S-LAL59

Code(d) **734515**
Code(e) **737512**

Refractive Index n_d	**1.734 00** 1.733 997	Abbe Number ν_d	**51.47**	Dispersion $n_F - n_C$	**0.014 261**
Refractive Index n_e	1.737 395	Abbe Number ν_e	51.24	Dispersion $n_{F'} - n_{C'}$	0.014 392

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.693 93
n_{1970}	1.970 09	1.701 30
n_{1530}	1.529 58	1.709 11
n_{1129}	1.128 64	1.715 93
n_t	1.013 98	1.718 17
n_s	0.852 11	1.722 10
$n_{A'}$	0.768 19	1.724 77
n_r	0.706 52	1.727 23
n_C	0.656 27	1.729 68
$n_{C'}$	0.643 85	1.730 36
$n_{He\text{-}Ne}$	0.632 8	1.731 01
n_D	0.589 29	1.733 87
n_d	0.587 56	1.734 00
n_e	0.546 07	1.737 39
n_F	0.486 13	1.743 94
$n_{F'}$	0.479 99	1.744 76
$n_{He\text{-}Cd}$	0.441 57	1.750 72
n_g	0.435 835	1.751 76
n_h	0.404 656	1.758 29
n_i	0.365 015	1.769 50

Constants of Dispersion Formula	
A_1	1.139 627 42E+00
A_2	8.052 278 38E-01
A_3	1.294 880 61E+00
B_1	4.932 948 62E-03
B_2	2.024 799 60E-02
B_3	9.347 465 07E+01

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	4
Weathering Resistance(Surface) Group W(S)	2
Acid Resistance(Surface) Group SR	52.0
Phosphate Resistance PR	2.0

Mechanical Properties		
Young's Modulus E (GPa)	113.7	
Rigidity Modulus G (GPa)	44.0	
Poisson's Ratio σ	0.293	
Knoop Hardness Hk[Class]	680	7
Abrasion Aa	69	

Partial Dispersions	
$n_C - n_t$	0.011 504
$n_C - n_{A'}$	0.004 905
$n_d - n_C$	0.004 318
$n_e - n_C$	0.007 716
$n_g - n_d$	0.017 767
$n_g - n_F$	0.007 824
$n_h - n_g$	0.006 531
$n_i - n_g$	0.017 734
$n_{C'} - n_t$	0.012 190
$n_e - n_{C'}$	0.007 030
$n_{F'} - n_e$	0.007 362
$n_i - n_{F'}$	0.024 741

Relative Partial Dispersions	
$\theta_{C,t}$	0.806 7
$\theta_{C,A'}$	0.343 9
$\theta_{d,C}$	0.302 8
$\theta_{e,C}$	0.541 1
$\theta_{g,d}$	1.245 8
$\theta_{g,F}$	0.548 6
$\theta_{h,g}$	0.458 0
$\theta_{i,g}$	1.243 5
$\theta'_{C',t}$	0.847 0
$\theta'_{e,C'}$	0.488 5
$\theta'_{F',e}$	0.511 5
$\theta'_{i,F'}$	1.719 1

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.018 5
$\Delta\theta_{C,A'}$	0.005 6
$\Delta\theta_{g,d}$	-0.012 0
$\Delta\theta_{g,F}$	-0.009 6
$\Delta\theta_{i,g}$	-0.050 5

Coloring			
λ_{80}	365	λ_5	280
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	347	$\lambda_{0.05}$	283

CCI		
B	G	R
0.00	0.36	0.33

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	0.02
290	0.11
300	0.20
310	0.34
320	0.48
330	0.62
340	0.74
350	0.83
360	0.89
370	0.934
380	0.959
390	0.973
400	0.982
420	0.990
440	0.993
460	0.995
480	0.997
500	0.998
550	0.999
600	0.998
650	0.998
700	0.998
800	0.999
900	0.998
1 000	0.997
1 200	0.997
1 400	0.994
1 600	0.994
1 800	0.986
2 000	0.964
2 200	0.905
2 400	0.65

Thermal Properties		
Strain Point StP (°C)		591
Annealing Point AP (°C)		620
Transformation Temperature Tg (°C)		641
Yield Point At (°C)		675
Softening Point SP (°C)		696
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	55
	(100 °C ~ 300 °C)	69
Thermal Conductivity λ (W/(m·K))		0.863

Linear coefficient of thermal expansion	
Temperature range (°C)	α_l (10^{-7} K^{-1})
-100 ~ -90	42
-90 ~ -80	43
-80 ~ -70	45
-70 ~ -60	46
-60 ~ -50	47
-50 ~ -40	48
-40 ~ -30	49
-30 ~ -20	50
-20 ~ -10	51
-10 ~ 0	52
0 ~ 10	53
10 ~ 20	54
20 ~ 30	55
30 ~ 40	56
40 ~ 50	57
50 ~ 60	58
60 ~ 70	59
70 ~ 80	60
80 ~ 90	61
90 ~ 100	62
100 ~ 110	63
110 ~ 120	63
120 ~ 130	64
130 ~ 140	65
140 ~ 150	66
150 ~ 160	67
160 ~ 170	67
170 ~ 180	68
180 ~ 190	69
190 ~ 200	69
200 ~ 210	70
210 ~ 220	70
220 ~ 230	71
230 ~ 240	72
240 ~ 250	72
250 ~ 260	73
260 ~ 270	73
270 ~ 280	74
280 ~ 290	74
290 ~ 300	74

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	1.87
Specific Gravity *d*	4.04
Remarks	

Temperature Coefficients of Refractive Index												
Range of Temperature (°C)	$\Delta n_{rel} / \Delta T$ (10^{-6} K^{-1})											
	1550	t	r	C	C'	d	e	F	F'	g	h	i
-80 ~ -60	4.3	4.4	4.7	4.8	5.0	5.1	5.2	5.6	5.6	6.0	6.4	7.1
-60 ~ -40	4.1	4.3	4.7	4.8	4.8	5.0	5.1	5.4	5.5	6.0	6.3	7.1
-40 ~ -20	4.1	4.3	4.6	4.7	4.7	5.0	5.2	5.5	5.5	5.9	6.3	7.2
-20 ~ 0	4.2	4.3	4.7	4.8	4.8	5.0	5.2	5.5	5.6	6.1	6.5	7.3
0 ~ 20	4.2	4.4	4.7	4.9	4.9	5.1	5.3	5.7	5.8	6.2	6.6	7.5
20 ~ 40	4.3	4.5	4.9	5.0	5.0	5.2	5.4	5.8	5.8	6.4	6.9	7.7
40 ~ 60	4.4	4.6	5.0	5.1	5.2	5.4	5.5	6.0	6.1	6.6	7.0	8.0
60 ~ 80	4.5	4.8	5.2	5.3	5.4	5.6	5.7	6.2	6.2	6.7	7.2	8.2
80 ~ 100	4.6	4.8	5.2	5.4	5.5	5.7	5.9	6.4	6.4	6.9	7.4	8.4
100 ~ 120	4.7	5.0	5.4	5.5	5.6	5.8	6.1	6.6	6.6	7.1	7.7	8.7
120 ~ 140	4.8	5.0	5.6	5.6	5.7	6.0	6.1	6.7	6.7	7.3	7.8	8.9
140 ~ 160	5.0	5.2	5.7	5.8	5.9	6.1	6.3	6.8	6.9	7.4	8.0	9.1
160 ~ 180	5.0	5.3	5.7	5.9	5.9	6.2	6.4	6.9	7.0	7.5	8.1	9.2

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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.