

SPECIFICATIONS OF OPTICAL GRADE POLYMERS AND GLASS



Technical Name	Acrylic (PMMA)	Polycarbonate (PC)	Polystyrene (PS)	Cyclic Olefin Copolymer (COC)	Cyclic Olefin Polymer (COP)	PolyEtherImide (PEI)	CROWN GLASS	FLINT GLASS
Common Trade Name	LUCITE, PLEXIGLASS, POLYCAST	LEXAN, MERLON	STYRON, LUSTREX	TOPAS	ZEONEX, ZEONOR	ULTEM	N-BK7	N-F2
Refractive Index:								
n_F (486.1nm)	1.498	1.599	1.604	1.540	1.537	1.689	1.522	1.632
n_d (587.6nm)	1.492	1.585	1.590	1.534	-	-	1.517	1.620
n_D (589.3nm)	1.492	1.585	1.590	1.534	1.530	1.682	1.517	1.620
n_C (656.3nm)	1.489	1.580	1.585	1.531	1.527	1.653	1.514	1.615
Rate of Index Change w/ Temp $dn_{abs}/dT \times 10^{-5} / ^\circ C$ Abbe Value (V_d)	-8.5 55 to 57	-11.8 to -14.3 30	-12 31	-10.1 56	-8 56	- 19	+0.16 64.17	+0.20 36.43
Transmission % Visible Spectrum Through 3.174mm	92	85-91	87-92	92	92	36-82	91.6	88.4
ΔHaze (%)	0.5 to 2	1 to 2	2 to 3	1 to 2	1 to 2	2	$\geq 0.3\%$ <1.0%	<0.3%
CTE: Coeff of Linear Expansion $\times 10^{-5} \text{ cm/cm}/^\circ C @ 70^\circ C$	6.74	6.6 to 7.0	6.0 to 8.0	6.0 to 7.0	6.0 to 7.0	4.7 to 5.6	20 $^\circ C$ 0.710	20 $^\circ C$ 0.784
Max Continuous Service Temp $T_{10}^{13.0}$	140 $^\circ F$ to 158 $^\circ F$ 60 $^\circ C$ to 70 $^\circ C$	255 $^\circ F$ 124 $^\circ C$	180 $^\circ F$ 82 $^\circ C$	266 $^\circ F$ 130 $^\circ C$	266 $^\circ F$ 130 $^\circ C$	338 $^\circ F$ 170 $^\circ C$	[$T_{10}^{13.0} - 200^\circ C$] 357 $^\circ C$	[$T_{10}^{13.0} - 200^\circ C$] 367 $^\circ C$
HDT: Heat Deflection Temp 3.6 $^\circ F$ /min @66psi [0.455MPa; annealed] 3.6 $^\circ F$ /min @264psi [1.82 Mpa; annealed]	214 $^\circ F$ /101 $^\circ C$ VS-100 177 $^\circ F$ 198 $^\circ F$ /92 $^\circ C$ VS-100 169 $^\circ F$	295 $^\circ F$ /146 $^\circ C$ 288 $^\circ F$ /142 $^\circ C$	230 $^\circ F$ /110 $^\circ C$ 180 $^\circ F$ /82 $^\circ C$	266 $^\circ F$ /130 $^\circ C$ 253 $^\circ F$ /123 $^\circ C$	266 $^\circ F$ /130 $^\circ C$ 263 $^\circ F$ /123 $^\circ C$	410 $^\circ F$ /210 $^\circ C$ 394 $^\circ F$ /201 $^\circ C$	- -	- -
Specific Gravity [water @ 72.5 $^\circ F$]	1.16 to 1.19	1.20 to 1.25	1.05 to 1.06	1.02 to 1.03	0.95 to 1.01	1.27	2.53	3.62
Hardness Impact Strength Notched Izod @ 73 $^\circ$ /23 $^\circ C$ (ft-Lbs/in notch)	Rockwell M97 0.3 to 0.5	Rockwell M70 12.0 to 17.0	Rockwell M90 0.35	Rockwell M89 0.5	Rockwell M89 0.5	Rockwell M109 0.6	Knoop 610 -	Knoop 420 -
Key Advantages	Scratch Resistance Chemical Resistance High Abbe # Excellent for Diamond Turning	Impact Strength Temperature Resistance	Clarity Low Cost	Low Moisture Absorption High Modulus Good Electrical Properties	Low Birefringence Chemical Resistance Completely Amorphous	Impact Resistance Thermal Resistance Chemical Resistance High Index		