Sight Glasses for Industrial Process Observation

Reliable visual monitoring of fluids, levels, and processes is critical in demanding industrial environments. Our comprehensive range of sight glasses combines precision-engineered glass technology with robust mechanical designs to provide clear, safe observation in pipelines, vessels, reactors, and level indicators. This catalog outlines our three core product families — **Circular Sight Glasses**, **Level Gauge Glasses**, and **Tubular Sight Glasses** — each offered in a selection of high-performance glass materials including borosilicate, quartz, and aluminosilicate. Every glass type is carefully selected to match specific thermal, mechanical, and chemical requirements, ensuring long service life and compliance with international standards.

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1. Circular Sight Glass

Circular sight glasses are disc-shaped windows installed in tanks, pressure vessels, bioreactors, and pipelines to allow direct visual inspection of processes. They can be supplied as single discs or as part of complete sight glass assemblies with metal housings, gaskets, and guard plates. Typical applications include monitoring of mixing, fermentation, flow detection, and light ingress in food, pharmaceutical, chemical, and petrochemical industries.

1． Material Options for Circular Sight Glasses

Borosilicate Glass

Borosilicate circular sight glasses offer excellent thermal shock resistance and high chemical durability, making them the standard choice for a wide range of neutral and acidic media. With a low coefficient of thermal expansion, they withstand sudden temperature changes without cracking.

Maximum operating temperature: up to 280 °C (depending on mechanical load)

Compliant with DIN 7080 / DIN 8902

Ideal for general chemical processes, food processing, and sight flow indicators

Quartz Glass

For applications involving extreme temperatures or ultraviolet (UV) transmission requirements, quartz glass sight glasses deliver unmatched thermal stability and optical

clarity. Fused quartz can be used continuously at temperatures where other glasses fail, and its high purity makes it suitable for semiconductor and high-vacuum environments.

Maximum operating temperature: up to 1100 °C

Excellent transmittance in UV to IR spectrum

Withstands aggressive thermal cycling and thermal shock

Recommended for furnaces, high-temperature reactors, and optical instruments

Aluminosilicate Glass

Aluminosilicate glass provides superior mechanical strength and enhanced thermal performance compared to borosilicate, making it the preferred material for high-pressure and high-temperature processes. It offers outstanding resistance to alkaline media and maintains its integrity under continuous thermal loads.

Maximum operating temperature: up to 500 °C (continuous)

High compressive strength, suitable for ASME and PED compliant assemblies

Excellent for steam boiler sight ports, power generation equipment, and harsh chemical environments

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2. Level Gauge Glass

Level gauge glasses are specialized transparent or reflex glasses used in liquid level indicators on boilers, storage tanks, and process vessels. They are manufactured with precise flatness and surface finish to ensure a tight seal and clear liquid level reading. Reflex glasses feature prismatic grooves on the process side that create a sharp optical distinction between liquid and gas phases, while transparent glasses allow viewing of the liquid color and interface through two opposite windows.

2．Material Options for Level Gauge Glasses

Borosilicate Level Gauge Glass

Borosilicate is the most widely used material for reflex and transparent level gauges in low to medium pressure steam boilers and chemical storage. Its reliable thermal behavior and smooth surface quality guarantee leak-free operation under varying temperatures.

Max service temperature: 250 °C

Standard lengths and widths per DIN 7081 / JIS B8211

Available in reflex and transparent types, suitable for water, oils, and many chemicals

Quartz Level Gauge Glass

Quartz level gauge glasses are engineered for ultra-high temperature steam and superheated water applications where borosilicate would deform or fail. Their near-zero thermal expansion eliminates breakage during rapid start-up and shut-down cycles.

Max service temperature: up to 1000 °C

Ideal for high-pressure steam drums and supercritical boilers

Often used with mica shields for added protection against alkaline boiler water

Aluminosilicate Level Gauge Glass

When both high temperature and high mechanical stress are present, aluminosilicate level gauge glasses outperform standard materials. Their higher softening point and superior resistance to alkali attack make them indispensable in modern high-pressure boiler plants and power stations.

Max continuous temperature: 430 °C

Exceptional resistance to erosion from steam and aggressive chemicals

Used in high-integrity reflex and transparent level gauges, often combined with protective mica in steam service

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3. Tubular Sight Glass

Tubular sight glasses consist of precision-bore glass tubes installed vertically in tubular level indicators or horizontally as flow indicators. They provide a continuous 360-degree view of the process fluid, making them highly effective for monitoring liquid level, color, turbidity, and flow presence. The tubes are typically clamped between end fittings with appropriate sealing elements, and their simple design enables easy cleaning and replacement.

3．Material Options for Tubular Sight Glasses

Borosilicate Tubular Sight Glass

Borosilicate glass tubes are the most economical and versatile solution for tubular level gauges and sight flow indicators. Their transparency and smooth inner surface minimize fouling, while good thermal shock resistance accommodates moderate temperature swings.

Standard outer diameters: 12 mm to 40 mm; custom sizes available

Max working temperature: 280 °C

Suitable for water treatment, lubricating oil systems, and chemical dosing lines

Quartz Tubular Sight Glass

Quartz tubes are employed where process temperatures exceed the limits of borosilicate or where optical transmission in the ultraviolet range is needed. Their outstanding purity and thermal stability ensure they remain crack-free under extreme conditions.

Max working temperature: up to 1100 °C

Excellent transmittance, ideal for photochemical reactors and UV disinfection monitoring

Thin-wall and heavy-wall options available for high-pressure furnace sight ports

Aluminosilicate Tubular Sight Glass

For high-pressure and high-alkalinity environments, aluminosilicate tubes deliver enhanced durability and safety. Their high softening point and improved chemical resistance reduce the risk of stress corrosion cracking and clouding in prolonged service.

Max working temperature: 500 °C

High mechanical strength supports longer unsupported spans

Recommended for steam boilers, autoclaves, and aggressive chemical processes

Material Comparison At-a-Glance

Property	Borosilicate	Quartz (Fused Silica)	Aluminosilicate
Density (g/cm^3)	2.23	2.20	2.55 – 2.64
Coefficient of Thermal Expansion ($10^{-6}/K$)	3.3	0.55	4.5 – 5.0
Softening Point (°C)	820	≈1700	≥960
Max Operating Temp. (°C)	280	1100	500
Thermal Shock	Excellent	Outstanding	Very Good

Property	Borosilicate	Quartz (Fused Silica)	Aluminosilicate
Resistance			
Alkali Resistance	Moderate	Good (with mica)	Excellent
Typical Standards	DIN 7080 / 8902	MIL-G-174	DIN 7081, ASME

All sight glass products can be supplied in custom dimensions, with edge finishing, surface polishing, and coating options upon request. For further technical specifications or assistance with material selection, please contact our engineering team.