

S-FSL 5

Code(d) 487702

Code(e) 489701

Refractive Index n_d	1.487 49 1.487 490	Abbe Number ν_d	70.23	Dispersion $n_F - n_C$	0.006 941
Refractive Index n_e	1.489 147	Abbe Number ν_e	70.04	Dispersion $n_{F'} - n_{C'}$	0.006 984

Refractive Indices		
λ (μm)		
n_{2325}	2.325 42	1.462 27
n_{1970}	1.970 09	1.467 65
n_{1530}	1.529 58	1.473 24
n_{1129}	1.128 64	1.477 78
n_t	1.013 98	1.479 15
n_s	0.852 11	1.481 38
$n_{A'}$	0.768 19	1.482 82
n_F	0.706 52	1.484 10
n_C	0.656 27	1.485 34
$n_{C'}$	0.643 85	1.485 69
n_{He-Ne}	0.632 8	1.486 01
n_D	0.589 29	1.487 43
n_d	0.587 56	1.487 49
n_e	0.546 07	1.489 15
n_F	0.486 13	1.492 28
$n_{F'}$	0.479 99	1.492 67
n_{He-Cd}	0.441 57	1.495 48
n_g	0.435 835	1.495 96
n_h	0.404 656	1.498 98
n_i	0.365 015	1.504 06

Constants of Dispersion Formula	
A_1	1.174 470 43E+00
A_2	1.400 561 54E-02
A_3	1.192 724 35E+00
B_1	8.418 551 81E-03
B_2	-5.817 907 67E-02
B_3	1.295 997 26E+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

Mechanical Properties	
Young's Modulus E (GPa)	62.3
Rigidity Modulus G (GPa)	25.4
Poisson's Ratio σ	0.227
Knoop Hardness Hk[Class]	520 5
Abrasion Aa	117

Partial Dispersions	
$n_C - n_t$	0.006 194
$n_C - n_{A'}$	0.002 522
$n_d - n_C$	0.002 146
$n_e - n_C$	0.003 803
$n_g - n_d$	0.008 474
$n_g - n_F$	0.003 679
$n_h - n_g$	0.003 019
$n_i - n_g$	0.008 099
$n_{C'} - n_t$	0.006 539
$n_e - n_{C'}$	0.003 458
$n_{F'} - n_e$	0.003 526
$n_i - n_{F'}$	0.011 390

Relative Partial Dispersions	
$\theta_{C,t}$	0.892 4
$\theta_{C,A'}$	0.363 3
$\theta_{d,C}$	0.309 2
$\theta_{e,C}$	0.547 9
$\theta_{g,d}$	1.220 9
$\theta_{g,F}$	0.530 0
$\theta_{h,g}$	0.435 0
$\theta_{i,g}$	1.166 8
$\theta'_{C,t}$	0.936 3
$\theta'_{e,C'}$	0.495 1
$\theta'_{F',e}$	0.504 9
$\theta'_{i,F'}$	1.630 9

Anomalous dispersion	
$\Delta\theta_{C,t}$	0.016 2
$\Delta\theta_{C,A'}$	0.002 3
$\Delta\theta_{g,d}$	0.002 0
$\Delta\theta_{g,F}$	0.002 2
$\Delta\theta_{i,g}$	0.029 9

Coloring			
λ_{80}	300	λ_5	265
λ_{70}			
Internal transmission			
$\lambda_{0.80}$	304	$\lambda_{0.05}$	277
CCI			
B	G	R	
0.00	0.00	0.00	

Internal Transmittance	
λ (nm)	τ_i (10 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
1 000	0.998
1 200	0.998
1 400	0.982
1 600	0.992
1 800	0.985
2 000	0.971
2 200	0.88
2 400	0.87

Thermal Properties	
Strain Point StP (°C)	457
Annealing Point AP (°C)	491
Transformation Temperature Tg (°C)	497
Yield Point At (°C)	592
Softening Point SP (°C)	679
Expansion Coefficients (-30 °C ~ 70 °C)	90
α_i (10 ⁻⁷ K ⁻¹) (100 °C ~ 300 °C)	98
Thermal Conductivity λ (W/(m·K))	1.01

Linear coefficient of thermal expansion	
Temperature range (°C)	α_i (10 ⁻⁷ K ⁻¹)
-100 ~ -90	81
-90 ~ -80	82
-80 ~ -70	82
-70 ~ -60	83
-60 ~ -50	84
-50 ~ -40	85
-40 ~ -30	86
-30 ~ -20	87
-20 ~ -10	87
-10 ~ 0	88
0 ~ 10	89
10 ~ 20	90
20 ~ 30	90
30 ~ 40	91
40 ~ 50	92
50 ~ 60	92
60 ~ 70	93
70 ~ 80	93
80 ~ 90	94
90 ~ 100	94
100 ~ 110	95
110 ~ 120	95
120 ~ 130	96
130 ~ 140	96
140 ~ 150	96
150 ~ 160	97
160 ~ 170	97
170 ~ 180	97
180 ~ 190	98
190 ~ 200	98
200 ~ 210	98
210 ~ 220	98
220 ~ 230	98
230 ~ 240	99
240 ~ 250	99
250 ~ 260	99
260 ~ 270	99
270 ~ 280	99
280 ~ 290	99
290 ~ 300	99

Other Properties	
Photoelastic Constant β nm/(cm·105Pa)	2.87
Specific Gravity d	2.46
Remarks	

Temperature Coefficients of Refractive Index													
Range of Temperature (°C)	$\Delta n_{rel} / \Delta T$ (10 ⁻⁶ K ⁻¹)												
	1550	t	r	C	C'	d	e	F	F'	g	h	i	
-80 ~ -60	-2.2	-2.1	-2.0	-1.9	-1.9	-1.8	-1.8	-1.6	-1.6	-1.4	-1.2	-0.9	
-60 ~ -40	-2.2	-2.1	-2.0	-1.9	-1.9	-1.8	-1.8	-1.6	-1.6	-1.5	-1.2	-0.9	
-40 ~ -20	-2.0	-2.0	-1.9	-1.9	-1.8	-1.8	-1.7	-1.6	-1.6	-1.3	-1.1	-0.8	
-20 ~ 0	-1.9	-1.9	-1.8	-1.7	-1.7	-1.6	-1.6	-1.4	-1.4	-1.1	-1.0	-0.6	
0 ~ 20	-1.7	-1.7	-1.5	-1.5	-1.5	-1.4	-1.4	-1.2	-1.2	-1.0	-0.9	-0.5	
20 ~ 40	-1.5	-1.5	-1.4	-1.3	-1.3	-1.2	-1.2	-1.0	-1.0	-0.9	-0.7	-0.3	
40 ~ 60	-1.4	-1.3	-1.2	-1.2	-1.2	-1.0	-1.0	-0.8	-0.8	-0.6	-0.4	-0.1	
60 ~ 80	-1.2	-1.1	-1.0	-1.0	-0.9	-0.9	-0.8	-0.7	-0.7	-0.5	-0.3	0.1	
80 ~ 100	-1.0	-0.9	-0.8	-0.8	-0.7	-0.7	-0.6	-0.5	-0.5	-0.3	-0.1	0.2	
100 ~ 120	-0.8	-0.8	-0.6	-0.6	-0.6	-0.5	-0.5	-0.3	-0.3	-0.1	0.0	0.3	
120 ~ 140	-0.7	-0.6	-0.5	-0.5	-0.5	-0.4	-0.3	-0.2	-0.2	0.0	0.1	0.6	
140 ~ 160	-0.6	-0.4	-0.3	-0.3	-0.3	-0.2	-0.1	0.0	0.0	0.2	0.3	0.6	
160 ~ 180	-0.4	-0.4	-0.2	-0.2	-0.2	-0.1	-0.1	0.1	0.1	0.2	0.4	0.7	

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