

# S-FPL53

Code(d) **439950**

Code(e) **440946**

Refractive Index $n_d$	<b>1.43875</b> 1.438750	Abbe Number $\nu_d$	<b>94.93</b>	Dispersion $n_F-n_C$	<b>0.004622</b>
Refractive Index $n_e$	1.439854	Abbe Number $\nu_e$	94.49	Dispersion $n_F-n_C'$	0.004655

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.42512
$n_{1970}$	1.97009	1.42762
$n_{1530}$	1.52958	1.43032
$n_{1129}$	1.12864	1.43269
$n_t$	1.01398	1.43346
$n_s$	0.85211	1.43480
$n_{A'}$	0.76819	1.43570
$n_r$	0.70652	1.43652
$n_C$	0.65627	1.43733
$n_{C'}$	0.64385	1.43756
$n_{\text{He-Ne}}$	0.6328	1.43777
$n_D$	0.58929	1.43871
$n_d$	0.58756	1.43875
$n_e$	0.54607	1.43985
$n_F$	0.48613	1.44195
$n_{F'}$	0.47999	1.44221
$n_{\text{He-Cd}}$	0.44157	1.44410
$n_g$	0.435835	1.44442
$n_h$	0.404656	1.44645
$n_i$	0.365015	1.44986

Constants of Dispersion Formula	
$A_1$	9.83532327E-01
$A_2$	6.95688140E-02
$A_3$	1.11409238E+00
$B_1$	4.92234955E-03
$B_2$	1.93581091E-02
$B_3$	2.64275294E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	2
Weathering Resistance(Surface) Group W(S)	3
Acid Resistance(Surface) Group SR	52.3
Phosphate Resistance PR	4.3

Mechanical Properties	
Young's Modulus E ( $10^9\text{N/m}^2$ )	691
Rigidity Modulus G ( $10^9\text{N/m}^2$ )	265
Poisson's Ratio $\sigma$	0.303
Knoop Hardness Hk[Class]	320   3
Abrasion Aa	480
Photoelastic Constant $\beta$ nm/(cm· $10^5\text{Pa}$ )	0.57

Partial Dispersions	
$n_C-n_t$	0.003870
$n_C-n_{A'}$	0.001631
$n_d-n_C$	0.001417
$n_e-n_C$	0.002521
$n_g-n_d$	0.005673
$n_g-n_F$	0.002468
$n_h-n_g$	0.002028
$n_i-n_g$	0.005437
$n_C-n_t$	0.004097
$n_e-n_{C'}$	0.002294
$n_F-n_e$	0.002361
$n_i-n_{F'}$	0.007645

Relative Partial Dispersions	
$\theta_{C,t}$	0.8373
$\theta_{C,A'}$	0.3529
$\theta_{d,C}$	0.3066
$\theta_{e,C}$	0.5454
$\theta_{g,d}$	1.2274
$\theta_{g,F}$	0.5340
$\theta_{h,g}$	0.4388
$\theta_{i,g}$	1.1763
$\theta'_{C,t}$	0.8801
$\theta'_{e,C'}$	0.4928
$\theta'_{F,e}$	0.5072
$\theta'_{i,F'}$	1.6423

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	-0.1548
$\Delta\theta_{C,A'}$	-0.0381
$\Delta\theta_{g,d}$	0.0598
$\Delta\theta_{g,F}$	0.0461
$\Delta\theta_{i,g}$	0.2462

Thermal Properties	
Strain Point StP (°C)	
Annealing Point AP (°C)	
Transformation Temperature Tg (°C)	426
Yield Point At (°C)	456
Softening Point SP (°C)	
Expansion Coefficients (-30~+70°C)	145
$\alpha$ ( $10^{-7}/^\circ\text{C}$ ) (+100~+300°C)	169
Thermal Conductivity $\lambda$ W/(m·K)	0.857

Coloring			
$\lambda_{80}$	330	$\lambda_5$	280
$\lambda_{70}$			

Internal transmission			
$\lambda_{0.80}$	326	$\lambda_{0.05}$	283

CCI		
B	G	R
0.00	0.13	0.08

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
280	0.04
290	0.12
300	0.28
310	0.51
320	0.71
330	0.85
340	0.928
350	0.967
360	0.985
370	0.992
380	0.996
390	0.997
400	0.996
420	0.995
440	0.995
460	0.996
480	0.997
500	0.998
550	0.999
600	0.998
650	0.997
700	0.998
800	0.998
900	0.997
1000	0.997
1200	0.998
1400	0.998
1600	0.998
1800	0.998
2000	0.998
2200	0.997
2400	0.998

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	-5.9	-5.8	-5.8	-5.7	-5.7	-5.6	-5.5
-20~ 0	-6.2	-6.1	-6.1	-6.1	-6.0	-5.9	-5.8
0~20	-6.5	-6.4	-6.4	-6.4	-6.3	-6.2	-6.1
20~40	-6.9	-6.8	-6.7	-6.7	-6.6	-6.5	-6.4
40~60	-7.2	-7.1	-7.1	-7.0	-7.0	-6.8	-6.7
60~80	-7.5	-7.4	-7.4	-7.3	-7.3	-7.2	-7.0

Other Properties	
Bubble Quality Group B	B
Specific Gravity d	3.62
Remarks	

OHARA 17-04

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.