

AMTIR-1

Custom sizes and specifications are available

COMPOSITION

$\text{Ge}_{33}\text{As}_{12}\text{Se}_{55}$ Glass

OPTICAL

Transmission Range, microns	0.8–13
Absorbance $\mu(\lambda)$, cm^{-1}	
at 2 microns	2.531
at 4 microns	2.515
at 8 microns	2.503

THERMAL

Conductivity	$6 \text{ cal / cm sec}^\circ\text{K} \times 10^{-4}$
Specific Heat	$0.07 \text{ cal / gm}^\circ\text{K}$
Upper Use Temperature	300°C
Resistivity	$2 \times 10^{12} \Omega\text{cm @ } 100 \text{ Hz}$
Glass Transition Temperature	362°C
Annealing Temperature	370°C

MECHANICAL

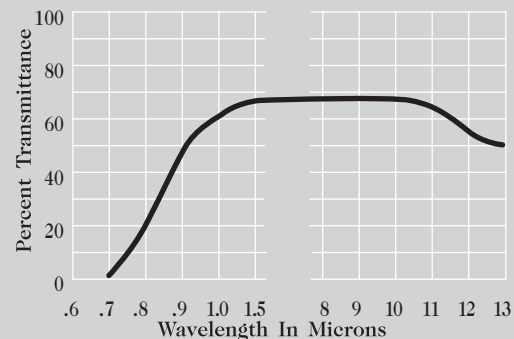
Density, g/cm^3	4.4
Knoop Hardness	170
Rupture Modulus, psi	2700
Young Modules (E), psi	3.2×10^6
Poisson Ratio	0.27

AMTIR-1 is a registered trademark of Amorphous Materials

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
1.0	2.605
1.5	2.546
2.0	2.531
2.4	2.525
3.0	2.518
4.0	2.514
5.0	2.511
6.0	2.509
7.0	2.506
8.0	2.503
9.0	2.500
10.0	2.497
11.0	2.494
12.0	2.490
13.0	2.486
14.0	2.482

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Barium Fluoride (BaF₂)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=6.196
	c=a
Cleavability	(111), perfect

OPTICAL

Refractive Index at n_e	1.4759
Refractive Index $n_F - n_C$	0.0059
Refractive Index at $n_{10.6}$	1.3926
Refractive Index $n_{8.0} - n_{12.5}$	0.0673
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	(-1.27)... (-1.51) x 10 ⁻⁵
Transmission Range, microns	0.15-12.5
Absorbance $\mu (\lambda), \text{cm}^{-1}$	
at 0.2 microns	0.2
at 0.4 microns	0.08
at 10.6 microns	0.13

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/-60 deg C	(16.5...19.2) x 10 ⁻⁶
Thermal Conductivity, W/(m•deg C) at 38 deg C	7.1
Specific Heat Capacity, J/(kg•deg C)	0.456 x 10 ³
Thermal Stability, deg C	10 +/-2
Melting Point, deg C	1354

MECHANICAL

Density, g/cm ³ at 20 deg C	4.83
Mohs Hardness	3
Vickers Microhardness, Pa	82 x 10 ⁷
Constants of Elastic Compliance, Pa ⁻¹	$S_{11}=15.30 \times 10^{-12}$ $S_{12}=-4.69 \times 10^{-12}$ $S_{44}=39.47 \times 10^{-12}$

Young Modulus (E), Pa	
in <100> direction	6.54 x 10 ¹⁰
in <111> direction	6.63 x 10 ¹⁰
Shear Modulus (G), Pa	
in <100> direction	2.51 x 10 ¹⁰
in <111> direction	2.53 x 10 ¹⁰
Poisson Ratio	0.307

CHEMICAL

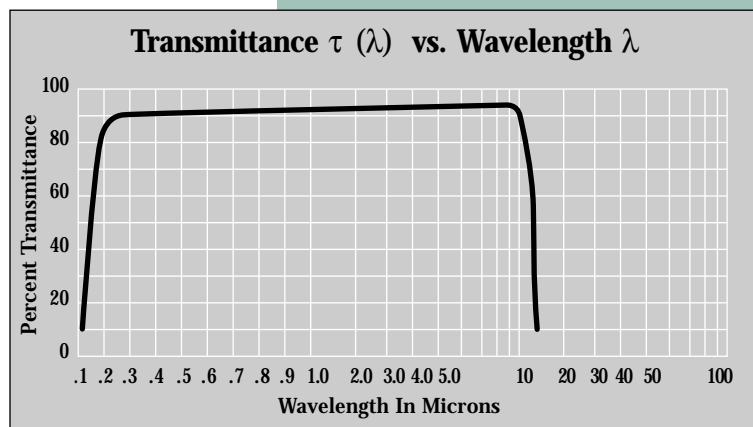
Molecular Weight	175.3
Solubility	
in water, gram/100 cm ³	0.17
in acids	soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.5573
0.5	1.4779
1.0	1.4686
2.0	1.4647
3.0	1.4612
4.0	1.4558
5.0	1.4511
6.0	1.4441
7.0	1.4357
8.0	1.4258
9.0	1.4144
10.0	1.4014
11.0	1.3865
12.0	1.3696
12.5	1.3585
15.0	1.3050

Internal Transmittance $\tau_i (\lambda)$ vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.70
0.5	0.96
1.0	0.97
3.0	0.97
5.0	0.97
6.0	0.97
7.0	0.97
8.0	0.97
9.0	0.97
10.0	0.85
12.0	0.42



Caesium Iodide (CsI)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m Pm3m
Lattice Constants, Angstrom	a=4.567

OPTICAL

Refractive Index at $n_{10.0}$	1.740
Refractive Index $n_{40.0}$	1.678
Thermal Coefficient of Refractive Index for 0-30 deg C	0.9×10^{-4}
Transmission Range, microns	0.25-55
Absorbance $\mu (\lambda), \text{cm}^{-1}$	
at 40 microns	0.1
at 45 microns	0.33
at 50 microns	0.5

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for 0-30 deg C	48.1×10^{-6}
Thermal Conductivity, W/(m•deg C) at 25 deg C	1.1
Specific Heat Capacity, J/(kg•deg C)	200
Melting Point, deg C	621

MECHANICAL

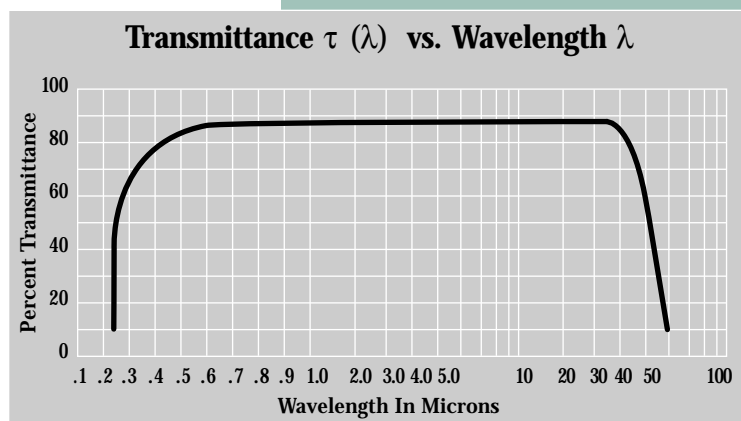
Density, g/cm ³	4.509
Mohs Hardness	1-2
Young Modulus (E), Pa	2×10^9
Shear Modulus (G), Pa	6.24×10^9
Poisson Ratio	0.214

CHEMICAL

Molecular Weight	259.81
Solubility	
in water, gram/100 cm ³	44
in alcohol	soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.25	2.210
0.5	1.807
1.0	1.758
2.0	1.747
3.0	1.744
5.0	1.743
10.0	1.740
15.0	1.735
20.0	1.728
25.0	1.719
30.0	1.708
35.0	1.695
40.0	1.678
45.0	1.659
50.0	1.637
55.0	1.611



Cadmium Telluride (CdTe)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	F43m
Lattice Constant, Angstrom	6.483

OPTICAL

Refractive Index at $n_{10.0}$	2.649
Refractive Index $n_{20.0}$	2.610
Transmission Range, microns	2-25
Absorbance $\mu(\lambda)$, cm^{-1} at 10 microns	0.167

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for 0-30 deg C	4.5 x 10 ⁻⁶
Thermal Conductivity, W/(m•deg C)	4.10
Specific Heat Capacity, J/(kg•deg C)	0.209
Melting Point, deg C	1092

MECHANICAL

Density, g/cm ³	5.86
Young Modulus (E), Pa	52 x 10 ⁹
Poisson Ratio	0.41

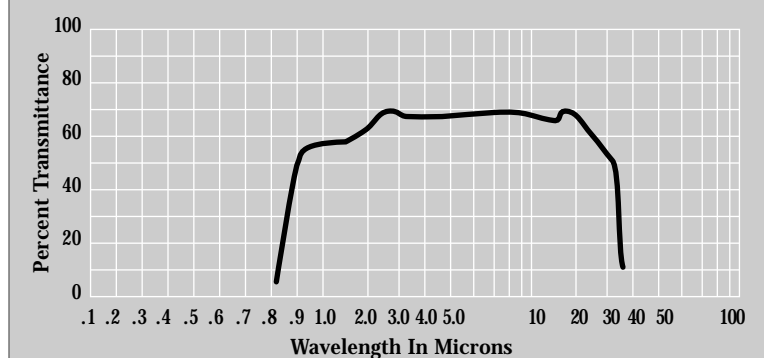
CHEMICAL

Molecular Weight	240.01
Solubility in water, gram/100 cm ³	insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
6.0	2.656
8.0	2.654
10.0	2.649
12.0	2.644
14.0	2.637
16.0	2.629
18.0	2.620
20.0	2.610
22.0	2.598

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Calcium Fluoride (CaF₂)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.462
	c=a
Cleavability	(111), perfect

OPTICAL

Refractive Index at n_e	1.4349
Refractive Index $n_F - n_C$	0.0043
Refractive Index at $n_{10.6}$	1.2996
Thermal Coefficient of Refractive Index at 3.39 microns for +/- 60 deg C	$(-0.95)... (-1.17) \times 10^{-5}$
Transmission Range, microns	0.15-9.0

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/- 60 deg C	$(16.5...19.4) \times 10^{-6}$
Thermal Conductivity, W/(m•deg C) at 36 deg C	9.71
Specific Heat Capacity, J/(kg•deg C)	0.8876×10^3
Thermal Stability, deg C	20 +/- 2
Melting Point, deg C	1418

MECHANICAL

Density, g/cm ³ at 20 deg C	3.18
Mohs Hardness	4
Vickers Microhardness, Pa	165×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11}=6.83 \times 10^{-12}$ $S_{12}=-1.53 \times 10^{-12}$ $S_{44}=29.58 \times 10^{-12}$

Young Modulus (E), Pa in <100> direction	14.61×10^{10}
in <111> direction	8.99×10^{10}
Shear Modulus (G), Pa in <100> direction	4.76×10^{10}
in <111> direction	3.38×10^{10}
Poisson Ratio	0.216

CHEMICAL

Molecular Weight	78.08
Solubility in water, gram/100 cm ³	0.0016

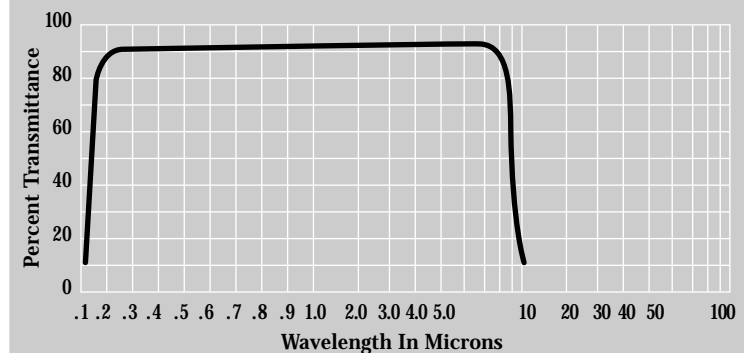
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.4951
0.5	1.4365
1.0	1.4289
2.0	1.4239
3.0	1.4179
4.0	1.4096
5.0	1.3990
6.0	1.3856
7.0	1.3693
8.0	1.3498
9.0	1.3268
10.0	1.3002
11.0	1.2676
12.0	1.2299

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.87
0.5	0.97
1.0	0.99
3.0	0.99
5.0	0.99
6.0	0.98
7.0	0.97
8.0	0.88
9.0	0.59
10.0	0.19

Transmittance τ (λ) vs. Wavelength λ



Gallium Arsenide (GaAs)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	43m F43m
Lattice Constant, Angstrom	5.653

OPTICAL

Refractive Index at $n_{8.0}$	3.2884
Transmission Range, microns	1-15
Absorbance $\mu(\lambda)$, cm^{-1} at 10.6 microns	0.01

THERMAL

Thermal Linear Expansion, deg C^{-1} for 0-30 deg C	5.39×10^{-6}
Thermal Conductivity, $\text{W}/(\text{m} \cdot \text{deg C})$ at 25 deg C	46.05
Specific Heat Capacity, $\text{J}/(\text{kg} \cdot \text{deg C})$	350
Melting Point, deg C	1238

MECHANICAL

Density, g/cm^3 at 20 deg C	5.316
Mohs Hardness	4.5
Vickers Microhardness, Pa	6.9×10^9
Young Modulus (E), Pa	85×10^9
Poisson Ratio	0.31

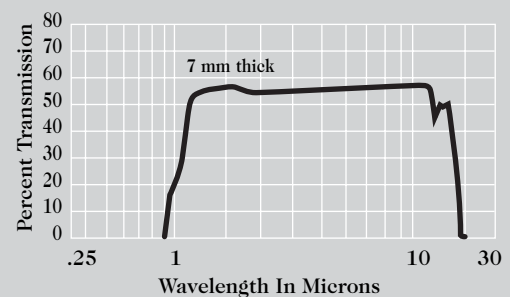
CHEMICAL

Molecular Weight	144.64
Solubility in water, $\text{gram}/100 \text{ cm}^3$	insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
7.0	3.2927
8.0	3.2884
9.0	3.2838
10.0	2.2786
11.0	2.2729
12.0	2.2667

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Germanium (Ge)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.657 c=a
Cleavability	(111), non-perfect

OPTICAL

Refractive Index at $n_{10.6}$	4.0034
Refractive Index $n_{8.0}$ - $n_{12.5}$	0.0036
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	35-40 x 10 ⁻⁵
Transmission Range, microns	2-17

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/-60 deg C	(5.1...5.8) x 10 ⁻⁶
Thermal Conductivity, W/(m•deg C) at 27 deg C	59.8
Specific Heat Capacity, J/(kg•deg C)	0.310
Melting Point, deg C	937
Absorbance μ (λ), cm ⁻¹ at 10.6 microns	0.027

MECHANICAL

Density, g/cm ³ at 25 deg C	5.33
Mohs Hardness	6
Vickers Microhardness, Pa	900 x 10 ⁷
Constants of Elastic Compliance, Pa ⁻¹	$S_{11}=9.69 \times 10^{-12}$ $S_{12}=-2.65 \times 10^{-12}$ $S_{44}=14.89 \times 10^{-12}$

Young Modulus (E), Pa in <100> direction	10.32 x 10 ¹⁰
in <111> direction	15.56 x 10 ¹⁰
Shear Modulus (G), Pa in <100> direction	6.72 x 10 ¹⁰
in <111> direction	4.67 x 10 ¹⁰
Poisson Ratio	0.278

CHEMICAL

Molecular Weight	72.61
Solubility in water, gram/100 cm ³	insoluble

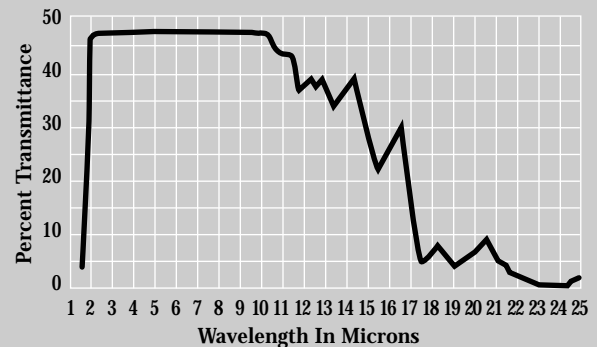
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
2.0	4.1079
3.0	4.0446
4.0	4.0242
5.0	4.0153
6.0	4.0106
7.0	4.0076
8.0	4.0053
9.0	4.0047
10.0	4.0040
11.0	4.0031
12.0	4.0029
12.5	4.0024
15.0	4.0017

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
3.0	0.97
5.0	0.97
6.0	0.97
7.0	0.97
8.0	0.97
9.0	0.97
10.0	0.96
12.0	0.70
15.0	0.56

Transmittance τ (λ) vs. Wavelength λ



BK7 Schott Glass (BK7)

Custom sizes and specifications are available

OPTICAL

Refractive Index at n_e	1.51872
Refractive Index at n_f	1.52283
Thermal Coefficient of Refractive Index at 0.546 microns for 0/+20 deg C	2.8×10^{-6}
Transmission Range, microns	0.35-2.0

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for -30/+70 deg C	7.1×10^{-6}
Thermal Conductivity, W/(m•deg C)	1.114
Specific Heat Capacity, J/(kg•deg C)	0.858×10^3
Melting Point, deg C	559

MECHANICAL

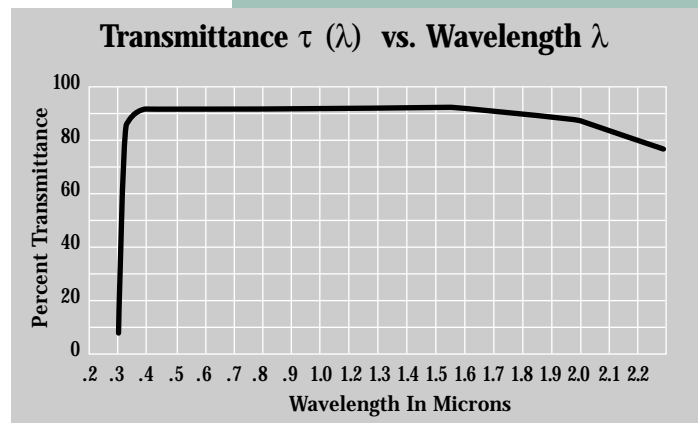
Density, g/cm ³ at 20 deg C	2.51
Young Modulus (E), Pa	8.1×10^{10}
Poisson Ratio	0.206

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.365	1.53626
0.4047	1.53024
0.4358	1.52669
0.4800	1.52283
0.4861	1.52238
0.5461	1.51872
0.5876	1.51680
0.5893	1.51673
0.6328	1.51509
0.6438	1.51472
0.6563	1.51432
0.7065	1.51289
0.8521	1.50981
1.0140	1.50731
1.0600	1.50669
1.5296	1.50094
1.9700	1.49500
2.3254	1.48929

Internal Transmittance τ_i (λ) for 5 mm vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE FOR 5mm
0.310	0.59
0.320	0.81
0.350	0.986
0.365	0.994
0.370	0.995
0.380	0.996
0.390	0.998
0.400	0.998
0.420	0.998
0.460	0.999
0.500	0.999
0.700	0.999
1.060	0.999
1.530	0.997
1.970	0.968
2.325	0.89



Fused Silica UV Grade (SiO₂)

Custom sizes and specifications are available

OPTICAL

Refractive Index at n_e	1.4601
Refractive Index $n_F - n_C$	0.0068
Refractive Index at n_D	1.4584
Refractive Index $n_F - n_C$	0.0068
Thermal Coefficient of Refractive Index at n_e for +20 deg C	100×10^{-7}
Transmission Range, microns	0.18-3.5

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for 0/+50 deg C	4.0×10^{-6}
Thermal Conductivity, W/(m•deg C) at 20 deg C	1.35
Specific Heat Capacity, J/(kg•deg C)	0.728×10^3
Melting Point, deg C	1900

MECHANICAL

Density, g/cm ³ at 20 deg C	2.21
Young Modulus (E), Pa	7.36×10^{10}
Shear Modulus (G), Pa	3.14×10^{10}
Poisson Ratio	0.17

CHEMICAL

Solubility	
in water, gram/100 cm ³	insoluble
in acids	insoluble

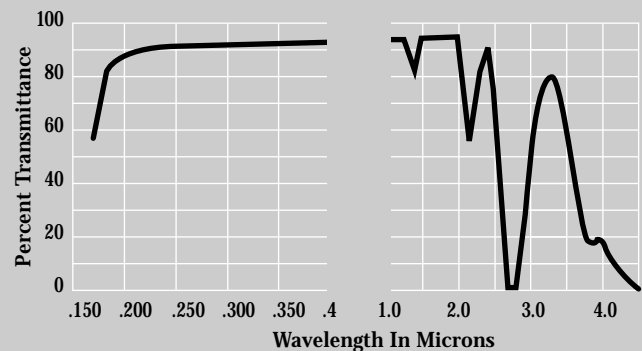
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.1700	1.615
0.1850	1.575
0.2000	1.550
0.2144	1.5337
0.2803	1.4940
0.3021	1.4872
0.3650	1.4745
0.4046	1.4696
0.4358	1.4666
0.5461	1.4601
0.5876	1.4585
0.5893	1.4584
0.6438	1.4567
0.6563	1.4564
0.8621	1.4525
1.0830	1.4494
1.3950	1.4458
1.7091	1.4421
2.0581	1.4372
3.2439	1.4131

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.170	0.63
0.200	0.96
0.400	0.999
0.500	0.999
0.700	0.999
0.900	0.999
1.000	0.999
1.385	0.880
2.000	0.999
2.200	0.580
2.300	0.880
2.380	0.950
2.500	0.790
2.720	0.000
2.800	0.000
2.900	0.295
3.000	0.670

Transmittance τ (λ) vs. Wavelength λ



Fused Silica IR Grade (SiO₂)

Custom sizes and specifications are available

OPTICAL

Refractive Index at n_e	1.4601
Refractive Index $n_F - n_C$	0.0068
Refractive Index at n_D	1.4584
Refractive Index $n_F - n_C$	0.0068
Thermal Coefficient of Refractive Index at n_C for +20 deg C	100×10^{-7}
Transmission Range, microns	0.18-3.5

THERMAL

Thermal Linear Expansion, deg C-1 for 0/+50 deg C	4.0×10^{-6}
Thermal Conductivity, W/(m•deg C) at 20 deg C	1.35
Specific Heat Capacity, J/(kg•deg C)	0.728×10^3
Melting Point, deg C	1900

MECHANICAL

Density, g/cm ³ at 20 deg C	2.21
Young Modulus (E), Pa	7.36×10^{10}
Shear Modulus (G), Pa	3.14×10^{10}
Poisson Ratio	0.17

CHEMICAL

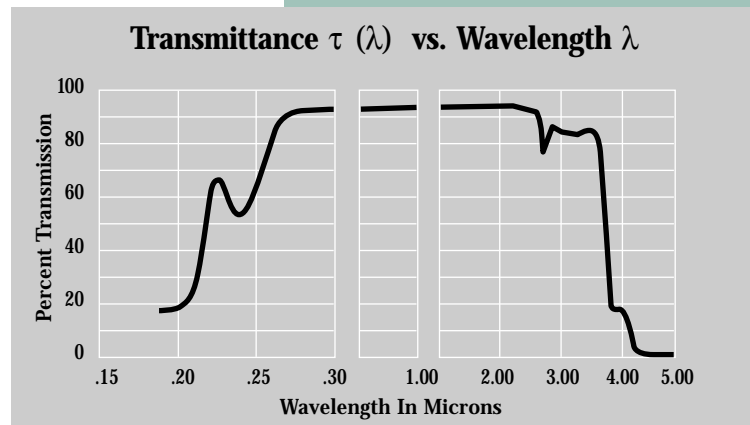
Solubility	
in water, gram/100 cm ³	insoluble
in acids	insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.1700	1.615
0.1850	1.575
0.2000	1.550
0.2144	1.5337
0.2803	1.4940
0.3021	1.4872
0.3650	1.4745
0.4046	1.4696
0.4358	1.4666
0.5461	1.4601
0.5876	1.4585
0.5893	1.4584
0.6438	1.4567
0.6563	1.4564
0.8621	1.4525
1.0830	1.4494
1.3950	1.4458
1.7091	1.4421
2.0581	1.4372
3.2439	1.4131

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.220	0.220
0.230	0.435
0.240	0.525
0.260	0.800
0.270	0.930
0.280	0.999
0.700	0.999
1.000	0.999
1.500	0.999
2.000	0.999
2.720	0.999
2.800	0.955
2.900	0.900
3.000	0.870
3.750	0.180



Lithium Fluoride Vacuum UV Grade (LiF)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=4.026 c=a
Cleavability	(100), perfect

OPTICAL

Refractive Index at n_e	1.3931
Refractive Index $n_F - n_C$	0.0040
Thermal Coefficient of Refractive Index at 3.39 microns for +/- 60 deg C	$(-1.25)...(-1.51) \times 10^{-5}$
Transmission Range, microns	0.12-6.5

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/- 60 deg C	$(28.1...34.8) \times 10^{-6}$
Thermal Conductivity, W/(m•deg C) at 38 deg C	14.2
Specific Heat Capacity, J/(kg•deg C)	1.5617×10^3
Melting Point, deg C	870

MECHANICAL

Density, g/cm ³ at 20 deg C	2.60
Mohs Hardness	4
Vickers Microhardness, Pa	98×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11}=11.32 \times 10^{-12}$ $S_{12}=-3.06 \times 10^{-12}$ $S_{44}=15.91 \times 10^{-12}$

Young Modulus (E), Pa	
in <100> direction	8.84×10^{10}
in <111> direction	14.22×10^{10}
Shear Modulus (G), Pa	
in <100> direction	4.09×10^{10}
in <111> direction	6.29×10^{10}
Poisson Ratio	0.270

CHEMICAL

Molecular Weight	25.94
Solubility	
in water, gram/100 cm ³	0.27
in acids	soluble

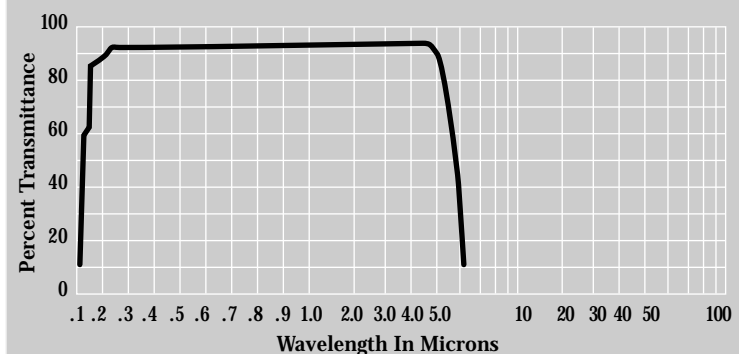
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.439
0.5	1.3943
1.0	1.3871
2.0	1.3788
3.0	1.3666
4.0	1.3494
5.0	1.3266
6.0	1.2975
7.0	1.262
8.0	1.218
9.0	1.165
10.0	1.101

Internal Transmittance $\tau_i(\lambda)$ vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.90
0.5	0.98
1.0	0.97
3.0	0.97
5.0	0.88
6.0	0.65
7.0	0.14

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Magnesium Fluoride (MgF₂)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Tetragonal
Symmetry Class	4/mmm
Lattice Constants, Angstrom	a=4.64 c=3.06
Cleavability	(100),(110), imperfect

OPTICAL

Refractive Index at n_e for "o"-ray	1.3786
Refractive Index n_e for "e"-ray	1.3904
Refractive Index at n_{F-C} for "o"-ray	0.0034
Refractive Index n_{F-C} for "e"-ray	0.0110
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	$\beta_o = (0.15...0.10) \times 10^{-5}$ $\beta_e = (0.10...0.04) \times 10^{-5}$
Transmission Range, microns	0.13-7.0

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/-60 deg C	
⊥ to c-axis	$(6.23...9.25) \times 10^{-6}$
to c-axis	$(10.86..14.54) \times 10^{-6}$
Specific Heat Capacity, J/(kg•deg C)	0.9200×10^3
Melting Point, deg C	1255

MECHANICAL

Density, g/cm ³ at 20 deg C	3.18
Mohs Hardness	6
Vickers Microhardness, Pa	
⊥ to c-axis	441×10^7
to c-axis	289×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11} = 12.45 \times 10^{-12}$ $S_{12} = -7.16 \times 10^{-12}$ $S_{13} = -1.66 \times 10^{-12}$ $S_{33} = 5.94 \times 10^{-12}$ $S_{44} = 17.54 \times 10^{-12}$ $S_{66} = 10.53 \times 10^{-12}$

Young Modulus (E), Pa	
⊥ to c-axis	16.91×10^{10}
to c-axis	7.97×10^{10}
Shear Modulus (G), Pa	
⊥ to c-axis	5.71×10^{10}
to c-axis	9.52×10^{10}
Poisson Ratio	
to c-axis	0.577

CHEMICAL

Molecular Weight	62.32
Solubility	
in water, gram/100 cm ³	0.0076
in acids	soluble

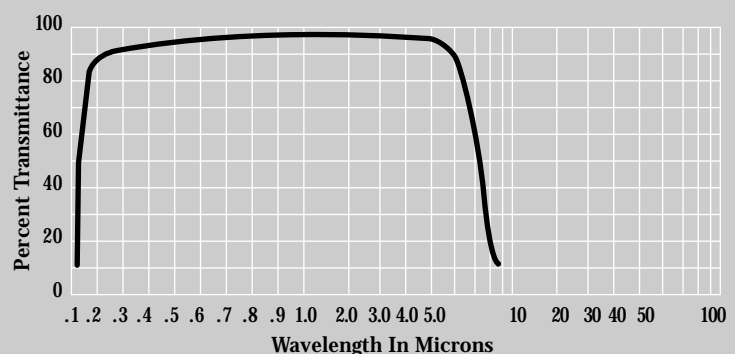
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX n_o	n_e
0.2	1.4231	1.4367
0.5	1.3797	1.3916
1.0	1.3736	1.3852
2.0	1.3686	1.3797
3.0	1.3618	1.3724
4.0	1.3525	1.3622
5.0	1.3400	1.3487
6.0	1.3242	1.3315
7.0	1.3044	1.3101

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.95
0.5	0.97
1.0	0.97
3.0	0.97
5.0	0.97
6.0	0.91
7.0	0.54
8.0	0.12

Transmittance τ (λ) vs. Wavelength λ



Potassium Bromide (KBr)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=6.598
	c=a
Cleavability	(100), perfect

OPTICAL

Refractive Index at n_e	1.5639
Refractive Index $n_F - n_C$	0.0617
Refractive Index at $n_{10.6}$	1.5251
Refractive Index $n_{8.0} - n_{12.5}$	0.0099
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	$(-3.95...-4.29) \times 10^{-5}$
Transmission Range, microns	0.21-28

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/-60 deg C	$(36.6...39.6) \times 10^{-6}$
Thermal Conductivity, W/(m•deg C) at 46 deg C	4.81
Specific Heat Capacity, J/(kg•deg C)	0.4522×10^3
Melting Point, deg C	728

MECHANICAL

Density, g/cm ³ at 20 deg C	2.75
Mohs Hardness	1.5
Vickers Microhardness, Pa	10×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11}=30.29 \times 10^{-12}$ $S_{12}=-4.18 \times 10^{-12}$ $S_{44}=194.92 \times 10^{-12}$

Young Modulus (E), Pa	
in <100> direction	3.30×10^{10}
in <110> direction	1.38×10^{10}
Shear Modulus (G), Pa	
in <100> direction	0.90×10^{10}
in <110 direction	0.51×10^{10}
Poisson Ratio	0.138

CHEMICAL

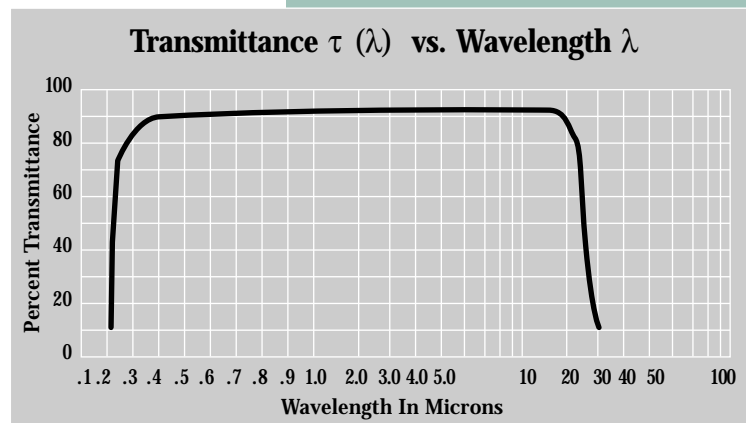
Molecular Weight	119.01
Solubility in water, gram/100 cm ³	53.48

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	2.0995
0.5	1.5700
1.0	1.5444
2.0	1.5383
3.0	1.5357
4.0	1.5346
5.0	1.5334
6.0	1.5319
7.0	1.5303
8.0	1.5285
9.0	1.5265
10.0	1.5242
11.0	1.5217
12.0	1.5204
15.0	1.5127
20.0	1.4924
30.0	1.4253

Internal Transmittance $\tau_i(\lambda)$ vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.48
0.5	0.98
1.0	0.98
3.0	0.98
5.0	0.98
6.0	0.98
7.0	0.98
8.0	0.98
9.0	0.98
10.0	0.98
12.0	0.98
15.0	0.98
20.0	0.92
30.0	0.26



Potassium Chloride (KCl)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=6.292
	c=a
Cleavability	(100), perfect

OPTICAL

Refractive Index at n_e	1.4930
Refractive Index $n_F - n_C$	0.0112
Refractive Index at $n_{10.6}$	1.4546
Refractive Index $n_{8.0} - n_{12.5}$	0.0172
Thermal Coefficient of Refractive Index at 3.39 microns for +/- 60 deg C	$(-3.28...-3.75) \times 10^{-5}$
Transmission Range, microns	0.21-21

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/- 60 deg C	$(34.1...38.3) \times 10^{-6}$
Thermal Conductivity, W/(m•deg C) at 46 deg C	6.53
Specific Heat Capacity, J/(kg•deg C)	0.695×10^3
Melting Point, deg C	776

MECHANICAL

Density, g/cm ³ at 20 deg C	1.98
Mohs Hardness	2
Vickers Microhardness, Pa	15×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11}=26.21 \times 10^{-12}$ $S_{12}=-3.47 \times 10^{-12}$ $S_{44}=161.98 \times 10^{-12}$
Young Modulus (E), Pa	
in <100> direction	3.82×10^{10}
in <110> direction	1.68×10^{10}
Shear Modulus (G), Pa	
in <100> direction	1.08×10^{10}
in <110> direction	0.63×10^{10}
Poisson Ratio	0.134

CHEMICAL

Molecular Weight	74.55
Solubility in water, gram/100 cm ³	34.7

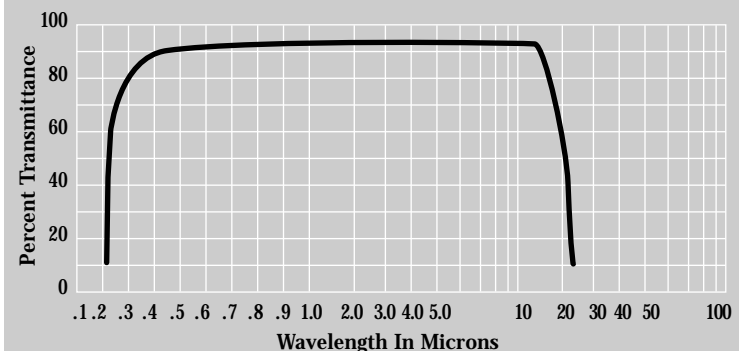
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.7170
0.5	1.4968
1.0	1.4796
2.0	1.4751
3.0	1.4735
4.0	1.4720
5.0	1.4703
6.0	1.4683
7.0	1.4659
8.0	1.4632
9.0	1.4601
10.0	1.4566
11.0	1.4527
12.0	1.4463
12.5	1.4460
15.0	1.4325
20.0	1.3947
30.0	1.2626

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.89
0.5	0.98
1.0	0.98
3.0	0.98
5.0	0.98
6.0	0.98
7.0	0.98
8.0	0.98
9.0	0.98
10.0	0.98
12.0	0.98
15.0	0.95
20.0	0.68

Transmittance τ (λ) vs. Wavelength λ



Sapphire (Al₂O₃)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Tetragon
Symmetry Class	3m
Lattice Constants, Angstrom	a=4.758 c=12.991
Cleavability	(1011),(1120), imperfect

OPTICAL

Refractive Index at n _e	1.7771
Refractive Index n _F -n _C	0.0107
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	β _o =(0.88...1.28) x 10 ⁻⁵ β _e =(0.99...1.39) x 10 ⁻⁵
Transmission Range, microns	0.17-5.0

THERMAL

Thermal Linear Expansion, deg ⁻¹ for +/-60 deg C	
⊥ to c-axis	(3.24...5.66) x 10 ⁻⁶
Thermal Conductivity, W/(m•deg C) at 46 deg C	
⊥ to c-axis	25.2
to c-axis	23.1
Specific Heat Capacity, J/(kg•deg C)	0.7610 x 10 ³
Thermal Stability, deg C	162+/-8
Melting Point, deg C	2030

MECHANICAL

Density, g/cm ³ at 20 deg C	3.98
Mohs Hardness	9
Vickers Microhardness, Pa	
⊥ to c-axis	2200
to c-axis	1940
Constants of Elastic Compliance, Pa ⁻¹	S ₁₁ =2.3 x 10 ⁻¹² S ₁₂ =-0.7 x 10 ⁻¹² S ₁₃ =-0.4 x 10 ⁻¹² S ₃₃ =2.2 x 10 ⁻¹² S ₄₄ =6.8 x 10 ⁻¹² S ₁₄ =0.5 x 10 ⁻¹²

Young Modulus (E), Pa	
⊥ to c-axis	46.26 x 10 ¹⁰
to c-axis	42.64 x 10 ¹⁰
Shear Modulus (G), Pa	
⊥ to c-axis	14.43 x 10 ¹⁰
to c-axis	16.29 x 10 ¹⁰
Poisson Ratio to c-axis	0.309

CHEMICAL

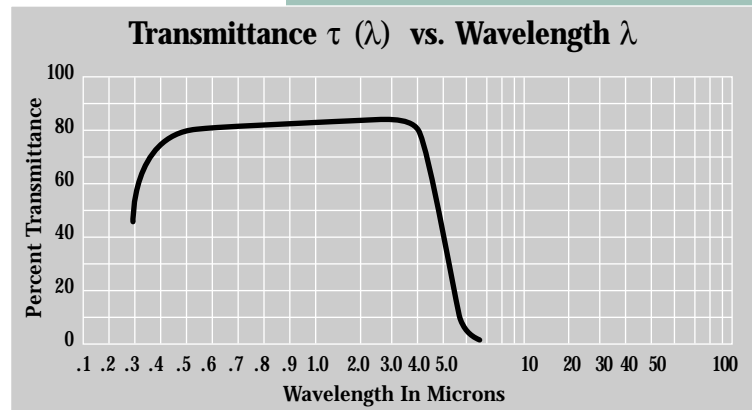
Molecular Weight	101.96
Solubility in water, gram/100 cm ³	98•10 ⁻⁶

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX n _o	REFRACTIVE INDEX n _e
1.0	1.7545	1.7460
2.0	1.7374	1.7299
3.0	1.7015	1.6920
4.0	1.6748	1.6679

Internal Transmittance τ_i (λ) vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.79
0.5	0.97
1.0	0.97
3.0	0.97
5.0	0.45



Silicon (Si)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.43089

OPTICAL

Refractive Index at $n_{3.0}$	3.436
Refractive Index at $n_{5.0}$	3.426
Thermal Coefficient of Refractive Index at 25 deg C	1.50×10^{-4}
Transmission Range, microns	1.2-10, 50-100

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for 25 deg C	2.55×10^{-6}
Thermal Conductivity, W/(m•deg C) at 27 deg C	159
Specific Heat Capacity (solid), J/(kg•deg C)	0.712×10^3
Melting Point, deg C	1412

MECHANICAL

Density, g/cm ³ at 20 deg C	2.329
Mohs Hardness	7
Young Modulus (E), Pa	1.89×10^{10}
Shear Modulus (G), Pa	7.99×10^{10}
Poisson Ratio	0.266

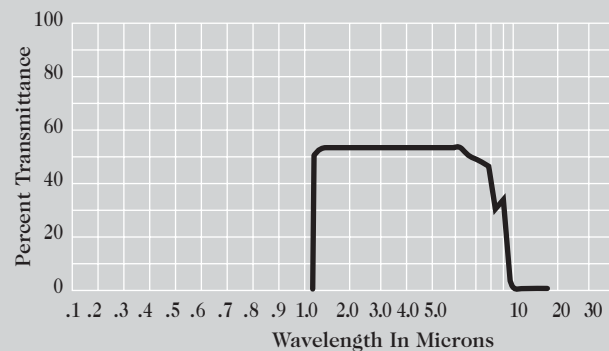
CHEMICAL

Molecular Weight	28.09
Solubility in water, gram/100 cm ³	insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
1.5	3.484
2.0	3.456
3.0	3.436
4.0	3.429
5.0	3.426
6.0	3.424
7.0	3.423
8.0	3.422
9.0	3.422

Transmittance τ (λ) vs. Wavelength λ



High Resistivity Silicon (Si)

Custom sizes and specifications are available

RESISTIVITY > 10,000 ohm cm

CRYSTALLOGRAPHIC

Syngony Cubic
Symmetry Class m3m
Lattice Constants, Angstrom a=5.43089

OPTICAL

Refractive Index at $n_{3,0}$ 3.430
Refractive Index at $n_{5,0}$ 3.420
Thermal Coefficient of Refractive Index at 25 deg C 1.50×10^{-4}
Transmission Range, microns 1.2-10, 50-100

THERMAL

Thermal Linear Expansion, deg C⁻¹ for 25 deg C 2.55×10^{-6}
Thermal Conductivity, W/(m•deg C) at 27 deg C 159
Specific Heat Capacity (solid), J/(kg•deg C) 0.712×10^3
Melting Point, deg C 1412

MECHANICAL

Density, g/cm³ at 20 deg C 2.329
Mohs Hardness 7
Young Modulus (E), Pa 1.89×10^{10}
Shear Modulus (G), Pa 7.99×10^{10}
Poisson Ratio 0.266

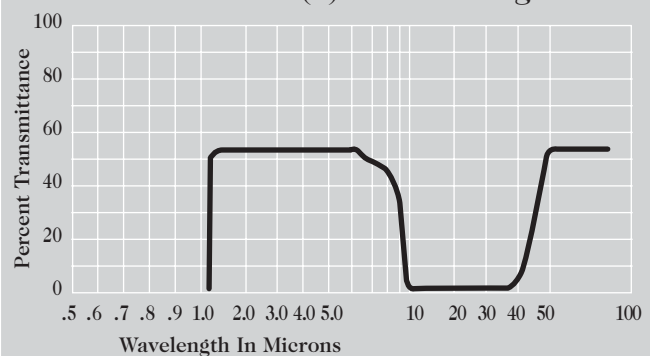
CHEMICAL

Molecular Weight 28.09
Solubility in water, gram/100 cm³ insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
3.00	3.430
3.25	3.428
3.50	3.427
3.75	3.425
4.00	3.423
4.25	3.422
4.50	3.421
4.75	3.421
5.00	3.420

Transmittance τ (λ) vs. Wavelength λ



Sodium Chloride (NaCl)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	m3m
Lattice Constants, Angstrom	a=5.640 c=a
Cleavability	(100),perfect

OPTICAL

Refractive Index at n_e	1.5467
Refractive Index $n_F - n_C$	0.0132
Refractive Index at $n_{10.6}$	1.4906
Refractive Index $n_{8.0} - n_{12.5}$	0.0308
Thermal Coefficient of Refractive Index at 3.39 microns for +/-60 deg C	$(-3.31) \dots (-3.73) \times 10^{-5}$
Transmission Range, microns	0.2-20

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for +/-60 deg C	$(36.4 \dots 40.8) \times 10^{-6}$
Thermal Conductivity, W/(m•deg C) at 35 deg C	6.15
Specific Heat Capacity, J/(kg•deg C)	0.871×10^3
Melting Point, deg C	801

MECHANICAL

Density, g/cm ³ at 20 deg C	2.17
Mohs Hardness	3
Vickers Microhardness, Pa	20×10^7
Constants of Elastic Compliance, Pa ⁻¹	$S_{11} = 22.85 \times 10^{-12}$ $S_{12} = -4.69 \times 10^{-12}$ $S_{44} = 78.34 \times 10^{-12}$

Young Modulus (E), Pa	
in <100> direction	4.37×10^{10}
in <111> direction	3.27×10^{10}
Shear Modulus (G), Pa	
in <100> direction	1.59×10^{10}
in <111> direction	1.28×10^{10}
Poisson Ratio	0.203

CHEMICAL

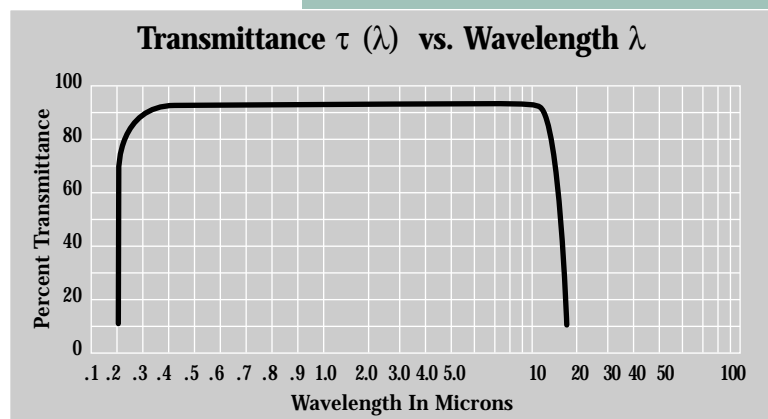
Molecular Weight	58.45
Solubility	
in water, gram/100 cm ³	35.7
in acids	soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.2	1.7899
0.5	1.5516
1.0	1.5320
2.0	1.5254
3.0	1.5242
4.0	1.5217
5.0	1.5185
6.0	1.5153
7.0	1.5112
8.0	1.5066
9.0	1.5009
10.0	1.4947
11.0	1.4878
12.0	1.4800
12.5	1.4758
15.0	1.4403
20.0	1.3822
30.0	1.0912

Internal Transmittance $\tau_i(\lambda)$ vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.2	0.16
0.5	0.97
1.0	0.97
3.0	0.98
5.0	0.98
6.0	0.98
7.0	0.98
8.0	0.98
9.0	0.98
10.0	0.98
12.0	0.98
15.0	0.87
20.0	0.05



Quartz (SiO₂)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Hexagonal
Symmetry Class	P ₃ 2 ₁
Lattice Constants, Angstrom	a=4.9138 c=5.4052

OPTICAL

Refractive Index n_o at n_{0,436}	1.5538
Refractive Index n_e at n_{0,436}	1.5632
Thermal Coefficient of Refractive Index in air at 340 nm for +20/+100 deg C	
n_o	-5.01 x 10 ⁻⁶
n_e	-3.93 x 10 ⁻⁶
Transmission Range, microns	0.15-3.3

THERMAL

Thermal Linear Expansion, deg C ⁻¹ for 0/+20 deg C	13.24 x 10 ⁻⁶
Thermal Conductivity, W/(m•deg C) at 25 deg C	
n_o	6.82
n_e	11.43
Specific Heat Capacity, J/(kg•deg C)	0.741 x 10 ³
Melting Point, deg C	1470

MECHANICAL

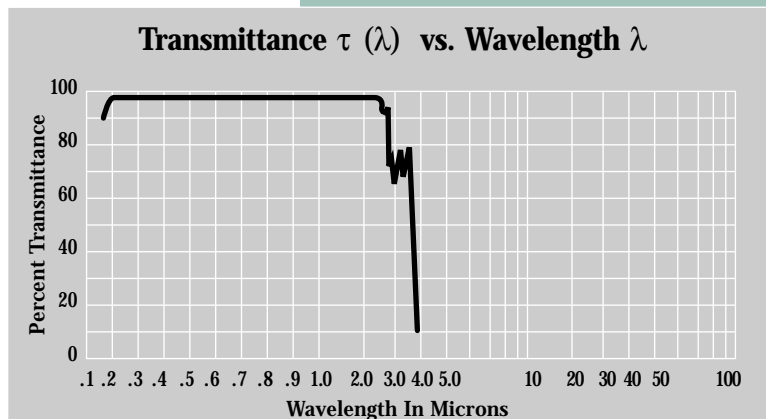
Density, g/cm ³ at 20 deg C	2.649
Mohs Hardness	7
Vickers Microhardness, Pa	981 x 10 ⁷
Young Modulus (E), Pa	
n_o	8.7 x 10 ¹⁰
n_e	10.5 x 10 ¹⁰

CHEMICAL

Molecular Weight	60.06
Solubility in water, gram/100 cm ³	insoluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX n_o	REFRACTIVE INDEX n_e
0.2001	1.6493	1.6623
0.2503	1.6003	1.6114
0.3034	1.5770	1.5872
0.4047	1.5572	1.5667
0.5086	1.5482	1.5575
0.6438	1.5423	1.5513
1.0000	1.5350	1.5438
1.2000	1.5323	1.5410
1.4000	1.5297	1.5383
1.6000	1.5270	1.5355
1.8000	1.5241	1.5324
2.5000	1.5116	1.5195
3.0000	1.4996	1.5070



Thallium Bromiodide KRS-5 (TIBr-TII)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony Cubic
Symmetry Class m3m Pm3m
Lattice Constants, Angstrom a=0.4125

OPTICAL

Refractive Index at $n_{10.0}$ 2.37
Transmission Range, microns 0.6-40

THERMAL

Thermal Linear Expansion, deg C⁻¹ for 0/+20 deg C 6×10^{-6}
Thermal Conductivity, W/(m•deg C) at 25 deg C 0.54
Specific Heat Capacity, J/(kg•deg C) 0.151×10^3
Melting Point, deg C 414.5

MECHANICAL

Density, g/cm³ at 20 deg C 7.371
Vickers Microhardness, Pa 35×10^7
Young Modulus (E), Pa 3.1×10^{10}
Shear Modulus (G), Pa 1.2×10^{10}
Poisson Ratio 0.37

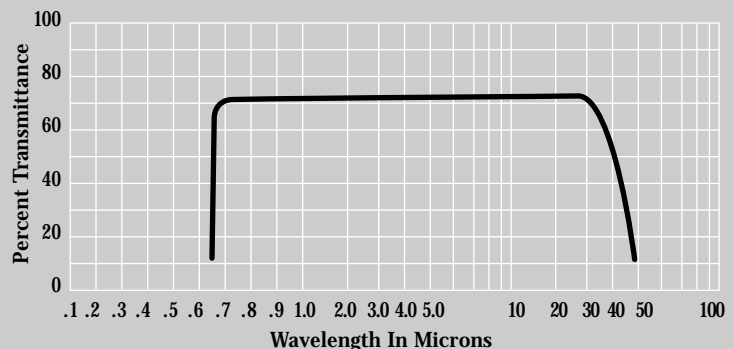
CHEMICAL

Molecular Weight 42 mole% TIBr / 58 mole% TII
Solubility 0.05
in water, gram/100 cm³
in acids soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.6	2.60
1.0	2.45
2.0	2.40
4.0	2.38
6.0	2.38
8.0	2.37
10.0	2.37
20.0	2.34
30.0	2.29
40.0	2.21

Transmittance τ (λ) vs. Wavelength λ



Zero Expansion Glass - ZERODUR®

Custom sizes and
specifications are available

OPTICAL

Refractive Index at n_e	1.5447
Refractive Index $n_F - n_C$	0.00975
Thermal Coefficient of Refractive Index (relative) at 0.5461 microns for 0/+20 deg C	14.3×10^{-6}
Transmission Range, microns	0.5-2.5

THERMAL

Thermal Linear Expansion, deg C ₋₁ for +20/+300 deg C	0.05×10^{-6}
Thermal Conductivity, W/(m•deg C) for +80/+100 deg C	1.64
Specific Heat Capacity, J/(kg•deg C)	0.821×10^3

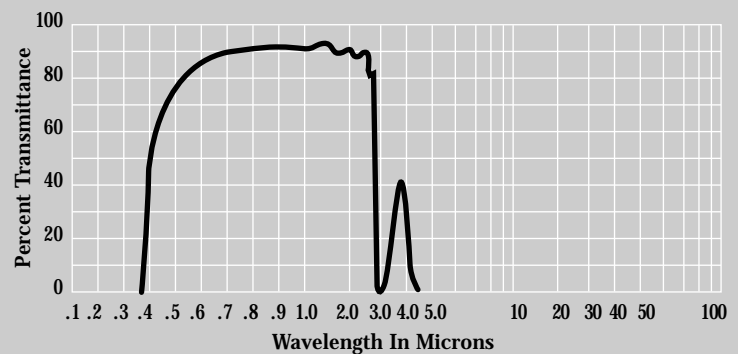
MECHANICAL

Density, g/cm ³	2.53
Young Modulus (E), Pa	9.1×10^{10}
Poisson Ratio	0.24

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.4358	1.5544
0.4800	1.5497
0.4861	1.5491
0.5461	1.5447
0.5876	1.5424
0.6438	1.5399
0.6563	1.5394

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Zerodur® is a registered trademark
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Zinc Selenide Laser Grade (ZnSe CVD)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony Cubic
Symmetry Class 43m

OPTICAL

Refractive Index at $n_{10.6}$ 2.4028
Thermal Coefficient of Refractive Index at 10.6 microns 6.1×10^{-5}
Transmission Range, microns 0.55-20

THERMAL

Thermal Linear Expansion, deg C⁻¹ at 27 deg C 7.57×10^{-6}
Thermal Conductivity, W/(m•deg C) at 20 deg C 16
Specific Heat Capacity, J/(kg•deg C) 0.339×10^3

MECHANICAL

Density, g/cm³ at 20 deg C 5.27
Mohs Hardness 4
Young Modulus (E), Pa 7.03×10^{10}
Poisson Ratio 0.28

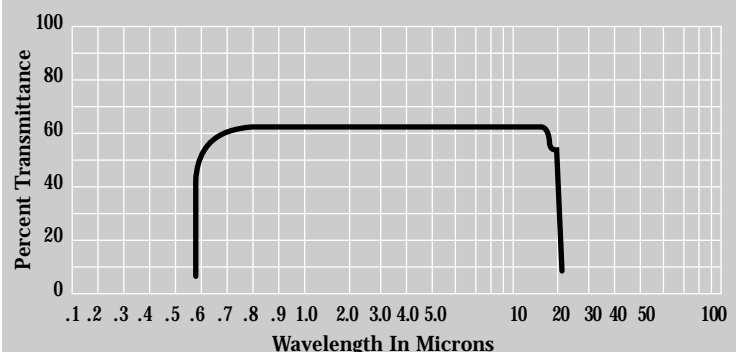
CHEMICAL

Molecular Weight 144.33
Solubility
in water, gram/100 cm³ insoluble
in acids soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.58	2.6754
1.0	2.4892
3.0	2.4376
5.0	2.4295
7.0	2.4218
9.0	2.4122
10.6	2.4028
11.0	2.4001
13.0	2.3850
15.0	2.3623
17.0	2.3448

Transmittance τ (λ) vs. Wavelength λ



Zinc Selenide Window Grade (ZnSe)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony	Cubic
Symmetry Class	43m
Lattice Constants, Angstrom	a=5.668

OPTICAL

Refractive Index at n_e	2.6645
Refractive Index $n_F - n_C$	0.1841
Refractive Index at $n_{10.6}$	2.4034
Refractive Index $n_{8.0} - n_{12.5}$	0.0285
Thermal Coefficient of Refractive Index at 3.39 microns for +/- 60 deg C	$(6...6.3) \times 10^{-5}$
Transmission Range, microns	0.55-18

THERMAL

Thermal Linear Expansion, deg C ⁻¹ at 27 deg C	7.9×10^{-6}
Thermal Conductivity, W/(m•deg C) at 20 deg C	14.1
Specific Heat Capacity, J/(kg•deg C)	0.367×10^3
Thermal Stability, deg C	57 +/- 7
Melting Point, deg C	1520 +/- 15

MECHANICAL

Density, g/cm ³ at 20 deg C	5.26
Mohs Hardness	4
Vickers Microhardness, Pa	$(101 +/- 3) \times 10^7$
Young Modulus (E), Pa	7.76×10^{10}
Shear Modulus (G), Pa	2.96×10^{10}
Poisson Ratio	0.311

CHEMICAL

Molecular Weight	144.33
Solubility	
in water, gram/100 cm ³	insoluble
in acids	soluble

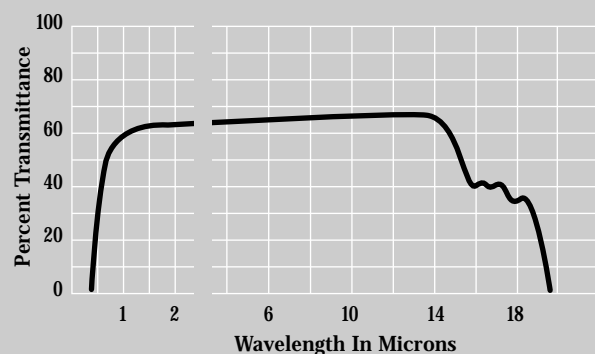
Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
1.0	2.4894
2.0	2.4462
3.0	2.4376
4.0	2.4331
5.0	2.4296
6.0	2.4258
7.0	2.4219
8.0	2.4176
9.0	2.4123
10.0	2.4067
11.0	2.4006
12.0	2.3936
12.5	2.3891
15.0	2.3662

Internal Transmittance $\tau_i(\lambda)$ vs. Wavelength λ

WAVELENGTH, MICRONS	INTERNAL TRANSMITTANCE
0.5	0.65
1.0	0.76
3.0	0.94
5.0	0.97
6.0	0.97
7.0	0.99
8.0	0.99
9.0	0.99
10.0	0.99
12.0	0.98
15.0	0.90
20.0	0.16

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Zinc Sulfide Cleartran® (ZnS)

Custom sizes and specifications are available

CRYSTALLOGRAPHIC

Syngony Cubic

OPTICAL

Refractive Index at $n_{0.4678}$ 2.44915
 Refractive Index at $n_{10.0}$ 2.20084
 Thermal Coefficient of Refractive Index
 at 0.6328 microns 5.43×10^{-5}
 Spectral Range, microns 0.37-14

THERMAL

Thermal Linear Expansion, deg C⁻¹ 6.5×10^{-6}
 Thermal Conductivity, W/(m•deg C) 27.2
 Specific Heat Capacity, J/(kg•deg C) 0.515×10^3

MECHANICAL

Density, g/cm³ at 20 deg C 4.09
 Young Modulus (E), Pa 7.45×10^{10}
 Vickers Microhardness, Pa 1.47×10^7
 Poisson Ratio 0.28

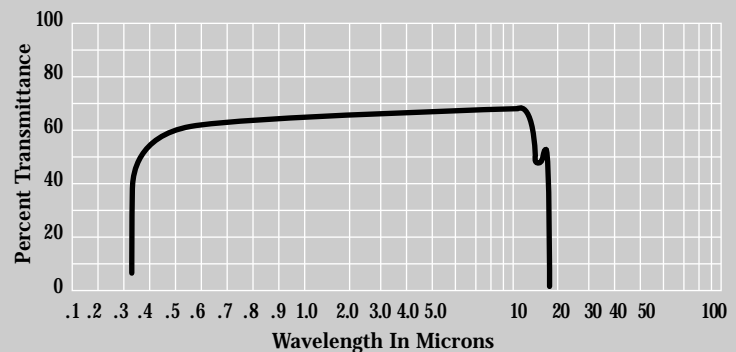
CHEMICAL

Molecular Weight 97.43
 Solubility
 in water, gram/100 cm³ 65×10^{-6}
 in acids soluble

Refr. Index n vs. Wavelength λ

WAVELENGTH, MICRONS	REFRACTIVE INDEX
0.4047	2.54515
0.4358	2.48918
0.4800	2.43691
0.5461	2.38838
0.6678	2.34033
0.7800	2.31669
0.8943	2.30183
1.0140	2.29165
2.0581	2.26442
3.000	2.25772
4.000	2.25231
5.000	2.24661
8.000	2.22334
9.000	2.21290
10.000	2.20084
12.000	2.17101
13.000	2.15252

Transmittance τ (λ) vs. Wavelength λ



ZnS Cleartran® is a registered trademark of Morton International, Inc.

Infrared Plastic

OPTICAL

Refractive Index at n_D	1.53
Refractive Index at 8-14 μm	1.52
Refractive Index at $>15 \mu\text{m}$	1.48
Transmission Range, microns	8-12 and 15-40

THERMAL

Thermal Linear Expansion, deg C^{-1}	$(11...13) \times 10^{-5}$
Service Temperature, deg C	100

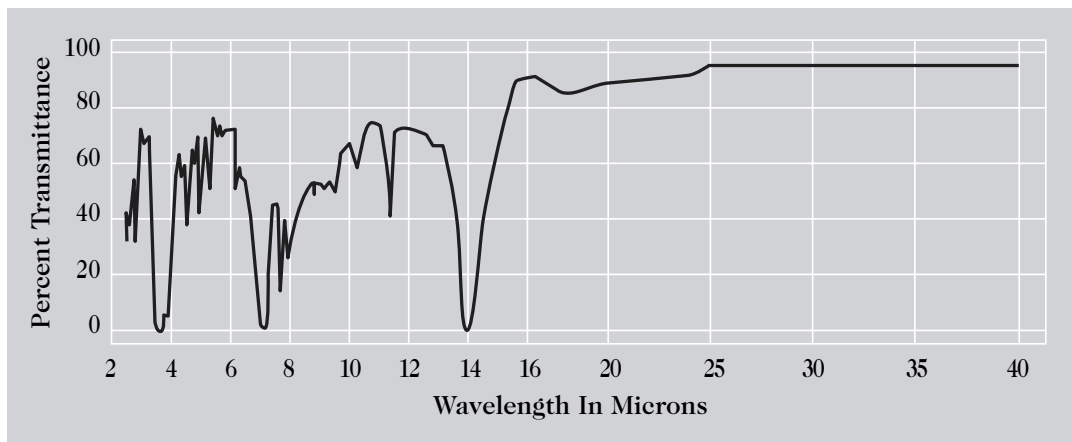
MECHANICAL

Shore Hardness	D60-70
Tensile Modulus, Pa	$(4...12) \times 10^8$
Flexural Modulus	$(7...18) \times 10^8$

CHEMICAL

Effect of Organic Solvents	little below 60 deg C
Effect of Strong Alkalies	very little
Effect of Weak Alkalies	very little
Effect of Strong Acids	attacked by oxidizing acids
Effect of Weak Acids	very little
Effect of Sunlight	none

Transmittance $\tau(\lambda)$ vs. Wavelength λ



Custom sizes and specifications are available