

Properties of Common Optical Polymers

	Unit	Acrylic	Acrylic Copolymer	Polystyrene	Polyetherimide	Poly-carbonate	Methyl-pentene	ABS	Cyclic Olefin Polymer	Nylon	NAS	SAN
Trade Name		Plexiglas	UVT	Styron	Ultem	Lexan	TPX	Acrylon	Zeonex	Polyamide	Methyl	Styrene Acrylonitrile
Refractive Index												
n_f (486.1 nm)		1.497	—	1.604	1.689	1.593	1.473		1.537		1.575	1.578
n_d (589 nm)		1.491	1.49	1.590	1.682	1.586	1.467	1.538	1.530	1.535	1.533–1.567	1.567–1.571
n_c (656.3 nm)		1.489	—	1.585	1.653	1.580	1.464		1.527		1.558	1.563
Abbe Value V_d		57.2	50–53	30.8	18.94	34	51.9		55.8		35	37.8
Transmission	% ¹	92–95	92–95	87–92	82	85–91	90	79–90.6 ²	90–92	88	90	88
Max Continuous Service Temp.	°F	161	190	180	338	255			253	179.6	199.4	174–190
	°C	72	88	82	170	124			123	82	93	79–88
Water Absorption	% ³	0.3	0.25	0.2	0.25	0.15			<0.01	3.3	0.15	0.2–0.35
Haze	%	1–2	2	2–3		1–3	5	12	1–2	7	3	3
dN/dT	x10 ⁻⁵ /°C	-8.5	-10 to -12	-12		-11.8–14.3			-8		-14	-11
Color/Tint		Water clear	Water clear	Water clear	Amber	Water clear	Slight yellow		Water clear		Water clear	Water clear
Key Advantages		High transmission & purity Scratch resistance Chemical resistance High Abbe value Low dispersion High melt flow	High transmission & purity Excellent UV properties 82% transmission at 294–301 nm, 1mm CT	High index Clarity	Impact resistance Thermal & chemical resistance High index	Impact strength Temperature resistance	Chemical resistance	Durable	Low moisture absorption High transmission & purity Good thermal stability	Chemical resistance	Good index range	Stable

¹ At 400–800 nm, 3 mm CT

² Uncoated luminous transmittance: 79% at thickness 6.35mm; 90.6% at thickness 0.381mm

³ Per 24 hours