# S-FPM 2

Code(d) **595677**
Code(e) **597674**

| | | | | | |
|---|---|---|---|---|---|
| Refractive Index $n_d$ | **1.595 22** 1.595 220 | Abbe Number $\nu_d$ | **67.74** | Dispersion $n_F - n_C$ | **0.008 787** |
| Refractive Index $n_e$ | 1.597 316 | Abbe Number $\nu_e$ | 67.37 | Dispersion $n_{F'} - n_{C'}$ | 0.008 866 |

| Refractive Indices | | |
|---|---|---|
| $\lambda$ (μm) | | |
| $n_{2325}$ | 2.325 42 | 1.572 52 |
| $n_{1970}$ | 1.970 09 | 1.576 31 |
| $n_{1530}$ | 1.529 58 | 1.580 45 |
| $n_{1129}$ | 1.128 64 | 1.584 26 |
| $n_t$ | 1.013 98 | 1.585 57 |
| $n_s$ | 0.852 11 | 1.587 91 |
| $n_{A'}$ | 0.768 19 | 1.589 54 |
| $n_r$ | 0.706 52 | 1.591 05 |
| $n_C$ | 0.656 27 | 1.592 55 |
| $n_{C'}$ | 0.643 85 | 1.592 98 |
| $n_{He\text{-}Ne}$ | 0.632 8 | 1.593 37 |
| $n_D$ | 0.589 29 | 1.595 14 |
| $n_d$ | 0.587 56 | 1.595 22 |
| $n_e$ | 0.546 07 | 1.597 32 |
| $n_F$ | 0.486 13 | 1.601 34 |
| $n_{F'}$ | 0.479 99 | 1.601 84 |
| $n_{He\text{-}Cd}$ | 0.441 57 | 1.605 49 |
| $n_g$ | 0.435 835 | 1.606 12 |
| $n_h$ | 0.404 656 | 1.610 08 |
| $n_i$ | 0.365 015 | 1.616 81 |

| Constants of Dispersion Formula | |
|---|---|
| $A_1$ | 7.612 427 85E-01 |
| $A_2$ | 7.470 333 75E-01 |
| $A_3$ | 9.389 289 47E-01 |
| $B_1$ | 3.211 740 95E-03 |
| $B_2$ | 1.402 344 23E-02 |
| $B_3$ | 1.395 235 30E+02 |

| Chemical Properties | |
|---|---|
| Water Resistance(Powder) Group RW(P) | 1 |
| Acid Resistance(Powder) Group RA(P) | 1 |
| Weathering Resistance(Surface) Group W(S) | 2 |
| Acid Resistance(Surface) Group SR | 51.3 |
| Phosphate Resistance PR | 4.1 |

| Mechanical Properties | | |
|---|---|---|
| Young's Modulus E (GPa) | 75.7 | |
| Rigidity Modulus G (GPa) | 29.4 | |
| Poisson's Ratio σ | 0.287 | |
| Knoop Hardness Hk[Class] | 400 | 4 |
| Abrasion Aa | 521 | |

| Partial Dispersions | |
|---|---|
| $n_C - n_t$ | 0.006 988 |
| $n_C - n_{A'}$ | 0.003 015 |
| $n_d - n_C$ | 0.002 665 |
| $n_e - n_C$ | 0.004 761 |
| $n_g - n_d$ | 0.010 904 |
| $n_g - n_F$ | 0.004 782 |
| $n_h - n_g$ | 0.003 960 |
| $n_i - n_g$ | 0.010 681 |
| $n_{C'} - n_t$ | 0.007 411 |
| $n_e - n_{C'}$ | 0.004 338 |
| $n_{F'} - n_e$ | 0.004 528 |
| $n_i - n_{F'}$ | 0.014 961 |

| Relative Partial Dispersions | |
|---|---|
| $\theta_{C,t}$ | 0.795 3 |
| $\theta_{C,A'}$ | 0.343 1 |
| $\theta_{d,C}$ | 0.303 3 |
| $\theta_{e,C}$ | 0.541 8 |
| $\theta_{g,d}$ | 1.240 9 |
| $\theta_{g,F}$ | 0.544 2 |
| $\theta_{h,g}$ | 0.450 7 |
| $\theta_{i,g}$ | 1.215 5 |
| $\theta'_{C,t}$ | 0.835 9 |
| $\theta'_{e,C'}$ | 0.489 3 |
| $\theta'_{F,e}$ | 0.510 7 |
| $\theta'_{i,F'}$ | 1.687 5 |

| Anomalous dispersion | |
|---|---|
| $\Delta\theta_{C,t}$ | -0.069 2 |
| $\Delta\theta_{C,A'}$ | -0.014 9 |
| $\Delta\theta_{g,d}$ | 0.016 9 |
| $\Delta\theta_{g,F}$ | 0.012 3 |
| $\Delta\theta_{i,g}$ | 0.057 7 |

| Coloring | | | |
|---|---|---|---|
| $\lambda_{80}$ | 355 | $\lambda_5$ | 295 |
| $\lambda_{70}$ | | | |

| Internal transmission | | | |
|---|---|---|---|
| $\lambda_{0.80}$ | 347 | $\lambda_{0.05}$ | 302 |

| CCI | | |
|---|---|---|
| B | G | R |
| 0.00 | 0.32 | 0.27 |

| Internal Transmittance | |
|---|---|
| $\lambda$ (nm) | $\tau_i$ (10 mm) |
| 280 | |
| 290 | |
| 300 | |
| 310 | 0.18 |
| 320 | 0.35 |
| 330 | 0.54 |
| 340 | 0.72 |
| 350 | 0.84 |
| 360 | 0.917 |
| 370 | 0.958 |
| 380 | 0.980 |
| 390 | 0.988 |
| 400 | 0.991 |
| 420 | 0.989 |
| 440 | 0.989 |
| 460 | 0.992 |
| 480 | 0.994 |
| 500 | 0.996 |
| 550 | 0.998 |
| 600 | 0.997 |
| 650 | 0.996 |
| 700 | 0.996 |
| 800 | 0.995 |
| 900 | 0.995 |
| 1 000 | 0.996 |
| 1 200 | 0.997 |
| 1 400 | 0.997 |
| 1 600 | 0.997 |
| 1 800 | 0.995 |
| 2 000 | 0.992 |
| 2 200 | 0.989 |
| 2 400 | 0.983 |

| Thermal Properties | | |
|---|---|---|
| Strain Point StP (℃) | | - |
| Annealing Point AP (℃) | | - |
| Transformation Temperature Tg (℃) | | 569 |
| Yield Point At (℃) | | 594 |
| Softening Point SP (℃) | | - |
| Expansion Coefficients $\alpha_l$ ($10^{-7}$ $K^{-1}$) | (-30 ℃ ~ 70 ℃) | 117 |
| | (100 ℃ ~ 300 ℃) | 137 |
| Thermal Conductivity $\lambda$ (W/(m·K)) | | 0.624 |

| Linear coefficient of thermal expansion | |
|---|---|
| Temperature range (℃ ) | $\alpha_l$ ($10^{-7}$ $K^{-1}$) |
| -100 ~ -90 | 100 |
| -90 ~ -80 | 101 |
| -80 ~ -70 | 103 |
| -70 ~ -60 | 104 |
| -60 ~ -50 | 106 |
| -50 ~ -40 | 108 |
| -40 ~ -30 | 109 |
| -30 ~ -20 | 111 |
| -20 ~ -10 | 112 |
| -10 ~ 0 | 113 |
| 0 ~ 10 | 115 |
| 10 ~ 20 | 116 |
| 20 ~ 30 | 118 |
| 30 ~ 40 | 119 |
| 40 ~ 50 | 120 |
| 50 ~ 60 | 122 |
| 60 ~ 70 | 123 |
| 70 ~ 80 | 124 |
| 80 ~ 90 | 125 |
| 90 ~ 100 | 126 |
| 100 ~ 110 | 128 |
| 110 ~ 120 | 129 |
| 120 ~ 130 | 130 |
| 130 ~ 140 | 131 |
| 140 ~ 150 | 132 |
| 150 ~ 160 | 133 |
| 160 ~ 170 | 134 |
| 170 ~ 180 | 135 |
| 180 ~ 190 | 136 |
| 190 ~ 200 | 137 |
| 200 ~ 210 | 138 |
| 210 ~ 220 | 138 |
| 220 ~ 230 | 139 |
| 230 ~ 240 | 140 |
| 240 ~ 250 | 141 |
| 250 ~ 260 | 142 |
| 260 ~ 270 | 142 |
| 270 ~ 280 | 143 |
| 280 ~ 290 | 144 |
| 290 ~ 300 | 144 |

| Other Properties | |
|---|---|
| Photoelastic Constant β nm/(cm·105Pa) | 0.51 |
| Specific Gravity $d$ | 4.17 |
| Remarks | |

## Temperature Coefficients of Refractive Index

| Range of Temperature (℃) | $\Delta n_{rel}$ / $\Delta T$ ($10^{-6}$ $K^{-1}$) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1550 | t | r | C | C' | d | e | F | F' | g | h | i |
| -80 ~ -60 | -5.9 | -5.8 | -5.7 | -5.6 | -5.6 | -5.6 | -5.5 | -5.4 | -5.3 | -5.1 | -4.9 | -4.7 |
| -60 ~ -40 | -6.1 | -6.1 | -5.9 | -5.8 | -5.8 | -5.7 | -5.7 | -5.5 | -5.5 | -5.3 | -5.2 | -4.8 |
| -40 ~ -20 | -6.2 | -6.2 | -6.1 | -5.9 | -5.9 | -5.8 | -5.7 | -5.6 | -5.6 | -5.4 | -5.2 | -4.8 |
| -20 ~ 0 | -6.3 | -6.2 | -6.1 | -6.0 | -6.0 | -5.8 | -5.8 | -5.6 | -5.6 | -5.4 | -5.2 | -4.9 |
| 0 ~ 20 | -6.3 | -6.2 | -6.0 | -6.0 | -6.0 | -5.9 | -5.8 | -5.6 | -5.6 | -5.4 | -5.2 | -4.8 |
| 20 ~ 40 | -6.3 | -6.2 | -6.0 | -6.0 | -6.0 | -5.9 | -5.8 | -5.6 | -5.6 | -5.4 | -5.2 | -4.7 |
| 40 ~ 60 | -6.3 | -6.2 | -6.0 | -6.0 | -6.0 | -5.9 | -5.8 | -5.6 | -5.6 | -5.2 | -5.0 | -4.7 |
| 60 ~ 80 | -6.2 | -6.2 | -6.0 | -5.9 | -5.9 | -5.8 | -5.7 | -5.5 | -5.5 | -5.3 | -5.0 | -4.6 |
| 80 ~ 100 | -6.3 | -6.2 | -6.0 | -5.9 | -5.9 | -5.8 | -5.7 | -5.5 | -5.4 | -5.2 | -5.0 | -4.6 |
| 100 ~ 120 | -6.2 | -6.2 | -6.0 | -5.9 | -5.9 | -5.8 | -5.7 | -5.4 | -5.4 | -5.2 | -4.9 | -4.5 |
| 120 ~ 140 | -6.3 | -6.2 | -6.0 | -5.9 | -5.9 | -5.8 | -5.7 | -5.5 | -5.4 | -5.2 | -4.9 | -4.5 |
| 140 ~ 160 | -6.3 | -6.3 | -6.0 | -6.0 | -5.9 | -5.8 | -5.7 | -5.5 | -5.5 | -5.2 | -4.9 | -4.4 |
| 160 ~ 180 | -6.4 | -6.4 | -6.1 | -6.0 | -5.9 | -5.8 | -5.7 | -5.5 | -5.4 | -5.2 | -4.9 | -4.4 |



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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.