S-LAL18

Code(d) **729547**
Code(e) **732544**

Refractive Index n_d	**1.729 16** 1.729 157	Abbe Number ν_d	**54.68**	Dispersion $n_F - n_C$	**0.013 335**
Refractive Index n_e	1.732 336	Abbe Number ν_e	54.45	Dispersion $n_{F'} - n_{C'}$	0.013 449

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.689 36
n_{1970}	1.970 09	1.697 01
n_{1530}	1.529 58	1.705 04
n_{1129}	1.128 64	1.711 90
n_t	1.013 98	1.714 11
n_s	0.852 11	1.717 90
$n_{A'}$	0.768 19	1.720 46
n_r	0.706 52	1.722 79
n_C	0.656 27	1.725 10
$n_{C'}$	0.643 85	1.725 75
$n_{He\text{-}Ne}$	0.632 8	1.726 35
n_D	0.589 29	1.729 04
n_d	0.587 56	1.729 16
n_e	0.546 07	1.732 34
n_F	0.486 13	1.738 44
$n_{F'}$	0.479 99	1.739 20
$n_{He\text{-}Cd}$	0.441 57	1.744 73
n_g	0.435 835	1.745 70
n_h	0.404 656	1.751 73
n_i	0.365 015	1.762 03

Constants of Dispersion Formula	
A_1	1.502 763 18E+00
A_2	4.302 244 97E-01
A_3	1.347 260 60E+00
B_1	1.454 623 56E-02
B_2	-3.327 841 53E-03
B_3	9.335 083 42E+01

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	4
Weathering Resistance(Surface) Group W(S)	1
Acid Resistance(Surface) Group SR	51.2
Phosphate Resistance PR	2.0

Mechanical Properties		
Young's Modulus E (GPa)	120.4	
Rigidity Modulus G (GPa)	46.7	
Poisson's Ratio σ	0.289	
Knoop Hardness Hk[Class]	720	7
Abrasion Aa	69	

Partial Dispersions	
$n_C - n_t$	0.010 994
$n_C - n_{A'}$	0.004 641
$n_d - n_C$	0.004 056
$n_e - n_C$	0.007 235
$n_g - n_d$	0.016 539
$n_g - n_F$	0.007 260
$n_h - n_g$	0.006 035
$n_i - n_g$	0.016 335
$n_{C'} - n_t$	0.011 640
$n_e - n_{C'}$	0.006 589
$n_{F'} - n_e$	0.006 860
$n_i - n_{F'}$	0.022 835

Relative Partial Dispersions	
$\theta_{C,t}$	0.824 4
$\theta_{C,A'}$	0.348 0
$\theta_{d,C}$	0.304 2
$\theta_{e,C}$	0.542 6
$\theta_{g,d}$	1.240 3
$\theta_{g,F}$	0.544 4
$\theta_{h,g}$	0.452 6
$\theta_{i,g}$	1.225 0
$\theta'_{C',t}$	0.865 5
$\theta'_{e,C'}$	0.489 9
$\theta'_{F',e}$	0.510 1
$\theta'_{i,F'}$	1.697 9

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.021 2
$\Delta\theta_{C,A'}$	0.005 8
$\Delta\theta_{g,d}$	-0.010 9
$\Delta\theta_{g,F}$	-0.008 6
$\Delta\theta_{i,g}$	-0.042 2

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

Internal transmission			
$\lambda_{0.80}$	343	$\lambda_{0.05}$	281

CCI		
B	G	R
0.00	0.30	0.31

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	0.04
290	0.21
300	0.30
310	0.32
320	0.55
330	0.68
340	0.78
350	0.86
360	0.912
370	0.946
380	0.967
390	0.978
400	0.984
420	0.991
440	0.994
460	0.996
480	0.997
500	0.998
550	0.999
600	0.998
650	0.999
700	0.999
800	0.998
900	0.998
1 000	0.997
1 200	0.996
1 400	0.991
1 600	0.991
1 800	0.982
2 000	0.956
2 200	0.87
2 400	0.60

Thermal Properties		
Strain Point StP (°C)		632
Annealing Point AP (°C)		655
Transformation Temperature Tg (°C)		679
Yield Point At (°C)		703
Softening Point SP (°C)		731
Expansion Coefficients α_l (10^{-7} K^{-1})	(-30 ℃ ~ 70 ℃)	58
	(100 °C ~ 300 °C)	72
Thermal Conductivity λ (W/(m·K))		0.871

Linear coefficient of thermal expansion	
Temperature range (°C)	α_l (10^{-7} K^{-1})
-100 ~ -90	44
-90 ~ -80	46
-80 ~ -70	47
-70 ~ -60	48
-60 ~ -50	50
-50 ~ -40	51
-40 ~ -30	52
-30 ~ -20	53
-20 ~ -10	54
-10 ~ 0	56
0 ~ 10	57
10 ~ 20	58
20 ~ 30	59
30 ~ 40	60
40 ~ 50	61
50 ~ 60	62
60 ~ 70	63
70 ~ 80	64
80 ~ 90	65
90 ~ 100	65
100 ~ 110	66
110 ~ 120	67
120 ~ 130	68
130 ~ 140	69
140 ~ 150	69
150 ~ 160	70
160 ~ 170	71
170 ~ 180	71
180 ~ 190	72
190 ~ 200	72
200 ~ 210	73
210 ~ 220	74
220 ~ 230	74
230 ~ 240	74
240 ~ 250	75
250 ~ 260	75
260 ~ 270	76
270 ~ 280	76
280 ~ 290	76
290 ~ 300	77

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	1.58
Specific Gravity *d*	4.18
Remarks	

Temperature Coefficients of Refractive Index

Range of Temperature (°C)	Δn_{rel} / ΔT (10^{-6} K^{-1})											
	1550	t	r	C	C'	d	e	F	F'	g	h	i
-80 ~ -60	2.5	2.6	2.9	2.9	3.0	3.2	3.3	3.6	3.6	3.9	4.3	4.9
-60 ~ -40	2.4	2.5	2.8	2.9	2.9	3.1	3.2	3.5	3.5	3.9	4.3	4.9
-40 ~ -20	2.4	2.5	2.8	2.9	2.9	3.0	3.3	3.5	3.6	3.9	4.2	5.0
-20 ~ 0	2.5	2.6	2.9	3.0	3.0	3.1	3.3	3.6	3.6	4.1	4.4	5.1
0 ~ 20	2.5	2.7	3.0	3.1	3.1	3.2	3.4	3.7	3.7	4.2	4.5	5.2
20 ~ 40	2.7	2.8	3.1	3.2	3.2	3.4	3.5	3.9	3.9	4.2	4.7	5.4
40 ~ 60	2.8	2.9	3.2	3.3	3.4	3.5	3.7	4.0	4.0	4.5	4.9	5.6
60 ~ 80	2.9	3.1	3.4	3.5	3.6	3.7	3.9	4.2	4.2	4.6	5.0	5.7
80 ~ 100	3.0	3.2	3.5	3.6	3.7	3.9	4.1	4.4	4.4	4.8	5.2	6.0
100 ~ 120	3.1	3.3	3.6	3.7	3.7	3.9	4.2	4.5	4.5	5.0	5.4	6.1
120 ~ 140	3.2	3.4	3.8	3.8	3.9	4.1	4.2	4.6	4.7	5.1	5.5	6.3
140 ~ 160	3.4	3.6	3.9	4.0	4.0	4.2	4.4	4.7	4.8	5.2	5.6	6.4
160 ~ 180	3.4	3.6	3.9	4.0	4.1	4.3	4.4	4.8	4.8	5.3	5.7	6.5

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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.