



Product Test Report

PTR-5024

Swagelok Company
29495 F.A. Lennon Drive
Solon, Ohio 44139 U.S.A.

Ver 02
November 2024
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TITLE

Low Temperature Thermal Cycle and Seal & Survive Tests of Swagelok® 8GB and 16GB Series General Service Ball Valves

PRODUCT TESTED

- (6) SS-8GBF8-SG
- (6) SS-A8GBF8-SG
- (6) SS-16GBS12-SG
- (6) SS-A16GBF16-SG

PURPOSE

This test was performed to observe the effects on seat and shell seal performance of the GB series ball valve over five thermal cycles from -40°F to 70°F (-40°C to 20°C). Additionally, a “seal and survive” test (Test Method – Part B) was performed on the valves over three additional thermal cycles from -58°F to 70°F (-50°C to 20°C).

TEST CONDITIONS

Original report date: January 2021

Test pressure: 80 psig (5.5 bar) nitrogen
6000 psig (413 bar) nitrogen

Test temperature: -40°F to 70°F (-40°C to 20°C)
 -58°F to 70°F (-50°C to 20°C) for seal and survive

Seat leak threshold: 3.0 std cm^3/min or 3 consecutive readings over 0.33 std cm^3/min

Seat leak test duration: 1 minute

Shell leak threshold: pressure loss does not exceed 1000 psig

Shell leak test duration: 5 minutes

TEST METHOD – Part A

1. All test valves were assembled according to standard Swagelok specifications.
2. The test valves were placed into an environmental chamber with the inlet connected to pressure and the outlet to atmosphere.
3. Test valves were pressurized to 6000 psig (413 bar) at ambient temperature of 70°F (20°C).
4. Valves were individually opened and closed one time, ending in the closed position.
5. The environmental chamber was cooled to -40°F (-40°C). The test valves were then allowed to come to the test temperature.
6. Seat and shell testing were performed at -40°F (-40°C). A stem packing adjust was permitted if shell leakage was detected.
7. The environmental chamber was brought to ambient temperature of 70°F (20°C). The test valves were then allowed to come to the test temperature.
8. Seat and shell testing were performed at ambient temperature of 70°F (20°C). A stem packing adjustment was permitted if shell leakage was detected.
9. Steps 1 through 8 completed one thermal cycle. The same steps were repeated for a total of five thermal cycles.



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TEST METHOD – Part B (Seal and Survive)

1. After the five thermal cycles, test valves were pressurized to 6000 psig (413 bar) at ambient temperature of 70°F (20°C).
2. The environmental chamber temperature was lowered to –58°F (–50°C). The test valves were then allowed to come to the test temperature.
3. Seat and shell testing were performed at –58°F (–50°C).
4. The environmental chamber was brought to ambient temperature of 70°F (20°C). The test valves were then allowed to come to the test temperature.
5. Seat and shell testing were performed at ambient temperature of 70°F (20°C).
6. Steps 1 through 5 completed one seal and survive cycle. The same steps were repeated for a total of three seal and survive thermal cycles. Note, the test sample is not cycled under pressure during Part B.

TEST RESULTS

At each test point, all valves performed successfully within the stated test conditions.

Note: SS-8GBF8-SG and SS-16GBS12-SG valves did not require any packing adjustments throughout the test procedure.

This test was performed to consider a specific set of conditions and should not be considered valid outside those conditions. Swagelok Company makes no representation or warranties regarding these selected conditions or the results attained. Laboratory tests cannot duplicate the variety of actual operating conditions. Test results are not offered as statistically significant. See the product catalog for technical data.

SAFE PRODUCT SELECTION

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

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