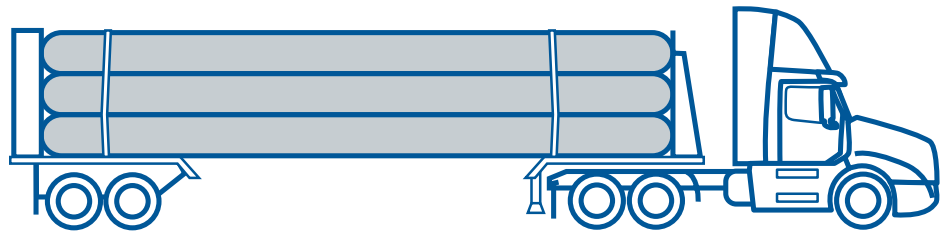


Swagelok[®] Hydrogen- Compatible Products

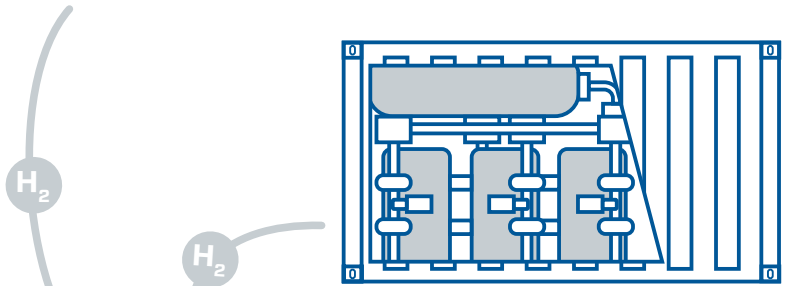
for the Alternative Fuels
Industry

Products that are compatible for
use in hydrogen on-vehicle and
infrastructure applications, available
from your local authorized sales and
service center.

The design and operation of
hydrogen systems are the
responsibility of the user, who should
obtain qualified assistance to ensure
their safe use of hydrogen.

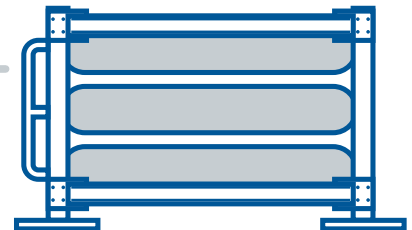


Gaseous Tube Trailer

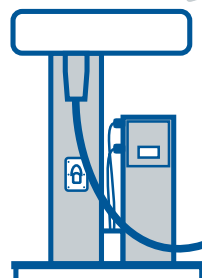


Electrolyzer System

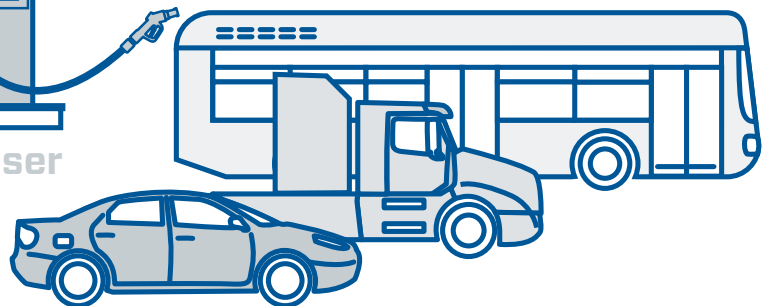
Compressor



**Compressed Hydrogen
Storage Tanks**



Dispenser



Fuel Cell Electric Vehicles

Swagelok[®]

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Introduction

Hydrogen fuel cell technology requires high-integrity fluid system components to fill and store hydrogen in cylinders and transfer it to the fuel cell on the vehicle. Swagelok offers a wide range of fluid system components for use in many types of hydrogen-related applications including the infrastructure that produces, transports, compresses, stores, and fills cylinders with hydrogen and for on-vehicle use.

Swagelok products, as listed in this document, are compatible with both on-vehicle and infrastructure hydrogen applications. Hydrogen-compatible products have had the materials of construction reviewed for appropriateness for use with hydrogen. Some metals are susceptible to hydrogen embrittlement, specifically hardened Belleville springs and stems. These have been replaced with less susceptible materials for compatibility with hydrogen service. Some elastomers are also more susceptible to hydrogen degradation and have also been replaced with more resilient materials. Products not listed in this document may not be suitable for hydrogen applications.

On-Vehicle Applications

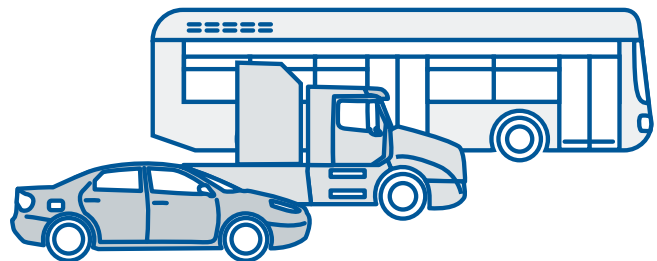
On-vehicle applications include light-duty (car and van), heavy-duty (bus and truck), rail, ship, and aerospace. Components used in light-duty cars and vans and heavy-duty trucks and buses may require EC-79 certification for use at working pressures above 30 bar (435 psig). Specific testing is required to achieve this certification, including corrosion resistance, endurance, hydraulic pressure cycle testing, and external leakage testing. Products with this certification will be specially marked to reflect the approval. Products certified for EC-79 are based on the nominal pressure of either H35 or H70 pressure classes. All products are tested and certified to the MAWP for the pressure class.

Fuel Cell Electric Vehicles

Hydrogen-compatible Products Available

Refer to Hydrogen-Compatible Products for Applications Up to 1 378 bar (20 000 psig) on page 4 for additional information.

- Assembly-by-torque (AbT) fittings
- FK series medium-pressure fittings
- VCO® O-ring face seal fittings
- VCR® metal gasket face seal fittings
- Pressure gauges
- All-metal hose
- Swagelok tubing
- Swagelok® Custom Solutions, such as CNC bent fuel lines



EC-79 Certified Products:

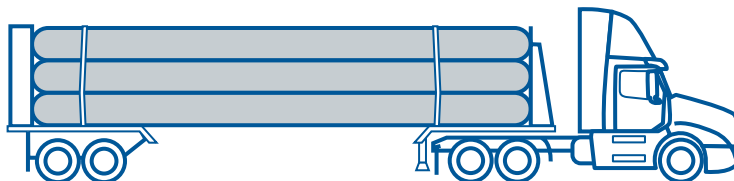
EC-79 certification for on vehicle applications come in two pressure classes:

- H35 Pressure class above 30 bar (435 psig) and Up to 350 bar (5 076 psig) see page 6 and 7 for additional information.
- H70 Pressure class above 30 bar (435 psig) and Up to 700 bar (10 159 psig) see page 8 and 9 for additional information

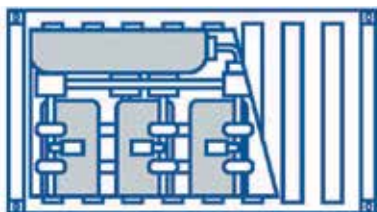
Infrastructure Applications

Infrastructure applications include the dispensers, storage cylinders, compressors, separators, and pressure control devices that make up the station, as well as the hydrogen tube trailers that bring the hydrogen to the stations. Components in these locations must be hydrogen-compatible but may not require specific certifications. In addition to standard Swagelok tube fittings, a range of FK series medium-pressure fittings, cone and thread fittings, hoses, valves, and pressure gauges that are hydrogen-compatible are available.

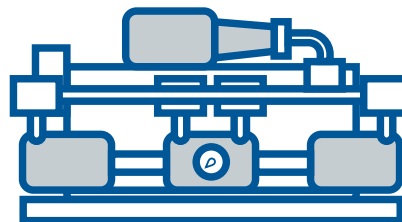
Note: For these applications, regional standards and specifications may vary. Please consult your local authorized Swagelok sales and service center for more information.



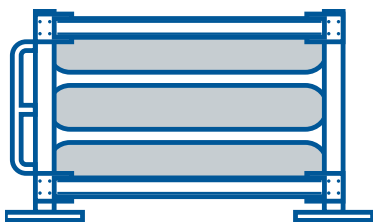
Gaseous Tube Trailer



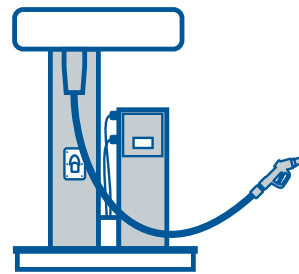
Electrolyzer System



Compressor



Compressed Hydrogen Storage Tanks



Dispenser

The following provides a list of products that are hydrogen-compatible for use in infrastructure applications. Refer to Hydrogen-Compatible Products for Applications Up to 1 378 bar (20 000 psig) on page 4 for additional information.

- Swagelok tube fittings and tubing
- FK series medium-pressure fittings and tubing
- FKB series medium-pressure ball valves
- IPT series and check valves
- I PT series cone and thread fittings and tubing
- AFS series ball valves
- FJ, FL, FM, and FX series hose
- S model pressure gauges
- Pipe fittings
- Swagelok Custom Solutions, such as filling, distribution, priority, and control panels, and tubing manifolds.

Hydrogen-Compatible Products for Applications Up to 1 378 bar (20 000 psig)

These products may be ordered using standard ordering numbers given in the product literature, except where noted. Individual product ratings are as noted in the product literature.

Product	Product Type/ Series	Description	Available Sizes	Working Pressure and Ordering Information
Fitting	Tube	Straight, elbow, tee, and cross standard tube fitting	1/16 to 2 in. 2 to 50 mm	Refer to <i>Tubing Data</i> , MS-01-107, for pressure rating information. Refer to <i>Gaugeable Tube Fittings and Adapter Fittings</i> , MS-01-140, for ordering information.
		Assembly-by-Torque (AbT)	1/4 to 1/2 in. 6 to 12 mm	Refer to <i>Assembly-by-Torque (AbT) Fittings</i> , MS-02-466
		Medium-pressure, FK series	1/4 to 1 in. 6 to 12 mm	Refer to <i>Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories</i> , MS-02-472
	Cone and Thread, IPT	Medium- and high-pressure cone and thread, medium-pressure pipe fittings and adapters	1/4 to 1 1/2 in.	Refer to <i>Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories</i> , MS-02-472
	Pipe	NPT/ISO	1/16 to 1 1/2 in.	Refer to <i>Pipe Fittings</i> , MS-01-147, and <i>Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories</i> , MS-02-472
		Male/female SAE	3/16 to 1 in.	Refer to <i>Pipe Fittings</i> , MS-01-147
	VCO with ethylene propylene O-rings only	O-ring face seal	1/8 to 1 in.	Refer to <i>VCO O-ring Face Seal Fittings</i> , MS-01-28, add -EP to selected ordering number
VCR with 316 stainless steel gaskets only	Metal gasket face seal	1/8 to 1 in.	Refer to <i>VCR Metal Gasket Face Seal Fittings</i> , MS-01-24, 316 stainless steel gaskets only	
Hose	FJ	304 SS single braid layer reinforcement, 316L stainless steel annular convoluted core	1/4 to 2 in.	Refer to <i>Hose and Flexible Tubing</i> , MS-01-180
	FL	321 stainless steel single braid layer reinforced, 316L stainless steel annular convoluted core	1/4, 1/2 in.	
	FM	316L stainless steel single braid layer reinforced, 316L stainless steel annular convoluted core	1/4 to 2 in.	
	FX	321 stainless steel double braid layer reinforced, 316L stainless steel annular convoluted core	1/4 to 2 in.	

Please consult your local authorized Swagelok sales and service center with any questions.

Products not listed in this document may not be suitable for hydrogen applications.

Hydrogen-Compatible Products for Applications Up to 1 378 bar (20 000 psig), continued

These products may be ordered using standard ordering numbers given in the product literature, except where noted. Individual product ratings are as noted in the product literature.

Product	Product Type/Series	Description	Working Pressure and Ordering Information
Tubing	316/316L seamless instrumentation grade	Stainless steel seamless tubing, ASTM A213/A269 1/8 to 2 in. and 3 to 25 mm	Refer to <i>Stainless Steel Seamless Tubing and Tube Support Systems</i> , MS-01-181
	Medium-pressure	Stainless steel medium-pressure tubing, ASTM A213/A269 1/4, 3/8, 1/2, and 3/4 in.	Refer to <i>Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories</i> , MS-02-472
	Cone and thread	Stainless steel cone and thread tubing, medium-pressure ASTM A213 1/4 to 1 in.	Refer to <i>Medium- and High-Pressure Fittings, Tubing, Valves, and Accessories</i> , MS-02-472
Valve	AFS	Alternative fuel service (AFS) ball valve, 1/4-turn, PEEK seats	Refer to <i>Swagelok Alternative Fuel Service (AFS) Ball Valves</i> , MS-02-303
	FKB	Medium-pressure trunion-style ball valve, PEEK seat	700 bar at -40°C (10 152 psig at -40°F) 1 034 bar at 85°C (15 000 psig at 185°F) SS-6FKBFK6-53402
	SK	Multipurpose ball valve, 1/4-turn, PEEK seats	Refer to <i>Multipurpose Ball Valves</i> , MS-02-345
Gauge	PGI	S model industrial pressure gauge	Refer to <i>Process Gauges, Industrial and Process</i> , MS-02-170

Please consult your local authorized Swagelok sales and service center with any questions.

Products not listed in this document may not be suitable for hydrogen applications.

Fittings With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 350 bar (5 076 psig) – H35 Pressure Class

Product	Product Type	Description	Available Sizes ^①
Tube fitting	Straight	Union - Swagelok tube fitting to Swagelok tube fitting Port connector Cap Plug	Tube fitting sizes: 1/4, 5/16, 3/8, 1/2, 5/8 in. 6, 8, 10, 12, 14, 15, 16 mm Ordering Information: pages 10 and 13
		Male connector - Swagelok tube fitting to 1/4 in. male NPT	Tube fitting sizes: 1/4, 5/16, 3/8, 1/2, 5/8 in. 6, 8, 10, 12, 14 mm Ordering Information: page 10
		Male connector - Swagelok tube fitting to SAE/MS straight thread (ST and STH) fitting ^②	Tube fitting sizes: 1/4, 3/8, 1/2, 5/8 in. 6, 8, 10, 12 mm SAE/MS straight thread Male: ST: 7/16-20, 9/16-18, STH: 3/4-16 Ordering Information: page 11
		Female connector - Swagelok tube fitting to 1/4 in. female NPT	Tube fitting sizes: 1/4, 5/16, 3/8, 1/2 in. 6, 8, 10, 12 mm Ordering Information: page 11
		Reducer - Swagelok tube fitting to tube adapter	1/4, 5/16, 3/8, 1/2 in. 6, 8, 10, 12 mm Ordering Information: page 12
	Elbow	Union - Swagelok tube fitting to Swagelok tube fitting	1/4, 5/16, 3/8, 1/2, 5/8 in. 6, 8, 10, 12, 14, 15, 16 mm Ordering Information: page 14
		Male connector - Swagelok tube fitting to 1/4 in. male NPT Female connector - Swagelok tube fitting to 1/4 in. female NPT	Tube fitting sizes: 1/4, 5/16, 3/8, 1/2 in. 6, 8, 10, 12 mm Ordering Information: page 14
	Tee	Union - all Swagelok tube fitting ends	1/4, 5/16, 3/8, 1/2, 5/8 in. 6, 8, 10, 12, 14, 15, 16 mm Ordering Information: page 15
		1/4 in. Male branch NPT (TTM) with Swagelok tube fittings 1/4 in. Female branch NPT (TTF) with Swagelok tube fittings 1/4 in. Female run NPT (TFT) with Swagelok tube fittings	Tube fitting sizes: 1/4, 3/8 in. 6, 8, 10, 12 mm Ordering Information: pages 15 and 16
		1/4 in. Male run NPT (TMT) with Swagelok tube fittings	Tube fitting sizes: 1/4, 3/8 in. 6, 8, 12 mm Ordering Information: page 15
	Cross	Union - all Swagelok tube fitting ends	1/4, 5/16, 3/8, 1/2 in. 6, 8, 10, 12, 16 mm Ordering Information: page 16

① Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

② O-ring material is 75 durometer fluorocarbon FKM.

Fittings With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 350 bar (5 076 psig) — H35 Pressure Class, continued

Product	Product Type	Description	Available Sizes ^①
Tube adapter	Male	1/4 in. NPT	Tube adapter sizes: 1/4, 5/16, 3/8, 1/2 in. 6, 8, 10, 12 mm Ordering Information: page 17
		SAE/MS straight thread (ST and STH) ^②	SAE/MS straight thread ST: 7/16-20, 9/16-18 STH: 3/4-16 Ordering Information: page 17
	Female	1/4 in. NPT	Tube adapter sizes: 1/4, 5/16, 3/8, 1/2 in. 6, 8, 10, 12 mm Ordering Information: page 17
Pipe fitting	Hex nipple	1/4 in. Male NPT	1/4 in. Ordering Information: page 18
	Adapter	1/4 in. Female to 1/4 in. male NPT	1/4 in. Ordering Information: page 18
		Male SAE/MS straight thread to 1/4 in. male NPT ^②	SAE/MS straight thread 7/16-20 to 1/4 in. NPT Ordering Information: page 18
		Male SAE/MS straight thread to 1/4 in. female NPT ^②	SAE/MS straight thread 7/16-20 to 1/4 in. NPT Ordering Information: page 18
	Reducer	Male to female SAE/MS straight thread (ST) ^②	SAE/MS straight thread ST: 9/16-18 to 7/16-20 STH: 3/4-16 to 9/16-18 and 3/4-16 to 7/16-20 Ordering Information: page 19
	Hex coupling	1/4 in. Female NPT	1/4 in. Ordering Information: page 19
	Plug	1/4 in. Male NPT	1/4 in. Ordering Information: page 19
	Hollow hex plug	Male SAE/MS straight thread (ST and STH) ^②	SAE/MS straight thread ST: 3/8-24, 7/16-20, 9/16-18, STH: 3/4-16 Ordering Information: page 20
Hex head plug	Male SAE/MS straight thread (ST and STH) ^②	SAE/MS straight thread ST: 3/8-24, 7/16-20, 9/16-18 STH: 3/4-16 Ordering Information: page 20	

① Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

② O-ring material is 75 durometer fluorocarbon FKM.

Valves With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 350 bar (5 076 psig) — H35 Pressure Class

Series	Description	Available Sizes	Working Pressure bar (psig)
SK	Multipurpose ball valve, 1/4-turn, PEEK seats, 10 mm Swagelok tube fitting	10 mm Ordering Information: SS-4SKPS10MM-33397 Additional Information on page 21	260 (3 770) at -40 to 120°C (-40 to 248°F)
AFS	Alternative fuel service (AFS) ball valve, 1/4-turn, PEEK seats, Female SAE/MS straight thread 3/4-16	Female SAE/MS straight thread 3/4-16 Ordering Information: SS-AFSMS8-30259 Additional Information on page 22	413.7 (6 000) at -40 to 120°C (-40 to 248°F)

Fittings With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 700 bar (10 159 psig) – H70 Pressure Class

Product	Product Type	Description	Available Sizes ^①	
Medium-Pressure Tube Fitting (FK Series)	Straight	Union - FK series fitting to FK series fitting Port connector Cap Plug	FK series fitting: 1/4, 3/8, 1/2 in. 6, 10, 12 mm Ordering Information: pages 23 to 27	
		Male connector - FK series fitting to 1/4 in. male NPT	FK series fitting: 1/4, 3/8, 1/2 in. 6, 10, 12 mm Ordering Information: page 23	
		Male connector - FK series fitting to SAE/MS straight thread (STH fitting) ^②	FK series fitting: 1/4, 3/8, 1/2 in. 6, 10, 12 mm SAE/MS straight thread Male: STH: 7/16-20, 9/16-18 Ordering Information: page 24	
		Female connector - FK series fitting to 1/4 in. female NPT	FK series fitting: 1/4, 3/8, 1/2 in. Ordering Information: page 24	
		Reducing Union - FK series fitting to FK series fitting	3/8, 1/2 in. 10, 12 mm Ordering Information: page 24	
		Reducer - FK series fitting to FK series fitting	1/4, 3/8, 1/2 in. Ordering Information: page 24	
		Medium-Pressure Cone and Thread Adapter	FK series fitting: 1/4 in. and 6 mm Ordering Information: page 25	
	Elbow	Union - FK series fitting to FK series fitting	1/4, 3/8, 1/2 in. 6, 10, 12 mm Ordering Information: page 26	
		Reducing Union - FK series fitting to FK series fitting	1/4, 3/8 in. 6, 10 mm Ordering Information: page 26	
	Tee	Union - all FK series fitting ends	1/4, 3/8, 1/2 in. 6, 10, 12 mm Ordering Information: page 27	
	Cross	Union - all FK series fitting ends	1/4, 3/8, 1/2 in. 6, 10, 12 mm Ordering Information: page 27	
	Tube Adapter (FK Series)	Male	1/4 in. Male NPT	1/4, 3/8, 1/2 in. Ordering Information: page 27

^① Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

^② O-ring is 90 durometer EPDM.

Fittings With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 700 bar (10 159 psig) – H70 Pressure Class

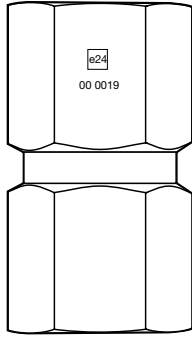
Product	Product Type	Description	Available Sizes ^①	
Tube fitting	Straight	Union - Swagelok tube fitting to Swagelok tube fitting Port connector Cap Plug	Tube fitting sizes: 1/4 in. and 6 mm Ordering Information: pages 28 and 29	
		Male connector - Swagelok tube fitting to 1/4 in. male NPT	Tube fitting sizes: 1/4 in. and 6 mm Ordering Information: page 28	
		Male connector - Swagelok tube fitting to SAE/MS straight thread (STH) fitting ^②	Tube fitting sizes: 1/4 in. and 6 mm SAE/MS straight thread Male: STH: 7/16-20, 9/16-18, Ordering Information: page 28	
		Female connector - Swagelok tube fitting to 1/4 in. female NPT	Tube fitting sizes: 1/4 in. and 6 mm Ordering Information: page 28	
		Reducer - Swagelok tube fitting to tube adapter	1/4 in. and 6 mm Ordering Information: page 29	
	Elbow	Union - Swagelok tube fitting to Swagelok tube fitting	1/4 in. Ordering Information: page 30	
		Male connector - Swagelok tube fitting to 1/4 in. male NPT Female connector - Swagelok tube fitting to 1/4 in. female NPT	Tube fitting sizes: 1/4 in. and 6 mm Ordering Information: page 30	
	Tee	Union - all Swagelok tube fitting ends	1/4 in. and 6 mm Ordering Information: page 31	
		1/4 in. Male NPT branch (TTM) with Swagelok tube fittings 1/4 in. Female NPT branch (TTF) with Swagelok tube fittings 1/4 in. Female NPT (TFT) run with Swagelok tube fittings 1/4 in. Male NPT (TMT) run with Swagelok tube fittings	Tube fitting sizes: 1/4 in. and 6 mm Ordering Information: page 31	
		Union - all Swagelok tube fitting ends	1/4 in. and 6 mm Ordering Information: page 32	
	Tube adapter	Male	1/4 in. NPT	Tube adapter sizes: 1/4 in. and 6 mm Ordering Information: page 32
			SAE/MS straight thread (STH)	SAE/MS straight thread STH: 7/16-20 Ordering Information: page 32
Female		1/4 in. NPT	Tube adapter sizes: 1/4 in. 6 mm Ordering Information: page 32	

① Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

② O-ring is 90 durometer EPDM.

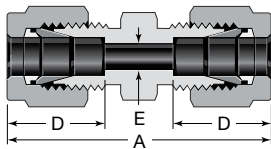
Ordering Numbers and Dimensions for Fittings With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 350 bar (5 076 psig) – H35 Pressure Class

Marking



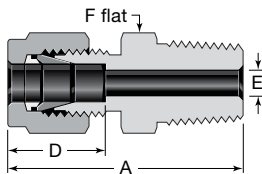
Straight Tube Fittings

Unions



Tube OD	Ordering Number	Dimensions		
		A	D	E
Dimensions, in.				
1/4	SS-400-6-HV35	1.61	0.60	0.19
5/16	SS-500-6-HV35	1.69	0.64	0.25
3/8	SS-600-6-HV35	1.77	0.66	0.28
1/2	SS-810-6-HV35	2.02	0.90	0.41
5/8	SS-1010-6-HV35	2.05	0.96	0.50
Dimensions, mm				
6	SS-6M0-6-HV35	41.0	15.3	4.8
8	SS-8M0-6-HV35	43.2	16.2	6.4
10	SS-10M0-6-HV35	46.2	17.2	7.9
12	SS-12M0-6-HV35	51.2	22.8	9.5
14	SS-14M0-6-HV35	52.0	24.4	11.1
15	SS-15M0-6-HV35			11.9
16	SS-16M0-6-HV35			12.7

Male Connectors



NPT

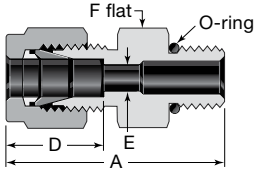
Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E ^①	F
Dimensions, in.						
1/4	1/4	SS-400-1-4-HV35	1.49	0.60	0.19	9/16
5/16		SS-500-1-4-HV35	1.52	0.64	0.25	9/16
3/8		SS-600-1-4-HV35	1.57	0.66	0.28	5/8
1/2		SS-810-1-4-HV35	1.71	0.90	0.28	13/16
5/8		SS-1010-1-4-HV35	1.74	0.96	0.28	15/16
Dimensions, mm						
6	1/4	SS-6M0-1-4-HV35	37.9	15.3	4.8	14
8		SS-8M0-1-4-HV35	38.7	16.2	6.4	15
10		SS-10M0-1-4-HV35	40.9	17.2	7.1	18
12		SS-12M0-1-4-HV35	43.4	22.8	7.1	22
14		SS-14M0-1-4-HV35	44.1	24.4	7.1	24

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Straight Tube Fittings

Male Connectors



Adapts to SAE J1926/1 and ISO 11926-1 straight thread boss.

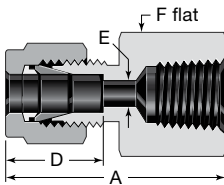
SAE/MS Straight Thread (ST) and (STH - heavy wall)

Tube OD	SAE/MS Thread Size	Ordering Number	Dimensions			
			A	D	E ^②	F
Dimensions, in.						
1/4	7/16-20	SS-400-1-4ST-HV35	1.34	0.60	0.19	9/16
	9/16-18	SS-400-1-6ST-HV35	1.40			11/16
	3/4-16	SS-400-1-8STH-HV35	1.57			7/8
3/8	7/16-20	SS-600-1-4ST-HV35	1.40	0.66	0.20	5/8
	9/16-18	SS-600-1-6ST-HV35	1.46			11/16
	3/4-16	SS-600-1-8STH-HV35	1.63			7/8
1/2	9/16-18	SS-810-1-6ST-HV35	1.54	0.90	0.28	13/16
	3/4-16	SS-810-1-8STH-HV35	1.74			7/8
5/8	3/4-16	SS-1010-1-8STH-HV35	1.74	0.96	0.39	15/16
Dimensions, mm						
6	7/16-20	SS-6M0-1-4ST-HV35	34.0	15.3	4.8	14
	9/16-18	SS-6M0-1-6ST-HV35	35.6			18
8	7/16-20	SS-8M0-1-4ST-HV35	35.0	16.2	5.2	15
	9/16-18	SS-8M0-1-6ST-HV35	36.6			18
10	7/16-20	SS-10M0-1-4ST-HV35	35.8	17.2	5.2	18
	9/16-18	SS-10M0-1-6ST-HV35	37.3			18
	3/4-16	SS-10M0-1-8STH-HV35	39.4			22
12	7/16-20	SS-12M0-1-4ST-HV35	40.6	22.8	5.2	22
	9/16-18	SS-12M0-1-6ST-HV35	39.9			
	3/4-16	SS-12M0-1-8STH-HV35	41.9			

① O-ring material is 75 durometer fluorocarbon FKM.

② The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Female Connectors



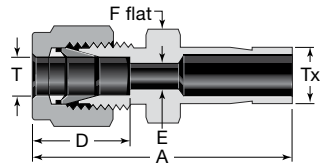
NPT

Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E	F
Dimensions, in.						
1/4	1/4	SS-400-7-4-HV35	1.41	0.60	0.19	3/4
5/16	1/4	SS-500-7-4-HV35	1.45	0.64	0.25	3/4
3/8	1/4	SS-600-7-4-HV35	1.48	0.66	0.28	3/4
1/2	1/4	SS-810-7-4-HV35	1.59	0.90	0.41	13/16
Dimensions, mm						
6	1/4	SS-6M0-7-4-HV35	35.8	15.3	4.8	19
8	1/4	SS-8M0-7-4-HV35	37.0	16.2	6.4	19
10	1/4	SS-10M0-7-4-HV35	37.8	17.2	7.9	19
12	1/4	SS-12M0-7-4-HV35	40.3	22.8	9.5	22

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Straight Tube Fittings

Reducers

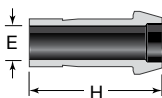


Tube OD		Ordering Number	Dimensions			
T	Tx		A	D	E	F
Dimensions, in.						
1/4	1/4	SS-400-R-4-HV35	1.54	0.60	0.17	1/2
	5/16	SS-400-R-5-HV35	1.57		0.19	1/2
	3/8	SS-400-R-6-HV35	1.60		0.19	1/2
	1/2	SS-400-R-8-HV35	1.82		0.19	9/16
5/16	3/8	SS-500-R-6-HV35	1.65	0.64	0.25	9/16
	1/2	SS-500-R-8-HV35	1.87			
3/8	1/4	SS-600-R-4-HV35	1.63	0.66	0.17	5/8
	3/8	SS-600-R-6-HV35	1.70		0.27	5/8
	1/2	SS-600-R-8-HV35	1.91		0.28	5/8
	5/8	SS-600-R-10-HV35	1.98		0.28	11/16
1/2	1/4	SS-810-R-4-HV35	1.77	0.90	0.17	13/16
	3/8	SS-810-R-6-HV35	1.84		0.27	
	1/2	SS-810-R-8-HV35	2.06		0.37	
	5/8	SS-810-R-10-HV35	2.12		0.41	
Dimensions, mm						
6	8	SS-6M0-R-8M-HV35	39.9	15.3	4.8	14
	10	SS-6M0-R-10M-HV35	40.7			
	12	SS-6M0-R-12M-HV35	46.3			
8	6	SS-8M0-R-6M-HV35	40.3	16.2	4.1	15
	10	SS-8M0-R-10M-HV35	42.0		6.4	
	12	SS-8M0-R-12M-HV35	47.6		6.4	
10	6	SS-10M0-R-6M-HV35	42.4	17.2	4.1	18
	8	SS-10M0-R-8M-HV35	43.4		5.6	
	12	SS-10M0-R-12M-HV35	49.8		7.9	
	15	SS-10M0-R-15M-HV35	51.3		7.9	
12	6	SS-12M0-R-6M-HV35	44.9	22.8	4.1	22
	8	SS-12M0-R-8M-HV35	45.9		5.6	
	10	SS-12M0-R-10M-HV35	46.7		7.1	
	16	SS-12M0-R-16M-HV35	53.8		9.5	

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

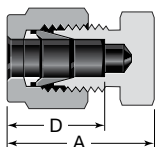
Straight Tube Fittings

Port Connectors



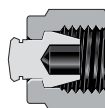
Tube OD	Ordering Number	Dimensions	
		E	H
Dimensions, in.			
1/4	SS-401-PC-HV35	0.17	0.98
5/16	SS-501-PC-HV35	0.22	1.02
3/8	SS-601-PC-HV35	0.27	1.05
1/2	SS-811-PC-HV35	0.37	1.43
5/8	SS-1011-PC-HV35	0.47	1.49
Dimensions, mm			
6	SS-6M1-PC-HV35	4.1	25.0
8	SS-8M1-PC-HV35	5.6	26.0
10	SS-10M1-PC-HV35	7.1	27.1
12	SS-12M1-PC-HV35	8.8	36.2
15	SS-15M1-PC-HV35	11.2	37.8
16	SS-16M1-PC-HV35	12.0	37.8

Caps and Plugs



Cap

Tube OD	Ordering Number	A	D
Dimensions, in.			
1/4	SS-400-C-HV35	0.92	0.60
5/16	SS-500-C-HV35	0.96	0.64
3/8	SS-600-C-HV35	1.01	0.66
1/2	SS-810-C-HV35	1.21	0.90
5/8	SS-1010-C-HV35	1.24	0.96
Dimensions, mm			
6	SS-6M0-C-HV35	23.1	15.3
8	SS-8M0-C-HV35	24.5	16.2
10	SS-10M0-C-HV35	26.6	17.2
12	SS-12M0-C-HV35	30.6	22.8
14	SS-14M0-C-HV35	31.4	24.4
15	SS-15M0-C-HV35	31.4	24.4
16	SS-16M0-C-HV35	31.4	24.4



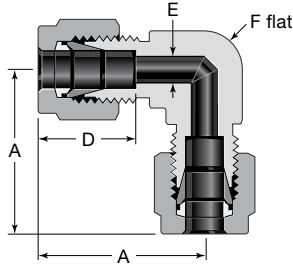
Plug

Tube OD	Ordering Number
Dimensions, in.	
1/4	SS-400-P-HV35
5/16	SS-500-P-HV35
3/8	SS-600-P-HV35
1/2	SS-810-P-HV35
5/8	SS-1010-P-HV35
Dimensions, mm	
6	SS-6M0-P-HV35
8	SS-8M0-P-HV35
10	SS-10M0-P-HV35
12	SS-12M0-P-HV35
14	SS-14M0-P-HV35
15	SS-15M0-P-HV35
16	SS-16M0-P-HV35

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

90° Elbows

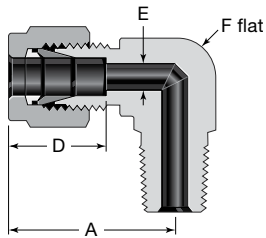
Unions



Tube ports are identical.

Tube OD	Ordering Number	Dimensions			
		A	D	E	F, in.
Dimensions, in.					
1/4	SS-400-9-HV35	1.06	0.60	0.19	1/2
5/16	SS-500-9-HV35	1.13	0.64	0.25	9/16
3/8	SS-600-9-HV35	1.20	0.66	0.28	5/8
1/2	SS-810-9-HV35	1.42	0.90	0.41	13/16
5/8	SS-1010-9-HV35	1.50	0.96	0.50	15/16
Dimensions, mm					
6	SS-6M0-9-HV35	27.0	15.3	4.8	1/2
8	SS-8M0-9-HV35	28.8	16.2	6.4	9/16
10	SS-10M0-9-HV35	31.5	17.2	7.9	11/16
12	SS-12M0-9-HV35	36.0	22.8	9.5	13/16
14	SS-14M0-9-HV35	38.0	24.4	11.1	15/16
15	SS-15M0-9-HV35	38.0	24.4	11.9	15/16
16	SS-16M0-9-HV35	38.0	24.4	12.7	15/16

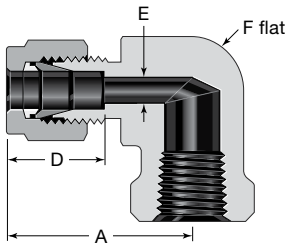
Male NPT



Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E ^①	F, in.
Dimensions, in.						
1/4	1/4	SS-400-2-4-HV35	1.06	0.60	0.19	1/2
5/16	1/4	SS-500-2-4-HV35	1.13	0.64	0.25	9/16
3/8	1/4	SS-600-2-4-HV35	1.20	0.66	0.28	5/8
1/2	1/4	SS-810-2-4-HV35	1.42	0.90	0.28	13/16
Dimensions, mm						
6	1/4	-6M0-2-4-HV35	27.0	15.3	4.8	1/2
8	1/4	-8M0-2-4-HV35	28.8	16.2	6.4	9/16
10	1/4	-10M0-2-4-HV35	31.5	17.2	7.1	11/16
12	1/4	-12M0-2-4-HV35	36.0	22.8	7.1	13/16

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Female NPT

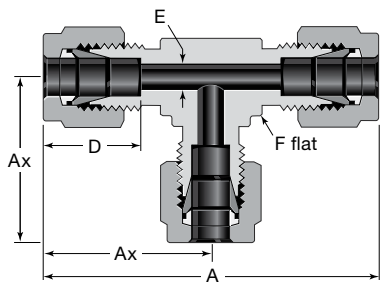


Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E	F, in.
Dimensions, in.						
1/4	1/4	SS-400-8-4-HV35	1.17	0.60	0.19	11/16
5/16	1/4	SS-500-8-4-HV35	1.20	0.64	0.25	11/16
3/8	1/4	SS-600-8-4-HV35	1.23	0.66	0.28	11/16
1/2	1/4	SS-810-8-4-HV35	1.42	0.90	0.41	13/16
Dimensions, mm						
6	1/4	SS-6M0-8-4-HV35	29.8	15.3	4.8	11/16
8	1/4	SS-8M0-8-4-HV35	30.6	16.2	6.4	11/16
10	1/4	SS-10M0-8-4-HV35	33.5	17.2	7.9	13/16
12	1/4	SS-12M0-8-4-HV35	36.0	22.8	9.5	13/16

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Tees

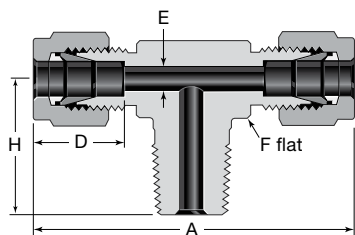
Unions



Tube ports are identical.

Tube OD	Ordering Number	Dimensions				
		A	Ax	D	E	F, in.
Dimensions, in.						
1/4	SS-400-3-HV35	2.12	1.06	0.60	0.19	1/2
5/16	SS-500-3-HV35	2.34	1.17	0.64	0.25	5/8
3/8	SS-600-3-HV35	2.40	1.20	0.66	0.28	5/8
1/2	SS-810-3-HV35	2.84	1.42	0.90	0.41	13/16
5/8	SS-1010-3-HV35	3.06	1.53	0.96	0.50	1
Dimensions, mm						
6	SS-6M0-3-HV35	53.9	27.0	15.3	4.8	1/2
8	SS-8M0-3-HV35	59.7	29.9	16.2	6.4	5/8
10	SS-10M0-3-HV35	63.0	31.5	17.2	7.9	11/16
12	SS-12M0-3-HV35	72.0	36.0	22.8	9.5	13/16
14	SS-14M0-3-HV35	77.6	38.8	24.4	11.1	1
15	SS-15M0-3-HV35	77.6	38.8	24.4	11.9	1
16	SS-16M0-3-HV35	77.6	38.8	24.4	12.7	1

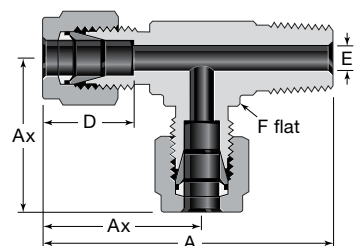
Male



Branch, NPT (TTM)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	D	E ^①	F, in.	H
Dimensions, in.							
1/4	1/4	SS-400-3-4TTM-HV35	2.12	0.60	0.19	1/2	0.92
3/8	1/4	SS-600-3TTM-HV35	2.40	0.66	0.28	5/8	1.00
Dimensions, mm							
6	1/4	SS-6M0-3-4TTM-HV35	53.9	15.3	4.8	1/2	23.4
8	1/4	SS-8M0-3-4TTM-HV35	59.7	16.2	6.4	5/8	25.4
10	1/4	SS-10M0-3TTM-HV35	67.0	17.2	7.1	13/16	26.2
12	1/4	SS-12M0-3-4TTM-HV35	72.0	22.8	7.1	13/16	28.2

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.



Run, NPT (TMT)

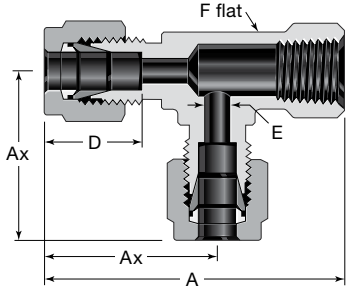
Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	Ax	D	E ^①	F, in.
Dimensions, in.							
1/4	1/4	SS-400-3-4TMT-HV35	1.98	1.06	0.60	0.19	1/2
3/8	1/4	SS-600-3TMT-HV35	2.20	1.20	0.66	0.28	5/8
Dimensions, mm							
6	1/4	SS-6M0-3-4TMT-HV35	50.3	27.0	15.3	4.8	1/2
8	1/4	SS-8M0-3-4TMT-HV35	55.3	29.9	16.2	6.4	5/8
12	1/4	SS-12M0-3-4TMT-HV35	64.2	36.0	22.8	7.1	13/16

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Tees

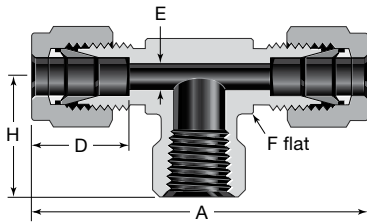
Female



Tube ports are identical.

Run, NPT (TFT)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	Ax	D	E	F, in.
Dimensions, in.							
1/4	1/4	SS-400-3-4TFT-HV35	2.05	1.17	0.60	0.19	11/16
3/8	1/4	SS-600-3TFT-HV35	2.11	1.23	0.66	0.28	11/16
Dimensions, mm							
6	1/4	SS-6M0-3-4TFT-HV35	52.1	29.8	15.3	4.8	11/16
8	1/4	SS-8M0-3-4TFT-HV35	53.0	30.6	16.2	6.4	11/16
10	1/4	SS-10M0-3TFT-HV35	55.9	33.5	17.2	7.9	13/16
12	1/4	SS-12M0-3-4TFT-HV35	58.4	36.0	22.8	9.5	13/16

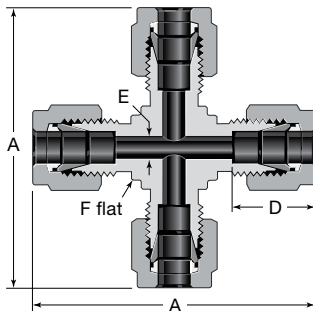


Branch, NPT (TTF)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	D	E	F, in.	H
Dimensions, in.							
1/4	1/4	SS-400-3-4TTF-HV35	2.34	0.60	0.19	11/16	0.88
3/8	1/4	SS-600-3TTF-HV35	2.46	0.66	0.28	11/16	0.88
Dimensions, mm							
6	1/4	SS-6M0-3-4TTF-HV35	59.5	15.3	4.8	11/16	22.4
8	1/4	SS-8M0-3-4TTF-HV35	61.2	16.2	6.4	11/16	22.4
10	1/4	SS-10M0-3TTF-HV35	67.0	17.2	7.9	13/16	22.4
12	1/4	SS-12M0-3-4TTF-HV35	72.0	22.8	9.5	13/16	22.4

Cross

Union



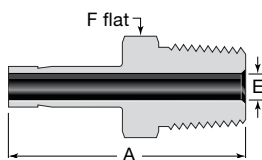
Tube ports are identical.

Tube OD	Ordering Number	Dimensions			
		A	D	E	F, in.
Dimensions, in.					
1/4	SS-400-4-HV35	2.12	0.60	0.19	1/2
5/16	SS-500-4-HV35	2.34	0.64	0.25	5/8
3/8	SS-600-4-HV35	2.40	0.66	0.28	5/8
1/2	SS-810-4-HV35	2.84	0.90	0.41	13/16
Dimensions, mm					
6	SS-6M0-4-HV35	53.9	15.3	4.8	1/2
8	SS-8M0-4HV35	59.7	16.2	6.4	5/8
10	SS-10M0-4-HV35	67.0	17.2	7.9	13/16
12	SS-12M0-4-HV35	72.0	22.8	9.5	13/16
16	SS-16M0-4-HV35	74.0	24.4	12.7	15/16

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Tube Adapters

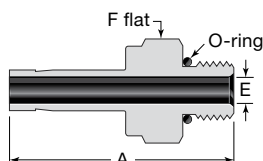
Male



NPT

Tube OD	NPT Size in.	Ordering Number	Dimensions		
			A	E ^①	F
Dimensions, in.					
1/4	1/4	SS-4-TA-1-4-HV35	1.46	0.17	9/16
5/16	1/4	SS-5-TA-1-4-HV35	1.50	0.22	9/16
3/8	1/4	SS-6-TA-1-4-HV35	1.53	0.27	9/16
1/2	1/4	SS-8-TA-1-4-HV35	1.75	0.28	9/16
Dimensions, mm					
6	1/4	SS-6-MTA-1-4-HV35	38.1	4.1	14
8	1/4	SS-8-MTA-1-4-HV35	39.1	5.6	14
10	1/4	SS-10-MTA-1-4-HV35	39.9	7.1	14
12	1/4	SS-12-MTA-1-4-HV35	46.5	7.1	16

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.



Adapts to SAE J1926/1 and ISO 11926-1 straight thread boss.

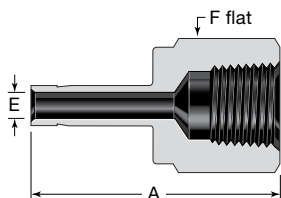
SAE/MS Straight Thread (ST) and (STH - Heavy Wall)

Tube OD	SAE/MS Thread Size	Ordering Number	Dimensions		
			A	E ^①	F
Dimensions, in.					
1/4	7/16-20	SS-4-TA-1-4ST-HV35	1.39	0.17	9/16
3/8	7/16-20	SS-6-TA-1-4ST-HV35	1.46	0.20	9/16
	9/16-18	SS-6-TA-1-6ST-HV35	1.52	0.27	11/16
	3/4-16	SS-6-TA-1-8STH-HV35	1.69	0.27	7/8
1/2	9/16-18	SS-8-TA-1-6ST-HV35	1.74	0.28	11/16
	3/4-16	SS-8-TA-1-8STH-HV35	1.95	0.37	7/8
Dimensions, mm					
6	7/16-20	SS-6-MTA-1-4ST-HV35	32.0	4.1	14
8	7/16-20	SS-8-MTA-1-4ST-HV35	32.8	5.2	14
	9/16-18	SS-8-MTA-1-6ST-HV35	34.5		18
10	9/16-18	SS-10-MTA-1-6ST-HV35	35.1	7.1	18
	3/4-16	SS-10-MTA-1-8STH-HV35	39.9		22
12	9/16-18	SS-12-MTA-1-6ST-HV35	41.7	7.1	18
	3/4-16	SS-12-MTA-1-8STH-HV35	46.5		8.8

O-ring material is 75 durometer fluorocarbon FKM.

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Female



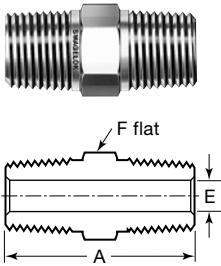
NPT

Tube OD	NPT Size in.	Ordering Number	Dimensions		
			A	E	F
Dimensions, in.					
1/4	1/4	SS-4-TA-7-4-HV35	1.46	0.17	3/4
5/16	1/4	SS-5-TA-7-4-HV35	1.48	0.22	3/4
3/8	1/4	SS-6-TA-7-4-HV35	1.50	0.27	3/4
1/2	1/4	SS-8-TA-7-4-HV35	1.71	0.37	3/4
Dimensions, mm					
6	1/4	SS-6-MTA-7-4-HV35	37.1	4.1	19
8	1/4	SS-8-MTA-7-4-HV35	37.6	5.6	19
10	1/4	SS-10-MTA-7-4-HV35	38.1	7.1	19
12	1/4	SS-12-MTA-7-4-HV35	43.7	8.8	19

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Pipe Fittings

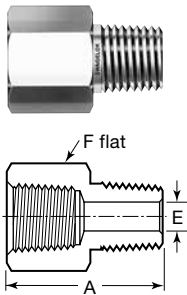
Hex Nipple



Male NPT

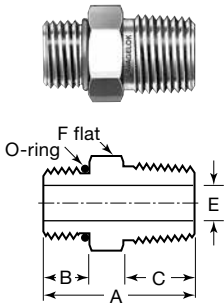
NPT Size in.	Ordering Number	Dimensions, in. (mm)		
		A	E	F
1/4	SS-4-HN-HV35	1.40 (35.6)	0.28 (7.1)	9/16

Adapters



Female to Male NPT

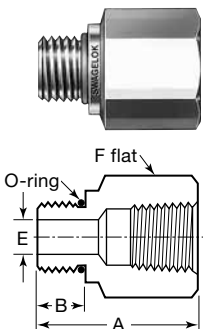
NPT Size in.	Ordering Number	Dimensions, in. (mm)		
		A	E	F
1/4	SS-4-A-HV35	1.40 (35.6)	0.28 (7.1)	3/4



Male SAE/MS Straight Thread to Male NPT

SAE/MS Thread Size in.	NPT Size in.	Ordering Number	Dimensions in. (mm)					Uniform O-Ring ^① Size
			A	B	C	E	F	
7/16-20	1/4	SS-4-SAE-1-4-HV35	1.20 (30.5)	0.36 (9.1)	0.56 (14.2)	0.20 (5.1)	9/16	-904

① O-ring material is 75 durometer fluorocarbon FKM.



Male SAE/MS Straight Thread to Female NPT

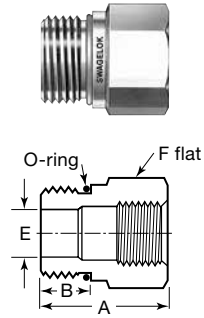
SAE/MS Thread Size in.	NPT Size in.	Ordering Number	Dimensions in. (mm)				Uniform O-Ring ^① Size
			A	B	E	F	
7/16-20	1/4	SS-4-SAE-7-4-HV35	1.32 (33.5)	0.36 (9.1)	0.20 (5.1)	3/4	-904

① O-ring material is 75 durometer fluorocarbon FKM.

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Pipe Fittings

Reducers

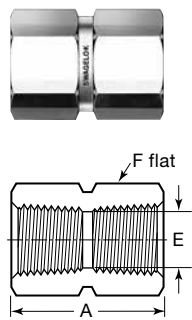


Male to Female SAE/MS Straight Thread (ST)

Male Thread Size in.	Female Thread Size in.	Ordering Number	Dimensions in. (mm)				Uniform O-Ring ^① Size
			A	B	E	F	
9/16-18	7/16-20	SS-6-RBST-4-HV35	1.12 (28.4)	0.39 (9.9)	0.28 (7.1)	13/16	-906
3/4-16	7/16-20	SS-8-RBSTH-4-HV35	1.10 (28.0)	0.55 (14.0)	0.39 (9.9)	7/8	-908
	9/16-18	SS-8-RBSTH-6-HV35	1.31 (33.3)	0.55 (14.0)	0.42 (10.7)	1	-908

① O-ring material is 75 durometer fluorocarbon FKM.

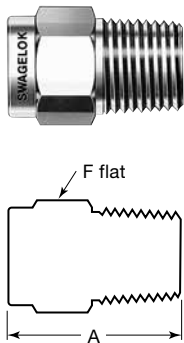
Hex Couplings



Female NPT

NPT Size in.	Ordering Number	Dimensions, in. (mm)		
		A	E	F
1/4	SS-4-HCG-HV35	1.19 (30.2)	0.45 (11.4)	3/4

Pipe Plugs



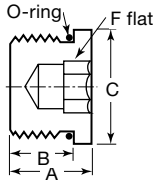
Male NPT

NPT Size in.	Ordering Number	Dimensions in. (mm)	
		A	F
1/4	SS-4-P-HV35	0.96 (24.4)	9/16

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Pipe Fittings

Hollow Hex Plugs

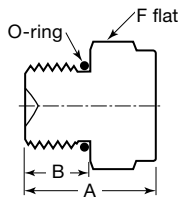


Male SAE/MS Straight Thread (ST) and (STH - Heavy Wall)

SAE/MS Thread Size in.	Ordering Number	Dimensions in. (mm)				Uniform O-Ring ^① Size
		A	B	C	F	
3/8-24	SS-3-HPST-HV35	0.39 (9.9)	0.30 (7.6)	0.49 (12.5)	1/8	-903
7/16-20	SS-4-HPST-HV35	0.45 (11.4)	0.36 (9.1)	0.56 (14.2)	3/16	-904
9/16-18	SS-6-HPST-HV35	0.48 (12.2)	0.39 (9.9)	0.69 (17.5)	1/4	-906
3/4-16	SS-8-HPSTH-HV35	0.67 (17.0)	0.55 (14.0)	0.87 (22.1)	5/16	-908

① O-ring material is 75 durometer fluorocarbon FKM.

Hex Head Plugs



Male SAE/MS Straight Thread (ST) and (STH - Heavy Wall)

SAE/MS Thread Size in.	Basic Ordering Number	Dimensions in. (mm)			Uniform O-Ring ^① Size
		A	B	F	
3/8-24	SS-3-PST-HV35	0.68 (17.3)	0.30 (7.6)	1/2	-903
7/16-20	SS-4-PST-HV35	0.76 (19.3)	0.36 (9.1)	9/16	-904
9/16-18	SS-6-PST-HV35	0.82 (20.8)	0.39 (9.9)	11/16	-906
3/4-16	SS-8-PSTH-HV35	0.99 (25.1)	0.55 (14.0)	7/8	-908

① O-ring material is 75 durometer fluorocarbon FKM.

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Ordering Numbers and Dimensions for Valves With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 350 bar (5 076 psig) — H35 Pressure Class

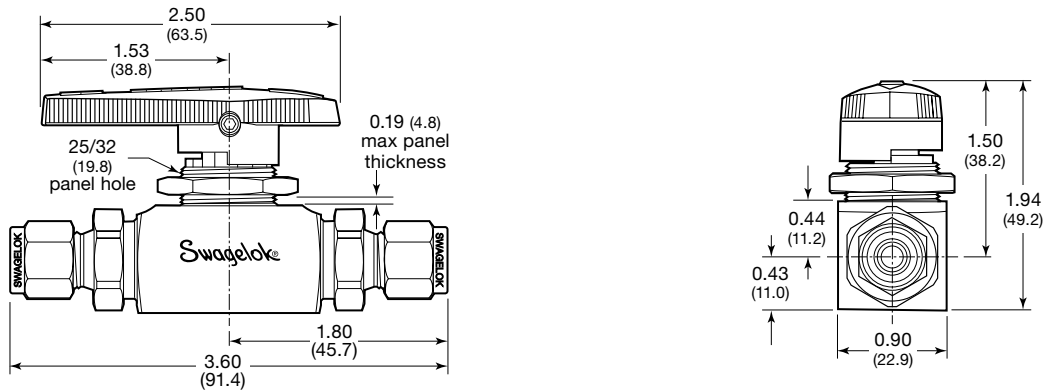
Multipurpose Ball Valve (SK Series)

Pressure rating: 260 bar at -40 to 120°C (3 770 psig at -40 to 248°F)

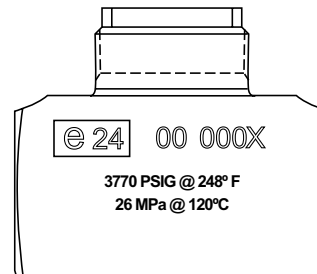
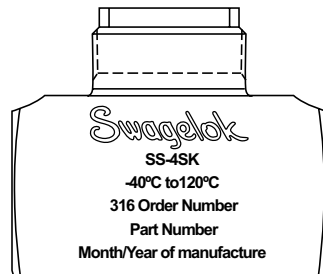
End connection: 10 mm Swagelok tube fitting

Ordering number: SS-4SKPS10MM-33397

Dimensions



Marking



Additional configurations may be available. Contact your local authorized Swagelok sales and service center for details.

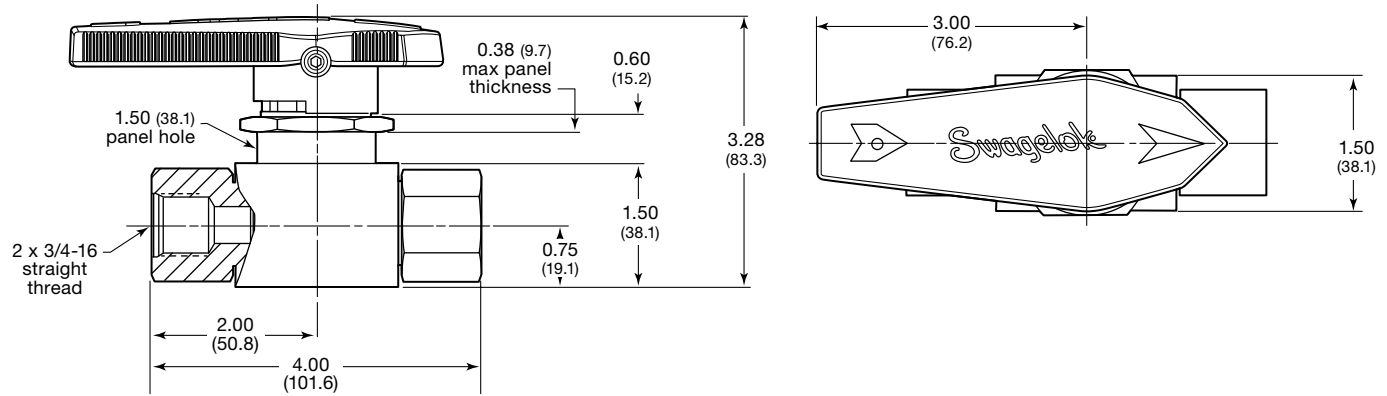
Alternative Fuel Service Ball Valve (AFS Series)

Pressure rating: 413.7 bar at -40 to 120°C (6 000 psig at -40 to 248°F)

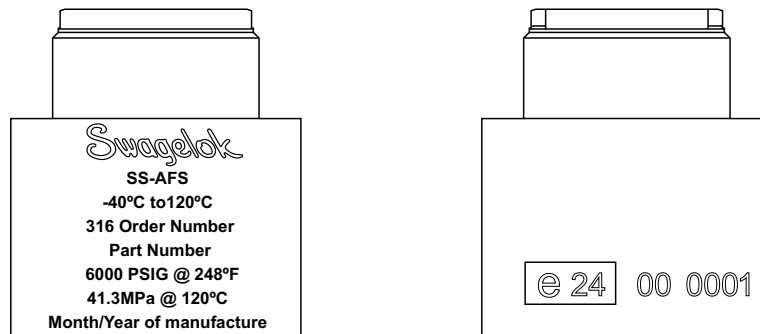
End connection: 3/4-16 SAE/MS Female

Ordering number: SS-AFSMS8-30259

Dimensions



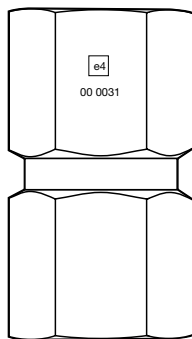
Marking



Additional configurations may be available. Contact your local authorized Swagelok sales and service center for details.

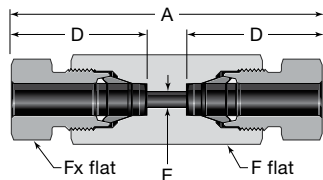
Ordering Numbers and Dimensions for Fittings With EC-79 Certification for Systems Above 30 bar (435 psig) and Up to 700 bar (10 159 psig) — H70 Pressure Class

Marking



FK Series Straight Fittings

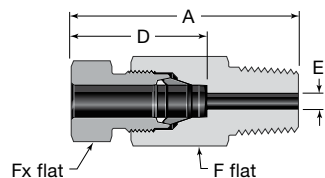
Unions



Union

Tube OD	Ordering Number	Dimensions				
		A	D	E	F	Fx
Dimensions, in.						
1/4	SS-4FK0-6-HV70	2.25	1.08	0.13	5/8	9/16
3/8	SS-6FK0-6-HV70	2.81	1.34	0.21	3/4	11/16
1/2	SS-8FK0-6-HV70	3.36	1.59	0.38	1	7/8
Dimensions, mm						
6	SS-6MFK0-6-HV70	57.2	27.4	3.2	16	15
10	SS-10MFK0-6-HV70	85.3	40.4	5.6	24	22
12	SS-12MFK0-6-HV70	85.3	40.4	6.4	27	22

Male Connectors

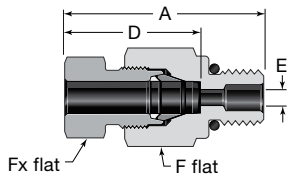


NPT

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	D	E	F	Fx
Dimensions, in.							
1/4	1/4	SS-4FK0-1-4-HV70	1.74	1.08	0.13	5/8	9/16
3/8	1/4	SS-6FK0-1-4-HV70	2.03	1.34	0.21	3/4	11/16
1/2	1/4	SS-8FK0-1-4-HV70	2.33	1.59	0.25	1	7/8
Dimensions, mm							
6	1/4	SS-6MFK0-1-4-HV70	44.1	27.4	3.2	16	15
10	1/4	SS-10MFK0-1-4-HV70	59.1	40.4	5.6	24	22
12	1/4	SS-12MFK0-1-4-HV70	59.1	40.4	6.4	27	22

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Straight Fittings



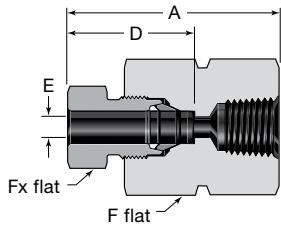
Heavy-Duty Male SAE/MS (STH)

Tube OD	SAE/MS ^① Thread Size	Ordering Number	Dimensions				
			A	D	E ^②	F	Fx
Dimensions, in.							
1/4	7/16-20	SS-4FK0-1-4STH-HV70	1.61	1.08	0.13	5/8	9/16
	9/16-18	SS-4FK0-1-6STH-HV70	1.65	1.08	0.13	3/4	9/16
3/8	7/16-20	SS-6FK0-1-4STH-HV70	1.91	1.34	0.18	3/4	11/16
	9/16-18	SS-6FK0-1-6STH-HV70	1.95	1.34	0.21	3/4	11/16
1/2	7/16-20	SS-8FK0-1-4STH-HV70	2.29	1.59	0.18	1	7/8
	9/16-18	SS-8FK0-1-6STH-HV70	2.29	1.59	0.25	1	7/8
Dimensions, mm							
6	7/16-20	SS-6MFK0-1-4STH-HV70	40.8	27.4	3.2	16	15
	9/16-18	SS-6MFK0-1-6STH-HV70	41.8	27.4	3.2	19	15
10	7/16-20	SS-10MFK0-1-4STH-HV70	58.2	40.4	4.5	24	22
	9/16-18	SS-10MFK0-1-6STH-HV70	58.2	40.4	5.6	24	22
12	7/16-20	SS-12MFK0-1-4STH-HV70	58.2	40.4	4.5	27	22
	9/16-18	SS-12MFK0-1-6STH-HV70	58.2	40.4	6.4	27	22

① O-ring is 90 durometer EPDM.

② The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

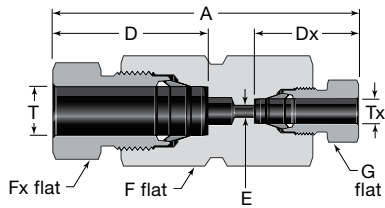
Female Connectors



NPT

Tube OD in.	NPT Size in.	Ordering Number	Dimensions, in.				
			A	D	E	F	Fx
1/4	1/4	SS-4FK0-7-4-HV70	1.85	1.08	0.13	1	9/16
3/8	1/4	SS-6FK0-7-4-HV70	2.10	1.34	0.21	1	11/16
1/2	1/4	SS-8FK0-7-4-HV70	2.42	1.59	0.38	1	7/8

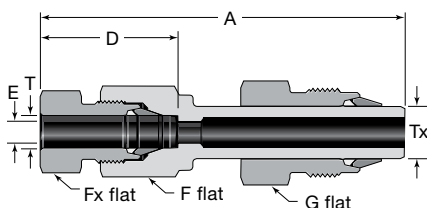
Reducers



Reducing Union

Tube OD		Ordering Number	Dimensions						
T	Tx		A	D	Dx	E	F	Fx	G
Dimensions, in.									
3/8	1/4	SS-6FK0-6-4-HV70	2.64	1.34	1.08	0.13	3/4	11/16	9/16
	1/2	SS-8FK0-6-4-HV70	2.90	1.59	1.34	0.13	1	7/8	9/16
1/2	3/8	SS-8FK0-6-6-HV70	3.19	1.59	1.34	0.21	1	7/8	11/16
	Dimensions, mm								
10	6	SS-10MFK0-6-6M-HV70	74.0	40.4	27.4	3.2	24	22	15
	12	SS-12MFK0-6-6M-HV70	74.0	40.4	27.4	3.2	27	22	15
12	6	SS-12MFK0-6-10M-HV70	86.4	40.4	40.4	5.6	27	22	22

Reducer



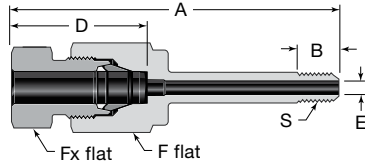
Tube OD, in.		Ordering Number	Dimensions, in.						
T	Tx		A	D	E	F	Fx	G	
1/4	3/8	SS-4FK0-R-6FK-HV70	2.97	1.08	0.13	5/8	9/16	11/16	
	1/2	SS-4FK0-R-8FK-HV70	3.31	1.08	0.13	5/8	9/16	7/8	
3/8	1/2	SS-6FK0-R-8FK-HV70	3.52	1.34	0.21	3/4	11/16	7/8	
1/2	3/8	SS-8FK0-R-6FK-HV70	3.65	1.59	0.21	1	7/8	11/16	

Reducers are furnished with nuts and preswaged ferrules.

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Straight Fittings

Medium-Pressure Cone and Thread Adapters



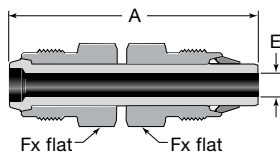
Tube Nipple

Tube OD	C&T Tube Size in.	Ordering Number	S Thread Size	Dimensions					
				A	B	D	E	F	Fx
Dimensions, in.									
1/4	1/4	SS-4FK0-1-4CW-HV70	1/4-28 LH	2.70	0.31	1.08	0.11	5/8	9/16
Dimensions, mm									
6	1/4	SS-6MFK0-1-4CW-HV70	1/4-28 LH	68.5	7.9	27.4	2.7	16	15

To protect surfaces from galling at installation, apply a system-compatible lubricant to the nose and threads of the coned end.

Standard CW end connections are not compatible with anti-vibration glands. Contact your authorized Swagelok representative for information on long CW end connections.

Port Connectors

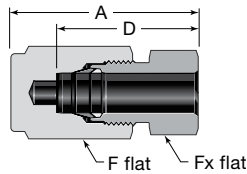


Tube OD	Ordering Number	Dimensions		
		A	E	Fx
Dimensions, in.				
1/4	SS-4FK0-PC-HV70	2.06	0.12	9/16
3/8	SS-6FK0-PC-HV70	2.54	0.21	11/16
1/2	SS-8FK0-PC-HV70	2.99	0.28	7/8
Dimensions, mm				
6	SS-6MFK0-PC-HV70	52.3	3.0	15
10	SS-10MFK0-PC-HV70	75.9	5.6	22
12	SS-12MFK0-PC-HV70	75.9	6.4	22

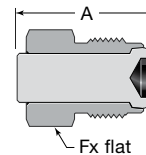
Port connectors are furnished with nuts and preswaged ferrules.

Caps and Plugs

Cap



Plug



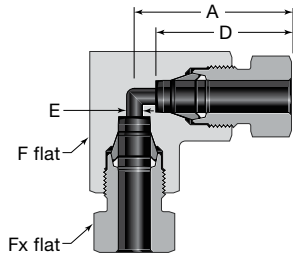
Tube OD	Ordering Number	Dimensions			
		A	D	F	Fx
Dimensions, in.					
1/4	SS-4FK0-C-HV70	1.33	1.08	5/8	9/16
3/8	SS-6FK0-C-HV70	1.74	1.34	3/4	11/16
1/2	SS-8FK0-C-HV70	2.05	1.59	1	7/8
Dimensions, mm					
6	SS-6MFK0-C-HV70	33.7	27.4	16	15
10	SS-10MFK0-C-HV70	52.0	40.4	24	22
12	SS-12MFK0-C-HV70	52.0	40.4	27	22

Tube OD	Ordering Number	Dimensions	
		A	Fx
Dimensions, in.			
1/4	SS-4FK0-P-HV70	1.03	9/16
3/8	SS-6FK0-P-HV70	1.26	11/16
1/2	SS-8FK0-P-HV70	1.45	7/8
Dimensions, mm			
6	SS-6MFK0-P-HV70	26.2	15
10	SS-10MFK0-P-HV70	36.7	22
12	SS-12MFK0-P-HV70	36.7	22

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

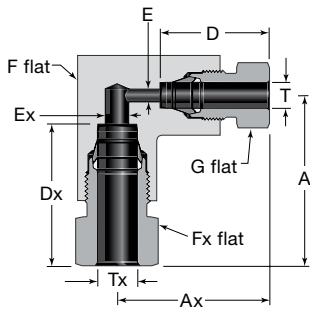
90° Elbows

Unions



Union

Tube OD	Ordering Number	Dimensions				
		A	D	E	F, in.	Fx
Dimensions, in.						
1/4	SS-4FK0-9-HV70	1.26	1.08	0.13	5/8	9/16
3/8	SS-6FK0-9-HV70	1.58	1.34	0.21	3/4	11/16
1/2	SS-8FK0-9-HV70	1.87	1.59	0.38	1	7/8
Dimensions, mm						
6	SS-6MFK0-9-HV70	31.9	27.4	3.0	5/8	15
10	SS-10MFK0-9-HV70	47.5	40.4	5.6	1	22
12	SS-12MFK0-9-HV70	47.5	40.4	6.4	1	22



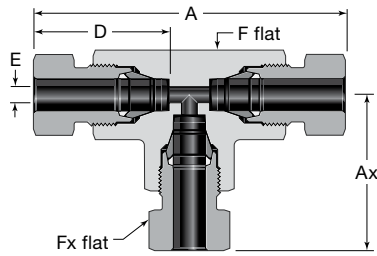
Reducing Union

Tube OD		Ordering Number	Dimensions								
T	Tx		A	Ax	D	Dx	E	Ex	F, in.	Fx	G
Dimensions, in.											
1/4	3/8	SS-6FK0-9-4-HV70	1.61	1.48	1.08	1.34	0.13	0.21	3/4	11/16	9/16
	1/2	SS-8FK0-9-4-HV70	1.91	1.69	1.08	1.59	0.13	0.38	1	7/8	9/16
3/8	1/2	SS-8FK0-9-6-HV70	1.91	1.82	1.34	1.59	0.21	0.38	1	7/8	11/16
Dimensions, mm											
6	10	SS-10MFK0-9-6M-HV70	48.5	42.8	27.4	40.4	3.2	5.6	1	22	15
	12	SS-12MFK0-9-6M-HV70	48.5	42.8	27.4	40.4	3.2	6.4	1	22	22
10	12	SS-12MFK0-9-10M-HV70	48.5	48.5	40.4	40.4	5.6	6.4	1	22	22

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Tees

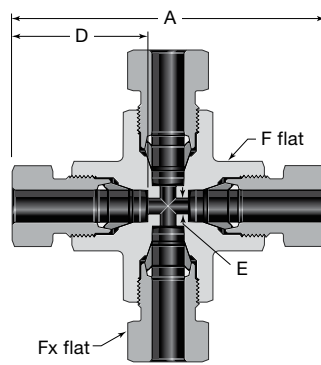
Unions



Tube OD	Ordering Number	Dimensions					
		A	Ax	D	E	F, in.	Fx
Dimensions, in.							
1/4	SS-4FK0-3-HV70	2.51	1.26	1.08	0.13	5/8	9/16
3/8	SS-6FK0-3-HV70	3.17	1.58	1.34	0.21	3/4	11/16
1/2	SS-8FK0-3-HV70	3.74	1.87	1.59	0.38	1	7/8
Dimensions, mm							
6	SS-6MFK0-3-HV70	63.8	31.9	27.4	3.2	5/8	15
10	SS-10MFK0-3-HV70	94.9	47.5	40.4	5.6	1	22
12	SS-12MFK0-3-HV70	94.9	47.5	40.4	6.4	1	22

Crosses

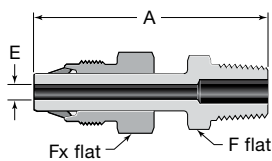
Unions



Tube OD	Ordering Number	Dimensions				
		A	D	E	F, in.	Fx
Dimensions, in.						
1/4	SS-4FK0-4-HV70	2.51	1.08	0.13	5/8	9/16
3/8	SS-6FK0-4-HV70	3.17	1.34	0.21	3/4	11/16
1/2	SS-8FK0-4-HV70	3.74	1.59	0.38	1	7/8
Dimensions, mm						
6	SS-6MFK0-4-HV70	63.8	27.4	3.0	5/8	15
10	SS-10MFK0-4-HV70	94.9	40.5	5.6	1	22
12	SS-12MFK0-4-HV70	94.9	40.5	6.4	1	22

Tube Adapters

Male NPT



Tube OD in.	NPT Size in.	Ordering Number	Dimensions, in.			
			A	E	F	Fx
1/4	1/4	SS-4FK-TA-1-4-HV70	2.18	0.12	9/16	9/16
3/8	1/4	SS-6FK-TA-1-4-HV70	2.53	0.21	9/16	11/16
1/2	1/4	SS-8FK-TA-1-4-HV70	2.87	0.25	9/16	7/8

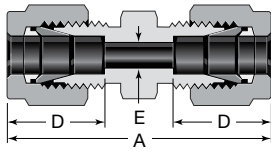
Tube adapters are furnished with nuts and preswaged ferrules.

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Ordering Numbers and Dimensions for EC-79 H70 Class (700 bar (10 159 psig)) Certified Products

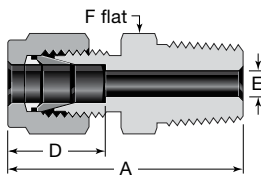
Straight Tube Fittings

Unions



Tube OD	Ordering Number	Dimensions		
		A	D	E
Dimensions, in.				
1/4	SS-400-6-HV70	1.61	0.60	0.19
Dimensions, mm				
6	SS-6M0-6-HV70	41.0	15.3	4.8

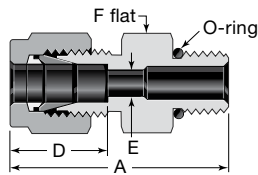
Male Connectors



NPT

Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E ^①	F
Dimensions, in.						
1/4	1/4	SS-400-1-4-HV70	1.49	0.60	0.19	9/16
Dimensions, mm						
6	1/4	SS-6M0-1-4-HV70	37.9	15.3	4.8	14

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.



Adapts to SAE J1926/1 and ISO 11926-1 straight thread boss.

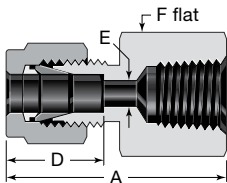
SAE/MS Straight Thread Heavy Wall (STH)

Tube OD	SAE/MS ^① Thread Size	Ordering Number	Dimensions			
			A	D	E ^②	F
Dimensions, in.						
1/4	7/16-20	SS-400-1-4STH-HV70	1.39	0.60	0.19	9/16
	9/16-18	SS-400-1-6STH-HV70	1.48			11/16
Dimensions, mm						
6	7/16-20	SS-6M0-1-4STH-HV70	35.3	15.3	4.8	14
	9/16-18	SS-6M0-1-6STH-HV70	37.1			18

① O-ring is 90 durometer EPDM.

② The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Female Connectors



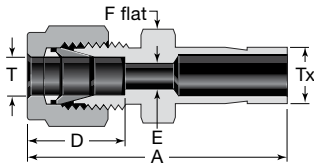
NPT

Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E	F
Dimensions, in.						
1/4	1/4	SS-400-7-4-HV70	1.41	0.60	0.19	3/4
Dimensions, mm						
6	1/4	SS-6M0-7-4-HV70	35.8	15.3	4.8	19

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

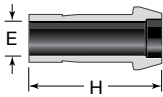
Straight Tube Fittings

Reducers



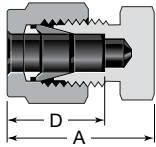
Tube OD		Ordering Number	Dimensions			
T	Tx		A	D	E	F
Dimensions, in.						
1/4	1/4	SS-400-R-4-HV70	1.54	0.60	0.17	1/2

Port Connectors



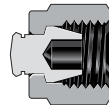
Tube OD	Ordering Number	Dimensions	
		E	H
Dimensions, in.			
1/4	SS-401-PC-HV70	0.17	0.98
Dimensions, mm			
6	SS-6M1-PC-HV70	4.1	25.0

Caps and Plugs



Cap

Tube OD	Ordering Number	A	D
Dimensions, in.			
1/4	SS-400-C-HV70	0.92	0.60
Dimensions, mm			
6	SS-6M0-C-HV70	23.1	15.3



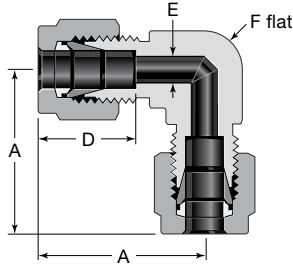
Plug

Tube OD	Ordering Number
Dimensions, in.	
1/4	SS-400-P-HV70
Dimensions, mm	
6	SS-6M0-P-HV70

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

90° Elbows

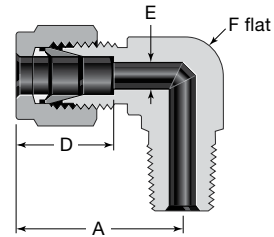
Unions



Tube ports are identical.

Tube OD	Ordering Number	Dimensions			
		A	D	E	F, in.
Dimensions, in.					
1/4	SS-400-9-HV70	1.06	0.60	0.19	1/2
Dimensions, mm					
6	SS-6M0-9-HV70	27.0	15.3	4.8	1/2

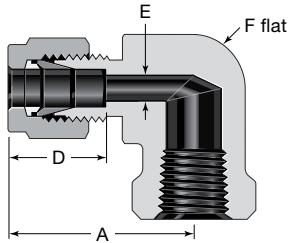
Male NPT



Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E ^①	F, in.
Dimensions, in.						
1/4	1/4	SS-400-2-4-HV70	1.06	0.60	0.19	1/2
Dimensions, mm						
6	1/4	SS-6M0-2-4-HV70	27.0	15.3	4.8	1/2

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Female NPT

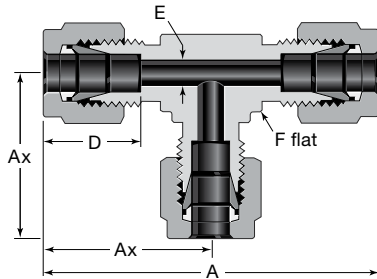


Tube OD	NPT Size	Ordering Number	Dimensions			
			A	D	E	F, in.
Dimensions, in.						
1/4	1/4	SS-400-8-4-HV70	1.17	0.60	0.19	11/16
Dimensions, mm						
6	1/4	SS-6M0-8-4-HV70	29.8	15.3	4.8	11/16

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Tees

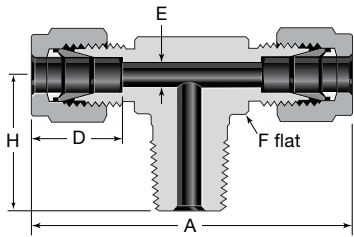
Unions



Tube ports are identical.

Tube OD	Ordering Number	Dimensions				
		A	Ax	D	E	F, in.
Dimensions, in.						
1/4	SS-400-3-HV70	2.12	1.06	0.60	0.19	1/2
Dimensions, mm						
6	SS-6M0-3-HV70	53.9	27.0	15.3	4.8	1/2

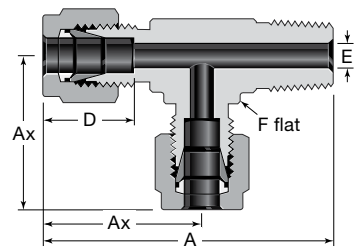
Male



Branch, NPT (TTM)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	D	E ^①	F, in.	H
Dimensions, in.							
1/4	1/4	SS-400-3-4TTM-HV70	2.12	0.60	0.19	1/2	0.92
Dimensions, mm							
6	1/4	SS-6M0-3-4TTM-HV70	53.9	15.3	4.8	1/2	23.4

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

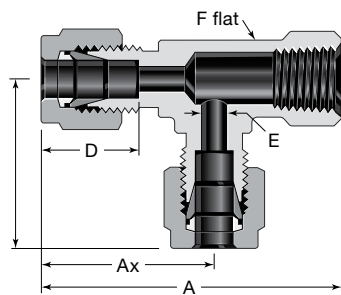


Run, NPT (TMT)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	Ax	D	E ^①	F, in.
Dimensions, in.							
1/4	1/4	SS-400-3-4TMT-HV70	1.98	1.06	0.60	0.19	1/2
Dimensions, mm							
6	1/4	SS-6M0-3-4TMT-HV70	50.3	27.0	15.3	4.8	1/2

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

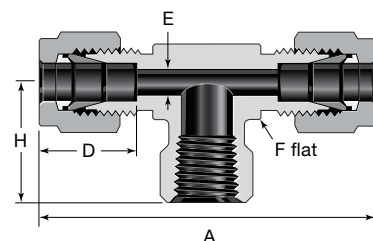
Female



Tube ports are identical.

Run, NPT (TFT)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	Ax	D	E	F, in.
Dimensions, in.							
1/4	1/4	SS-400-3-4TFT-HV70	2.05	1.17	0.60	0.19	11/16
Dimensions, mm							
6	1/4	SS-6M0-3-4TFT-HV70	52.1	29.8	15.3	4.8	11/16



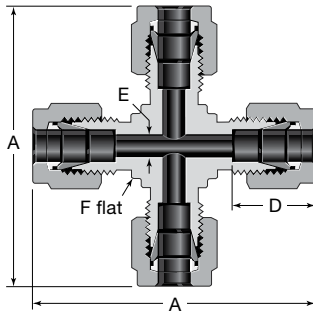
Branch, NPT (TTF)

Tube OD	NPT Size in.	Ordering Number	Dimensions				
			A	D	E	F, in.	H
Dimensions, in.							
1/4	1/4	SS-400-3-4TTF-HV70	2.34	0.60	0.19	11/16	0.88
Dimensions, mm							
6	1/4	SS-6M0-3-4TTF-HV70	59.5	15.3	4.8	11/16	22.4

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Cross

Union

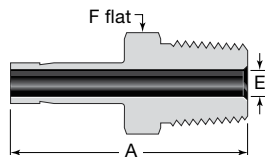


Tube ports are identical.

Tube OD	Ordering Number	Dimensions			
		A	D	E	F, in.
Dimensions, in.					
1/4	SS-400-4-HV70	2.12	0.60	0.19	1/2
Dimensions, mm					
6	SS-6M0-4-HV70	53.9	15.3	4.8	1/2

Tube Adapters

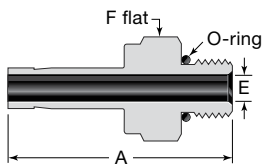
Male



NPT

Tube OD	NPT Size in.	Ordering Number	Dimensions		
			A	E ^①	F
Dimensions, in.					
1/4	1/4	SS-4-TA-1-4-HV70	1.46	0.17	9/16
Dimensions, mm					
6	1/4	SS-6-MTA-1-4-HV70	38.1	4.1	14

① The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.



Adapts to SAE J1926/1 and ISO 11926-1 straight thread boss.

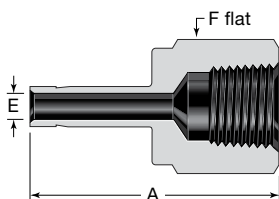
SAE/MS Straight Thread Heavy Wall (STH)

Tube OD	SAE/MS ^① Thread Size	Ordering Number	Dimensions		
			A	E ^②	F
Dimensions, in.					
1/4	7/16-20	SS-4-TA-1-4STH-HV70	1.45	0.17	9/16
Dimensions, mm					
6	7/16-20	SS-6-MTA-1-4STH-HV70	33.8	4.1	14

① O-ring is 90 durometer EPDM.

② The E dimension is the minimum nominal opening. These fittings may have a larger opening at the pipe/straight thread end.

Female



NPT

Tube OD	NPT Size in.	Ordering Number	Dimensions		
			A	E	F
Dimensions, in.					
1/4	1/4	SS-4-TA-7-4-HV70	1.46	0.17	3/4
Dimensions, mm					
6	1/4	SS-6-MTA-7-4-HV70	37.1	4.1	19

Additional sizes are available. Contact your local authorized Swagelok sales and service center for details.

Replacement Parts

Swagelok Tube Fitting Nut-Ferrule Set and Ferrule Set

Use of Nuts and Ferrules

Using Swagelok nuts and ferrules on tube fittings or valves with tube end connections requires critical interaction of precision parts.

Swagelok nuts and ferrules are sold as replacement parts for use with only Swagelok bodies, fittings, valves, and hose products.

Sets are shown with arbors. One arbor holds five nut-ferrule sets.

Nut-Ferrule Set



The nut-ferrule set contains one nut, one back ferrule, and one front ferrule.

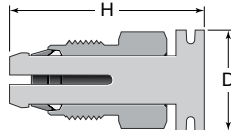
Tube OD	Basic Ordering Number	
	HV35	HV70
Dimensions, in.		
1/4	SS-400-NFSET-HV35	SS-400-NFSET-HV70
3/8	SS-600-NFSET-HV35	—
1/2	SS-810-NFSET-HV35	—
Dimensions, mm		
6	SS-6M0-NFSET-HV35	SS-6M0-NFSET-HV70
8	SS-8M0-NFSET-HV35	—
10	SS-10M0-NFSET-HV35	—
12	SS-12M0-NFSET-HV35	—

FK Series Fitting Nut and Ferrules Cartridge

Each cartridge contains a front ferrule, back ferrule, and male nut. Fractional cartridges are assembled on red arbors; metric cartridges are assembled on yellow arbors.



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



Tube OD	Ordering Number	Dimensions	
		D	H
Dimensions, in.			
1/4	SS-4FK-NFSET-HV70	0.69	1.43
3/8	SS-6FK-NFSET-HV70	0.81	1.72
1/2	SS-8FK-NFSET-HV70	1.00	1.97
Dimensions, mm			
6	SS-6MFK-NFSET-HV70	17.5	36.4
10	SS-10MFK-NFSET-HV70	25.4	49.9
12	SS-12MFK-NFSET-HV70	25.4	49.9

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.