

Application Note

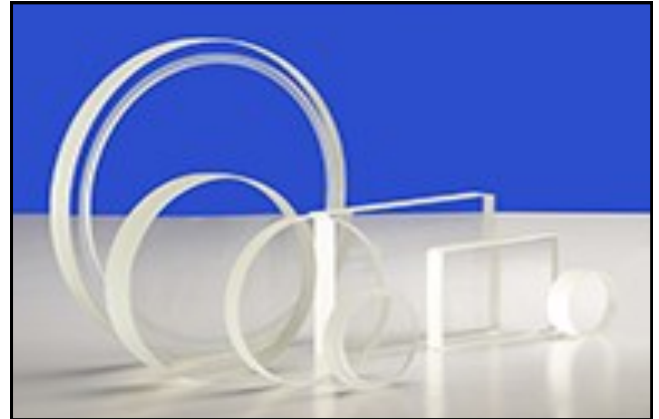
What is Sight Glass?

Sight glass, also known as a sight window or view port window, is a visual observation window made from a robust glass substrates such as SCHOTT Borofloat[®] and is used to verify conditions in piping, vessels, chemical reactors or other industrial equipment. Sight glass is generally subjected to elevated temperatures, chemical attack and high pressure. So selecting the appropriate glass substrate is critical in order to ensure safety even in the harshest of environmental conditions.

The sight glass is a disc held between two metal frames which are bolted, clamped, or fused to the frame. The glass itself can be strengthened (heat tempered) for additional durability, and may be coated for enhanced visibility and corrosion resistance. Fused sight glass is also called mechanically pre-stressed glass, because the glass is strengthened by compression of the metal ring. Heat is applied to a glass disc and its surrounding steel ring, causing a fusion of the materials. As the steel cools, it contracts, compressing the glass and making it resistant to tension. Because glass typically breaks under tension, mechanically pre-stressed glass is unlikely to break and endanger workers.

Typically, a sight glass window is made from a thick borosilicate glass such as SCHOTT Borofloat[®], an optically clear, very versatile glass that has excellent light transmission, thermal and chemical properties. Borofloat[®] outperforms soda lime glass due to its low iron content resulting in exceptional UV and light transmission. For less critical applications, soda lime glass may be used. For the most extreme applications, one should choose quartz or sapphire.

When determining glass thickness and diameter/area of the vessel pressure must be taken into consideration.



The sum of SCHOTT Borofloat[®] properties makes it unique for sight glass applications as it has outstanding thermal resistance, it is chemically durable, has excellent mechanical strength and exceptionally high transparency all of which are selection criteria.

When electing a sight glass substrate the following characteristics of the glass should be considered:

- Transparency
- Thermal Shock
- Corrosion
- Abrasion
- Pressure
- Impact

For operating conditions of up to 500°F, borosilicate glass should be selected. For temperatures over 500°F, such as high temperature steam, quartz or sapphire would be the recommended substrate. Applications requiring a temperature range of 300°F or less may use soda lime glass.

Typical sizes are up to 8" in diameter and ¾" thick, but can be provided as large as 25" in diameter and up to 1" thick if required.

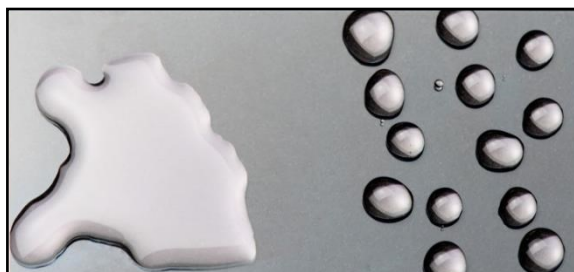
Application Note

Abrisa Technologies can customize sight glass for unique installation requirements by providing stepped, flanged, or beveled or polished edges. Grooves can also be added to accommodate mounting. The rectangles/rounds can also be tempered. For easy readability in less than desirable environments, oleophobic/hydrophobic coating (**CleanVue PRO™**) improves visibility, and gaskets aid with mounting and sealing.

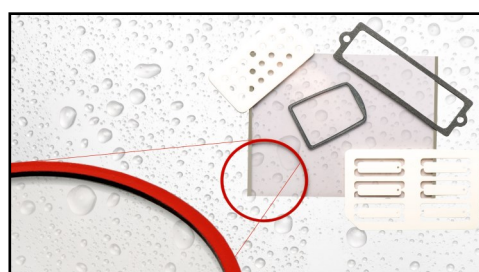
Value-Added Options



Sight Glass in Flange



Easy-to-Clean Oleo/Hydrophobics



Gaskets for Environmental Seals

Common Edge & Installation Treatments



Grooved Edge



Stepped Edge



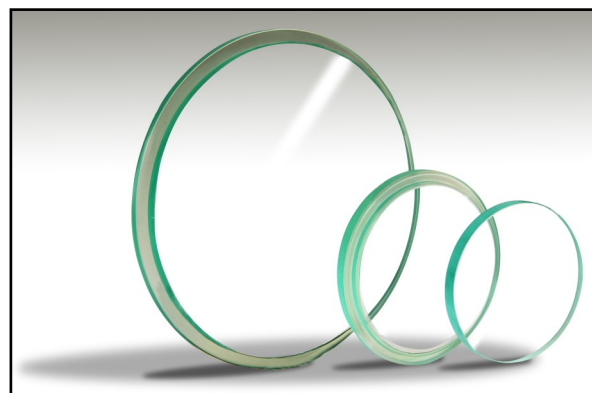
Beveled or Polished Edge

Comparative Information for Sight Glass Selection:

Glass Disc Substrate Material	Temperature Application	Thermal Shock Resistance	Corrosion Resistance	Abrasion Resistance	Pressure Capability	Impact Resistance
Soda Lime	Up to 300°F	Good	Good	Good	Superior	Good
Fused Silica	Up to 300°F	Superior	Good	Good	Excellent	Excellent
Borosilicate (Borofloat®)	Up to 300°F	Excellent	Excellent	Excellent	Excellent	Excellent
Quartz	Up to 500°F	Best	Best	Best	Excellent	Superior

Sight Glass/View Port Industry Applications:

- Chemical & Petrochemical
- Pharmaceutical & Biotech
- Food & Beverage
- Oil & Gas
- Utility Industry
- Bio-Gas & Bio-Fuels
- Wastewater Treatment



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What is Sight Glass?

Glass Fabrication



Coating Deposition



CNC Machining



Strengthening - Chemical & Heat



Screen Printing of Graphics



Abrisa Technologies, a member of HEF Photonics, is a globally recognized technology glass fabrication and optical thin film coating company with expertise in high volume manufacturing and engineering capabilities, delivering Total Solutions that provide excellent performance, fitness-for-use and economies of scale.

Our US based, state-of-the-art ISO 9001:2015 and ITAR registered facilities include Abrisa Industrial Glass in Santa Paula, CA and ZC&R Coatings for Optics in Torrance CA. These two divisions produce solutions from cut-to-order coated glass components to custom complex and ready-to-install fabricated, strengthened, optically coated, electronically enabled and branded sub-assemblies.

Our Total Solutions serve a variety of markets including Micro-Electronics, Defense and Avionics, Display, Industrial Automation, Optical Sensors, Imaging, Photonics, Medical & Dental, Life Science and more.



Abrisa Industrial Glass
200 South Hallock Drive
Santa Paula, CA 93060

ZC&R Coatings for Optics
1401 Abalone Avenue
Torrance, CA 90501

(877) 622-7472

www.abrisatechnologies.com
info@abrisatechnologies.com