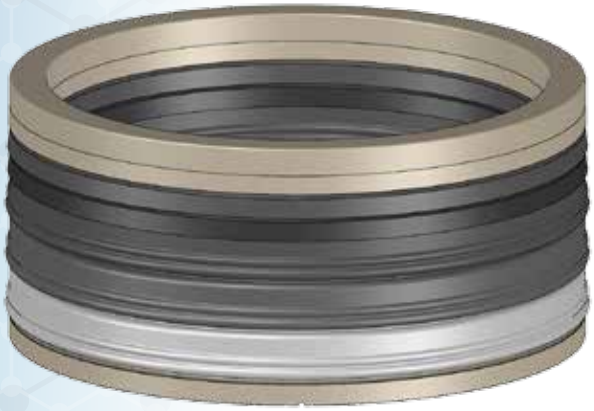
API 15000 6A PR2 Trunnion Ball Valve

Case studies

EGC Seal Design

S18404: Stem Seals



Valve Overview

Valve Type	Quarter Turn Trunnion Ball Valve
Stem diameter	125 mm (4.921 in)
Housing Diameter	145 mm (5.709 in)
Design Pressure	1034 bar (15000 psi)
Test Pressure	1551 bar (22500 psi)
Max. Test Temperature	200°C (392°F)
Min. Test Temperature	24°C (75°F)

Testing Details and Results

Hydrostatic Pressure Test

- Media: Water
- Temperature: 75°F
- Test Details: Pressurize the test fixture to 22,500 psig and dwell for 1 hour.
- Results: PASSED. No change in pressure observed.

Ambient Temperature Static Test

- Media: N2
- Temperature: 75°F
- Test Details: Pressurize the fixture to 22,500 psig and dwell for 1 hour.
- Results: PASSED. No nitrogen bubbles observed during test.

Ambient Temperature Cycle Test

- Media: N2
- Temperature: 75°F
- Number of cycles:160
- Test Details: Pressurize the test fixture to 22,500 psig. Turn the valve stem one quarter turn clockwise and then back. Bleed pressure to 0 psig and dwell 5 minutes. Repeat for 160 cycles.
- Results: PASSED. No nitrogen bubbles observed during test.

High Temperature Static Test

- Media: N2
- Temperature: 400°F
- Test Details: Heat the test fixture to 400°F. Pressurize the test fixture to 22,500 psig and dwell for1 hour.
- Results: PASSED. No nitrogen bubbles observed during test.

High Pressure/High Temperature Test

- Media: N2
- Temperature: 400°F
- Number of cycles: 20
- Test Details: Heat the test fixture to 400°F. Pressurize the test fixture to 22,500 psig. Turn the valve stem one quarter turn clockwise and then back.
- Bleed pressure to 0 psig and dwell 5 minutes. Repeat for 20 cycles.
- Results: PASSED. No nitrogen bubbles observed during test.

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ISO 15848 Fugitive Emissions Trunnion Ball Valve

Case studies

EGC Seal Design

S19314: Stem Seals, installed on 60mm stem

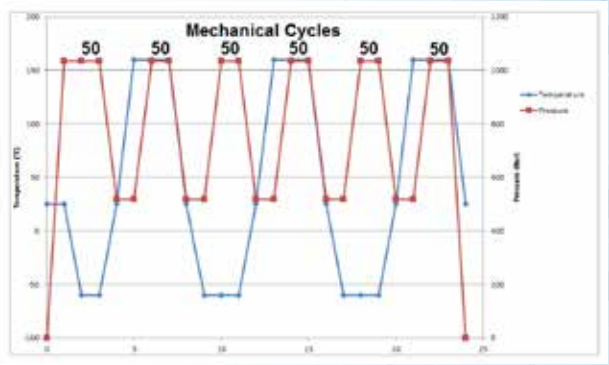
Valve Overview

Valve Type	Quarter Turn Trunnion Ball Valve
Stem diameter	60 mm (2.362 in)
Housing Diameter	72 mm (2.835 in)
Design Pressure	1034 bar (15000 psi)
Test Pressure	1034 bar (15000 psi)
Max. Test Temperature	-60°C (-76°F)
Min. Test Temperature	160°C (320°F)

Testing Details

- Custom Test measured to ISO 15848-1:2015 tightness
- Endurance class: Custom C01 (300 mechanical cycles, 6 thermal cycles)
- Tightness: AH for 60mm Stem (1.6E-6 Atm*cc/s)
- Test Media: Helium, 97% purity
- Sampling Method: Vacuum
- Temperature: -60°C to 160°C

Testing Profile



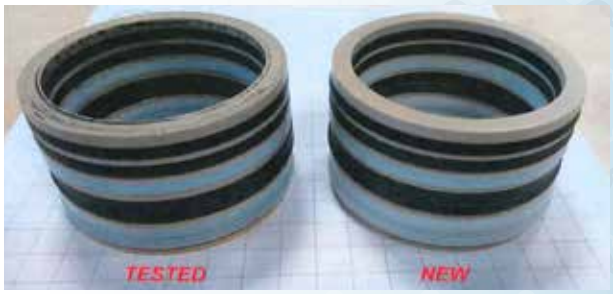
Test Results: PASSED

All 300 mechanical cycles and 6 thermocycles were preformed as planned.

The seal design passed testing by maintaining well below the acceptable leakage rate of 1.6E-6 Atm*cc/s as defined by ISO 15848 AH tightness for a 60mm stem.

The maximum measured leak rate during the test was 6.5E-8 Atm*cc/s.

Since 97% helium was used in the test, the leakage scaled to account for impurities was calculated to be 6.5E-7 Atm*cc/s which is 2 ½ times tighter sealing than was required by the specification.



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In-depth Solutions

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