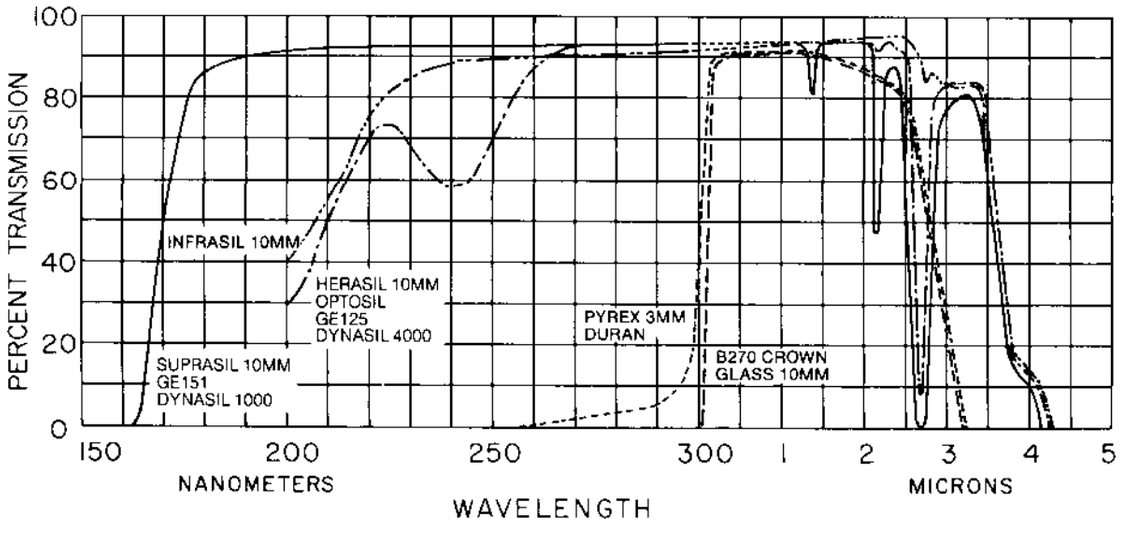
ROLYN OPTICS COMPANY

706 Arrowgrand Circle • Covina, California 91722 • (626) 915-5707 • FAX (626) 915-1379

PHYSICAL PROPERTIES OF COMMON OPTICAL MATERIALS

Listed below are several physical properties of some of the more commonly used optical materials. The B270 is most commonly used for simple lenses; BK7 for prisms and windows. Pyrex and Tempax are generally used as mirror substrates or wherever heat resistance and thermal stability are required. The various fused silicas are usually selected for thermal stability, heat resistance and spectral considerations.

The data shown below is of necessity limited in accuracy, completeness and consistency of presentation to what was available from the raw material manufacturers at time of printing. It is printed here merely as a convenience.



REFRACTIVE INDEX (n)								
Wavelength Angstroms	**Spectral Line**	**Color**	**Symbol**	**#523586 B270**	**#517645 BK7**	**Suprasil I Herasil I**	**Acrylic Plastic**	**Pyrex 7740**
6563	H	Red	nc=	1.5204	1.5143	1.4564		
6438	Cd	Red	nc´=	1.5209	1.5147	1.4567	1.490	1.473
5890	Na	Yellow	nD=	1.5230	1.5167	1.4584		
5876	He	Yellow	nd=	1.5231	1.5168	1.4585	1.491	1.474
5461	Hg	Green	ne=	1.5252	1.5187	1.4601	1.494	1.477
4861	H	Blue	nf=	1.5293	1.5224	1.4631		
4800	Cd	Blue	nf´=	1.5298	1.5228	1.4642	1.498	1.481
4358	Hg	Blue	ng=	1.5341	1.5267	1.4667		

Abbe Number	Vd=	58.8	64.2	67.7	57.2	60.2	60.2

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PHYSICAL PROPERTIES (cont'd)

THERMAL PROPERTIES	B270	BK7	Suprasil Herasil	Acrylic Plastic	Pyrex 7740	Tempax
Linear Coefficient of Expansion X 10^{-7} / °C(20 to 300)	95	71-83	5.5	3.6 x 10^{-5}	32.5	32.0
Thermal Conductivity Cal/m.h. °C		.92	1.19	5.0		1.0
Specific Heat Cal/g. °C (at 20 °C)		.20	.19	.35	.25	.20
Softening Point (°C) Viscosity (Poise)	708 $10^{7.6}$	720	1600		820	
Annealing Point (°C) Viscosity (Poise)	533 10^{13}	556	1120		565	568 10^{13}
Strain Point (°C) Viscosity (Poise)	505 $10^{14.5}$	528	1025		515	510 $10^{14.5}$
Max. Operating Temp. (°C) (Tempered)	250	250	1000 —	79	290 490	500
Normal Service Temp. (°C) (Tempered)			950 —		230 260	

MECHANICAL PROPERTIES						
Density g/cm^3 (20°C)	2.56	2.46	2.20	1.19	2.23	2.23
Modulus of Elasticity (Young's Mod.) kg/cm^2 X 10^5	7.0	7.5	10.6		6.8	
Poissons Constant (20°C)		.21	.17	.35	.20	.22
Tensile Strength kg/cm^2			600	632		5-800

1 kg/cm^2 = 14.22 lb.in^2 1 gm/cm^3 = 0.036 lb/in^3

TEMPERATURE CONVERSION TABLE

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
0	32	250	482	500	932	750	1382	1000	1832
50	122	300	572	550	1022	800	1472	1100	2012
100	212	350	662	600	1112	850	1562	1200	2192
150	302	400	752	650	1202	900	1652		
200	392	450	842	700	1292	950	1742		

$$°F = \frac{9}{5}\,°C + 32 \quad \text{and} \quad °C = \frac{5}{9}\,(°F - 32)$$