TESTING TYPE 1279 SOLID FRONT GAUGE

The results of the following tests conducted on the subject gauge demonstrate safety features of this case and should prove useful in your discussions with customers:

WEATHERPROOF (DRY) GAUGE

1. **Pressure Leak Test**

   The tube is cut off at the socket and the pressure increased slowly to simulate a slow tube leak

   Result: Back relieved at approximately 0.5 psi. Case and window did not fail.

2. **Tube Rupture Test**

   15 psi bronze tube system subjected to pressure increase until tube ruptured at approximately 2000 psi.

   Result: Back relieved properly. Case and window did not fail.

LIQUID FILLED GAUGE

1. **Frangible Disc Test (Navy MIL-I-18997)**

   Tube of gauge is cut off at socket. Gauge is connected by a short length of pipe to a receiver tank having a volume 10 times the volume of the gauge case. Located in the pipe between the gauge and the receiver is a frangible disc designed to rupture at 1500 psi. Rupture of the disc simulates a sudden tube failure.

   Result:
   - Rear cover (metal) opened 160 degrees
   - Diaphragm (Buna N) relieved properly
   - Case or window did not fail

2. **“Shell Oil” Test**

   Test #1
   Similar to the Frangible Disc Test except a quick-opening valve is substituted for the rupture disc and the pressure is 2000 psi.

   Result:
   - Rear cover and diaphragm relieved properly
   - Case or window did not fail

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Test #2
Case pressure was increased slowly.

Result: Back relieved at approximately 10 psi. Case or window did not fail.

Test #3
A steel plate replaced the Buna N diaphragm and the pressure was increased slowly.

Result: Acrylic window relieved at 30 psi and "popped out" at 49 psi.

Shell's requirement was that the window "fail" pressure (measured by Test #3) must be at least 1.5 times the back relief pressure (Test #2).

3. Wall Mounted Test

A sealed case gauge was surface (or wall) mounted and subjected to a slow pressure leak test. Such a mounting limits the distance the back can move in an outward direction.

Result:
- Back relieved at approximately 15 psi
- Case and window did not fail

4. Temperature Leak Test

Gauge subjected to 250°F for a 4 week period. No leakage.

Same type of test except temperature reduced to –50°F. Again, no leakage.

WINDOW BURST PRESSURES

Windows of different materials were tested to determine their approximate "fail" pressure.

Result:	Material	Approximate "Fail" Pressure (psi)
	Acrylic	55
	Standard Glass	38
	Laminated Safety Glass	22 (large hole) 14 (cracked)

Note that the window that withstood the most pressure was acrylic, which is what we use as standard in the sealed case designs (liquid filled and hermetically sealed).

An excellent way to put the pressure on competition is to review these tests with your customer and suggest that he also obtain test results on the competitive gauge.

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