

# S-LAH89

Code(d) **852408**

Code(e) **856405**

Refractive Index $n_d$	<b>1.85150</b> 1.851500	Abbe Number $\nu_d$	<b>40.78</b>	Dispersion $n_F-n_C$	<b>0.020880</b>
Refractive Index $n_e$	1.856460	Abbe Number $\nu_e$	40.53	Dispersion $n_F-n_C'$	0.021134

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.80561
$n_{1970}$	1.97009	1.81233
$n_{1530}$	1.52958	1.81983
$n_{1129}$	1.12864	1.82718
$n_t$	1.01398	1.82987
$n_s$	0.85211	1.83487
$n_{A'}$	0.76819	1.83847
$n_r$	0.70652	1.84186
$n_C$	0.65627	1.84530
$n_{C'}$	0.64385	1.84628
$n_{\text{He-Ne}}$	0.6328	1.84719
$n_D$	0.58929	1.85132
$n_d$	0.58756	1.85150
$n_e$	0.54607	1.85646
$n_F$	0.48613	1.86618
$n_{F'}$	0.47999	1.86741
$n_{\text{He-Cd}}$	0.44157	1.87648
$n_g$	0.435835	1.87807
$n_h$	0.404656	1.88822
$n_i$	0.365015	

Constants of Dispersion Formula	
$A_1$	1.95118827E+00
$A_2$	3.77607223E-01
$A_3$	1.47757262E+00
$B_1$	9.76560799E-03
$B_2$	3.82232043E-02
$B_3$	1.12236720E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	2
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 ( $10^9\text{N/m}^2$ )	1208
Rigidity Modulus G ( $10^9\text{N/m}^2$ )	463
Poisson's Ratio $\sigma$	0.303
Knoop Hardness Hk[Class]	660   7
Abrasion Aa	68
Photoelastic Constant $\beta$ nm/(cm $\cdot$ 10 $^5$ Pa)	1.27

Partial Dispersions	
$n_C-n_t$	0.015434
$n_C-n_{A'}$	0.006834
$n_d-n_C$	0.006196
$n_e-n_C$	0.011156
$n_g-n_d$	0.026575
$n_g-n_F$	0.011891
$n_h-n_g$	0.010143
$n_i-n_g$	
$n_C-n_t$	0.016409
$n_e-n_{C'}$	0.010181
$n_F-n_e$	0.010953
$n_i-n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.7392
$\theta_{C,A'}$	0.3273
$\theta_{d,C}$	0.2967
$\theta_{e,C}$	0.5343
$\theta_{g,d}$	1.2727
$\theta_{g,F}$	0.5695
$\theta_{h,g}$	0.4858
$\theta_{i,g}$	
$\theta'_{C,t}$	0.7764
$\theta'_{e,C'}$	0.4817
$\theta'_{F,e}$	0.5183
$\theta'_{i,F'}$	

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	0.0012
$\Delta\theta_{C,A'}$	0.0020
$\Delta\theta_{g,d}$	-0.0073
$\Delta\theta_{g,F}$	-0.0060
$\Delta\theta_{i,g}$	

Thermal Properties	
Strain Point StP (°C)	634
Annealing Point AP (°C)	660
Transformation Temperature Tg (°C)	669
Yield Point At (°C)	702
Softening Point SP (°C)	743
Expansion Coefficients (-30~+70°C)	68
$\alpha$ ( $10^{-7}/^\circ\text{C}$ ) (+100~+300°C)	80
Thermal Conductivity $\lambda$ W/(m $\cdot$ K)	0.861

Coloring			
$\lambda_{80}$		$\lambda_5$	340
$\lambda_{70}$	380		

Internal transmission			
$\lambda_{0.80}$	376	$\lambda_{0.05}$	339

CCI		
B	G	R
0.00	1.47	1.52

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
280	
290	
300	
310	
320	
330	
340	0.07
350	0.31
360	0.57
370	0.74
380	0.84
390	0.89
400	0.930
420	0.962
440	0.975
460	0.983
480	0.989
500	0.993
550	0.998
600	0.999
650	0.998
700	0.999
800	0.999
900	0.999
1000	0.999
1200	0.999
1400	0.998
1600	0.997
1800	0.992
2000	0.975
2200	0.938
2400	0.78

Temperature Coefficients of Refractive Index							
Range of Temperature (°C)	$\Delta n/\Delta T$ relative ( $10^{-6}/^\circ\text{C}$ )						
	t	C'	He-Ne	D	e	F'	g
-40~-20	4.0	4.9	4.9	5.2	5.5	6.3	7.1
-20~ 0	4.0	4.9	5.0	5.2	5.6	6.4	7.2
0~20	4.0	4.9	5.0	5.3	5.7	6.5	7.4
20~40	4.0	5.0	5.0	5.3	5.7	6.6	7.5
40~60	4.1	5.1	5.1	5.4	5.8	6.7	7.6
60~80	4.2	5.2	5.3	5.6	6.0	7.0	7.9

Other Properties	
Bubble Quality Group B	
Specific Gravity d	4.70
Remarks	

OHARA 17-04

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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.