# Product Test Report

**PTR-5015**

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## TITLE

Positive Pressure Nitrogen Gas Leak Test with Repeated Reassembly of Alloy 2507 Swagelok® Medium-Pressure Tube Fittings Assembled with Alloy 2507 Seamless Tubing

## PRODUCT TESTED

The following alloy 2507 Swagelok medium-pressure tube fittings were tested with the identified alloy 2507 super duplex seamless tubing.

| Ordering Number | Quantity Tested | Tubing in. | Tubing Hardness |
|---|---|---|---|
| 2507-4FK0-1-4HP-SG2 | 12 | 1/4 × 0.035 | HRC 22 to 26 |
| 2507-4FK0-9-SG2 | 12 | | |
| 2507-4FK0-1-4HP-SG2 | 15 | 1/4 × 0.049 | |
| 2507-4FK0-9-SG2 | 15 | | |
| 2507-6FK0-1-4HP-SG2 | 12 | 3/8 × 0.049 | HRC 20 to 28 |
| 2507-6FK0-9-SG2 | 12 | | |
| 2507-6FK0-1-4HP-SG2 | 12 | 3/8 × 0.083 | |
| 2507-6FK0-9-SG2 | 12 | | |
| 2507-8FK0-1-4HP-SG2 | 12 | 1/2 × 0.065 | HRC 26 to 30 |
| 2507-8FK0-9-SG2 | 12 | | |
| 2507-8FK0-1-4HP-SG2 | 12 | 1/2 × 0.095 | |
| 2507-8FK0-9-SG2 | 12 | | |
| 2507-12FK0-1-4HP-SG2 | 12 | 3/4 × 0.095 | HRC 28 to 30 |
| 2507-12FK0-9-SG2 | 12 | | |
| 2507-12FK0-1-4HP-SG2 | 12 | 3/4 × 0.134 | |
| 2507-12FK0-9-SG2 | 12 | | |

## PURPOSE

These assemblies were tested under laboratory conditions to observe the gas seal reassembly performance of alloy 2507 Swagelok medium-pressure tube fittings when installed on alloy 2507 super duplex seamless tubing.

## TEST CONDITIONS

Original test report date: October 2019

Each sample tested consisted of one tube length and two test fittings. Each fitting was assembled according to the Swagelok medium-pressure tube fitting installation instructions. Testing was conducted at room temperature.

## TEST METHOD

1. The assemblies were attached to a positive gas test stand, submerged in water, pressurized to a minimum of 1.25 times working pressure with nitrogen for 10 minutes, and monitored for leakage. The judgment criterion was less than one bubble per minute at the applied pressure.
2. Pressure was dropped and the fittings were disassembled. The fittings were reassembled according to Swagelok reassembly instructions.
3. The fittings were leak tested using nitrogen at a minimum of 1.25 times the working pressure following the instructions and judgment criteria from step 1 at every fifth reassembly.
4. A total of 15 reassemblies were conducted on each test end.

## TEST RESULTS

| **Tubing** in. | **Samples Tested** | **Working Pressure** psig (bar) | **Working Pressure Basis** | **Test Pressure** psig (bar) | **Results** |
|---|---|---|---|---|---|
| 1/4 × 0.035 | 12 | 10 000 (689) | ASME B31.3 Base Code | 12 500 (861) | Pass |
| 1/4 × 0.049 | 15 | 22 500 (1550) | ASME B31.3 Chapter IX High Pressure Piping | 28 125 (1937) | Pass |
| 3/8 × 0.049 | 12 | 10 100 (695) | ASME B31.3 Base Code | 12 625 (869) | Pass |
| 3/8 × 0.083 | 12 | 22 500 (1550) | ASME B31.3 Chapter IX High Pressure Piping | 28 125 (1937) | Pass |
| 1/2 × 0.065 | 12 | 10 100 (695) | ASME B31.3 Base Code | 12 625 (869) | Pass |
| 1/2 × 0.095 | 12 | 22 500 (1550) | ASME B31.3 Chapter IX High Pressure Piping | 28 125 (1937) | Pass |
| 3/4 × 0.095 | 12 | 10 000 (689) | ASME B31.3 Base Code | 12 625 (869) | Pass |
| 3/4 × 0.134 | 12 | 20 000 (1378) | ASME B31.3 Chapter IX High Pressure Piping | 25 000 (1722) | Pass |

Note: Working pressures are based on the Swagelok catalog *Medium- and High-Pressure Fittings and Adapters–Alloy Materials,* MS-02-474

The alloy 2507 Swagelok medium-pressure tube fitting demonstrated both initial assembly gas seal and repeated gas seal through 15 reassemblies at a minimum of 1.25 times the working pressure under laboratory conditions.

**The tests were conducted beyond the product's recommended operating parameters and do not modify the published product ratings.**

These tests were 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.

## Referenced Document

ASME B31.3, *Process Piping*, ASME International, Three Park Avenue, New York, NY, 10016-5900 USA, www.asme.org