

Fused Sight Glasses

Data Sheet DS65-200-5



Unique One-Piece Design Provides:

- Strength
- Safety
- Simplicity

Our fused sight glasses are actually fused into a glassed ring to achieve strengths not previously available. The ultra high strength derived from the uniform high compression of the lens provides outstanding resistance to failure from impact and cracking. The Fused Sight Glass is a simple, one-piece unit, with no loose or separate parts. No preassembly is required and there is no potting material to leak or degrade under use.

Applications

The Fused Sight Glass, depending on model, can be used on glassed-steel vessels which operate at either 150 or 300 psig design pressure. It is a suitable replacement for all tempered glass and safety sight glasses previously sold by Pfaudler.

Strength in Reserve

The Fused Sight Glass not only resists the normal stresses caused by rated operating pressure and temperature, but also withstands those additional stresses that can result from impact, thermal shock and scratches on the lens. The reserve strength inherent in this fused-steel composite enables it to handle a wide range of operational stresses with ease. The result is a very long service life.

Resistance to Impact

The fused glass shows significant resistance to chipping and cracking caused by minor impact. If nicks or chips should occur, they will not lead to failure of the Fused Sight Glass. The stress of minor impact is offset by the built-in reserve strength.

High Tolerance to Scratches and Pitting

Unlike a tempered lens, which is significantly weakened by scratches and surface pitting, the Fused Sight Glass is virtually unaffected by these hazards. The uniform high compression of the fused lens provides the strength to resist these hazards and allows continued use.

Operational Advantages

In terms of operation, one-piece construction and reserve strength can be translated as:

- Quick and easy installation with no bench assembly required.
- Serviceability unaffected by scratches and chipping or minor impact.

- Capacity to withstand cold water impingement from a fire hose while at rated temperature and pressure.
- Long service life.

Safety

All models of the Fused Sight Glass are designed and tested to have a safety factor of at least 20 times rated pressure before leakage occurs, and at least 10 times rated pressure, at rated temperature, before stress cracks appear. These safety factors are determined by measured values rather than theoretical assumptions.

Cracks are Self-Arresting

The soda-lime silicate lens of the Fused Sight Glass exhibits an unusual cracking pattern when subjected to extreme stress. Superficial cracks which result from excessive stress do not penetrate completely through the lens. They are self-arresting, and additional stress is required to generate new or deeper cracks. Even after cracks appear, massive overpressurization of the order of 20 times rated pressure is required before leaks occur.

Testing

Fused Sight Glasses have been tested by the Pfaudler Engineering Test Center and by an independent testing lab. All tests were performed in accordance with recognized standards and procedures.

Ultimate strength is determined by applying hydraulic pressure to the lens of the Fused Sight Glass, at room temperature, until extensive cracking causes leaks to develop. The ultimate strength of the 150/300 psi model is 7500 psig.

Specifications (Dimensions in inches unless otherwise indicated.)

Fused-Steel Sight Glass

Nozzle Size	Nominal Lens Diameter	Rated Pressure	Rated Temperature	Glassed Ring O.D.	Glassed Ring Thickness
2	2	150 psig	-20 to 450° F.	4	1
2	2	300 psig	-20 to 450° F.	4	1
3	3	150 psig	-20 to 450° F.	5-1/3	1-1/2
3	3	300 psig	-20 to 450° F.	5-1/3	1-1/2
4	4	150 psig	-20 to 450° F.	6-1/2	1-1/2
4	4	300 psig	-20 to 450° F.	6-1/2	1-1/2
6	4	150 psig	-20 to 450° F.	8-1/2	1-1/2
6	4	300 psig	-20 to 450° F.	8-1/2	1-1/2
8	4	150 psig	-20 to 450° F.	10-1/2	1-1/2
8	4	300 psig	-20 to 450° F.	10-1/2	1-1/2

Fused-Inconel Sight Glass

2	2	150 psig	Below -20 to 450° F.	4	1
2	2	300 psig	Below -20 to 450° F.	4	1
3	3	150 psig	Below -20 to 450° F.	5-1/3	1-1/2
3	3	300 psig	Below -20 to 450° F.	5-1/3	1-1/2
4	4	150 psig	Below -20 to 450° F.	6-1/2	1-1/2
4	4	300 psig	Below -20 to 450° F.	6-1/2	1-1/2
6	4	150 psig	Below -20 to 450° F.	8-1/2	1-1/2
6	4	300 psig	Below -20 to 450° F.	8-1/2	1-1/2
8	4	150 psig	Below -20 to 450° F.	10-1/2	1-1/2
8	4	300 psig	Below -20 to 450° F.	10-1/2	1-1/2

Impact loads are applied by dropping a steel ball onto the center of the lens while the Fused Sight Glass is at rated pressure and temperature, after which the pressure is increased to four times the rated limit. The 150/300 psi model successfully passed a 22 ft. lbs. impact test. Resistance to thermal shock from outside the vessel is determined under simulated emergency conditions by directing cold tap water at 60 degrees F. onto the lens surface of the Fused Sight Glass at rated operating temperature and pressure. Under these conditions, only minor crazing of the lens surface has been

observed. Thermal shock limits are the same as those recommended for the glassed-steel vessel.

Light Assembly Available

An accessory light assembly for illuminating the inside of the vessel is available for use with Fused Sight Glasses. Contact Pfaudler for details.

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