

# SCHOTT, your reliable solutions provider in the IR industry

## Infrared Chalcogenide Glass IRG 22

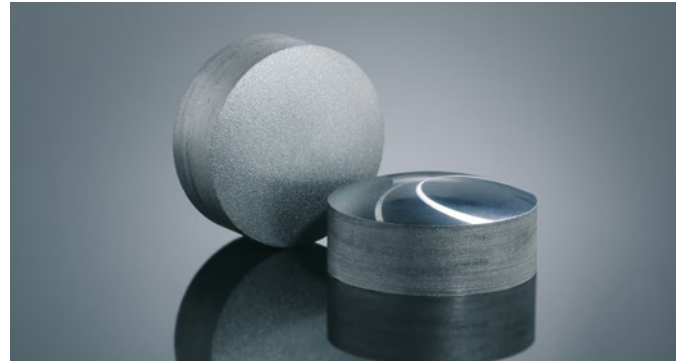
### Product Information

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

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

$$\frac{dn}{dT} = \frac{n^2(\lambda, 22) - 1}{2n(\lambda, 22)} \left[ D_0 + \frac{E_0}{\lambda^2 - \lambda_{TK}^2} \right]$$

Constants of Dispersion Formulas	
B <sub>1</sub>	2.4834
B <sub>2</sub>	2.8203
B <sub>3</sub>	0.9773
C <sub>1</sub>	0.0000
C <sub>2</sub>	0.1352
C <sub>3</sub>	1420.7
D <sub>0</sub>	6.41 · 10 <sup>-5</sup>
E <sub>0</sub>	1.68 · 10 <sup>-7</sup>
λ <sub>TK</sub>	9.96 · 10 <sup>-1</sup>

Material Properties	
Composition	Ge <sub>33</sub> As <sub>12</sub> Se <sub>55</sub>
Density	4.41 g/cm <sup>3</sup>
Thermal Expansion (20 – 100°C)	12.5 · 10 <sup>-6</sup> /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 <sup>1/2</sup>
Shear Modulus	8.9 GPa
Young's Modulus	21.5 GPa

Wavelength [μm]	Refractive Index (@ 22°C)	Δn abs / ΔT [10 <sup>-6</sup> /K] 22°C
1.0	2.5971	94.8
1.5	2.5462	69.1
2.0	2.5299	68.4
3.0	2.5182	68.0
4.0	2.5134	67.8
5.0	2.5104	67.7
6.0	2.5079	67.6
7.0	2.5054	67.5
8.0	2.5028	67.4
9.0	2.5000	67.3
10.0	2.4968	67.1
11.0	2.4933	67.0
12.0	2.4893	66.9

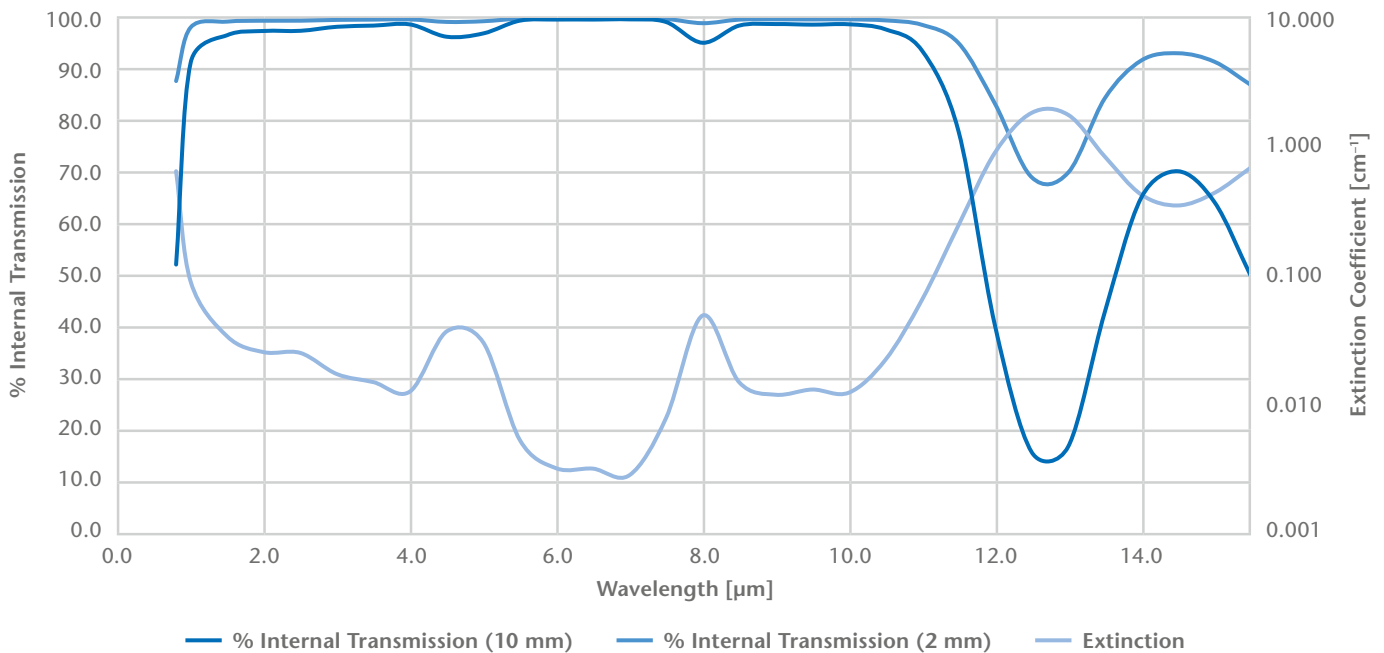
Refractive index tolerance at 10 μm wavelength: ± 0.001

\*For more information and questions please contact us



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## IRG 22 Extinction and Internal Transmission



Wavelength [μm]	% Transmission (10 mm)	% Transmission (2 mm)	Extinction [cm <sup>-1</sup> ]
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]	% Transmission (10 mm)	% Transmission (2 mm)	Extinction [cm <sup>-1</sup> ]
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

Version July 2018 | SCHOTT Advanced Optics reserves the right to make specification changes in this product flyer without notice.



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