S-LAL21

Code(d) **703524**
Code(e) **706521**

Refractive Index n_d	**1.703 00** 1.703 000	Abbe Number ν_d	**52.38**	Dispersion $n_F - n_C$	**0.013 422**
Refractive Index n_e	1.706 198	Abbe Number ν_e	52.11	Dispersion $n_{F'} - n_{C'}$	0.013 553

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.669 40
n_{1970}	1.970 09	1.674 90
n_{1530}	1.529 58	1.680 93
n_{1129}	1.128 64	1.686 52
n_t	1.013 98	1.688 46
n_s	0.852 11	1.691 95
$n_{A'}$	0.768 19	1.694 40
n_r	0.706 52	1.696 67
n_C	0.656 27	1.698 95
$n_{C'}$	0.643 85	1.699 59
$n_{He\text{-}Ne}$	0.632 8	1.700 19
n_D	0.589 29	1.702 88
n_d	0.587 56	1.703 00
n_e	0.546 07	1.706 20
n_F	0.486 13	1.712 37
$n_{F'}$	0.479 99	1.713 15
$n_{He\text{-}Cd}$	0.441 57	1.718 78
n_g	0.435 835	1.719 76
n_h	0.404 656	1.725 93
n_i	0.365 015	1.736 49

Constants of Dispersion Formula	
A_1	9.352 507 79E-01
A_2	9.059 887 06E-01
A_3	1.433 512 12E+00
B_1	1.808 360 47E-02
B_2	4.084 526 43E-03
B_3	1.386 834 10E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	2
Acid Resistance(Surface) Group SR	4.0
Phosphate Resistance PR	1.0

Mechanical Properties		
Young's Modulus E (GPa)	112.9	
Rigidity Modulus G (GPa)	43.6	
Poisson's Ratio σ	0.293	
Knoop Hardness Hk[Class]	700	7
Abrasion Aa	60	

Partial Dispersions	
$n_C - n_t$	0.010 494
$n_C - n_{A'}$	0.004 551
$n_d - n_C$	0.004 048
$n_e - n_C$	0.007 246
$n_g - n_d$	0.016 764
$n_g - n_F$	0.007 390
$n_h - n_g$	0.006 165
$n_i - n_g$	0.016 723
$n_{C'} - n_t$	0.011 135
$n_e - n_{C'}$	0.006 605
$n_{F'} - n_e$	0.006 948
$n_i - n_{F'}$	0.023 341

Relative Partial Dispersions	
$\theta_{C,t}$	0.781 9
$\theta_{C,A'}$	0.339 1
$\theta_{d,C}$	0.301 6
$\theta_{e,C}$	0.539 9
$\theta_{g,d}$	1.249 0
$\theta_{g,F}$	0.550 6
$\theta_{h,g}$	0.459 3
$\theta_{i,g}$	1.245 9
$\theta'_{C,t}$	0.821 6
$\theta'_{e,C'}$	0.487 3
$\theta'_{F,e}$	0.512 7
$\theta'_{i,F'}$	1.722 2

Anomalous dispersion	
$\Delta\theta_{C,t}$	-0.010 5
$\Delta\theta_{C,A'}$	-0.000 3
$\Delta\theta_{g,d}$	-0.006 9
$\Delta\theta_{g,F}$	-0.006 1
$\Delta\theta_{i,g}$	-0.040 5

Coloring			
λ_{80}	395	λ_5	320
λ_{70}			

Internal transmission			
$\lambda_{0.80}$	374	$\lambda_{0.05}$	320

CCI		
B	G	R
0.00	1.01	0.99

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	0.01
320	0.05
330	0.15
340	0.30
350	0.48
360	0.65
370	0.77
380	0.85
390	0.909
400	0.942
420	0.975
440	0.986
460	0.991
480	0.994
500	0.996
550	0.998
600	0.997
650	0.997
700	0.996
800	0.995
900	0.992
1 000	0.991
1 200	0.992
1 400	0.989
1 600	0.992
1 800	0.987
2 000	0.979
2 200	0.949
2 400	0.87

Thermal Properties		
Strain Point StP (℃)		-
Annealing Point AP (℃)		-
Transformation Temperature Tg (℃)		769
Yield Point At (℃)		823
Softening Point SP (℃)		879
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	51
	(100 ℃ ~ 300 ℃)	64
Thermal Conductivity λ (W/(m·K))		0.983

Linear coefficient of thermal expansion	
Temperature range (℃)	α_l (10^{-7} K^{-1})
-100 ~ -90	39
-90 ~ -80	40
-80 ~ -70	41
-70 ~ -60	42
-60 ~ -50	44
-50 ~ -40	45
-40 ~ -30	46
-30 ~ -20	47
-20 ~ -10	48
-10 ~ 0	49
0 ~ 10	50
10 ~ 20	51
20 ~ 30	52
30 ~ 40	53
40 ~ 50	54
50 ~ 60	54
60 ~ 70	55
70 ~ 80	56
80 ~ 90	57
90 ~ 100	58
100 ~ 110	58
110 ~ 120	59
120 ~ 130	60
130 ~ 140	60
140 ~ 150	61
150 ~ 160	62
160 ~ 170	62
170 ~ 180	63
180 ~ 190	63
190 ~ 200	64
200 ~ 210	64
210 ~ 220	65
220 ~ 230	65
230 ~ 240	66
240 ~ 250	66
250 ~ 260	66
260 ~ 270	67
270 ~ 280	67
280 ~ 290	67
290 ~ 300	68

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	1.64
Specific Gravity *d*	3.85
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	5.9	6.1	6.5	6.6	6.6	6.8	6.9	7.4	7.4	7.8	8.2	9.0
-60 ~ -40	5.8	6.0	6.3	6.4	6.5	6.6	6.9	7.2	7.3	7.7	8.1	9.0
-40 ~ -20	5.7	6.0	6.3	6.4	6.5	6.7	6.8	7.2	7.2	7.7	8.2	9.0
-20 ~ 0	5.8	6.0	6.4	6.5	6.6	6.8	6.9	7.3	7.3	7.8	8.2	9.1
0 ~ 20	5.9	6.1	6.5	6.6	6.6	6.8	7.0	7.4	7.4	7.9	8.4	9.3
20 ~ 40	5.9	6.2	6.6	6.7	6.8	7.0	7.2	7.5	7.6	8.1	8.5	9.5
40 ~ 60	6.1	6.3	6.7	6.8	6.9	7.1	7.3	7.7	7.7	8.2	8.7	9.7
60 ~ 80	6.2	6.4	6.9	7.0	7.0	7.3	7.5	7.9	7.9	8.4	8.9	9.8
80 ~ 100	6.3	6.5	6.9	7.1	7.1	7.3	7.5	8.0	8.0	8.6	9.1	10.1
100 ~ 120	6.4	6.6	7.1	7.2	7.2	7.5	7.7	8.1	8.2	8.7	9.3	10.3
120 ~ 140	6.5	6.7	7.1	7.3	7.3	7.6	7.8	8.2	8.3	8.9	9.4	10.4
140 ~ 160	6.5	6.8	7.3	7.4	7.5	7.7	7.9	8.4	8.5	9.0	9.5	10.6
160 ~ 180	6.6	6.9	7.3	7.5	7.5	7.8	8.0	8.5	8.5	9.1	9.6	10.7

※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.