VITRON IG-3

- Discover the Original

VITRON
Your Material Specialist

Our glass IG-3 features excellent transmittance and low thermal change in refractive index and dispersion.

IG-3 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 Infrared and Optoelectronics industries.

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

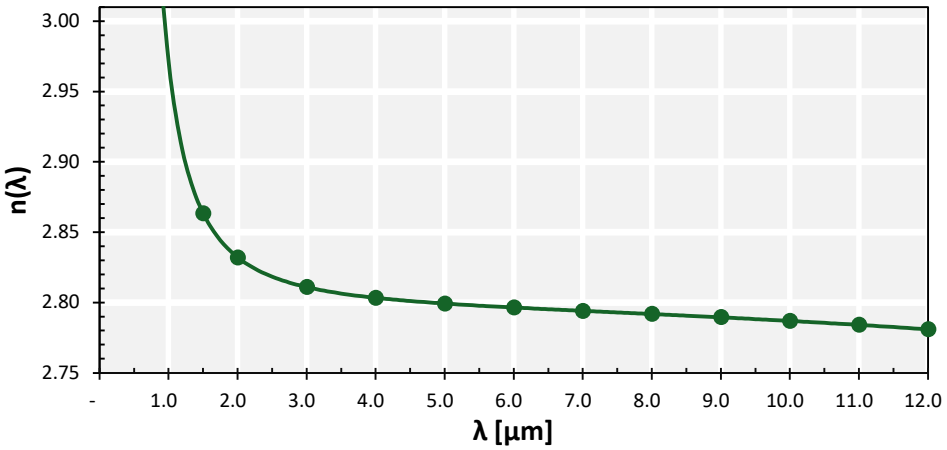
VITRON currently produces 6 different types of Chalcogenide Glasses that are applicable to optics and optoelectronics system design.

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	-
1.50	2.8635
2.00	2.8321
3.00	2.8111
4.00	2.8034
5.00	2.7993
6.00	2.7965
7.00	2.7941
8.00	2.7919
9.00	2.7896
10.00	2.7870
11.00	2.7841
12.00	2.7810



Sellmeier-Formula (@ 20°C)

A	4.5553
B_1	3.2634
C_1	0.4856
B_2	0.4690
C_2	28.8700

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

Thermo-Optical Coefficient (@ 20°C)

λ_{TK}	$5.63 \cdot 10^{-1}$
D_0	$8.42 \cdot 10^{-5}$
E_0	$1.95 \cdot 10^{-5}$

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

λ [µm]	dn/dT [K^{-1}]
3.4	$105.4 \cdot 10^{-6}$
7.0	$103.1 \cdot 10^{-6}$
10.6	$102.4 \cdot 10^{-6}$

Dispersion (@ 20°C)

λ [µm]	v_λ
4.00	153
10.00	164

$$v_4 = \frac{n_4 - 1}{n_3 - n_5} \qquad v_{10} = \frac{n_{10} - 1}{n_8 - n_{12}}$$

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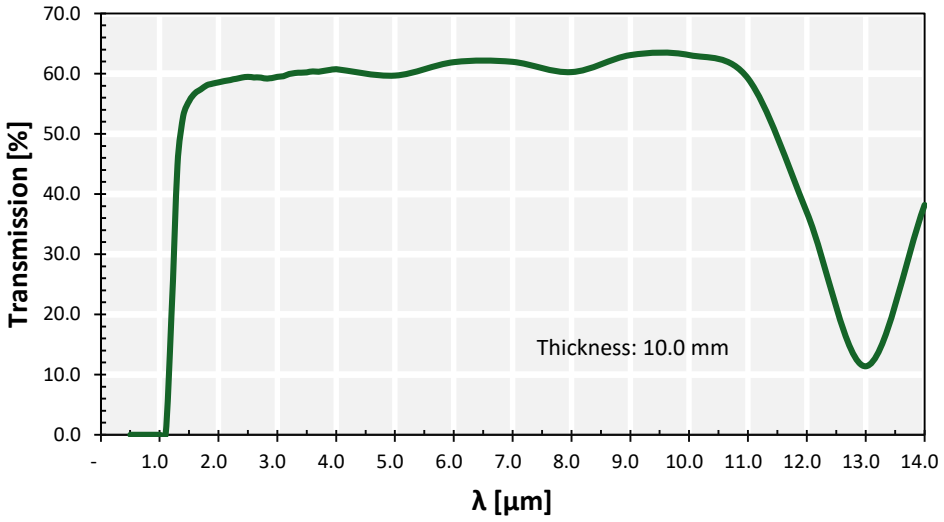
Transmission

λ [µm]	T(λ) [%]
1.00	-
1.50	55.5
2.00	58.6
3.00	59.5
4.00	60.7
5.00	59.7
6.00	61.9
7.00	62.0
8.00	60.3
9.00	63.1
10.00	63.1
11.00	59.2
12.00	37.0
13.00	11.4
14.00	38.2



Material Properties

Composition	$Ge_{30}As_{13}Se_{32}Te_{25}$	
Density	4.84	$g \cdot cm^{-3}$
Thermal Expansion (20°C – 100°C)	13.4	$x\ 10^{-6}\ K^{-1}$
Specific Heat Capacity	0.32	$J \cdot g^{-1} \cdot K^{-1}$
Thermal Conductivity	0.22	$W \cdot m^{-1} \cdot K^{-1}$
Transition Temperature	275	°C
Softening Point	360	°C
Young's Modulus	22.0	GPa
Modulus of Rupture	18	MPa
Shear Modulus	8.9	GPa
Hardness (Knoop)	1.36	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 ≤ 10^{-3}
within a batch ≤ 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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