

# S-LAL21

Code(d) **703524**

Code(e) **706521**

Refractive Index $n_d$	<b>1.70300</b> 1.703000	Abbe Number $\nu_d$	<b>52.38</b>	Dispersion $n_F-n_C$	<b>0.013422</b>
Refractive Index $n_e$	1.706198	Abbe Number $\nu_e$	52.11	Dispersion $n_F-n_{C'}$	0.013553

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.66940
$n_{1970}$	1.97009	1.67490
$n_{1530}$	1.52958	1.68093
$n_{1129}$	1.12864	1.68652
$n_t$	1.01398	1.68846
$n_s$	0.85211	1.69195
$n_{A'}$	0.76819	1.69440
$n_r$	0.70652	1.69667
$n_C$	0.65627	1.69895
$n_{C'}$	0.64385	1.69959
$n_{\text{He-Ne}}$	0.6328	1.70019
$n_D$	0.58929	1.70288
$n_d$	0.58756	1.70300
$n_e$	0.54607	1.70620
$n_F$	0.48613	1.71237
$n_{F'}$	0.47999	1.71315
$n_{\text{He-Cd}}$	0.44157	1.71878
$n_g$	0.435835	1.71976
$n_h$	0.404656	1.72593
$n_i$	0.365015	1.73649

Constants of Dispersion Formula	
$A_1$	9.35250779E-01
$A_2$	9.05988706E-01
$A_3$	1.43351212E+00
$B_1$	1.80836047E-02
$B_2$	4.08452643E-03
$B_3$	1.38683410E+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 ( $10^9\text{N/m}^2$ )	1129
Rigidity Modulus G ( $10^9\text{N/m}^2$ )	436
Poisson's Ratio $\sigma$	0.293
Knoop Hardness Hk[Class]	690   7
Abrasion Aa	60
Photoelastic Constant $\beta$ nm/(cm $\cdot$ 10 $^5$ Pa)	1.64

Partial Dispersions	
$n_C-n_t$	0.010494
$n_C-n_{A'}$	0.004551
$n_d-n_C$	0.004048
$n_e-n_C$	0.007246
$n_g-n_d$	0.016764
$n_g-n_F$	0.007390
$n_h-n_g$	0.006165
$n_i-n_g$	0.016723
$n_C-n_t$	0.011135
$n_e-n_{C'}$	0.006605
$n_F-n_e$	0.006948
$n_i-n_{F'}$	0.023341

Relative Partial Dispersions	
$\theta_{C,t}$	0.7819
$\theta_{C,A'}$	0.3391
$\theta_{d,C}$	0.3016
$\theta_{e,C}$	0.5399
$\theta_{g,d}$	1.2490
$\theta_{g,F}$	0.5506
$\theta_{h,g}$	0.4593
$\theta_{i,g}$	1.2459
$\theta'_{C,t}$	0.8216
$\theta'_{e,C'}$	0.4873
$\theta'_{F',e}$	0.5127
$\theta'_{i,F'}$	1.7222

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	-0.0105
$\Delta\theta_{C,A'}$	-0.0003
$\Delta\theta_{g,d}$	-0.0069
$\Delta\theta_{g,F}$	-0.0061
$\Delta\theta_{i,g}$	-0.0405

Thermal Properties	
Strain Point StP ( $^{\circ}\text{C}$ )	
Annealing Point AP ( $^{\circ}\text{C}$ )	
Transformation Temperature Tg ( $^{\circ}\text{C}$ )	767
Yield Point At ( $^{\circ}\text{C}$ )	814
Softening Point SP ( $^{\circ}\text{C}$ )	879
Expansion Coefficients (-30~+70 $^{\circ}\text{C}$ )	50
$\alpha$ ( $10^{-7}/^{\circ}\text{C}$ ) (+100~+300 $^{\circ}\text{C}$ )	61
Thermal Conductivity $\lambda$ W/(m $\cdot$ K)	0.983

Coloring			
$\lambda_{80}$	395	$\lambda_5$	320
$\lambda_{70}$			

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

CCI		
B	G	R
0.00	1.01	0.99

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
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
1000	0.991
1200	0.992
1400	0.989
1600	0.992
1800	0.987
2000	0.979
2200	0.949
2400	0.87

Temperature Coefficients of Refractive Index							
Range of Temperature ( $^{\circ}\text{C}$ )	$\Delta n/\Delta T$ relative ( $10^{-6}/^{\circ}\text{C}$ )						
	t	C'	He-Ne	D	e	F'	g
-40~-20	6.8	7.4	7.4	7.6	7.8	8.2	8.7
-20~ 0	6.9	7.4	7.5	7.6	7.8	8.3	8.8
0~20	6.9	7.5	7.5	7.7	7.9	8.4	8.9
20~40	6.9	7.5	7.6	7.7	7.9	8.4	9.0
40~60	7.0	7.6	7.6	7.8	8.0	8.6	9.1
60~80	7.1	7.8	7.8	8.0	8.2	8.7	9.3

Other Properties	
Bubble Quality Group B	
Specific Gravity d	3.85
Remarks	

OHARA 18-05

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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.