

# S-FSL 5

Code(d) **487702**

Code(e) **489701**

Refractive Index $n_d$	1.48749 1.487490	Abbe Number $v_d$	70.2 70.23	Dispersion $n_F-n_C$	0.00694 0.006941
Refractive Index $n_e$	1.489147	Abbe Number $v_e$	70.04	Dispersion $n_F-n_C'$	0.006984

Refractive Indices		
$\lambda(\mu\text{m})$		
$n_{2325}$	2.32542	1.46227
$n_{1970}$	1.97009	1.46765
$n_{1530}$	1.52958	1.47324
$n_{1129}$	1.12864	1.47778
$n_t$	1.01398	1.47915
$n_s$	0.85211	1.48138
$n_{A'}$	0.76819	1.48282
$n_r$	0.70652	1.48410
$n_C$	0.65627	1.48534
$n_{C'}$	0.64385	1.48569
$n_{\text{He-Ne}}$	0.6328	1.48601
$n_D$	0.58929	1.48743
$n_d$	0.58756	1.48749
$n_e$	0.54607	1.48915
$n_F$	0.48613	1.49228
$n_{F'}$	0.47999	1.49267
$n_{\text{He-Cd}}$	0.44157	1.49548
$n_g$	0.435835	1.49596
$n_h$	0.404656	1.49898
$n_i$	0.365015	1.50406

Partial Dispersions	
$n_C-n_t$	0.006194
$n_C-n_{A'}$	0.002522
$n_d-n_C$	0.002146
$n_e-n_C$	0.003803
$n_g-n_d$	0.008474
$n_g-n_F$	0.003679
$n_h-n_g$	0.003019
$n_i-n_g$	0.008099
$n_C-n_t$	0.006539
$n_e-n_{C'}$	0.003458
$n_{F'}-n_e$	0.003526
$n_i-n_{F'}$	0.011390

Relative Partial Dispersions	
$\theta_{C,t}$	0.8924
$\theta_{C,A'}$	0.3633
$\theta_{d,C}$	0.3092
$\theta_{e,C}$	0.5479
$\theta_{g,d}$	1.2209
$\theta_{g,F}$	0.5300
$\theta_{h,g}$	0.4350
$\theta_{i,g}$	1.1668
$\theta'_{C,t}$	0.9363
$\theta'_{e,C'}$	0.4951
$\theta'_{F',e}$	0.5049
$\theta'_{i,F}$	1.6309

Thermal Properties	
Strain Point StP (°C)	457
Annealing Point AP (°C)	491
Transformation Temperature Tg (°C)	500
Yield Point At (°C)	568
Softening Point SP (°C)	679
Expansion Coefficients (-30~+70°C)	90
$\alpha$ (10 <sup>-7</sup> /°C) (+100~+300°C)	95
Thermal Conductivity k (W/m-K)	1.007

Coloring			
$\lambda_{80}$	31	$\lambda_5$	28
$\lambda_{70}$			

Internal Transmittance	
$\lambda(\text{nm})$	$\tau_{10\text{mm}}$
280	0.13
290	0.43
300	0.73
310	0.89
320	0.961
330	0.984
340	0.992
350	0.995
360	0.995
370	0.998
380	0.998
390	0.999
400	0.999
420	0.999
440	0.999
460	0.999
480	0.999
500	0.999
550	0.999
600	0.999
650	0.999
700	0.999
800	0.999
900	0.999
1000	0.998
1200	0.998
1400	0.982
1600	0.992
1800	0.985
2000	0.971
2200	0.88
2400	0.87

Deviation of Relative Dispersions $\Delta\theta$ from "Normal"	
$\Delta\theta_{C,t}$	0.0162
$\Delta\theta_{C,A'}$	0.0023
$\Delta\theta_{g,d}$	0.0020
$\Delta\theta_{g,F}$	0.0022
$\Delta\theta_{i,g}$	0.0299

Mechanical Properties	
Young's Modulus E (10 <sup>8</sup> N/m <sup>2</sup> )	623
Rigidity Modulus G (10 <sup>8</sup> N/m <sup>2</sup> )	254
Poisson's Ratio $\sigma$	0.227
Knoop Hardness Hk[Class]	520   5
Abrasion Aa	111
Photoelastic Constant $\beta$ (nm/cm/10 <sup>5</sup> Pa)	2.87

Constants of Dispersion Formula	
A <sub>1</sub>	1.17447043E+00
A <sub>2</sub>	1.40056154E-02
A <sub>3</sub>	1.19272435E+00
B <sub>1</sub>	8.41855181E-03
B <sub>2</sub>	-5.81790767E-02
B <sub>3</sub>	1.29599726E+02

Chemical Properties	
Water Resistance(Powder) Group RW(P)	3
Acid Resistance(Powder) Group RA(P)	4
Weathering Resistance(Surface) Group W(S)	1 ~ 2
Acid Resistance(Surface) Group SR	3.0
Phosphate Resistance PR	2.0

Other Properties	
Bubble Quality Group B	
Specific Gravity d	2.46
Remarks	

Temperature Coefficients of Refractive Index							
Range of Temperature (°C)	$dn/dt$ relative (10 <sup>-6</sup> /°C)						
	t	C'	He-Ne	D	e	F'	g
-40~-20	-1.3	-1.2	-1.2	-1.1	-1.1	-0.9	-0.7
-20~ 0	-1.3	-1.1	-1.1	-1.0	-1.0	-0.8	-0.6
0~20	-1.3	-1.1	-1.0	-0.9	-0.8	-0.6	-0.4
20~40	-1.1	-0.8	-0.8	-0.7	-0.6	-0.4	-0.3
40~60	-1.0	-0.6	-0.6	-0.5	-0.4	-0.2	0.0
60~80	-0.9	-0.4	-0.4	-0.3	-0.2	-0.1	0.2