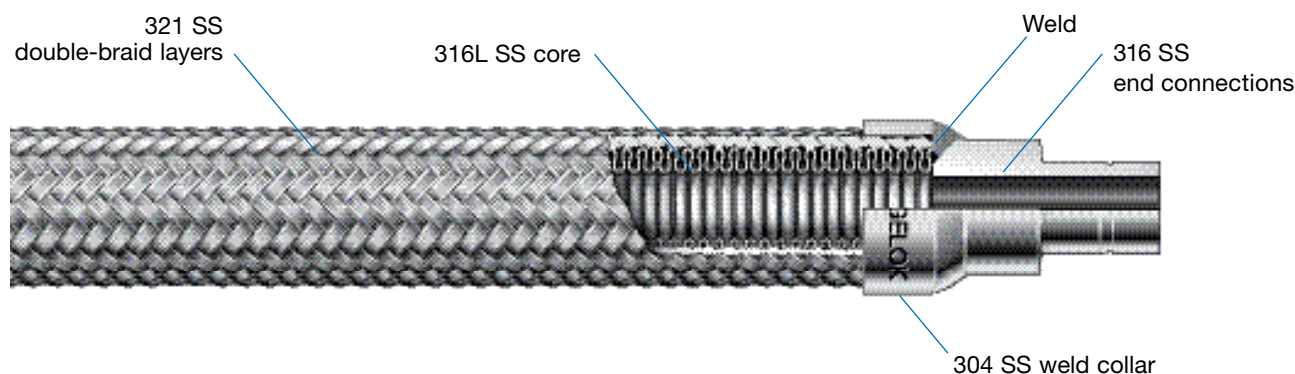


FX Series Metal Hose

Features

- High-pressure corrosion resistant all-metal hose.
- 316L stainless steel annular convoluted core.
- Size range of 1/4 through 2 in. and working pressures from vacuum to 6000 psig (413 bar).
- Double braid layers of 321 stainless steel promotes hose pressure containment.
- End connections welded in accordance with ASME Boiler and Pressure Vessel Code Section IX.
- Commonly used in high-temperature vacuum and high-pressure corrosive environments or where permeation is undesirable.
- Standard and custom assemblies available.
- Options include hose covers, hose tags, and additional helium leak testing. See page 100 for details.
- For electrical properties, see page 5 for details.



Technical Data

Nominal Hose Size in. (mm)	Inside Diameter in. (mm)	Outside Diameter in. (mm)	Minimum Center Line Bend Radius in. (cm)		Temperature Range °F (°C)	Working Pressure at -325 to 300°F (-200 to 148°C) Vacuum to ... psig (bar)	Minimum Burst Pressure at 70°F (20°C) psig (bar)	Bulk Hose Weight lb/ft (kg/m)
			Static	Dynamic				
1/4 (6.4)	0.25 (6.4)	0.68 (17.3)	1.5 (3.81)	5.5 (14.0)	-325 to 1000 (-200 to 537)	6000 (413)	24 000 (1653)	0.49 (0.73)
3/8 (9.7)	0.38 (9.5)	0.92 (23.4)	2.5 (6.40)	7.0 (17.8)		5000 (344)	20 000 (1378)	0.77 (1.15)
1/2 (12.7)	0.51 (13.0)	0.98 (24.9)	3.0 (7.62)	8.0 (20.3)		4500 (310)	18 000 (1240)	0.85 (1.26)
3/4 (19.0)	0.75 (19.0)	1.40 (35.6)	4.0 (10.2)	10.0 (25.4)		3600 (248)	14 400 (992)	1.58 (2.35)
1 (25.4)	1.00 (25.4)	1.70 (43.2)	5.0 (12.7)	11.0 (27.9)		3000 (206)	12 000 (826)	2.32 (3.45)
1 1/4 (31.8)	1.25 (31.8)	2.00 (50.8)	6.5 (16.5)	12.5 (31.8)		2600 (179)	10 400 (716)	2.88 (4.29)
1 1/2 (38.1)	1.50 (38.1)	2.36 (59.9)	7.5 (19.1)	13.0 (33.0)		2200 (151)	8 800 (606)	3.57 (5.31)
2 (50.8)	2.00 (50.8)	2.82 (71.6)	9.0 (22.9)	14.0 (35.6)		1675 (115)	6 700 (461)	4.45 (6.62)

Pressure-temperature ratings may be limited by the end connections.

Pressure-Temperature Ratings

Ratings are based on ASME Code for Pressure Piping B31.3, Process Piping.

Nominal Hose Size, in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Temperature °F (°C)	Working Pressure Vacuum to ... psig (bar)							
-325 (-200) to 300 (148)	6000 (413)	5000 (344)	4500 (310)	3600 (248)	3000 (206)	2600 (179)	2200 (151)	1675 (115)
400 (204)	5640 (388)	4700 (323)	4230 (291)	3384 (233)	2820 (194)	2444 (168)	2068 (142)	1574 (108)
500 (260)	5317 (366)	4431 (305)	3988 (274)	3190 (219)	2658 (183)	2304 (158)	1949 (134)	1484 (102)
600 (315)	5029 (346)	4191 (288)	3772 (259)	3017 (207)	2514 (193)	2179 (150)	1844 (127)	1404 (96.7)
700 (371)	4850 (334)	4041 (278)	3637 (250)	2910 (200)	2425 (167)	2101 (144)	1778 (122)	1354 (93.2)
800 (426)	4634 (319)	3862 (266)	3476 (239)	2780 (191)	2317 (159)	2008 (138)	1699 (117)	1293 (89.0)
850 (454)	4562 (314)	3802 (261)	3422 (235)	2737 (188)	2281 (157)	1977 (136)	1673 (115)	1273 (87.7)
900 (482)	4455 (306)	3712 (255)	3341 (230)	2673 (184)	2227 (153)	1930 (132)	1633 (112)	1243 (85.6)
950 (510)	4347 (299)	3622 (249)	3260 (224)	2608 (179)	2173 (149)	1883 (129)	1594 (109)	1213 (83.5)
1000 (537)	4239 (292)	3532 (243)	3179 (219)	2543 (175)	2119 (145)	1837 (126)	1554 (107)	1183 (81.5)

Every Swagelok FX series hose assembly is inboard helium leak tested to a maximum leak rate of 1×10^{-5} std cm³/s.

Swagelok FX series hose components are cleaned in accordance with Swagelok *Standard Cleaning and Packaging* (SC-10) catalog, MS-06-62. Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed.

⚠ Do not subject flexible metal hose to pressure surges, shock, or pulsations, where the peak pressure is greater than 50 % of the working pressure rating.

Custom Hose Assemblies

Typical Ordering Number

1 Material

End Connections

SS = 316 stainless steel

2 Hose

FX = FX series high-pressure metal hose

3 Nominal Hose Size, in.

4 = 1/4	16 = 1
6 = 3/8	20 = 1 1/4
8 = 1/2	24 = 1 1/2
12 = 3/4	32 = 2

4 End Connections

See **End Connection Designator**
column in tables on next page.

5 Overall Length

Inches in tenths or centimeters, in whole numbers. Include **CM** as shown for centimeter lengths.

6 Options

For multiple options, add designators with a dash between each designator.

A = Armor guard

F = Fire jacket

F1 = Thermosleeve

H7 = Helium leak test (1×10^{-7} std
cm³/s)

N3 = Nitrogen pressure test

Z = 316L SS braid material

Mat Tags

MA = Gray

MO = Orange

MB = Blue

MP = Purple

MC = Brown

MR = Red

MG = Green

MW = White

MK = Black

MY = Yellow

MN = Pink

Other Tags

T = Lanyard tag

T2 = Two lanyard tags

T5 = Clamp tag

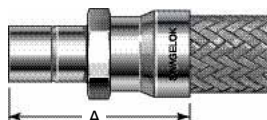
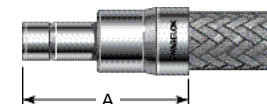
Specify text for tags. See **Hose Tag Text** table, page 101.

See page 100 for detailed descriptions of options.

FX Series Metal Hose

End Connections

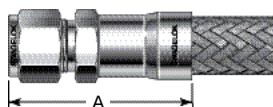
Swagelok Tube Adapters



End Connections
with Hex Flat

Tube Adapter Size	Nominal Hose Size Designator	End Connection Designator	Dimensions		
			A	Minimum Inside Diameter	Maximum Outside Dimension
Dimensions, in. (mm)					
1/4	4	TA4	1.64 (41.7)	0.18 (4.6)	0.78 (19.8)
3/8	6	TA6	1.81 (46.0)	0.27 (6.9)	1.01 (25.7)
1/2	8	TA8	2.28 (57.9)	0.37 (9.4)	1.08 (27.4)
3/4	12	TA12	2.62 (66.5)	0.58 (14.7)	1.50 (38.1)
1	16	TA16	2.99 (75.9)	0.80 (20.3)	1.79 (45.5)
1 1/4	20	TA20	3.91 (99.3)	1.02 (25.9)	2.16 (54.9)
1 1/2	24	TA24	4.47 (114)	1.25 (31.8)	2.59 (65.8)
2	32	TA32	5.70 (145)	1.72 (43.7)	3.45 (87.6)
Dimensions, mm (in.)					
6	4	TM6	42.2 (1.66)	4.1 (0.16)	19.8 (0.78)
8	4	TM8	42.4 (1.67)	5.6 (0.22)	19.8 (0.78)
10	6	TM10	53.3 (2.10)	7.1 (0.28)	25.7 (1.01)
12	8	TM12	67.9 (2.67)	8.9 (0.35)	27.4 (1.08)
18	12	TM18	64.0 (2.52)	14.0 (0.55)	38.1 (1.50)
25	16	TM25	75.9 (2.99)	19.8 (0.78)	45.5 (1.79)
32	20	TM32	87.4 (3.44)	26.4 (1.04)	57.4 (2.26)
38	24	TM38	97.3 (3.83)	31.8 (1.25)	69.1 (2.72)

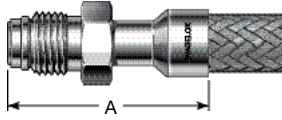
Swagelok Tube Fittings



Tube Fitting Size	Nominal Hose Size Designator	End Connection Designator	Dimensions		
			A	Minimum Inside Diameter	Maximum Outside Dimension
Dimensions, in. (mm)					
1/4	4	SL4	1.99 (50.5)	0.19 (4.8)	0.78 (19.8)
3/8	6	SL6	2.07 (52.6)	0.28 (7.1)	1.01 (25.7)
1/2	8	SL8	2.56 (65.0)	0.41 (10.4)	1.08 (27.4)
3/4	12	SL12	2.74 (69.6)	0.63 (16.0)	1.50 (38.1)
1	16	SL16	3.20 (81.3)	0.88 (22.4)	1.79 (45.5)
1 1/4	20	SL20	3.79 (96.3)	1.09 (27.7)	2.10 (53.3)
1 1/2	24	SL24	4.25 (108)	1.35 (34.3)	2.45 (62.2)
2	32	SL32	5.47 (138.9)	1.82 (46.2)	3.17 (80.5)
Dimensions, mm (in.)					
6	4	SM6	50.5 (1.99)	4.8 (0.19)	19.8 (0.78)
8	4	SM8	51.6 (2.03)	6.4 (0.25)	19.8 (0.78)
10	6	SM10	53.6 (2.11)	7.9 (0.31)	25.7 (1.01)
12	8	SM12	65.0 (2.56)	9.7 (0.38)	27.4 (1.08)
18	12	SM18	69.6 (2.74)	15.0 (0.59)	38.1 (1.50)
25	16	SM25	81.3 (3.20)	21.8 (0.86)	45.5 (1.79)
32	20	SM32	98.8 (3.89)	28.7 (1.13)	53.3 (2.10)
38	24	SM38	111 (4.36)	33.8 (1.33)	63.2 (2.49)

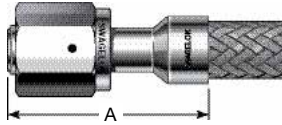
FX Series Metal Hose

Rotatable Male VCR® Metal Gasket Face Seal Fittings



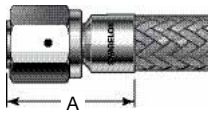
VCR Size in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
			A	Minimum Inside Diameter	Maximum Outside Dimension
1/4	4	RM4	1.81 (46)	0.18 (4.6)	0.78 (19.8)
1/2	8	RM8	2.13 (54.1)	0.40 (10.2)	1.08 (27.4)
3/4	12	RM12	2.75 (69.9)	0.63 (16.0)	1.51 (38.4)
1	16	RM16	2.97 (75.4)	0.88 (22.4)	1.88 (47.8)

Rotatable Female VCR Metal Gasket Face Seal Fittings



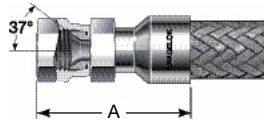
VCR Size in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
			A	Minimum Inside Diameter	Maximum Outside Dimension
1/4	4	RF4	1.81 (46)	0.18 (4.6)	0.87 (22.1)
1/2	8	RF8	2.13 (54.1)	0.40 (10.2)	1.23 (31.2)
3/4	12	RF12	2.75 (69.9)	0.63 (16.0)	1.73 (43.9)
1	16	RF16	2.97 (75.4)	0.88 (22.4)	2.02 (51.3)

Female VCO O-Ring Face Seal Fittings



VCO Size in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
			A	Minimum Inside Diameter	Maximum Outside Dimension
1/4	4	VF4	1.27 (32.3)	0.19 (4.8)	0.79 (20.1)
1/2	8	VF8	1.44 (36.6)	0.41 (10.4)	1.08 (27.4)
3/4	12	VF12	1.69 (42.9)	0.63 (16.0)	1.73 (43.9)
1	16	VF16	1.73 (43.9)	0.88 (22.4)	2.02 (51.3)

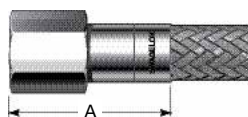
SAE 37° (JIC) Female Swivel



Swivel Size in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
			A	Minimum Inside Diameter	Maximum Outside Dimension
1/4	4	AS4	1.67 (42.4)	0.19 (4.8)	0.78 (19.8)
3/8	6	AS6	1.79 (45.5)	0.28 (7.1)	1.01 (25.7)
1/2	8	AS8	2.08 (52.8)	0.39 (9.9)	1.08 (27.4)
3/4	12	AS12	2.39 (60.7)	0.61 (15.5)	1.50 (38.1)
1	16	AS16	2.64 (67.1)	0.84 (21.3)	1.79 (45.5)

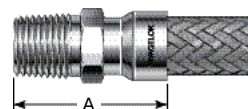
FX Series Metal Hose

Female Pipe Threads, NPT



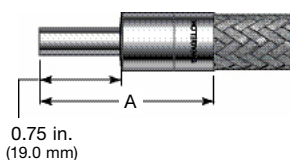
NPT Size in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
			A	Minimum Inside Diameter	Maximum Outside Dimension
1/4	4	PF4	1.72 (43.7)	0.30 (7.6)	0.87 (22.1)
3/8	6	PF6	1.84 (46.7)	0.42 (10.7)	1.01 (25.7)
1/2	8	PF8	2.58 (65.5)	0.58 (14.7)	1.23 (31.2)
3/4	12	PF12	2.53 (64.3)	0.73 (18.5)	1.51 (38.4)
1	16	PF16	2.92 (74.2)	0.95 (24.1)	1.88 (47.8)
1 1/2	24	PF24	3.28 (83.3)	1.50 (38.1)	2.74 (69.6)

Male Pipe Threads, NPT and ISO/BSP Tapered (ISO 7)



NPT and ISO/BSP Tapered Size in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
			A	Minimum Inside Diameter	Maximum Outside Dimension
NPT					
1/4	4	PM4	1.82 (46.2)	0.28 (7.1)	0.78 (19.8)
3/8	6	PM6	1.91 (48.5)	0.38 (9.7)	1.01 (25.7)
1/2	8	PM8	2.45 (62.2)	0.47 (11.9)	1.08 (27.4)
3/4	12	PM12	2.57 (65.3)	0.63 (16.0)	1.50 (38.1)
1	16	PM16	3.05 (77.5)	0.88 (22.4)	1.79 (45.5)
1 1/4	20	PM20	3.14 (79.8)	1.09 (27.7)	2.10 (53.3)
1 1/2	24	PM24	3.38 (85.9)	1.34 (34.0)	2.45 (62.2)
2	32	PM32	3.88 (98.6)	1.81 (46.0)	2.92 (74.2)
ISO/BSP Tapered					
1/4	4	MT4	1.82 (46.2)	0.28 (7.1)	0.78 (19.8)
3/8	6	MT6	1.91 (48.5)	0.38 (9.7)	1.01 (25.7)
1/2	8	MT8	2.45 (62.2)	0.47 (11.9)	1.08 (27.4)
3/4	12	MT12	2.57 (65.3)	0.63 (16.0)	1.50 (38.1)
1	16	MT16	3.05 (77.5)	0.88 (22.4)	1.79 (45.5)
1 1/4	20	MT20	3.14 (79.8)	1.09 (27.7)	2.10 (53.3)
1 1/2	24	MT24	3.38 (85.9)	1.34 (34.0)	2.45 (62.2)

Tube Butt Welds



Tube Butt Weld Size in.	Wall Thickness in.	Nominal Hose Size Designator	End Connection Designator	Dimensions, in. (mm)		
				A	Minimum Inside Diameter	Maximum Outside Dimension
1/4	0.035	4	TB4	1.77 (45.0)	0.18 (4.6)	0.78 (19.8)
3/8	0.035	6	TB6	1.82 (46.2)	0.31 (7.9)	1.01 (25.7)
1/2	0.049	8	TB8	2.17 (55.1)	0.40 (10.2)	1.08 (27.4)
3/4	0.049	12	TB12	2.27 (57.7)	0.65 (16.5)	1.50 (38.1)
1	0.065	16	TB16	2.46 (62.5)	0.87 (22.1)	1.79 (45.5)