



Product Test Report

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

PTR-3267
Ver 02
December 2022
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TITLE

Tensile Pull Test of Alloy 825 Swagelok® Tube Fittings with Alloy 825 Tubing

PRODUCT TESTED

Samples Tested	Alloy 825 Tubing Size OD x Wall in.	Tubing Hardness 15-T	Description Ordering Number
6	3/4 x 0.095	78	Male Connector 825-1210-1-8
6	1 x 0.109	78	Male Connector 825-1610-1-8

Samples Tested	Alloy 825 Tubing Size OD x Wall mm	Tubing Hardness 15-T	Description Ordering Number
6	18 x 2.5	83	Male Connector 825-18M0-1-8
6	25 x 2.8	78	Male Connector 825-25M0-1-8

PURPOSE

These assemblies were tested under laboratory conditions to observe the tensile pull performance of alloy 825 Swagelok tube fittings when installed on alloy 825 heavy-wall tubing.

TEST CONDITIONS

Original test date: November 2012

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.



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Tensile Pull Test (Reference ASTM F1387):

1. For each sample, assembled one tube length and two male connectors according to Swagelok assembly procedures.
2. Attached non-pressurized samples to a tensile test machine.
3. Tensile pulled samples at a rate of 0.125 in. (3.2 mm) per minute until either the tube pulled out of the fitting or the tube fractured.
4. The acceptance criterion is taken from ASTM F1387, Annex A7.

$$\text{Calculated tensile load} = A_p \times S_y$$

where:

A_p = cross-section area of the tube based on wall thickness

S_y = minimum specified yield strength of the tube.

5. The test result should exceed the calculated tensile load.

TEST RESULTS

Tensile Pull Test

Alloy 825 Tubing Size OD x Wall in.	ASTM F1387 Calculated Tensile Load lbf (N)	Samples Attaining ASTM F1387 Calculated Tensile Load
¾ x 0.095	7474 (33 244)	6 / 6
1 x 0.109	11 610 (51 641)	6 / 6

Alloy 825 Tubing Size OD x Wall mm	ASTM F1387 Calculated Tensile Load lbf (N)	Samples Attaining ASTM F1387 Calculated Tensile Load
18 x 2.5	32 063 (7208)	6 / 6
25 x 2.8	51 488 (11 575)	6 / 6

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



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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 Documents

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

ASTM F1387-99, *Standard Specification for Performance of Piping and Tubing Mechanically Attached Fittings*, American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428

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