



## Product Test Report

Swagelok Company  
29500 Solon Road  
Solon, Ohio 44139 U.S.A.

**PTR-1275**  
Rev. -  
July 17, 2006  
Page 1 of 3

### TITLE

Evaluation of Swagelok® Medium-Pressure Tube Fittings With 316 Stainless Steel Tubing Typically Used With Cone and Thread Type Fittings

### PRODUCTS TESTED

Ordering Number	Quantity Tested	Tubing
SS-4FK0-1-4	3	Cone and thread type 316 stainless steel tubing
SS-4FK0-C	3	
SS-6FK0-1-4	3	Cone and thread type 316 stainless steel tubing
SS-6FK0-C	3	

### PURPOSE

The Swagelok medium-pressure tube fittings assembled to 316 stainless steel tubing typically used with cone and thread type fittings were tested to observe the gas pressure sealing and hydraulic burst pressure capability of the assemblies under laboratory conditions.

### TEST CONDITIONS

Each sample tested consisted of one tube length and two test fittings. The fittings were assembled according to the Swagelok medium-pressure tube fitting assembly instructions of one turn past finger-tight.

### TEST METHOD

#### O.D. and Wall Measurement

1. Three O.D. measurements were taken at 120° increments to obtain maximum and minimum readings.
2. Three wall thickness measurements were taken at 120° increments to obtain maximum and minimum readings.

#### Tubing Hardness Test

1. Hardness measured on each O.D. as skin hardness check.
2. Placed tubing samples on stand using 15N scale with N diamond.
3. Took five hardness measurements and used averages as actual readings.
4. Used Wilson Cylindrical Correction Chart #53 to add cylindrical conversion factors to actual 15N readings.
5. Used United Hardness Scale Conversions Chart to convert from 15-N to HRC readings.

#### Nitrogen Gas Bubble Leak Test

1. The test samples were attached to a gas test stand and submerged in water.
2. The samples were pressurized to the working pressure of the Swagelok medium-pressure fitting with nitrogen for 10 minutes and monitored for leakage.
3. The judgment criterion was no visually detectable leakage.



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**PTR-1275**  
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Page 2 of 3

### Hydraulic Pressure Test

1. Each sample was attached to a hydraulic test stand.
2. The pressure was recorded when tube slip, material rupture, leakage or pressure exceeding 4 times the working pressure was achieved whichever came first.
3. Results were compared to the Swagelok medium-pressure fitting working pressure.

### TEST RESULTS

#### O.D., Wall and Hardness Measurements

Minimum/Maximum O.D. in. (mm)	Minimum/Maximum Wall in. (mm)	Hardness HRC
0.246 / 0.247 (6.25 / 6.27)	0.068 / 0.069 (1.73 / 1.75)	26
0.366 / 0.367 (9.30 / 9.32)	0.083 / 0.084 (2.11 / 2.13)	25

#### Nitrogen Gas Bubble Leak Test and Hydraulic Burst Pressure Test

Test Samples	Samples Tested	Fitting Working Pressure psig (bar)	Leak Test Results	4 × Working Pressure psig (bar)	Samples Attaining 4 × Working Pressure
SS-4FK0-1-4	3	15 000 (1033)	Pass	60 000 (4134)	3/3
SS-4FK0-C					
SS-6FK0-1-4	3	15 000 (1033)	Pass	60 000 (4134)	3/3
SS-6FK0-C					

These tests do not simulate any specific application and are not a guarantee of performance in actual service. Swagelok Company makes no representation or warranties regarding these selected conditions or the results attained there from. Laboratory tests cannot duplicate the variety of actual operating conditions. Data presented is not offered as statistically significant test results. See the product catalog for technical data.

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

### 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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Rev. -  
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Page 3 of 3

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### Reference Documents

*Wilson Cylindrical Correction Chart # 53*, Wilson Instrument Division, 929 Connecticut Avenue, Bridgeport, CT 06602

*United Hardness Scale Conversions Chart*, United Testing Systems, 5171 Exchange Drive, Flint MI 48507

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