

# SCHOTT, your reliable solutions provider in the IR industry

## Infrared Chalcogenide Glass IRG 24

### Product Information

IRG 24 has excellent transmission in the SWIR, MWIR, & LWIR and has the lowest dn/dT 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 24 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 24 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

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

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

### Constants of Dispersion Formulas

B <sub>1</sub>	2.8965
B <sub>2</sub>	2.9567
B <sub>3</sub>	0.9461
C <sub>1</sub>	0.0000
C <sub>2</sub>	0.1620
C <sub>3</sub>	1939.1
D <sub>0</sub>	1.80 · 10 <sup>-5</sup>
E <sub>0</sub>	2.10 · 10 <sup>-5</sup>
λ <sub>TK</sub>	1.67 · 10 <sup>-3</sup>

### Material Properties

Composition	Ge <sub>10</sub> As <sub>40</sub> Se <sub>50</sub>
Density	4.47 g/cm <sup>3</sup>
Thermal Expansion (20 – 100°C)	20.0 · 10 <sup>-6</sup> /K
Specific Heat	0.37 J/(g · K)
Thermal Conductivity	0.18 W/(m · K)
Transition Temperature	225 °C
Hardness (Knoop)	1.12 GPa
Fracture Toughness	0.347 MPa · m <sup>1/2</sup>
Shear Modulus	8.5 GPa
Young's Modulus	20.5 GPa

Wavelength [µm]	Refractive Index (@ 22°C)	Δn abs/ΔT [10 <sup>-6</sup> /K] 22°C
0.8	2.8028	–
0.9	2.7555	–
1.0	2.7249	46.0
1.5	2.6612	31.3
2.0	2.6413	26.3
3.0	2.6274	22.9
4.0	2.6222	21.7
5.0	2.6192	21.1
6.0	2.6170	20.8
7.0	2.6151	20.6
8.0	2.6132	20.5
9.0	2.6111	20.4
10.0	2.6090	20.3
11.0	2.6066	20.2
12.0	2.6040	20.2

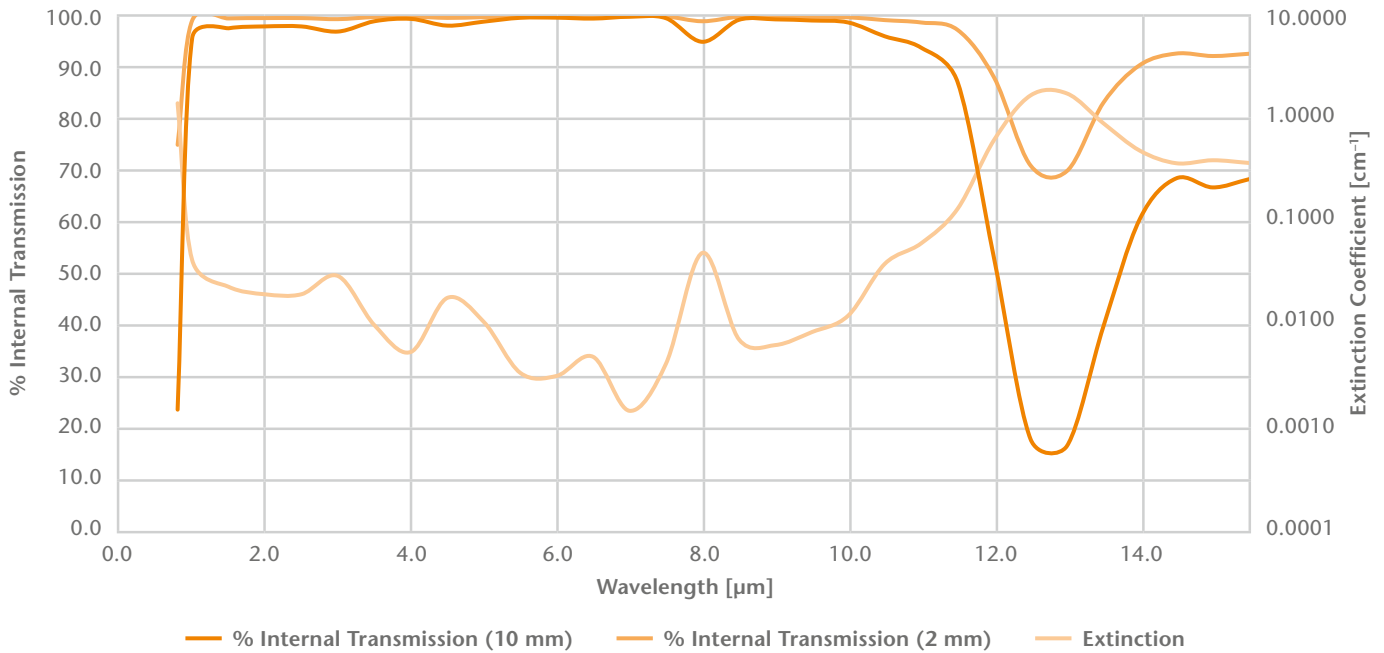
Refractive index tolerance at 10 µm wavelength: ±0.001

\*For more information and questions please contact us

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glass made of ideas

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## IRG 24 Extinction and Internal Transmission



Wavelength [μm]	Transmission (10 mm)	Transmission (2 mm)	Extinction [cm <sup>-1</sup> ]
0.8	23.9	75.1	1.432
1.0	95.7	99.1	0.044
1.5	97.6	99.5	0.024
2.0	98.0	99.6	0.020
2.5	98.0	99.6	0.020
3.0	97.0	99.4	0.031
3.5	99.0	99.8	0.010
4.0	99.4	99.9	0.006
4.5	98.1	99.6	0.019
5.0	98.9	99.8	0.011
5.5	99.6	99.9	0.004
6.0	99.7	99.9	0.003
6.5	99.5	99.9	0.005
7.0	99.8	100.0	0.002
7.5	99.6	99.9	0.004
8.0	95.0	99.0	0.051

Wavelength [μm]	Transmission (10 mm)	Transmission (2 mm)	Extinction [cm <sup>-1</sup> ]
8.5	99.3	99.9	0.007
9.0	99.3	99.9	0.007
9.5	99.1	99.8	0.009
10.0	98.7	99.7	0.013
10.5	96.1	99.2	0.040
11.0	93.9	98.7	0.063
11.5	87.2	97.3	0.137
12.0	53.2	88.1	0.632
12.5	18.2	71.1	1.704
13.0	16.9	70.0	1.781
13.5	40.0	83.2	0.917
14.0	60.8	90.5	0.498
14.5	68.6	92.7	0.377
15.0	66.8	92.3	0.403
15.5	68.5	92.7	0.379

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