asphera

incorporated

ultra-violet and infrared optics

About Us

www.asphera.com

ASPHERA INCORPORATED is a precision optics company located in Santa Cruz, California, a technology center near the coastline with convenient access to Silicon Valley. Asphera was founded in 2013 by optical industry experts.

Our mission is to satisfy our customer's financial needs through use of cutting-edge manufacturing methods, superior customer service and competitively priced optics.

UV-IR PRECISION OPTICS

Asphera Incorporated has a strong reputation with UV-IR (192nm to 50µm) components (waveplates, targets, windows, wedges, domes, lens, prisms, blanks...) providing research and development as well as industrial and government. In this brochure, we highlight unique capabilities with UV Ultra-Pure LiF (Lithium Fluoride), X,Y,Z-cut Alpha-Quartz, HEMEX Grade Sapphire, NaCl (Soldium Chloride), CaF2 (Calcium Fluoride), and our new addition of MgO (Magnesium Oxidie) in high-demand.

- **ultra-thin windows**
- **ultra-purity**
- **laue photo - lattice planes**
- **Coatings: AR, BBAR, Cr, Ta**

CALL US: (831) 431-6801

SEND RFQ: sales@asphera.com

TECH SUPPORT: tech@asphera.com

PRODUCTION: production@asphera.com

- Proven track record with universities and research laboratories around the world since 2013.
- Ultra-thin LiF (150um) and Z-Cut Alpha Quartz (20um) Windows
- Experience with difficult and rare window materials: NaCl, MgO, Ga203, CsI, and more.
- Custom windows built to specification within 5-6 weeks.

Asphera Incorporated
629 Center Street
Santa Cruz, CA 95060 USA

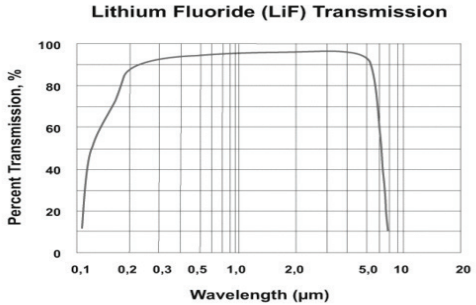
www.asphera.com

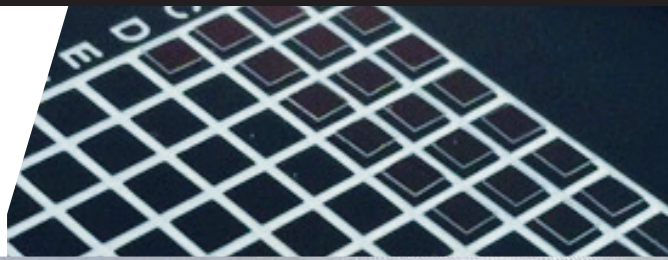
LiF (Lithium Fluoride) UV Single & IR Poly

LITHIUM FLUORIDE (LiF) is commonly used for optical components (windows, wedge windows, lenses, prisms) in a wide spectrum band from vacuum ultra-violet to infared and is transparent over the entire range of 0.140µm to 7µm.

LiF crystals are optically isotropic and unsoluable in water. However, precautions must be taken against environmental moisture at 400°C (completely softens at 600°C) and high-radiation damage sensitive to thermal shock.

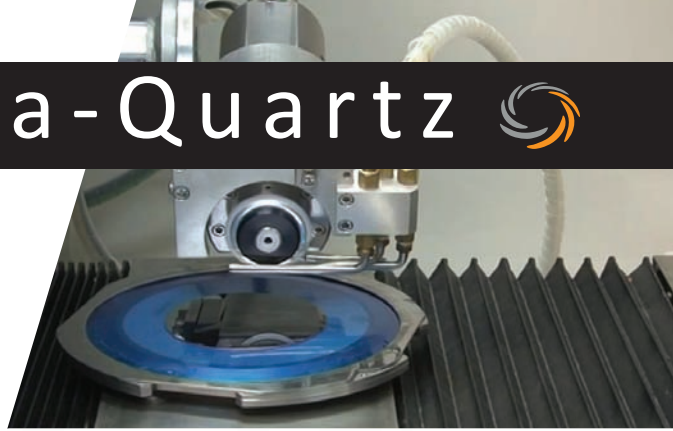
Its refractive index is the lowest out of all common infared materials. We offer micro-windows 1.6 mm diameters in thickness as low as 150um up to large 100 mm diameters and 50 mm thicknesses in (100) and (110) orientations.





TOLERANCES:
DIAMETERS: 1.6 - 100 mm
THICKNESS: 150um - 50mm
SURFACE QUALITY: 40-20
PARALLELISM: 30 arc sec

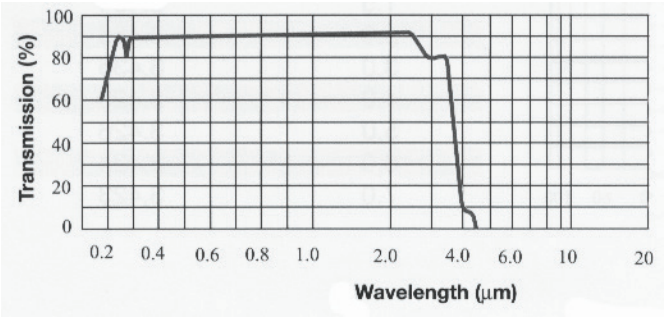
Ultra-thin Alpha-Quartz

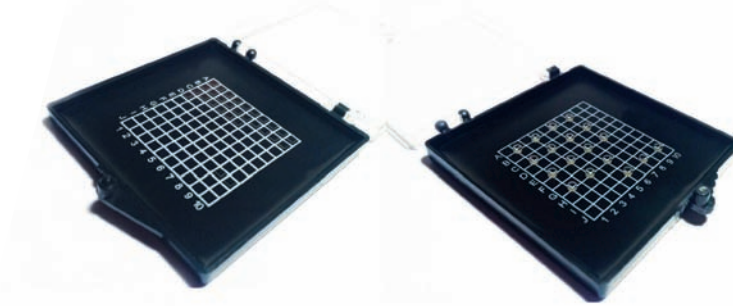


QUARTZ is a stronger material than glass and can be used up to 1050°C. Alpha-quartz (or low quartz) is the name of the high crystalline type of quartz. It has a high transmission (230nm - 3000nm) and is useful in UV applications.

Most common applications for quartz are shock physics and sensing. Common components are micro-optics, Brewster windows, step windows, Quarter waveplates, and prisms.

Our focus has been on ultra-thin windows with thicknesses of 20um, 50um, 100um with diameters or squares of 2-5mm (±0.03mm).





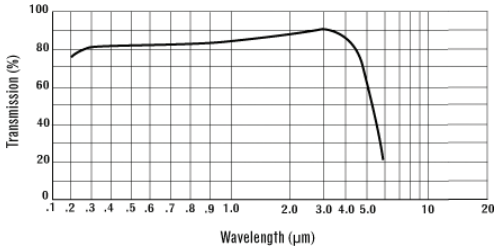
TOLERANCES:
ORIENTATION: X, Y, Z Cut
DIMENSTION: ±0.01mm
SURFACE QUALITY: 10-5
PARALLELISM: 10 sec

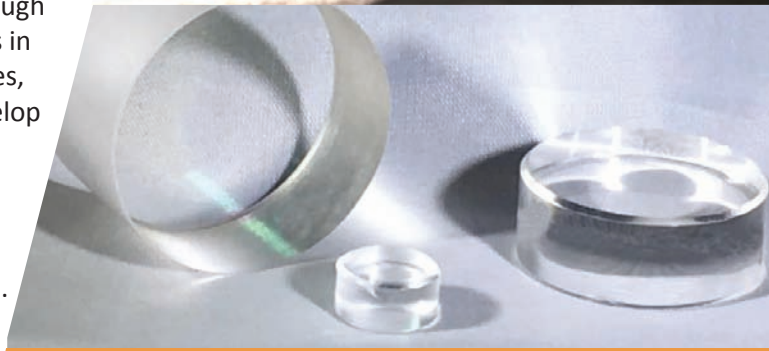
Sapphire A1203 UV Grade, HEMEX

SAPPHIRE WINDOWS are made from synthetic sapphire commonly chosen for high power laser applications because of its thermal properties and broad transmission range of 190 to 4000nm can withstand any mounting configuration and can protect any sensing device.

Our experience with both micro-optic sizes of 2mm through large diameters of 4.75 inch diameter sapphire windows in a variety of materials (UV, IR, Diffuser) and shapes (circles, squares, prisms, tubes, and rods) has allowed us to develop a wide range of components (IR and UV windows, step windows, wafers, waveplates, and prisms).

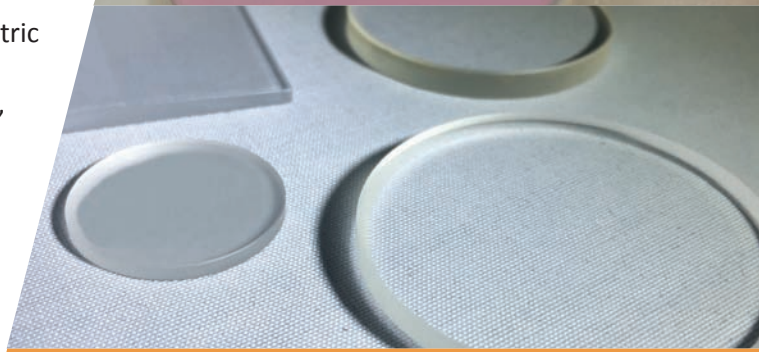
Common applications for sapphire windows are: shock physics, display windows, cameras and image projection.





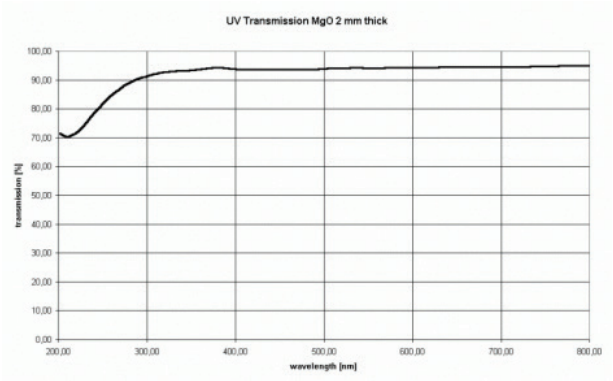
TOLERANCES:
ORIENTATION: A, C, or R Planes
DIMENSTION: ±0.03mm
SURFACE QUALITY: 10-5
FLATNESS: λ/10

MgO (Magnesium Oxide) Windows



MAGNESIUM OXIDE (MgO) is a single crystal (purity >99.9%) substrate used by high temperature thin film superconductor researchers worldwide most comonly as polished wafers for the field of Plasma Display Panel (PDP) technology.

The standard orientation is along the <100> plane. Some advantages of MgO substrates are high wear-resisting, electric insulation, resistant acid-base, high intensity, high temperature tolerance, high strength, precision processing, high mechanical strength, and chemical stability.



TOLERANCES:

PURITY: >99.9%

ORIENTATION: <100>, <111>

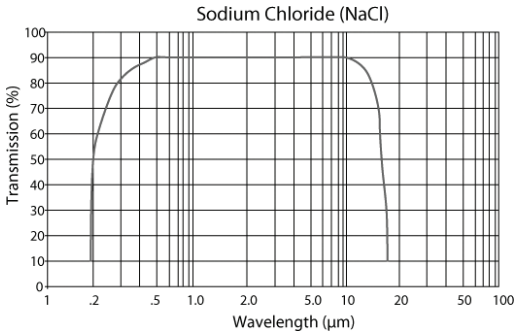
DIMENSTION: ±0.03mm

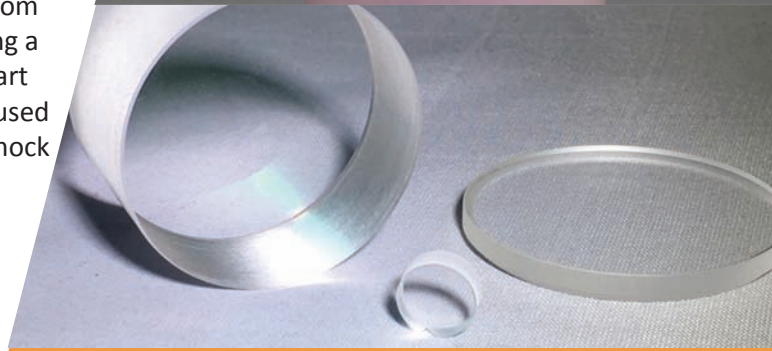
SURFACE QUALITY: 20-10

NaCl (Sodium Chloride) Windows

SODIUM CHLORIDE (NaCl) is used for windows, lenses and prisms where transmission in the range 0.25-16µm is desired. The refractive index varies from about 1.6 to 1.4 in this range. Because of its low absorbtion, Sodium Chloride is being used in high power laser systems.

Polished surfaces of NaCl windows must be protected from moisture by exposing to only a dry atmoshere or by using a heating element to maintain temperature of the NaCl part above the ambient temperature. NaCl windows can be used to a temperature of 400C. NaCl is sensitive to thermal shock and irradiation generates color centers.



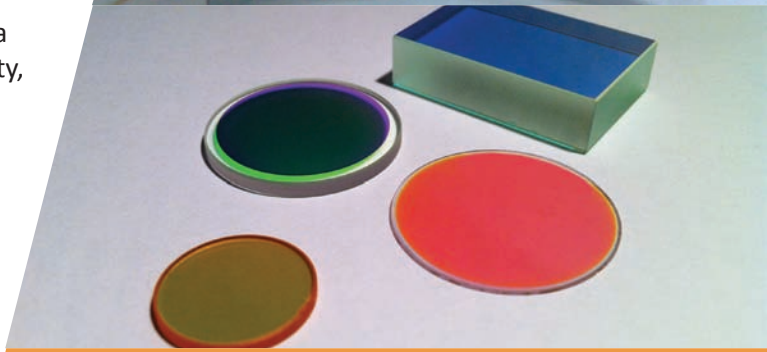


TOLERANCES:
ORIENTATION: <100>
DIMENSTION: ±0.03mm
SCRATCH / DIG: 40/20
FLATNESS: λ/4

Optical Coatings

OUR OPTICAL COATINGS WITH THIN FILM DEPOSITION TECHNIQUES for all methods of aspheric production offer several coating options completed within 3-5 days at an affordable option. Our complete metrology lab will insure your coatings will effectively meet the desired wavelengths and reflection for your application.

Our innovative E-Beam and extensive experience with Plasma Ion Assist Deposition allow us to meet high-accuracy, flexibility, short lead times, and reliable consistency while maintaining optimal pricing.



COATING OPTIONS WITH ASPHERA:

- Single Layer MgF2 Anti-Reflective
- Multi-Layer Anti-Reflective
- Multi-Layer Broadband Anti-Reflective
- Dielectric High-Reflective
- Metallic High-Reflective

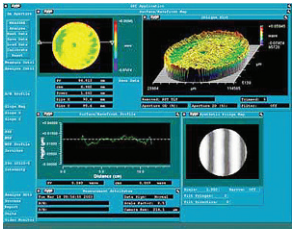
- **COATING OPTIONS FOR EVERY ASPHERIC SUBSTRATE**
- **EXPEDITED 2-DAY LEAD TIMES**
- **HIGH-REFLECTANCE COATINGS >98%**
- **MICRO-OPTIC COATINGS <2MM DIAMETER**

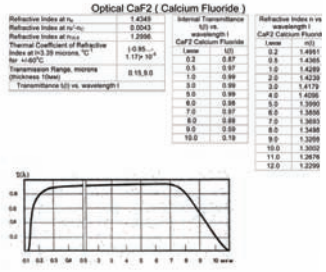
Metrology & Inspection

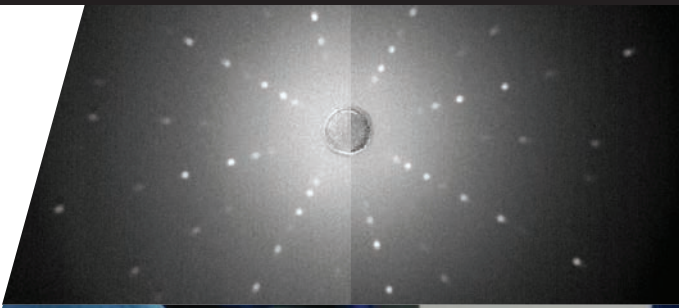
WE APPROACH METROLOGY WITH A COMBINATION OF ACCURACY AND FLEXIBILITY. Qualifying crystals can be a challenging process. We offer a Laue Photo (upon request) with your shipment. Single-Crystal X-ray Diffraction is most commonly used for precise determination of a unit cell, including cell dimensions and positions of atoms within the lattice. Bond-lengths and angles are directly related to the atomic positions. The crystal structure of a mineral is a characteristic property that is the basis for understanding many of the properties of each mineral.

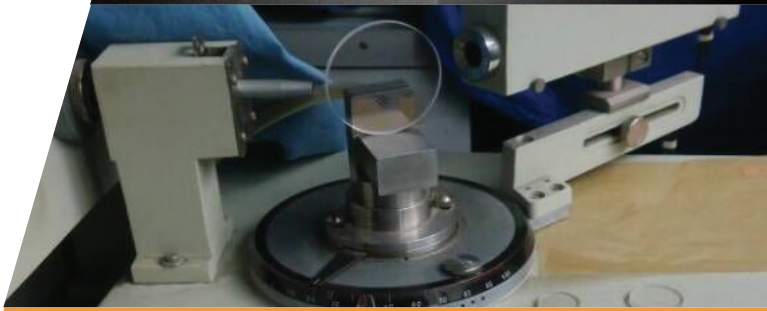
INSPECTION REPORTS CONFIRM MEASUREMENTS FOR:

- diameter, radius, thickness
- material certificate, Laue photo
- surface quality, flatness, orientation, parallelism





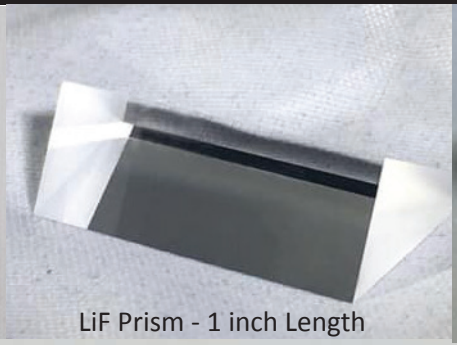




- **ISO9001: 2015 CERTIFIED INSPECTION PACKAGE**
- **SGS TESTING AND CERTIFICATION**
- **100% LOT TEST REPORT**

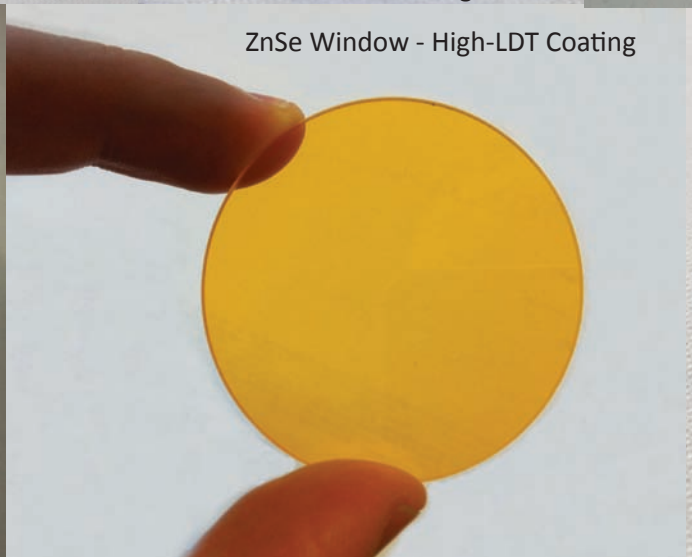
Awesome Accomplishments

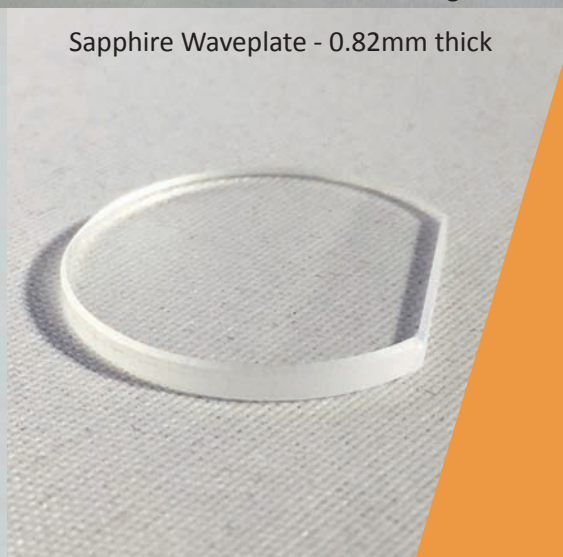

BK7 Beveled Window


LiF Prism - 1 inch Length


LiF Window - Polished Radial Edge


200mm dia. - ultra-thin Sapphire


ZnSe Window - High-LDT Coating


Sapphire Waveplate - 0.82mm thick

MOLDED & PRECISION ASPHERES

Asphera Incoporated
629 Center Street
Santa Cruz, CA 95060 USA
(831) 431-6801
www.asphera.com
sales@asphera.com