

# S-LAH93

Code(d) **905350**

Code(e) **911348**

Refractive Index $n_d$	<b>1.90525</b> 1.905250	Abbe Number $\nu_d$	<b>35.04</b>	Dispersion $n_F-n_C$	<b>0.025838</b>
Refractive Index $n_e$	1.911372	Abbe Number $\nu_e$	34.79	Dispersion $n_F-n_{C'}$	0.026200

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.85401
$n_{1970}$	1.97009	1.86068
$n_{1530}$	1.52958	1.86834
$n_{1129}$	1.12864	1.87630
$n_t$	1.01398	1.87935
$n_s$	0.85211	1.88517
$n_{A'}$	0.76819	1.88944
$n_r$	0.70652	1.89350
$n_C$	0.65627	1.89768
$n_{C'}$	0.64385	1.89886
$n_{\text{He-Ne}}$	0.6328	1.89998
$n_D$	0.58929	1.90502
$n_d$	0.58756	1.90525
$n_e$	0.54607	1.91137
$n_F$	0.48613	1.92351
$n_{F'}$	0.47999	1.92506
$n_{\text{He-Cd}}$	0.44157	1.93658
$n_g$	0.435835	1.93862
$n_h$	0.404656	1.95176
$n_i$	0.365015	

Constants of Dispersion Formula	
$A_1$	2.17884378E+00
$A_2$	3.25508683E-01
$A_3$	1.70608646E+00
$B_1$	1.15760879E-02
$B_2$	4.95982503E-02
$B_3$	1.28913580E+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	4.0
Phosphate Resistance PR	1.0

Mechanical Properties	
Young's Modulus E ( $10^9\text{N/m}^2$ )	1247
Rigidity Modulus G ( $10^9\text{N/m}^2$ )	478
Poisson's Ratio $\sigma$	0.304
Knoop Hardness Hk[Class]	680   7
Abrasion Aa	60
Photoelastic Constant $\beta$ nm/(cm $\cdot$ 10 $^5$ Pa)	1.10

Partial Dispersions	
$n_C-n_t$	0.018330
$n_C-n_{A'}$	0.008240
$n_d-n_C$	0.007573
$n_e-n_C$	0.013695
$n_g-n_d$	0.033374
$n_g-n_F$	0.015109
$n_h-n_g$	0.013137
$n_i-n_g$	
$n_C-n_t$	0.019516
$n_e-n_{C'}$	0.012509
$n_F-n_e$	0.013691
$n_i-n_{F'}$	

Relative Partial Dispersions	
$\theta_{C,t}$	0.7094
$\theta_{C,A'}$	0.3189
$\theta_{d,C}$	0.2931
$\theta_{e,C}$	0.5300
$\theta_{g,d}$	1.2917
$\theta_{g,F}$	0.5848
$\theta_{h,g}$	0.5084
$\theta_{i,g}$	
$\theta'_{C,t}$	0.7449
$\theta'_{e,C'}$	0.4774
$\theta'_{F,e}$	0.5226
$\theta'_{i,F'}$	

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	-0.0017
$\Delta\theta_{C,A'}$	0.0006
$\Delta\theta_{g,d}$	-0.0002
$\Delta\theta_{g,F}$	0.0000
$\Delta\theta_{i,g}$	

Thermal Properties	
Strain Point StP ( $^{\circ}\text{C}$ )	645
Annealing Point AP ( $^{\circ}\text{C}$ )	672
Transformation Temperature Tg ( $^{\circ}\text{C}$ )	677
Yield Point At ( $^{\circ}\text{C}$ )	716
Softening Point SP ( $^{\circ}\text{C}$ )	761
Expansion Coefficients (-30~+70 $^{\circ}\text{C}$ )	70
$\alpha$ ( $10^{-7}/^{\circ}\text{C}$ ) (+100~+300 $^{\circ}\text{C}$ )	86
Thermal Conductivity $\lambda$ W/(m $\cdot$ K)	0.892

Coloring			
$\lambda_{80}$		$\lambda_5$	355
$\lambda_{70}$	410		

Internal transmission			
$\lambda_{0.80}$	397	$\lambda_{0.05}$	353

CCI		
B	G	R
0.00	3.75	3.96

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
280	
290	
300	
310	
320	
330	
340	
350	
360	0.22
370	0.48
380	0.65
390	0.75
400	0.82
420	0.901
440	0.938
460	0.959
480	0.974
500	0.984
550	0.996
600	0.998
650	0.999
700	0.999
800	0.999
900	0.999
1000	0.999
1200	0.999
1400	0.999
1600	0.998
1800	0.993
2000	0.979
2200	0.952
2400	0.84

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	3.9	5.0	5.0	5.4	5.8	6.8	7.9
-20~ 0	3.9	5.0	5.1	5.4	5.9	6.9	8.2
0~20	3.9	5.1	5.2	5.5	6.0	7.1	8.4
20~40	3.9	5.1	5.2	5.5	6.0	7.2	8.5
40~60	4.0	5.2	5.3	5.7	6.2	7.4	8.8
60~80	4.2	5.5	5.6	6.0	6.5	7.7	9.2

Other Properties	
Bubble Quality Group B	
Specific Gravity d	4.83
Remarks	

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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.