Product Test Report

PTR-1210

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

TITLE

Hydrostatic Pressure Test of Stainless Steel Swagelok® Medium-Pressure Tube Fittings with Tubing Not Bottomed

PRODUCT TESTED

The following stainless steel Swagelok medium-pressure tube fittings were tested with the identified stainless steel tubing.

Ordering Number	Quantity Tested	Tubing	Tubing Hardness
Fractional			
SS-4FK0-1-4	4	1/4 × 0.095 in. annealed	Rb 80
SS-4FK0-C	4		
SS-4FK0-1-4	4	1/4 × 0.065 in. cold-drawn 1/8-hard	Rc 25
SS-4FK0-C	4		
SS-6FK0-1-4	4	3/8 × 0.134 in. annealed	Rb 84
SS-6FK0-C	4		
SS-6FK0-1-4	4	3/8 × 0.083 in. cold-drawn 1/8-hard	Rc 22
SS-6FK0-C	4		
SS-8FK0-1-4	4	1/2 × 0.188 in. annealed	Rb 89
SS-8FK0-C	4		
SS-8FK0-1-4	4	1/2 × 0.109 in. cold-drawn 1/8-hard	Rc 23
SS-8FK0-C	4		
SS-12FK0-1-44M	3	3/4 × 0.165 in. cold-drawn 1/8-hard	Rc 26
SS-12FK0-C	3		
Metric			
SS-6MFK0-1-4	3	6 × 2.2 mm annealed	Rb 85
SS-6MFK0-C	3		
SS-6MFK0-1-4	3	6 × 1.5 mm cold-drawn 1/8-hard	Rc 23
SS-6MFK0-C	3		
SS-10MFK0-1-44M	3	10 × 3.5 mm annealed	Rb 88
SS-10MFK0-C	3		
SS-10MFK0-1-44M	3	10 × 2.2 mm cold-drawn 1/8-hard	Rc 28
SS-10MFK0-C	3		
SS-12MFK0-1-44M	3	12 × 4.5 mm annealed	Rb 90
SS-12MFK0-C	3		
SS-12MFK0-1-44M	3	12 × 2.8 mm cold-drawn 1/8-hard	Rc 25
SS-12MFK0-C	3		

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PURPOSE

These assemblies were tested to observe the tube grip performance of stainless steel Swagelok medium-pressure tube fittings with heavy-wall annealed and cold-drawn 1/8-hard tubing with the tubing not bottomed on the shoulder of the fitting body.

TEST CONDITIONS

Original test date: April 2006

Each sample tested consisted of one tube length and two test fittings. Prior to tightening, the assemblies had the tubing withdrawn from the tube shoulder by 1/16 to 1/8 in. (1.5 to 3.2 mm). For 3/4 in. fittings tested, the assemblies had the tubing withdrawn from the piston bottom by 1/8 inch prior to the preswaging in **the Multihead Hydraulic Swaging Unit (MHSU),** The fitting nut was then tightened according to the Swagelok medium-pressure tube fitting installation instructions. Testing was conducted at room temperature.

Proper installation requires the tubing to rest firmly on the shoulder of the tube fitting body or properly bottomed in the Multihead Hydraulic Swaging Unit (MHSU), according to Swagelok medium-pressure tube fitting installation instructions.

TEST METHOD

The fittings were tested as follows:

1. Each sample was attached to a hydraulic test stand.
2. The tubing was restricted from burst by clamping blocks, thereby forcing a failure at the fitting-to-tubing engagement.
3. The pressure was recorded when tube slip, material rupture, or leakage that prevented applying higher pressure occurred, whichever came first.
4. Results were compared to the tubing working pressure.

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TEST RESULTS

Tubing	Samples Tested	Working Pressure (WP) psig (bar)	4 × Working Pressure psig (bar)	Samples Attaining 4 × WP Without Leakage or Tube Slip
Fractional				
1/4 × 0.095 in. annealed	4	15 000 (1034)	60 000 (4134)	4 / 4
1/4 × 0.065 in. cold-drawn 1/8-hard	4			4 / 4
3/8 × 0.134 in. annealed	4			4 / 4
3/8 × 0.083 in. cold-drawn 1/8-hard	4			4 / 4
1/2 × 0.188 in. annealed	4			4 / 4
1/2 × 0.109 in. cold-drawn 1/8-hard	4			4 / 4
3/4 × 0.165 in. cold-drawn 1/8-hard	3			3 / 3
Metric				
6 × 2.2 mm annealed	3	15 000 (1034)	60 000 (4134)	3 / 3
6 × 1.5 mm cold-drawn 1/8-hard	3			3 / 3
10 × 3.5 mm annealed	3			3 / 3
10 × 2.2 mm cold-drawn 1/8-hard	3			3 / 3
12 × 4.5 mm annealed	3			3 / 3
12 × 2.8 mm cold-drawn 1/8-hard	3			3 / 3

Proper installation requires the tubing to rest firmly on the shoulder of the tube fitting body or properly bottomed in the Multihead Hydraulic Swaging Unit (MHSU), according to Swagelok medium-pressure tube fitting installation instructions.

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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.

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