

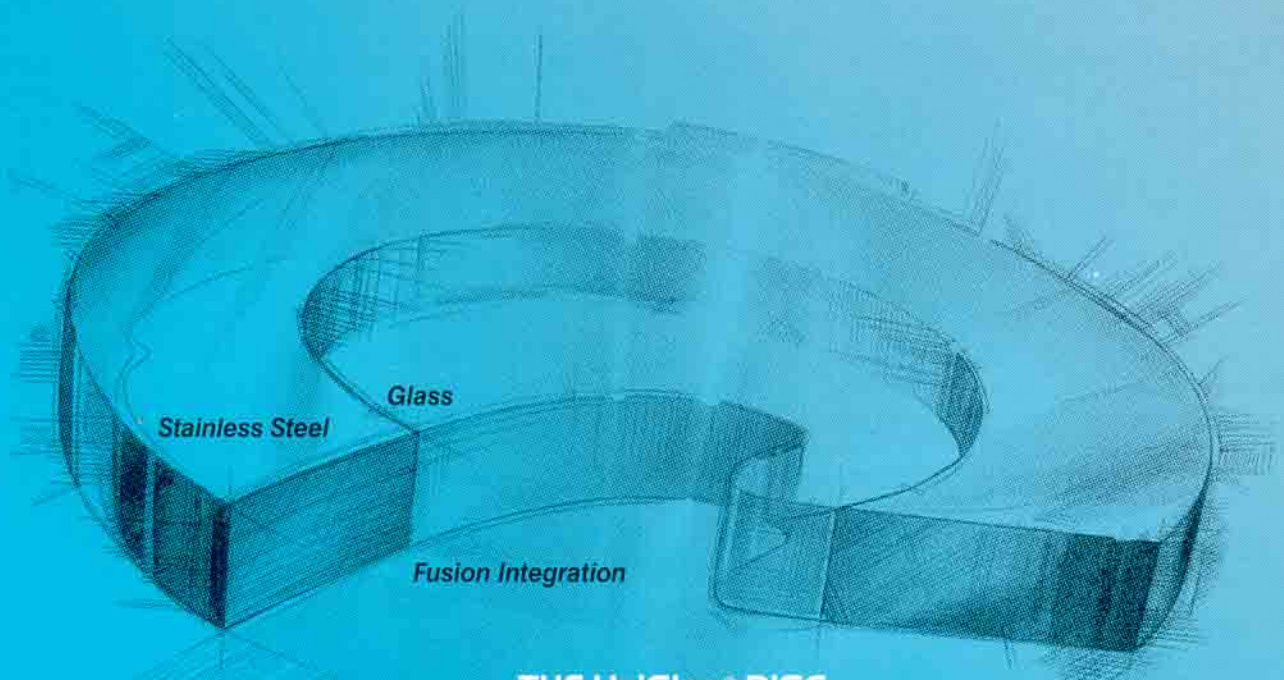
# PHENOMENAL UniGlas®

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



A Division Of The  
Clark • Reliance Corporation

**Over 80 years of Quality!**



## **THE UniGlas® DISC**

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



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

**F**rom 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 tell-tale flow characteristics of gases, liquids and solids.

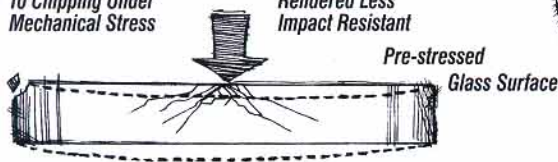
Unfortunately, these windows have forever been lacking in one functional way or another. The glass scratches or chips too much. Designs using glass layers are too thick, bulky. Packings and adjusting screws and shims add to parts inventories. Steel and glass expand differently at elevated temperatures, 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.**

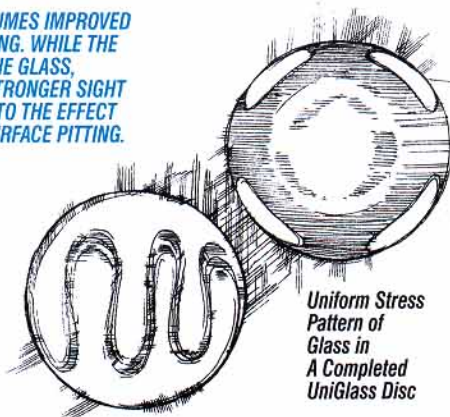
**Negative: More Prone To Chipping Under Mechanical Stress**

**Negative: Surface Rendered Less Impact Resistant**



**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.**

**Random Stress Pattern in Unprocessed Borosilicate Glass**



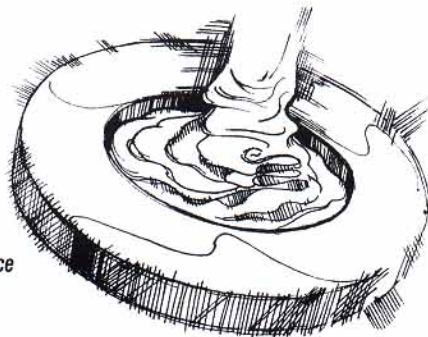
## UniGlas®. It's Still Metal And Glass. But That's Where Similarities End.

**T**he 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.**

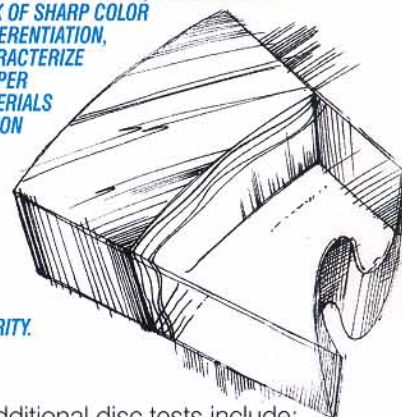


## Rigorous Testing Procedures Assure Product Uniformity Batch After Batch.

**A**ll 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.

Retaining Flange

Body



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

Continuous  
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 RETAINING  
FLANGES IMPACTS DIRECTLY ON GLASS  
EDGES, INVITING CHIPPING OR DEFORMITY

Installation Induced Stress



Installation  
Induced Stress

Weld Pad  
Style



Threaded  
Style



Rotary  
Threaded Style

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.



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.



**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.

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

#### DUAL UNIGLAS DISC COMPONENTS

#### SIGHT FLOW INDICATOR SHOWING DUAL UNIGLAS DISCS



## 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

##### 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.

vacuum components, compressors, pumps, filters and other related equipment. Jacoby-Tarbox UniGlas products are manufactured for both new and retrofit installations.

#### INSTALLATION & MAINTENANCE

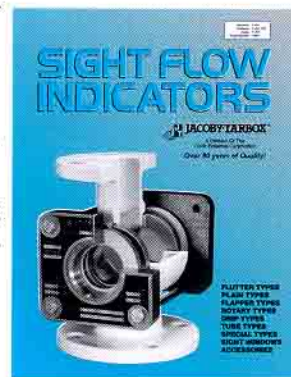
• UniGlas, due to its outer metal ring, helps preclude accidents caused by improper installation.

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

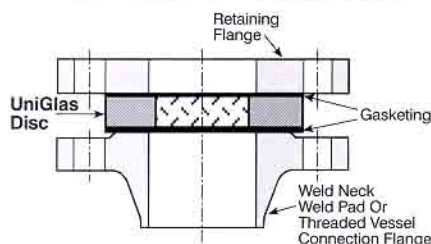
• Complete installation guidelines are supplied. As for any products containing glass, Jacoby-Tarbox suggests: (1) careful handling and compliance with all installation instructions; (2) inspection of all fittings, parts, glasses and gaskets for cleanliness; (3) complete attention to mounting bolt instructions 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.



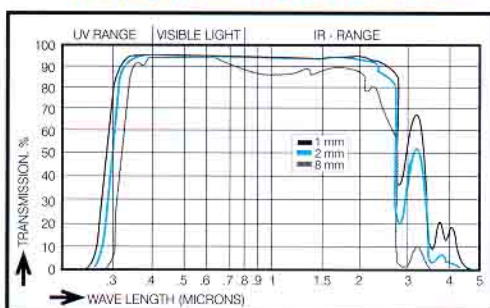
#### JACOBY-TARBOX SIGHT WINDOW SHOWING UNIGLAS "FULL FACE" DISC HELD IN POSITION BY SEPARATE RETAINING FLANGE



##### 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 ASME 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<sup>-6</sup> Torr. 1 Sec.

#### 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,

\*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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