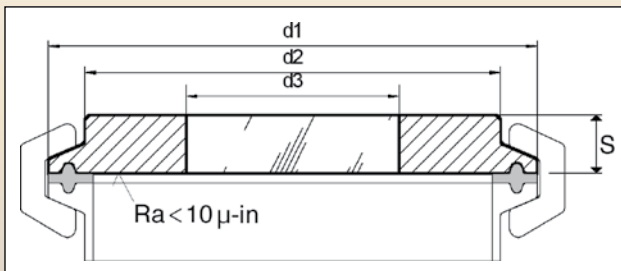


Metaglas® MetaClamp®

Sanitary Sight Glass

Data Sheet 03-0020
Rev. 10/14



Standard Tube OD	d1		d2		d3		S		PSIG@ 450°F
	Inch	MM	Inch	MM	Inch	MM	Inch	MM	
1/2", 3/4"	0.98	25	0.71	18	0.39	10	0.39	10	230
1", 1-1/2"	1.99	51	1.61	41	0.98	25	0.39	10	230
2"	2.52	64	2.05	52	1.18	30	0.39	10	230
2-1/2"	3.05	78	2.51	64	1.38	35	0.47	12	230
3"	3.58	91	2.99	76	1.57	40	0.39	10	150
3-1/2"	4.17	106	3.54	90	1.97	50	0.39	10	150
4"	4.69	119	3.97	101	2.17	55	0.47	12	150
6"	6.57	167	5.98	152	2.95	75	0.63	16	85
8"	8.56	218	7.80	198	3.94	100	0.71	18	85
10"	10.55	268	9.65	245	4.72	120	0.79	20	85
12"	12.56	319	11.81	300	5.51	140	0.87	22	85

Note: Temperature and pressure apply to sightglass only.

The strongest, most secure sight glass available, Metaglas® mechanically prestressed windows, are available in a sanitary clamp design, MetaClamp®, for sight ports and light ports in processing applications or inline visual flow indicators.

Application:

Sanitary MetaClamps to fit sanitary clamp connections. With simple and fast installation with no risk of breakage, this sleek, compact, one-piece design provides a cleaner look, less bacteria traps and unsurpassed safety. The MetaClamp sight glass can be used as a view port mounted on a ferrule, a "cross" for inline visual flow indication or as a light port. Many other connection types are also available, as shown on the reverse side. Materials available include 2205 Duplex Stainless Steel, Hastelloy®, Monel® and Inconel®.

Approvals and Technical Data:

- USP Class VI (tested to confirm biocompatibility)
- BPE Compliant and TÜV Approved
- Sight glass fused to metal conforming to DIN7079
- Borosilicate glass to USP Type I and DIN7080
- Standard surface finish of 10 Ra μ-in (0.25μm)
- Material to ASTM/ASME, TÜV and DIN/EN standards
- Certificate of Conformity to EN 10204-3.1B or 3.1A
- Pressure Equipment Directive 97/23/EG

How Metaglas® Works:

Metaglas provides a level of safety and a useful service life, well beyond that provided by conventional tempered glass or plastic used as sight glass windows. Even in the most extreme temperature (to 572°F using Hastelloy) or overpressure situations, sudden, total failure essentially never occurs. Patented Metaglas windows are formed by melting borosilicate glass into a precisely formed metal ring. As the glass cools, it solidifies, preventing the metal ring from contracting back to its theoretical size. The result is a uniform, mechanically prestressed fusion of glass and metal that combines excellent optical characteristics with greatly enhanced physical characteristics. Vital in sanitary service, the Metaglas discs have an uninterrupted surface with no crevice to trap bacteria - no epoxies, resins, or glue - a true fusion. The standard surface finish is 10 Ra μ-in (0.25 Ra μm). Electropolishing available upon request.

Metaglas® MetaClamp®

Sanitary Sight Glass

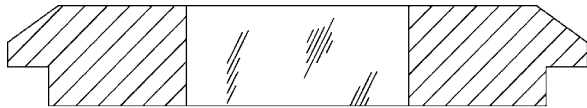


MetaClamp® with Lumiglas® Light

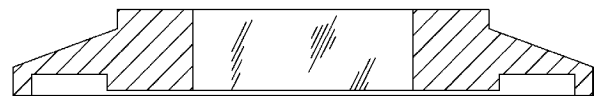
Metaglas® Sightglasses for Various Fittings

Because Metaglas® is created with an exterior ring of Duplex Stainless, Hastelloy®, etc., it can be machined to fit many different connection types. A few examples are listed and shown below.

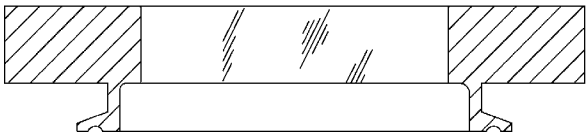
- MetaClamp® for Lumiglas® Lights
- “I” Line Fittings
- Bevel Seat Fittings
- John Perry Fittings
- APV Fittings
- Swagelok TS Fittings
- Tuchenhagen Varivent®
- BBS-Systems’ Quick Connect
- Sanitary in-line sightglass



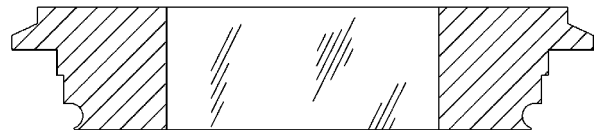
Metaglas® I-Line Fitting



Metaglas® for Swagelok's TS Fitting



Metaglas® Large View



Metaglas® Tuchenhagen Varivent® Fitting

Sight glass discs typically fail because the glass cannot tolerate a particular combination of shock and bending forces they encounter when operating under pressure. When undue stress is applied to conventional glass - both the stress introduced by system pressure or that inadvertently induced during reinstallation after cleaning - the force is concentrated along tensile stress lines. Eventually the lines develop into cracks which can immediately compromise the barrier. Worse, a general pattern of cracking can occur suddenly, either spontaneously or as the result of a slight impact, compromising the physical integrity of the glass. So, when a conventional glass disc fails, it can do so without warning, suddenly shattering into fragments with explosive force.

Metaglas windows accept a much higher level of stress without damage because, being uniformly compressed, they are more uniformly elastic. Cracks are absorbed by the homogeneous compression stress that is imposed across the full section of the glass. When further stressed, by either extreme pressure or impact, the reaction is a progressive pattern of spalling or slivering, usually on the external surface of the glass, but the barrier is uncompromised.

