

SCHOTT, your reliable solutions provider in the IR industry

Infrared Chalcogenide Glass IRG 23

Product Information

IRG 23 has excellent transmission in the SWIR, MWIR, & LWIR and has the highest refractive index 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 23 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 23 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 100 mm and 150 mm length. For sample parts we offer polished banks:

- Diameter: 10 to 100 mm
- Thickness: 5 to 30 mm



Constants of Dispersion Formulas (1.0–12.0 μm)

B_1	9.1325	–	$4.5462 * e^{0.00057621 * T(K)}$
B_2	–4.2472	+	$6.3237 * e^{0.00049808 * T(K)}$
B_3	0.5059	+	$49.9978 * e^{-0.016089 * T(K)}$
C_1	0.0000		
C_2	0.3680	+	$0.1771 * e^{-0.0010444 * T(K)}$
C_3	29.4566	+	$372.6114 * e^{-0.011925 * T(K)}$

Refractive index as a function of both wavelength and temperature may be determined from the following relation

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

Material Properties

Composition	$\text{Ge}_{30}\text{As}_{13}\text{Se}_{32}\text{Te}_{25}$
Density	4.84 g/cm ³
Thermal Expansion	$13.4 \times 10^{-6}/\text{K}$
Specific Heat	0.32 J/gK
Thermal Conductivity	0.22 W/mK
Transition Temperature	275 °C
Hardness (Knoop)	1.36 GPA
Fracture Toughness	0.414 MPa·m ^{1/2}
Shear Modulus	8.9 GPA
Young's Modulus	22.0 GPA
Thermal Change dn/dt	$102.8 \times 10^{-6}/\text{K}$ @10.6 μm

Wavelength μm

Refractive Index (@20 °C)

1.2	2.9085
1.5	2.8636
2.0	2.8322
3.0	2.8112
4.0	2.8034
5.0	2.7994
6.0	2.7965
7.0	2.7941
8.0	2.7918
9.0	2.7894
10.0	2.7869
11.0	2.7841
12.0	2.7811

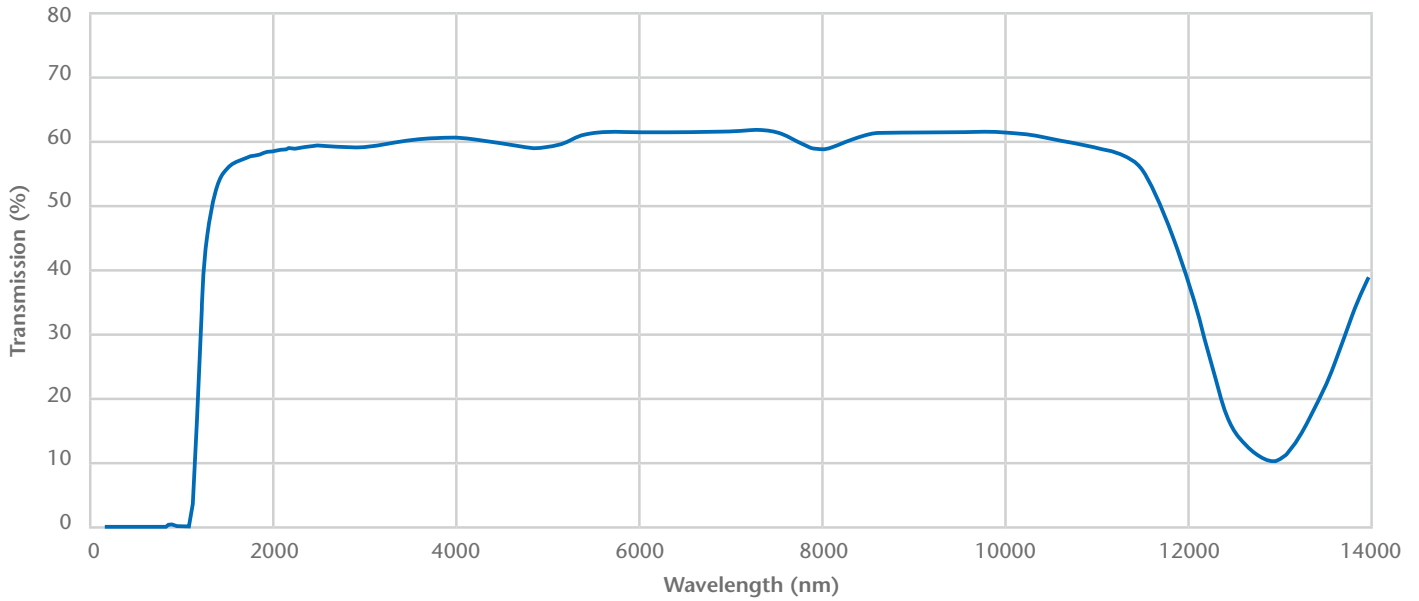
Temperature Coefficients of Refractive Index –55 to 75 °C*

λ (μm)	$\Delta n_{\text{rel}} / \Delta T [10^{-6}/\text{K}]$
1.0	151.3
3.0	106.2
5.0	103.0
7.0	103.0
10.6	102.8
12.0	102.8

*For more information and questions please contact us

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Transmission of Infrared Glass IRG 23 with Thickness 10.0 mm (Typical Values)



NIR: 750 – 1400 nm	
Wavelength (nm)	Transmission T(%)
750	0.00
800	0.00
850	0.00
900	0.00
950	0.00
1000	0.00
1100	0.00
1200	19.58
1300	44.77
1400	52.98

SWIR: 1400 – 3000 nm	
Wavelength (nm)	Transmission T(%)
1400	52.98
1450	54.56
1550	56.45
1650	57.15
1750	57.70
1850	58.05
1950	58.48
2050	58.69
2150	58.92
2250	59.04
2350	59.30
2450	59.47
2500	59.55
3000	59.28

MWIR: 3000 – 5000 nm	
Wavelength (nm)	Transmission T(%)
3000	59.28
3500	60.27
4000	60.76
4500	59.97
5000	59.22

LWIR: 8000 – 14000 nm	
Wavelength (nm)	Transmission T(%)
8000	58.94
8500	61.19
9000	61.56
9500	61.62
10000	61.63
10500	60.60
11000	59.16
11500	56.04
12000	39.11
12500	15.54
13000	10.28
13500	21.22
14000	39.09

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