

GASIR®1 – 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®1 is an industry standard amongst the chalcogenide glasses. Combining good mechanical properties with excellent optical properties and moldability, it has proven its value in the field by being the material of choice for over 1,000,000 lenses.

Physical Data & Typical Characteristics

Mechanical properties

Density	4.40 ± 0.01 g/cm ³
Compression resistance	161 MPa
Young's modulus	17.89 GPa
Torsion modulus	6.98 GPa
Flexion resistance	17.2 MPa
Poisson Ratio	0.28
Vickers' Hardness	170 HV

Thermal properties

Glass temperature	292 °C
Upper use temperature	250 °C
Specific heat	0.36 Jg ⁻¹ K ⁻¹
Coefficient of thermal expansion (300 K)	17 x 10 ⁻⁶ K ⁻¹
Thermal conductivity (288 – 307 K)	0.28 Wm ⁻¹ K ⁻¹
Heat capacity	0.36 Jg ⁻¹ K ⁻¹
Dielectric constant	>20 MΩ (insulator)

Optical properties

Refractive index @ 20 °C

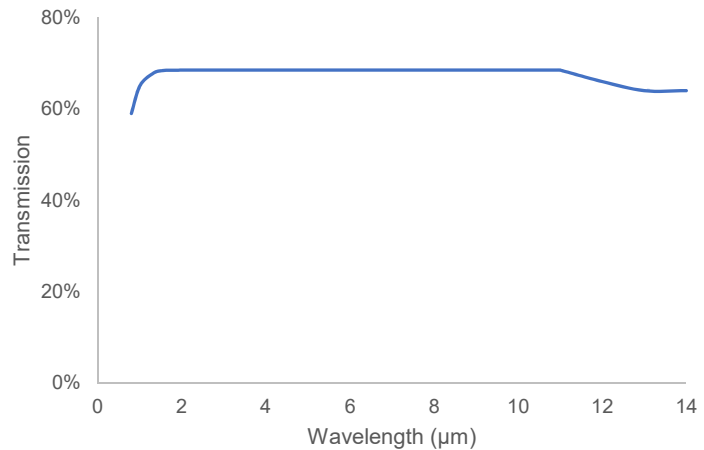
λ (μm)	n
1.064	2.5796
1.54	2.5424
2	2.5267
3	2.5148
3.5	2.5120
4	2.5100
4.5	2.5085
5	2.5071
6	2.5047
7	2.5024
8	2.4999
9	2.4973
10	2.4944
11	2.4911
12	2.4874
13	2.4834
14	2.4787
Variation between lots	< 6 x 10 ⁻⁴

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

λ (μm)	T = 20 °C	T = 100 °C
1.06	8.4 x 10 ⁻⁵ K ⁻¹	10.1 x 10 ⁻⁵ K ⁻¹
10.66	5.5 x 10 ⁻⁵ K ⁻¹	6.7 x 10 ⁻⁵ K ⁻¹

Optical properties (continued)

λ (μm)	Max. absorption coefficient (cm^{-1})	Transmission* (%)
0.8		59
1		65.0
1.3		67.7
1.54		68.4
2		68.5
3		68.5
4		68.5
5		68.5
6		68.5
7		68.5
8	0.01	68.5
9	0.01	68.5
10	0.01	68.5
11	0.04	68.5
12	0.2	66.0
13	0.4	64.0
14		64.0



*: Including Fresnel losses

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

Available shapes

Disks, blanks
Moulded spherical, aspherical and asphero-diffractive lenses
For coating options, please consult our datasheets at eom.umicore.com

Sizes

Diameters up to 200 mm

Additional information

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