

# Q-FKH2S

$n_d = 1.455620$

$n_e = 1.456812$

$v_d = 91.31$

$v_e = 90.89$

|                |        |
|----------------|--------|
| Glass code (d) | 456913 |
| Glass code (e) | 457909 |

| Spectral l. | Refractive idx |
|-------------|----------------|
| 2.058       | 1.44294        |
| 1.970       | 1.44357        |
| 1.530       | 1.44649        |
| 1.129       | 1.44906        |
| 1.064       | 1.44952        |
| t           | 1.44990        |
| s           | 1.45135        |
| A'          | 1.452324       |
| r           | 1.453212       |
| C           | 1.454089       |
| C'          | 1.454334       |
| He-Ne       | 1.454561       |
| D           | 1.455575       |
| d           | 1.455620       |
| e           | 1.456812       |
| F           | 1.459079       |
| F'          | 1.459360       |
| g           | 1.461745       |
| h           | 1.463935       |
| 0.389       | 1.465261       |
| i           | 1.467620       |

| Coef. disp. form. (pwr ser.) |                 |
|------------------------------|-----------------|
| A0                           | 2.10025148E+00  |
| A1                           | -4.58689757E-03 |
| A2                           | -2.09903123E-05 |
| A3                           | 6.85727645E-03  |
| A4                           | 2.32345667E-05  |
| A5                           | 4.89859472E-06  |
| A6                           | -1.82336191E-07 |
| A7                           | 0.00000000E+00  |
| A8                           | 0.00000000E+00  |

| Partial dispersion |          |
|--------------------|----------|
| F-C                | 0.004990 |
| F'-C'              | 0.005026 |
| C-t                | 0.004189 |
| C-A'               | 0.001765 |
| d-C                | 0.001531 |
| e-C                | 0.002723 |
| g-d                | 0.006125 |
| g-F                | 0.002666 |
| h-g                | 0.002190 |
| i-g                | 0.005875 |
| C'-t               | 0.004434 |
| e-C'               | 0.002478 |
| F'-e               | 0.002548 |
| i-F'               | 0.008260 |

| Relative partial dispersion |        |
|-----------------------------|--------|
| C-t/F-C                     | 0.8395 |
| C-A'/F-C                    | 0.3537 |
| d-C/F-C                     | 0.3068 |
| e-C/F-C                     | 0.5457 |
| g-d/F-C                     | 1.2275 |
| g-F/F-C                     | 0.5343 |
| h-g/F-C                     | 0.4389 |
| i-g/F-C                     | 1.1774 |
| C'-t/F'-C'                  | 0.8822 |
| e-C'/F'-C'                  | 0.4930 |
| F'-e/F'-C'                  | 0.5070 |
| i-F'/F'-C'                  | 1.6435 |

| Deviation of relative partial disp. |         |
|-------------------------------------|---------|
| $\Delta PdC$                        | -0.0116 |
| $\Delta PgF$                        | 0.0431  |

| Internal CC (80%/5%) |  |
|----------------------|--|
| 341/299              |  |

| Color Code (80%/5%) |  |
|---------------------|--|
| 345/300             |  |

| CCI |      |
|-----|------|
| B   | 0.00 |
| G   | 0.19 |
| R   | 0.13 |

| Thermal properties     |       |
|------------------------|-------|
| CTE(-30,70) [1E-7/°C]  | 134   |
| CTE(100,300) [1E-7/°C] | 160   |
| Tg [°C]                | 454   |
| At [°C]                | 482   |
| Ht condct. [W/m·K]     | 0.868 |
| Sp. heat [kJ/kg·K]     | 0.684 |
| diffus. [1E-6 m2/sec]  | 0.345 |

| Chemical properties [class] |   |
|-----------------------------|---|
| Acid res. (surface)         | 7 |
| Alkaline detergent res.     | 4 |
| Climate resistance          | 1 |
| Water res. (powder)         | 1 |
| Acid res. (powder)          | 3 |

| Mechanical properties                |         |
|--------------------------------------|---------|
| Knoop hardness                       | 335 (3) |
| Abrasion hardness                    | 404     |
| Young's mod. [GPa]                   | 71.4    |
| Shear mod. [GPa]                     | 27.3    |
| Poisson's ratio                      | 0.305   |
| Stress optical coef. [1E-5 nm/cm/Pa] | 0.82    |

| Internal trans. (10mm) |        |
|------------------------|--------|
| $\lambda$ [nm]         | $\tau$ |
| 280                    | 0.00   |
| 290                    | 0.00   |
| 300                    | 0.06   |
| 310                    | 0.18   |
| 320                    | 0.39   |
| 330                    | 0.61   |
| 340                    | 0.79   |
| 350                    | 0.89   |
| 360                    | 0.949  |
| 370                    | 0.976  |
| 380                    | 0.988  |
| 390                    | 0.993  |
| 400                    | 0.995  |
| 420                    | 0.994  |
| 440                    | 0.994  |
| 460                    | 0.996  |
| 480                    | 0.996  |
| 500                    | 0.998  |
| 550                    | 0.999  |
| 600                    | 0.998  |
| 650                    | 0.997  |
| 700                    | 0.998  |
| 800                    | 0.996  |
| 900                    | 0.994  |
| 1000                   | 0.994  |
| 1200                   | 0.995  |
| 1400                   | 0.994  |
| 1600                   | 0.994  |
| 1800                   | 0.991  |
| 2000                   | 0.995  |
| 2200                   | 0.994  |
| 2400                   | 0.998  |

| Specific gravity |  |
|------------------|--|
| 3.67             |  |

| Relative $\Delta n / \Delta T$ [1E-6/°C] |       |      |      |      |      |      |      |       |      |      |      |      |      |      |       |
|--|-------|------|------|------|------|------|------|-------|------|------|------|------|------|------|-------|
| Temp. [°C]                               | 1.083 | t    | s    | A'   | r    | C    | C'   | He-Ne | d    | e    | F    | F'   | g    | h    | 0.389 |
| 80 to 90(ref.)                           | -6.9  | -6.9 | -6.9 | -6.8 | -6.8 | -6.7 | -6.7 | -6.7  | -6.6 | -6.5 | -6.4 | -6.4 | -6.3 | -6.1 | -6.0  |
| 60 to 80(ref.)                           | -6.8  | -6.7 | -6.7 | -6.6 | -6.6 | -6.5 | -6.5 | -6.5  | -6.5 | -6.4 | -6.3 | -6.3 | -6.1 | -6.0 | -5.9  |
| 40 to 60                                 | -6.5  | -6.5 | -6.5 | -6.4 | -6.4 | -6.3 | -6.3 | -6.3  | -6.2 | -6.2 | -6.1 | -6.0 | -5.9 | -5.8 | -5.7  |
| 20 to 40                                 | -6.3  | -6.3 | -6.2 | -6.2 | -6.1 | -6.1 | -6.1 | -6.0  | -6.0 | -5.9 | -5.8 | -5.8 | -5.7 | -5.5 | -5.4  |
| 0 to 20                                  | -6.0  | -6.0 | -5.9 | -5.9 | -5.8 | -5.8 | -5.8 | -5.8  | -5.7 | -5.7 | -5.5 | -5.5 | -5.4 | -5.3 | -5.2  |
| -20 to 0                                 | -5.6  | -5.6 | -5.6 | -5.5 | -5.5 | -5.5 | -5.4 | -5.4  | -5.4 | -5.3 | -5.2 | -5.2 | -5.1 | -4.9 | -4.9  |
| -40 to -20                               | -5.2  | -5.2 | -5.2 | -5.1 | -5.1 | -5.1 | -5.1 | -5.0  | -5.0 | -4.9 | -4.8 | -4.8 | -4.7 | -4.6 | -4.5  |
| -60 to -40(ref.)                         | -4.8  | -4.7 | -4.7 | -4.7 | -4.6 | -4.6 | -4.6 | -4.6  | -4.5 | -4.5 | -4.4 | -4.4 | -4.2 | -4.1 | -4.0  |
| -70 to -60(ref.)                         | -4.3  | -4.3 | -4.3 | -4.2 | -4.2 | -4.2 | -4.2 | -4.2  | -4.1 | -4.1 | -3.9 | -3.9 | -3.8 | -3.7 | -3.6  |

| Absolute $\Delta n / \Delta T$ [1E-6/°C] |       |      |      |      |      |      |      |       |      |      |      |      |      |      |       |
|--|-------|------|------|------|------|------|------|-------|------|------|------|------|------|------|-------|
| Temp. [°C]                               | 1.083 | t    | s    | A'   | r    | C    | C'   | He-Ne | d    | e    | F    | F'   | g    | h    | 0.389 |
| 80 to 90                                 | -7.8  | -7.8 | -7.7 | -7.7 | -7.7 | -7.6 | -7.6 | -7.6  | -7.5 | -7.5 | -7.3 | -7.3 | -7.2 | -7.0 | -7.0  |
| 60 to 80                                 | -7.7  | -7.7 | -7.7 | -7.6 | -7.6 | -7.5 | -7.5 | -7.5  | -7.5 | -7.4 | -7.3 | -7.3 | -7.1 | -7.0 | -6.9  |
| 40 to 60                                 | -7.6  | -7.6 | -7.6 | -7.5 | -7.5 | -7.4 | -7.4 | -7.4  | -7.4 | -7.3 | -7.2 | -7.2 | -7.0 | -6.9 | -6.8  |
| 20~40                                    | -7.5  | -7.5 | -7.5 | -7.4 | -7.4 | -7.3 | -7.3 | -7.3  | -7.3 | -7.2 | -7.1 | -7.1 | -7.0 | -6.8 | -6.7  |
| 0 to 20                                  | -7.4  | -7.4 | -7.3 | -7.3 | -7.3 | -7.2 | -7.2 | -7.2  | -7.2 | -7.1 | -7.0 | -7.0 | -6.9 | -6.8 | -6.7  |
| -20 to 0                                 | -7.3  | -7.3 | -7.2 | -7.2 | -7.2 | -7.1 | -7.1 | -7.1  | -7.1 | -7.0 | -6.9 | -6.9 | -6.8 | -6.7 | -6.6  |
| -40 to -20                               | -7.2  | -7.2 | -7.1 | -7.1 | -7.1 | -7.0 | -7.0 | -7.0  | -7.0 | -6.9 | -6.8 | -6.8 | -6.7 | -6.6 | -6.5  |
| -60 to -40                               | -7.1  | -7.1 | -7.0 | -7.0 | -7.0 | -6.9 | -6.9 | -6.9  | -6.9 | -6.8 | -6.7 | -6.7 | -6.6 | -6.5 | -6.4  |
| -70 to -60                               | -7.0  | -7.0 | -7.0 | -6.9 | -6.9 | -6.9 | -6.9 | -6.9  | -6.8 | -6.8 | -6.7 | -6.7 | -6.6 | -6.5 | -6.4  |

| Coef. disp. form. (frac. eq.) (ref.) |   |
|--------------------------------------|---|
| P1                                   | - |
| Q1                                   | - |
| P2                                   | - |
| Q2                                   | - |
| P3                                   | - |
| Q3                                   | - |

| Fitting error of disp. form. $\sigma$ [1E-6] |         |          |
|--|---------|----------|
|  | Visible | Infrared |
| Power ser. eq.                               | 0.3     | 9.5      |
| Frac. eq. (ref.)                             | -       | -        |

|                      |   |
|----------------------|---|
| Prod. Freq. (A to D) | B |
|----------------------|---|

| Similar glass type |   |        |   |
|--------------------|---|--------|---|
| OHARA              | - | HOYA   | - |
| C.D.G.M            | - | SCHOTT | - |

|          |               |
|----------|---------------|
| 2019-4-1 | Transmittance |
| 2018-4-1 | Prod. Freq    |
| 2015-4-1 | Color Code    |