



Product Test Report

PTR-2852

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

Ver 04
November 2018
Page 1 of 3

TITLE

Hydrostatic Pressure Test of Super Austenitic 254 SMO[®] (6-moly) Stainless Steel Tubing with Stainless Steel Swagelok[®] Tube Fittings

PRODUCT TESTED

Samples Tested	254 SMO SS Tubing Size OD x Wall in.	Tubing Hardness HRB	Part Description Ordering Number	Form
28	1/4 x 0.065	94	Male Connector SS-400-1-4	Bar stock
			Union Elbow SS-400-9	Forging
			Plug SS-400-P	Bar stock
28	1/2 x 0.083	86	Male Connector SS-810-1-4	Bar stock
			Union Elbow SS-810-9	Forging
			Plug SS-810-P	Bar stock
24	3/4 x 0.095	90	Male Connector SS-1210-1-8	Bar stock
			Union Elbow SS-1210-9	Forging
			Plug SS-1210-P	Bar stock
24	1 x 0.120	86	Male Connector SS-1610-1-8	Bar stock
			Union Elbow SS-1610-9	Forging
			Plug SS-1610-P	Bar stock

PURPOSE

These assemblies were tested under laboratory conditions to observe the tube grip performance of stainless steel Swagelok tube fittings when installed on heavy-wall, 254 SMO stainless steel tubing with hydrostatic pressure.



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Page 2 of 3

TEST CONDITIONS

Original Test Date: October 2011

- Each sample tested consisted of one tube length and two test fittings. The fittings were assembled according to Swagelok tube fitting installation instructions.
- Testing was conducted at room temperature in a laboratory environment.

TEST METHOD

Hardness Measurements of Tubing:

1. Performed five measurements equally spaced apart on each tube OD with the United Hardness Tester using the 15-T scale with the 1/16-inch diameter ball penetrator.
2. Reported the average of the five measurements.
3. Added the tubing cylindrical values taken from the Wilson Chart #53 Cylindrical Conversion Table.
4. Used the ASTM E140 Table 6—Austenitic Stainless Steel hardness conversion chart to convert the 15-T readings to the HRB values.

Hydrostatic Pressure Test:

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. Pressure was gradually increased and the pressure was recorded when loss of tube grip, material rupture or leakage that prevented applying higher pressure occurred, whichever came first.
4. Results were compared to the tubing working pressure.

TEST RESULTS

Samples Tested	254 SMO SS Tubing Size OD x Wall in.	Working Pressure psig (bar)	4 x Working Pressure psig (bar)	Samples Attaining 4 x W.P.
28	1/4 x 0.065	10 200 (702)	40 800 (2811)	28 / 28
28	1/2 x 0.083	6700 (461)	26 800 (1846)	28 / 28
24	3/4 x 0.095	4900 (337)	19 600 (1350)	24 / 24
24	1 x 0.120	3600 (248)	14 400 (992)	24 / 24



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Page 3 of 3

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 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.

Referenced Documents

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

ASTM E140, *Table 6—Approximate Hardness Conversion Numbers for Austenitic SS*, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2858