

SCHOTT, your reliable solutions provider in the IR industry

Infrared Chalcogenide Glass IRG 22

Product Information

IRG 22 has excellent transmission in the SWIR, MWIR, & LWIR and has the best transmission of the IRG series in the NIR band with transmission beginning as low as 0.7 μm. With physical properties such as low dn/dT and low dispersion enables the optical engineers to design color corrected optical systems without thermal defocusing. IRG 22 is optimized for pairing within the family of IR glasses as well as other IR materials to support cost effective and high performing optical designs. Furthermore, IRG 22 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	2.4834
B ₂	2.8203
B ₃	0.9773
C ₁	0.0000
C ₂	0.1352
C ₃	1420.7
D ₀	6.34 · 10 ⁻⁵
E ₀	1.75 · 10 ⁻⁵
λ _{TK}	0.214

Material Properties

Composition	Ge ₃₃ As ₁₂ Se ₅₅
Density	4.41 g/cm ³
Thermal Expansion	12.1 · 10 ⁻⁶ /K
Specific Heat	0.33 J/(g · K)
Thermal Conductivity	0.24 W/(m · K)
Transition Temperature	368 °C
Hardness (Knoop)	1.41 GPa
Fracture Toughness	0.55 MPa · m ^{1/2}
Shear Modulus	8.9 GPa
Young's Modulus	21.5 GPa

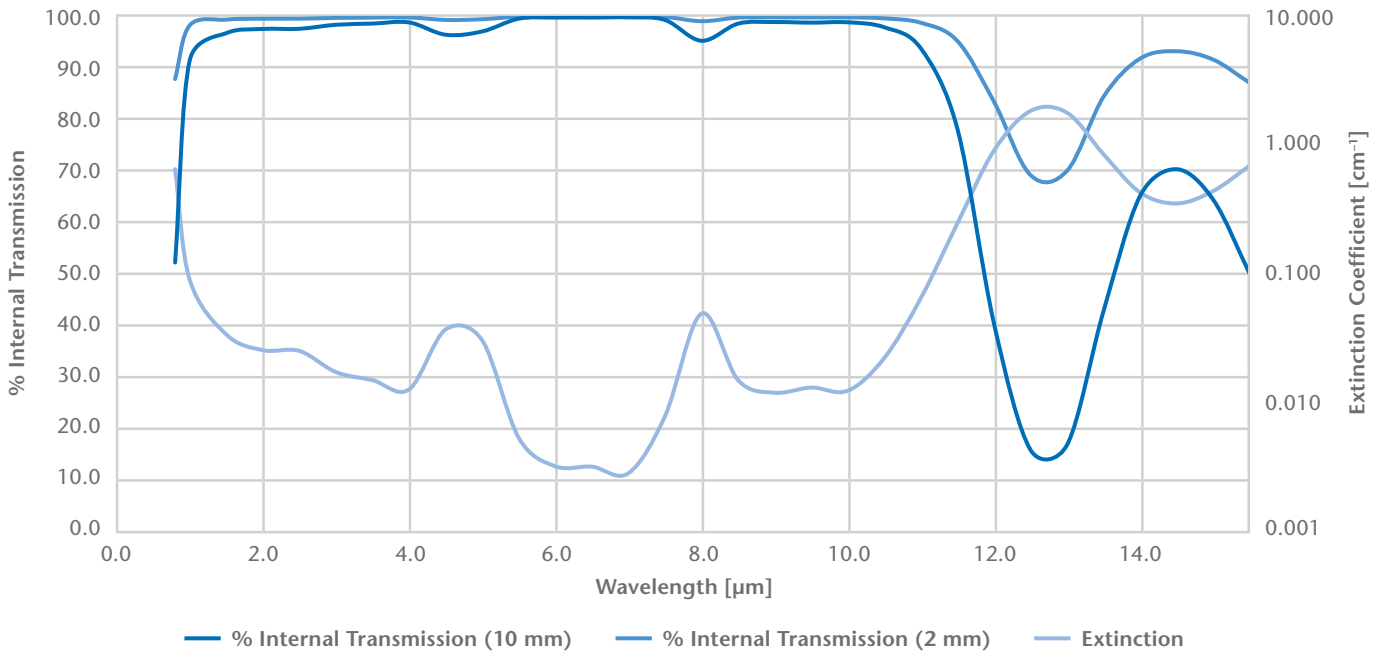
Wavelength [μm]	Refractive Index (@ 20 °C)	Temperature Coefficients of Refractive Index -50 to 75 °C* [10 ⁻⁶ /K]
0.8	2.6568	119.1
1.0	2.5969	94.7
1.5	2.5461	77.5
2.0	2.5297	72.6
3.0	2.5180	69.3
4.0	2.5133	68.2
5.0	2.5103	67.7
6.0	2.5078	67.4
7.0	2.5053	67.1
8.0	2.5027	67.0
9.0	2.4999	66.8
10.0	2.4967	66.6
11.0	2.4932	66.5
12.0	2.4892	66.3

Refractive index tolerance at 10 μm wavelength: ±0.001

*For more information and questions please contact us

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IRG 22 Extinction and Internal Transmission



Wavelength [μm]	% Internal Transmission (10 mm)	% Internal Transmission (2 mm)	Extinction [cm ⁻¹]
0.8	52.2	87.8	0.650
1.0	91.4	98.2	0.090
1.5	96.7	99.3	0.034
2.0	97.5	99.5	0.026
2.5	97.5	99.5	0.025
3.0	98.3	99.7	0.017
3.5	98.5	99.7	0.015
4.0	98.7	99.7	0.013
4.5	96.3	99.3	0.037
5.0	97.0	99.4	0.031
5.5	99.5	99.9	0.005
6.0	99.7	99.9	0.003
6.5	99.7	99.9	0.003
7.0	99.7	99.9	0.003
7.5	99.2	99.8	0.008
8.0	95.2	99.0	0.049

Wavelength [μm]	% Internal Transmission (10 mm)	% Internal Transmission (2 mm)	Extinction [cm ⁻¹]
8.5	98.5	99.7	0.015
9.0	98.8	99.8	0.012
9.5	98.7	99.7	0.013
10.0	98.8	99.8	0.012
10.5	97.8	99.6	0.022
11.0	93.7	98.7	0.065
11.5	78.0	95.2	0.248
12.0	40.2	83.4	0.910
12.5	15.8	69.2	1.844
13.0	16.9	70.1	1.779
13.5	43.0	84.4	0.845
14.0	65.2	91.8	0.428
14.5	70.3	93.2	0.353
15.0	64.3	91.5	0.442
15.5	49.9	87.0	0.696

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