

S-LAL12Q

Code(d) 678553
Code(e) 681551

Refractive Index n_d	1.677 90 1.677 900	Abbe Number v_d	55.35	Dispersion $n_F - n_C$	0.012 248
Refractive Index n_e	1.680 821	Abbe Number v_e	55.12	Dispersion $n_{F'} - n_{C'}$	0.012 351

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.641 08
n_{1970}	1.970 09	1.648 21
n_{1530}	1.529 58	1.655 66
n_{1129}	1.128 64	1.662 00
n_t	1.013 98	1.664 04
n_s	0.852 11	1.667 54
$n_{A'}$	0.768 19	1.669 90
n_r	0.706 52	1.672 04
n_C	0.656 27	1.674 17
$n_{C'}$	0.643 85	1.674 76
$n_{\text{He-Ne}}$	0.632 8	1.675 32
n_D	0.589 29	1.677 79
n_d	0.587 56	1.677 90
n_e	0.546 07	1.680 82
n_F	0.486 13	1.686 42
$n_{F'}$	0.479 99	1.687 12
$n_{\text{He-Cd}}$	0.441 57	1.692 19
n_g	0.435 835	1.693 07
n_h	0.404 656	1.698 60
n_i	0.365 015	1.708 03

Constants of Dispersion Formula	
A_1	1.098 870 25E+00
A_2	6.655 004 82E-01
A_3	1.071 836 58E+00
B_1	5.381 037 54E-03
B_2	1.867 177 09E-02
B_3	8.308 165 00E+01

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	3
Weathering Resistance(Surface) Group W(S)	2
Acid Resistance(Surface) Group SR	51.0
Phosphate Resistance PR	3.0

Mechanical Properties	
Young's Modulus E (GPa)	106.8
Rigidity Modulus G (GPa)	41.4
Poisson's Ratio σ	0.289
Knoop Hardness Hk[Class]	700 7
Abrasion Aa	62

Partial Dispersions	
$n_C - n_t$	0.010 130
$n_C - n_{A'}$	0.004 273
$n_d - n_C$	0.003 729
$n_e - n_C$	0.006 650
$n_g - n_d$	0.015 174
$n_g - n_F$	0.006 655
$n_h - n_g$	0.005 527
$n_i - n_g$	0.014 954
$n_{C'} - n_t$	0.010 724
$n_e - n_{C'}$	0.006 056
$n_{F'} - n_e$	0.006 295
$n_i - n_{F'}$	0.020 912

Relative Partial Dispersions	
$\theta_{C,t}$	0.827 1
$\theta_{C,A'}$	0.348 9
$\theta_{d,C}$	0.304 5
$\theta_{e,C}$	0.542 9
$\theta_{g,d}$	1.238 9
$\theta_{g,F}$	0.543 4
$\theta_{h,g}$	0.451 3
$\theta_{i,g}$	1.220 9
$\theta'_{C,t}$	0.868 3
$\theta'_{e,C'}$	0.490 3
$\theta'_{F,e}$	0.509 7
$\theta'_{i,F'}$	1.693 1

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.020 7
$\Delta\theta_{C,A'}$	0.005 9
$\Delta\theta_{g,d}$	-0.010 9
$\Delta\theta_{g,F}$	-0.008 5
$\Delta\theta_{i,g}$	-0.040 6

Coloring			
λ_{80}	380	λ_5	310
λ_{70}			
Internal transmission			
$\lambda_{0.80}$	363	$\lambda_{0.05}$	308
CCI			
B	G	R	
0.00	0.53	0.50	

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	0.01
310	0.06
320	0.15
330	0.30
340	0.48
350	0.64
360	0.77
370	0.86
380	0.917
390	0.950
400	0.969
420	0.987
440	0.993
460	0.996
480	0.997
500	0.998
550	0.999
600	0.998
650	0.998
700	0.998
800	0.998
900	0.996
1 000	0.996
1 200	0.996
1 400	0.981
1 600	0.988
1 800	0.975
2 000	0.944
2 200	0.82
2 400	0.59

Thermal Properties	
Strain Point StP (°C)	637
Annealing Point AP (°C)	670
Transformation Temperature Tg (°C)	690
Yield Point At (°C)	718
Softening Point SP (°C)	750
Expansion Coefficients (-30 °C ~ 70 °C)	49
α_l (10^{-7}K^{-1}) (100 °C ~ 300 °C)	61
Thermal Conductivity λ (W/(mK))	0.914

Linear coefficient of thermal expansion	
Temperature range (°C)	α_l (10^{-7}K^{-1})
-100 ~ -90	37
-90 ~ -80	38
-80 ~ -70	39
-70 ~ -60	41
-60 ~ -50	42
-50 ~ -40	43
-40 ~ -30	44
-30 ~ -20	45
-20 ~ -10	46
-10 ~ 0	47
0 ~ 10	48
10 ~ 20	49
20 ~ 30	50
30 ~ 40	50
40 ~ 50	51
50 ~ 60	52
60 ~ 70	53
70 ~ 80	54
80 ~ 90	55
90 ~ 100	55
100 ~ 110	56
110 ~ 120	57
120 ~ 130	57
130 ~ 140	58
140 ~ 150	59
150 ~ 160	59
160 ~ 170	60
170 ~ 180	60
180 ~ 190	61
190 ~ 200	62
200 ~ 210	62
210 ~ 220	63
220 ~ 230	63
230 ~ 240	63
240 ~ 250	64
250 ~ 260	64
260 ~ 270	65
270 ~ 280	65
280 ~ 290	65
290 ~ 300	66

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	4.5	4.6	4.8	4.9	4.9	5.2	5.3	5.5	5.6	5.9	6.2	6.8
-60 ~ -40	4.3	4.5	4.8	4.8	4.9	5.0	5.1	5.4	5.4	5.8	6.1	6.7
-40 ~ -20	4.3	4.4	4.8	4.9	4.9	5.0	5.1	5.4	5.5	5.8	6.2	6.8
-20 ~ 0	4.3	4.5	4.7	4.8	4.9	5.0	5.2	5.5	5.6	5.9	6.2	6.8
0 ~ 20	4.4	4.5	4.9	5.0	5.0	5.2	5.3	5.6	5.7	6.0	6.3	7.1
20 ~ 40	4.5	4.6	4.9	5.1	5.2	5.3	5.5	5.8	5.8	6.2	6.5	7.2
40 ~ 60	4.7	4.8	5.2	5.3	5.3	5.4	5.6	5.9	6.0	6.3	6.7	7.4
60 ~ 80	4.7	4.9	5.2	5.3	5.4	5.5	5.8	6.1	6.2	6.5	6.9	7.6
80 ~ 100	4.9	5.1	5.4	5.5	5.5	5.7	5.9	6.2	6.3	6.7	7.1	7.8
100 ~ 120	5.0	5.2	5.5	5.7	5.7	5.9	6.0	6.4	6.4	6.8	7.2	8.0
120 ~ 140	5.1	5.3	5.7	5.8	5.8	6.0	6.2	6.5	6.6	7.0	7.5	8.3
140 ~ 160	5.2	5.4	5.8	5.9	5.9	6.1	6.4	6.7	6.8	7.2	7.6	8.4
160 ~ 180	5.4	5.6	5.9	6.0	6.1	6.3	6.5	6.8	6.9	7.3	7.7	8.5

Other Properties	
Photoelastic Constant β nm/(cm ³ 105Pa)	1.97
Specific Gravity d	3.59
Remarks	

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