Section: T100
Bulletin: T100.95
Date: 9/03
Supersedes: 12/98

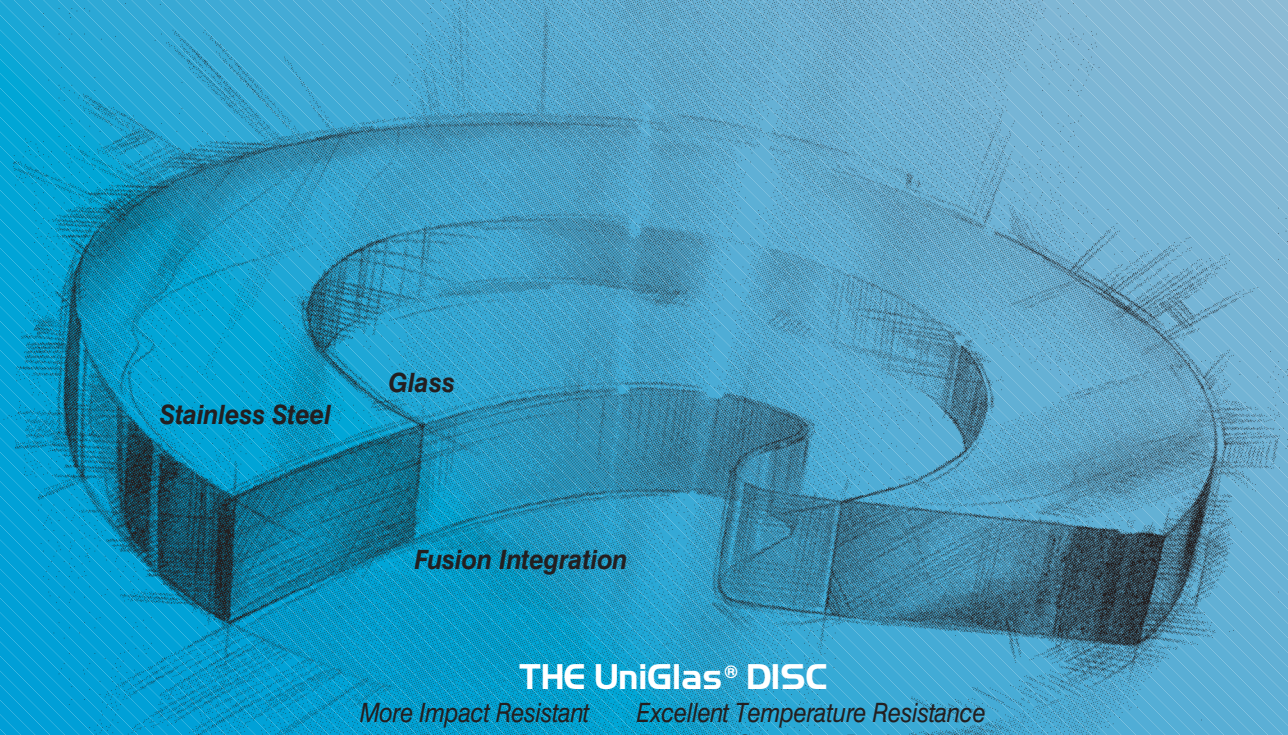
PHENOMENAL UniGlas®

SIGHT WINDOW SAFETY FOR THE 21ST CENTURY. AVAILABLE NOW. A JACOBY-TARBOX EXCLUSIVE FOR AMERICAN PLANTS AND FACTORIES.

JACOBY·TARBOX®

A Product Line of
The Clark • Reliance Corporation

Over 80 years of Quality!



THE UniGlas® DISC

More Impact Resistant
More Pressure Resistant
More Stress Resistant
Excellent Temperature Resistance
Excellent Corrosion Resistance
More Shock Resistant

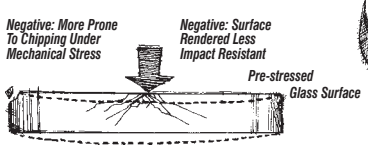
You've Always Wanted A Better View Of What's Going On Inside Your Systems. A Safer View, For Sure.

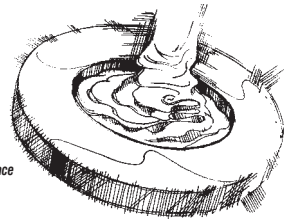
From the beginning, designers have relied on glass and steel to make the small, strong windows that can show you what's happening inside your system's pipes, tanks and vessels. Through these precisely engineered ports, you can check the speed, volume, viscosity, mix, color and other telltale flow characteristics of gases, liquids and solids.

Unfortunately, these windows have forever been lacking in one functional way or another. The glass scratches or chips too much. Designs using glass layers are too thick, bulky. Packings and adjusting screws and shims add to parts inventories. Steel and glass expand differently at elevated temperatures, inviting burst failure. Corrosive liquids or gases simply eat windows away. Pre-stressed glass suddenly shatters when smacked by solid materials.

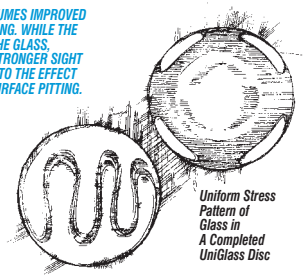
So it has been a long struggle, trying to make a sight window that will tolerate closed chambers by dramatically resisting high pressures, thermal influences, chemical attack and mechanical forces. Plus resist all that for a long time, safely, cost-effectively.

SOME SIGHT GLASS IS PRE-STRESSED, BY SURFACE TREATMENT, TO REDUCE THE EFFECTS OF BOWING UNDER HIGH PRESSURES. HOWEVER, THIS GLASS BECOMES MORE VULNERABLE TO IMPACT SHATTERING AND EDGE CHIPPING.





IN UNIGLAS DISCS, THE GLASS ASSUMES IMPROVED PROPERTIES FOLLOWING PROCESSING. WHILE THE METAL RING "SHRINKS" AROUND THE GLASS, COMPRESSIVE FORCES CREATE A STRONGER SIGHT WINDOW GLASS, MORE RESISTANT TO THE EFFECT OF SCRATCHING, CHIPPING, AND SURFACE PITTING.



UniGlas®. It's Still Metal And Glass. But That's Where Similarities End.

The outer ring of the UniGlas disc is machined from carbon steel, stainless steel, or Hastelloy C. The specific grades of these metals are extraordinary, relative to their significantly lower thermal expansion coefficients.

The glass component of the UniGlas disc is an exceptional material as well. The hybrid glass formula is equivalent to the material used in glass lined reactors. (1) high resistance to damage from both alkalis and acids; (2) resistance to steam wear and erosion; and, critically important, (3) a coefficient of thermal expansion compatible with that of the metal outer ring.

Combining these specific metal and glass materials allows UniGlas discs to expand as one component in response to even extreme temperature and pressure variables. This harmony under stress allows unprecedented sight window glass strength, structural soundness, and safety.

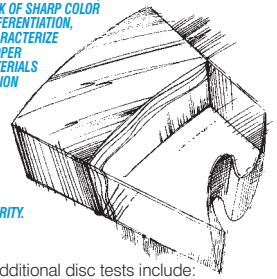
DURING UNIGLAS MANUFACTURE, THE GLASS FLOWS INTO A METAL RING. FURTHER PROCESSING MOVES BEYOND BONDING ACTION TO ACTUALLY ACHIEVE FUSION INTEGRATION. NO OTHER SIGHT WINDOW GLASS CAN COMPARE IN UNIT INTEGRITY.

Rigorous Testing Procedures Assure Product Uniformity Batch After Batch.

All UniGlas discs are manufactured under continuous control of highly experienced and expertly trained personnel. Discs are processed in batches, with each batch subjected to a program of carefully calculated tests.

As an example, each disc is visually tested for proper materials fusion. Viewed perpendicularly under polarized light, each glass surface must show several concentric lines at the edge (isochromatics) which are highly serrated near the ring.

EDGE ISOCHROMATICS, PLUS INTERIOR LACK OF SHARP COLOR DIFFERENTIATION, CHARACTERIZE PROPER MATERIALS FUSION



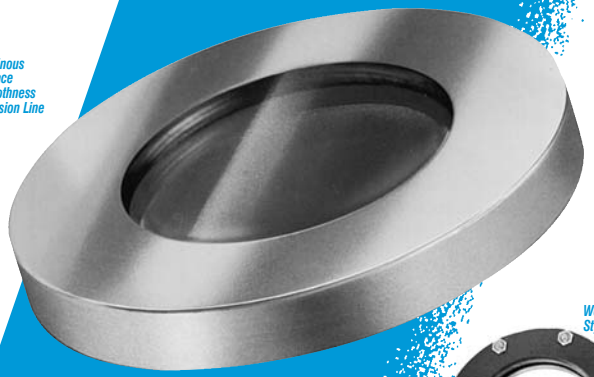
Additional disc tests include:

- Underwater "dip bubble" fusion tightness, at 100 psi (6.9 bar).
- Pressure tolerance, at 5 times admissible operating pressure.
- Quenching resistance, with a preheated disc (600°F/315°C) subjected to a one-minute wash with water (68°F/20°C).
- Dimensional variation, including diameter, thickness, flatness, parallelism and roughness.

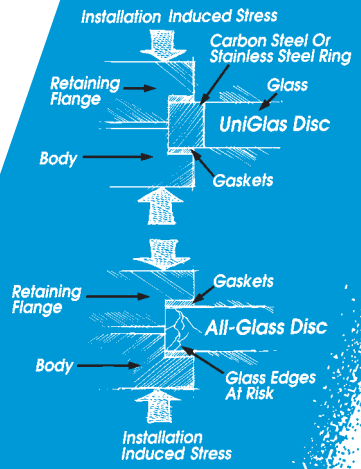
Tightness, pressure and dimensional tests are performed on randomly selected samples from every processed batch, the number of samples being determined by the size of the batch. Quench tests are performed at random. All tests performed are documented and documents are available for customer inspection.

FINISH LAPPING WITH CERIUM OXIDE PRODUCES A DISC WITH SMOOTH, UNINTERRUPTED SURFACES. THERE ARE NO OPPORTUNITIES FOR EDGE KNICKS OR FOREIGN-MATTER BUILDUP.

Continous Surface Smoothness At Fusion Line



MECHANICAL STRESSES THAT OCCUR DURING INSTALLATION OF UNIGLAS DISCS ARE LARGELY ABSORBED BY THE DISC'S METAL RING, THEREBY PRESERVING DISC FLATNESS AND INTEGRITY. WITH ORDINARY ALL-GLASS DISCS, PRESSURE FROM TIGHTENING BOLTS ON RETAIING FLANGES IMPACTS DIRECTLY ON GLASS EDGES, INVITING CHIPPING OR DEFORMITY



Weld Pad Style

Threaded Style

Rotary Threaded Style

Flanged Plain Style

90° Drip Tube Style

TRU-SAN™ 6000 Sanitary Style With UNI-SAN™ 6500 Windows (Patent #5,297,429)

You May Have UniGlas® Most Any Way You Want It. In New Jacoby-Tarbox Equipment Or As Retrofits.

Applications for UniGlas sight windows are the same as those for any sight window. They can provide higher standards of safety and strength for viewing inside tanks, vessels, pipes and other chambers, under gas-tight and liquid-tight conditions, in all major manufacturing and processing industries. Performance characteristics vary, depending on the specific sight window style and whether the UniGlas disc ring is constructed of stainless steel or carbon steel. UniGlas sight windows are available as large as 12" in diameter.

UniGlas Sight Windows Individual units, in a variety of sizes and styles, are available for direct connection to vessels or other chambers. These UniGlas sight windows consist of four pieces: (1) the UniGlas disc; (2) the installation flange; (3) a sealing gasket; and (4) a cushion gasket. On-site installations are simple, quick, and require no adjustments.

Weld Neck Style

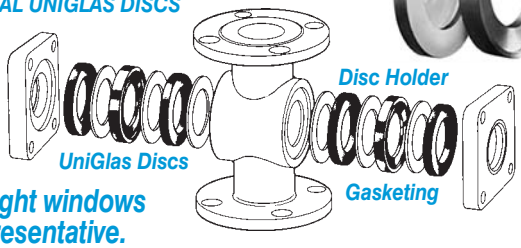
Jacoby-Tarbox Sight Flow Indicators With UniGlas Discs
A wide selection of Jacoby-Tarbox sight flow indicators is available with UniGlas discs. Styles include plain, rotary, flapper, drip and ball types for service in a wide range of pressures and temperatures. Threaded, flanged, 90°, jacketed, lined and special-purpose indicators are included.

Dual UniGlas Discs For extraordinary applications involving toxic or otherwise dangerous materials, UniGlas discs can be installed back-to-back, doubling already increased safety and strength factors. Dual UniGlas is available for both retrofit and new applications. Wherever installed, either as a sight window or in sight flow indicators, Dual UniGlas provides a "back-up" disc to maintain pressure in the event of system malfunctions.

NOTE: Standard models of most Jacoby-Tarbox sight windows and sight flow indicators are fitted with an all-glass (borosilicate) window which is held in place by separate metal flanges. These standard products are readily available with UniGlas discs. Also, UniGlas discs can easily be retrofitted to Jacoby-Tarbox and other brand products now in service.

DUAL UNIGLAS DISC COMPONENTS

SIGHT FLOW INDICATOR SHOWING DUAL UNIGLAS DISCS



Product literature describing Jacoby-Tarbox sight flow indicators and sight windows featuring UniGlas discs is available from your local Jacoby-Tarbox representative.

TECHNICAL DATA & PERFORMANCE CHARACTERISTICS

UniGlas Discs • Sight Windows • Sight Flow Indicators

THE UNIGLAS DISC

Definition

Pressure resistant circular glass-to-metal sealed sight glass serving temperatures from -435°F (-258°C) to 600°F (315°C).

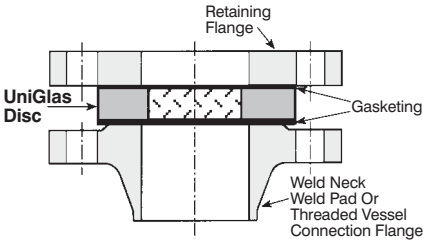
Disc Materials Specification*

Carbon Steel Ring:
- ASTM A516 GR. 70
- ASTM A108

Stainless Steel Ring:
- ASTM A240
- ASTM A182
- ASTM A479

Hastelloy C,C22,C276 Ring:
- ASTM B574
- ASTM B575

JACOBY-TARBOX SIGHT WINDOW SHOWING UNIGLAS "FULL FACE" DISC HELD IN POSITION BY SEPARATE RETAINING FLANGE



Maximum Disc Pressure Range

The high pressure and high vacuum capabilities of UniGlas allow applications not previously possible with conventional glass, either annealed or tempered. Standard UniGlas applications serve pressures up to ANSI Class 600. Special discs are available to serve pressures to 10,000 PSI (690 bar) depending on dimensions and temperature. Vacuum tightness of glass-to-metal fusion: $<10^{-8}$ Torr. 1 Sec.

Maximum Disc Dimensions

Outside Diameter Of Metal - 12.0 inches (305 mm)
Outside Diameter Of Glass - 9.0 inches (241 mm)
Thickness Of Glass - 1.2 inches (30 mm)

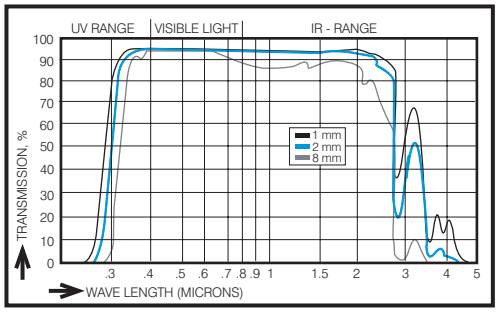
Glass Chemical Resistance

Acids-DIN 12116 C1
Bases-DIN 52322 C2
Water-DIN ISO 719: HGB 1

Glass Light Transmission

UniGlas transmits light free of distortion and with virtually total trueness allowing, for example, use of laser sensor measuring with absolute accuracy.

UNIGLAS LIGHT TRANSMISSION FOR 1, 2, AND 8MM GLASS THICKNESSES



UNIGLAS APPLICATIONS

UniGlas Sight Windows and UniGlas Sight Flow Indicators enjoy widespread application throughout major industries: chemical, pharmaceutical, food & beverage, nuclear, biological, mining, electrical and general manufacturing/fabricating. Windows and Indicators are installed in conjunction with tanks, vessels, autoclaves, pipelines, vacuum components, compressors, pumps, filters and other related equipment. Jacoby-Tarbox UniGlas products are manufactured for both new and retrofit installations.

INSTALLATION & MAINTENANCE

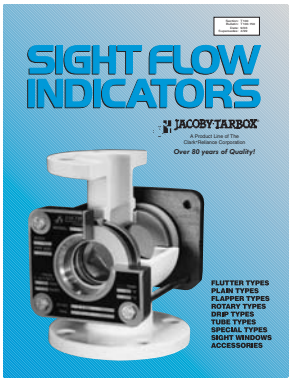
•UniGlas, due to its outer metal ring, helps preclude accidents caused by improper installation.

•UniGlas products removed from service, or for system maintenance, may be reinstalled when found to be free from visible damage.

•Complete installation guidelines are supplied. As for any products containing glass, Jacoby-Tarbox suggests: (1) careful handling and compliance with all installation instructions; (2) inspection of all fittings, parts, glasses and gaskets for cleanliness; (3) complete attention to mounting bolt instructions to assure proper torque and uniform tightening; and (4) installation by only qualified personnel. UniGlas installation requires no special tools or procedures.

UNIGLAS PRODUCT INFORMATION

The complete range of UniGlas products now inventoried by Jacoby-Tarbox is reviewed in our current condensed catalog. For your copy, contact your local Jacoby-Tarbox representative.



*Consistent with our ISO-9000 policy of continuous product improvement, specifications are subject to change without previous written notification.

JACOBY·TARBOX®
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ISO 9001 REGISTERED Clark•Reliance

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DRAWN: TFK	CHECKED: DEP			
SCALE: NONE	DATE: 9-15-95			
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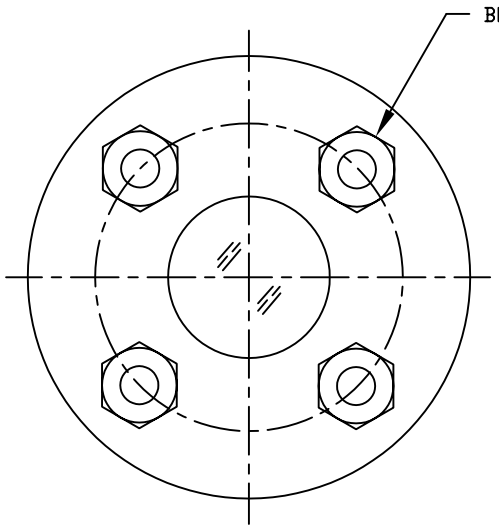


PARTS LIST

PIECE NO.	NAME OF PART	QUAN.	MATERIAL	COMMENTS
1	RETAINER	1	STEEL	
2	UNIGLAS	1	SEE BELOW	
3	SEAL GASKET	1		
4	CUSHION GASKET	1	FIBER	

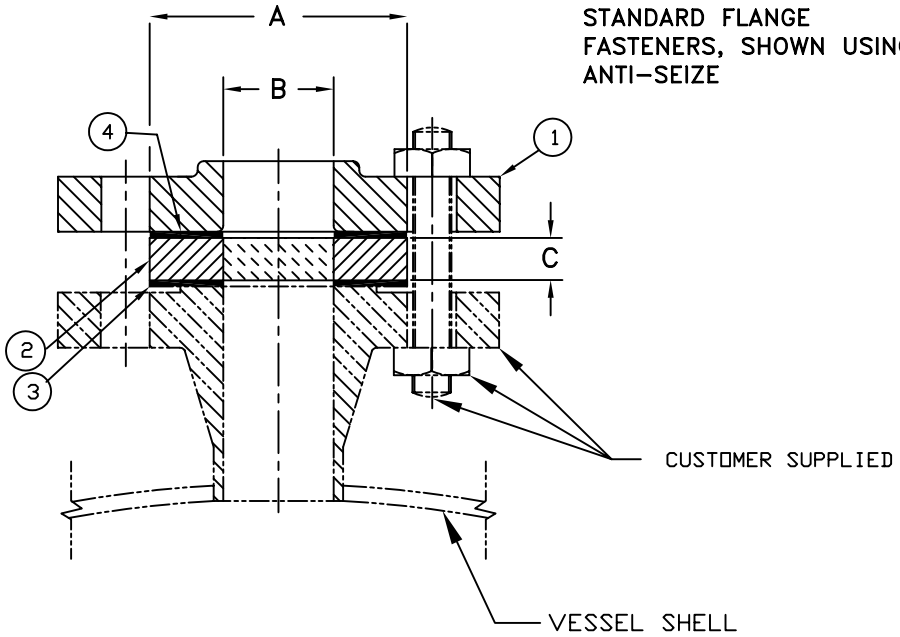
STANDARD DESIGN MATERIALS:

UNIGLAS RING:
- ALLOY STEEL ☐
- HASTELLOY C ☐

RETAINER: ASTM A-105 (STEEL)
FASTENERS: CUSTOMER SUPPLIED
STUDDING OUTLET/NOZZLE BODY:
CUSTOMER SUPPLIED
304/316 SS RETAINER AVAILABLE

ASME CLASS PRESSURE/TEMP RATINGS

TEMP F	150 CLASS		300 CLASS		600 CLASS	
	STEEL	HAST-C	STEEL	HAST-C	STEEL	HAST-C
-20 TO 100	285	290	740	750	1480	1500
150	270	275	705	750	1415	1500
200	260	260	675	750	1350	1500
250	245	245	665	740	1335	1475
300	230	230	655	730	1315	1455
350	215	215	645	717	1290	1430
400	200	200	635	705	1270	1410
450	185	185	615	685	1235	1370
500	170	170	600	665	1200	1330



*TORQUE VALUES FOR STANDARD FLANGE FASTENERS, SHOWN USING ANTI-SEIZE

SIZE	CLASS	TORQUE*	A (IN)	A (mm)	B (IN)	B (mm)	C (IN)	C (mm)
1	150	10	2.00	50.8	1.12	28.6	.38	9.5
	300	15	2.00	50.8	1.12	28.6	.38	9.5
	600	15	2.00	50.8	1.12	28.6	.75	19.0
1-1/2	150	15	3.00	76.2	1.50	38.1	.75	19.0
	300	30	3.00	76.2	1.50	38.1	.75	19.0
	600	35	3.00	76.2	1.50	38.1	.75	19.0
2	150	20	3.62	91.9	2.12	53.8	.75	19.0
	300	15	3.62	91.9	2.12	53.8	.75	19.0
	600	15	3.62	91.9	2.12	53.8	.90	22.9
2-1/2	150	40	4.50	114	2.50	63.5	.75	19.0
	300	25	4.50	114	2.50	63.5	.75	19.0
	600	35	4.50	114	2.50	63.5	.90	22.9
3	150	50	5.00	127	3.00	76.2	.75	19.0
	300	40	5.00	127	3.00	76.2	.90	22.9
	600	50	5.00	127	3.00	76.2	1.18	30.0
4	150	35	6.00	152	4.00	102	.75	19.0
	300	55	6.00	152	4.00	102	.90	22.9
	600	85	6.00	152	4.00	102	1.18	30.0
6	150	65	8.38	213	5.75	146	.75	19.0
	300	60	8.38	213	5.75	146	.90	22.9
	600	120	8.38	213	4.00	102	1.18	30.0
8	150	120	10.50	267	7.50	190	.90	22.9
	300	120	10.50	267	6.00	152	1.40	35.6
	600	TBA						
10	150	100	12.00	305	6.00	152	.90	22.9
	300	125	12.00	305	6.00	152	1.40	35.6
	600	TBA						