

SPECIFICATIONS OF OPTICAL GRADE POLYMERS



Common Trade Names	Acrylic (PMMA)	Polycarbonate (PC)	Polystyrene (PS)	Cyclic Olefin Copolymer (COC)	Cyclic Olefin Polymer (COP)	PolyEtherImide (PEI)	Thermo-plastic Polyimide	AL-6261	AL-6263
	LUCITE, PLEXIGLASS, POLYCAST	LEXAN, MERLON	DYLENE, STYRON, LUSTREX	TOPAS	ZEONEX, ZEONOR	ULTEM	EXTEM	OKP4	OKP4HT
Refractive Index: n _F (486.1nm) n _d (587.6nm) n _D (589.3nm) n _c (656.3nm)	1.498 1.492 1.492 1.489	1.599 1.585 1.585 1.580	1.604 1.590 1.590 1.585	1.540 1.534 1.534 1.531	1.537 - 1.530 1.527	1.689 - 1.682 1.653	1.685 1.660 - 1.650	1.623 1.607 1.607 1.601	1.653 1.632 1.632 1.625
Rate of Index change w/Temp dn _{abs} /dT X 10 ⁻⁵ /°C Abbe Value (V_d)	-8.5 55 to 57	-11.8 to -14.3 30	-12 31	-10.1 56	-8 56	- 19	-9.1 19	-13 27	-11 23
Transmission % Visible Spectrum through 3.174mm	92	85-91	87-92	92	92	36-82	-	85-92	85-92
ΔHaze (%)	0.5 to 2	1 to 2	2 to 3	1 to 2	1 to 2	2	-	1	1
CTE: Coeff. of Linear Exp. X 10 ⁻⁵ cm/cm/°C @ 70°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	5.0	7.2	6.9
Max Continuous Service Temp T ₁₀ ^{13.0}	140°F to 158°F 60°C to 70°C	255°F 124°C	180°F 82°C	266°F 130°C	266°F 130°C	338°F 170°C	446°F 230°C	- -	- -
HDT: Heat Deflection Temp 3.6°F/min @66psi [0.455MPa; annealed] 3.6°F/min @264psi [1.82 Mpa; annealed]	214°F/101°C VS-100 177°F 198°F/92°C VS-100 169°F	295°F/146°C 288°F/142°C	230°F/110°C 180°F/82°C	266°F/130°C 253°F/123°C	266°F/130°C 263°F/123°C	410°F/210°C 394°F/201°C	482°F/250°C Unannealed 455°F/235°C Unannealed	222°F/106°C @1.8 Mpa -	253°F /123°C @1.8 Mpa -
Specific Gravity [water @ 72.5°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	1.31	1.22	1.26
Hardness	Rockwell M97	Rockwell M70	Rockwell M90	Rockwell M89	Rockwell M89	Rockwell M109	-	-	-
Impact Strength Notched Izod @ 73°/23°C (ft-Lbs/in notch)	0.3 to 0.5	12.0 to 17.0	0.35	0.5	0.5	0.6	0.8	0.75	1.24
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	High Fluidity High Thermal Resistance Chemical Resistance Low Abbe #	High Index Low Birefringence Low Abbe # High Fluidity	High Index Low Birefringence Low Abbe # High Fluidity