

SCHOTT, your reliable solutions provider in the IR industry

Infrared Chalcogenide Glass IRG 27

Product Information

IRG 27 exhibits excellent transmission through the short and mid-wave IR (SWIR-MWIR). The germanium-free composition offers various advantages, including a near zero dn/dT starting at $1.5 \mu\text{m}$ that continues through the MWIR and into the LWIR. IRG 27 displays low dispersion for SWIR and MWIR applications and can be used as a flint material in achromatic doublets for multi-band IR applications. The glass can be processed by conventional grinding and polishing methods, as well as single point diamond turning, and molding. Based on similar thermal and mechanical characteristics to IRG 26, IRG 27 will process in a similar manner.

Typical Forms of Supply

Typical forms of supply are upon customer request. Maximum sizes up to $\varnothing 95 \text{ mm}$ and 150 mm length. For sample parts we 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_1	1.4005
B_2	3.4429
B_3	1.0394
C_1	0.0000
C_2	0.0871
C_3	805.5
D_0	$-3.89 \cdot 10^{-6}$
E_0	$1.77 \cdot 10^{-5}$
λ_{TK}	$2.4 \cdot 10^{-1}$

Material Properties

Composition	As_2S_3
Density	3.20 g/cm^3
Thermal Expansion (20 – 100°C)	$22.5 \cdot 10^{-6}/\text{K}$
Thermal Conductivity (25°C)	$0.33 \text{ W}/(\text{m} \cdot \text{K})$
Transition Temperature	197°C
Hardness (Knoop)	1.11 GPa
Fracture Toughness	$0.286 \text{ MPa} \cdot \text{m}^{1/2}$
Young's Modulus	16.77 GPa
Thermal Change dn/dt	$-3.7 \cdot 10^{-6}/\text{K}$ (@ $10.6 \mu\text{m}$)
Specific Heat	$0.482 \text{ J}/(\text{g} \cdot \text{K})$

Wavelength [μm]	Refractive Index (@ 22°C)	$\Delta n \text{ abs}/\Delta T$ [$10^{-6}/\text{K}$] @ 22°C
0.6	2.6347	62.2
0.7	2.5665	40.6
0.8	2.5268	28.4
0.9	2.5014	20.7
1.0	2.4841	15.6
1.5	2.4452	4.3
2.0	2.4320	0.6
2.5	2.4257	-1.0
3.0	2.4218	-1.9
4.0	2.4169	-2.8
5.0	2.4129	-3.2
6.0	2.4090	-3.4
7.0	2.4046	-3.5
8.0	2.3997	-3.6
9.0	2.3939	-3.6
10.0	2.3873	-3.7
11.0	2.3795	-3.7
12.0	2.3705	-3.7

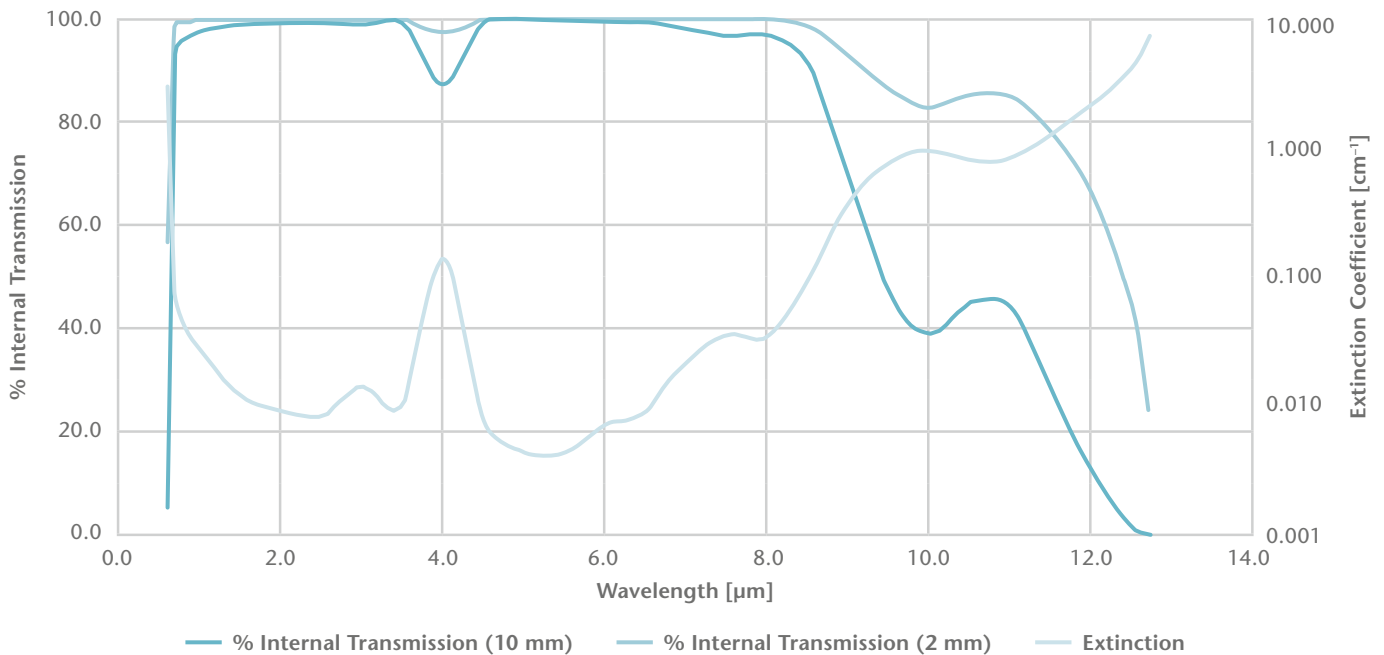
Refractive index tolerance at $10 \mu\text{m}$ wavelength: ± 0.001

*For more information and questions please contact us

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IRG 27 Extinction and Internal Transmission



Wavelength [μm]	% Transmission (10 mm)	% Transmission (2 mm)	Extinction [cm ⁻¹]
0.6	5.8	56.5	2.855
0.7	93.3	98.6	0.070
0.8	95.7	99.1	0.043
1.0	97.3	99.5	0.028
1.5	98.8	99.8	0.012
2.0	99.1	99.8	0.009
2.5	99.2	99.8	0.008
3.0	98.6	99.7	0.014
3.5	99.0	99.8	0.010
4.0	87.2	97.3	0.137
4.5	99.2	99.8	0.008
5.0	99.6	99.9	0.004
5.5	99.6	99.9	0.004
6.0	99.3	99.9	0.007

Wavelength [μm]	% Transmission (10 mm)	% Transmission (2 mm)	Extinction [cm ⁻¹]
6.5	99.1	99.8	0.009
7.0	97.8	99.6	0.022
7.5	96.5	99.3	0.035
8.0	96.6	99.3	0.035
8.5	91.0	98.1	0.094
9.0	69.3	92.9	0.366
9.5	46.8	85.9	0.759
10.0	38.8	82.8	0.946
10.5	44.9	85.2	0.801
11.0	44.0	84.8	0.822
11.5	28.3	77.7	1.263
12.0	11.8	65.2	2.137
12.5	1.6	43.5	4.158
12.7	0.1	24.5	7.025

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