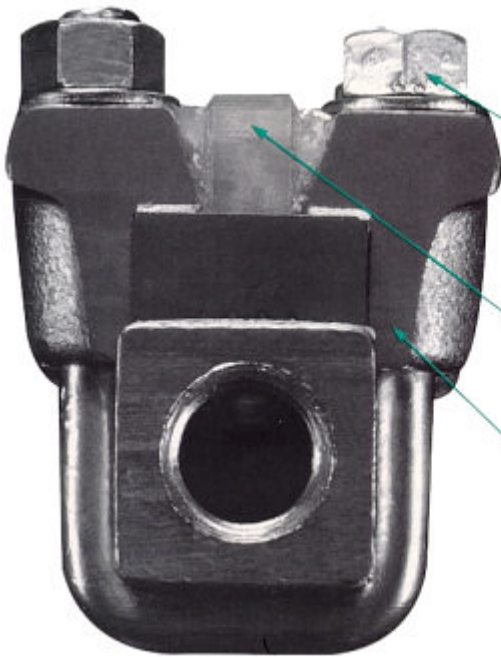


Offshore Gage Glasses



Three Protective Coatings

First, and prior to assembly, all metal parts are coated with a layer of sacrificial inorganic zinc. Then, after assembly, they are sprayed with an epoxy tie coat and urethane finish.

Stainless Steel Hardware

Nuts, bolts and washers are stainless steel to assure that they will never rust and that nuts can be periodically retorqued, as required. Washers, in turn, prevent the protective coatings on the cover from being scraped off.

Tough Acrylic Panel

Attached with a durable silicone sealant, this strong clear acrylic panel fully protects the glass front from flying sand and debris.

Deep Well Cover

Gage cover extends the full depth of the glass and protects it laterally from sandblasting and other abrasives from nearby installation and maintenance operations.

After experiencing a problem on one of their offshore rigs, a major oil company requested that Penberthy initiate a research program to develop better corrosion protection for offshore gage glass. To assess the relative strengths and weaknesses of various coatings and materials commonly used as "offshore protection," we subjected a number of our own gages as well as competitive models to an accelerated corrosion/weathering test (ASTM B117). While the tests were performed in a controlled laboratory environment, the exposure to over 2500 hours of heat and salt spray provided a corrosive environment that was judged to be comparable to two years of actual offshore use.

As a result of these tests, Penberthy has developed a unique three-part coating, applied to the components before the gage is assembled, to provide unprecedented gage protection in offshore application.

The Penberthy gage also includes a variety of unique design features to further extend gage life.

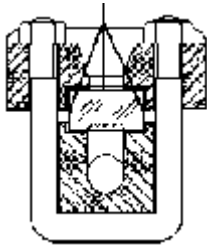
Competitive comparison shows the need for concern in selecting a gage with "offshore" design

As important as coatings are in making a gage corrosion-resistant, their value can be rendered useless if the glass is left vulnerable to other types of damage. The total protection of gage glass is critical in complementing the effectiveness of offshore coatings.

The Penberthy offshore gage design is unique in its ability to completely isolate the gage glass from abrasive forces. This complete protection is important because even seemingly minor abrasions can cause the tempered gage glass to lose most of its pressure containing ability.

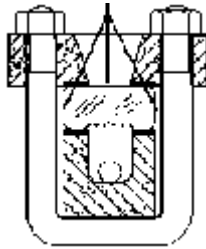
The following diagrams illustrate the relative vulnerability of the glass on competitive models.

Exposed Glass



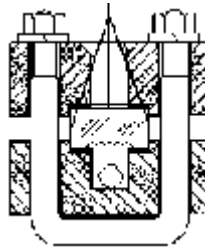
Other U.S. Manufacturer

Exposed Glass



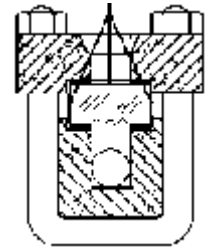
European Manufacturer

Exposed Glass



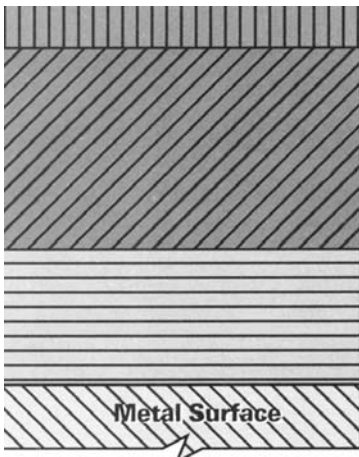
Japanese
Manufacturer

Exposed Glass



Latin American
Manufacturer

Durable coatings complement the effectiveness of inorganic zinc



Polyurethane To-Coat (2 to 3 mil) Its glossy tile-like finish dramatically upgrades the weather resistance of the layered coatings. Provides excellent added protection from chemicals and abrasion as well. Epoxy Tie-Coat (4 to 8 mil) Epoxy polyamide complements the zinc primer by providing added abrasion resistance and protection from weathering. Also provides an effective base for the topcoat. Inorganic Zinc Primer (2.5 to 3 mil). This self-curing coating produces a tight bond to prepare surfaces and protects steel galvanically. Meets performance requirements of ANSI N 101.2-1972 and N 5.12-1974.