

# VITRON IG-4 – discover the Original

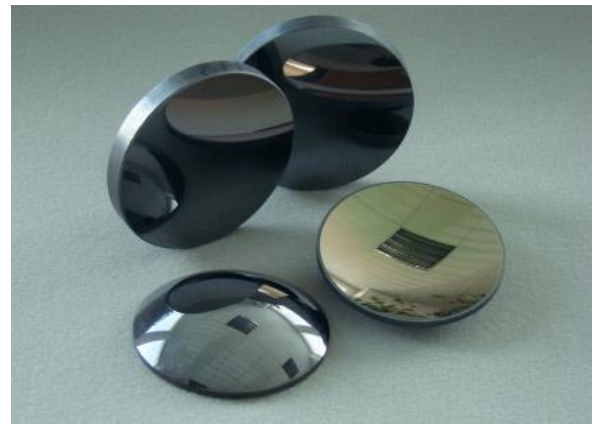
Our glass IG-4 features excellent transmittance and low thermal change in refractive index and dispersion.

IG-4 is ideal for applications in combination with other IR material for color corrected designs and infrared optical systems without thermal defocusing in the 2-12 μm spectrum.

Molding, classical polishing or Single-Point-Diamond-Machining permits the production of optical components with flat, spherical and/or aspherical shaped surfaces for the Infra-Red and Optoelectronics industries.

Antireflection coatings further improve transmission by reducing the reflection at the air-glass interfaces.

VITRON currently produces 5 different types of Chalcogenide Glass that are applicable to optics and optoelectronics system design.

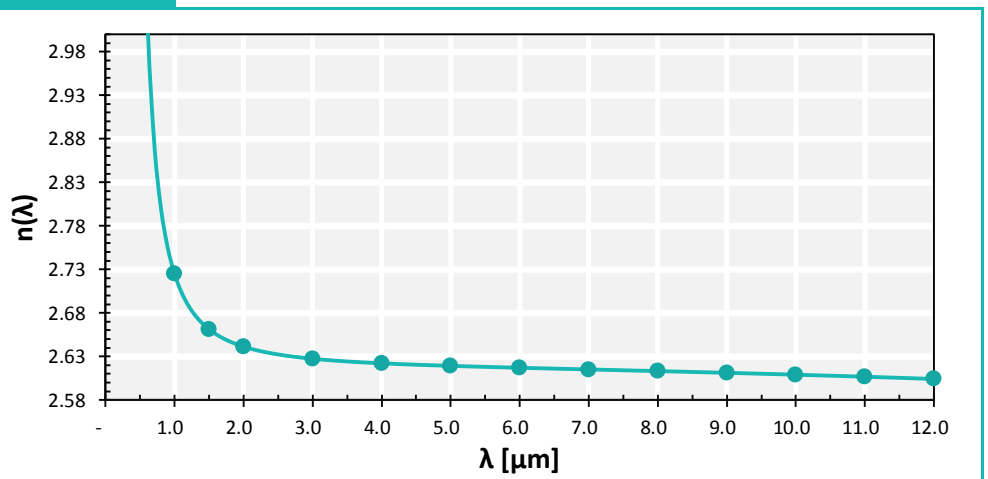


Typical delivery in form of blanks:

- ∅ 5 – 150 mm
- 5 – 100 mm
- ct 0.8 – 150 mm

## Index of Refraction (@ 20°C)

λ [μm]	n(λ)
1.00	2.7249
1.50	2.6612
2.00	2.6413
3.00	2.6274
4.00	2.6220
5.00	2.6192
6.00	2.6169
7.00	2.6150
8.00	2.6131
9.00	2.6112
10.00	2.6091
11.00	2.6066
12.00	2.6041



## Sellmeier-Coefficients (@ 20°C)

<b>A</b>	3.8110
<b>B<sub>1</sub></b>	3.0416
<b>C<sub>1</sub></b>	0.3981
<b>B<sub>2</sub></b>	0.8634
<b>C<sub>2</sub></b>	42.5165

$$n^2(\lambda) = A + \frac{B_1 \lambda^2}{\lambda^2 - C_1^2} + \frac{B_2 \lambda^2}{\lambda^2 - C_2^2}$$

## Dispersion (@ 20°C)

λ [μm]	v <sub>λ</sub>
4.00	198
10.00	179

$$v_4 = \frac{n_4 - 1}{n_3 - n_5}$$

$$v_{10} = \frac{n_{10} - 1}{n_8 - n_{12}}$$

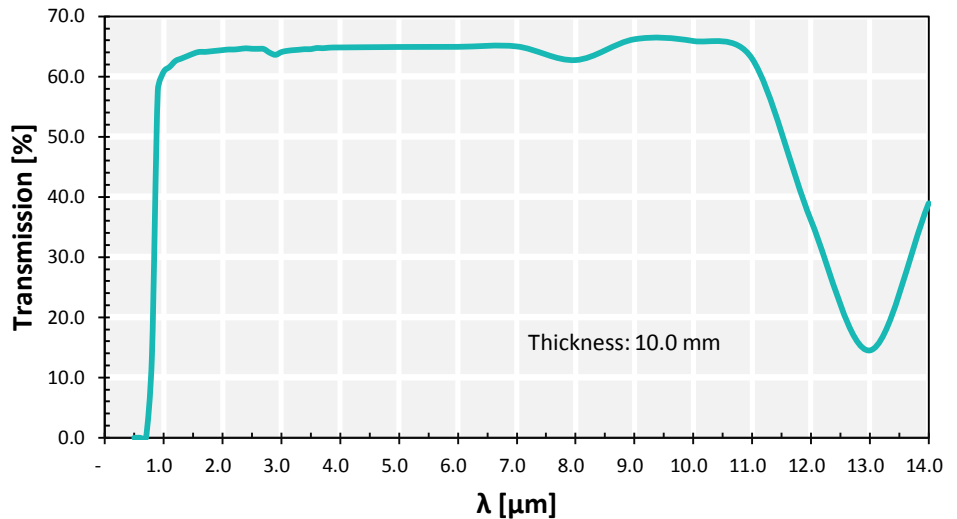
## Thermo-Optical Coefficient (@ 20°C)

λ [μm]	dn/dT [x10 <sup>-6</sup> /K]
3.40	23.0
10.60	19.9

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## Transmission

$\lambda$ [ $\mu\text{m}$ ]	$T(\lambda)$ [%]
1.00	60.8
1.50	63.8
2.00	64.4
3.00	62.5
4.00	63.6
5.00	64.1
6.00	64.5
7.00	65.0
8.00	62.7
9.00	66.2
10.00	65.9
11.00	63.0
12.00	36.1
13.00	14.5
14.00	38.9



## Material Properties

	$\text{Ge}_{10}\text{As}_{40}\text{Se}_{50}$	
Composition		
Density	4.47	$\text{g}\cdot\text{cm}^{-3}$
Thermal Expansion (20°C – 100°C)	20.4	$\times 10^{-6} \text{K}^{-1}$
Specific Heat Capacity	0.37	$\text{J}\cdot\text{g}^{-1}\cdot\text{K}^{-1}$
Thermal Conductivity	0.18	$\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$
Transition Temperature	225	°C
Softening Point	310	°C
Young's Modulus	20.5	GPa
Modulus of Rupture	18	MPa
Shear Modulus	8.5	GPa
Hardness (Knoop)	1.12	GPa

## Chemical Properties

The VITRON chalcogenid glasses are insoluble in water. Under normal circumstances, no reactions are observed between glass and organic solvents.

## Typical Forms of Supply

Our chalcogenid glasses are fine-annealed with 3.75 K/h. Variability of the index of refraction: between charges  $\leq 10^{-3}$   
within a charge  $\leq 10^{-4}$

Semi-finished: Boules, Blanks in disk and rectangular shapes, Rods  
Other shapes by customer request

Optical components: Windows, Lenses, Prisms and other optical parts according to customer specification  
AR/AR coatings on customer request

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