*LYTKARINO OPTICAL GLASS FACTORY, JSC*

ЛЗОС LZOS

# TK12

glass type

| | | |
|---|---|---|
| $n_e$ 1.571039 | $\upsilon_e$ 62.71 | $n_{F'} - n_{C'}$ 0.009106 |
| $n_d$ 1.568881 | $\upsilon_d$ 62.93 | $n_F - n_C$ 0.009040 |

| Class of bubbles | Viscosity temperature | | | | |
|---|---|---|---|---|---|
| | η [Poise] | $10^{14.5}$ | $10^{13}$ | $10^{10}$ | $10^{8}$ |
| 2 | t [°C ] | 575 | 605 | 670 | 720 |

| Relative partial dispersion deviations from the 'Normal Line' | | | | |
|---|---|---|---|---|
| | i – F' | g – F' | F' - e | F' - r |
| ΔP | -0.006 | -0.0007 | +0.0004 | -0.0010 |
| Δ $\upsilon_e$ | -0.7 | -0.5 | +0.8 | +1.4 |
| | i – F | g – F | F - e | F - r |
| ΔP | -0.005 | -0.0004 | +0.0005 | -0.0006 |
| Δ $\upsilon_d$ | -0.5 | -0.2 | +0.9 | +1.2 |

| Stress optical coefficient B [nm·cm$^{-1}$ / kp·cm$^{-2}$], λ=550nm | Thermal conductivity | | | |
|---|---|---|---|---|
| | -50°C | 0°C | +20°C | +50°C |
| 2.40 | 0.69 | 0.75 | 0.77 | 0.79 |

| Optical density increment on irradiation | | |
|---|---|---|
| Initial density $D_0$ [cm$^{-1}$] | Radiation dose [R] | Optical density increment Δ D [cm$^{-1}$] |
| 0.045 | $1 \cdot 10^4$ | 0.035 |
| | $1 \cdot 10^5$ | 0.31 |

| Young's modulus E [kp · mm$^{-2}$] | Shear modulus G [kp·mm$^{-2}$] | Coefficient of linear thermal expansion $\alpha_{20/t} \cdot 10^7$ [°C] | | Chemical resistance | |
|---|---|---|---|---|---|
| | | | | Stain resistance | |
| | | | | Group | III |
| 8550 | 3439 | | | | |
| Poisson's ratio μ | Density ρ [g · cm$^{-3}$] | +20 ÷ -60°C | +20 ÷ +120°C | Weather resistance | |
| 0.243 | 3.06 | 58 | 65 | Group | A |

| Refractive indices | | |
|---|---|---|
| λ [nm] | n | |
| 312.6 | - | - |
| 334.1 | - | - |
| 365.0 | i | 1.59084 |
| 404.66 | h | 1.58402 |
| 435.83 | g | 1.580001 |
| 479.99 | F' | 1.575661 |
| 486.13 | F | 1.575151 |
| 546.07 | e | 1.571039 |
| 587.56 | d | 1.568881 |
| 589.29 | D | 1.568800 |
| 643.85 | C' | 1.566555 |
| 656.27 | C | 1.566111 |
| 706.52 | r | 1.56452 |
| 768.2 | - | 1.56290 |
| 852.1 | - | 1.56110 |
| 1013.9 | - | 1.55838 |
| 1128.6 | - | 1.55676 |
| 1395.1 | - | 1.55331 |
| 1529.6 | - | 1.55158 |
| 1813.1 | - | 1.54770 |
| 1970.1 | - | 1.54535 |
| 2249.3 | - | 1.54072 |
| 2325.4 | - | 1.53935 |

| Dispersion coefficients | |
|---|---|
| $\nu_h = \frac{n_h - 1}{n_i - n_g}$ | 53.9 |
| $\nu_e = \frac{n_e - 1}{n_{F'} - n_{C'}}$ | 62.71 |
| $\nu_d = \frac{n_d - 1}{n_F - n_C}$ | 62.93 |
| $\nu_D = \frac{n_D - 1}{n_F - n_C}$ | 62.92 |
| $\nu_{1529.6} = \frac{n_{1529.6} - 1}{n_{1013.9} - n_{2249.3}}$ | 31.2 |

| Relative partial dispersions | | |
|---|---|---|
| Δ n | $\frac{\Delta n}{n_{F'} - n_{C'}}$ | $\frac{\Delta n}{n_F - n_C}$ |
| 312.6 – 334.1 | - | - |
| 334.1 - i | - | - |
| i - h | 0.749 | |
| h - g | 0.4414 | 0.4446 |
| g – F | 0.5326 | 0.5365 |
| g – F' | 0.4766 | 0.4801 |
| F - e | 0.4516 | 0.4549 |
| F - D | 0.6975 | 0.7025 |
| F' - e | 0.5075 | 0.5112 |
| d - D | 0.0089 | 0.0090 |
| D - C | 0.2953 | 0.2975 |
| e – C' | 0.4925 | 0.4961 |
| e - C | 0.5412 | 0.5451 |
| C' - r | 0.224 | 0.225 |
| C - r | 0.175 | 0.176 |
| r – 852.1 | 0.375 | 0.378 |
| 852.1 – 1013.9 | 0.299 | 0.301 |
| 1013.9 – 1128.6 | 0.178 | 0.179 |
| 1128.6 – 1395.1 | 0.378 | 0.381 |
| 1395.1 – 1529.6 | 0.190 | 0.192 |
| 1529.6 – 1813.1 | 0.426 | 0.429 |
| 1813.1 – 1970.1 | 0.258 | 0.260 |
| 1970.1 – 2249.3 | 0.508 | 0.512 |
| 2249.3 – 2325.4 | 0.151 | 0.152 |

| Internal transmittance | | |
|---|---|---|
| λ [nm] | $\tau_i$ (s=10mm) | $\tau_i$ (s=25mm) |
| 280 | - | - |
| 300 | - | - |
| 320 | - | - |
| 340 | - | - |
| 360 | - | - |
| 380 | 0.954 | 0.890 |
| 400 | 0.985 | 0.963 |
| 420 | 0.989 | 0.972 |
| 440 | 0.989 | 0.972 |
| 460 | 0.992 | 0.980 |
| 480 | 0.994 | 0.985 |
| 500 | 0.995 | 0.987 |
| 520 | 0.996 | 0.990 |
| 540 | 0.996 | 0.990 |
| 560 | 0.996 | 0.990 |
| 580 | 0.995 | 0.987 |
| 600 | 0.995 | 0.987 |
| 620 | 0.995 | 0.987 |
| 640 | 0.994 | 0.985 |
| 660 | 0.995 | 0.987 |
| 680 | 0.995 | 0.987 |
| 700 | 0.996 | 0.990 |
| 750 | 0.996 | 0.990 |
| 800 | 0.996 | 0.990 |
| 900 | 0.995 | 0.987 |
| 1000 | 0.995 | 0.987 |
| 1050 | 0.995 | 0.987 |
| 1100 | 0.995 | 0.987 |
| 1200 | - | - |
| 1300 | - | - |
| 1400 | - | - |
| 1500 | - | - |

| Refractive indices at laser wavelengths | |
|---|---|
| λ [ nm ] | n |
| 350.7 | - |
| 356.4 | - |
| 488.0 | 1.57499 |
| 514.0 | 1.57306 |
| 520.8 | 1.57260 |
| 530.0 | 1.57201 |
| 568.2 | 1.56983 |
| 632.8 | 1.56697 |
| 647.1 | 1.56644 |
| 694.3 | 1.56488 |
| 890.0 | 1.56039 |
| 1060.0 | 1.55771 |

**Radiation resistant analogue glass type-**

**TK112**