S-BAL14

Code(d) **569563**
Code(e) **571561**

Refractive Index n_d	**1.568 83**	Abbe Number ν_d	**56.36**	Dispersion $n_F - n_C$	**0.010 092**
Refractive Index n_e	1.571 237	Abbe Number ν_e	56.09	Dispersion $n_{F'} - n_{C'}$	0.010 185

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.540 50
n_{1970}	1.970 09	1.545 65
n_{1530}	1.529 58	1.551 16
n_{1129}	1.128 64	1.556 01
n_t	1.013 98	1.557 61
n_s	0.852 11	1.560 40
$n_{A'}$	0.768 19	1.562 30
n_r	0.706 52	1.564 04
n_C	0.656 27	1.565 77
$n_{C'}$	0.643 85	1.566 26
$n_{He\text{-}Ne}$	0.632 8	1.566 71
n_D	0.589 29	1.568 74
n_d	0.587 56	1.568 83
n_e	0.546 07	1.571 24
n_F	0.486 13	1.575 87
$n_{F'}$	0.479 99	1.576 45
$n_{He\text{-}Cd}$	0.441 57	1.580 67
n_g	0.435 835	1.581 41
n_h	0.404 656	1.586 04
n_i	0.365 015	1.594 00

Constants of Dispersion Formula	
A_1	1.275 536 96E+00
A_2	1.460 833 93E-01
A_3	1.167 546 99E+00
B_1	7.496 923 59E-03
B_2	3.104 215 30E-02
B_3	1.289 470 92E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	2
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	2～3
Acid Resistance(Surface) Group SR	1.0
Phosphate Resistance PR	2.0

Mechanical Properties		
Young's Modulus E (GPa)	81.1	
Rigidity Modulus G (GPa)	32.7	
Poisson's Ratio σ	0.240	
Knoop Hardness Hk[Class]	570	6
Abrasion Aa	140	

Partial Dispersions	
$n_C - n_t$	0.008 164
$n_C - n_{A'}$	0.003 476
$n_d - n_C$	0.003 057
$n_e - n_C$	0.005 462
$n_g - n_d$	0.012 574
$n_g - n_F$	0.005 539
$n_h - n_g$	0.004 629
$n_i - n_g$	0.012 595
$n_{C'} - n_t$	0.008 650
$n_e - n_{C'}$	0.004 976
$n_{F'} - n_e$	0.005 209
$n_i - n_{F'}$	0.017 555

Relative Partial Dispersions	
$\theta_{C,t}$	0.809 0
$\theta_{C,A'}$	0.344 4
$\theta_{d,C}$	0.302 9
$\theta_{e,C}$	0.541 2
$\theta_{g,d}$	1.245 9
$\theta_{g,F}$	0.548 9
$\theta_{h,g}$	0.458 7
$\theta_{i,g}$	1.248 0
$\theta'_{C',t}$	0.849 3
$\theta'_{e,C'}$	0.488 6
$\theta'_{F',e}$	0.511 4
$\theta'_{i,F'}$	1.723 6

Anomalous dispersion	
$\Delta\theta_{C,t}$	-0.002 1
$\Delta\theta_{C,A'}$	0.000 2
$\Delta\theta_{g,d}$	-0.001 8
$\Delta\theta_{g,F}$	-0.001 4
$\Delta\theta_{i,g}$	-0.005 1

Coloring			
λ_{80}	360	λ_5	325
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	354	$\lambda_{0.05}$	329

CCI		
B	G	R
0.00	0.26	0.24

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	
320	
330	0.09
340	0.44
350	0.74
360	0.88
370	0.946
380	0.970
390	0.983
400	0.989
420	0.992
440	0.993
460	0.994
480	0.995
500	0.997
550	0.998
600	0.998
650	0.997
700	0.998
800	0.998
900	0.998
1 000	0.997
1 200	0.997
1 400	0.989
1 600	0.993
1 800	0.983
2 000	0.967
2 200	0.914
2 400	0.86

Thermal Properties		
Strain Point StP (℃)		533
Annealing Point AP (℃)		562
Transformation Temperature Tg (℃)		582
Yield Point At (℃)		640
Softening Point SP (℃)		700
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	79
	(100 ℃ ~ 300 ℃)	94
Thermal Conductivity λ (W/(m·K))		0.967

Linear coefficient of thermal expansion	
Temperature range (℃)	α_l (10^{-7} K^{-1})
-100 ～ -90	66
-90 ～ -80	67
-80 ～ -70	68
-70 ～ -60	69
-60 ～ -50	71
-50 ～ -40	72
-40 ～ -30	73
-30 ～ -20	74
-20 ～ -10	75
-10 ～ 0	76
0 ～ 10	77
10 ～ 20	78
20 ～ 30	79
30 ～ 40	80
40 ～ 50	81
50 ～ 60	82
60 ～ 70	83
70 ～ 80	84
80 ～ 90	85
90 ～ 100	86
100 ～ 110	87
110 ～ 120	88
120 ～ 130	89
130 ～ 140	90
140 ～ 150	90
150 ～ 160	91
160 ～ 170	92
170 ～ 180	93
180 ～ 190	94
190 ～ 200	94
200 ～ 210	95
210 ～ 220	96
220 ～ 230	96
230 ～ 240	97
240 ～ 250	98
250 ～ 260	98
260 ～ 270	99
270 ～ 280	100
280 ～ 290	100
290 ～ 300	101

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	2.32
Specific Gravity *d*	2.89
Remarks	

Temperature Coefficients of Refractive Index

Range of Temperature (℃)	$\Delta n_{rel}/\Delta T$ (10^{-6} K^{-1})											
	1550	t	r	C	C'	d	e	F	F'	g	h	i
-80 ~ -60	0.7	0.8	1.0	1.0	1.1	1.3	1.4	1.6	1.6	1.9	2.3	2.9
-60 ~ -40	0.6	0.7	0.9	1.0	1.0	1.1	1.2	1.6	1.6	1.9	2.2	2.8
-40 ~ -20	0.6	0.7	0.9	0.9	1.0	1.1	1.2	1.6	1.6	1.9	2.2	2.9
-20 ~ 0	0.6	0.7	0.9	1.0	1.0	1.2	1.3	1.6	1.6	2.0	2.4	3.0
0 ~ 20	0.6	0.7	1.0	1.2	1.2	1.3	1.5	1.7	1.8	2.1	2.4	3.1
20 ~ 40	0.7	0.8	1.2	1.3	1.3	1.4	1.6	1.9	1.9	2.2	2.6	3.3
40 ~ 60	0.9	1.0	1.3	1.4	1.4	1.5	1.7	2.0	2.0	2.4	2.7	3.6
60 ~ 80	0.9	1.2	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.6	2.9	3.7
80 ~ 100	1.1	1.2	1.5	1.6	1.7	1.9	2.0	2.3	2.4	2.7	3.1	3.9
100 ~ 120	1.2	1.3	1.6	1.8	1.8	2.0	2.1	2.4	2.5	2.9	3.3	4.1
120 ~ 140	1.3	1.5	1.8	1.9	1.9	2.1	2.2	2.6	2.6	3.0	3.4	4.2
140 ~ 160	1.4	1.5	1.8	1.9	2.0	2.1	2.3	2.6	2.7	3.1	3.5	4.3
160 ~ 180	1.4	1.5	1.9	2.0	2.0	2.2	2.3	2.7	2.8	3.2	3.7	4.5

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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.