



SAN DIEGO PLASTICS, INC.

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Engineering Plastics Stock Shapes



ENSINGER superior quality engineering plastics . . .

DELRIN®

DELRIN® is a family of acetal homopolymer resins whose properties include superior tensile properties, fatigue endurance, creep resistance, and toughness in comparison to acetal copolymers. It also exhibits low moisture absorption, and excellent chemical resistance to hydrocarbons, solvents and neutral chemicals. DELRIN is used in surface wear applications on conveyors, as bushings, fittings, and impellers, and is generally a superior bearing and wear material under load to acetal copolymer

■ Natural ■ Black ■ PTFE-filled ■ 20% Glass-filled

TECAFORM™

TECAFORM™ (acetal copolymer) offers good mechanical and bearing properties, plus dimensional stability, stiffness and low moisture absorption. Resistant to hydrocarbons, ketones, esters and hot water, TECAFORM is appropriate for general industrial applications such as bushings, rollers, and pulleys.

■ Natural ■ Black ■ PTFE-filled Homopolymer
■ Static Dissipative

TECAMID™

TECAMID™ is an extruded nylon family exhibiting excellent mechanical properties. Available as a standard in type 6/6, it is chemically resistant to hydrocarbons, ketone and esters. TECAMID™ is often used as bushings, bearings, pulleys and other wear parts.

■ Natural ■ Black ■ MoS₂ ■ 30% Glass Filled
■ Heat Stabilized ■ Super Tough

TECAST™

TECAST™ cast nylons exhibit an excellent combination of bearing properties, toughness, strength and light weight. Stock shapes are available in an almost limitless size range or can be cast to your custom configuration.

■ Natural ■ Black ■ Blue ■ Custom Colors
■ MDS ■ Graphite-filled ■ Oil-filled ■ High Heat

TECANAT™

TECANAT™ (polycarbonate) is an amorphous engineering plastic offering toughness, clarity and high heat-deflection temperatures. It often replaces metal, glass and wood in the automotive, medical, food and beverage, and electronic industries.

■ Natural ■ Black ■ 20% Glass-reinforced

TECAPET™ PET / HYDEX®4101 (PBT)

TECAPET™ and HYDEX® are semi-crystalline polyesters exhibiting excellent wear properties, low moisture absorption, and good mechanical properties as well as resistance to many chemicals, weathering and high energy radiation. It is used in water purification, food-handling equipment, and for pump and valve components.

■ Natural ■ Black

TECAFLON™ PVDF

TECAFLON™ PVDF combines typical fluoropolymer properties, with the mechanical properties of more rigid thermoplastics. Other properties include non-toxicity, high purity, a high heat-deflection temperature, and UV and gamma radiation resistance. TECAFLON™ PVDF is used in semi-conductor processing, chemical processing and heat exchangers.

■ Natural

TECARAN™ ABS

TECARAN™ ABS is a terpolymer which exhibits good impact and chemical resistance without sacrificing physical properties. TECARAN™ can be easily bonded and is often used in model shops for prototype parts. It is also a popular choice in the transportation, construction, computer and appliance markets.

■ Natural ■ Flame Retardant ■ Black

TECASON™ S

TECASON™ S (polysulfone) is a transparent engineering plastic known for its chemical and steam resistance, rigidity and high-temperature performance. TECASON™ S is ideal for medical, electrical, microwave, and electronic applications.

■ Natural

TECATRON™

TECATRON™ (PPS), a semi-crystalline engineering plastic that withstands almost all chemical contact up to 400°F, is inherently flame resistant and exhibits excellent electrical insulation properties. Its superior dimensional stability makes TECATRON™ ideal for valve and pump components.

■ Natural ■ 40% Glass-reinforced

TECASINT®

TECASINT® is a family of high-temperature, high-performance plastics which combine superior bearing and wear, mechanical, and electrical properties. Specific grades are available providing unique properties, such as high purity and low outgassing. TECASINT® is used in the semiconductor, aerospace, nuclear, heat transfer, electrical/electronics, and off-road vehicle industries.

■ Polyimides ■ Polyamide-imides

TECAPEEK™

TECAPEEK™ is a high-performance engineering plastic with a high operating temperature, excellent chemical and steam resistance, and superior mechanical and bearing properties. TECAPEEK™ is used in the nuclear, electronics, aerospace, petroleum, medical and analytical equipment industries.

■ Natural ■ Black ■ 30% Glass-reinforced
■ 30% Carbon-fiber-reinforced

TECATOR

TECATOR is a high-temperature polymer with excellent mechanical and wear properties for environments with a temperature greater than 500°F.

ULTEM®

ULTEM® is an amorphous polyetherimide combining excellent mechanical, thermal and electrical properties. These characteristics plus ULTEM®'s exceptional resistance to environmental forces suit it for applications in the medical, electrical, electronic, microwave and aircraft industries.

■ Natural ■ 30% Glass-reinforced ■ Black

NORYL®

NORYL®, an amorphous modified polyphenylene oxide, exhibits low moisture absorption and good electrical insulation properties over a wide temperature and humidity range. It has superior impact strength and long-term dimensional stability and is used in business equipment, appliance and electrical applications.

■ Black ■ 30% Glass-reinforced

POLYOLEFINS

POLYOLEFINS are a family of moderate strength, chemically resistant materials, such as polypropylene and high density polyethylene. Both materials can be used for liners, tanks, labware and medical devices. Polypropylene also finds applications in valve components and fittings.

■ Tecafine™ PP ■ Tecafine™ HDPE

ENSINGER Materials: Specifications and Standards

RESIN	ASTM RESIN SPECIFICATION	FDA	NSF*	USDA	3A	ASTM SHAPES SPECIFICATION
DELTRIN® 150	D6778-06 POM0111 & D4181-00 POM111	YES	YES	YES	YES	D6100-05 S-POM0111
DELTRIN® 150E BK602	D4181-98 POM100B44330 LD25	NO	NO	NO	NO	D6100-05 S-POM0111
DELTRIN® 570 20% GLASS	D6778-06 POM0110G20A22220 Z01 & D4181-00 POM110G20A29990,UM19, PM2.2, Z01	NO	YES	NO	NO	D6100-05 S-POM0100G201125453
HYDEX® 4101 PBT NAT	D5927-03 TPES0111	YES	NO	YES	NO	D6261-98 (2003) S-TPES0111
HYDLAR™ Z	D6779-07 PA0100 & D4066-01a PA0110	NO	NO	NO	NO	D5989-05 S-PA0101R1710000000
NORYL® EN265-701 BLK	D4349-96 (2004) PPE220B50541, F13, G1106	NO	NO	NO	NO	NONE
NORYL® 30% GLASS	D4349-96 (2004)PPE220G30A00000	NO	NO	NO	NO	NONE
TECASINT™	NONE	NO	NO	NO	NO	NONE
TECAFINE™ HDPE NAT	D4976-04a PE235	YES	NO	YES	NO	NONE
TECAFINE™ PP NAT	D4101-05 PP0210	YES	NO	YES	NO	NONE
TECAFLON™ PVDF	D3222-05 Type II	YES	YES	YES	NO	D6713-01 S-PVDF0110
TECAFORM™ Natural Copolymer	D6778-06 POM0211 & D4181-00 POM211	YES	YES	YES	YES	D6100-05 S-POM0211
TECAFORM™ Black Copolymer	D6778-06 POM0211 &D4181-00 POM211	YES	YES	YES	NO	D6100-05 S-POM0211
TECAFORM™ HPV-13	D4181-00 POM110L13A00000	YES	NO	YES	NO	D6100-05 S-POM0132
TECAMID™ 6/6 Natural	D6779-07 PA0110B54220 &D4066-01a PA0110B54220 &D4066-98 PA0114	YES	YES	YES	YES	D5989-05 S-PA0111
TECAMID™ 6/6 BLK	D6779-07 PA0110B54220 &D4066-01A PA0110B54220	NO	NO	NO	NO	D5989-05 S-PA0111
TECAMID™ MDS	D6779-07 PA0110L01A00000 &D4066-01A PA0110L01A00000	NO	NO	NO	NO	D5989-05 S-PA0121
TECAMID™ 6/6 GF30	D6779-07 PA0110G30A00000 &D4066-01A PA0110G30A00000	NO	NO	NO	NO	D5989-05 S-PA0101G3014444440
TECANAT™ PC NAT	D3935-02 PC0150B34740	YES	YES	YES	YES	D6098-97 (2003) S-PC0111
TECANAT™ PC BLK	D3935-02 PC0150B34740	YES	YES	YES	YES	D6098-97 (2003) S-PC0111
TECANAT™ 20% GF NAT	D3935-02 PC0110G20A33230	NO	NO	NO	NO	D6098-97 (2003) S-PC0100G2010000000
TECAPEEK™ NAT	D4000-08 PAEK; MIL-P-46183 Ty. I	YES	NO	YES	YES	D6262-05 S-PAEK0111
TECAPEEK™ BLK	D4000-08 PAEK	NO	NO	NO	NO	D6262-05 S-PAEK0111
TECAPEEK™ 30% GLASS	D4000-08 PAEK; MIL-P-46183 Ty. II Cl. 3, excp. Elong	NO	NO	NO	NO	D6262-05 S-PAEK0122
TECAPET™ PET NAT	D5927-03 TPES0211	YES	NO	YES	NO	D6261-98 (2003) S-TPES0211
TECARAN™ ABS NAT	D4673-02 ABS220B44500	YES	NO	YES	YES	NONE
TECARAN™ ABS BLK	D4673-02 ABS220B44500	YES	NO	NO	NO	NONE
TECASON™ P PPSU	D6394-07 SP0112	YES	YES	YES	YES	NONE
TECASON™ S Polysulfone	D6394-07 SP0311	YES	NO	YES	NO	NONE
TECAST™ 6PA NAT	L-P-410A. Amend. 4	YES	NO	YES	NO	D5989-05 S-PA0211
TECAST™ 6PA COLORS	NONE	NO	NO	NO	NO	D5989-05 S-PA0211
TECAST™ 6PAG	NONE	NO	NO	NO	NO	D5989-05 S-PA0200
TECAST™ 6PAL	NONE	NO	NO	NO	NO	D5989-05 S-PA0251
TECAST™ 6PALM	NONE	NO	NO	NO	NO	D5989-05 S-PA0200
TECAST™ 6PAM	L-P-410A. Amend. 4 WEAR RESISTANT	NO	NO	NO	NO	D5989-05 S-PA0220
TECAST™ 6PB	NONE	NO	NO	NO	NO	D5989-05 S-PA0200
TECAST™ 6XAU	NONE	NO	NO	NO	NO	D5989-05 S-PA0230
TECTOR	D5204-06 PAI0210	NO	NO	NO	NO	NONE
TECATRON™ PPS NAT	D6358-06 PPS000B33050	NO	NO	NO	NO	NONE
ULTEM® 1000 NAT	D5205-96 (2003) PEI0113	YES	YES	YES	NO	NONE
ULTEM® 2300 30% GLASS	D5205-96 (2003) PEI0110G30A96299, 159 Mpa, 224 Mpa 208oC	NO	YES	NO	NO	NONE

These specifications are current to the date at far right. * Resins used in stock shapes.
If your specifications are critical, please contact your Ensinger sales representative for any updates.

5/2009

Extruded Rod Availability

■ Normally Stocked

Approximate Weight

MATERIAL		Diameter in Inches - Standard Length 10 Feet																	
		3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2	1-5/8	1-3/4	1-7/8
DELTRIN®	Natural, Black	.017	.030	.047	.068	.093	.121	.154	.189	.273	.371	.485	.614	.758	.917	1.09	1.28	1.49	1.71
	570	.019	.033	.052	.075	.102	.133	.168	.207	.299	.407	.531	.672	.830	1.00	1.20	1.40	1.63	1.87
	AF Blend	.018	.033	.051	.074	.100	.131	.166	.205	.295	.401	.524	.664	.819	.991	1.18	1.38	1.61	1.84
TECAFORM™	Natural, Black	.017	.030	.047	.068	.093	.121	.154	.189	.273	.371	.485	.614	.758	.917	1.09	1.28	1.49	1.71
	SD	.016	.022	.045	.064	.087	.114	.144	.178	.257	.349	.456	.577	.713	.862	1.03	1.20	1.40	1.60
	HPV 13	.018	.033	.051	.074	.100	.131	.166	.205	.295	.401	.524	.664	.819	.991	1.18	1.38	1.61	1.84
TECAMID™	Natural, Black	.014	.024	.038	.055	.074	.097	.127	.152	.218	.297	.388	.491	.607	.734	.873	1.02	1.19	1.36
	MDS	.014	.024	.038	.055	.074	.097	.127	.152	.218	.297	.388	.491	.607	.734	.873	1.02	1.19	1.36
	Natural GF 30	.016	.029	.045	.065	.088	.115	.145	.179	.259	.352	.460	.582	.718	.869	1.03	1.21	1.41	1.62
TECANAT™	Natural	.014	.026	.040	.057	.078	.102	.129	.160	.230	.313	.409	.517	.638	.772	.919	1.08	1.25	1.44
	Natural GF 20	.016	.029	.045	.064	.087	.114	.144	.178	.257	.349	.456	.577	.713	.863	1.03	1.20	1.40	1.60
TECAPET™ PET	Natural	.016	.029	.045	.066	.089	.117	.148	.182	.262	.357	.466	.590	.729	.882	1.05	1.23	1.43	1.64
TECAFLON™ PVDF	Natural	.021	.038	.060	.085	.116	.151	.192	.237	.341	.464	.606	.767	.947	1.15	1.36	1.60	1.86	2.13
TECARAN™ ABS	Natural, Black	.013	.023	.035	.051	.069	.090	.114	.141	.203	.276	.361	.457	.564	.682	.812	.953	1.11	1.27
	Flame Retardant	.015	.027	.041	.060	.081	.106	.134	.165	.238	.324	.423	.536	.662	.800	.953	1.12	1.30	1.49
TECASON™ S	Natural	.015	.026	.041	.059	.081	.106	.134	.165	.238	.323	.422	.534	.660	.798	.950	1.11	1.29	1.48
TECATRON™	Natural	.016	.029	.045	.065	.088	.115	.145	.179	.259	.352	.460	.582	.718	.869	1.03	1.21	1.41	1.62
	Natural GF 40	.019	.035	.055	.079	.107	.140	.176	.217	.315	.428	.559	.707	.872	1.06	1.26	1.47	1.71	1.97
TECAPEEK™	Natural	.016	.028	.043	.062	.085	.111	.140	.173	.249	.339	.443	.560	.692	.837	.996	1.17	1.36	1.56
	Natural GF 30	.018	.032	.050	.072	.098	.128	.162	.200	.287	.391	.511	.646	.798	.966	1.15	1.35	1.56	1.80
	Natural CF 30	.017	.031	.048	.069	.094	.123	.156	.192	.276	.376	.491	.621	.767	.929	1.11	1.30	1.50	1.73
ULTEM®	Natural	.015	.021	.042	.061	.083	.108	.137	.169	.243	.331	.432	.547	.676	.817	.973	1.14	1.32	1.52
	Natural GF 10	.016	.022	.045	.064	.087	.114	.144	.178	.257	.349	.456	.577	.713	.862	1.03	1.20	1.40	1.60
	Natural GF 20	.017	.023	.047	.068	.093	.121	.153	.189	.272	.370	.483	.612	.756	.913	1.09	1.27	1.48	1.70
	Natural GF 30	.018	.025	.050	.073	.099	.128	.163	.201	.289	.394	.514	.650	.804	.971	1.16	1.36	1.57	1.81
NORYL®	Black EN 265	.013	.023	.035	.051	.069	.090	.114	.141	.203	.276	.361	.457	.564	.682	.812	.953	1.11	1.27
	GF 30	.017	.030	.045	.065	.089	.115	.146	.234	.260	.354	.463	.586	.724	.875	1.04	1.22	1.42	1.63
TECAFINE™ PP	Natural	.012	.019	.030	.043	.059	.076	.097	.119	.172	.234	.306	.388	.479	.579	.688	.808	.941	1.08
TECAFINE™ HDPE	Natural	.015	.020	.032	.046	.063	.081	.103	.126	.182	.248	.324	.411	.508	.614	.729	.856	.997	1.14
TECASINT®	Natural	.016	.022	.045	.064	.087	.114	.144	.178	.257	.349	.456	.577	.713	.862	1.03	1.20	1.40	1.60
	15% graph	.017	.030	.047	.068	.093	.121	.154	.189	.273	.371	.485	.614	.758	.917	1.09	1.28	1.49	1.71

Ensinger™ welcomes inquiries regarding engineering plastics other than those listed above.

Standard Length - up to 4-3/4" - 10 ft. 5" and larger - 5 ft.
Other diameters and tolerances are available on a custom-order basis.

Diameter	Tolerances	
3/16" - 1"	+ 0.002"	-0.000"

(pounds per foot)

Diameter in Inches - Standard Length 10 or 5 Feet

	2	2-1/8	2-1/4	2-3/8	2-1/2	2-5/8	2-3/4	2-7/8	3	3-1/4	3-1/2	3-3/4	4	4-1/4	4-1/2	4-3/4	5	5-1/2	6	6-1/2	7	7-1/2	8
	1.94	2.19	2.46	2.74	3.03	3.34	3.67	4.01	4.37	5.12	5.94	6.82	7.76	8.76	9.83	11.0	12.1	14.7	17.5	21.5	24.8	28.4	32.2
	2.12	2.40	2.74	3.00	3.32	3.66	4.02	4.39	4.78	5.61	6.51	7.47	8.50	9.59	10.8	12.0	13.3	16.1	19.1	22.4	26.0	29.9	34.0
	2.10	2.37	2.65	2.96	3.28	3.61	3.97	4.33	4.72	5.54	6.42	7.37	8.39	9.47	10.6	11.8	13.1	15.9	18.9	22.2	25.7	29.5	33.6
	1.94	2.19	2.46	2.74	3.03	3.34	3.67	4.01	4.37	5.12	5.94	6.82	7.76	8.76	9.83	11.0	12.1	14.7	17.5	21.5	24.8	28.4	32.2
	1.83	2.06	2.31	2.57	2.85	3.14	3.45	3.77	4.11	4.82	5.59	6.42	7.30	8.24	9.24	10.3	11.4	13.8	16.4	19.3	22.4	25.7	29.2
	2.10	2.37	2.65	2.96	3.28	3.61	3.97	4.33	4.72	5.54	6.42	7.37	8.39	9.47	10.6	11.8	13.1	15.9	18.9	22.2	25.7	29.5	33.6
	1.55	1.75	1.97	2.19	2.43	2.67	2.94	3.21	3.49	4.10	4.75	5.46	6.21	7.01	7.86	8.76	9.71	11.7	14.0	16.4	19.0	21.8	24.8
	1.55	1.75	1.97	2.19	2.43	2.67	2.94	3.21	3.49	4.10	4.75	5.46	6.21	7.01	7.86	8.76	9.71	11.7	14.0	16.4	19.0	21.8	24.8
	1.84	2.08	2.33	2.59	2.87	3.17	3.48	3.80	4.14	4.86	5.63	6.46	7.35	8.30	9.31	10.4	11.5	13.9	16.6	-	-	-	-
	1.63	1.85	2.07	2.30	2.55	2.81	3.09	3.88	4.00	4.32	5.01	5.75	6.54	7.38	8.27	9.22	10.2	12.4	14.7	17.3	20.0	23.0	26.2
	1.83	2.06	2.31	2.57	2.85	3.14	3.45	3.77	4.11	4.82	5.59	6.42	7.30	8.24	9.24	10.3	11.4	13.8	16.4	19.3	22.4	25.7	29.2
	1.87	2.11	2.36	2.63	2.91	3.21	3.53	3.86	4.20	4.93	5.71	6.56	7.46	8.43	9.45	10.5	11.7	14.1	16.8	21.5	22.9	26.2	-
	2.42	2.74	3.09	3.42	3.79	4.18	4.58	5.06	5.41	6.40	7.42	8.52	9.80	11.0	12.3	13.7	15.2	18.3	21.8	25.7	29.7	34.1	38.8
	1.44	1.63	1.83	2.04	2.26	2.49	2.73	2.98	3.25	3.81	4.42	5.07	5.77	6.52	7.31	8.14	9.02	10.9	13.0	15.1	17.7	20.3	23.1
	1.69	1.91	2.15	2.39	2.65	2.92	3.20	3.50	3.81	4.47	5.18	5.95	6.77	7.64	8.58	9.55	10.6	12.8	15.2	17.7	20.8	23.8	27.1
	1.69	1.91	2.14	2.38	2.64	2.91	3.19	3.49	3.80	4.46	5.17	5.94	6.76	7.63	8.55	9.53	10.6	12.8	15.2	17.8	20.7	23.8	27.0
	1.84	2.08	2.33	2.59	2.87	3.17	3.48	3.80	4.14	4.86	5.63	6.46	7.35	8.30	9.31	10.4	11.5	13.9	16.6	-	-	-	-
	2.24	2.53	2.83	3.15	3.49	3.85	4.23	4.62	5.03	5.90	6.84	7.85	8.93	10.1	11.3	12.6	14.0	16.9	20.2	-	-	-	-
	1.77	2.00	2.24	2.50	2.77	3.05	3.53	3.66	3.98	4.68	5.42	6.22	7.08	7.99	8.96	9.99	11.1	13.4	15.7	-	-	-	-
	2.04	2.31	2.59	2.88	3.19	3.52	3.86	4.22	4.60	5.39	6.26	7.18	8.17	-	-	-	-	-	-	-	-	-	-
	1.96	2.22	2.49	2.77	3.07	3.38	3.71	4.06	4.42	5.18	6.02	6.90	7.86	-	-	-	-	-	-	-	-	-	-
	1.73	1.95	2.19	2.44	2.70	2.98	3.27	3.57	3.89	4.57	5.30	6.78	6.92	7.81	8.76	9.76	10.8	13.1	15.6	17.7	21.2	25.0	27.7
	1.83	2.06	2.31	2.57	2.85	3.14	3.45	3.77	4.11	4.82	5.59	6.42	7.30	8.24	9.24	10.3	11.4	13.8	16.4	19.3	22.4	25.7	29.2
	1.93	2.18	2.45	2.73	3.02	3.33	3.66	3.99	4.35	5.11	5.93	7.58	7.74	8.73	9.79	10.9	12.1	14.6	17.4	20.5	23.7	27.2	31.0
	2.06	2.32	2.60	2.90	3.21	3.54	3.89	4.24	4.63	5.43	6.30	8.06	8.23	9.29	10.4	11.6	12.8	15.6	18.5	21.8	25.2	28.9	32.9
	1.44	1.63	1.83	2.04	2.26	2.49	2.73	2.98	3.25	3.81	4.42	5.07	5.77	6.52	7.31	8.14	9.02	10.9	13.0	15.1	17.7	20.3	23.1
	1.85	2.09	2.35	2.62	2.90	3.19	3.50	3.82	4.17	4.89	5.67	6.50	7.40	8.37	9.38	10.4	11.6	14.0	16.7	19.4	22.7	26.0	29.6
	1.23	1.38	1.55	1.73	1.91	2.11	2.32	2.53	2.76	-	3.75	4.31	4.90	5.53	6.21	6.95	7.64	9.28	11.1	12.9	15.0	17.2	19.6
	1.30	1.46	1.64	1.83	2.02	2.24	2.46	2.68	2.93	3.52	3.98	4.57	5.19	5.86	6.58	7.37	8.10	9.84	11.8	13.7	15.9	18.2	20.8
	1.83	2.06	2.31	2.57	2.85	3.14	3.45	3.77	4.11	4.82	5.59	6.42	7.30	8.24	9.24	10.3	11.4	13.8	16.4	19.3	22.4	25.7	29.2
	1.94	2.19	2.46	2.74	3.03	3.34	3.67	4.01	4.37	5.12	5.94	6.82	7.76	8.76	9.83	11.0	12.1	14.7	17.5	20.5	23.8	27.3	31.1

Diameter	Tolerances	
Over 1"-2"	+ 0.005"	-0.000"

Diameter	Tolerances	
Over 2"- 2-7/8"	+ 0.030"	-0.000"

Diameter	Tolerances	
Over 2-7/8"- 8"	+ .250"	-0.000"

Extruded Plate Availability ■ Normally Stocked Approximate Weight

MATERIAL		Thickness in Inches - Standard Size 24" x 48"																
		1/32	1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1	1-1/4	1-1/2	1-3/4	2
DELTRIN®	Natural, Black	.231	.463	.694	.925	1.39	1.85	2.31	2.78	3.70	4.63	5.56	6.49	7.41	9.27	11.1	13.0	14.8
	570*	-	-	-	-	-	2.03	2.54	3.04	4.06	5.07	6.09	7.10	8.12	10.1	12.2	14.2	16.2
	AF Blend	-	-	-	-	-	2.00	2.50	3.00	4.01	5.01	6.01	7.01	8.01	10.0	12.0	14.0	16.0
TECAFORM™	Natural, Black	.231	.463	.694	.925	1.39	1.85	2.31	2.78	3.70	4.63	5.56	6.49	7.41	9.27	11.1	13.0	14.8
	SD	-	-	-	-	-	1.85	2.23	2.62	3.48	4.36	5.23	6.10	6.97	8.72	10.5	12.2	13.9
	HPV 13	-	-	-	-	-	2.00	2.50	3.00	4.01	5.01	6.01	7.01	8.01	10.0	12.0	14.0	16.0
TECAMID™	Natural, Black	.185	.370	.555	.740	1.11	1.48	1.85	2.22	2.97	3.71	4.45	5.19	5.93	7.41	8.90	12.3	11.9
	MDS	.185	.370	.555	.740	1.11	1.48	1.85	2.22	2.97	3.71	4.45	5.19	5.93	7.41	8.90	12.3	11.9
	Natural GF 30*	.254	.486	.748	1.01	1.59	1.75	2.20	2.64	3.52	4.39	5.27	6.15	7.03	8.79	10.6	12.3	14.1
TECANAT™	Natural, Black	-	-	-	-	-	1.56	1.95	2.34	3.12	3.90	4.68	5.46	6.24	7.80	9.36	10.9	12.5
	Natural GF 20*	-	-	-	-	-	1.74	2.18	2.61	3.49	4.36	5.23	6.10	6.97	8.71	10.5	12.2	13.9
TECAPET™ PET	Natural	.250	.480	.750	1.00	1.59	1.78	2.23	2.67	3.56	4.45	5.35	6.24	7.13	8.91	10.7	12.5	14.3
TECAFLON™ PVDF	Natural	.330	.630	.960	1.20	2.04	2.31	2.89	3.47	4.63	5.79	6.94	8.10	9.26	11.57	13.89	16.2	18.52
TECARAN™ ABS	Natural, Black	-	-	-	-	-	1.38	1.72	2.07	2.76	3.45	4.14	4.83	5.51	6.89	8.27	9.65	11.0
	Flame Retardant	-	-	-	-	-	1.62	2.02	2.43	3.24	4.05	4.86	5.67	6.46	8.08	9.70	11.3	12.9
TECASON™ S	Natural	.234	.447	.690	.930	1.45	-	-	2.42	3.23	4.03	4.84	5.64	6.45	8.06	9.68	11.3	12.9
TECATRON™	Natural	.258	.493	.758	1.02	1.61	1.75	2.20	2.64	3.52	4.39	5.27	6.15	7.03	8.78	10.6	12.3	14.1
	Natural GF 40*	-	-	-	-	-	2.14	2.66	3.21	4.28	5.33	6.40	7.47	8.53	10.7	12.8	14.9	17.0
TECAPEEK™	Natural	.243	.465	.315	.965	1.52	1.69	2.11	2.54	3.38	4.23	5.07	5.92	6.76	8.45	10.1	11.8	13.5
	Natural GF 30*	-	-	-	-	-	1.95	2.44	2.93	3.90	4.88	5.85	6.83	7.80	9.75	11.7	13.7	15.6
	Natural CF 30*	-	-	-	-	-	1.87	2.34	2.81	3.74	4.68	5.62	6.56	7.49	9.36	11.2	13.2	15.0
ULTEM®	Natural	.234	.447	.690	.930	1.46	1.75	-	2.50	3.30	4.13	4.96	5.78	6.61	8.26	9.91	11.6	13.2
	Natural GF 10*	-	-	-	-	-	-	-	2.62	3.48	4.36	5.23	6.10	6.97	8.72	10.5	12.2	13.9
	Natural GF 20*	-	-	-	-	-	-	-	2.77	3.69	4.62	5.55	6.46	7.39	9.24	11.1	13.0	14.8
	Natural GF 30*	-	-	-	-	-	2.07	2.50	2.95	3.92	4.91	5.89	6.87	7.86	9.82	11.8	13.8	15.7
NORYL®	Black EN 265	.199	.380	.585	.790	1.24	1.38	1.72	2.07	2.76	3.45	4.14	4.83	5.51	6.89	8.27	9.65	11.0
	GF 30*	-	-	-	-	-	1.68	2.10	2.52	3.36	4.19	5.03	5.87	6.71	8.39	10.1	11.7	13.4
TECASINT®	Natural	-	-	-	-	-	-	-	2.62	3.48	4.36	5.23	6.10	6.97	8.72	10.5	12.2	13.9
	15% graph	.231	.463	.694	.925	1.39	1.85	2.31	2.78	3.70	4.63	5.56	6.49	7.41	9.27	11.1	13.0	14.8

(lbs. per sq. ft.)

					24" x 48" and 12" x 48"			
	2-1/4	2-1/2	2-3/4	3	3-1/4	3-1/2	3-3/4	4
	16.7	18.5	20.4	22.2	24.1	26.0	27.8	29.7
	18.3	20.3	22.3	24.4	26.4	28.4	30.4	32.5
	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.1
	16.7	18.5	20.4	22.2	24.1	26.0	27.8	29.7
	15.7	17.4	19.2	20.9	22.7	24.4	26.2	27.9
	18.0	20.0	22.0	24.0	-	-	-	-
	13.3	14.8	16.3	17.8	19.3	20.8	22.2	23.7
	13.3	14.8	16.3	17.8	19.3	20.8	22.2	23.7
	15.8	17.6	19.3	21.1	22.9	24.6	26.4	28.1
	14.1	15.6	17.2	18.7	20.3	21.9	23.4	25.0
	15.7	17.4	19.2	20.9	22.7	24.4	26.1	27.9
	16.0	17.8	19.6	21.4	23.2	25.0	26.7	28.5
	20.83	23.15	25.46	27.78	30.09	32.41	34.72	37.04
	12.4	13.8	15.2	16.5	17.9	19.3	20.7	22.1
	14.5	16.2	17.8	19.4	21.0	22.6	24.3	25.9
	14.5	16.1	17.7	19.4	21.0	22.6	24.2	25.8
	15.8	17.6	19.3	21.1	22.9	24.6	26.4	28.1
	19.2	21.4	23.6	25.5	27.7	29.9	32.1	34.1
	15.2	16.9	18.6	20.3	22.0	23.7	25.4	27.1
	17.0	19.0	20.8	22.7	24.6	26.5	28.4	30.2
	-	-	-	-	-	-	-	-
	14.9	16.5	18.2	19.8	21.5	23.1	24.8	26.4
	15.7	17.4	19.2	20.9	22.7	24.4	26.2	27.9
	16.7	18.4	20.3	22.1	24.0	25.8	27.7	29.5
	17.7	19.6	21.6	23.5	25.6	27.5	29.5	31.4
	12.4	13.8	15.2	16.5	17.9	19.3	20.7	22.1
	15.1	-	-	-	-	-	-	-
	15.7	17.4	19.2	20.9	22.7	24.4	26.2	27.9
	16.7	18.5	20.4	22.2	24.1	26.0	27.8	29.7

* Supplied unplanned

Extruded Plate Tolerances

Size	Thickness	Width	Length
1/32"	+0.003" - 0.003"	+0.500" - 0.000"	+1.000" - 0.000"
1/16"	+0.005" - 0.005"	+0.500" - 0.000"	+1.000" - 0.000"
3/32"	+0.007" - 0.007"	+0.500" - 0.000"	+1.000" - 0.000"
1/8"	+0.010" - 0.010"	+0.500" - 0.000"	+1.000" - 0.000"
3/16"	+0.025" - 0.000"	+0.500" - 0.000"	+1.000" - 0.000"
1/4"- 4"	+0.025" - 0.000"	+0.250" - 0.000"	+0.500" - 0.000"

Other thicknesses and tolerances are available on a custom-order basis.

Extruded Tube Availability

OD	ID	OD	ID	OD	ID	OD	ID	OD	ID
1.5"	1.00"	2.90"	2.00"	4.00"	1.00"	5.00"	1.00"	6.00"	1.00"
	1.25"		2.30"		1.25"		1.25"		1.25"
1.75"	1.00"	3.00"	1.00"	4.50"	1.50"	5.50"	1.50"	7.09"	1.25"
	1.25"		1.25"		1.50"		1.50"		1.50"
	1.50"		2.00"		2.00"		2.00"		2.00"
2.00"	1.00"	3.50"	2.00"	4.50"	2.30"	5.50"	2.30"	7.87"	2.50"
	1.25"		1.25"		1.50"		1.50"		1.50"
	1.50"		2.00"		2.00"		2.00"		2.00"
	2.00"		2.30"		2.30"		2.30"		2.30"
2.50"	1.00"	3.50"	2.50"	4.50"	2.50"	5.50"	2.50"	7.87"	2.50"
	1.25"		2.50"		2.50"		2.50"		2.50"
	1.50"		3.00"		3.00"		3.00"		3.00"

Available sizes and tolerances:

Material is sufficiently oversized (OD) or undersized (ID) to allow machining to the listed size. Minimum production runs may apply. Please call for custom sizes and formulations.

For additional information on Ensinger™ extruded engineering plastics -

- Standard Values of Ensinger™ Engineering Plastics (Pub. No. SV701/0408)
- Standard Values of Ensinger™ Reinforced Engineering Plastics (Pub. No. SV702/0408)
- Guidelines for Machining Ensinger™ Engineering Plastics (Pub. No. GM704/0408)
- Chemical Resistance of Ensinger™ Engineering Plastics (Pub. No. CR703/0408)

TECAST™ Cast Nylon Rods and Plates

Material:

- 6PA:** Type 6 cast nylon; natural, blue, black and OSHA orange. Other colors available on a custom-order basis.
- 6PAM:** Type 6 cast nylon with molybdenum disulfide filler; black
- 6XAU:** Type 6 cast nylon, heat stabilized; black
- 6PAG:** Type 6 cast nylon with graphite filler; black
- 6PAL:** Type 6 cast nylon, oil-impregnated; green
- 6PB:** Type 6 cast nylon, higher flexibility; OSHA orange

6PALM: Type 6 cast nylon with molybdenum disulfide and oil filler; midnight blue

Specifications:

- 6PA** meets or exceeds ASTM D-5989 S-PA0211
- 6PAM** meets or exceeds ASTM D-5989 S-PA0220
- 6PAL** meets or exceeds ASTM D-5989 S-PA0251
- Cast Type 6 (Blue or Black) meets or exceeds ASTM D-5989 SPA0211

TECAST™ Nylon Rods ■ Normally stocked Approximate Weight (lbs. per foot)

Material	Diameter Inches																			
	2	2-1/4	2-1/2	2-3/4	3	3-1/4	3-1/2	3-3/4	4	4-1/4	4-1/2	4-3/4	5	5-1/4	5-1/2	5-3/4	6	6-1/4	6-1/2	6-3/4
6PA 6PAG 6PAM 6PAL	1.56	1.99	2.45	2.97	3.52	4.14	4.79	5.51	6.26	7.07	7.93	8.84	9.80	10.8	11.8	12.9	14.1	15.3	16.5	17.9
6PALM 6XAU 6PB	1.56	1.99	2.45	2.97	3.52	4.14	4.79	5.51	6.26	7.07	7.93	8.84	9.80	10.8	11.8	12.9	14.1	15.3	16.5	17.9
	7	7-1/4	7-1/2	7-3/4	8	8-1/2	9	9-1/2	10	10-1/2	11	12	13	14	15	16	17	18	19	20
6PA 6PAM 6PAG	19.2	20.6	22.0	23.5	25.1	28.3	31.7	35.3	39.2	43.2	47.4	56.4	66.2	76.8	88.1	100	113	127	141	157
6XAU 6PB 6PALM	19.2	20.6	22.0	23.5	25.1	28.3	31.7	35.3	39.2	43.2	47.4	56.4	66.2	76.8	88.1	100	113	127	141	157

Standard Length:

2" through 9" diameter supplied in 5-ft lengths; over 9" diameter supplied in 1-ft. lengths. Ensinger reserves the right to supply 10% of any order in less than standard lengths.

Tolerances:

All diameters are oversized to permit machining to size. All lengths are +1", -0".

TECAST™ Cast Nylon Plates ■ Normally stocked Approximate Weight (lbs. per sq. ft.)

Material	Thickness Inches																				
	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	2-3/4	3	3-1/4	3-1/2	3-3/4	4	5
6PA 6PAM 6PAG	1.50	1.87	2.24	2.99	3.74	4.49	5.24	5.99	7.48	8.98	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.4	23.9	29.95
6PAL 6PALM 6XAU 6PB	1.50	1.87	2.24	2.99	3.74	4.49	5.24	5.99	7.48	8.98	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.4	23.9	29.95

- Most sizes and materials are available from stock.
- Capability up to 48" wide x 120" long, 3/8" and greater thickness
- Thickness planed up to 29" wide

- Widths less than 2' available on quotation

Tolerances:

	2' x 4'	4' x 10'
Thickness:	+ .025" - .000"	.375 - 1" - +.025". - .000" 1-1/4" - 1-3/4" - +.040", -.000" Over 1-3/4" - +.050". - .000"
Width:	+ .500" - .000"	
Length:	+ .500" - .000"	

TECAST™ Large Shape Capability

- Rings and discs up to 81" OD
- 5" thick plate
- Rectangular blocks up to 14" thick
- Other sizes and shapes available with tooling charge

TECAST™ Cast Nylon Tubes

OD and ID in inches

OD	ID	OD	ID	OD	ID	OD	ID	OD	ID	OD	ID	OD	ID	OD	ID	OD	ID					
2	1½	4	2½	5½	3½	6¾	5	8	7¼	9½	6	11½	5	15	13	18	12½					
	1¼		2¼		3¼		4¾		5½		6¾		7		8½		9½	10½	11½	12		
	1⅛		2		2¾		3		4		4¾		5¼		6		7	8	9	10	11	12
	1		1¾		2½		2¾		3¾		4		5		6		7	8	9	10	11	12
2¼	1¾	4¼	3¾	5¾	5	7	6¼	8½	7½	10½	9	13	10½	16	14	19	13½					
	1½		2¾		3½		4¾		5½		6¾		7¼		8		9	10	11	12		
	1¼		2		2¾		3		4		4¾		5¼		6		7	8	9	10	11	12
	1		1¾		2½		2¾		3¾		4		5		6		7	8	9	10	11	12
2½	2	4½	4	6	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	1¾		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	1½		3		4		5		6		7		8		9		10	11	12			
	1¼		2¾		3		4		5		6		7		8		9	10	11	12		
2¾	2¼	4½	3¾	6	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	2		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	1¾		3		4		5		6		7		8		9		10	11	12			
	1½		2¾		3		4		5		6		7		8		9	10	11	12		
3	2½	5	4¼	6½	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	2¼		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	2		3		4		5		6		7		8		9		10	11	12			
	1¾		2¾		3		4		5		6		7		8		9	10	11	12		
3¼	2½	5¼	4¼	6½	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	2¼		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	2		3		4		5		6		7		8		9		10	11	12			
	1¾		2¾		3		4		5		6		7		8		9	10	11	12		
3½	3	5½	4¼	6½	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	2¾		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	2½		3		4		5		6		7		8		9		10	11	12			
	2¼		2¾		3		4		5		6		7		8		9	10	11	12		
3¾	3	5¼	4¼	6½	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	2¾		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	2½		3		4		5		6		7		8		9		10	11	12			
	2¼		2¾		3		4		5		6		7		8		9	10	11	12		
4	3½	5½	4¼	6½	5¼	7¼	6½	9	7½	11½	10	14	11½	17	15	20	14½					
	3¼		3¾		4½		5½		6¾		7¼		8		9		10	11	12			
	3		3		4		5		6		7		8		9		10	11	12			
	2¾		2¾		3		4		5		6		7		8		9	10	11	12		

Cast Nylon Shapes

Prompt delivery on all TECAST™ cast nylon tubes

Available sizes and tolerances:

Diameter: Diameters listed are standard sizes. Common sizes are in stock for next day delivery. Other diameter combinations are available by quotation. Minimum production runs may apply. Material is sufficiently oversized (OD) or undersized (ID) to allow machining to the listed size.

Length: Standard length is 2 feet (+1/2", -0"). Some diameters are also readily available in 26 and 52 inch lengths. Also, many larger diameters can be provided in less than standard length. Details are available by quotation. Minimum production runs may apply.

TECAST™ Custom Cast Nylon Parts

Ensinger™ offers the option of custom castings to reduce material waste and machining time. TECAST™ castings, available in custom colors, weigh less than brass, bronze, or aluminum, and can be produced in complex shapes such as **wheels, sheaves, flanged bearings, and sprockets**. These custom cast nylon parts are used in heavy equipment, marine

equipment, and other industries where reduced weight, wear resistance, and corrosion resistance are essential. Ensinger™ can determine whether cast nylon can do a better job in applications or designs where cast aluminum, bronze, and brass have previously been used. Services such as finished machining and assembly are also offered.

Compression Molded Shapes

Not every application demands high volume production runs of standard materials. Smaller quantities of high-performance compounds may be required. In these cases, the economics and flexibility of compression molding may apply. Ensinger offers custom compounding and compression moldings of specialty high-performance engineering plastics. Near-net-shapes are available in a number of custom formulations based on materials such as PPS, polyimide, polyamide-imide, and PEEK™. Common shapes include rings, rods, plates, tubes and discs.

Ensinger welcomes both low and high volume inquiries regarding compression molding, along with custom requirements for materials and shapes other than those noted.

Ensinger's TECASINT™ materials can be direct-formed for higher-volume, smaller cross-sectional components. Direct-forming, while similar to compression molding, allows for tighter tolerance applications such as small thrust washers or seal rings.

Typical Fillers for Compression Molding Shapes

- Glass-fiber ■ Carbon-fiber
- Graphite ■ PTFE

Materials	Rod & Disc	Plate	Tube
PEEK™ Unfilled	Up to 26" diameter	Up to 3" thick	Up to 66" OD
PEEK™ Filled	Up to 26" diameter	Up to 3" thick	Up to 66" OD
PPS Filled	Up to 26" diameter	3" thick max	Up to 66" OD
PCTFE	Up to 45" diameter	2" thick max	Up to 66" OD
TECASINT™ Unfilled Polyimide 15% Graphite Filled 40% Graphite Filled	Up to 20" diameter	Up to 2" thick	66" OD max

ENSINGER Where Ideas Meet Technology!

Ideas meeting technology. It's an ongoing process at Ensinger.

Our proprietary extrusion, casting, and compression molding equipment combined with leading-edge technology enable us to produce the highest quality engineering plastics available today. Commitment to this kind of excellence has made it possible for Ensinger to offer design engineers a wide variety of engineering plastic shapes.

Unsurpassed quality always at Ensinger

Ensinger's process and equipment technology also plays a leading part in our unsurpassed product quality. To assure our customers that quality is constant throughout every aspect of our operation, we provide complete product traceability back to the base resin. By starting with premium grade resins and utilizing sophisticated process technology, we produce engineering plastics that not only meet but often exceed customer requirements. When needed, certificates of compliance are promptly provided by Ensinger. This dedication to providing quality materials was validated through the achievement of ISO 9001:2008 certification at our Washington, PA and Grenloch, NJ shapes extrusion facilities.

We solve product and application problems

Some applications require specific physical testing of materials. Our testing laboratory is equipped to analyze materials to make certain that they meet our customers' specifications. A direct 800 line provides technical support and answers to questions on chemical compatibility, product standards and specifications and material identification.

If a designer has an application in mind but isn't sure of its feasibility, Ensinger's marketing and application specialists will work alongside them to create solutions to problem applications.

Superior customer service is our standard

Ensinger products are brought to the market through a vast distribution network with worldwide locations. A computerized system provides our trained customer service representatives and field sales representatives with inventory information from all stocking facilities. With strategically located warehouses, both nationally and internationally, Ensinger quality products are always nearby.

Superior materials, processes, testing, application knowledge, and technical service are all part of the Ensinger business philosophy designed to meet our customers' current needs and anticipate the markets' constantly changing requirements.

This information is only to assist and advise you on current technical knowledge and is given without obligation or liability. All trade and patent rights should be observed. All rights reserved.

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