Two Ply Testable Bellows

The bellows, as the most critical part of the Expansion Joint, can be single ply, multiply, redundant ply or reinforced.

In two ply testable bellows each ply is designed for the full operating conditions (pressure, temperature and movements). If a hole or stress crack develops in the inner ply during service, the outer ply takes over without exposing operators to increased risk or creating the need for an unscheduled shutdown.

In monitored ply bellows the annular space between plies can be monitored for leakage to detect a ply failure. This will serve as a warning of an imminent problem. A pressure device in the outer ply alerts about the inner ply failure. The two ply testable bellows also allows inspectors to pressure test the inner and outer ply during shutdowns.

2 ply testable bellows system improves reliability, in most of cases provide early warning about bellows failure and makes the expansion joint more maintenance friendly.

Refineries generally use two-ply testable bellows especially in critical process equipment such as the FCC unit.

Monitoring devices

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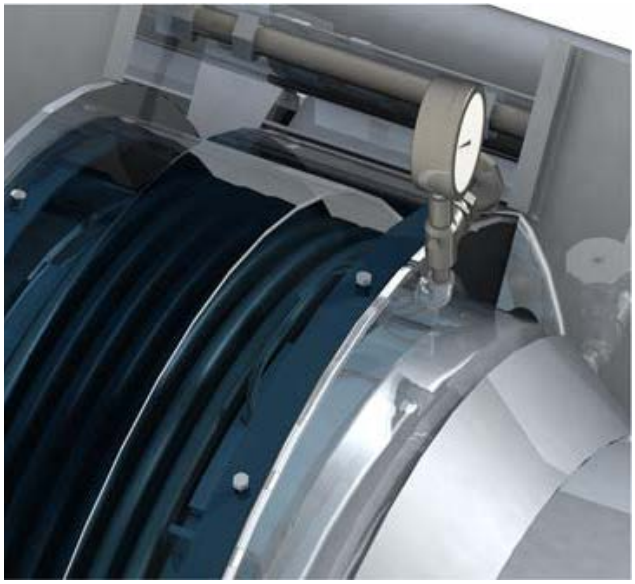
Passive monitor: when the inner ply fails, the monitor is activated by the pressure between the plies. Active monitor: the active monitor can detect inner and outer ply failures. A vacuum is created between the inner and outer ply before installing the monitoring device. If the inner ply fails, the pressure between the plies will activate the monitoring device and if the outer ply fails the vacuum will be lost and the monitoring device will be activated.



Monitoring system detail with pressure gauge

Main benefits

- Early warning leak detection.
- Two ply allow for 100% redundancy.
- The Expansion Joint will be working while a replacement can be arranged.

More information available at www.macoga.com

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