

FUSED SILICA (QUARTZ) VIEWPORTS

- Synthetic Fused Silica
- Standard & Zero Length
- 40-20 Scratch-Dig
- Non-Coated Optics

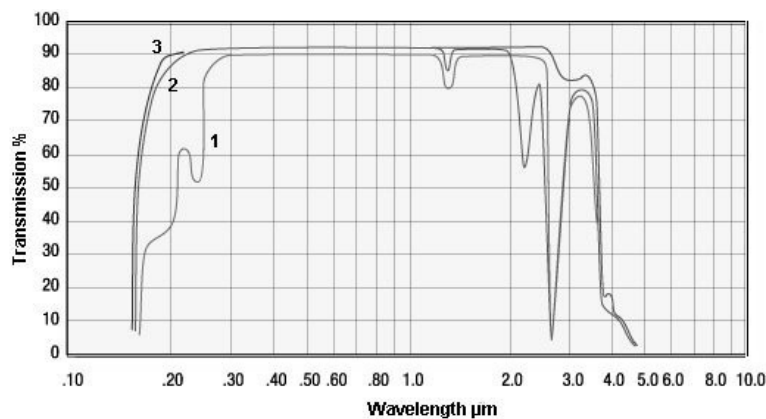
Fused Silica Introduction

Allectra's Fused Silica Viewports are designed and rated for high and ultra-high vacuum applications. They are constructed using vacuum grade materials including high purity silicon dioxide, 304 stainless steel and vacuum tube-grade braze alloys.

Fused Silica is a polycrystalline, isotropic material with no crystal orientation. Its physical, thermal, dielectric and optical properties are uniform in all directions of measurement.

Conventional Fused Quartz is suitable for basic non-demanding optical applications. However, impurities in Fused Quartz cause a blue-violet fluorescence when exposed to ultraviolet radiation at 253.7 microns. This fluorescence is not evident in synthetic Fused Silica, which is manufactured by flame hydrolysis of silicon tetrachloride.

Transmission vs Wavelength



(1) Fused Quartz (2) Base and Deep UV (3) Excimer UV

Fused Silica Viewports are preferred over Glass Viewports because of their transparency to ultraviolet radiation. Other advantages include a higher abrasion resistance and a low coefficient of thermal expansion, making them very resistant to thermal shock. Poor surface finish can contribute as much as 10% to overall transmission losses. All viewports are supplied with flat faces which have been finished to standards suitable for most applications. Allectra's standard finish for fused silica viewports is 40-20 scratch-dig. Other finishes are available on request at additional cost. For Deep-UV grade materials, the optics industry typically recommends a 20-10 scratch-dig optical finish for service below 0.25 microns.

| General Specifications | |
|--|---------------------|
| | Transmission Range: |
| ⁽¹⁾ Fused Quartz (Discontinued) | 300nm to 2.50μ |
| ⁽²⁾ Base Ultraviolet (UV) | 200nm to 2.00μ |
| ⁽²⁾ Deep Ultraviolet (DUV-200) | 200nm to 2.00μ |
| ⁽³⁾ Excimer Ultraviolet (EUV-185) | 185nm to 2.20μ |

| Material | Inclusion Class Number | Total Inclusion Cross-Section | Maximum Inclusion Cross Section | Index of Homogeneity | |
|----------|------------------------|-------------------------------|---------------------------------|----------------------|-----|
| | | | | Grade | ppm |
| UV | 2 | 0.10-0.25mm ² | 0.50mm | F | <5 |
| DUV-200 | 0 | 0.00-0.03mm ² | 0.10mm | A | <1 |
| EUV-185 | 0 | 0.00-0.03mm ² | 0.10mm | C | <2 |

Temperature Rating: CF flange types 200°C

Allectra offers three ultraviolet grades of fused silica, a base ultraviolet and two deep ultraviolet grades, DUV-200 and EUV-185. The base grade material is suitable for all but the most demanding optical applications and certified to meet >80%/cm @185nm external transmittance. DUV-200 fused silica is equivalent to Suprasil-1* and similar to the base grade with the exception of inclusion specifications. EUV-185 is an Excimer grade window material which offers excellent performance for Excimer-UV laser applications. This material is certified to meet >85%/cm @185nm external transmittance.

Notes

Transmission curves are approximations, intended for reference only. They are based on a 10mm sample thickness as tested by Quartz manufacturers. Thermal gradient should not exceed 25°C/minute. Lead-silver braze alloy melts at ~300°C.

Vacuum Compatibility Fused Silica Viewports are suitable for UHV use and maximum differential pressure of 1 bar (1 atmosphere).

They can be baked to 200°C. They are supplied on CF copper gasket style Vacuum Flanges in sizes CF16, CF40, CF63 and up to CF200. The use of annealed copper gaskets is recommended.

Prices For price information, please refer to the current Allectra catalogue

Accessories – Please refer to the current Allectra catalogue for details:

Lead glass radiation protection screen

Shutter

Annealed Copper Gaskets