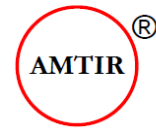


AMORPHOUS MATERIALS, INC.

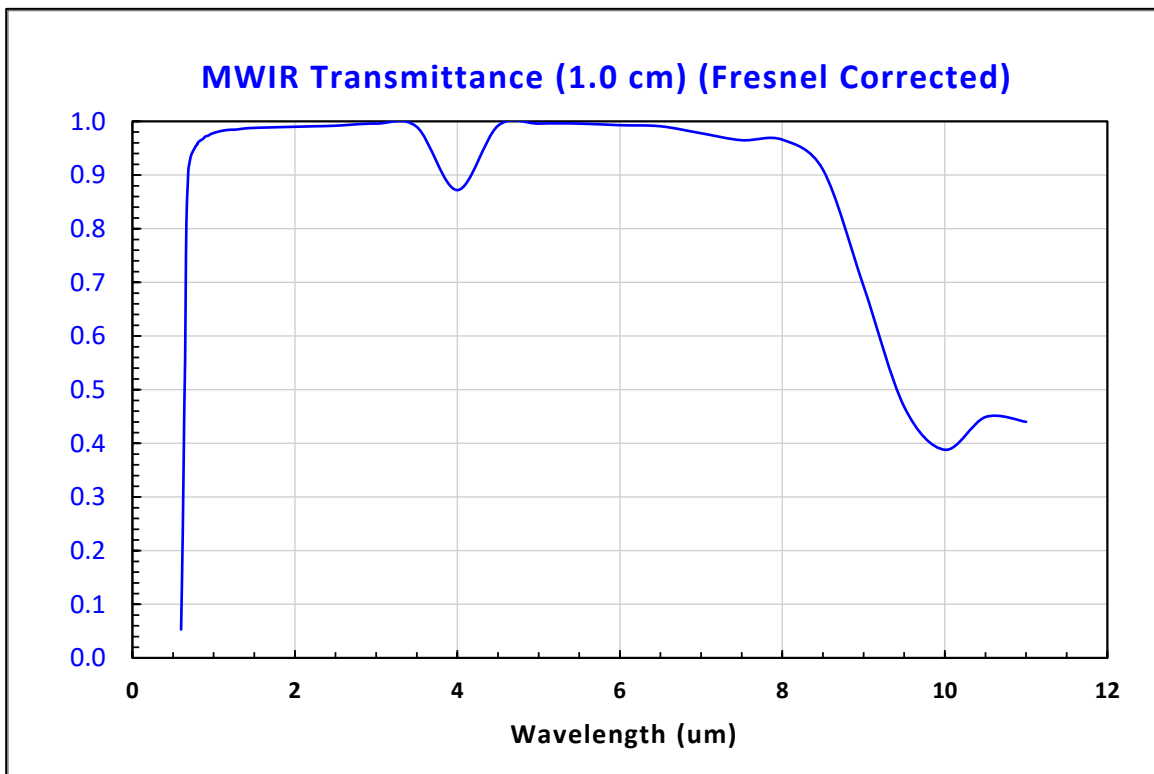
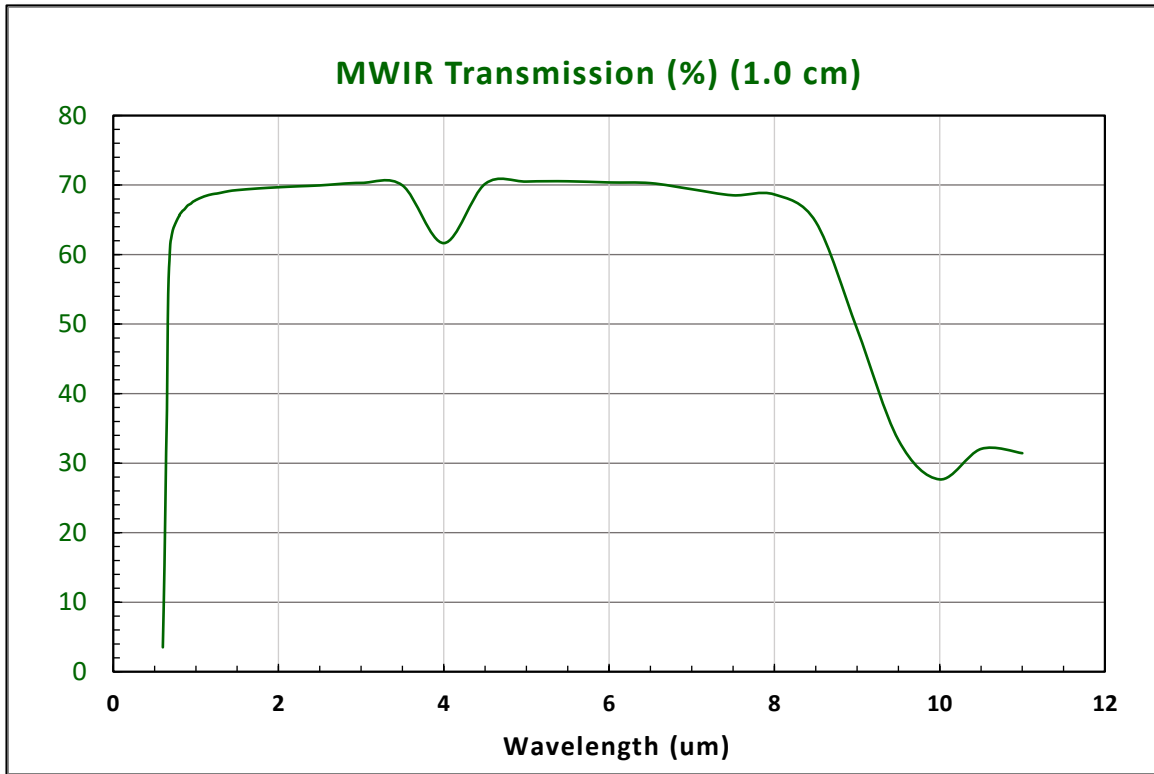
MANUFACTURER OF IR MATERIALS

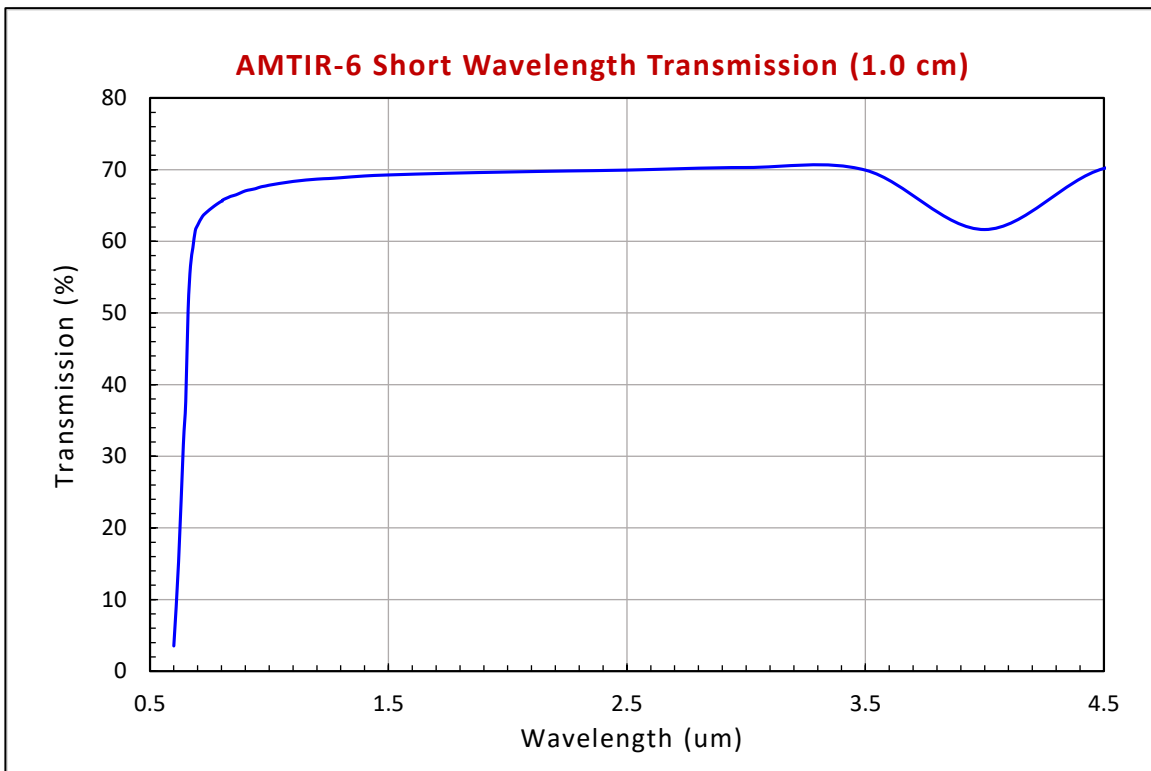
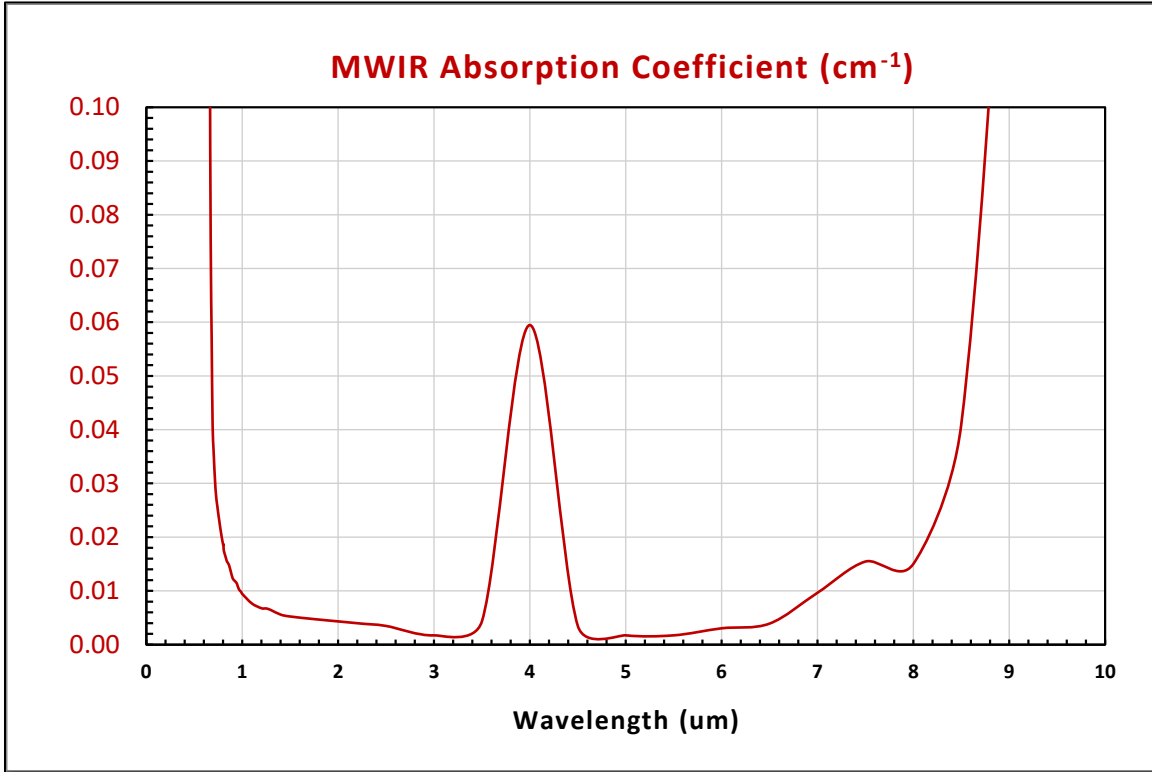


AMTIR-6 Material Properties

PROPERTY	METRIC UNITS	ENGLISH UNITS
Composition	As₂S₃	
Glass Transition Temperature (T _g)	182 °C	360 °F
Annealing Temperature	190 °C	374 °F
Dilatometric Softening Point	202 °C	396 °F
Thermal Expansion Coefficient	22.5 ppm / °C	12.5 ppm / °F
Specific Heat	0.115 cal/gm-°C	
Thermal Conductivity	7.9 x 10 ⁻⁴ cal /sec-cm-°K	1.91 x 10 ⁻¹ BTU/ Hr-ft-°F
Knoop Hardness	109	
Young's Modulus (E)	16.2 GPa	2.35 x 10 ⁶ lbs /in ²
Shear Modulus (G)	6.2 GPa	8.99 x 10 ⁵ lbs/ in ²
Poisson's Ratio	0.305	
Tensile Strength	8.8 MPa	1,275 lbs / in ²
Compressive Strength	74.5 MPa	10,800 lbs / in ²
Rupture Modulus (ASTM-C158)	14.5 MPa	2100 lbs / in ²
Density	3.20 gm/cm ³	199.8 lbs/ft ³
Dielectric Constant	7.7	
Resistivity (@100Hz)	>2x 10 ¹² ohm-cm	>8 x 10 ¹¹ ohm-in
Refractive Index @ 0.9 um (22 °C)	2.4994	
Refractive Index @ 3.0 um (22 °C)	2.4202	
Refractive Index @ 6.0 um (22 °C)	2.4070	
Refractive Index @ 8.0 um (22 °C)	2.3976	
δn/ΔT @ 0.9 um	0.00002070	
δn/ΔT @ 3.0 um	0.00000419	
δn/ΔT @ 6.0 um	-0.00000265	
δn/ΔT @ 8.0 um	-0.00000354	
Chemical Durability (weight loss in milligrams in a 4 Hour Period)		
Solution	Temperature (°C)	Milligrams
H ₂ O	90 °C	0
2% NH ₄ OH	60 °C	16
2% KOH	60 °C	45
HCl, H ₂ SO ₄ , HNO ₃ & EtOH (all conc)	60 °C	<1

NOTE: All data provided on these datasheets are typical values and believed to be accurate and representative of standard AMI melt practice, at the time of publication.





Summary Transmission and Absorption Data

Wavelength (μm)	Fresnel Coefficient	Transmission (%) (1.0 cm)	Transmittance (2.54 cm) (corrected)	Absorption Coefficient (cm^{-1})
0.600	0.663	3.514	0.053	1.276
0.700	0.677	62.259	0.920	0.036
0.800	0.685	65.600	0.958	0.019
1.000	0.693	67.837	0.979	0.009
2.000	0.704	69.677	0.990	0.004
3.000	0.706	70.304	0.996	0.002
4.000	0.707	61.643	0.872	0.059
5.000	0.708	70.494	0.996	0.002
6.000	0.709	70.367	0.993	0.003
7.000	0.710	69.394	0.978	0.010
8.000	0.711	68.641	0.966	0.015
9.000	0.712	49.321	0.693	0.159
10.000	0.713	27.663	0.388	0.411

NOTE: Amorphous Materials, Inc. calculates the values for Absorption Coefficients, using the standard formulas and approach recommended by the Optical Society of America (OSA) and used routinely by most Optical Engineers.

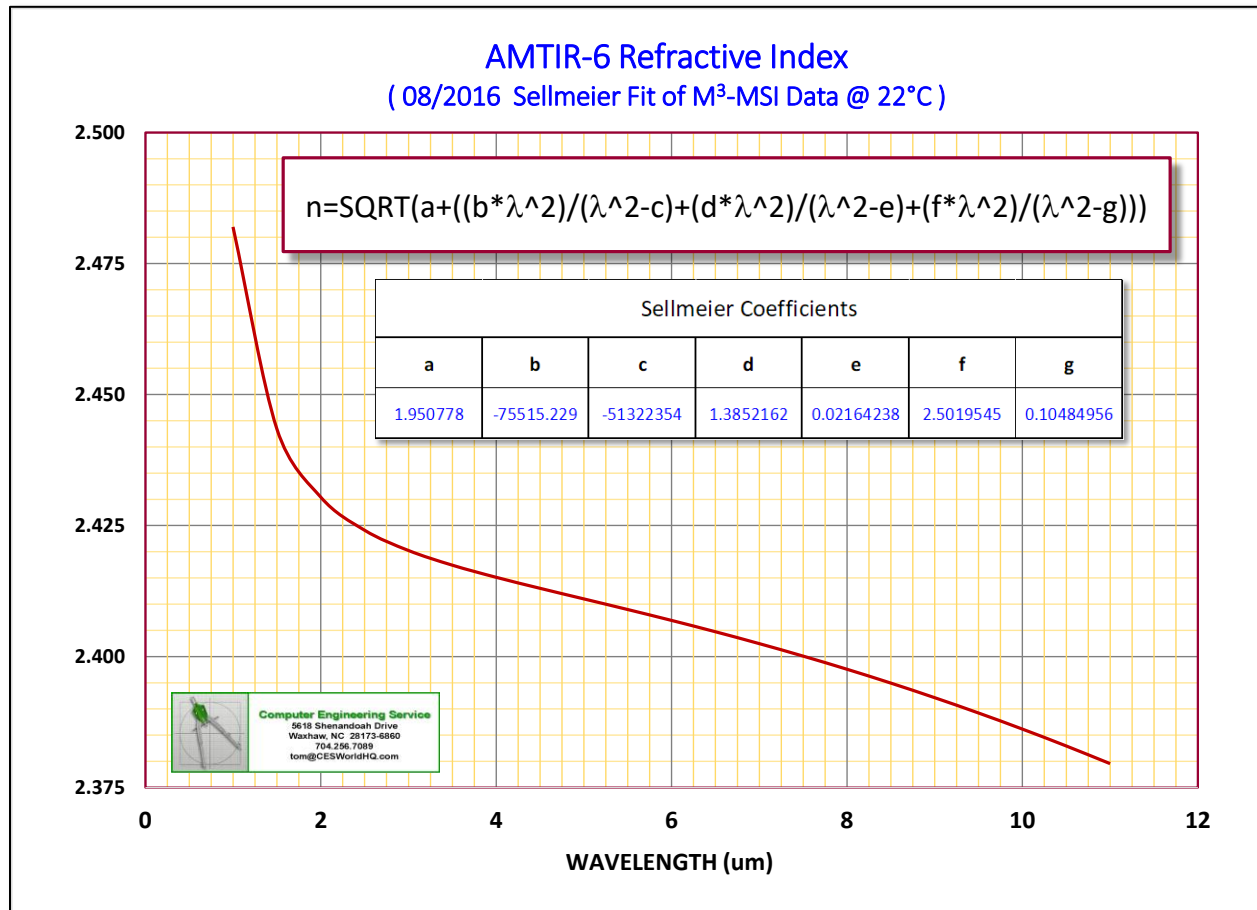
Calculate the ABSORBANCE (Abs), at a given wavelength, corrected for multiple-internal reflections (i.e., Fresnel losses) and divide this value by the light path (i.e., sample thickness in centimeters).

FRESNEL REFLECTION COEFFICIENT (R_λ) = $2n_\lambda / (n_\lambda^2 + 1)$; where n_λ = the Refractive Index @ λ

INTERNAL TRANSMITTANCE (T_i) $_\lambda$ = OVERALL TRANSMISSION (T_o) $_\lambda$ / R_λ

ABSORBANCE at the wavelength (Abs_λ) = $-\text{Log}_{10}(T_i)_\lambda$ or $Abs_\lambda = \text{Log}_{10}(1/(T_i)_\lambda)$

ABSORPTION COEFFICIENT (A_λ) = $Abs_\lambda / \text{thickness}(\text{cm})$



$\Delta n / \Delta T$	Wavelength (microns)	Refractive Index (22 °C)
0.0000626	0.6000	2.63707
0.0000406	0.7000	2.56561
0.00002840	0.8000	2.52501
0.00002070	0.9000	2.49936
0.00001602	1.0000	2.48197
0.00000913	2.0000	2.43042
0.00000419	3.0000	2.42023
0.00000080	4.0000	2.41512
-0.00000137	5.0000	2.41100
-0.00000265	6.0000	2.40689
-0.00000330	7.0000	2.40246
-0.00000354	8.0000	2.39757
-0.00000355	9.0000	2.39215
-0.00000348	10.0000	2.38616