

SCHOTT, your reliable solutions provider in the IR industry

Infrared Chalcogenide Glass IRG 23

Product Information

IRG 23 has excellent transmission in the SWIR, MWIR, & LWIR and has the highest refractive index of the IR series glasses. Physical properties such as low dn/dT and low dispersion enable optical engineers to design color corrected optical systems without thermal defocusing. IRG 23 is optimized for pairing within the family of IR glasses and with other IR materials to support cost effective and high performance optical designs. Furthermore, IRG 23 can be processed by conventional grinding and polishing, single point diamond turning, or molding to support low to high volume component level fabrication.



Typical Forms of Supply

Typical forms of supply are upon customer request. Maximum sizes up to Ø 95 mm and 150 mm length. For sample parts we would like to offer you the following polished blanks:

- Diameter: 10 to 95 mm
- Thickness: 5 to 30 mm

Calculation Formula: Refractive index as a function of wavelength and temperature

$$n(\lambda, T) = \sqrt{1 + \frac{B_1 \lambda^2}{\lambda^2 - C_1} + \frac{B_2 \lambda^2}{\lambda^2 - C_2} + \frac{B_3 \lambda^2}{\lambda^2 - C_3}} + \frac{dn}{dT} (T - 20^\circ\text{C})$$

$$\frac{dn}{dT} = \frac{n^2(\lambda, 20^\circ\text{C}) - 1}{2n(\lambda, 20^\circ\text{C})} \left[D_0 + \frac{E_0}{\lambda^2 - \lambda_{TK}} \right]$$

Constants of Dispersion Formulas

B_1	3.7107
B_2	3.1091
B_3	0.8202
C_1	0.0000
C_2	0.2459
C_3	1451.5
D_0	$8.44 \cdot 10^{-5}$
E_0	$1.51 \cdot 10^{-5}$
λ_{TK}	0.992

Material Properties

Composition	$\text{Ge}_{30}\text{As}_{13}\text{Se}_{32}\text{Te}_{25}$
Density	4.84 g/cm ³
Thermal Expansion	$13.4 \cdot 10^{-6}/\text{K}$
Specific Heat	0.32 J/(g · K)
Thermal Conductivity	0.22 W/(m · K)
Transition Temperature	275 °C
Hardness (Knoop)	1.36 GPa
Fracture Toughness	0.414 MPa · m ^{1/2}
Shear Modulus	8.9 GPa
Young's Modulus	22.0 GPa

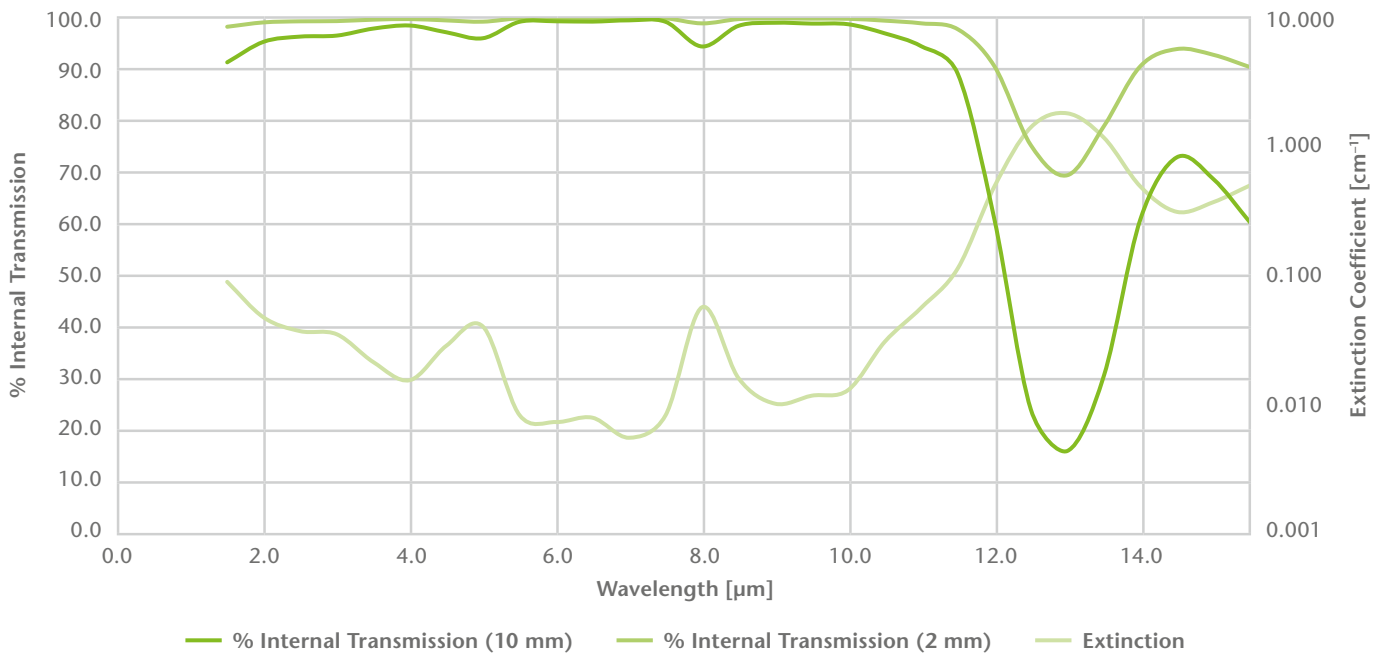
Wavelength [µm]	Refractive Index (@ 20 °C)	Temperature Coefficients of Refractive Index -50 to 75 °C* [10 ⁻⁶ /K]
1.2	2.9085	151.4
2.0	2.8322	110.8
3.0	2.8111	105.9
4.0	2.8034	104.5
5.0	2.7993	103.8
6.0	2.7965	103.4
7.0	2.7941	103.2
8.0	2.7918	103.0
9.0	2.7894	102.8
10.0	2.7869	102.6
11.0	2.7842	102.5
12.0	2.7811	102.3

Refractive index tolerance at 10 µm wavelength: ±0.001

*For more information and questions please contact us

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IRG 23 Extinction and Internal Transmission



Wavelength [μm]	% Internal Transmission (10 mm)	% Internal Transmission (2 mm)	Extinction [cm ⁻¹]
1.5	91.3	98.2	0.091
2.0	95.3	99.0	0.048
2.5	96.3	99.2	0.038
3.0	96.5	99.3	0.036
3.5	97.8	99.6	0.022
4.0	98.4	99.7	0.016
4.5	97.1	99.4	0.029
5.0	96.0	99.2	0.041
5.5	99.2	99.8	0.009
6.0	99.3	99.9	0.007
6.5	99.2	99.8	0.008
7.0	99.4	99.9	0.006
7.5	99.2	99.8	0.008
8.0	94.4	98.9	0.058
8.5	98.4	99.7	0.016

Wavelength [μm]	% Internal Transmission (10 mm)	% Internal Transmission (2 mm)	Extinction [cm ⁻¹]
9.0	99.0	99.8	0.010
9.5	98.8	99.8	0.012
10.0	98.7	99.7	0.013
10.5	96.9	99.4	0.031
11.0	94.4	98.9	0.057
11.5	89.1	97.7	0.115
12.0	61.1	90.6	0.493
12.5	24.3	75.4	1.414
13.0	16.3	69.6	1.815
13.5	30.8	79.0	1.177
14.0	61.0	90.6	0.494
14.5	73.0	93.9	0.315
15.0	68.8	92.8	0.374
15.5	60.4	90.4	0.504

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