

# SCHOTT, your reliable solutions provider in the IR industry

## Infrared Chalcogenide Glass IRG 25

### Product Information

IRG 25 has excellent transmission in the SWIR, MWIR, & LWIR. Physical properties such as low  $dn/dT$  and low dispersion enable optical engineers to design color corrected optical systems without thermal defocusing. IRG 25 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 25 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  $\varnothing$  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

$B_1$	2.7574
$B_2$	3.0990
$B_3$	1.6660
$C_1$	0.0000
$C_2$	0.15961
$C_3$	2045.5
$D_0$	$5.2 \cdot 10^{-5}$
$E_0$	$1.31 \cdot 10^{-4}$
$\lambda_{TK}$	-7.82

### Material Properties

Composition	$\text{Ge}_{28}\text{Sb}_{12}\text{Se}_{60}$
Density	4.66 g/cm <sup>3</sup>
Thermal Expansion	$14.0 \cdot 10^{-6}/\text{K}$
Specific Heat	0.33 J/(g · K)
Thermal Conductivity	0.25 W/(m · K)
Transition Temperature	285 °C
Hardness (Knoop)	1.13 GPa
Fracture Toughness	0.438 MPa · m <sup>1/2</sup>
Young's Modulus	22.1 GPa

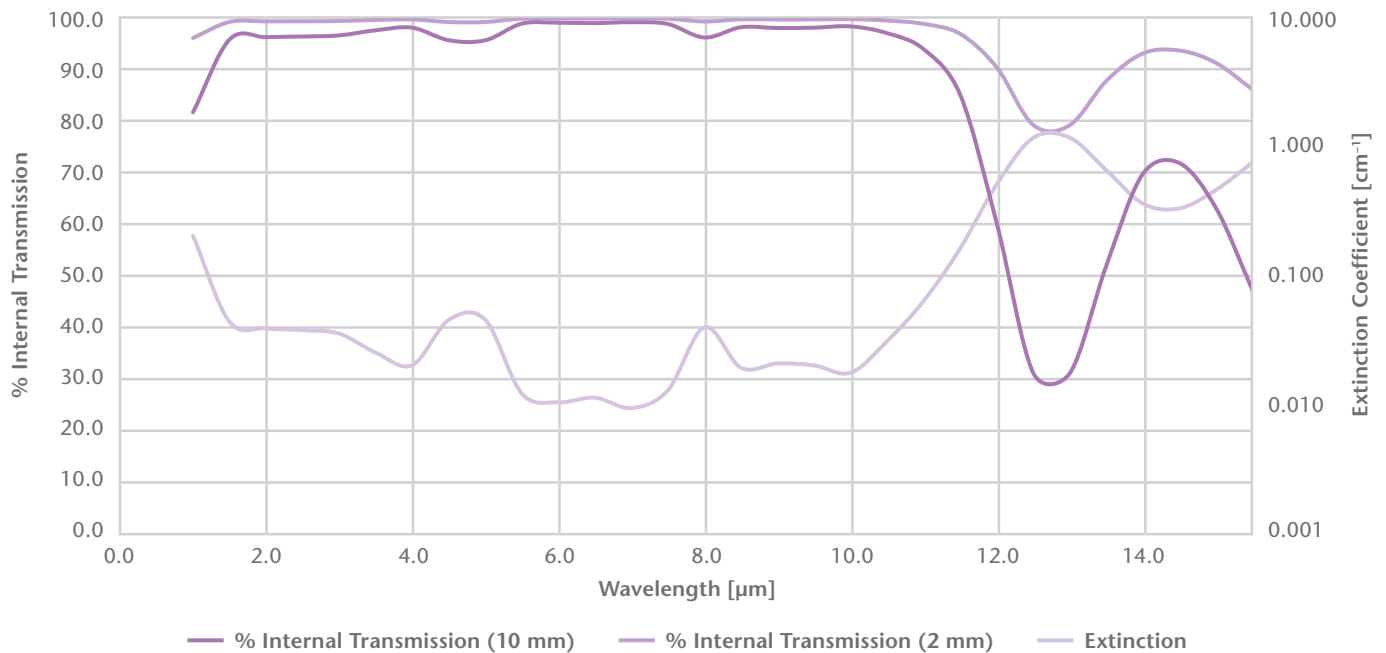
Wavelength [μm]	Refractive Index (@ 20 °C)	Temperature Coefficients of Refractive Index -50 to 75 °C* [10 <sup>-6</sup> /K]
0.85	2.7811	81.5
1.0	2.7284	78.9
1.5	2.6629	74.4
2.0	2.6423	71.4
3.0	2.6277	67.2
4.0	2.6219	64.4
5.0	2.6183	62.6
6.0	2.6154	61.4
7.0	2.6126	60.5
8.0	2.6097	59.9
9.0	2.6065	59.4
10.0	2.6030	59.0
11.0	2.5992	58.7
12.0	2.5949	58.4

Refractive index tolerance at 10 μm wavelength: ±0.001

\*For more information and questions please contact us

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## IRG 25 Extinction and Internal Transmission



Wavelength [μm]	% Internal Transmission (10 mm)	% Internal Transmission (2 mm)	Extinction [cm <sup>-1</sup> ]
1.0	81.6	96.0	0.203
1.5	95.7	99.1	0.044
2.0	96.2	99.2	0.039
2.5	96.3	99.2	0.038
3.0	96.5	99.3	0.036
3.5	97.5	99.5	0.025
4.0	98.0	99.6	0.020
4.5	95.6	99.1	0.045
5.0	95.6	99.1	0.045
5.5	98.8	99.8	0.012
6.0	99.0	99.8	0.010
6.5	98.9	99.8	0.011
7.0	99.1	99.8	0.009
7.5	98.7	99.7	0.013
8.0	96.1	99.2	0.040

Wavelength [μm]	% Internal Transmission (10 mm)	% Internal Transmission (2 mm)	Extinction [cm <sup>-1</sup> ]
8.5	98.1	99.6	0.019
9.0	97.9	99.6	0.021
9.5	98.0	99.6	0.020
10.0	98.2	99.6	0.018
10.5	96.9	99.4	0.031
11.0	93.8	98.7	0.064
11.5	85.0	96.8	0.163
12.0	60.1	90.3	0.509
12.5	31.1	79.2	1.167
13.0	31.1	79.2	1.167
13.5	52.0	87.7	0.654
14.0	69.7	93.0	0.361
14.5	71.8	93.6	0.332
15.0	63.1	91.2	0.461
15.5	47.2	86.0	0.752

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