

# S-BAL12

Code(d) **540595**

Code(e) **542592**

Refractive Index $n_d$	<b>1.53996</b> 1.539956	Abbe Number $\nu_d$	<b>59.46</b>	Dispersion $n_F-n_C$	<b>0.009081</b>
Refractive Index $n_e$	1.542121	Abbe Number $\nu_e$	59.20	Dispersion $n_F-n_{C'}$	0.009158

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.51358
$n_{1970}$	1.97009	1.51848
$n_{1530}$	1.52958	1.52370
$n_{1129}$	1.12864	1.52825
$n_t$	1.01398	1.52974
$n_s$	0.85211	1.53230
$n_{A'}$	0.76819	1.53404
$n_r$	0.70652	1.53562
$n_C$	0.65627	1.53719
$n_{C'}$	0.64385	1.53763
$n_{\text{He-Ne}}$	0.6328	1.53804
$n_D$	0.58929	1.53988
$n_d$	0.58756	1.53996
$n_e$	0.54607	1.54212
$n_F$	0.48613	1.54627
$n_{F'}$	0.47999	1.54679
$n_{\text{He-Cd}}$	0.44157	1.55056
$n_g$	0.435835	1.55122
$n_h$	0.404656	1.55532
$n_i$	0.365015	1.56232

Constants of Dispersion Formula	
$A_1$	7.14605258E-01
$A_2$	6.21993289E-01
$A_3$	1.22537681E+00
$B_1$	3.01763913E-03
$B_2$	1.66505450E-02
$B_3$	1.43506314E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	1
Acid Resistance(Surface) Group SR	1.0
Phosphate Resistance PR	2.0

Mechanical Properties	
Young's Modulus E (GPa)	71.0
Rigidity Modulus G (GPa)	30.6
Poisson's Ratio $\sigma$	0.161
Knoop Hardness Hk(Class)	530   5
Abrasion Aa	112

Partial Dispersions	
$n_C-n_t$	0.007456
$n_C-n_{A'}$	0.003156
$n_d-n_C$	0.002762
$n_e-n_C$	0.004927
$n_g-n_d$	0.011260
$n_g-n_F$	0.004941
$n_h-n_g$	0.004105
$n_i-n_g$	0.011107
$n_C-n_t$	0.007896
$n_e-n_{C'}$	0.004487
$n_{F'}-n_e$	0.004671
$n_i-n_{F'}$	0.015531

Relative Partial Dispersions	
$\theta_{C,t}$	0.8211
$\theta_{C,A'}$	0.3475
$\theta_{d,C}$	0.3042
$\theta_{e,C}$	0.5426
$\theta_{g,d}$	1.2400
$\theta_{g,F}$	0.5441
$\theta_{h,g}$	0.4520
$\theta_{i,g}$	1.2231
$\theta'_{C,t}$	0.8622
$\theta'_{e,C'}$	0.4900
$\theta'_{F',e}$	0.5100
$\theta'_{i,F'}$	1.6959

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	-0.0046
$\Delta\theta_{C,A'}$	-0.0005
$\Delta\theta_{g,d}$	-0.0012
$\Delta\theta_{g,F}$	-0.0012
$\Delta\theta_{i,g}$	-0.0040

Thermal Properties	
Strain Point StP (°C)	432
Annealing Point AP (°C)	468
Transformation Temperature Tg (°C)	478
Yield Point At (°C)	527
Softening Point SP (°C)	624
Expansion Coefficients (-30~+70°C)	86
$\alpha$ ( $10^{-7} \text{K}^{-1}$ ) (+100~+300°C)	102
Thermal Conductivity $\lambda$ W/(m·K)	0.982

Coloring			
$\lambda_{80}$	330	$\lambda_5$	300
$\lambda_{70}$			

Internal transmission			
$\lambda_{0.80}$	330	$\lambda_{0.05}$	301

CCI		
B	G	R
0.00	0.09	0.06

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
280	
290	
300	0.02
310	0.23
320	0.57
330	0.80
340	0.914
350	0.959
360	0.979
370	0.989
380	0.992
390	0.995
400	0.997
420	0.997
440	0.997
460	0.997
480	0.998
500	0.999
550	0.999
600	0.999
650	0.998
700	0.999
800	0.999
900	0.999
1000	0.999
1200	0.999
1400	0.993
1600	0.995
1800	0.983
2000	0.966
2200	0.920
2400	0.89

Temperature Coefficients of Refractive Index							
Range of Temperature (°C)	$\Delta n / \Delta T$ relative ( $10^{-6} \text{K}^{-1}$ )						
	t	C'	He-Ne	D	e	F'	g
-40~-20	1.4	1.7	1.8	1.8	2.0	2.3	2.6
-20~ 0	1.4	1.7	1.8	1.9	2.0	2.3	2.6
0~20	1.4	1.7	1.8	1.9	2.0	2.3	2.7
20~40	1.4	1.7	1.8	1.9	2.0	2.4	2.7
40~60	1.4	1.7	1.8	1.9	2.1	2.4	2.8
60~80	1.4	1.8	1.8	1.9	2.1	2.4	2.8

Other Properties	
Photoelastic Constant $\beta$ nm/(cm·10 <sup>5</sup> Pa)	2.60
Specific Gravity d	2.75
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.