

# PBL 1Y

Code(d) **548457**

Code(e) **551455**

Refractive Index $n_d$	<b>1.54814</b>	Abbe Number $\nu_d$	<b>45.73</b>	Dispersion $n_F - n_C$	<b>0.011986</b>
Refractive Index $n_e$	1.550989	Abbe Number $\nu_e$	45.45	Dispersion $n_F - n_{C'}$	0.012123

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.51892
$n_{1970}$	1.97009	1.52371
$n_{1530}$	1.52958	1.52892
$n_{1129}$	1.12864	1.53374
$n_t$	1.01398	1.53542
$n_s$	0.85211	1.53845
$n_{A'}$	0.76819	1.54058
$n_r$	0.70652	1.54256
$n_C$	0.65627	1.54456
$n_{C'}$	0.64385	1.54513
$n_{\text{He-Ne}}$	0.6328	1.54566
$n_D$	0.58929	1.54804
$n_d$	0.58756	1.54814
$n_e$	0.54607	1.55099
$n_F$	0.48613	1.55655
$n_{F'}$	0.47999	1.55725
$n_{\text{He-Cd}}$	0.44157	1.56242
$n_g$	0.435835	1.56333
$n_h$	0.404656	1.56911
$n_i$	0.365015	1.57931
$n_{334}$	0.334148	1.59092
$n_{326}$	0.326106	1.59476

Constants of Dispersion Formula	
$A_1$	1.24772961E+00
$A_2$	1.01954909E-01
$A_3$	3.50479619E-01
$B_1$	9.26606623E-03
$B_2$	4.51754311E-02
$B_3$	4.50186705E+01

Chemical Properties	
Water Resistance(Powder) Group RW(P)	2
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	2
Acid Resistance(Surface) Group SR	1.0
Phosphate Resistance PR	1.1

Mechanical Properties	
Young's Modulus E (GPa)	61.3
Rigidity Modulus G (GPa)	25.2
Poisson's Ratio $\sigma$	0.217
Knoop Hardness Hk[Class]	420 4
Abrasion Aa	127

Partial Dispersions	
$n_C - n_t$	0.009141
$n_C - n_{A'}$	0.003985
$n_d - n_C$	0.003576
$n_e - n_C$	0.006424
$n_g - n_d$	0.015189
$n_g - n_F$	0.006779
$n_h - n_g$	0.005775
$n_i - n_g$	0.015976
$n_C - n_t$	0.009705
$n_e - n_{C'}$	0.005860
$n_{F'} - n_e$	0.006263
$n_i - n_{F'}$	0.022054

Relative Partial Dispersions	
$\theta_{C,t}$	0.7626
$\theta_{C,A'}$	0.3325
$\theta_{d,C}$	0.2983
$\theta_{e,C}$	0.5360
$\theta_{g,d}$	1.2672
$\theta_{g,F}$	0.5656
$\theta_{h,g}$	0.4818
$\theta_{i,g}$	1.3329
$\theta'_{C,t}$	0.8005
$\theta'_{e,C'}$	0.4834
$\theta'_{F',e}$	0.5166
$\theta'_{i,F'}$	1.8192

※Refractive Indices of the wavelength nm can be calculated from 326 to 1129 nm by this constant. Use the appended list of the constants to calculate 1129-2325nm.

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	0.0014
$\Delta\theta_{C,A'}$	0.0012
$\Delta\theta_{g,d}$	-0.0025
$\Delta\theta_{g,F}$	-0.0019
$\Delta\theta_{i,g}$	-0.0092

Thermal Properties	
Strain Point StP (°C)	361
Annealing Point AP (°C)	396
Transformation Temperature Tg (°C)	407 *
Yield Point At (°C)	467 *
Softening Point SP (°C)	567
Expansion Coefficients (-30~+70°C)	92 *
$\alpha$ ( $10^{-7} K^{-1}$ ) (+100~+300°C)	111 *
Thermal Conductivity $\lambda$ W/(m·K)	0.951

Coloring			
$\lambda_{80}$	325	$\lambda_5$	305
$\lambda_{70}$			

Internal transmission			
$\lambda_{0.80}$	320	$\lambda_{0.05}$	305

CCI		
B	G	R
0.00	0.00	0.00

Internal Transmittance		
$\lambda(\text{nm})$	$\tau$ 10mm	$\tau$ 25mm
240		
250		
260		
270		
280		
290		
300		
310	0.29	0.04
320	0.80	0.57
330	0.954	0.88
340	0.988	0.970
350	0.995	0.988
360	0.997	0.993
365	0.997	0.994
370	0.998	0.995
380	0.998	0.996
390	0.999	0.997
400	0.999	0.998
420	0.999	0.998
440	0.999	0.998
460	0.999	0.998
480	0.999	0.998
500	0.999	0.999
550	0.999	0.999
600	0.999	0.999
650	0.999	0.999
700	0.999	0.999
800	0.999	0.999
900	0.999	0.999
1000	0.999	0.999
1200	0.999	0.999
1400	0.998	0.996
1600	0.996	0.991
1800	0.983	0.958
2000	0.960	0.903
2200	0.919	0.81
2400	0.88	0.73

Other Properties	
Photoelastic Constant $\beta$ nm/(cm $\cdot$ 10 $^5$ Pa)	2.94
Specific Gravity d	2.95
Remarks	

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※The name of the glass type is the model number assigned based on the main components of the composition: large, medium, small refractive index and serial number.

Temperature Coefficients of Refractive Index								
Range of Temperature (°C)	$\Delta n / \Delta T$ relative ( $10^{-6} K^{-1}$ )							
	t	C'	He-Ne	D	e	F'	g	i
-40~-20	1.2	1.6	1.7	1.8	2.0	2.5	3.0	4.5
-20~ 0	1.2	1.7	1.7	1.9	2.1	2.6	3.1	4.7
0~20	1.2	1.7	1.8	1.9	2.2	2.7	3.2	4.9
20~40	1.3	1.8	1.8	2.0	2.2	2.8	3.3	5.0
40~60	1.3	1.8	1.9	2.1	2.3	2.9	3.4	5.2
60~80	1.3	1.9	1.9	2.1	2.4	2.9	3.5	5.4