

GASIR®5 - Infrared Transmitting Glass

Introduction



Umicore's GASIR® chalcogenide glass has been developed for high transmission, high refractive index and maximum purity. Available as raw material, blanks, spherical lenses, aspheres and asphero-diffractive lenses, GASIR® improves system performance while simultaneously reducing cost.

GASIR®5 is Umicore's equivalent to the IG6 and IRG26 glasses. Its high refractive index and thermal expansion coefficient close to that of aluminum allows reduced system complexity and cost while keeping athermal performance at a maximum.

Physical Data & Typical Characteristics

Mechanical properties

Density	4.62 ± 0.01 g/cm ³
Young's modulus	19.2 GPa
Torsion modulus	7.0 GPa
Poisson Ratio	0.29
Vickers' Hardness	144 HV
Fracture toughness	0.256 MPa m ^{1/2}

Thermal properties

Glass temperature	180 °C
Upper use temperature	155 °C
Specific heat	0.36 Jg ⁻¹ K ⁻¹
Thermal expansion coefficient (300 K)	23.5 x 10 ⁻⁶ K ⁻¹
Dielectric constant	>20 MΩ (insulator)

Optical properties

Refractive index @ 20 °C

λ (μm)	n
1.54	2.8390
2	2.8185
3	2.8003
4	2.7934
5	2.7897
6	2.7869
7	2.7844
8	2.7821
9	2.7797
10	2.7770
11	2.7741
12	2.7710
Variation between lots	< 6 x 10 ⁻⁴

Temperature coefficient of refractive index ($\frac{\partial n}{\partial T}$)

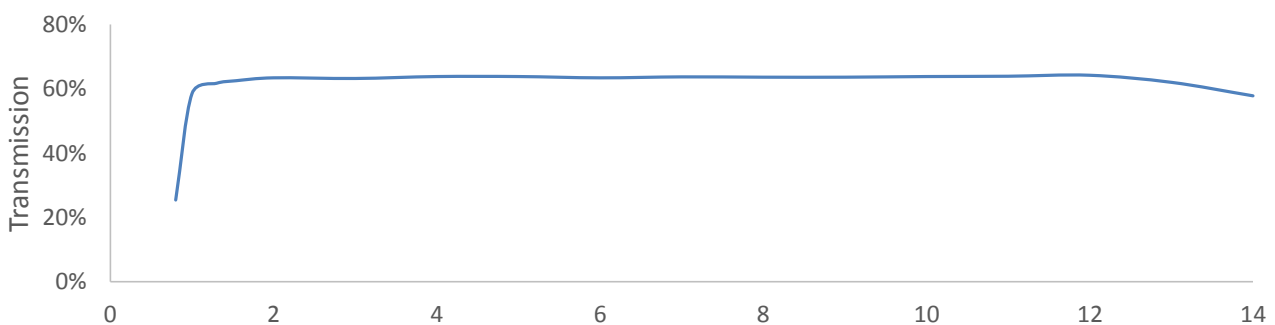
λ (μm)	T = 20 °C
10.66	3.2 x 10 ⁻⁵ K ⁻¹

Optical properties (continued)

λ (μm)	Max. absorption coefficient (cm^{-1})	Transmission* (%)
0.8		25.4
1		58.5
1.3		61.7
1.54		62.5
2		63.4
3		63.2
4		63.8
5		63.8
6		63.4
7		63.7
8	0.01	63.6
9	0.01	63.6
10	0.01	63.8
11	0.02	63.9
12	0.05	64.2
13	0.25	62.0
14		57.8

Uncoated plano disc polished both sides, thickness 2.0 mm, double beam IR spectrometer Perkin Elmer 882
Air reference method, slit dimension: diameter 8 mm

*: Including Fresnel losses



Available shapes

Disks, blanks

Moulded spherical, aspherical and asphero-diffractive lenses

For coating options, please consult our datasheets at www.optics.umicore.com

Sizes

Diameters up to 200 mm

Additional information

Special demands outside the scope of above-mentioned specifications and limits upon request