S-LAH98

Code(d) **954323**
Code(e) **961321**

Refractive Index n_d	**1.953 75** 1.953 750	Abbe Number ν_d	**32.32**	Dispersion $n_F - n_C$	**0.029 506**
Refractive Index n_e	1.960 733	Abbe Number ν_e	32.09	Dispersion $n_{F'} - n_{C'}$	0.029 940

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.897 37
n_{1970}	1.970 09	1.904 36
n_{1530}	1.529 58	1.912 50
n_{1129}	1.128 64	1.921 15
n_t	1.013 98	1.924 52
n_s	0.852 11	1.931 02
$n_{A'}$	0.768 19	1.935 82
n_r	0.706 52	1.940 42
n_C	0.656 27	1.945 14
$n_{C'}$	0.643 85	1.946 49
$n_{He\text{-}Ne}$	0.632 8	1.947 75
n_D	0.589 29	1.953 49
n_d	0.587 56	1.953 75
n_e	0.546 07	1.960 73
n_F	0.486 13	1.974 65
$n_{F'}$	0.479 99	1.976 43
$n_{He\text{-}Cd}$	0.441 57	1.989 70
n_g	0.435 835	1.992 07
n_h	0.404 656	2.007 32
n_i	0.365 015	

Constants of Dispersion Formula	
A_1	2.285 106 29E+00
A_2	3.855 322 64E-01
A_3	2.065 511 20E+00
B_1	1.221 789 62E-02
B_2	5.147 523 42E-02
B_3	1.459 208 70E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	1
Weathering Resistance(Surface) Group W(S)	1
Acid Resistance(Surface) Group SR	3.0
Phosphate Resistance PR	1.0

Mechanical Properties		
Young's Modulus E (GPa)	129.3	
Rigidity Modulus G (GPa)	49.5	
Poisson's Ratio σ	0.306	
Knoop Hardness Hk[Class]	730	7
Abrasion Aa	55	

Partial Dispersions	
$n_C - n_t$	0.020 620
$n_C - n_{A'}$	0.009 319
$n_d - n_C$	0.008 609
$n_e - n_C$	0.015 592
$n_g - n_d$	0.038 320
$n_g - n_F$	0.017 423
$n_h - n_g$	0.015 249
$n_i - n_g$	
$n_{C'} - n_t$	0.021 965
$n_e - n_{C'}$	0.014 247
$n_{F'} - n_e$	0.015 693
$n_i - n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.698 8
$\theta_{C,A'}$	0.315 8
$\theta_{d,C}$	0.291 8
$\theta_{e,C}$	0.528 4
$\theta_{g,d}$	1.298 7
$\theta_{g,F}$	0.590 5
$\theta_{h,g}$	0.516 8
$\theta_{i,g}$	
$\theta'_{C,t}$	0.733 6
$\theta'_{e,C'}$	0.475 9
$\theta'_{F,e}$	0.524 1
$\theta'_{i,F'}$	

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.000 5
$\Delta\theta_{C,A'}$	0.000 8
$\Delta\theta_{g,d}$	0.001 1
$\Delta\theta_{g,F}$	0.001 3
$\Delta\theta_{i,g}$	

Coloring			
λ_{80}		λ_5	355
λ_{70}	405		

Internal transmission			
$\lambda_{0.80}$	390	$\lambda_{0.05}$	352

CCI		
B	G	R
0.00	2.90	3.06

Internal Transmittance	
λ (nm)	τ_i (10 mm)
280	
290	
300	
310	
320	
330	
340	
350	0.02
360	0.18
370	0.47
380	0.68
390	0.80
400	0.86
420	0.927
440	0.953
460	0.967
480	0.978
500	0.986
550	0.996
600	0.998
650	0.998
700	0.999
800	0.999
900	0.999
1 000	0.999
1 200	0.999
1 400	0.999
1 600	0.998
1 800	0.993
2 000	0.979
2 200	0.952
2 400	0.84

Thermal Properties		
Strain Point StP (°C)		680
Annealing Point AP (°C)		716
Transformation Temperature Tg (°C)		724
Yield Point At (°C)		757
Softening Point SP (°C)		791
Expansion Coefficients	(-30 ℃ ~ 70 ℃)	74
α_l (10^{-7} K^{-1})	(100 °C ~ 300 °C)	88
Thermal Conductivity λ (W/(m·K))		0.924

Linear coefficient of thermal expansion	
Temperature range (°C)	α_l (10^{-7} K^{-1})
-100 ~ -90	60
-90 ~ -80	61
-80 ~ -70	63
-70 ~ -60	64
-60 ~ -50	65
-50 ~ -40	66
-40 ~ -30	68
-30 ~ -20	69
-20 ~ -10	70
-10 ~ 0	71
0 ~ 10	72
10 ~ 20	74
20 ~ 30	75
30 ~ 40	76
40 ~ 50	77
50 ~ 60	78
60 ~ 70	79
70 ~ 80	80
80 ~ 90	80
90 ~ 100	81
100 ~ 110	82
110 ~ 120	83
120 ~ 130	84
130 ~ 140	85
140 ~ 150	85
150 ~ 160	86
160 ~ 170	87
170 ~ 180	87
180 ~ 190	88
190 ~ 200	89
200 ~ 210	89
210 ~ 220	90
220 ~ 230	90
230 ~ 240	91
240 ~ 250	91
250 ~ 260	92
260 ~ 270	92
270 ~ 280	92
280 ~ 290	93
290 ~ 300	93

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	0.86
Specific Gravity *d*	4.94
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	1.1	1.4	2.1	2.3	2.3	2.7	3.0	4.0	4.1	5.2	6.7	-
-60 ~ -40	1.0	1.4	2.0	2.2	2.3	2.7	3.1	4.0	4.1	5.3	6.8	-
-40 ~ -20	1.2	1.5	2.1	2.3	2.4	2.8	3.3	4.2	4.3	5.6	7.2	-
-20 ~ 0	1.3	1.6	2.2	2.5	2.5	3.1	3.5	4.4	4.6	5.9	7.5	-
0 ~ 20	1.4	1.7	2.4	2.7	2.8	3.3	3.7	4.7	4.9	6.2	7.8	-
20 ~ 40	1.5	1.9	2.7	2.9	3.0	3.5	3.9	5.0	5.1	6.6	8.3	-
40 ~ 60	1.8	2.1	2.9	3.2	3.2	3.7	4.2	5.3	5.4	7.0	8.7	-
60 ~ 80	1.9	2.2	3.0	3.3	3.4	3.9	4.4	5.6	5.8	7.3	9.1	-
80 ~ 100	1.9	2.4	3.3	3.5	3.6	4.1	4.6	5.8	6.0	7.6	9.4	-
100 ~ 120	2.0	2.4	3.3	3.7	3.8	4.3	4.9	6.1	6.2	7.9	9.8	-
120 ~ 140	2.1	2.5	3.5	3.8	3.9	4.4	5.0	6.2	6.4	8.1	10.1	-
140 ~ 160	2.1	2.6	3.6	3.9	4.0	4.5	5.1	6.4	6.6	8.3	10.4	-
160 ~ 180	2.2	2.6	3.6	3.9	4.0	4.6	5.2	6.5	6.7	8.5	10.6	-

OHARA Copyright© OHARA INC. All Rights Reserved.

※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.