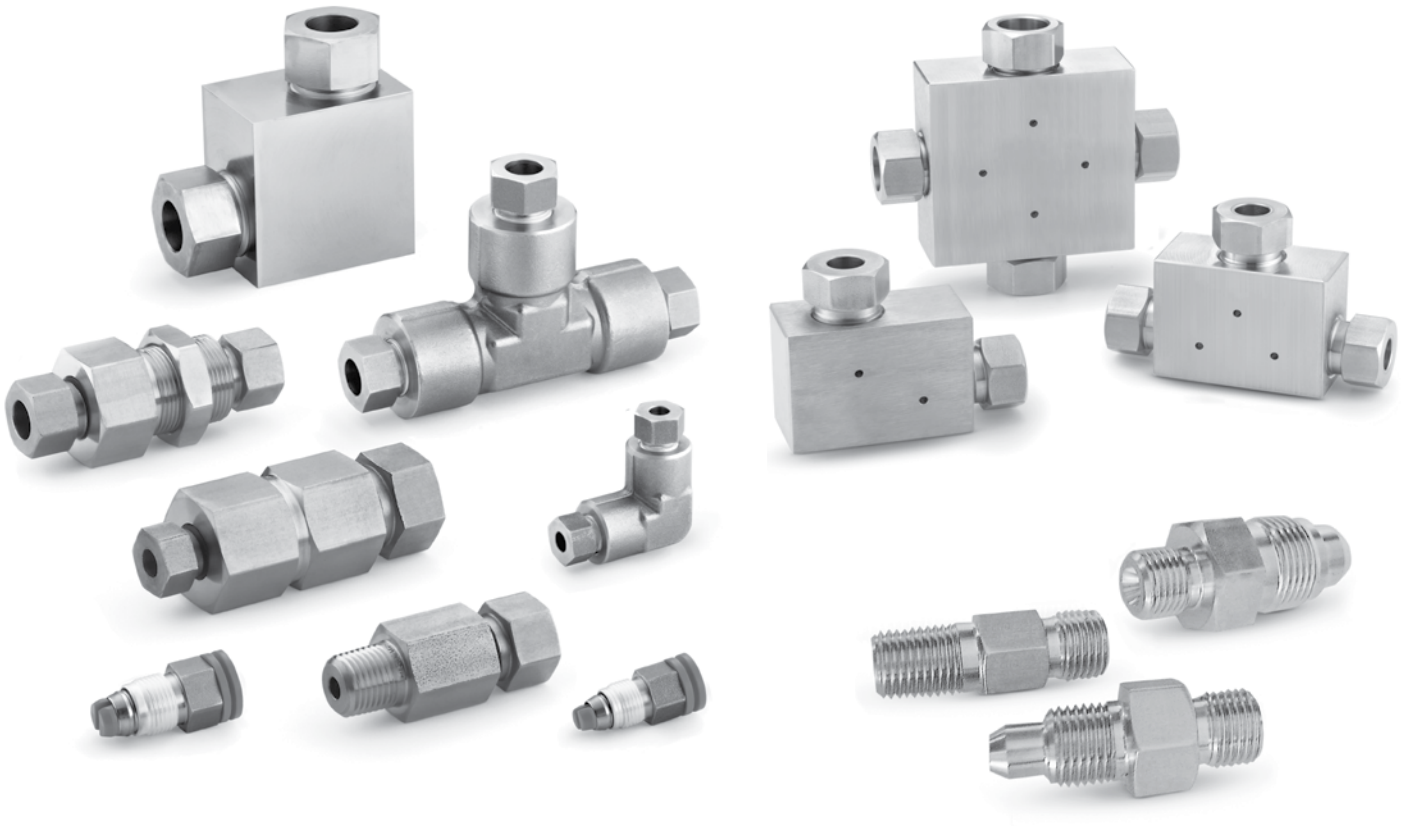
Swagelok® Medium- and High-Pressure Fittings and Adapters—Alloy Materials

Alloy 2507 and Alloy 625

For Pressures up to 40 000 psig (2756 bar)



FK and IPT Series

- Cone and thread or medium-pressure FK fitting connections
- Excellent corrosion resistance in chloride-containing environments
  - Alloy 625 meets NACE® MR0175/ISO15156
  - Alloy 2507 meets NACE® MR0175/ISO15156 and NORSOK M-630 and M-650

Swagelok®

Swagelok® Medium- and High-Pressure Fittings

Since 1947, Swagelok has designed, developed, and manufactured high-quality fluid system products to meet the evolving needs of global industries. Our focus is on understanding our customers' needs, finding timely solutions, and adding value with our products and services.

This catalog provides the technical detail required for alloy medium and high pressure products that are used in high chloride applications. In the following pages you will find technical and ordering information for Swagelok cone and thread and medium-pressure tube fittings. These products have the following pressure characteristics:

Product Type		Maximum Working Pressure, psig (bar)			
		Medium Pressure		High Pressure	
		Alloy 2507	Alloy 625	Alloy 2507	Alloy 625
IPT Series	Cone & Thread Fittings, Adapters, and Couplings	Up to 20 000 (1378)	Up to 15 000 (1034)	Up to 40 000 (2756)	Up to 36 000 (2480)
	Cone & Thread Tubing	Up to 20 000 (1378)		Up to 40 000 (2756)	Up to 36 000 (2480)
FK Series	Medium Pressure Gaugeable Tube Fitting	Up to 22 500 (1550)		No	No
	Tubing	Up to 22 500 (1550)①		No	No

① For stainless steel products using alloy 2507 tubing options, up to 20 000 psig (1378 bar), see catalog MS-02-472.

Applications

Medium- and high-pressure fittings and components are designed to meet requirements of demanding applications such as the following:

- Oil and gas
  - Wellhead control panels
  - Hydraulic control panels
  - Grease injector units
  - Blowout preventers
  - Chemical injection skids

Product Ratings

Swagelok Company rates products based on the principles of two ASME standards:

- ASME B31.3, Process Piping (Base Code)
- ASME B31.3, Process Piping, Chapter IX High Pressure Piping (Chapter IX)

As such, some products reference two pressure ratings for the same product. To ensure safe product selection, it is important for the system designer and user to understand how each standard applies to the application when selecting a product.

Compatibility of Cone and Thread Fittings

Swagelok IPT series medium- and high-pressure cone and thread fittings may be assembled with cone and thread fittings and tube end assemblies from other manufacturers who follow the dimensions referenced in the table "Dimensions—Cone & Thread End Connections," on page 22.

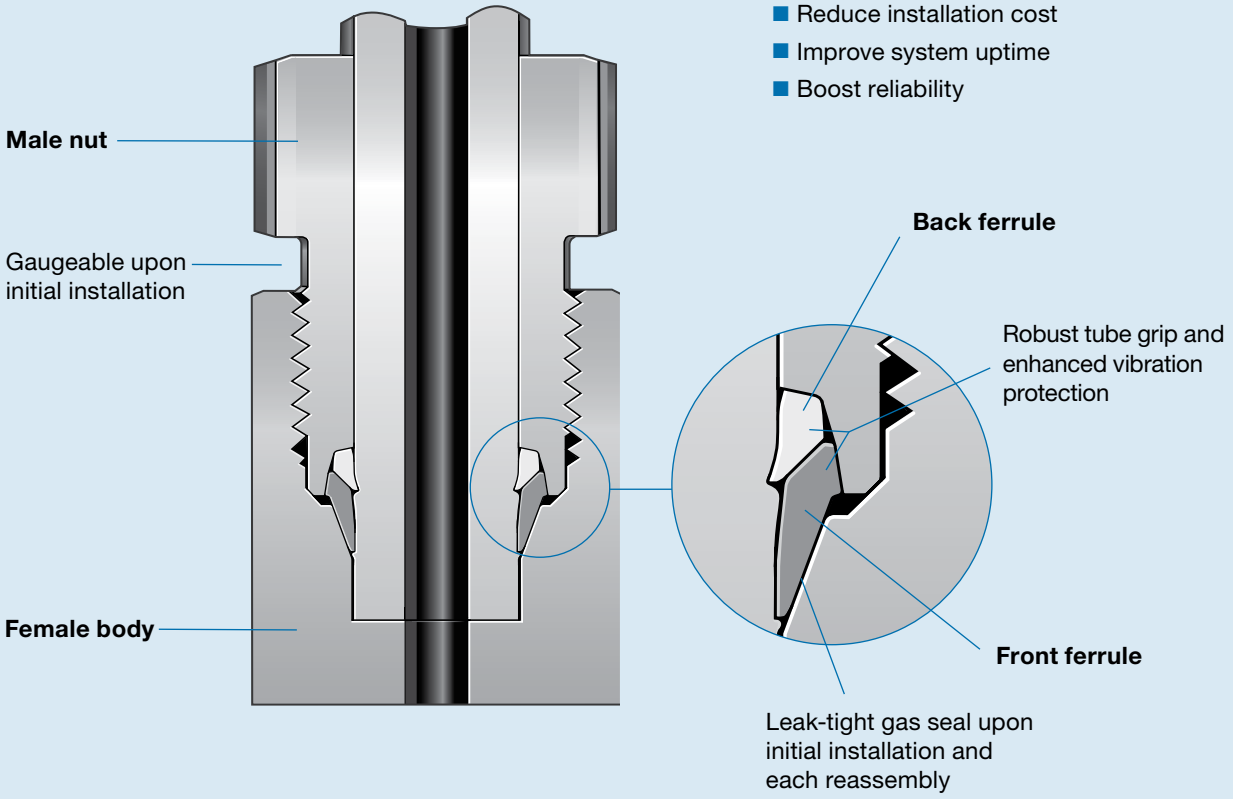
Important: The above statement applies *only* to Swagelok IPT series medium- and high-pressure cone and thread fittings.

API-6A, Specification for Wellhead and Christmas Tree Equipment, defines the dimensions for the 9/16 inch high-pressure cone and thread fitting. Swagelok Company complies with the mechanical sealing dimensions called out in this specification. No other sizes or styles of cone and thread fittings or tubing are referenced in API-6A.

Contents

Contents

Swagelok Medium-Pressure FK Fittings



Features

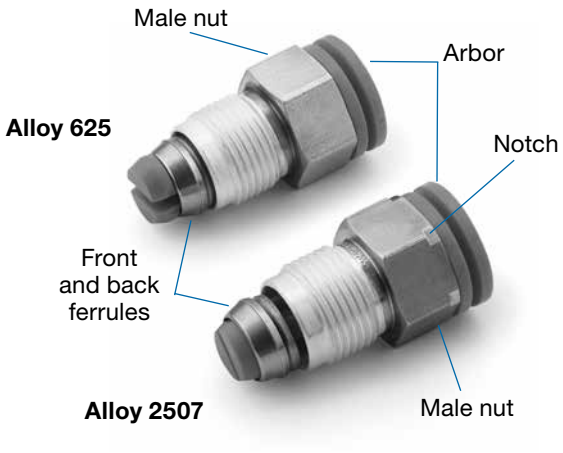
The simple two-piece design of Swagelok patented medium-pressure tube fittings and adapters consists of a female fitting body and preassembled cartridge containing the male nut and front and back ferrules on a disposable plastic arbor. The preassembled cartridge ensures installers of correct ferrule orientation, visual confirmation of ferrule presence, and proper installation into the female body. Components are released only after the nut is threaded finger-tight on the fitting body.

The Swagelok medium-pressure tube fitting offers a leak-tight gas seal and vibration resistance in applications up to 22 500 psig (1550 bar).

Additional features of this tube fitting technology include:

- Patented low-temperature case hardening processing of the ferrules, plus the specially designed ferrule geometry, promotes a hinging-colleting™ action
  - Robust tube grip
  - Enhanced vibration protection
- Materials selected in accordance with NACE MR0175/ISO 15156. For additional information on NACE compliance, see Ordering Information and Dimensions, page 8.
- For stainless steel products using alloy 2507 tubing options, see catalog MS-02-472.
- NORSOK compliance to M-630/M-650
- Identification notch on 2507 FK male nuts

Preassembled cartridge for rapid error-proof assembly



Materials of Construction

Component	ASTM Specification	
	Alloy 2507	Alloy 625
Body	*A182 or A479*	*B564 or B446*
Front ferrule	*A479 or B691*	*B446*
Nut①	A479	B446
Back ferrule	A479 or B691	B446

Wetted components listed in *italics*.

① Silver plated.

Pressure Ratings

Pressure ratings are dependent on the end connection or system component with the lowest pressure rating. Ratings for the end connections used in this catalog are identified below.

Swagelok Medium-Pressure Tube Fittings

Swagelok alloy 2507 FK Series medium pressure fittings are rated for use with alloy 2507 tubing. Swagelok alloy 625 FK Series medium-pressure fittings are rated for use with alloy 625 tubing. Swagelok medium-pressure ends are rated to the working pressure of the tubing as listed below. Calculations are based on maximum outside diameter and minimum wall thickness.

*Alloy 2507 Super Duplex Tubing*①

Allowable working pressures are calculated from an *S* value of 38 700 psi (266.6 MPa) for ASME B31.3 and an *S* value of 53 300 psi (367 MPa) for ASME B31.3 Chapter IX. Pressure ratings are for metal temperatures from -20 to 100°F (-28 to 37°C). See **Elevated Temperature Factors,** page 7, for tubing use above 100°F (37°C).

Tube OD in.	Wall Thickness in.②	Working Pressure, psig (bar)	
		ASME B31.3③	Chapter IX④
1/4	0.035	10 000 (689)	14 100 (971)
	0.049	15 000 (1034)⑤	22 500 (1550)⑤
3/8	0.049	10 100 (695)⑤	14 400 (992)⑤
	0.065	12 700 (875)	18 300 (1260)
	0.083	15 000 (1034)	22 500 (1550)
1/2	0.065	10 100 (695)⑤	14 400 (992)⑤
	0.083	12 900 (888)	18 600 (1281)
	0.095	15 000 (1034)	22 500 (1550)⑤
3/4	0.095	10 000 (689)⑤	14 300 (985)⑤
	0.109	11 100 (764)	16 000 (1102)
	0.120	12 400 (854)	17 900 (1233)
	0.134	15 000 (1034)⑤	20 000 (1378)

Suggested Ordering Information

High-quality, fully annealed Alloy 2507 super duplex tubing, ASTM A789 or equivalent. Hardness not to exceed 32 HRC. Tubing to be free of scratches, suitable for bending and flaring.

① No allowance is made for corrosion, erosion, bending, or elevated temperatures.
② For gas service, select a tube wall thickness *outside* of the shaded areas.
③ Working pressure determined based on ASME B31.3 Process Piping.
④ Working pressure determined based on ASME B31.3 Process Piping, Chapter IX High Pressure Piping.
⑤ Pressure rating based on special wall thickness tolerance for Swagelok Alloy 2507 tubing.

*Heavy-Wall Annealed Alloy 625 Tubing*①

Allowable working pressures are calculated from an *S* value of 40 000 psi (275.7 MPa) for ASTM B444 Grade 1 tubing at –20 to 100°F (–28 to 37°C), as listed in ASME B31.3, Table A-1; tubing outside diameter and wall thickness tolerances from ASTM B444 for small-diameter tube. See **Elevated Temperature Factors** for tubing used above 100°F (37°C).

Tube OD in.	Tube Wall Thickness, in.					
	0.035	0.049	0.065	0.083	0.109	0.165
	Working Pressure, psig (bar)					
1/4	11 200 (772)	15 000 (1034)	15 000 (1034)			
3/8		10 300 (710)	14 200 (978)	15 000 (1034)		
1/2			10 300 (710)	13 500 (930)	15 000 (1034)	
3/4						15 000 (1034)

Suggested Ordering Information

Fully annealed, high-quality type alloy 625 tubing ASTM B444 Grade 1 or equivalent. Hardness not to exceed 25 HRC or 226 HV. Tubing to be free of scratches and suitable for bending and flaring.

① No allowance is made for corrosion, erosion, bending, or elevated temperatures.

Elevated Temperature Factors

Temperature		Elevated Temperature Factors①		
		Alloy 625 Grade 1 Tubing	Alloy 2507 Super Duplex Tubing	
°F	°C	B31.3 Base Code	B31.3 Base Code	B31.3 Chapter IX
150	66	1.00	1.00	0.92
200	93		0.99	0.88
250	121		0.96	0.84
300	149	0.99	0.94	0.81
400	204	0.98	0.91	0.76
500	260	0.96	0.89②	0.73②
600	316	0.94	–	–
700	371	0.92		
800	427	0.91		
900	482	0.90		
1000	538	0.78		

① Elevated temperature factor = suggested allowable working pressure at elevated temperature / suggested allowable working pressure at room temperature.

② Alloy 2507 Super Duplex Tubing has a maximum temperature rating of 482°F (250°C).

Example: heavy-wall alloy 625 tubing 1/4 in. OD { 0.065 in. wall at 1000°F (537°C):

1. The allowable working pressure at –20 to 100°F (–28 to 37°C) is 15 000 psig (1034 bar).
2. The elevated temperature factor for 1000°F (537°C) is 0.78:

   15 000 psig (1034 bar) × 0.78 = 11 700 psig (806 bar)

The allowable working pressure for heavy-wall annealed alloy 625 tubing 1/4 in. OD { 0.065 in. wall at 1000°F (537°C) is 11 700 psig (806 bar).

NPT End Connections①

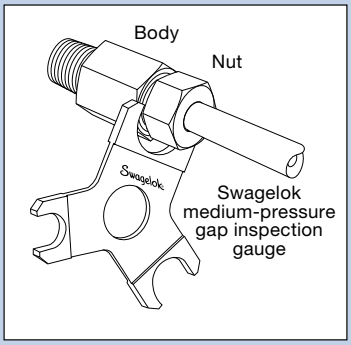
Male and Female NPT Size in.	Alloy 625 Pressure Rating psig (bar)	Alloy 2507 Pressure Rating psig (bar)
1/4, 3/8, 1/2	12 000 (826)	15 000 (1 034)
3/4	10 000 (689)	10 000 (689)

① No allowance is made for corrosion, erosion, bending, or elevated temperatures.

Tubing/Fitting Compatibility Matrix

Fitting		Tubing Compatability (Material and Fractional Size)							
Material	Series	Description	OD Size	1/4 in (mm)	3/8 in (mm)	1/2 in (mm)	9/16 in (mm)	3/4 in (mm)	ASTM Specification
Alloy 2507	FK	2507 tubing (annealed)	True	√	√	√		√	A789
	IPT - Medium-Pressure		Nominal	√	√		√	√	A789
Alloy 625	FK	625 tubing (annealed)	True	√	√	√		√	B444 Grade 1
	IPT - Medium-Pressure		Nominal	√	√		√	√	B444 Grade 1

Gaugeability



On initial installation, the **Swagelok medium-pressure gap inspection gauge** assures the installer or inspector that a fitting has been sufficiently tightened.

Position the Swagelok medium-pressure gap inspection gauge next to the gap between the nut and body.

- If the gauge will not enter the gap, the fitting is sufficiently tightened.
- If the gauge will enter the gap, additional tightening is required.

Cleaning and Packaging

All medium-pressure fittings are cleaned in accordance with Swagelok *Standard Cleaning and Packaging (SC-10),* MS-06-62.

Each medium-pressure fittings includes one preassembled cartridge that contains the male nut and front and back ferrules on a disposable plastic arbor.

Ordering Information and Dimensions

Dimensions are for reference only and are subject to change. Dimensions shown are with Swagelok nuts finger-tight.

The order number will begin with the appropriate material designator (2507 or 625).

Alloy 2507 meets NACE compliance at all temperatures and is only available with the **-SG2** suffix.

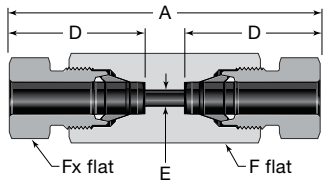
Alloy 625 is NACE compliant up to 300°F (149°C) at any H_2S partial pressure. For NACE compliant applications above 300°F (149°C) at any H_2S partial pressure, add **-SG2** to the ordering number.

Examples: 2507-8FK0-6-**SG2**
625-12FK0-3
625-4FK0-6-**SG2**

Additional configurations and adapters are available on request. Contact your authorized Swagelok sales and service representative.

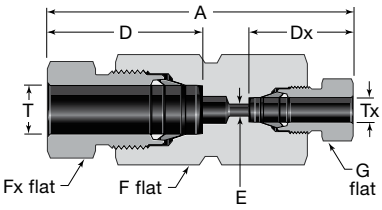
Straight Fittings

Unions



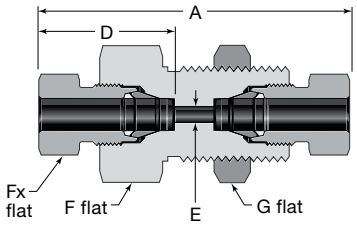
Union

Tube OD in.	Basic Ordering Number	Dimensions, in.					
		A	D	E	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	4FK0-6	2.25	1.08	0.13	11/16	9/16	9/16
3/8	6FK0-6	2.81	1.34	0.21	13/16	11/16	11/16
1/2	8FK0-6	3.36	1.59	0.38	1 1/16	15/16	7/8
3/4	12FK0-6	4.84	2.29	0.56	1 5/8	1 3/8	1 3/8



Reducing Union

Tube OD in.		Basic Ordering Number	Dimensions, in.								
T	Tx		A	D	Dx	E	F	Alloy 2507 Fx	Alloy 625 Fx	Alloy 2507 G	Alloy 625 G
3/8	1/4	6FK0-6-4	2.64	1.34	1.08	0.13	13/16	11/16	11/16	9/16	9/16
1/2	1/4	8FK0-6-4	2.90	1.59	1.34	0.13	1 1/16	15/16	7/8	9/16	9/16
	3/8	8FK0-6-6	3.19	1.59	1.34	0.21	1 1/16	15/16	7/8	11/16	11/16
3/4	1/2	12FK0-6-8	4.26	2.29	1.59	0.38	1 5/8	1 3/8	1 3/8	15/16	7/8

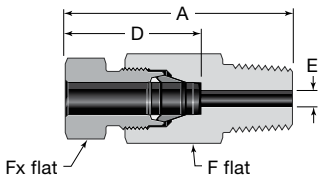


Bulkhead Union

Tube OD in.	Basic Ordering Number	Dimensions, in.								
		A	D	E	F	Alloy 2507 Fx	Alloy 625 Fx	G	Panel Hole Size	Maximum Panel Thickness
1/4	4FK0-61	2.25	1.08	0.13	1 1/16	9/16	9/16	15/16	49/64	0.50
3/8	6FK0-61	2.81	1.34	0.21	1 1/16	11/16	11/16	1 1/16	57/64	0.66
1/2	8FK0-61	3.38	1.59	0.38	1 1/2	15/16	7/8	1 5/16	1 9/64	0.75
3/4	12FK0-61	4.84	2.29	0.56	2 1/4	1 3/8	1 3/8	2 1/4	1 61/64	1.00

Straight Fittings

Male Connectors



NPT

Tube OD in.	NPT Size in.	Basic Ordering Number	Dimensions, in.					
			A	D	E	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	1/4	4FK0-1-4	1.74	1.08	0.13	11/16	9/16	9/16
	3/8	4FK0-1-6	1.74	1.08	0.13	11/16	9/16	9/16
	1/2	4FK0-1-8	1.93	1.08	0.13	7/8	9/16	9/16
3/8	1/4	6FK0-1-4	2.03	1.34	0.21	13/16	11/16	11/16
	3/8	6FK0-1-6	2.03	1.34	0.21	13/16	11/16	11/16
	1/2	6FK0-1-8	2.22	1.34	0.21	7/8	11/16	11/16
1/2	1/4	8FK0-1-4	2.33	1.59	0.25	1 1/16	15/16	7/8
	3/8	8FK0-1-6	2.33	1.59	0.33	1 1/16	15/16	7/8
	1/2	8FK0-1-8	2.52	1.59	0.38	1 1/16	15/16	7/8
	3/4	8FK0-1-12	2.52	1.59	0.38	1 1/16	15/16	7/8
3/4	1/2	12FK0-1-8	3.37	2.29	0.41	1 5/8	1 3/8	1 3/8
	3/4	12FK0-1-12	3.37	2.29	0.56	1 5/8	1 3/8	1 3/8

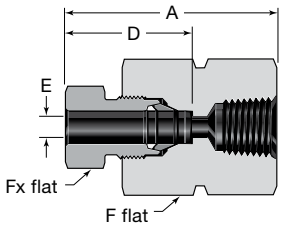
Swagelok FK series bored through male connectors are available in select sizes and alloys.
To order bored-through FK Series fittings add a **BT** to the ordering number. Example: 625-4FK0-1-8**BT**

Bored-through fittings have a reduced pressure rating.

Reduced Pressure Rating Factors

Size in.	Factor
1/4	0.75
3/8	0.75

Female Connectors

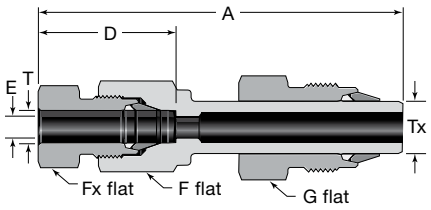


NPT

Tube OD in.	NPT Size in.	Basic Ordering Number	Dimensions, in.					
			A	D	E	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	1/4	4FK0-7-4	1.85	1.08	0.13	1 1/16	9/16	9/16
3/8	1/4	6FK0-7-4	2.10	1.34	0.21	1 1/16	11/16	11/16
1/2	1/4	8FK0-7-4	2.42	1.59	0.38	1 1/16	15/16	7/8
	1/2	8FK0-7-8	2.66	1.59	0.38	1 1/2	15/16	7/8
3/4	1/2	12FK0-7-8	3.40	2.29	0.56	1 5/8	1 3/8	1 3/8

Straight Fittings

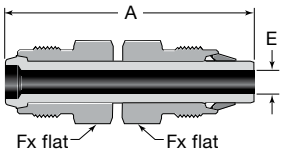
Reducers



Tube OD in.		Basic Ordering Number	Dimensions, in.							
T	Tx		A	D	E	F	Alloy 2507 Fx	Alloy 625 Fx	Alloy 2507 G	Alloy 625 G
1/4	3/8	4FK0-R-6FK	2.97	1.08	0.13	11/16	9/16	9/16	11/16	11/16
	1/2	4FK0-R-8FK	3.31	1.08	0.13	11/16	9/16	9/16	15/16	7/8
3/8	1/2	6FK0-R-8FK	3.52	1.34	0.21	13/16	11/16	11/16	15/16	7/8
1/2	3/8	8FK0-R-6FK	3.65	1.59	0.21	1 1/16	15/16	7/8	11/16	11/16
	3/4	8FK0-R-12FK	4.66	1.59	0.38	1 1/16	15/16	7/8	1 3/8	1 3/8
3/4	1/2	12FK0-R-8FK	4.76	2.29	0.28	1 5/8	1 3/8	1 3/8	15/16	7/8

Reducers are furnished with nuts and preswaged ferrules. See page 16 for installation information.

Port Connectors

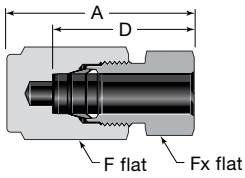


Tube OD in.	Basic Ordering Number	Dimensions, in.			
		A	E	Alloy 2507 Fx	Alloy 625 Fx
1/4	4FK0-PC	2.06	0.12	9/16	9/16
3/8	6FK0-PC	2.54	0.21	11/16	11/16
1/2	8FK0-PC	2.99	0.28	15/16	7/8
3/4	12FK0-PC	4.22	0.42	1 3/8	1 3/8

Port connectors are furnished with nuts and preswaged ferrules.
See page 16 for installation information.

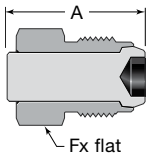
Caps and Plugs

Cap



Tube OD in.	Basic Ordering Number	Dimensions, in.				
		A	D	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	4FK0-C	1.33	1.08	11/16	9/16	9/16
3/8	6FK0-C	1.74	1.34	13/16	11/16	11/16
1/2	8FK0-C	2.05	1.59	1 1/16	15/16	7/8
3/4	12FK0-C	2.86	2.29	1 5/8	1 3/8	1 3/8

Plug

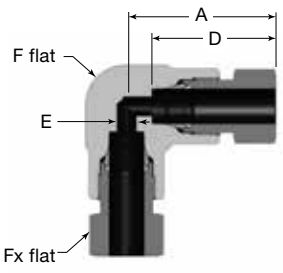


Tube OD in.	Basic Ordering Number	Dimensions, in.		
		A	Alloy 2507 Fx	Alloy 625 Fx
1/4	4FK0-P	1.03	9/16	9/16
3/8	6FK0-P	1.26	11/16	11/16
1/2	8FK0-P	1.45	15/16	7/8
3/4	12FK0-P	1.98	1 3/8	1 3/8

90° Elbows

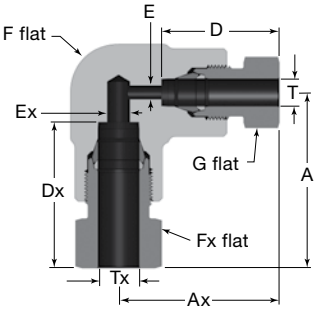
Unions

Union



Tube OD in.	Basic Ordering Number	Dimensions, in.						
		Alloy 2507 A	Alloy 625 A	D	E	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	4FK0-9	1.26	1.48	1.08	0.13	13/16	9/16	9/16
3/8	6FK0-9	1.58	1.61	1.34	0.21	13/16	11/16	11/16
1/2	8FK0-9	1.88	2.62	1.59	0.38	1 1/4	15/16	7/8
3/4	12FK0-9	2.83	2.76	2.29	0.56	1 3/4	1 3/8	1 3/8

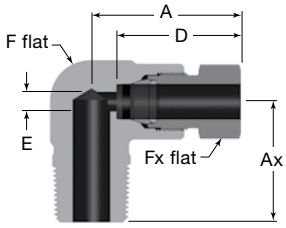
Reducing Union



Tube OD in.		Basic Ordering Number	Dimensions, in.												
T	Tx		Alloy 2507 A	Alloy 625 A	Alloy 2507 Ax	Alloy 625 Ax	D	Dx	E	Ex	F	Alloy 2507 Fx	Alloy 625 Fx	Alloy 2507 G	Alloy 625 G
1/4	3/8	6FK0-9-4	1.61	1.61	1.48	1.48	1.08	1.34	0.13	0.21	13/16	11/16	11/16	9/16	9/16
	1/2	8FK0-9-4	1.88	2.62	1.69	2.40	1.08	1.59	0.13	0.38	1 1/4	15/16	7/8	9/16	9/16
3/8	1/2	8FK0-9-6	1.88	2.62	1.82	2.53	1.34	1.59	0.21	0.38	1 1/4	15/16	7/8	11/16	11/16
1/2	3/4	12FK0-9-8	2.83	2.76	2.51	2.44	1.59	2.29	0.38	0.56	1 3/4	1 3/8	1 3/8	15/16	7/8

Male

NPT

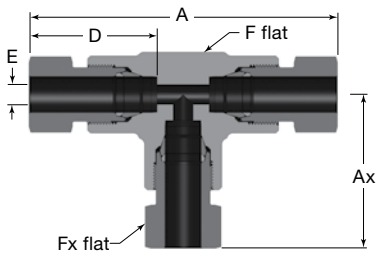


Tube OD in.	NPT Size in.	Basic Ordering Number	Dimensions, in. Alloy 625 Only①					
			A	Ax	D	E	F	Fx
1/4	1/4	4FK0-2-4	1.48	1.11	1.08	0.13	13/16	9/16
	3/8	4FK0-2-6	1.48	0.97	1.08	0.13	13/16	9/16
	1/2	4FK0-2-8	1.48	1.37	1.08	0.13	13/16	9/16
3/8	1/4	6FK0-2-4	1.61	0.97	1.34	0.21	13/16	11/16
	3/8	6FK0-2-6	1.61	0.97	1.34	0.21	13/16	11/16
	1/2	6FK0-2-8	1.61	1.30	1.34	0.21	13/16	11/16
1/2	1/4	8FK0-2-4	2.62	1.48	1.59	0.25	1 1/4	7/8
	3/8	8FK0-2-6	2,62	1.48	1.59	0.28	1 1/4	7/8
	1/2	8FK0-2-8	2.62	1.67	1.59	0.28	1 1/4	7/8
3/4	1/2	12FK0-2-8	2.76	2.11	2.29	0.41	1 3/4	1 3/8
	3/4	12FK0-2-12	2.76	2.11	2.29	0.56	1 3/4	1 3/8

① Contact your authorized Swagelok sales and service representative for alloy 2507 dimensions.

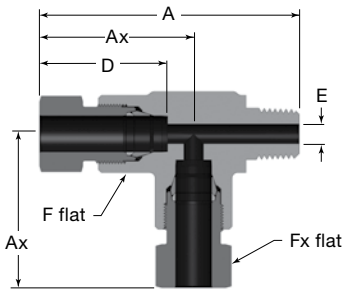
Tees

Unions



Tube OD in.	Basic Ordering Number	Dimensions, in.								
		Alloy 2507 A	Alloy 625 A	Alloy 2507 Ax	Alloy 625 Ax	D	E	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	4FK0-3	2.52	2.96	1.26	1.48	1.08	0.13	13/16	9/16	9/16
3/8	6FK0-3	3.16	3.23	1.58	1.61	1.34	0.21	13/16	11/16	11/16
1/2	8FK0-3	3.76	5.24	1.88	2.62	1.59	0.38	1 1/4	15/16	7/8
3/4	12FK0-3	5.66	5.51	2.83	2.76	2.29	0.56	1 3/4	1 3/8	1 3/8

Male Run, NPT (TMT)

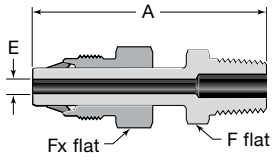


Tube OD in.	NPT Size in.	Basic Ordering Number	Dimensions, in. Alloy 625 Only①					
			A	Ax	D	E	F	Fx
1/4	1/4	4FK0-3-4TMT	2.59	1.48	1.08	0.13	13/16	9/16
3/8	1/4	6FK0-3TMT	2.72	1.61	1.34	0.21	13/16	11/16
1/2	1/4	8FK0-3-4TMT	4.10	2.62	1.59	0.25	1 1/4	7/8
	3/8	8FK0-3TMT	4.10	2.62	1.59	0.28	1 1/4	7/8
3/4	3/4	12FK0-3TMT	4.49	2.76	2.29	0.56	1 3/4	1 3/8

① Contact your authorized Swagelok sales and service representative for alloy 2507 dimensions.

Tube Adapters

Male NPT



Tube OD in.	NPT Size in.	Basic Ordering Number	Dimensions, in.				
			A	E	F	Alloy 2507 Fx	Alloy 625 Fx
1/4	1/4	4FK-TA-1-4	2.18	0.12	9/16	9/16	9/16
3/8	1/4	6FK-TA-1-4	2.53	0.21	9/16	11/16	11/16
	1/2	6FK-TA-1-8	2.78	0.21	7/8	11/16	11/16
1/2	1/4	8FK-TA-1-4	2.87	0.25	9/16	15/16	7/8
	1/2	8FK-TA-1-8	3.12	0.28	7/8	15/16	7/8
3/4	3/4	12FK-TA-1-12	3.92	0.42	1 1/16	1 3/8	1 3/8

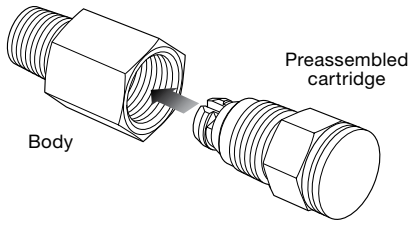
Tube adapters are furnished with nuts and preswaged ferrules. See page 16 for installation information.

Installation Instructions

Medium-Pressure Tube Fitting Assembly—Alloy 2507 and Alloy 625 Materials

These instructions apply to alloy 2507 and alloy 625 medium-pressure tube fitting sizes from 1/4 to 3/4 in.
For 3/4 in. medium-pressure tube fittings *only,* you can use the Swagelok multihead hydraulic swaging unit (MHSU) to preswage the ferrules onto the tube and install in accordance with **Connections Preswaged with the MHSU,** page 15.

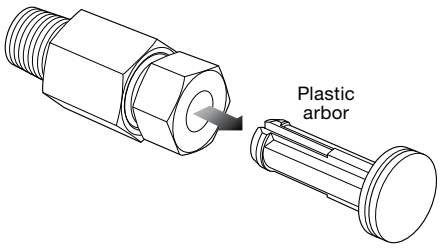
Fig. 1



1. Thread the preassembled cartridge (nut, ferrules, and plastic arbor) into the fitting body until finger-tight (Fig. 1).

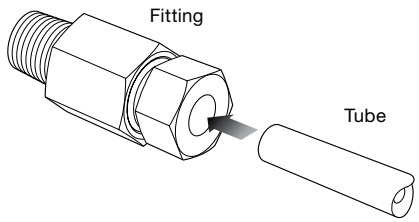
   For temperatures above 400°F (204°C), use Silver Goop™ high-temperature thread lubricant on fitting nut threads.

Fig. 2



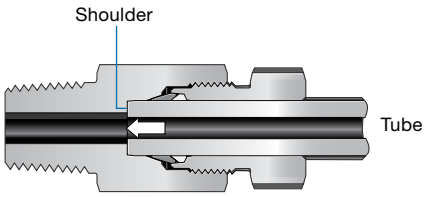
2. Remove the plastic arbor (Fig. 2).

Fig. 3



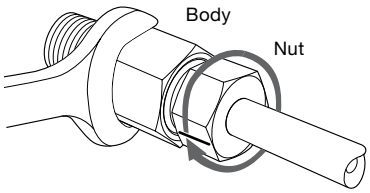
3. Insert the tube into the fitting (Fig. 3).

Fig. 4



4. Make sure that the tube rests firmly on the shoulder of the fitting body (Fig. 4).

Fig. 5

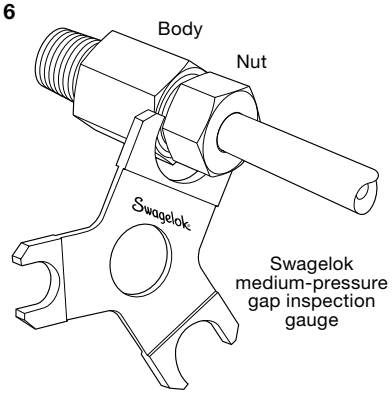


5. Mark the nut, then hold the body steady and tighten the nut one full turn (Fig. 5).

   Alternatively, for Alloy 2507 fittings, hold the body steady and tighten the nut to the specified torque.

Tube OD in.	Alloy 2507 Only Required Torque	
	ft·lb	N·m
1/4	30	40
3/8	50	65
1/2	140	190
3/4	270	365

Fig. 6



6. Use the Swagelok medium-pressure gap inspection gauge to ensure that the fitting has been tightened sufficiently.

   If the gap inspection gauge will enter the gap, then hold the fitting body steady and tighten the nut slightly.

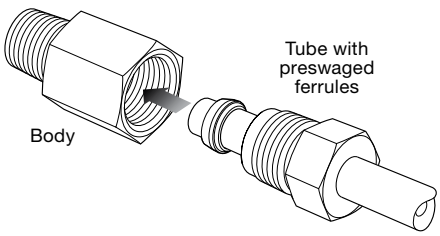
   Recheck the gap with the gap inspection gauge. If the gap inspection gauge will still enter the gap, then slightly tighten the nut again. Repeat this additional tightening until the gap inspection gauge will not enter the gap (Fig. 6).

Installation Instructions

Connections Preswaged with the MHSU

These instructions apply to 3/4 in. alloy 2507 and alloy 625 medium-pressure tube fittings *only.* These fittings can also be assembled in accordance with **Medium-Pressure Tube Assembly,** page 14.

Fig. 1



1. Preswage the ferrules onto the tube using a Swagelok multihead hydraulic swaging unit (MHSU) and the appropriate medium-pressure tooling.

   See the Multihead Hydraulic Swaging Unit (MHSU) Setup and Operating Instructions, MS-12-37.

2. Inspect the tube end for a bottoming mark. This radial indentation indicates the tube was properly bottomed in the MHSU. If there is not a visible indentation, the preswaged assembly should not be used.

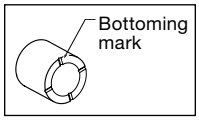
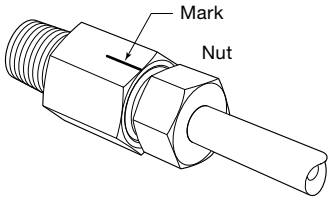


Fig. 2



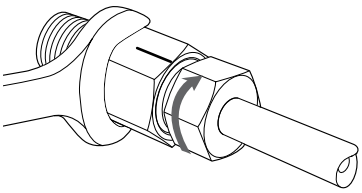
The MHSU should be used to preswage a set of ferrules only one time. If the ferrules were insufficiently preswaged, discard the ferrules and started the process again with a new set of ferrules.

3. Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body; rotate the nut finger-tight (Fig. 1).

   For temperatures above 400°F (204°C), use Silver Goop high-temperature thread lubricant on fitting nut threads.

4. Place a mark on the fitting body in line with one of the hex points of the nut (Fig. 2).

Fig. 3



5. Hold the fitting body steady and tighten the nut one-third turn (Fig. 3). This is equivalent to advancing the nut two hex points from the mark.

   Alternatively, for Alloy 2507 fittings, hold the body steady and tighten the nut to the specified torque.

Tube OD in.	Alloy 2507 Only Required Torque	
	ft·lb	N·m
3/4	270	365

6. Use the Swagelok medium-pressure gap inspection gauge to ensure that the fitting has been tightened sufficiently.

   If the gap inspection gauge will enter the gap, then hold the fitting body steady and tighten the nut slightly.

   Recheck the gap with the gap inspection gauge. If the gap inspection gauge will still enter the gap, then slightly tighten the nut again. Repeat this additional tightening until the gap inspection gauge will not enter the gap.

Caps and Plugs

Caps Installation

See **Medium-Pressure Tube Fitting Assembly,** page 14.

Plugs Installation

Hold the body steady and tighten the plug one-quarter turn from the finger-tight position.

Alternatively, for Alloy 2507 fittings, hold the body steady and tighten the nut to the specified torque.

Tube OD in.	Alloy 2507 Only Required Torque	
	ft·lb	N·m
1/4	30	40
3/8	50	65
1/2	140	190
3/4	270	365

Port Connectors Installation

For installation of the machined ferrule end of the port connector, see **Plugs Installation,** this page.

For installation of the preswaged ferrule end of the port connector, see **Tube Adapters and Reducers Installation,** this page.

Tube Adapters and Reducers Installation

For initial installation, insert the tube with preswaged ferrules into the body; rotate the nut finger-tight.

For temperatures above 400°F (204°C), use Silver Goop high-temperature thread lubricant on fitting nut threads.

- For preswaged 1/2 in. and smaller fittings, hold the body steady and rotate the nut to the previously pulled-up position. At this point, you will feel a significant increase in resistance. Tighten the nut an additional one-fourth turn.①
- For preswaged 3/4 in. fittings, hold the fitting body steady and tighten the nut one-third turn.①

① *Alternatively, for Alloy 2507 fittings, hold the body steady and tighten the nut to the specified torque.*

Use the Swagelok medium-pressure gap inspection gauge to ensure that the fitting has been tightened sufficiently.

If the gap inspection gauge will enter the gap, then hold the fitting body steady and tighten the nut slightly.

Recheck the gap with the gap inspection gauge. If the gap inspection gauge will still enter the gap, then slightly tighten the nut again. Repeat this additional tightening until the gap inspection gauge will not enter the gap.

Installation Instructions

Preswaging Tool

These instructions apply to alloy 2507 and alloy 625 medium-pressure tube fitting sizes from 1/4 to 1/2 in.

Fig. 1

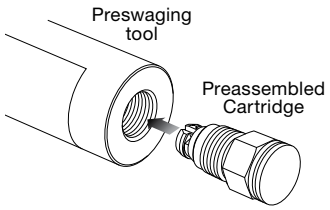


Fig. 2

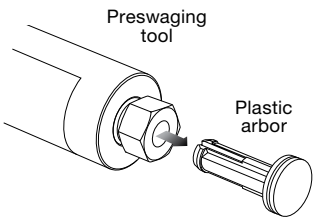


Fig. 3

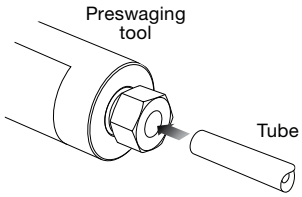


Fig. 4

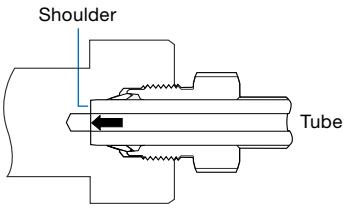


Fig. 5

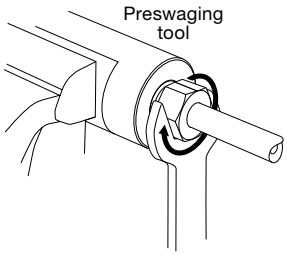


Fig. 6

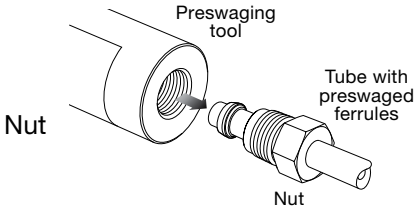


Fig. 7

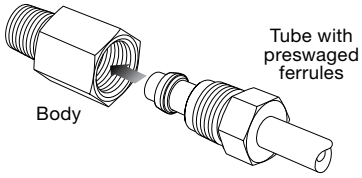


Fig. 8

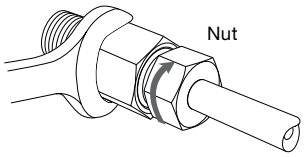
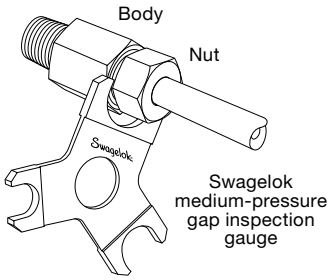


Fig. 9



1. Thread the preassembled cartridge (nut, ferrules, and plastic arbor) into the preswaging tool until finger-tight (Fig. 1).
2. Remove the plastic arbor (Fig. 2).
3. Insert the tube into the preswaging tool (Fig. 3).
4. Make sure that the tube rests firmly on the shoulder of the preswaging tool body; rotate the nut finger-tight (Fig. 4).
5. Mark the nut, then hold the preswaging tool steady and tighten the nut three-quarters turn with a wrench (Fig. 5).
6. Loosen the nut.
7. Remove the tube with preswaged ferrules from the preswaging tool (Fig. 6).

   If the tube sticks in the preswaging tool, remove the tube by gently rocking it back and forth. Do not turn the tube.

8. Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body; rotate the nut finger-tight (Fig. 7).

   For temperatures above 400°F (204°C), use Silver Goop high-temperature thread lubricant on fitting nut threads.

9. Using a wrench, rotate the nut past finger tight, to the previously pulled-up position. At this point, you will feel a significant increase in resistance. Now apply alignment marks in a line along the nut and fitting body flats. Tighten the nut an additional onefourth turn with a wrench (Fig. 8).

Tube OD in.	Alloy 2507 Only Required Torque	
	ft·lb	N·m
1/4	30	40
3/8	50	65
1/2	140	190

Alternatively, for Alloy 2507 fittings, hold the body steady and tighten the nut to the specified torque.

10. Use the Swagelok medium-pressure gap inspection gauge to ensure that the fitting has been tightened sufficiently.

    If the gap inspection gauge will enter the gap, then hold the fitting body steady and tighten the nut slightly.

    Recheck the gap with the gap inspection gauge. If the gap inspection gauge will still enter the gap, then slightly tighten the nut again.

    Repeat this additional tightening until the gap inspection gauge will not enter the gap (Fig. 9).

Installation Instructions

Medium-Pressure Tube Fitting Reassembly—Alloy 2507 and Alloy 625 Materials

Fig. 1

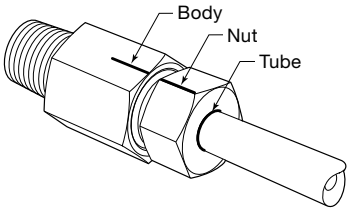


Fig. 2

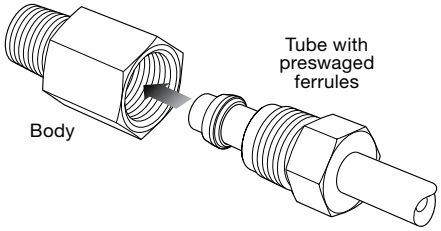
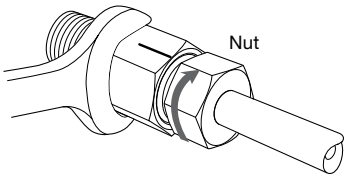


Fig. 3



You may disassemble and reassemble alloy 2507 and alloy 625 Swagelok medium-pressure tube fittings many times.

1. Prior to disassembly, mark the tube at the back of the nut; mark a line along the nut and fitting body flats. (Fig. 1). *Use these marks to ensure that you return the nut to the previously pulled up position.*
2. Insert the tube with the preswaged ferrules into the fitting body until the front ferrule seats against the fitting body (Fig. 2).
3. While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position as indicated by the marks on the tube and flats. At this point, you will feel a significant increase in resistance. Tighten the nut slightly (Fig. 3).

   Alternatively, for Alloy 2507 fittings, hold the body steady and tighten the nut to the specified torque.

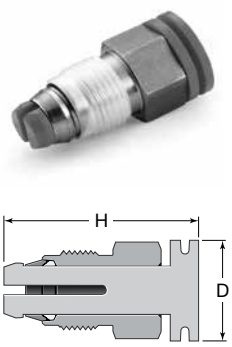
Tube OD in.	Alloy 2507 Only Required Torque	
	ft·lb	N·m
1/4	30	40
3/8	50	65
1/2	140	190

⚠ **The gap inspection gauge can be used as an important diagnostic tool for reassembled tube fittings. Rechecking the nut-to-body gap upon reassembly can prevent under-tightened conditions.**

Replacement Parts

Nut and Ferrules Cartridge

Each cartridge contains a front ferrule, back ferrule, and male nut. Cartridges are assembled on orange arbors.



⚠ **Do not use medium-pressure nut and ferrules with any other Swagelok tube fittings.**

Tube OD	Alloy 625 Ordering Number	Alloy 2507 Ordering Number	Dimensions	
			D	H
Dimensions, in.				
1/4	625-4FK-NFSET	2507-4FK-NFSET	0.69	1.43
3/8	625-6FK-NFSET	2507-6FK-NFSET	0.81	1.72
1/2	625-8FK-NFSET	2507-8FK-NFSET	1.00	1.97
3/4	625-12FK-NFSET	2507-12FK-NFSET	1.60	2.59

Multihead Hydraulic Swaging Unit (MHSU)

- Preswages Swagelok 3/4 in. medium-pressure ferrules onto tubing
- Is standard with a tube marking feature to indicate when tube is properly bottomed
- Requires the 1 in./25mm and over MHSU unit and medium-pressure tooling

⚠ **The MHSU cannot be used for preswaging 1/2 in. and under medium-pressure fittings.**

1 in./25 mm and Over MHSU Unit Components

- Multihead hydraulic swaging unit
- 6 ft (1.8 m) hydraulic hose
- Retaining ring pliers
- Safety glasses
- Operating instructions
- Carrying case

Medium-Pressure Tooling Kit Components

- Die head set for Swagelok 3/4 in. medium-pressure tube fitting
- Gap inspection gauge

Description	Ordering Number
MHSU only (1 in./25 mm and over size)	MS-MHSU-O-E
3/4 in. medium-pressure tooling	MS-MHSUT-O-12FK-M

See the Swagelok *Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-01-140, for more information about the MHSU.

See the Swagelok *Multihead Hydraulic Swaging Unit (MHSU) Setup and Operating Instructions,* MS-12-37, for instructions.

Tools and Accessories

Preswaging Tool

For Swagelok tube fitting installations in close quarters, the Swagelok preswaging tool is a convenient accessory.

Tube OD	Ordering Number
Dimensions, in.	
1/4	MS-ST-4FK0
3/8	MS-ST-6FK0
1/2	MS-ST-8FK0

Depth Marking Tool

Swagelok depth marking tools help ensure that tubing is bottomed on the shoulder inside the Swagelok tube fitting body.

Tube OD	Ordering Number
Dimensions, in.	
1/4	MS-DMT-4FK0
3/8	MS-DMT-6FK0
1/2	MS-DMT-8FK0
3/4	MS-DMT-12FK0

Medium-Pressure Gap Inspection Gauge

The Swagelok medium-pressure gap inspection gauge assures the installer or inspector that the fitting has been sufficiently pulled up on initial installation, whether using a torque wrench, standard wrench tightening, or preswaging with the MHSU.

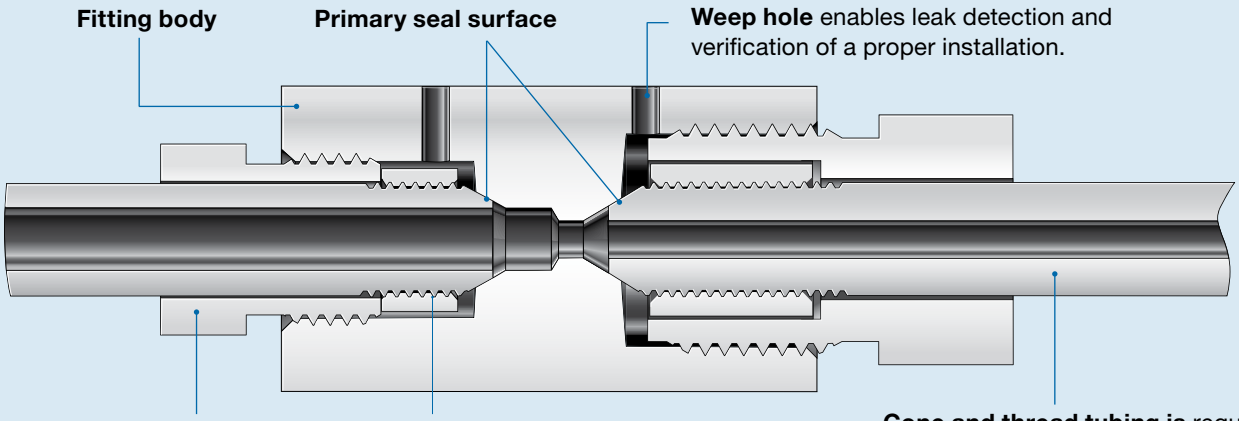
⚠ **The medium-pressure gap inspection gauge is different from the gap gauge for all other Swagelok tube fittings.**

Tube OD in.	Ordering Number
1/4, 3/8, 1/2	MS-IG-FK0
3/4	MS-IG-12FK0

Cone and Thread Fitting—IPT Series

Medium-pressure cone and thread end connection shown on left side of fitting

High-pressure cone and thread end connection shown on right side of fitting



Cone and Thread Fittings—IPT Series

Features

- All C&T adapters and couplings materials meet NACE MR0175/ISO 15156.
  - Alloy 2507 NORSOK M-630 and M-650
- Sizes available:
  - Medium-pressure—1/4 to 1 1/2 in.
  - High-pressure—1/4 to 9/16 in.

Pressure Ratings

Working pressure ratings are calculated from S values based on ASME B31.3 Process Piping, Chapter IX High Pressure Piping calculations.

Pressure ratings are dependent on the end connection or system component with the lowest pressure rating.

Ratings apply to annealed materials listed in the **Materials of Construction**.

For lower temperature use, see Alloy 2507 **Low-Temperature Ratings**.

- **Medium-pressure cone and thread end connections:**
  - Alloy 2507 rated up to 20 000 psig (1378 bar).
  - Alloy 625 rated up to 15 000 (1034) bar.
- **High-pressure cone and thread end connections:**
  - Alloy 2507 rated up to 40 000 psig (2756 bar).
  - Alloy 625 rated up to 36 000 (2480) bar.

Pressure Ratings

Elevated Temperature Factors

Temperature		Elevated Temperature Factors①	
		Annealed Alloy 625 Grade 1	Annealed Alloy 2507
°F	°C	B31.3 Chapter IX	B31.3 Chapter IX
150	66	1.00	1.00
200	93		0.98
250	121		0.93
300	149		0.90
400	204		0.84
500	260	0.98	0.81②
600	315	0.95	—
700	371	0.93	

① Elevated temperature factor = suggested allowable working pressure at elevated temperature / suggested allowable working pressure at room temperature.

② Alloy 2507 Super Duplex Tubing has a maximum temperature rating of 482°F (250°C).

Example: 1/4 in. annealed alloy 625 medium pressure Cone and Thread coupling at 500°F (260°C):

The elevated temperature factor for 500°F (260°C) is 0.98.

15 000 psig (1034 bar) × 0.98 is 14 700 psig (1014 bar).

The allowable working pressure for 1/4 in. annealed alloy 625 medium pressure Cone and Thread coupling at 500°F (260°C) is 14 700 psig (1014 bar).

Alloy 2507 Low-Temperature Ratings

Fitting pressure ratings are for metal temperatures from –50 to 100°F (–46 to 37°C), based on –50°F (–46°C) impact tests performed on 2507 bar and forgings.

However, the NORSOK M-001 Materials Selection standard allows this tubing to be used at a minimum temperature of –50°F (–46°C). According to the NORSOK M-630 Material Data Sheets for Piping, 2507 tubing does not have to undergo low-temperature impact testing so long as wall thicknesses are below 0.236 in. (6 mm).

Materials of Construction

Component	Material/ASTM Specification	
	Annealed Alloy 2507	Grade 1 Annealed Alloy 625
Body	*ASTM A479*	*ASTM B446*
Gland	ASTM A479	ASTM B446
Collar	ASTM A479	ASTM B446

Wetted components listed in *italics*.

Tubing/Fitting Compatibility

For Tubing/Fitting Compatibility Matrix on page 8.

Alloy Tubing Selection

- High-quality, fully annealed alloy 625 tubing ASTM B444 Grade 1 or equivalent. Hardness not exceeding 25 HRC.
- High-quality, fully annealed alloy 2507 super duplex tubing, ASTM A789 or equivalent. Hardness not to exceed 32 HRC.
- Tubing to be free of detectable seams, laps, flaws, and fissures.
- Tubing shall meet the dimensions shown with total included run-out between the ID and OD not to exceed 10% of the average wall.

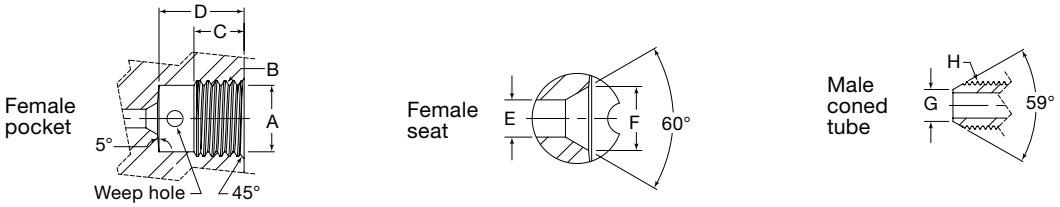
Fractional Tube OD in.	Nominal Tube OD in.	Nominal Tube ID in.	Pressure Rating psig (bar)	
			Alloy 2507	Alloy 625
Medium Pressure				
1/4	0.248 – 0.243	0.104 – 0.109	20 000 (1378)	15 000 (1037)
3/8	0.370 – 0.365	0.198 – 0.203		
9/16	0.557 – 0.552	0.307 – 0.312		
3/4	0.745 – 0.740	0.432 – 0.438		
1	0.995 – 0.990	0.557 – 0.562		
1 1/2	1.495 – 1.490	0.932 – 0.937	15 000 (1037)	—
High Pressure				
1/4	0.248 – 0.243	0.079 – 0.083	40 000 (2756)	36 000 (2480)
3/8	0.370 – 0.365	0.121 – 0.125		
9/16	0.557 – 0.552	0.182 – 0.187		

Cleaning and Packaging

All cone and thread fittings are cleaned in accordance with Swagelok *Standard Cleaning and Packaging (SC-10),* MS-06-62.

Dimensions—Cone & Thread End Connections

- Dimensions are for reference only and are subject to change.
- Dimensions are the same as stainless steel design.



Fitting Size in.	Dimensions, in. (mm)								
	A	B	C	D	E	F	G	H	Tube Engagement Length
Medium Pressure									
1/4	0.39 (9.9)	7/16-20	0.28 (7.1)	0.50 (12.7)	0.11 (2.8)	0.19 (4.6)	0.14 (3.6)	1/4-28	0.56 (14.2)
3/8	0.52 (13.2)	9/16-18	0.38 (9.7)	0.63 (16.0)	0.20 (5.1)	0.31 (7.9)	0.25 (6.4)	3/8-24	0.69 (17.5)
9/16	0.75 (19.0)	13/16-16	0.44 (11.2)	0.75 (19.0)	0.31 (7.9)	0.50 (12.7)	0.41 (10.4)	9/16-18	0.84 (21.3)
3/4	0.95 (24.1)	3/4-14 NPSM	0.70 (17.8)	0.94 (23.9)	0.44 (11.2)	0.63 (16.0)	0.56 (14.2)	3/4-16	1.00 (25.4)
1	1.30 (33.0)	1 3/8-12	0.81 (20.6)	1.31 (33.3)	0.56 (14.2)	0.88 (22.4)	0.72 (18.3)	1-14	1.47 (37.3)
1 1/2	1.80 (45.6)	1 7/8-12	1.00 (25.4)	1.60 (40.6)	0.94 (23.8)	1.35 (34.3)	1.13 (28.6)	1 1/2-12	1.81 (46.0)
High Pressure									
1/4	0.52 (13.2)	9/16-18	0.38 (9.7)	0.44 (11.2)	0.09 (2.3)	0.17 (4.3)	0.13 (3.3)	1/4-28	0.50 (12.7)
3/8	0.69 (17.5)	3/4-16	0.53 (13.5)	0.63 (16.0)	0.13 (3.3)	0.27 (6.9)	0.22 (5.6)	3/8-24	0.69 (17.5)
9/16	1.05 (26.7)	1 1/8-12	0.62 (15.7)	0.75 (19.0)	0.19 (4.6)	0.38 (9.7)	0.28 (7.1)	9/16-18	0.88 (22.4)

⚠ **When interchanging antivibration glands, it is recommended to install per the gland manufactures instructions.**

Ordering Information and Dimensions

- Alloy cone and thread fittings are not supplied with collars and glands. Collar and glands must be ordered separately. See page 26.
- Collar and glands are shown for dimensional purposes only; dimensions are shown with cone and thread glands finger-tight.
- Dimensions are for reference only and are subject to change.
- Build an alloy cone and thread fitting ordering number by combining the designators as shown below.

1 Basic Ordering Number

2 Cone and Thread Pressure Rating
20 = Alloy 2507, MP
40 = Alloy 2507, HP
15 = Alloy 625, MP
36 = Alloy 625, HP

3 Cone and Thread Material
2507 = Alloy 2507
625 = Alloy 625

4 Nace Compliant Standard
NACE

1		2		3		4
CN6MF		**20**	-	**2507**	-	**NACE**

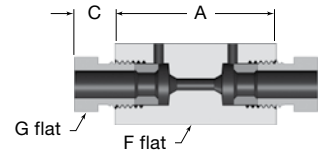
No pressure rating required for collars, glands, caps or plugs.

For adapters and couplings use pressure ratings from table (pages 27-35).

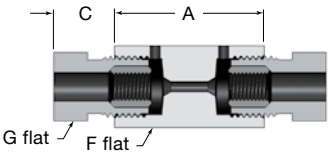
Example: CN4MF**15-625-NACE**

Couplings

Medium Pressure



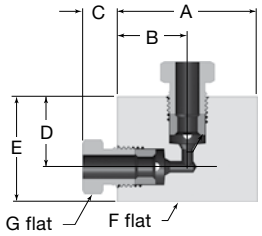
High Pressure



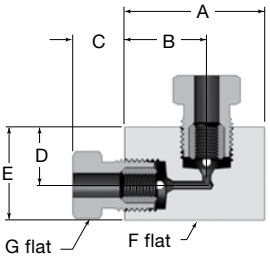
Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)			
		A	C	F	G
Medium Pressure					
1/4	CN4MF	1.50 (38.1)	0.38 (9.7)	3/4	1/2
3/8	CN6MF	1.75 (44.5)	0.48 (12.2)	3/4	5/8
9/16	CN9MF	2.12 (53.8)	0.68 (17.3)	1	7/8
3/4	CN12MF	2.50 (63.5)	0.59 (15.0)	1 3/8	1 3/16
1	CN16MF	3.50 (88.9)	0.74 (18.8)	1 3/4	1 3/8
1 1/2	CN24MF	4.38 (111.2)	1.10 (27.9)	2 1/4	1 7/8
High Pressure					
1/4	CN4HF	1.38 (35.1)	0.59 (15.0)	3/4	5/8
3/8	CN6HF	1.75 (44.5)	0.72 (18.3)	1	13/16
9/16	CN9HF	2.25 (57.2)	1.00 (25.4)	1 3/8	1 3/16

Elbows

Medium Pressure



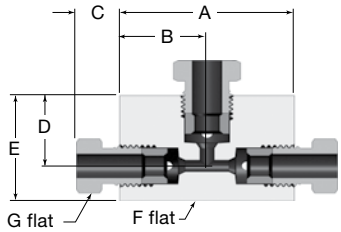
High Pressure



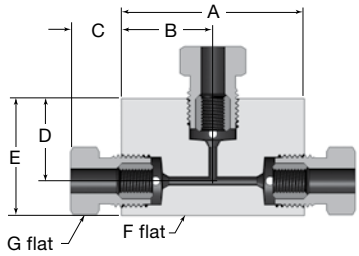
Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)						
		A	B	C	D	E	F	G
Medium Pressure								
1/4	L4MF	1.50 (38.1)	0.75 (19.1)	0.38 (9.7)	0.75 (19.1)	1.13 (28.6)	5/8	1/2
3/8	L6MF	2.00 (50.8)	1.00 (25.4)	0.48 (12.2)	1.00 (25.4)	1.38 (35.1)	3/4	5/8
9/16	L9MF	2.50 (63.5)	1.25 (31.8)	0.68 (17.3)	1.25 (31.8)	1.75 (44.5)	1	7/8
3/4	L12MF	3.00 (76.2)	1.50 (38.1)	0.59 (15)	1.50 (38.1)	2.25 (57.2)	1 3/8	1 3/16
1	L16MF	4.13 (105)	2.06 (52.3)	0.74 (18.8)	2.06 (52.3)	3.00 (76.2)	1 3/4	1 3/8
1 1/2	L24MF	5.75 (146)	2.88 (73.0)	1.10 (27.9)	2.88 (73.0)	4.00 (101.6)	2 1/4	1 7/8
High Pressure								
1/4	L4HF	1.50 (38.1)	0.88 (22.4)	0.59 (15)	0.63 (15.9)	1.00 (25.4)	1	5/8
3/8	L6HF	2.00 (50.8)	1.25 (31.8)	0.72 (18.3)	1.00 (25.4)	1.50 (38.1)	1	13/16
9/16	L9HF	2.62 (66.5)	1.88 (47.6)	1.00 (25.4)	1.13 (28.6)	1.88 (47.6)	1 1/2	1 3/16

Tees

Medium Pressure



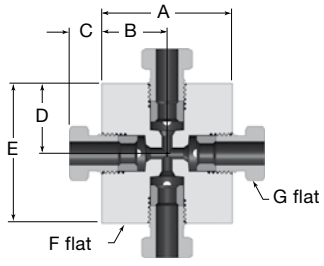
High Pressure



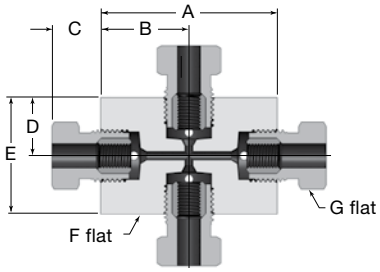
Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)						
		A	B	C	D	E	F	G
Medium Pressure								
1/4	T4MF	1.50 (38.1)	0.75 (19.1)	0.38 (9.7)	0.75 (19.1)	1.13 (28.6)	5/8	1/2
3/8	T6MF	2.00 (50.8)	1.00 (25.4)	0.48 (12.2)	1.00 (25.4)	1.38 (35.1)	3/4	5/8
9/16	T9MF	2.50 (63.5)	1.25 (31.8)	0.68 (17.3)	1.25 (31.8)	1.75 (44.5)	1	7/8
3/4	T12MF	3.00 (76.2)	1.50 (38.1)	0.59 (15)	1.50 (38.1)	2.25 (57.2)	1 3/8	1 3/16
1	T16MF	4.12 (105)	2.06 (52.3)	0.74 (18.8)	2.06 (52.3)	3.00 (76.2)	1 3/4	1 3/8
1 1/2	T24MF	5.75 (146)	2.88 (73.0)	1.10 (27.9)	2.88 (73.0)	4.00 (101.6)	2 1/4	1 7/8
High Pressure								
1/4	T4HF	2.00 (50.8)	1.00 (25.4)	0.59 (15)	0.88 (22.4)	1.25 (31.8)	1	5/8
3/8	T6HF	2.00 (50.8)	1.00 (25.4)	0.72 (18.3)	1.06 (27.0)	1.56 (39.6)	1	13/16
9/16	T9HF	2.62 (66.5)	1.31 (33.3)	1.00 (25.4)	1.38 (34.9)	2.12 (53.8)	1 1/2	1 3/16

Crosses

Medium Pressure



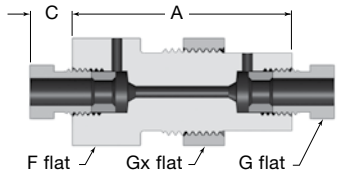
High Pressure



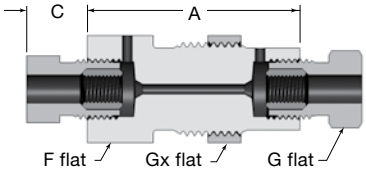
Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)						
		A	B	C	D	E	F	G
Medium Pressure								
1/4	X4MF	1.50 (38.1)	0.75 (19.1)	0.38 (9.7)	0.75 (19.1)	1.50 (38.1)	5/8	1/2
3/8	X6MF	2.00 (50.8)	1.00 (25.4)	0.48 (12.2)	1.00 (25.4)	2.00 (50.8)	3/4	5/8
9/16	X9MF	2.50 (63.5)	1.25 (31.8)	0.68 (17.3)	1.25 (31.8)	2.50 (63.5)	1	7/8
3/4	X12MF	3.00 (76.2)	1.50 (38.1)	0.59 (15)	1.50 (38.1)	3.00 (76.2)	1 3/8	1 3/16
1	X16MF	4.12 (105)	2.06 (52.3)	0.74 (18.8)	2.06 (52.3)	4.12 (105)	1 3/4	1 3/8
High Pressure								
1/4	X4HF	2.00 (50.8)	1.00 (25.4)	0.59 (15.0)	0.63 (16.0)	1.25 (31.8)	1	5/8
3/8	X6HF	2.00 (50.8)	1.00 (25.4)	0.72 (18.3)	1.06 (27.0)	2.12 (53.8)	1	13/16
9/16	X9HF	2.62 (66.5)	1.31 (33.3)	1.00 (25.4)	1.38 (34.9)	2.75 (69.8)	1 1/2	1 3/16

Bulkheads

Medium Pressure



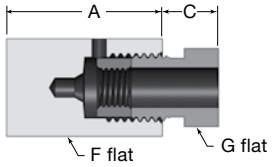
High Pressure



Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)						
		A	C	F	G	Gx	Panel Hole Size	Panel Thickness Max
Medium Pressure								
1/4	BH4MF	2.00 (50.8)	0.38 (9.7)	1	1/2	1	0.88 (22.4)	0.38 (9.7)
3/8	BH6MF	2.00 (50.8)	0.48 (12.2)	1	5/8	1	0.94 (23.9)	0.38 (9.7)
9/16	BH9MF	2.62 (66.5)	0.68 (17.3)	1 3/8	7/8	1 3/8	1.25 (31.8)	0.50 (12.7)
3/4	BH12MF	2.62 (66.5)	0.59 (15)	1 7/8	1 3/16	1 7/8	1.69 (42.9)	0.38 (9.7)
1	BH16MF	3.50 (88.9)	0.74 (18.8)	2 1/8	1 3/8	2 1/8	2.00 (50.8)	0.50 (12.7)
High Pressure								
1/4	BH4HF	2.00 (50.8)	0.59 (15.0)	1	5/8	1	0.94 (23.9)	0.50 (12.7)
3/8	BH6HF	2.38 (40.5)	0.72 (18.3)	1 3/8	13/16	1 3/8	1.12 (28.4)	0.38 (9.7)
9/16	BH9HF	2.75 (69.9)	1.00 (25.4)	1 7/8	1 3/16	1 7/8	1.75 (44.5)	0.62 (15.7)

Caps and Plugs

Caps

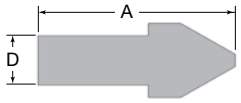


Medium-pressure configuration shown

Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)			
		A	C	F	G
Medium Pressure					
1/4	CA4M	1.00 (25.4)	0.38 (9.7)	5/8	1/2
3/8	CA6M	1.25 (31.8)	0.48 (12.2)	3/4	5/8
9/16	CA9M	1.50 (38.1)	0.68 (17.3)	1	7/8
3/4	CA12M	1.75 (44.5)	0.59 (15)	1 3/8	1 3/16
1	CA16M	2.25 (57.2)	0.74 (18.8)	1 3/4	1 3/8
High Pressure					
1/4	CA4H	1.06 (27.0)	0.59 (15)	3/4	5/8
3/8	CA6H	1.25 (31.8)	0.72 (18.3)	1	13/16
9/16	CA9H	1.62 (41.2)	1.00 (25.4)	1 3/8	1 3/16

Caps are manufactured with two or four flats.

Plugs



Tube OD in.	Basic Ordering Number	Dimensions, in. (mm)	
		A	D
Medium Pressure			
1/4	PL4M-	1.00 (25.4)	0.25 (6.4)
3/8	PL6M-	1.25 (31.8)	0.38 (9.5)
9/16	PL9M-	1.56 (39.6)	0.56 (14.2)
3/4	PL12M-	1.62 (41.2)	0.75 (19.5)
1	PL16M-	2.19 (55.6)	1.00 (25.4)
1 1/2	PL24M-	3.01 (76.5)	1.50 (38.1)
High Pressure			
1/4	PL4H-	1.16 (29.4)	0.25 (6.4)
3/8	PL6H-	1.56 (39.6)	0.38 (9.5)
9/16	PL9H-	2.00 (50.8)	0.56 (14.2)

Collars and Glands

Collars

Glands

Tube OD in.	Basic Ordering Number		
	Collar	Gland	Antivibration Gland
Medium Pressure			
1/4	CL4M-	GL4M-	AV4M-
3/8	CL6M-	GL6M-	AV6M-
9/16	CL9M-	GL9M-	AV9M-
3/4	CL12M-	GL12M-	AV12M-
1	CL16M-	GL16M-	AV16M-
1 1/2	CL24M-	GL24M-	AV24M-
High Pressure			
1/4	CL4H-	GL4H-	AV4H-
3/8	CL6H-	GL6H-	AV6H-
9/16	CL9H-	GL9H-	AV9H-

To order collars and glands in 316 stainless steel, see the Swagelok *Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories* catalog, MS-02-472.

Antivibration Glands

Medium-pressure antivibration glands include the antivibration gland nut, collet body and collet.
Example: AV6M-625-NACE

High-pressure antivibration glands include the antivibration gland nut and collet.
Example: AV6H-2507-NACE

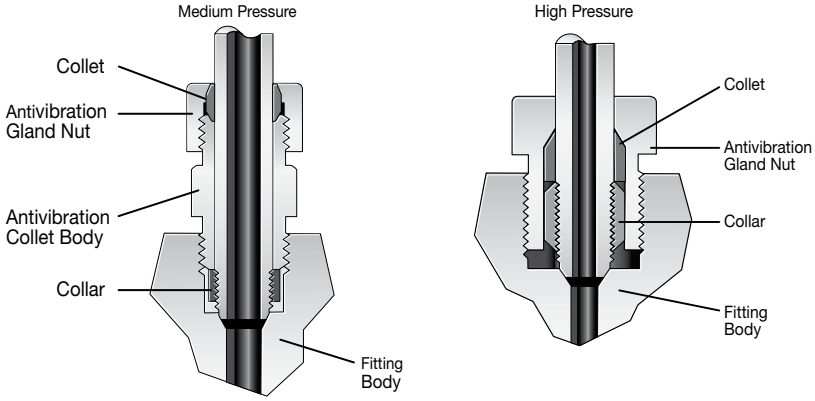
Options and Accessories

Antivibration

For systems that experience shock or vibration, it is recommended to use antivibration components to help extend the life of the tubing connection

Antivibration connection components are available for all cone and thread fittings. To order, add **-AV** to the ordering number.

Example: CN4MF20-**AV**



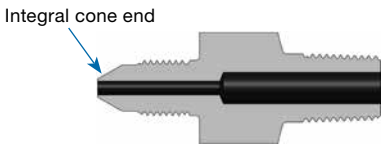
Cone and Thread Adapters and Couplings—IPT Series

Features

- End connection types include
  - NPT
  - Medium-pressure cone and thread (C&T)
  - High-pressure cone and thread (C&T).

- All C&T adapters and couplings materials meet NACE MR0175/ISO 15156.
  - Alloy 2507 NORSOK M-630 and M-650
- Sizes available:
  - Medium-pressure—1/4 to 1 1/2 in.
  - High-pressure—1/4 to 9/16 in.
- C&T adapters and couplings are available in one piece design *only.*

One-piece Design

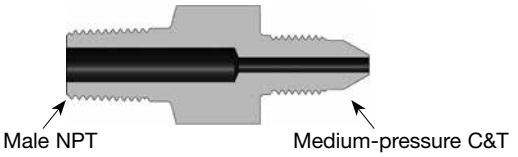


- One-piece design is standard for alloy fittings.
- Features integral cone end on body for ease of assembly.

Ordering Information

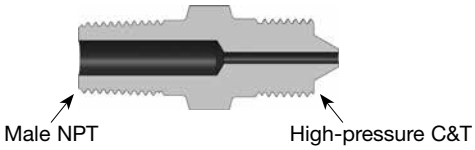
Male-to-Male Adapters and Couplings

Male NPT to Medium-Pressure Cone and Thread



Male NPT Size in.	Medium-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NM4MM	15 000 (1034)	12 000 (826)
	3/8	CN4NM6MM		
	9/16	CN4NM9MM		
	3/4	CN4NM12MM		
	1	CN4NM16MM		
3/8	1/4	CN6NM4MM	15 000 (1034)	12 000 (826)
	3/8	CN6NM6MM		
	9/16	CN6NM9MM		
	3/4	CN6NM12MM		
	1	CN6NM16MM		
1/2	1/4	CN8NM4MM	15 000 (1034)	12 000 (826)
	3/8	CN8NM6MM		
	9/16	CN8NM9MM		
	3/4	CN8NM12MM		
	1	CN8NM16MM		
3/4	1/4	CN12NM4MM	10 000 (689)	10 000 (689)
	3/8	CN12NM6MM		
	9/16	CN12NM9MM		
	3/4	CN12NM12MM		
	1	CN12NM16MM		
1	1/4	CN16NM4MM	10 000 (689)	10 000 (689)
	3/8	CN16NM6MM		
	9/16	CN16NM9MM		
	3/4	CN16NM12MM		
	1	CN16NM16MM		

Male NPT to High-Pressure Cone and Thread



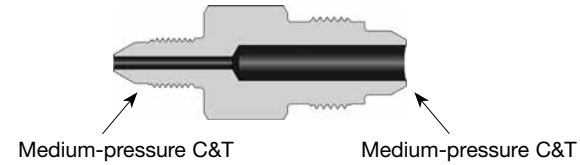
Male NPT Size in.	High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NM4HM	15 000 (1034)	12 000 (826)
	3/8	CN4NM6HM		
	9/16	CN4NM9HM		
3/8	1/4	CN6NM4HM	15 000 (1034)	12 000 (826)
	3/8	CN6NM6HM		
	9/16	CN6NM9HM		
1/2	1/4	CN8NM4HM	15 000 (1034)	12 000 (826)
	3/8	CN8NM6HM		
	9/16	CN8NM9HM		
3/4	1/4	CN12NM4HM	10 000 (689)	10 000 (689)
	3/8	CN12NM6HM		
	9/16	CN12NM9HM		
1	1/4	CN16NM4HM	10 000 (689)	10 000 (689)
	3/8	CN16NM6HM		
	9/16	CN16NM9HM		

Male NPT to Male NPT

Male NPT Size in.	Male NPT Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NM	15 000 (1034)	12 000 (826)
	3/8	CN4NM6NM		
	1/2	CN4NM8NM		
	3/4	CN4NM12NM	10 000 (689)	10 000 (689)
	1	CN4NM16NM		
3/8	3/8	CN6NM	15 000 (1034)	12 000 (826)
	1/2	CN6NM8NM		
	3/4	CN6NM12NM	10 000 (689)	10 000 (689)
	1	CN6NM16NM		
1/2	1/2	CN8NM	15 000 (1034)	12 000 (826)
	3/4	CN8NM12NM	10 000 (689)	10 000 (689)
	1	CN8NM16NM		
3/4	3/4	CN12NM	10 000 (689)	10 000 (689)
	1	CN12NM16NM		
1	1	CN16NM	10 000 (689)	10 000 (689)

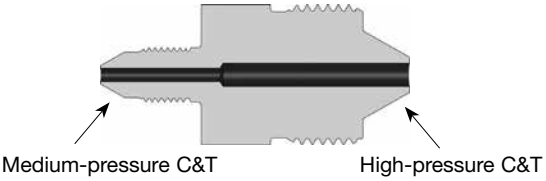
Male-to-Male Adapters and Couplings

Medium-Pressure Cone and Thread to Medium-Pressure Cone and Thread



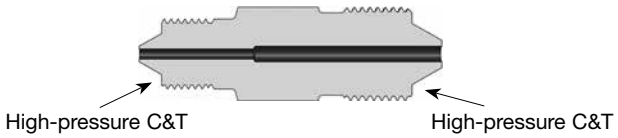
Medium-Pressure C&T Size in.	Medium-Pressure C&T Size in.	Basic Ordering Numberr	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MM	20 000 (1378)	15 000 (1034)
	3/8	CN4MM6MM		
	9/16	CN4MM9MM		
	3/4	CN4MM12MM		
	1	CN4MM16MM		
3/8	3/8	CN6MM	20 000 (1378)	15 000 (1034)
	9/16	CN6MM9MM		
	3/4	CN6MM12MM		
	1	CN6MM16MM		
9/16	9/16	CN9MM	20 000 (1378)	15 000 (1034)
	3/4	CN9MM12MM		
	1	CN9MM16MM		
3/4	3/4	CN12MM	20 000 (1378)	15 000 (1034)
	1	CN12MM16MM		
1	1	CN16MM	20 000 (1378)	15 000 (1034)

Medium-Pressure Cone and Thread to High-Pressure Cone and Thread



Medium-Pressure C&T Size in.	High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MM4HM	20 000 (1378)	15 000 (1034)
	3/8	CN4MM6HM		
	9/16	CN4MM9HM		
3/8	1/4	CN6MM4HM	20 000 (1378)	15 000 (1034)
	3/8	CN6MM6HM		
	9/16	CN6MM9HM		
9/16	1/4	CN9MM4HM	20 000 (1378)	15 000 (1034)
	3/8	CN9MM6HM		
	9/16	CN9MM9HM		
3/4	1/4	CN12MM4HM	20 000 (1378)	15 000 (1034)
	3/8	CN12MM6HM		
	9/16	CN12MM9HM		
1	1/4	CN16MM4HM	20 000 (1378)	15 000 (1034)
	3/8	CN16MM6HM		
	9/16	CN16MM9HM		

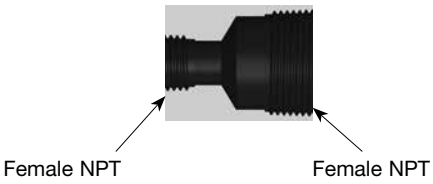
High-Pressure Cone and Thread to High-Pressure Cone and Thread



High-Pressure C&T Size in.	High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4HM	40 000 (2756)	36 000 (2480)
	3/8	CN4HM6HM		
	9/16	CN4HM9HM		
3/8	3/8	CN6HM	40 000 (2756)	36 000 (2480)
	9/16	CN6HM9HM		
9/16	9/16	CN9HM	40 000 (2756)	36 000 (2480)

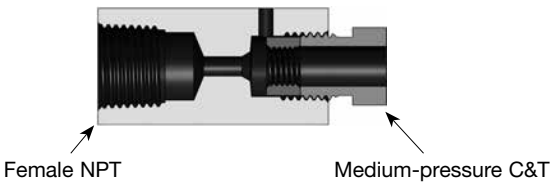
Female-to-Female Adapters and Couplings

Female NPT to Female NPT



Female NPT Size in.	Female NPT Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NF	15 000 (1034)	12 000 (826)
	3/8	CN4NF6NF		
	1/2	CN4NF8NF		
	3/4	CN4NF12NF	10 000 (689)	10 000 (689)
	1	CN4NF16NF		
3/8	3/8	CN6NF	15 000 (1034)	12 000 (826)
	1/2	CN6NF8NF		
	3/4	CN6NF12NF	10 000 (689)	10 000 (689)
	1	CN6NF16NF		
1/2	1/2	CN8NF	15 000 (1034)	12 000 (826)
	3/4	CN8NF12NF	10 000 (689)	10 000 (689)
	1	CN8NF16NF		
3/4	3/4	CN12NF	10 000 (689)	10 000 (689)
	1	CN12NF16NF		
1	1	CN16NF	10 000 (689)	10 000 (689)

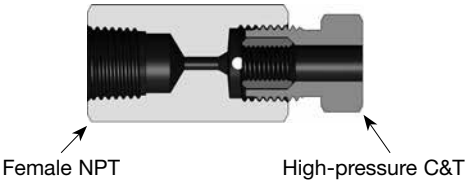
Female NPT to Medium-Pressure Cone and Thread



Female NPT Size in.	Medium-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NF4MF	15 000 (1034)	12 000 (826)
	3/8	CN4NF6MF		
	9/16	CN4NF9MF		
	3/4	CN4NF12MF		
	1	CN4NF16MF		
3/8	1/4	CN6NF4MF	15 000 (1034)	12 000 (826)
	3/8	CN6NF6MF		
	9/16	CN6NF9MF		
	3/4	CN6NF12MF		
	1	CN6NF16MF		
1/2	1/4	CN8NF4MF	15 000 (1034)	12 000 (826)
	3/8	CN8NF6MF		
	9/16	CN8NF9MF		
	3/4	CN8NF12MF		
	1	CN8NF16MF		
3/4	1/4	CN12NF4MF	10 000 (689)	10 000 (689)
	3/8	CN12NF6MF		
	9/16	CN12NF9MF		
	3/4	CN12NF12MF		
	1	CN12NF16MF		
1	1/4	CN16NF4MF	10 000 (689)	10 000 (689)
	3/8	CN16NF6MF		
	9/16	CN16NF9MF		
	3/4	CN16NF12MF		
	1	CN16NF16MF		

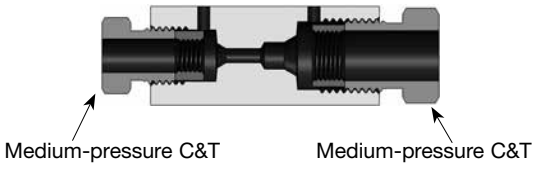
Female-to-Female Adapters and Couplings

Female NPT to High-Pressure Cone and Thread



Female NPT Size in.	HP C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NF4HF	15 000 (1034)	12 000 (826)
	3/8	CN4NF6HF		
	9/16	CN4NF9HF		
3/8	1/4	CN6NF4HF	15 000 (1034)	12 000 (826)
	3/8	CN6NF6HF		
	9/16	CN6NF9HF		
1/2	1/4	CN8NF4HF	15 000 (1034)	12 000 (826)
	3/8	CN8NF6HF		
	9/16	CN8NF9HF		
3/4	1/4	CN12NF4HF	10 000 (689)	10 000 (689)
	3/8	CN12NF6HF		
	9/16	CN12NF9HF		
1	1/4	CN16NF4HF	10 000 (689)	10 000 (689)
	3/8	CN16NF6HF		
	9/16	CN16NF9HF		

Medium-Pressure Cone and Thread to Medium-Pressure Cone and Thread

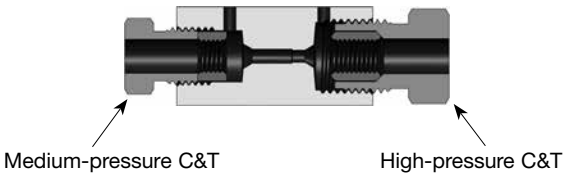


Medium-Pressure C&T Size in.	Medium-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MF	20 000 (1378)	15 000 (1034)
	3/8	CN4MF6MF		
	9/16	CN4MF9MF		
	3/4	CN4MF12MF		
	1	CN4MF16MF		
3/8	3/8	CN6MF	20 000 (1378)	15 000 (1034)
	9/16	CN6MF9MF		
	3/4	CN6MF12MF		
	1	CN6MF16MF		
9/16	9/16	CN9MF	20 000 (1378)	15 000 (1034)
	3/4	CN9MF12MF		
	1	CN9MF16MF		
3/4	3/4	CN12MF	20 000 (1378)	15 000 (1034)
	1	CN12MF16MF		
1	1	CN16MF	20 000 (1378)	15 000 (1034)

Manufactured with two or four flats.

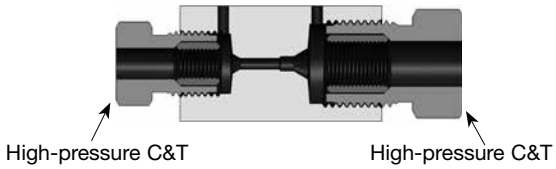
Female-to-Female Adapters and Couplings

Medium-Pressure Cone and Thread to High-Pressure Cone and Thread



Medium-Pressure C&T Size in.	High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MF4HF	20 000 (1378)	15 000 (1034)
	3/8	CN4MF6HF		
	9/16	CN4MF9HF		
3/8	1/4	CN6MF4HF	20 000 (1378)	15 000 (1034)
	3/8	CN6MF6HF		
	9/16	CN6MF9HF		
9/16	1/4	CN9MF4HF	20 000 (1378)	15 000 (1034)
	3/8	CN9MF6HF		
	9/16	CN9MF9HF		
3/4	1/4	CN12MF4HF	20 000 (1378)	15 000 (1034)
	3/8	CN12MF6HF		
	9/16	CN12MF9HF		
1	1/4	CN16MF4HF	20 000 (1378)	15 000 (1034)
	3/8	CN16MF6HF		
	9/16	CN16MF9HF		

High-Pressure Cone and Thread to High-Pressure Cone and Thread



High-Pressure C&T Size in.	High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4HF	40 000 (2756)	36 000 (2480)
	3/8	CN4HF6HF		
	9/16	CN4HF9HF		
3/8	1/4	CN4HF6HF	40 000 (2756)	36 000 (2480)
	3/8	CN6HF		
	9/16	CN6HF9HF		
9/16	1/4	CN4HF9HF	40 000 (2756)	36 000 (2480)
	3/8	CN6HF9HF		
	9/16	CN9HF		

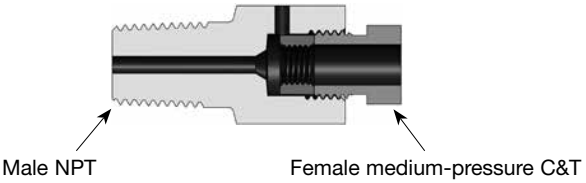
Manufactured with two or four flats.

Male-to-Female Adapters and Couplings

Male NPT to Female NPT

Male NPT Size in.	Female NPT Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NM4NF	15 000 (1034)	12 000 (826)
	3/8	CN4NM6NF		
	1/2	CN4NM8NF		
	3/4	CN4NM12NF	10 000 (689)	10 000 (689)
	1	CN4NM16NF		
3/8	1/4	CN6NM4NF	15 000 (1034)	12 000 (826)
	3/8	CN6NM6NF		
	1/2	CN6NM8NF		
	3/4	CN6NM12NF	10 000 (689)	10 000 (689)
	1	CN6NM16NF		
1/2	1/4	CN8NM4NF	15 000 (1034)	12 000 (826)
	3/8	CN8NM6NF		
	1/2	CN8NM8NF		
	3/4	CN8NM12NF	10 000 (689)	10 000 (689)
	1	CN8NM16NF		
3/4	1/4	CN12NM4NF	10 000 (689)	10 000 (689)
	3/8	CN12NM6NF		
	1/2	CN12NM8NF		
	3/4	CN12NM12NF		
	1	CN12NM16NF		
1	1/4	CN16NM4NF	10 000 (689)	10 000 (689)
	3/8	CN16NM6NF		
	1/2	CN16NM8NF		
	3/4	CN16NM12NF		
	1	CN16NM16NF		

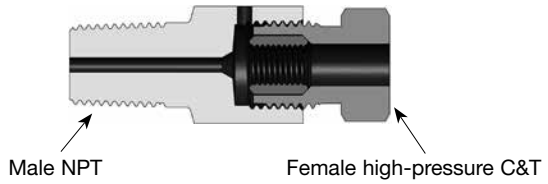
Male NPT to Medium-Pressure Cone and Thread



Male NPT Size in.	Female Medium-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NM4MF	15 000 (1034)	12 000 (826)
	3/8	CN4NM6MF		
	9/16	CN4NM9MF		
	3/4	CN4NM12MF		
	1	CN4NM16MF		
3/8	1/4	CN6NM4MF	15 000 (1034)	12 000 (826)
	3/8	CN6NM6MF		
	9/16	CN6NM9MF		
	3/4	CN6NM12MF		
	1	CN6NM16MF		
1/2	1/4	CN8NM4MF	15 000 (1034)	12 000 (826)
	3/8	CN8NM6MF		
	9/16	CN8NM9MF		
	3/4	CN8NM12MF		
	1	CN8NM16MF		
3/4	1/4	CN12NM4MF	10 000 (689)	10 000 (689)
	3/8	CN12NM6MF		
	9/16	CN12NM9MF		
	3/4	CN12NM12MF		
	1	CN12NM16MF		
1	1/4	CN16NM4MF	10 000 (689)	10 000 (689)
	3/8	CN16NM6MF		
	9/16	CN16NM9MF		
	3/4	CN16NM12MF		
	1	CN16NM16MF		

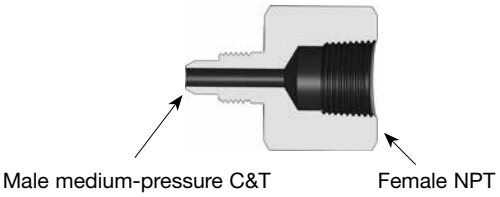
Male-to-Female Adapters and Couplings

Male NPT to High-Pressure Cone and Thread



Male NPT Size in.	Female High-Pressure C&T Size in.	Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4NM4HF	15 000 (1034)	12 000 (826)
	3/8	CN4NM6HF		
	9/16	CN4NM9HF		
3/8	1/4	CN6NM4HF	15 000 (1034)	12 000 (826)
	3/8	CN6NM6HF		
	9/16	CN6NM9HF		
1/2	1/4	CN8NM4HF	15 000 (1034)	12 000 (826)
	3/8	CN8NM6HF		
	9/16	CN8NM9HF		
3/4	1/4	CN12NM4HF	10 000 (689)	10 000 (689)
	3/8	CN12NM6HF		
	9/16	CN12NM9HF		
1	1/4	CN16NM4HF	10 000 (689)	10 000 (689)
	3/8	CN16NM6HF		
	9/16	CN16NM9HF		

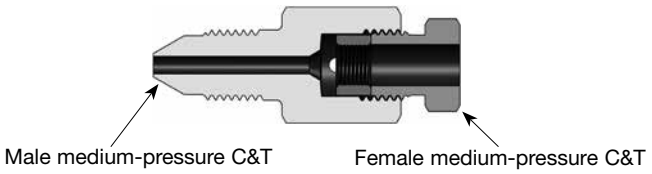
Medium-Pressure Cone and Thread to Female NPT



Male Medium-Pressure C&T Size in.	Female NPT Size in.	Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MM4NF	15 000 (1034)	12 000 (826)
	3/8	CN4MM6NF		
	1/2	CN4MM8NF		
	3/4	CN4MM12NF	10 000 (689)	10 000 (689)
	1	CN4MM16NF		
3/8	1/4	CN6MM4NF	15 000 (1034)	12 000 (826)
	3/8	CN6MM6NF		
	1/2	CN6MM8NF		
	3/4	CN6MM12NF	10 000 (689)	10 000 (689)
	1	CN6MM16NF		
9/16	1/4	CN9MM4NF	15 000 (1034)	12 000 (826)
	3/8	CN9MM6NF		
	1/2	CN9MM8NF		
	3/4	CN9MM12NF	10 000 (689)	10 000 (689)
	1	CN9MM16NF		
3/4	1/4	CN12MM4NF	15 000 (1034)	12 000 (826)
	3/8	CN12MM6NF		
	1/2	CN12MM8NF		
	3/4	CN12MM12NF	10 000 (689)	10 000 (689)
	1	CN12MM16NF		
1	1/4	CN16MM4NF	15 000 (1034)	12 000 (826)
	3/8	CN16MM6NF		
	1/2	CN16MM8NF		
	3/4	CN16MM12NF	10 000 (689)	10 000 (689)
	1	CN16MM16NF		

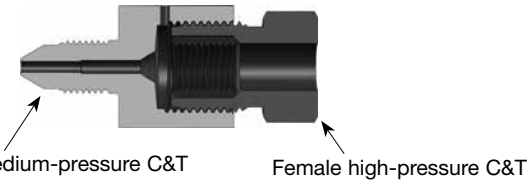
Male-to-Female Adapters and Couplings

Medium-Pressure Cone and Thread to Medium-Pressure Cone and Thread



Male Medium-Pressure C&T Size in.	Female Medium-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN4MM6MF		
	9/16	CN4MM9MF		
	3/4	CN4MM12MF		
	1	CN4MM16MF		
3/8	1/4	CN6MM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN6MM6MF		
	9/16	CN6MM9MF		
	3/4	CN6MM12MF		
	1	CN6MM16MF		
9/16	1/4	CN9MM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN9MM6MF		
	9/16	CN9MM9MF		
	3/4	CN9MM12MF		
	1	CN9MM16MF		
3/4	1/4	CN12MM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN12MM6MF		
	9/16	CN12MM9MF		
	3/4	CN12MM12MF		
	1	CN12MM16MF		
1	1/4	CN16MM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN16MM6MF		
	9/16	CN16MM9MF		
	3/4	CN16MM12MF		
	1	CN16MM16MF		
1 1/2	1/4	CN24MM4MF	15 000 (1034)	
	9/16	CN24MM9MF		
	1	CN24MM16MF		
	1 1/2	CN24MM24MF		

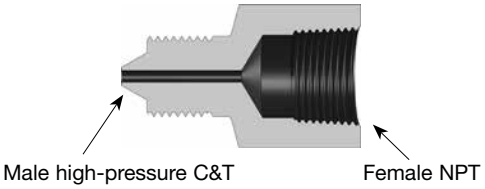
Medium-Pressure Cone and Thread to High-Pressure Cone and Thread



Male Medium-Pressure C&T Size in.	Female High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4MM4HF	20 000 (1378)	15 000 (1034)
	3/8	CN4MM6HF		
	9/16	CN4MM9HF		
3/8	1/4	CN6MM4HF	20 000 (1378)	15 000 (1034)
	3/8	CN6MM6HF		
	9/16	CN6MM9HF		
9/16	1/4	CN9MM4HF	20 000 (1378)	15 000 (1034)
	3/8	CN9MM6HF		
	9/16	CN9MM9HF		
3/4	1/4	CN12MM4HF	20 000 (1378)	15 000 (1034)
	3/8	CN12MM6HF		
	9/16	CN12MM9HF		
1	1/4	CN16MM4HF	20 000 (1378)	15 000 (1034)
	3/8	CN16MM6HF		
	9/16	CN16MM9HF		

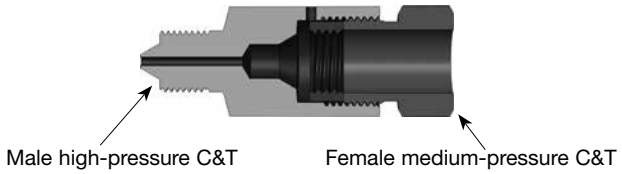
Male-to-Female Adapters and Couplings

High-Pressure Cone and Thread to Female NPT



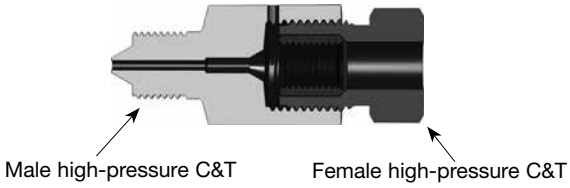
Male High-Pressure C&T Size in.	Female NPT Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4HM4NF	15 000 (1034)	12 000 (826)
	3/8	CN4HM6NF		
	1/2	CN4HM8NF		
	3/4	CN4HM12NF	10 000 (689)	10 000 (689)
	1	CN4HM16NF		
3/8	1/4	CN6HM4NF	15 000 (1034)	12 000 (826)
	3/8	CN6HM6NF		
	1/2	CN6HM8NF		
	3/4	CN6HM12NF	10 000 (689)	10 000 (689)
	1	CN6HM16NF		
9/16	1/4	CN9HM4NF	15 000 (1034)	12 000 (826)
	3/8	CN9HM6NF		
	1/2	CN9HM8NF		
	3/4	CN9HM12NF	10 000 (689)	10 000 (689)
	1	CN9HM16NF		

High-Pressure Cone and Thread to Medium-Pressure Cone and Thread



Male High-Pressure C&T Size in.	Female Medium-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4HM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN4HM6MF		
	9/16	CN4HM9MF		
	3/4	CN4HM12MF		
	1	CN4HM16MF		
3/8	1/4	CN6HM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN6HM6MF		
	9/16	CN6HM9MF		
	3/4	CN6HM12MF		
	1	CN6HM16MF		
9/16	1/4	CN9HM4MF	20 000 (1378)	15 000 (1034)
	3/8	CN9HM6MF		
	9/16	CN9HM9MF		
	3/4	CN9HM12MF		
	1	CN9HM16MF		

High-Pressure Cone and Thread to High-Pressure Cone and Thread



Male High-Pressure C&T Size in.	Female High-Pressure C&T Size in.	Basic Ordering Number	Pressure Ratings	
			Alloy 2507 psig (bar)	Alloy 625 psig (bar)
1/4	1/4	CN4HM4HF	40 000 (2756)	36 000 (2480)
	3/8	CN4HM6HF		
	9/16	CN4HM9HF		
3/8	1/4	CN6HM4HF	40 000 (2756)	36 000 (2480)
	3/8	CN6HM6HF		
	9/16	CN6HM9HF		
9/16	1/4	CN9HM4HF	40 000 (2756)	36 000 (2480)
	3/8	CN9HM6HF		
	9/16	CN9HM9HF		

Installation Instructions

Medium-Pressure Cone and Thread Fitting Assembly

These figures apply to 1/4, 3/8, 9/16, 3/4, 1 and 1 1/2 in. medium-pressure cone and thread fitting sizes.

Fig. 1

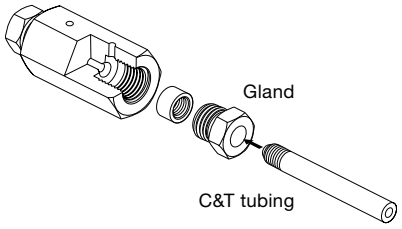


Fig. 2

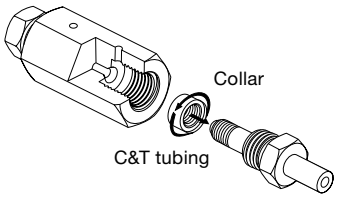


Fig. 3

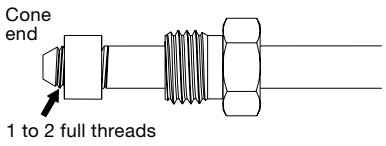


Fig. 4

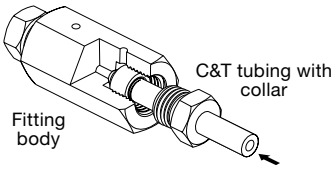


Fig. 5

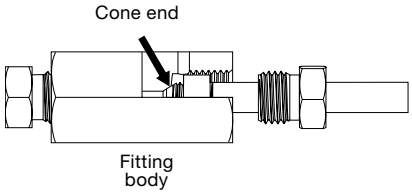
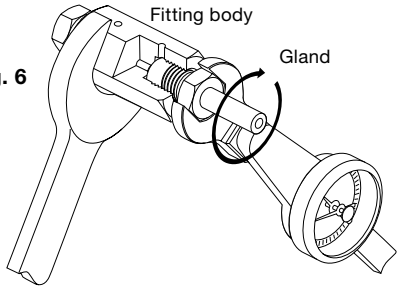


Fig. 6



High-Pressure Cone and Thread Fitting Assembly

These figures apply to 1/4, 3/8, and 9/16 in. high-pressure cone and thread fitting sizes.

Fig. 1

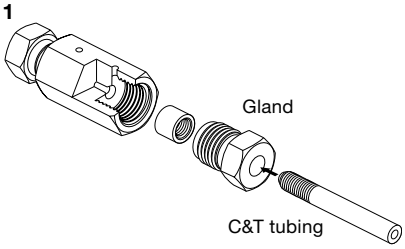


Fig. 2

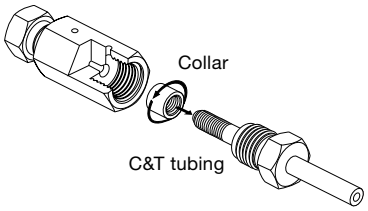


Fig. 3

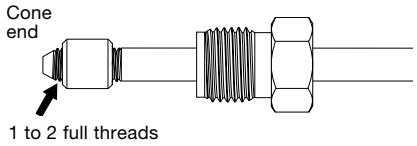


Fig. 4

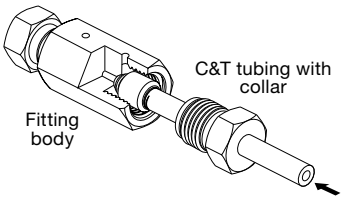


Fig. 5

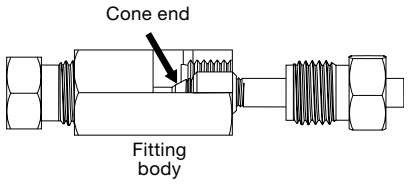
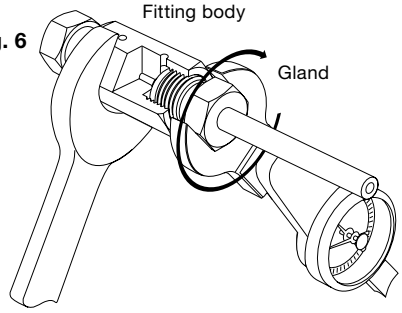


Fig. 6



Installation Instructions

1. Lubricate all male threads with an anti-seize lubricant, such as a Swagelok Goop product. Lubricate the cone end of the tubing with a system compatible lubricant. *NOTE: Antivibration collet bodies and gland nuts containing dry film lubricate applied at the factory do not need additional lubrication.*
2. For standard fittings, slide the C&T tubing into the gland (Fig. 1). For antivibration option (see diagram on page 26), slide antivibration gland nut and collet onto tubing.

   For medium-pressure antivibration fittings, slide the antivibration collet body onto tubing.
   Note: Ensure proper orientation of collet body. Tapered face of collet body is to mate with collet.
3. Thread the collar counter-clockwise (left-hand thread) onto the C&T tubing (Fig. 2).
4. Continue threading until 1 to 2 full threads are exposed at the cone end of the tubing. This will indicate proper position of the collar (Fig. 3).
5. Insert the C&T tubing with the collar into the fitting body (Fig. 4).
6. Make sure the cone end of the tubing rests firmly on the angled seat of the fitting body (Fig. 5).
7. For standard fittings thread the gland into the fitting body until finger tight. Hold the fitting body steady and tighten the gland (Fig. 6) to the required torque.

   For high-pressure antivibration fittings, thread the gland nut into the fitting body until finger tight. Hold the body steady and tighten the gland to the required torque.

   For medium-pressure antivibration fittings thread the antivibration collet body into the fitting body until finger tight. Tighten the antivibration collet body to specified torque. Then thread the antivibration gland nut onto the antivibration collet body until finger tight. Tighten the antivibration gland nut to the required torque. The collet will grip the tube when the antivibration gland nut is tightened.

Medium-Pressure C&T Fitting

	Required Torque, ft·lb (N·m)	
Fitting Size in.	**316 SS and Alloy 2507**	**Alloy 625**
1/4	20 (27.2)	15 (20.3)
3/8	30 (40.7)	25 (33.9)
9/16	55 (74.6)	40 (54.2)
3/4	90 (123)	70 (94.9)
1	150 (204)	115 (156)
1 1/2	200 (271)	-

High-Pressure C&T Fitting

	Required Torque, ft·lb (N·m)	
Fitting Size in.	**316 SS and Alloy 2507**	**Alloy 625**
1/4	25 (33.9)	15 (20.3)
3/8	50 (67.8)	30 (40.7)
9/16	110 (150)	65 (88.1)

Related Products

Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories

Swagelok offers a complete line of medium- and high-pressure products. For more information, see the Swagelok *Medium- and High-Pressure Fittings, Tubing, Valves and Accessories* catalog, MS-02-472.

Alloy 2507 Tube Fitting

See the Swagelok *Gageable Alloy 2507 Super Duplex Tube Fittings* catalog, MS-01-174, for more information.

Coning and Threading Tool

See the Swagelok *Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories* catalog, MS-02-472, for more information.

Tube Benders

For tube benders, see the Swagelok *Tubing Tools and Accessories* catalog, MS-01-179.

Lubricants and Sealants

See the Swagelok *Leak Detectors, Lubricants, and Sealants* catalog, MS-01-91, for more information.

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.

⚠ WARNING
Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.

MS-02-474, RevH, February 2022