VITRON IG-2

- Discover the Original

Your Material Specialist

Our glass IG-2 features excellent transmittance and low thermal change in refractive index and dispersion.

IG-2 is ideal for applications in combination with other IR material for color corrected designs and infrared optical systems without thermal defocusing in the 1-12 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 Infrared and Optoelectronics industries.

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

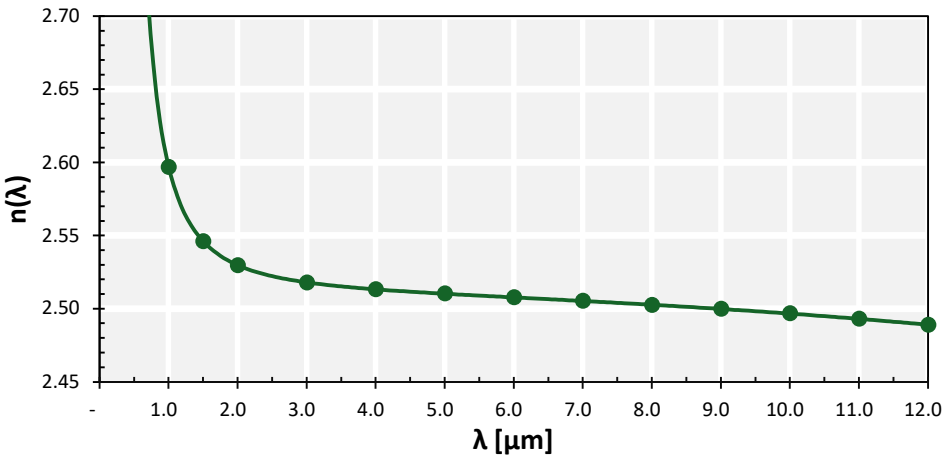
VITRON currently produces 6 different types of Chalcogenide Glasses that are applicable to optics and optoelectronics system design.

Typical delivery in form of blanks:

Ø	*5 – 150 mm*
☐	*5 – 100 mm*
ct	*0.8 – 150 mm*

Index of Refraction (@ 20°C)

λ [µm]	n(λ)
1.00	2.5969
1.50	2.5462
2.00	2.5298
3.00	2.5180
4.00	2.5133
5.00	2.5104
6.00	2.5078
7.00	2.5054
8.00	2.5026
9.00	2.4999
10.00	2.4968
11.00	2.4931
12.00	2.4891



Sellmeier-Formula (@ 20°C)

A	3.3408
B_1	2.9626
C_1	0.3600
B_2	0.8298
C_2	35.0011

$$n^2(\lambda;20) = \boldsymbol{A} + \frac{\boldsymbol{B_1}\lambda^2}{\lambda^2 - \boldsymbol{C_1^2}} + \frac{\boldsymbol{B_2}\lambda^2}{\lambda^2 - \boldsymbol{C_2^2}}$$

Thermo-Optical Coefficient (@ 20°C)

λ_{TK}	$1.83 \cdot 10^{-1}$
D_0	$6.41 \cdot 10^{-5}$
E_0	$1.94 \cdot 10^{-5}$

$$\frac{dn(\lambda)_{abs}}{dT} = \frac{n^2(\lambda;20) - 1}{2n(\lambda;20)} \cdot \left[\boldsymbol{D_0} + \frac{\boldsymbol{E_0}}{\lambda^2 - \boldsymbol{\lambda_{TK}^2}}\right]$$

λ [µm]	dn/dT [K^{-1}]
3.4	$67.9 \cdot 10^{-6}$
7.0	$67.5 \cdot 10^{-6}$
10.6	$67.1 \cdot 10^{-6}$

Dispersion (@ 20°C)

λ [µm]	ν_λ
4.00	199
10.00	111

$$\nu_4 = \frac{n_4 - 1}{n_3 - n_5} \qquad \nu_{10} = \frac{n_{10} - 1}{n_8 - n_{12}}$$

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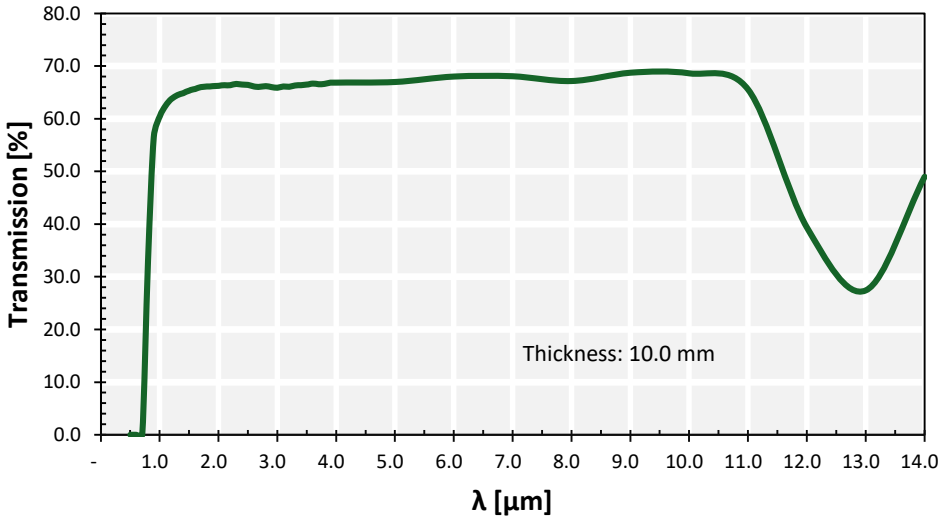
Transmission

λ [µm]	T(λ) [%]
1.00	60.5
1.50	65.4
2.00	66.3
3.00	65.9
4.00	66.9
5.00	67.0
6.00	68.1
7.00	68.1
8.00	67.2
9.00	68.8
10.00	68.7
11.00	65.6
12.00	39.4
13.00	27.4
14.00	49.0



Material Properties

Composition	$Ge_{33}As_{12}Se_{55}$	
Density	4.41	$g \cdot cm^{-3}$
Thermal Expansion (20°C – 100°C)	12.1	$x\ 10^{-6}\ K^{-1}$
Specific Heat Capacity	0.33	$J \cdot g^{-1} \cdot K^{-1}$
Thermal Conductivity	0.24	$W \cdot m^{-1} \cdot K^{-1}$
Transition Temperature	368	°C
Softening Point	445	°C
Young's Modulus	21.5	GPa
Modulus of Rupture	19	MPa
Shear Modulus	8.9	GPa
Hardness (Knoop)	1.41	GPa

Chemical Properties

VITRON chalcogenide 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 batches $\leq 10^{-3}$, within a batch $\leq 10^{-4}$

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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