



## Product Test Report

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

**PTR-3221**  
Ver 04  
November 2018  
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### TITLE

Nitrogen Gas Test of 316 Stainless Steel Swagelok® Tube Fittings with Stainless Steel Thin-Wall Tubing

### PRODUCT TESTED

The following bar stock and forged body Swagelok tube fittings were tested.

### Fractional

Ordering Number	Part Form	Tubing Size	Tubing Hardness HRB
SS-400-1-4	Bar stock	1/4 × 0.028	80 to 84
SS-400-9	Forging		
SS-600-1-4	Bar stock	3/8 × 0.035	70 to 88
SS-600-9	Forging		
SS-810-1-4	Bar stock	1/2 × 0.049	72 to 83
SS-810-9	Forging		
SS-1010-1-4	Bar stock	5/8 × 0.065	77 to 83
SS-1010-9	Forging		
SS-1210-1-8	Bar stock	3/4 × 0.065	76 to 80
SS-1210-9	Forging		
SS-1410-6-8	Bar stock	7/8 × 0.083	74 to 78
SS-1410-2-8	Forging		
SS-1610-1-4	Bar stock	1 × 0.083	74 to 80
SS-1610-9	Forging		



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### Metric

Ordering Number	Form	Tubing Size mm	Tubing Hardness HRB
SS-6M0-1-4	Bar stock	6 × 0.8	75 to 92
SS-6M0-9	Forging		
SS-8M0-1-4	Bar stock	8 × 1.0	75 to 86
SS-8M0-9	Forging		
SS-10M0-1-4	Bar stock	10 × 1.0	78 to 84
SS-10M0-9	Forging		
SS-12M0-1-4	Bar stock	12 × 1.0	77 to 88
SS-12M0-9	Forging		
SS-14M0-1-8	Bar stock	14 × 1.2	74 to 85
SS-14M0-9	Forging		
SS-15M0-1-8	Bar stock	15 × 1.5	78 to 82
SS-15M0-9	Forging		
SS-16M0-1-8	Bar stock	16 × 1.5	76 to 88
SS-16M0-9	Forging		
SS-18M0-1-8	Bar stock	18 × 1.5	74 to 84
SS-18M0-9	Forging		
SS-20M0-1-8	Bar stock	20 × 1.8	76 to 82
SS-20M0-9	Forging		
SS-22M0-1-8	Bar stock	22 × 2.0	72 to 80
SS-22M0-9	Forging		
SS-25M0-1-8	Bar stock	25 × 2.2	74 to 80
SS-25M0-9	Forging		

### PURPOSE

These assemblies were tested to observe the leak-tight performance of stainless steel Swagelok tube fittings with thin-wall, stainless steel tubing during a gas seal test under laboratory conditions.

### TEST CONDITIONS

Original Test Date: September 2012

Each sample tested consisted of one tube length and two test fittings. The fitting was assembled according to the Swagelok tube fitting installation instructions.



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### TEST METHOD

The assemblies were attached to a positive pressure gas test stand, submerged in water, pressurized to working pressure with nitrogen gas for at least 10 minutes, and monitored for leakage.

### TEST RESULTS

The following data sets include production fittings tested from 2012 through 2015 year to date.

#### Fractional

Tube Size in.	Quantity Tested	Working Pressure psig (bar)	Number of Leak-Tight Samples After Standard Assembly (1 1/4 Turns) and Initial Test qty. (%)
1/4 × 0.028	192	4000 (275)	192 / 192 (100 %)
3/8 × 0.035	144	3300 (227)	144 / 144 (100 %)
1/2 × 0.049	132	3700 (254)	132 / 132 (100 %)
5/8 × 0.065	108	4000 (275)	108 / 108 (100 %)
3/4 × 0.065	120	3300 (227)	120 / 120 (100 %)
7/8 × 0.083	60	3600 (248)	59 / 60 (98.3 %)
1 × 0.083	144	3100 (213)	143 / 144 (99.3 %)
Total Samples	900	—	898 / 900 (99.7 %)

Note: Working pressure was based on the Swagelok Tubing Data sheet, MS-01-107.



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### Metric

Tube Size mm	Quantity Tested	Working Pressure bar (psig)	Number of Leak-Tight Samples After Standard Assembly (1 1/4 Turns) and Initial Test qty. (%)
6 × 0.8	144	310 (4499)	144 / 144 (100 %)
8 × 1.0	120	310 (4499)	120 / 120 (100 %)
10 × 1.0	120	240 (3483)	120 / 120 (100 %)
12 × 1.0	120	200 (2902)	120 / 120 (100 %)
14 × 1.2	72	200 (2902)	72 / 72 (100 %)
15 × 1.5	72	250 (3628)	72 / 72 (100 %)
16 × 1.5	108	230 (3338)	108 / 108 (100 %)
18 × 1.5	84	200 (2902)	84 / 84 (100 %)
20 × 1.8	60	230 (3338)	60 / 60 (100 %)
22 × 2.0	60	230 (3338)	60 / 60 (100 %)
25 × 2.2	60	230 (3338)	60 / 60 (97.2 %)
Total Samples	1020	—	1020 / 1020 (100 %)

Note: Working pressure was based on the Swagelok Tubing Data sheet, MS-01-107.

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 there from. 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.