

# S-FPL51

Code(d) **497816**

Code(e) **498810**

Refractive Index $n_d$	<b>1.49700</b> 1.496999	Abbe Number $\nu_d$	<b>81.54</b>	Dispersion $n_F-n_C$	<b>0.006095</b>
Refractive Index $n_e$	1.498455	Abbe Number $\nu_e$	81.14	Dispersion $n_F-n_{C'}$	0.006143

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.47952
$n_{1970}$	1.97009	1.48269
$n_{1530}$	1.52958	1.48610
$n_{1129}$	1.12864	1.48911
$n_t$	1.01398	1.49010
$n_s$	0.85211	1.49183
$n_{A'}$	0.76819	1.49300
$n_r$	0.70652	1.49407
$n_C$	0.65627	1.49514
$n_{C'}$	0.64385	1.49543
$n_{\text{He-Ne}}$	0.6328	1.49571
$n_D$	0.58929	1.49694
$n_d$	0.58756	1.49700
$n_e$	0.54607	1.49845
$n_F$	0.48613	1.50123
$n_{F'}$	0.47999	1.50158
$n_{\text{He-Cd}}$	0.44157	1.50407
$n_g$	0.435835	1.50451
$n_h$	0.404656	1.50720
$n_i$	0.365015	1.51176

Constants of Dispersion Formula	
$A_1$	1.17010505E+00
$A_2$	4.75710783E-02
$A_3$	7.63832445E-01
$B_1$	6.16203924E-03
$B_2$	2.63372876E-02
$B_3$	1.41882642E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	1
Acid Resistance(Powder) Group RA(P)	3
Weathering Resistance(Surface) Group W(S)	1
Acid Resistance(Surface) Group SR	52.1
Phosphate Resistance PR	4.0

Mechanical Properties	
Young's Modulus E ( $10^9\text{N/m}^2$ )	727
Rigidity Modulus G ( $10^8\text{N/m}^2$ )	280
Poisson's Ratio $\sigma$	0.299
Knoop Hardness Hk[Class]	350   4
Abrasion Aa	449
Photoelastic Constant $\beta$ (nm/cm/ $10^9\text{Pa}$ )	0.74

Temperature Coefficients of Refractive Index							
Range of Temperature (°C)	dn/dT relative ( $10^{-6}/^\circ\text{C}$ )						
	t	C'	He-Ne	D	e	F'	g
-40~-20	-5.7	-5.5	-5.5	-5.4	-5.4	-5.3	-5.1
-20~ 0	-5.9	-5.8	-5.7	-5.7	-5.6	-5.5	-5.3
0~20	-6.2	-6.0	-6.0	-5.9	-5.8	-5.7	-5.5
20~40	-6.4	-6.2	-6.2	-6.2	-6.1	-5.9	-5.8
40~60	-6.7	-6.5	-6.5	-6.4	-6.3	-6.1	-6.0
60~80	-6.9	-6.7	-6.7	-6.7	-6.6	-6.4	-6.2

Partial Dispersions	
$n_C-n_t$	0.005033
$n_C-n_{A'}$	0.002134
$n_d-n_C$	0.001863
$n_e-n_C$	0.003319
$n_g-n_d$	0.007508
$n_g-n_F$	0.003276
$n_h-n_g$	0.002698
$n_i-n_g$	0.007253
$n_C-n_t$	0.005330
$n_e-n_{C'}$	0.003022
$n_F-n_e$	0.003121
$n_i-n_{F'}$	0.010184

Relative Partial Dispersions	
$\theta_{C,t}$	0.8258
$\theta_{C,A'}$	0.3501
$\theta_{d,C}$	0.3057
$\theta_{e,C}$	0.5445
$\theta_{g,d}$	1.2318
$\theta_{g,F}$	0.5375
$\theta_{h,g}$	0.4427
$\theta_{i,g}$	1.1900
$\theta'_{C,t}$	0.8677
$\theta'_{e,C'}$	0.4919
$\theta'_{F,e}$	0.5081
$\theta'_{i,F'}$	1.6578

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	-0.1035
$\Delta\theta_{C,A'}$	-0.0246
$\Delta\theta_{g,d}$	0.0364
$\Delta\theta_{g,F}$	0.0280
$\Delta\theta_{i,g}$	0.1478

Thermal Properties	
Strain Point StP (°C)	
Annealing Point AP (°C)	
Transformation Temperature Tg (°C)	458
Yield Point At (°C)	489
Softening Point SP (°C)	
Expansion Coefficients (-30~+70°C)	131
$\alpha$ ( $10^{-7}/^\circ\text{C}$ ) (+100~+300°C)	155
Thermal Conductivity k (W/m·K)	0.780

Coloring			
$\lambda_{80}$	340	$\lambda_5$	290
$\lambda_{70}$			

Internal transmission			
$\lambda_{0.80}$	333	$\lambda_{0.05}$	290

CCI		
B	G	R
0.00	0.16	0.13

Internal Transmittance	
$\lambda(\text{nm})$	$\tau$ 10mm
280	0.01
290	0.05
300	0.17
310	0.37
320	0.60
330	0.77
340	0.88
350	0.947
360	0.975
370	0.988
380	0.994
390	0.996
400	0.995
420	0.994
440	0.994
460	0.996
480	0.997
500	0.998
550	0.999
600	0.998
650	0.998
700	0.998
800	0.999
900	0.999
1000	0.999
1200	0.999
1400	0.999
1600	0.999
1800	0.999
2000	0.999
2200	0.997
2400	0.996

Other Properties	
Bubble Quality Group B	
Specific Gravity d	3.62
Remarks	

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