹³ - 2x10 ¹⁵	10 ¹⁴	40	KC 600	0,9	1,9	+	HB	-	TECAMID 11
TECAMID 11 GF 30	185	43	120	165	150	0,23		5			10 ¹⁴	> 10 ¹⁴	45	KB 600 KC 600	0,45	1,3	(+)	HB	-	TECAMID 11 GF 30



+ = Resistant (+) = Limited resistance - = Not resistant
(depending on concentration, time and temperature)

These values represent the average of a number of individual measurements. Unless otherwise stated the test results apply to injection moulded samples.

ENSINGER Engineering plastics. Material standard values.

Mechanical properties

Trade name	DIN-abbreviation	Additives and/or colour	Service temperature °C long term	ρ g/cm ³	σ _S MPa	σ _T MPa	ε _B %	E _T MPa	E _M MPa	H _k MPa	a kJ/m ²	σ _{B/1000} MPa	σ _{T/1000} MPa	μ -	V μ/km	Trade name
TECANAT HT	PC-HT	transparent	140	1,15	65		7	2300	2200	115	n. b. (c)					TECANAT HT
TECANAT	PC	transparent	120	1,20	60			2300		100	n. b. (c)	48	18	0,52-0,58	22	TECANAT
TECANAT GF 30	PC GF 30	30% glass fibre	120	1,42		130	2,5	7500		148 ^(a)	55 (c)	>50				TECANAT GF 30
TECAFINE PMP	PMP	transparent	120	0,83		15			1500	85	n. b. (c)					TECAFINE PMP
TECADUR PET	PET	natural, also in black ⁽¹⁾	110	1,37	88			2700		95	n. b. (c)		13	0,25	0,35	TECADUR PET
TECAPET	PET	natural, also in black ⁽¹⁾	110	1,37	88			3200		95	40 (c)		13	0,25	0,35	TECAPET
TECAPET TF	PET	solid lubricant, grey	110	1,44	73			2900			40 (c)			0,1		TECAPET TF
TECADUR PBT	PBT	natural	110	1,31	55			2500		125	n. b. (c)	36	12	0,24	0,2	TECADUR PBT
TECADUR PBT GF 30	PBT GF 30	30% glass fibre grey white	110	1,53		135	2,5	10000		190	60 (c)		57	0,24		TECADUR PBT GF 30
TECAFORM AH	POM-C	natural, also in black ⁽¹⁾	100	1,41	62		30	2700		145	n. b. (c)	40	13	0,32	8,9	TECAFORM AH
TECAFORM AH GF 25	POM-C GF 25	25% glass fibre	100	1,58		130	3	9000		195	40 (c)					TECAFORM AH GF 25
TECAFORM AH LA	POM-C	solid lubricant, blue	100	1,35	45	25		1600	2100	90 ⁽²⁾	> 40 (c)			~0,2		TECAFORM AH LA
TECAFORM AH ELS	POM-C	conductive carbon, black	100	1,45	50		15	2000		M97(r)	>1000 (di)					TECAFORM AH ELS
TECAFORM AH SD	POM-C	beige	100	1,33	45		> 25	1400	1450		100 (ai)			0,18		TECAFORM AH SD
TECAFORM AH MT color	POM-C	also in black ⁽¹⁾	100	1,41	55		30	2100		145	n. b. (c)	40	13	0,32	8,9	TECAFORM AH MT color
TECAFORM AD	POM-H	natural	110	1,42	70		25	3000	2620	170	n. b. (c)	40	13	0,34	4,6	TECAFORM AD
TECAFORM AD AF	POM-H	PTFE, brown	110	1,54	50		10	2900	2410		40 (c)			0,14		TECAFORM AD AF
TECAPRO MT	PP	heat stabilisator, also in black ⁽¹⁾	100	0,92	35				1470	100 (r)	41,9 (ai)					TECAPRO MT
TECAFINE PP	PP	also in black ⁽¹⁾ and grey	100	0,91	30		> 50	1600		80	n. b. (c)	22	4	0,3	11	TECAFINE PP
TECAFINE PP ELS	PP	conductive carbon, black	100	0,98	26	18	27	1200		71	30 (c)					TECAFINE PP ELS
TECAFINE PP GF 30	PP GF 30	30% glass fibre	100	1,14		85	3	5500		110	40 (c)			0,5	8,4	TECAFINE PP GF 30
TECAFINE PE 10	PE-UHMW	natural	90	0,93	17	40	> 50	650	800	35	n. b. (c)			0,29		TECAFINE PE 10
TECAFINE PE 5	PE-HMW	natural	90	0,95	25	40	> 50	1100	900	52	n. b. (c)			0,29		TECAFINE PE 5
TECAFINE PE	PE-HD	also in black ⁽¹⁾	90	0,96	25			1000	1000	50	n. b. (c)	12,5	3	0,29		TECAFINE PE
TECARAN ABS	ABS	grey	75	1,06	50			2400		85	n. b. (c)	28	17	0,5	8,4	TECARAN ABS
TECANYL	PPE	grey	85	1,06	55			2300		125	n. b. (c)		21	0,4	90	TECANYL
TECANYL GF 30	PPE GF 30	30% glass fibre, beige	85	1,29		105	2	8000			30 (c)		47			TECANYL GF 30

The information corresponds with current knowledge, and indicates our products and possible applications. We cannot give you a legally binding guarantee of the physical properties or the suitability for a specific application. Existing commercial patents are to be taken into account. A definite quality guarantee is given in our general conditions of sale. Tests are carried out in a standard atmosphere of 23 °C/50% r.h. according to DIN 50 014. We reserve the right to make technical alterations.

Remark: For polyamides the values strongly depend on the humidity contents.

* humid, after storage in standard atmosphere 23 °C/50% r.h. (DIN 50 014) until saturation.

(1) When plastics are listed under "additives and colour" as available "also in black", the electrical properties are not valid for the black variant. The black variants are resistant to weathering.

(2) Testing of semi-finished products
(3) Expected values.

(4) Impact resistance is measured with different methods.

The values in the following tables are marked with the following letters:

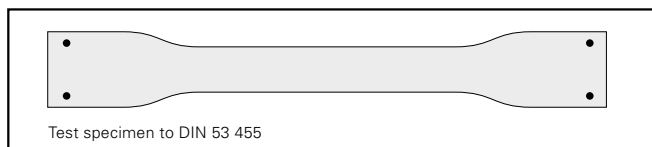
(c) Charpy: DIN EN ISO 179: a, kJ/m²

(ai) Izod: ASTM D 256: a, J/m

(di) Izod: DIN EN ISO 180, a, kJ/m²

(k) Notch impact strength: DIN EN ISO 179: a, kJ/m²

Trade name	Thermal properties											Electrical properties					Miscellaneous data			
	T _g °C	T _g °C	HDT/A °C	HDT/B °C	°C	λ W/(K·m)	c J/(g·K)	α 10 ⁻⁵ 1/K	ε _r -	tan δ -	ρ _s Ω·cm	R _o Ω	E _d kV/mm	Stufe	W(H ₂ O) %	W _s %	-	-	-	Trade name
	Melting point (DIN 53 765)	Glass transition temperature (DIN 53 755)	Heat distortion temperature (DIN EN ISO 75 method A)	Heat distortion temperature (DIN EN ISO 75 method B)	Service temperature short term	Thermal conductivity (23 °C)	Specific heat (23 °C)	Coefficient of linear thermal expansion (23 °C, ASTM D 695, DIN ISO 7599, ASTM E 831)	Dielectric constant (106 Hz, ASTM D 150, DIN 53 483, IEC 250)	Dielectric loss factor (106 Hz, ASTM D 150, DIN 53 483, IEC 250)	Surface volume resistance (ASTM D 257, IEC 93, DIN IEC 60093)	Surface resistance (ASTM D 257, IEC 93, DIN IEC 60093)	Dielectric strength (ASTM D 149, DIN EN 60093)	Resistance to tracking (DIN EN 60112, VDE 0302 Teil 1)	Moisture absorption to equilibrium 23 °C / 50% rel. humidity (DIN EN ISO 62)	Water absorption to equilibrium (DIN EN ISO 62)	Resistance to hot water washing soda	Flammability acc. to UL-Standard 94	Resistance to weathering ^{en}	
TECANAT HT		180	161-197	173-195	170			7	2,9	0,01	> 10 ¹⁵	10 ¹⁵	35	CTI 600	0,2			HB	-	TECANAT HT
TECANAT		148	135	140	140	0,19	1,2	7	3	0,006	10 ¹³	10 ¹⁵	27	KA 1	0,15	0,36	-	HB	-	TECANAT
TECANAT GF 30		148	142		140	0,26		3 ⁽²⁾	3,3	0,009	10 ¹⁰⁽²⁾	10 ¹⁴⁽²⁾	30	KB 160	0,1	0,28	-	HB	-	TECANAT GF 30
TECAFINE PMP		20	51	85		0,17	2,18	12	2,12		10 ¹⁴	10 ¹³	65	KA 3c KB>600 KC>600	<0,05	0,01	+	HB	-	TECAFINE PMP
TECADUR PET	245	70	95	170	170	0,24	1,1	7	3,2	0,0021	10 ¹³	10 ¹⁵	60	KC 350	0,25	0,5	-	HB	-	TECADUR PET
TECAPET	255	70	95	170	170	0,24	1,1	7	3,2	0,0021	10 ¹³	10 ¹⁵	60	KC 350	0,25	0,5		HB		TECAPET
TECAPET TF	255		70												0,25	0,5				TECAPET TF
TECADUR PBT	225	60	80	165	170	0,21	1,21	8	3	0,012	>10 ¹³	> 10 ¹⁵	>45	KB 425 KC>600	0,25	0,4	-	HB	-	TECADUR PBT
TECADUR PBT GF 30	225	60	210	225	200		1,5	3,5	3,8	0,009	10 ¹³	10 ¹⁵	50	KB 225 KC 550	0,15	0,35	-	HB	-	TECADUR PBT GF 30
TECAFORM AH	165	-60	110	160	140	0,31	1,5	10	3,5	0,003	10 ¹⁴	10 ¹⁴	>50	KA 3c	<0,3	0,5	(+)	HB	-	TECAFORM AH
TECAFORM AH GF 25	165	-60			140			3	4,8	0,005	10 ¹⁴	10 ¹²	>50		0,15					TECAFORM AH GF 25
TECAFORM AH LA	165	-60	88		140		1,5	16 ⁽²⁾	3,8	0,007	7x 10 ¹⁰⁽²⁾	9x10 ¹³	35	CTI 600	0,2	0,8	(+)	HB	-	TECAFORM AH LA
TECAFORM AH ELS	165	-60	89		140			11			10 ² -10 ⁴	10 ² -10 ⁴			<0,3	0,5	(+)	HB	+	TECAFORM AH ELS
TECAFORM AH SD	165	-60	88		140	0,3		6,5			10 ³ -10 ¹¹	10 ³ -10 ¹¹			0,25	~0,8	(+)	HB	-	TECAFORM AH SD
TECAFORM AH MT farbig	165	-60	110	160	140	0,31	1,5	10	3,5	0,003	10 ¹⁴	10 ¹⁴	> 50	KA 3c	< 0,3	0,5	(+)	HB	-	TECAFORM AH MT farbig
TECAFORM AD	175	-60	124	170	150	0,31	1,5	10	3,7	0,005	>10 ¹⁴	> 10 ¹⁴	>50	KA 3c	<0,3	0,5	-	HB	-	TECAFORM AD
TECAFORM AD AF	175	-60	118	168	150			8	3,1	0,009	>10 ¹⁵	> 10 ¹⁵	15		0,18	0,72	-	HB	-	TECAFORM AD AF
TECAPRO MT	163	86			140						10 ¹⁵		>40		>0,05	0,1	-	HB	-	TECAPRO MT
TECAFINE PP	165	-18	65	105	130	0,22	1,7	17	2,25	0,0002	>10 ¹⁴	> 10 ¹³	>40	KA 3c C>600	<0,1	<0,1	+	HB	-	TECAFINE PP
TECAFINE PP ELS	165	-18	150	90	120	0,2					<10 ⁹	<10 ⁴			<0,1	<0,1	(+)	HB	-	TECAFINE PP ELS
TECAFINE PP GF 30	165	-18	120	155	140	0,27	1,47	6	2,64		>10 ¹⁴	>10 ¹³		KA3c KB>600 KC>600	<0,1	<0,1	+	HB	-	TECAFINE PP GF 30
TECAFINE PE 10	135		42	~70	120	0,41	1,84	20	3		10 ¹⁴	10 ¹²	45	KA3c KB>600 KC>600	0,01	0,02	+	HB	-	TECAFINE PE 10
TECAFINE PE 5	136		44	~70	120	0,41	1,84	20	2,9	0,0004	10 ¹⁵	10 ¹³	>150	KC>600	0,01		+	HB	-	TECAFINE PE 5
TECAFINE PE	130	-95	42-49	70-85	90	0,35-0,43	1,7-2	13-15	2,4	0,0002	>10 ¹⁵	> 10 ¹³	>50	KA 3c	<0,05	0,05	+	HB	-	TECAFINE PE
TECARAN ABS		115	82-104	96-108	100	0,17	1,2	8-11	3,3	0,015	10 ¹⁵	10 ¹³	>22	KA 3b	0,4	0,7	-	HB	-	TECARAN ABS
TECANYL		150	130	138	110	0,22	1,2	7	2,6	0,001	10 ¹³	10 ¹⁵	50	KA 1	0,1	0,2	+	HB	-	TECANYL
TECANYL GF 30		150	135	143	110		1,34	3	3,1	0,0021	10 ¹⁵	10 ¹⁵	50	KB 250	0,05	0,18	(+)	HB	-	TECANYL GF 30

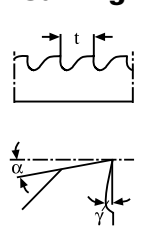
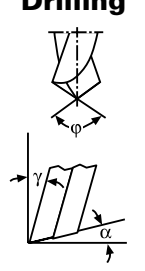

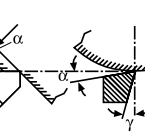


+ = Resistant (+) = Limited resistance - = Not resistant
(depending on concentration, time and temperature)

These values represent the average of a number of individual measurements. Unless otherwise stated the test results apply to injection moulded samples.

Processing of Plastics

Machining guidelines

		TECAMID TECAST	TECAFINE PE, PP, PMP	TECAFORM AH, AD	TECADUR PET, PBT	TECAMAT	TECANYL	TECAMID TR	TECARAN ABS	TECARLON ETFE PVDF, PTFE	TECASON S, P, E	TECAPEI	TECATRON	TECAPEEK	SINTIMID, PI	SINTIMID, TECATOR PAI	VESPEL*	Reinforced/filled ENSINGER materials*	
Sawing  alpha Clearance angle (°) gamma Rake angle (°) V Cutting speed m/min t Pitch mm	alpha	20 - 30	20 - 30	20 - 30	15 - 30	15 - 30	15 - 30	15 - 30	20 - 30	15 - 30	15 - 30	15 - 30	15 - 30	5 - 10	5 - 10	5 - 10	15 - 30		
	gamma	2 - 5	2 - 5	0 - 5	5 - 8	5 - 8	5 - 8	5 - 8	0 - 5	5 - 8	0 - 4	0 - 4	0 - 5	0 - 5	0 - 3	0 - 3	0 - 3	10 - 15	
	V	500	500	500 - 800	300	300	300	300	300	300	500	500	500 - 800	500 - 800	800 - 900	800 - 900	800 - 900	200 - 100	
	t	3 - 8	3 - 8	2 - 5	3 - 8	3 - 8	3 - 8	3 - 8	2 - 8	2 - 5	2 - 5	2 - 5	3 - 5	3 - 5	10 - 14	10 - 14	10 - 14	3 - 5	
Drilling  alpha Clearance angle (°) gamma Rake angle (°) phi Point angle (°) V Cutting speed m/min S Feed mm/rev The twist angle beta of the drill bit should be approx. 12° to 16°	alpha	5 - 15	5 - 15	5 - 10	5 - 10	8 - 10	8 - 10	8 - 10	10 - 12	10 - 16	3 - 10	3 - 10	5 - 10	5 - 10	5 - 10	5 - 10	5 - 10	6	
	gamma	10 - 20	10 - 20	15 - 30	10 - 20	10 - 20	10 - 20	10 - 20	10 - 30	5 - 20	10 - 20	10 - 20	10 - 30	10 - 30	5 - 10	5 - 10	5 - 10	5 - 10	
	phi	90	90	90	90	90	90	90	130	90	90	90	90	120	120	90 - 120	90 - 120	120	
	V	50 - 150	50 - 150	50 - 200	50 - 100	50 - 100	50 - 100	50 - 100	50 - 200	150 - 200	20 - 80	20 - 80	50 - 200	50 - 200	80 - 100	80 - 100	80 - 100	80 - 100	
	S	0,1 - 0,3	0,1 - 0,3	0,1 - 0,3	0,2 - 0,3	0,2 - 0,3	0,2 - 0,3	0,2 - 0,3	0,2 - 0,3	0,1 - 0,3	0,1 - 0,3	0,1 - 0,3	0,1 - 0,3	0,1 - 0,3	0,02 - 0,1	0,02 - 0,1	0,05 - 0,15	0,1 - 0,3	
Milling  alpha Clearance angle (°) gamma Rake angle (°) chi Side angle (°) V Cutting speed m/min The feed can be up to 0.5 mm/tooth	alpha	10 - 20	10 - 20	5 - 15	5 - 15	10 - 20	10 - 20	10 - 20	5 - 10	5 - 15	2 - 10	2 - 10	5 - 15	5 - 15	2 - 5	2 - 5	2 - 5	15 - 30	
	gamma	5 - 15	5 - 15	5 - 15	5 - 15	5 - 15	5 - 15	5 - 15	0 - 10	5 - 15	1 - 5	1 - 5	6 - 10	6 - 10	0 - 5	0 - 5	0 - 5	6 - 10	
	V	250 - 500	250 - 500	250 - 500	300	300	300	300	300	250 - 500	250 - 500	250 - 500	250 - 500	250 - 500	90 - 100	90 - 100	90 - 100	80 - 100	
	chi	45 - 60	45 - 60	45 - 60	45 - 60	45 - 60	45 - 60	45 - 60	15	10	45 - 60	45 - 60	45 - 60	45 - 60	7 - 10	7 - 10	7 - 10	45 - 60	
Turning  alpha Relief angle (°) gamma Rake angle (°) chi Side angle (°) V Cutting speed m/min S Feed mm/rev The tip radius r must be at least 0.5 mm	alpha	6 - 10	6 - 10	6 - 8	5 - 10	5 - 10	5 - 10	5 - 15	10	6	6	6 - 8	6 - 8	2 - 5	2 - 5	2 - 5	6 - 8		
	gamma	0 - 5	0 - 5	0 - 5	0 - 5	6 - 8	6 - 8	6 - 8	25 - 30	5 - 8	0	0	0 - 5	0 - 5	0 - 5	0 - 5	0 - 5	2 - 8	
	chi	45 - 60	45 - 60	45 - 60	45 - 60	45 - 60	45 - 60	45 - 60	15	10	45 - 60	45 - 60	45 - 60	45 - 60	7 - 10	7 - 10	7 - 10	45 - 60	
	V	250 - 500	250 - 500	300 - 600	300 - 400	300	300	300	200 - 500	150 - 500	350 - 400	350 - 400	250 - 500	250 - 500	100 - 120	100 - 120	100 - 120	150 - 200	
	S	0,1 - 0,5	0,1 - 0,5	0,1 - 0,4	0,2 - 0,4	0,1 - 0,5	0,1 - 0,5	0,1 - 0,5	0,2 - 0,5	0,1 - 0,3	0,1 - 0,3	0,1 - 0,3	0,1 - 0,5	0,1 - 0,5	0,05 - 0,08	0,05 - 0,08	0,05 - 0,25	0,1 - 0,5	
Special measures	Heat before sawing: from 60 mm diameter TECAPEEK GF/PVX, TECATRON from 80 mm diameter TECAMID 66 GF, TECADUR PET/PBT from 100 mm diameter TECAMID 6 GF, 66, 66 MH																		
	Heat before drilling in the centre: from 60 mm diameter TECAPEEK GF/PVX, TECATRON GF/PVX from 80 mm diameter TECAMID 66 MH, 66 GF, TECADUR PET/PBT from 100 mm diameter TECAMID 6 GF, 66, TECAM 6 Mo, TECANYL GF																		
	Preheat material to 120 °C						Caution when using coolants: susceptible to stress cracking						Use carbide-tipped tools						

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

I 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.

I 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. 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.

I 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 4 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. (Figures 2 and 3).

2. Milling

For plane 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. 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

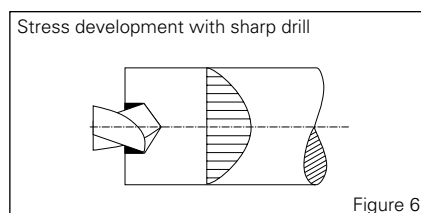
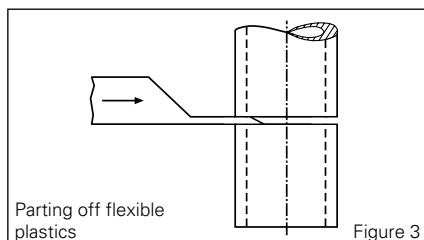
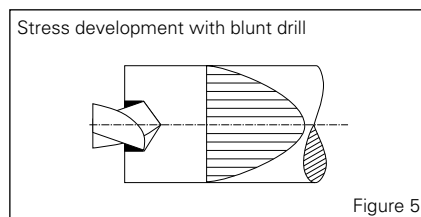
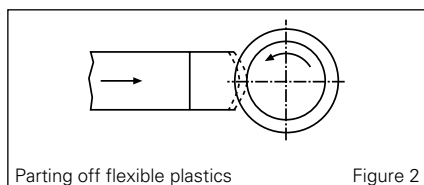
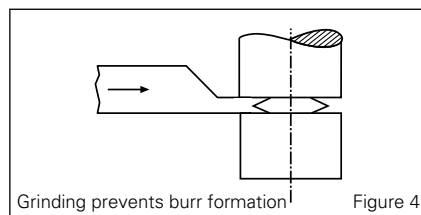
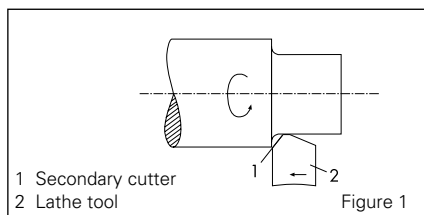
Threads are best cut using thread chasers. Burr formation can be avoided by using twin-toothed chasers.

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.



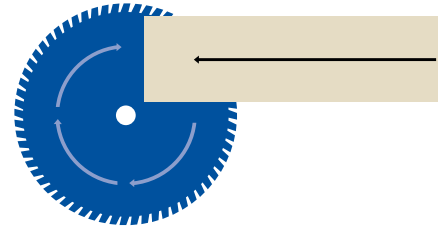
* Our applications advice, both written and oral, is intended to help you in your work. It must be regarded as a recommendation without obligation, also with respect to possible third-party property rights. We can assume no liability for any damage occurring during machining.

Flexible and versatile – the finished solution for your application.

Semi-finished products can be further processed to meet individual requirements. We have available all the necessary manufacturing techniques within our production facilities.

I Cutting:

Small blocks and billets are cut at right-angles and exactly to size by numerically controlled machines.



Rod cutting

Diameter:	3 – 150 mm	50 – 360 mm
Smallest length:	10 mm (5 mm on request)	20 mm
Length tolerances:	+/- 0,1 mm	+/- 0,5 mm

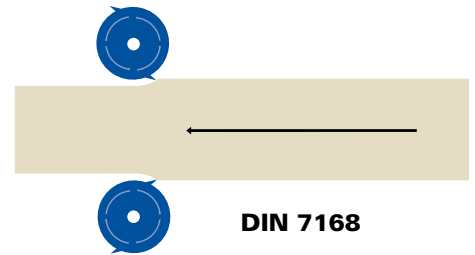
Plate cutting

Length:	from 20 – 3200 mm
Width:	from 10 – 1200 mm
Thickness:	from 1 – 120 mm

Tolerances unfilled materials: +/- 0,3 mm
Tolerances materials filled with glass fibres: +/- 0,5 mm

I Planing:

Parallel planing is performed on 2 sides. Angular planing is performed on 4 sides. Very close tolerances and optimum surface finishes are possible even with fibre-reinforced plastics.

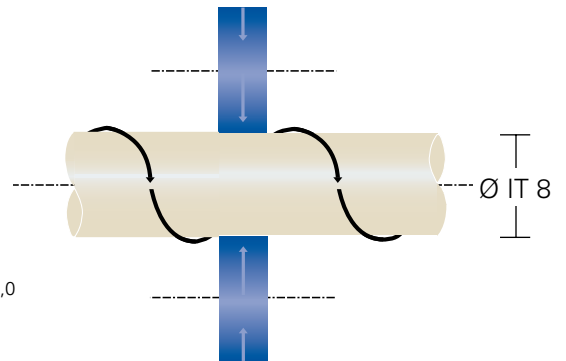


I Grinding:

Rods, heavy and thin wall tubes are ground to give an excellent surface finish characterised by close tolerances. In special cases rods may be ground to IT 7 tolerance. They have very good concentricity properties.

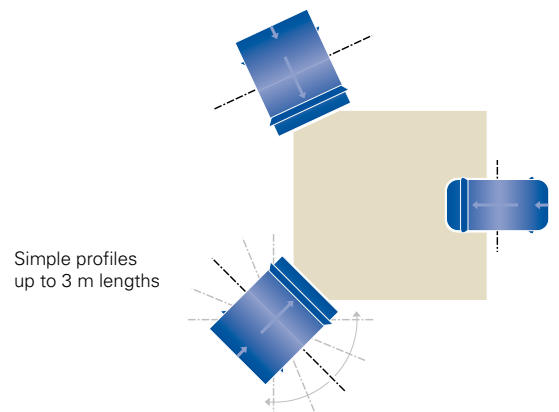
Tolerances:	to 30 mm Ø	h9
	30 - 50 mm Ø	h11

Diameter: 2 - 60 mm
Max. surface quality: Ra 1,0



I Profiling:

Even small quantities of a semi-finished product can be further processed at short notice by profile planing. The finished products have simple geometries and good dimensional and positional tolerances.



Important notes on the ENSINGER product range.

Publication of this brochure supercedes and invalidates all previous issues. You can find current changes under www.ensinger-online.com.

You can order semi-finished products with alternative fillers and reinforcing agents and other filler contents than specified (e.g. with bronze, talcum, MoS₂, graphite, mica, PTFE, PE, wax or silicon oil, etc.).

Colours are also possible. We can naturally also extrude plastics not listed here for you. If no alternative colours are given, ENSINGER plastics are produced in their natural colour.

Please send us your enquiry.

We will be happy to quote for solid or hollow profiles manufactured to your drawings.

All our products are supplied annealed for stress relief.

Warranty Clause

Our applications advice, both written and verbally, 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 – and does not relieve you of the necessity to carry out your own practical tests of the products as to their suitability for the intended purposes and applications. The descriptions of production processes contain no statement on liability for any damage. If any liability is incurred by us, damages shall be limited to the value of the products supplied and employed.

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www.plastic-metal.com

This product range contains only dimensions in metric units. Dimensions in imperial units (inch) are also available. Please ask us. The weights indicated are purely arithmetic values calculated from the density and the mean value of the tolerance dimensions.

The stock length of our rods, plates tubes and profiles is 3000 mm.

For sheets with a thickness from 1 to 4 mm and for our materials SINTIMID and TECAST, please refer to the tables for different stock sizes. Extruded heavy wall tubes can be supplied up to 500 mm outside diameter, centrifugally cast polyamide tubes up to 710 mm, compression moulded rings up to 1520 mm. Other delivery lengths, sections and discs are also available. Please let us have your enquiry. Rods, heavy and thin wall tubes can also be supplied with outside diameters ground to other special dimensions. Intermediate sizes or different tolerances can also be supplied.

Semi-finished product tolerances conform to the following DIN standards:

Rods: DIN 16 980.

Plates: DIN 16 986.

Tubes: DIN 16 809, 16 978, 16 983.

Our technical terms of supply are based on DIN standards, e.g. DIN 16 985.

Please note that modified materials are not standard and that the tolerances quoted by us should be used as a guide only.

We reserve the right to incorporate modifications in line with technical developments.

Exclusion of liability

Our information and statements do not constitute a promise or guarantee whether these are express or inferred. They are in accordance with the present state of our knowledge and are intended to provide information about our products and the possibilities for their use. Any Information supplied is therefore not intended as a legally binding assurance or guarantee of the chemical resistance, the nature of the products or the marketable nature of the goods.

The suitability for the end use of the products are influenced by various factors such as choice of materials, additions to the material, design of shaped parts and tools, and processing or environmental conditions. Unless otherwise indicated, the measured values are guideline values which are based on laboratory tests under standardized conditions. The information provided does not, alone, form any sufficient basis for component or tool design. The decision as to the suitability of a particular material or procedure or a particular component and tool design for a concrete purpose is left exclusively to the customer in question. Suitability for a specific purpose or a particular use is not assured or guaranteed on a legally binding basis, unless we have been informed in writing about the specific purpose and conditions of use and we have confirmed in writing that our product is suitable for this purpose within the conditions notified.

The nature of our products conform to statutory provisions valid in Germany at the time of the transfer of risk, in so far as these statutory provisions contain regulations regarding the nature of these products specifically. The customer must expressly point out in writing

that he intends to export our products – after processing or installation if applicable – only then will we confirm the suitability for export expressly in writing, will we also ensure compliance with the export regulations of the European Union, its member states, the other states who are signatory to the agreement on the European Economic Area (Norway, Iceland, Liechtenstein) and Switzerland and the USA. We are not obliged to take any steps to comply with the statutory regulations of other states.

We are responsible for ensuring that our products are free from any rights or claims by third parties based on commercial or other intellectual property (patents, patented designs, registered designs, authors' rights and other rights). This obligation applies for Germany; it also applies for the other member states of the European Union and the other states who are signatory to the agreement on the European Economic Area and Switzerland and the USA. Only if the customer expressly points out to us in writing that he intends to export our products – after processing or installation if applicable - and we expressly confirm in writing that the products can be exported will we accept any liability for states other than those listed.

We reserve the right to make changes to the design or form, deviations in colour and changes to the scope of delivery or service in so far as the changes or deviations are reasonable for the customer whilst taking our interests into account.

Our products are not destined for use in medical and dental implants.

Ultraform® Ultrason® Ultradur® Ultralon® Ultramid® Terluran® are registered trade marks of BASF AG.
Makrolon® Pohan® Durethan® Novodur® are registered trade marks of BAYER AG.
TPX® Halar® are registered trade marks of MITSUI.
Delrin® Crastin® VESPEL® Zytel® Teflon® Tefzel® are registered trade marks of DuPont.
Grivory® Grilon® are registered trade marks of EMS-Chemie AG.
Arnitel® Arnite® Stanyl® Akulon are registered trade marks of N.V. DSM.
Vestamid Trogamid are registered trade marks of DEGUSSA HÜLS AG.
Kynar® Voltalef® Rilsan® are registered trade marks of ATOFINA.
Udel® Radel® Torlon® Solef® are registered trade marks of Solvay SA.
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Fortron® Hostaform® are registered trade marks of TICONA GmbH.
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PEEK-CLASSIX™ and Invibio® are registered trade marks of Invibio Ltd.
Vespele® is a registered trade mark of DuPont de Nemours and Company.

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www.plastic-metal.com

General Terms of Delivery of ENSINGER GmbH

These General Terms of Delivery apply to our parent company in Germany.

If you obtain goods from one of our subsidiary or associate companies then their General Terms of Delivery will apply.

I. Scope, Rejection of external GDC

1. We provide goods and services solely on the basis of these General Terms of Delivery, no matter whether the case in question is based on a purchase agreement, work agreement or factory supply contract or any other contractual relationship. This also applies for future transactions.
2. We only agree to the inclusion of the General Terms and Conditions of our customers if we have expressly confirmed them in writing.

II. Technical Documentation, Moulds and Tools

1. If we send the customer technical documentation and specifications on our products, such as diagrams or technical drawings, then the customer is only allowed to use these for the purpose we intended and is not permitted to copy or give third parties access to them apart from government authorities and courts. We retain the title and copyright of such documentation. As requested by us, the customer has to return them to us immediately free of charge.
2. Providing no alternative agreement has been reached, moulds and any other tools remain our property, even if the customer bears the cost of them.

III. Material provision

If the customer has to provide materials, then these are to be supplied by him on time, at his risk and expense with an appropriate quantity surplus of at least 5% and of a quality suitable for its purpose and specification. If the customer provides too little or defective material or provides it late, then he is responsible for the additional costs resulting from this including those resulting from interruption in production, with the exception of cases of force majeure.

IV. Confirmation of order

1. The contract is made binding by our confirmation of order in so far as we confirm the transaction directly, by whatever means, after oral, written or telephonic negotiations and the customer is a commercial entity or, as an independent trader, does not only play a minor part in business life and concludes the transaction within the operations of his company.
2. This does not apply if we could not expect customer's consent or customer objects to our confirmation immediately.

V. Prices and Price Increases

1. Unless our prices and charges are agreed as fixed on ordering, our prices or remuneration rates shall be those valid on the day of delivery.
2. Our prices are set ex works and not including VAT. Packaging, transport and other additional services (such as customs clearance) will be charged separately.
3. For subsequent orders we are not bound by price agreements for preceding orders.
4. If part-deliveries are agreed to be delivered within a certain period of time or on certain dates or to be called off by the customer, then once 4 months after placing the order has passed, we reserve the right to increase the price for deliveries in accordance with our current pricing policy.
5. If the order is not executed within a year from it being placed, and this delay is not due to circumstances that are our responsibility, we reserve the right to increase the price with the customer to the same extent and to deliver the goods to complete the order and receive payment for the same.

VI. Terms of payment, offsetting

1. On complete receipt of payment within 14 days of the invoice date, we will grant a 2% discount on the amount invoiced deducting expenses listed in the invoice (e.g. transport).
2. If payment is delayed, interest of 5% above the base rate, or if the customer is a trading company or business, 8% above the base rate, shall be paid on our remuneration. This shall not affect our claim for further damages.
3. We accept bills of exchange and cheques only for payment purposes. The customer bears the cost of discounting and collection. In the case of payment by bill, we will not grant any cash discount.
4. Payments are only effective when the sum of money is finally at our disposal. The customer may only offset undisputed or legally agreed liabilities against payments due to us under this contract.

VII. Performance time, delay, retention, place of performance, part services

1. Delivery times do not start until we have agreed with the customer on all details of execution and all conditions for the transaction. Delivery times do not begin until the materials and technical documentation to be provided by the customer have been received, including all authorisations, technical specifications and approval by the customer. An agreed delivery date is delayed by the period of time by which these pre-requisites are also delayed.
2. If our services are provided late, we are not considered to be in default as long as the delay is based on circumstances which we could not have predicted or prevented given a reasonable level of care and which we cannot overcome by taking reasonable measures.
3. As long as the customer does not fulfil an obligation arising from the business relations, we have the right to defer our performance.
4. If the contract is a commercial transaction for the customer, he may only retain payment for the goods or services if we violate our obligations under the contract by gross negligence or our services are seriously deficient.
5. Placement and fulfilment for our performance is the supplier's plant in Nufingen.
6. We have the right to partial performance.

VIII. Bearing the Risk, Dispatch and Receipt

1. The risk for the goods is passed to the customer at the latest on dispatch of the goods to the customer. This also applies if we bear the transport costs for delivery. We are not obliged to insure the goods against in transit damage. If requested by the customer, we will insure the consignment against theft, transport damage as well as other insurable risks but the customer on placing the order must request this.
2. If dispatch is delayed for reasons beyond our control, then the risk for the goods is passed to the customer as soon as the goods are ready to dispatch.
3. The customer is to take delivery of the goods supplied, even if the goods are damaged, without affecting the customers' statutory rights. Defective goods are to be returned to us should we require it.

IX. Transport damage

1. The customer must give notification of damage caused in transport or losses immediately, or within twenty four hours of receipt of goods, and must leave the consignment for inspection to be viewed as soon as possible. This also applies if the transport damage does not become apparent until the goods are unpacked or at a later date.

X. Notice of defects and guarantee

1. The customer must notify us of obvious defects in our performance within a week of receipt of the same; if he misses this deadline, our performance shall be deemed to be in accordance with the contract. If the contract is a commercial transaction for the customer, then Clauses 377, 381 Para. 2 of the Commercial Code shall apply.
2. If our performance is deficient on transfer of risk, we shall meet this obligation subsequently, either, as we choose, by repairing the defect or by supplying an item free from defects in exchange for the defective item. Replaced parts become our property. If the attempt to meet this obligation fails, the customer may reduce payment to us or, as he chooses, withdraw from the contract. If a defect is maliciously concealed or if a guarantee is undertaken for the properties of the item, the statutory provisions will apply.
3. We do not take any responsibility for material supplied by the customer or obtained on the basis of specifications laid down by him or for structures specified by the customer.
4. Any claims on the part of the customer for subsequent fulfilment or for damages expenditure or compensation of expenditure due to defects shall expire, in the case of deliveries, a year from delivery of the goods. If we maliciously conceal the defect or have undertaken a guarantee regarding the properties of the item, the statutory provisions will apply.
5. If there is a consumer goods purchase on the part of the customer, the statutory provisions will apply.

XI. Damages and Statutory Limitation

1. If we should default in our performance, then we will compensate the customer the damages due to ordinary occurrences up to the amount of 1% of the price of the relevant goods ordered for every day of default, with a maximum payable by us of the total price of the relevant goods ordered. We will pay the full damages in the case of intent or gross negligence.
2. If we have to pay damages compensation instead of fulfilment, we will repay to the customer the damages occurring on the basis of the normal course of affairs up to the total sum of the relevant goods ordered. We will pay the full damages in the case of intent or gross negligence.
3. Otherwise we are only liable for gross negligence or intentional infringement of our obligations. This also applies to information provided, advice as well as to unauthorised actions during preparation, conclusion and processing the contract.
4. Our general partner, the managing directors and our employees are liable to the customer for unauthorised actions carried out during preparation, conclusion and processing the contract only in the case of intention or gross negligence.
5. Claims for damages by the customer against us, our directors and our staff arising from the violation of precontractual and contractual obligations and from unauthorised actions committed in the preparation, conclusion and handling of the contract shall lapse a year from the end of the year in which the claim arose and the customer obtained knowledge of the circumstances justifying the claim and the identity of the party liable or should have obtained such knowledge without gross negligence.
6. Any claims by the customer for damages or compensation due to injury to life, body or health based on an intentional or negligent violation of obligations and against the violation of other major obligations which are important by the nature of the contract and for the achievement of the contractual purpose shall remain unaffected in every respect.

XII. Withdrawal and assignment

1. If we do not render service despite its being due or - with the exception of a defect in our goods or services - do not render service in accordance with the contract, the customer may define a reasonable deadline for such service or for subsequent fulfilment. The deadline must allow us to complete the service that has already been started; generally, the deadline period may not be less than two weeks. If we nonetheless do not provide the service or subsequent fulfilment within a reasonable period of time, the customer may withdraw from the contract. This does not apply if the service or fulfilment is not provided due to circumstances beyond our control.
2. If the asset situation of the customer deteriorates materially, if an application for his insolvency is made or if insolvency proceedings have been started, we are entitled to withdraw from the contract.

3. The customer may only assign his rights under this contract without our prior agreement to insurance companies and only in so far as these undertake to pay the damages claimed by the customer. Clause 354 a of the Commercial Code remains unaffected.

XIII. Security

1. Notwithstanding delivery the property in the Goods shall not pass to the Buyer until the Buyer has paid in full the price of the Goods and all outstanding claims in connection with the business relationship.
2. Processing or working with the reserved property by the customer takes place free of charge for us without it resulting in any obligations for us; the new object becomes our property. If the goods are processed with other goods which do not belong to the customer, then we acquire co-ownership of the new object in the ratio of the value of the reserved property to the value of the other goods; in the case of mixing, combining or blending we acquire co-ownership according to legal provisions. If the customer acquires sole ownership through mixing, combining or blending, then he already transfers co-ownership to us now in the ratio of the value of the reserved property to the value of the other goods at the time of the mixing, combining or blending. In the above mentioned cases, the customer has to keep in safe custody and free of charge the objects which we are owners or co-owners of which are also reserved property in the sense of the following provisions.
3. The customer already assigns to us claims arising from resale of the reserved property to the value of the reserved goods with all ancillary rights. The corresponding applies if the reserved property is installed into the property of a third party as a key component. If we retain title to the reserved goods, then the claims are assigned to the amount that corresponds to the value of our share of the overall value. The assignment of future claims also covers a possible balance claim from the current account. The customer is authorised to collect the claim.
4. As long as the customer does not default in his obligations to us, he has the right to avail himself of the reserved property in the ordinary course of business and under retention of title, providing the claims according to fig. XI.3 are effectively transferred. Extraordinary dispositions, such as pledges, chattel mortgage and any assignments are not permitted. We must immediately be informed of access of third parties to the reserved property or assigned claims, in particular pledges.
5. If the customer is in default of a payment due to us for longer than a week or if he undergoes forfeiture of assets, where he in particular ceases payment, our claims shall become payable immediately and any deferral of payment ends. In these cases, we are entitled to take the retention goods and to revoke the collection authorisation. The customer is - with rights of retention excluded - obliged to return same. If the customer is a consumer, he only has to return the retained goods to us if we have withdrawn from the contract. The acceptance and seizure of the retained goods by us shall not be considered as a withdrawal from the contract, except in consumer credit transactions. All the costs of the recovery and realisation shall be borne by the customer; we are entitled to sell the goods in the open market. Upon request, the customer shall provide us immediately with a list of the liabilities assigned to us according to Fig. 3 and shall give us all further information and documents necessary to apply our rights and notify the party liable of the assignment.
6. We undertake to release securities as we choose if the realisable value exceeds the total of our claims under the business arrangement by more than 15%.
7. If the retention of title or the assignment is not legally effective according to the laws of the country which the goods are in, then the security which comes as close as possible to the retention of title or assignment is considered to be agreed, if according to this the co-operation of the customer is required, then he has to undertake all legal transactions necessary to establish and retain such rights.

XIV. Proprietary rights

If we have to render service on the basis of drawings, models, samples or using parts provided by the customer, the customer herewith states that this shall not violate the statutory rights of third parties. The customer releases us from any claims by third parties due to the violation of any rights and will reimburse us any damages arising and our costs and expenses. If the customer and/or we are forbidden to manufacture or deliver by a third party with reference to a proprietary right, we are entitled, without closer examination of the legal position, to cease the works.

XV. Legal system and legal venue

1. If any provision of these conditions and the further agreements reached are or become invalid this shall not affect the validity of the remaining conditions. The contract partners are obliged to replace the invalid provision by a provision that comes as close as possible to it in terms of commercial success.
2. German law shall apply excluding Collision Law and the United Nations Agreement on contracts for the international sale of goods (CISG).
3. If the customer is a commercial entity, legal entity in public law or a special fund under public law, then Nufingen is the legal venue for all disputes arising directly or indirectly from contractual relationships based on these General Terms of Delivery. For legal action against the customer, the court at the customer's registered offices is also competent locally.

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