

# Material Properties

## Stock Shape Products for Machined Parts



Rods – 3/8" to 12" Diameter 96"   120"   Custom Size			Engineering Plastics								High Performance Plastics											
			Nylon 6/6	Nylon 6/6 30% Glass Fiber Filled	Nylon 6/6 MoS <sub>2</sub> Filled	Acetal-Copolymer	Acetal-Homopolymer	PET	PBT	Polycarbonate	Polycarbonate 20% Glass Fiber Filled	PEEK	PEEK 30% Glass Fiber Filled	PEEK 30% Carbon Filled	PEI - Ultem®	PEI - Ultem® 30% Glass Fiber Filled	Modified PPO - Noryl®	PPS	PFSU	Polysulfone	PVDF	
Plates – 3/8" to 5" Thick 12" x 48"   24" x 48"   Custom Size																						
Tubular Bars – Thickness >= 3/8" ID >= 2"   OD <= 20" Custom Size																						
Physical Properties																						
Specific Gravity	D792	g/cm3	1.14	1.34	1.16	1.41	1.42	1.34	1.31	1.2	1.35	1.32	1.5	1.4	1.27	1.51	1.08	1.35	1.29	1.24	1.78	
Melting Point	D3417	0 F	500	500	500	335	347	490	430	310	330	630	645	644	460	442	-	540	424	-	335	
Continuous Use Temp Limit	-	0 F	220	220	220	180	185	220	220	250	260	480	510	480	340	340	220	425	320	300	280	
Water Absorption/24 Hours	D570	%	1.2	0.7	1.0	0.2	0.25	0.1	0.25	0.15	0.16	0.1	0.1	0.1	0.25	0.16	0.07	0.02	0.37	0.30	0.03	
Water Absorption@ saturation	D570	%	8.5	5.5	8.5	0.9	0.9	0.7	0.4	0.35	0.29	0.5	0.3	0.3	1.25	0.9	0.2	0.03	1.1	0.6	0.05	
Mechanical Properties																						
Tensile Strength	D638	psi (k)	12	23	12	9.5	10	11.5	8	10	16	14	24	20	15.2	24.5	9.4	13	11	10.2	7	
Tensile Modulus	D638	psi (k)	410	1,200	475	400	450	400	250	325	860	500	1,300	1,100	430	1,300	350	480	340	360	250	
Tensile Elongation @ break	D638	%	60	6	50	40	40	50	100	75	5	20	3	5	60	3	30	4 to 5	60 to 120	50	100	
Flexural Strength	D790	psi (k)	15	16	17	12	14	15	8	13	19	25	28	25	22	33	13.4	21	13.2	15.4	8	
Flexural Modulus	D790	psi (k)	401	110	480	400	420	400	290	340	800	550	1,350	1,350	480	1,300	360	580	350	390	290	
Compressive Strength	D695	psi (k)	12.5	20	16	15	16	15	10.5	12	16	17	26	30	22	30.7	-	21	14	13.9	10.5	
Compressive Modulus	D695	psi (k)	420	-	420	400	450	420	-	-	-	500	-	-	480	-	-	-	-	-	-	
Rockwell Hardness	D785	M	M85	M100	M85	M88	M94	M95	M72	M72	M91	M110	M105	M102	M109	M114	-	M95	M80	M69	M75	
Rockwell Hardness	D785	R	R120	R122	R115	R120	R121	R120	-	R118	R122	R126	R126	R124	R123	R127	R120	R125	R120	R120	R84	
Izod Impact Notched	D256	ft.lb/inch	0.6	2.0	0.7	1.2	1.2	0.5	0.6	17	2.0	1.6	1.4	1.3	1.0	1.8	0.6	0.5	13.0	1.3	3.0	
Hardness, Durometer, Shore D	2240	-	D80	-	D85	D85	D86	D87	-	D80	D87	D85	D86	D93	D86	1	D86	D80	D80	D80	D77	
Shear Strength	D732	Psi (k)	10	-	10.5	8	9	8	-	9	-	7.7	14	-	15	-	-	9	9	9	-	
Coeff of Friction	-	ft.lb/inch	0.25	0.31	0.25	0.15	0.2	0.2	-	0.38	0.22	0.4	-	0.2	-	0.24	0.35	-	-	0.36	0.58	
Coeff of Linear Thermal Expansion	D696	in/0F (1.0E-5)	4.0 to 4.4	1.50	4 to 4.4	5.40	5.50	3.30	4.0	3.80	1.50	2.60	1.20	1.10	3.1	1.1	3.3	2.90	3.10	3.10	6.60	
Heat Deflection Temp @ 66 psi	D648	0 F	425	500	470	320	330	240	320	295	300	360	500	-	410	414	290	400	417	358	270	
Heat Deflection Temp @ 264 psi	D648	0 F	197	485	200	230	270	175	175	270	295	320	-	530	392	410	260	225	405	345	230	
Thermal Conductivity	C177	BTU-in/ft <sup>2</sup> -hr-F	1.7	2	1.7	1.6	2.5	1.8	1.4	1.3	1.47	1.74	2.98	6.3	1.0	1.8	1.6	2.0	2.42	1.75	0.75	
Flammability rating	UL94	-	V-2	HB	HB	HB	HB	HB	HB	HB	V-0	V-1	V-0	V-0	V-0	V-0	V-1	V-0	V-0	V-0	V-0	
Electrical Properties																						
Dielectric Strength	D149	Volts/mil	-	350	350	500	500	390	400	380	490	480	500	32	830	770	500	400	370	425	1600	
Dielectric Constant @ 1 MHz	D150	-	3.60	3.60	3.80	3.80	3.50	3.10	3.00	3.10	3.13	3.30	-	3.30	3.15	3.70	2.7	3.00	3.40	3.06	8.35	
Dissipation Factor @ 1MHz	D150	-	0.03	0.0016	0.02	0.005	0.0048	0.02	-	0.006	0.009	0.003	-	-	0.001	0.0015	0.001	0.001	0.0002	0.005	0.06	
Volume Resistivity	D257	ohm-cm	1.00E+15	1.00E+15	>1.0E+13	1.00E+15	1.00E+15	1.00E+16	> 1.0E13	>1.0E+13	1.00E+17	1.00E+15	1.00E+16	<1.0E+5	1.00E+17	3.00E+16	1.00E+17	4.50E+16	1.00E+16	5.00E+16	2.00E+14	
Compliance																						
FDA Compliance	-	-	yes	no	no	yes	yes	yes	yes	no	no	yes	no	no	yes	no	no	no	yes	yes	yes	

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