

Hose



Hose Assemblies, Bulk Hose, and End Connections

- PTFE-lined, stainless steel braided
- Metal flexible
- Multipurpose push-on
- Thermoplastic
- Conductive core

Contents

PTFE-Lined, Stainless Steel Braided Hose 3



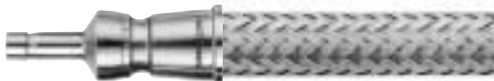
- Working pressures ambient to 3000 psig (206 bar)
- Temperatures from -65 to 450°F (-53 to 230°C)
- End connection sizes from 1/8 to 1 1/2 in. and 6 to 25 mm
- Standard and custom-length assemblies

High-Pressure, Metal Flexible Hose (FM Series) 8



- Working pressures from vacuum up to 3100 psig (213 bar)
- Temperatures from -325 to 850°F (-200 to 454°C)
- End connection sizes from 1/4 to 2 in. and 6 to 12 mm
- Standard and custom-length assemblies

Low-Pressure, Metal Flexible Hose (FL Series) 13



- Working pressures from vacuum up to 1500 psig (103 bar)
- Temperatures from -325 to 850°F (-200 to 454°C)
- End connection sizes from 1/4 to 1/2 in. and 6 to 12 mm
- Standard and custom-length assemblies

Multipurpose Push-On Hose 17



- Working pressures ambient to 350 psig (24.1 bar)
- Temperatures from -40 to 200°F (-40 to 93°C)
- End connection sizes from 1/4 to 3/4 in. and 6 to 18 mm
- Bulk hose, end connections, and custom-length assemblies

Thermoplastic Hose 21



- Working pressures ambient to 5000 psig (344 bar)
- Temperatures from -40 to 200°F (-40 to 93°C)
- End connection sizes from 1/4 to 1 in. and 6 to 22 mm
- Bulk hose, end connections, and custom-length assemblies

Conductive Core Hose 26

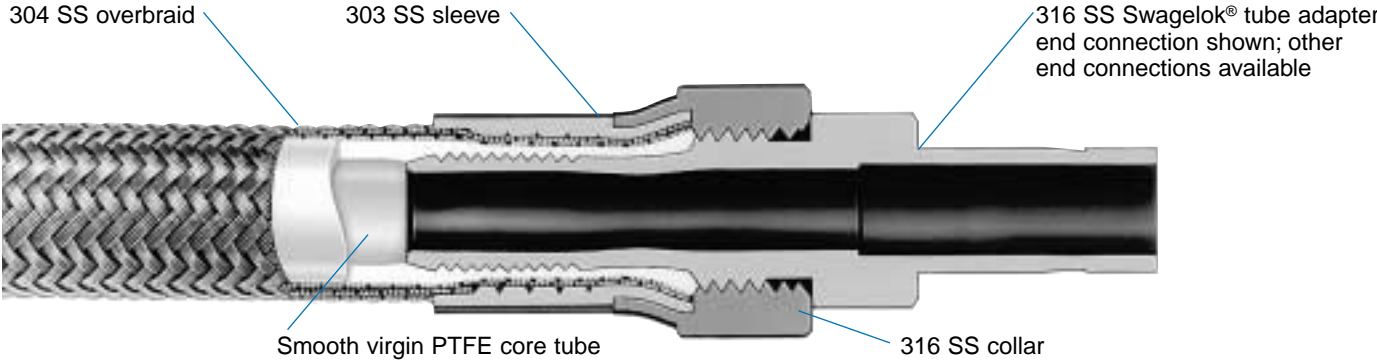


- Working pressures ambient to 5000 psig (344 bar)
- Temperatures from -40 to 150°F (-40 to 65°C)
- End connection sizes of 1/4 and 3/8 in. and 8 and 10 mm
- Custom-length assemblies

See SAE J1273, *Recommended Practices for Hydraulic Hose Assemblies*, for information on installation and use of hose.

See NAHAD ASC 001.01, *Flexible Metal Hose Assembly Standard*, for common hose routing guidelines.

PTFE-Lined, Stainless Steel Braided Hose (TH Series)



Features

- Stainless steel end connections are available in 1/8 to 1 1/2 in. and 6 to 25 mm sizes. Select end connections are available in other alloys; contact your authorized Swagelok sales and service representative.
- Lightweight construction allows easy handling and installation.
- Standard and custom lengths are available.
- PTFE material complies with FDA regulation 21CFR Part 177.1550 for contact with water, food, and beverages.
- PTFE is a nonconductive material. In applications that require conductivity to help prevent static-electric discharge, PTFE-lined hose with carbon black-filled core tube (TC series) is available.
- PTFE-lined hose with alloy 400/R-405 end connections and overbraid (TL4 series) is available. The pressure rating is 1500 psig (103 bar) at 70°F (20°C).

Technical Data

| Nominal Hose Size in. (mm) | Minimum Bend Radius ^① in. (cm) | | Temperature Range ^② °F (°C) | Working Pressure at 70°F (20°C) psig (bar) | Minimum Burst Pressure at 70°F (20°C) psig (bar) |
|-------------------------------|--|-------------|---|---|---|
| | Static | Dynamic | | | |
| 3/16 (4.8) | 1.50 (3.81) | 2.00 (5.08) | -65 to 450 (-53 to 230) | 3000 (206) | 12 000 (826) |
| 5/16 (7.9) | 3.50 (8.89) | 5.00 (12.7) | | 2500 (172) | 10 000 (689) |
| 13/32 (10.3) | 4.50 (11.4) | 6.00 (15.2) | | 2000 (137) | 8 000 (551) |
| 5/8 (15.9) | 6.00 (15.2) | 7.50 (19.0) | | 1500 (103) | 6 000 (413) |
| 7/8 (22.2) | 9.00 (22.9) | 11.3 (28.7) | | 1000 (68.9) | 4 000 (275) |

① Measured to inside of bend.
 ② Thermal cycling of hose may affect its ability to maintain a leak-tight seal.
⚠ Testing should be performed to verify suitability in actual operating conditions.

Pressure-Temperature Ratings

To determine pressure-temperature ratings at elevated temperatures, follow these steps:

1. Find the working pressure at 70°F (20°C) in the **Technical Data** table above.
2. Multiply this by the appropriate factor listed in the **Pressure-Temperature Rating Factors** table.

Example: 3/16 in. TH series hose at 300°F (148°C)

1. The working pressure rating at 70°F (20°C) is 3000 psig (206 bar).
2. The temperature factor for 300°F (148°C) is 0.52:
 $3000 (206) \times 0.52 = 1560 \text{ psig (107 bar)}$.

The 3/16 in. TH series hose pressure rating at 300°F (148°C) is 1560 psig (107 bar).

Pressure-Temperature Rating Factors

Ratings maintain a minimum factor of 4:1 between working pressure and minimum burst pressure.

| Temperature °F (°C) | Factor | |
|------------------------|---------------|------------|
| | TH, TC Series | TL4 Series |
| -65 (-53) | 0.75 | 1.00 |
| 0 (-17) | 1.00 | |
| 100 (37) | 1.00 | |
| 200 (93) | 0.58 | 0.87 |
| 300 (148) | 0.52 | 0.81 |
| 400 (204) | 0.48 | 0.79 |
| 450 (230) | 0.46 | 0.78 |

Testing

Every Swagelok PTFE-lined hose assembly is pressure tested with water for 30 to 60 seconds at 1.5 times the working pressure to a requirement of no visible leakage at ambient temperature.

Cleaning and Packaging

Swagelok PTFE-lined, stainless steel braided hose components are cleaned in accordance with Swagelok standard cleaning and packaging specification (SC-10). Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed.

Additional Considerations

PTFE is a permeable material. Gases, vapors, and liquids can migrate through the PTFE core tube. The rate of permeation is affected by many application-specific variables.

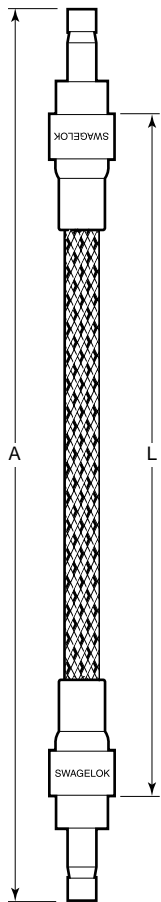
Ordering Information

Dimensions are for reference only and are subject to change.

PTFE-Lined Hose Standard Assemblies

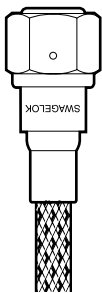
Select an ordering number.

Tube Adapter End Connections



| Nominal Hose Size | Tube OD | Minimum Inside Diameter | Maximum Outside Diameter | A | Ordering Number | L |
|-----------------------------|---------|-------------------------|--------------------------|-----------------|-----------------|-------------|
| Dimensions, in. (mm) | | | | in. (cm) | | |
| 3/16 | 1/4 | 0.16 (4.1) | 0.54 (13.7) | 8.00 (20.3) | SS-4BHT-6 | 5.97 (15.2) |
| | | | | 14.0 (35.6) | SS-4BHT-12 | 12.0 (30.5) |
| | | | | 20.0 (50.8) | SS-4BHT-18 | 18.0 (45.7) |
| | | | | 26.0 (66.0) | SS-4BHT-24 | 24.0 (61.0) |
| | | | | 38.0 (96.5) | SS-4BHT-36 | 36.0 (91.4) |
| | | | | 50.0 (127) | SS-4BHT-48 | 48.0 (122) |
| | | | | 62.0 (157) | SS-4BHT-60 | 60.0 (152) |
| | | | | 74.0 (188) | SS-4BHT-72 | 72.0 (183) |
| 5/16 | 3/8 | 0.27 (6.9) | 0.73 (18.5) | 14.0 (35.6) | SS-6BHT-12 | 11.8 (30.0) |
| | | | | 26.0 (66.0) | SS-6BHT-24 | 23.8 (60.5) |
| | | | | 38.0 (96.5) | SS-6BHT-36 | 35.8 (90.9) |
| | | | | 50.0 (127) | SS-6BHT-48 | 47.8 (121) |
| 13/32 | 1/2 | 0.36 (9.1) | 0.86 (21.8) | 14.5 (36.8) | SS-8BHT-12 | 11.8 (30.0) |
| | | | | 26.5 (67.3) | SS-8BHT-24 | 22.3 (56.6) |
| | | | | 38.5 (97.8) | SS-8BHT-36 | 35.8 (90.9) |
| | | | | 50.5 (128) | SS-8BHT-48 | 47.8 (121) |
| | | | | 62.5 (159) | SS-8BHT-60 | 59.8 (152) |
| 5/8 | 3/4 | 0.53 (13.5) | 1.04 (26.4) | 26.5 (67.3) | SS-12BHT-24 | 23.8 (60.5) |
| | | | | 38.5 (97.8) | SS-12BHT-36 | 35.8 (90.9) |
| 7/8 | 1 | 0.80 (20.3) | 1.36 (34.5) | 39.5 (100) | SS-16BHT-36 | 36.8 (93.5) |
| | | | | 51.5 (131) | SS-16BHT-48 | 48.8 (124) |
| Dimensions, mm (in.) | | | | cm (in.) | | |
| 3/16 in. | 6 | 4.1 (0.16) | 13.7 (0.54) | 35.6 (14.0) | SS-4MBHT-12 | 30.2 (11.9) |
| | | | | 66.0 (26.0) | SS-4MBHT-24 | 60.7 (23.9) |
| | | | | 96.5 (38.0) | SS-4MBHT-36 | 91.2 (35.9) |
| 13/32 in. | 12 | 8.3 (0.33) | 21.8 (0.86) | 67.3 (26.5) | SS-8MBHT-24 | 60.5 (23.8) |
| | | | | 97.8 (38.5) | SS-8MBHT-36 | 90.9 (35.8) |

VCO® O-Ring Face Seal Fitting End Connections



| Nominal Hose Size in. | VCO Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | A in. (cm) | Ordering Number | L in. (cm) |
|-----------------------|--------------|----------------------------------|-------------------------------------|-------------|-----------------|-------------|
| 3/16 | 1/4 | 0.16 (4.1) | 11/16 in. | 13.5 (34.3) | SS-4BHO-12 | 12.1 (30.7) |
| | | | | 25.5 (64.8) | SS-4BHO-24 | 24.1 (61.2) |
| | | | | 37.5 (95.3) | SS-4BHO-36 | 36.1 (91.7) |
| 13/32 | 1/2 | 0.36 (9.1) | 1 in. | 13.5 (34.3) | SS-8BHO-12 | 11.3 (28.7) |
| | | | | 25.5 (64.8) | SS-8BHO-24 | 23.3 (59.2) |
| | | | | 37.5 (95.3) | SS-8BHO-36 | 35.3 (89.7) |
| | | | | 49.5 (126) | SS-8BHO-48 | 47.3 (120) |

PTFE-Lined Hose Custom Assemblies

Typical Ordering Number

Build a hose assembly ordering number by combining the designators in the sequence shown below.

SS - TH 4 TA 4 TA 4 - 28 or 71 CM

End Connection Material

SS = 316 stainless steel
 C20 = Alloy 20
 M = Alloy 400/R-405
 INC = Alloy 600
 HC = Alloy C-276
 TI = Titanium

1st End Connections

2nd End Connections

See tables below.

in. Overall Length

cm Overall Length

Must be in whole number increments.

Hose Series

TH = PTFE hose
 TC = PTFE hose, carbon black filled
 TL = 1/4 in. PTFE hose with alloy 400/R-405 overbraid

Hose Size

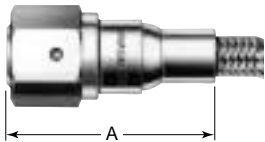
4 = 3/16 in. (only size available for TL series)
 6 = 5/16 in.
 8 = 13/32 in.
 12 = 5/8 in.
 16 = 7/8 in.

Tube Adapters



| Tube OD | Minimum Inside Diameter | Maximum Outside Diameter | Hose Size Designator | End Connection Designator | A |
|-----------------------------|-------------------------|--------------------------|----------------------|---------------------------|-------------|
| Dimensions, in. (mm) | | | | | |
| 1/4 | 0.16 (4.1) | 0.54 (13.7) | 4 | TA4 | 1.64 (41.7) |
| 3/8 | 0.27 (6.9) | 0.73 (18.5) | 6 | TA6 | 1.81 (46.0) |
| | | | 8 | | 2.27 (57.7) |
| 1/2 | 0.36 (9.1) | 0.86 (21.8) | | TA8 | 2.19 (55.6) |
| 3/4 | 0.53 (13.5) | 1.02 (25.9) | 12 | TA12 | 2.72 (69.1) |
| | 0.56 (14.2) | 1.36 (34.5) | 16 | | 3.29 (83.6) |
| 1 | 0.58 (14.7) | 1.34 (34.0) | 12 | TA16 | 2.99 (75.9) |
| | 0.80 (20.3) | 1.36 (34.5) | 16 | | 3.57 (90.7) |
| Dimensions, mm (in.) | | | | | |
| 6 | 4.1 (0.16) | 13.7 (0.54) | 4 | TM6 | 42.2 (1.66) |
| 8 | | 14.0 (0.55) | | TM8 | 50.5 (1.99) |
| 10 | 6.9 (0.27) | 15.5 (0.61) | 6 | TM10 | 54.1 (2.13) |
| 12 | 8.4 (0.33) | 20.1 (0.79) | 8 | TM12 | 65.3 (2.57) |
| 18 | 13.5 (0.53) | 26.9 (1.06) | 12 | TM18 | 69.1 (2.72) |
| 25 | 19.0 (0.75) | 34.5 (1.36) | 16 | TM25 | 88.6 (3.49) |

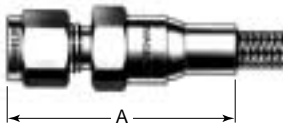
VCO O-Ring Face Seal Fittings, Female Swivel



| VCO Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| 1/4 | 0.16 (4.1) | 11/16 in. | 4 | VF4 | 1.69 (42.9) |
| 1/2 | 0.27 (6.9) | 1 in. | 6 | VF8 | 1.83 (46.5) |
| | 0.36 (9.1) | | 8 | | 1.95 (49.5) |
| 3/4 | 0.58 (14.7) | 1 1/2 in. | 12 | VF12 | 2.21 (56.1) |
| | 0.63 (16.0) | | 16 | | 2.71 (68.8) |
| 1 | 0.80 (20.3) | 1 3/4 in. | | VF16 | 2.68 (68.1) |

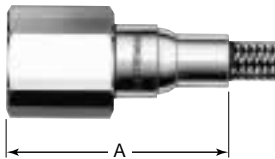
See next page for more end connections.

Swagelok Tube Fittings



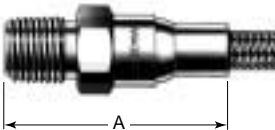
| Fitting Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|-----------------------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| Dimensions, in. (mm) | | | | | |
| 1/8 | 0.10 (2.5) | 9/16 in. | 4 | SL2 | 1.94 (49.3) |
| 1/4 | 0.16 (4.1) | | | SL4 | 1.97 (50.0) |
| 3/8 | 0.27 (6.9) | 3/4 in. | 6 | SL6 | 2.27 (57.7) |
| 1/2 | 0.36 (9.1) | 15/16 in. | 8 | SL8 | 2.43 (61.7) |
| 3/4 | 0.58 (14.7) | 1 1/8 in. | 12 | SL12 | 2.87 (72.9) |
| Dimensions, mm (in.) | | | | | |
| 6 | 4.1 (0.16) | 9/16 in. | 4 | SM6 | 49.8 (1.96) |
| 10 | 6.9 (0.27) | 3/4 in. | 6 | SM10 | 44.7 (1.76) |
| 12 | 9.1 (0.36) | 15/16 in. | 8 | SM12 | 61.7 (2.43) |
| 18 | 14.7 (0.58) | 30 mm | 12 | SM18 | 72.9 (2.87) |

Female Pipe Threads



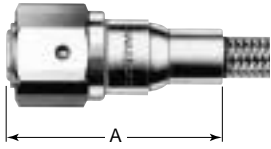
| Pipe Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|-------------------------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| Female NPT | | | | | |
| 1/4 | 0.16 (4.1) | 3/4 in. | 4 | PF4 | 1.88 (47.8) |
| | 0.27 (6.9) | | 6 | | 1.96 (49.8) |
| 3/8 | 0.27 (6.9) | 7/8 in. | 6 | PF6 | 2.02 (51.3) |
| 1/2 | 0.36 (9.1) | 1 1/16 in. | 8 | PF8 | 2.42 (61.5) |
| 3/4 | 0.58 (14.7) | 1 5/16 in. | 12 | PF12 | 2.57 (65.3) |
| Female BSP/ISO Tapered | | | | | |
| 1/4 | 0.16 (4.1) | 3/4 in. | 4 | FT4 | 1.88 (47.8) |
| 1/2 | 0.36 (9.1) | 1 1/16 in. | 8 | FT8 | 2.42 (61.5) |

Male Pipe Threads



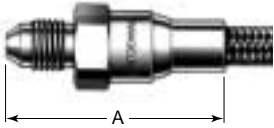
| Pipe Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|-----------------------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| Male NPT | | | | | |
| 1/4 | 0.16 (4.1) | 11/16 in. | 4 | PM4 | 1.88 (47.8) |
| | 0.27 (6.9) | | 6 | | 1.98 (50.3) |
| | 0.28 (7.1) | | 8 | | 2.10 (53.3) |
| 3/8 | 0.27 (6.9) | 7/8 in. | 6 | PM6 | 1.98 (50.3) |
| | 0.36 (9.1) | | 8 | | 2.10 (53.3) |
| 1/2 | 0.47 (11.9) | 1 1/16 in. | 12 | PM8 | 2.32 (58.9) |
| | 0.58 (14.7) | | | | 2.47 (62.7) |
| 3/4 | 0.63 (16.0) | 1 1/8 in. | 16 | PM12 | 2.99 (75.9) |
| | 0.80 (20.3) | | | | 3.22 (81.8) |
| 1 | 0.80 (20.3) | 1 3/8 in. | 16 | PM16 | 3.22 (81.8) |
| Male BSP/ISO Tapered | | | | | |
| 1/4 | 0.16 (4.1) | 11/16 in. | 4 | MT4 | 1.88 (47.8) |
| 1/2 | 0.36 (9.1) | 7/8 in. | 8 | MT8 | 2.32 (58.9) |
| 3/4 | 0.58 (14.7) | 1 1/16 in. | 12 | MT12 | 2.47 (62.7) |
| 1 | 0.80 (20.3) | 1 3/8 in. | 16 | MT16 | 3.22 (81.8) |

VCR® Metal Gasket Face Seal Fittings, Female Swivel



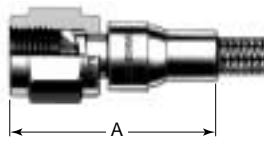
| VCR Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| 1/4 | 0.16 (4.1) | 3/4 in. | 4 | RF4 | 1.87 (47.5) |
| 1/2 | 0.36 (9.1) | 1 1/16 in. | 8 | RF8 | 2.17 (55.1) |
| 3/4 | 0.58 (14.7) | 1 1/2 in. | 12 | RF12 | 2.52 (64.0) |
| 1 | 0.80 (20.3) | 1 3/4 in. | 16 | RF16 | 3.35 (85.1) |

Male JIC (AN) 37° Flare



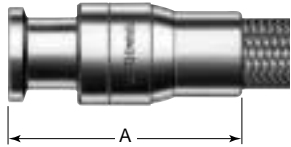
| Fitting Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|------------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| 1/4 | 0.16 (4.1) | 1 1/16 in. | 4 | AN4 | 1.88 (47.8) |
| 3/8 | 0.27 (6.9) | 5/8 in. | 6 | AN6 | 1.98 (50.3) |
| 1/2 | 0.36 (9.1) | 7/8 in. | 8 | AN8 | 2.32 (58.9) |

Female JIC (AN) 37°, Female Swivel



| Fitting Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Size Designator | End Connection Designator | A in. (mm) |
|------------------|----------------------------------|-------------------------------------|----------------------|---------------------------|-------------|
| 1/4 | 0.16 (4.1) | 9/16 in. | 4 | AS4 | 1.62 (41.1) |
| 3/8 | 0.27 (6.9) | 3/4 in. | 6 | AS6 | 1.82 (46.2) |
| 1/2 | 0.36 (9.1) | 15/16 in. | 8 | AS8 | 2.09 (53.1) |

Sanitary Flanges



| Fitting Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Diameter in. (mm) | Hose Size Designator | End Connection Designator | A in. (mm) |
|------------------|----------------------------------|-----------------------------------|----------------------|---------------------------|-------------|
| 1/2 | 0.36 (9.1) | 0.99 (25.1) | 6 | SC8 | 2.08 (52.8) |
| 3/4 | 0.58 (14.7) | 1.00 (25.4) | 12 | SC12 | 2.23 (56.6) |
| 1 | 0.80 (20.3) | 1.06 (26.9) | 16 | SC16 | 2.91 (73.9) |
| 1 1/2 | | 1.98 (50.3) | | SC24 | 2.35 (59.7) |

Maximum pressure rating is 300 psig (20.6 bar). Working pressure and temperature ratings of hoses with sanitary flange end connections may be limited by the gasket material and clamp.

Options and Accessories

Options and accessories do not change hose technical data. Hose operating parameters must be considered when selecting a cover.

Clear PVC Cover

- resists abrasion
- withstands temperatures from -40 to 165°F (-40 to 73°C).

To order, add **V** to a hose assembly ordering number.

Example: SS-TH4TA4TA4-28V

Polyolefin Cover

- resists moisture
- withstands temperatures from -65 to 275°F (-53 to 135°C).

To order, add **P** to a hose assembly ordering number.

Example: SS-TH4TA4TA4-28P

Acryl-Saturated Fiberglass Cover

- resists abrasion and UV light.

To order, add **F1** to a hose assembly ordering number.

Example: SS-TH4TA4TA4-28F1



Silicone-Coated Fiberglass Cover

- maintains flexibility down to -65°F (-53°C).

To order, add **F** to a hose assembly ordering number.

Example: SS-TH4TA4TA4-28F



302 Stainless Steel Spring Guard

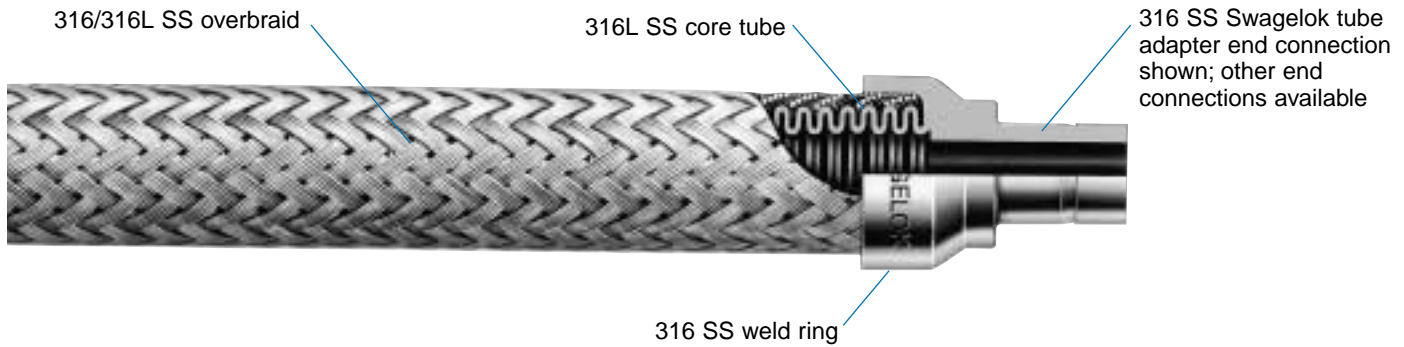
- covers entire hose to protect against kinking and abrasion.



To order, add **S** to a hose assembly ordering number.

Example: SS-TH4TA4TA4-28S

High-Pressure, Metal Flexible Hose (FM Series)



Features

- Hose can be used in vacuum and positive pressure service.
- Stainless steel end connections are available in 1/4 to 2 in. and 6 to 12 mm sizes.
- End connections are welded in accordance with ASME Boiler and Pressure Vessel Code Section IX.
- Standard and custom lengths are available.

Technical Data

| Nominal Hose Size in. (mm) | Minimum Bend Radius ^① in. (cm) | | Temperature Range °F (°C) | Working Pressure at -325 to 100°F (-200 to 37°C) psig (bar) | Minimum Burst Pressure at 70°F (20°C) psig (bar) | Hose Series |
|----------------------------------|--|-------------|---------------------------------|---|---|----------------|
| | Static | Dynamic | | | | |
| 1/4 (6.4) | 2.25 (5.72) | 10.0 (25.4) | -325 to 850 (-200 to 454) | 3100 (213) | 12 400 (854) | FM4 |
| 3/8 (9.7) | 3.00 (7.62) | 12.0 (30.5) | | 2000 (137) | 8 000 (551) | FM6 |
| 1/2 (12.7) | 4.50 (11.4) | 16.0 (40.6) | | 1800 (124) | 7 200 (496) | FM8 |
| 3/4 (19.0) | 6.00 (15.2) | 17.0 (43.2) | | 1500 (103) | 6 000 (413) | FM12 |
| 1 (25.4) | 6.75 (17.1) | 20.0 (50.8) | | 1200 (82.7) | 4 800 (330) | FM16 |
| 1 1/4 (31.8) | 4.50 (11.4) | 23.0 (58.4) | | 950 (65.4) | 3 800 (261) | FM20 |
| 1 1/2 (38.1) | 5.25 (13.3) | 26.0 (66.0) | | 900 (62.0) | 3 600 (248) | FM24 |
| 2 (50.8) | 6.75 (17.1) | 32.0 (81.3) | | 500 (34.4) | 2 000 (137) | FM32 |

① Measured to inside of bend.

Pressure-Temperature Ratings

To determine pressure-temperature ratings at elevated temperatures, follow these steps:

1. Find the working pressure at 70°F (20°C) in the **Technical Data** table above.
2. Multiply this by the appropriate factor listed in the **Pressure-Temperature Rating Factors** table.

Example: 1/4 in. hose at 500°F (260°C)

1. The working pressure rating at 70°F (20°C) is 3100 psig (213 bar).
2. The temperature factor for 500°F (260°C) is 0.65:
3100 (213) × 0.65 = 2015 psig (138 bar).

The 1/4 in. hose pressure rating at 500°F (260°C) is 2015 psig (138 bar).

Pressure-Temperature Rating Factors

Ratings maintain a minimum factor of 4:1 between working pressure and minimum burst pressure.

| Temperature °F (°C) | Factor |
|------------------------|--------|
| -325 (-200) | 1.00 |
| 100 (37) | 1.00 |
| 200 (93) | 0.84 |
| 300 (148) | 0.76 |
| 400 (204) | 0.70 |
| 500 (260) | 0.65 |
| 600 (315) | 0.62 |
| 700 (371) | 0.59 |
| 800 (426) | 0.57 |
| 850 (454) | 0.56 |

Testing

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

Helium leak testing to a maximum leak rate of 1×10^{-9} std cm³/s is available. See **Custom Assemblies**, page 10.

Cleaning and Packaging

Swagelok FM series metal flexible hose components are cleaned in accordance with Swagelok standard cleaning and packaging specification (SC-10). Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed or crated.

⚠ DO NOT SUBJECT METAL FLEXIBLE HOSE TO SYSTEM PRESSURE SURGES, SHOCK, OR PULSATIONS GREATER THAN 50 % OF THE WORKING PRESSURE RATING.

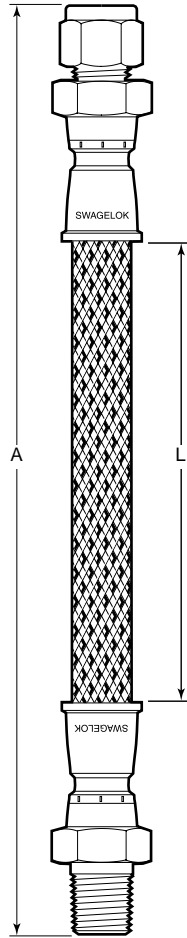
Ordering Information

Dimensions are for reference only and are subject to change.

FM Series Metal Flexible Hose Standard Assemblies

Select an ordering number.

Swagelok Tube Fitting to Male NPT End Connection



| Tube OD in. | Pipe Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | A in. (cm) | Ordering Number | Hose Series | L in. (cm) |
|-------------|---------------|----------------------------------|-------------------------------------|-------------|--------------------|-------------|-------------|
| 1/4 | 1/4 | 0.19 (4.8) | 13/16 in. | 12.0 (30.5) | SS-FM4SL4PM4-12 | FM4 | 8.26 (21.0) |
| | | | | 36.0 (91.4) | SS-FM4SL4PM4-36 | | 32.3 (82.0) |
| 3/8 | 3/8 | 0.28 (7.1) | 15/16 in. | 18.0 (45.7) | SS-FM6SL6PM6-18 | FM6 | 14.2 (36.1) |
| | | | | 36.0 (91.4) | SS-FM6SL6PM6-36 | | 32.2 (81.8) |
| 1/2 | 1/2 | 0.40 (10.2) | 1 1/16 in. | 18.0 (45.7) | SS-FM8SL8PM8-18 | FM8 | 13.6 (34.5) |
| | | | | 48.0 (122) | SS-FM8SL8PM8-48 | | 43.6 (111) |
| 3/4 | 3/4 | 0.62 (15.7) | 1 1/2 in. | 18.0 (45.7) | SS-FM12SL12PM12-18 | FM12 | 13.4 (34.0) |
| | | | | 48.0 (122) | SS-FM12SL12PM12-48 | | 43.4 (110) |
| 1 | 1 | 0.87 (22.1) | 1 3/4 in. | 24.0 (61.0) | SS-FM16SL16PM16-24 | FM16 | 18.8 (47.8) |
| | | | | 60.0 (152) | SS-FM16SL16PM16-60 | | 54.8 (139) |

Swagelok Tube Fitting End Connections

| Tube OD in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | A in. (cm) | Ordering Number | Hose Series | L in. (cm) |
|-------------|----------------------------------|-------------------------------------|-------------|--------------------|-------------|-------------|
| 1/4 | 0.19 (4.8) | 13/16 in. | 12.0 (30.5) | SS-FM4SL4SL4-12 | FM4 | 8.12 (20.6) |
| | | | 36.0 (91.4) | SS-FM4SL4SL4-36 | | 32.1 (81.5) |
| 3/8 | 0.28 (7.1) | 15/16 in. | 18.0 (45.7) | SS-FM6SL6SL6-18 | FM6 | 14.0 (35.6) |
| | | | 36.0 (91.4) | SS-FM6SL6SL6-36 | | 32.0 (81.3) |
| 1/2 | 0.40 (10.2) | 1 1/16 in. | 18.0 (45.7) | SS-FM8SL8SL8-18 | FM8 | 13.5 (34.3) |
| | | | 48.0 (122) | SS-FM8SL8SL8-48 | | 43.5 (110) |
| 3/4 | 0.62 (15.7) | 1 1/2 in. | 18.0 (45.7) | SS-FM12SL12SL12-18 | FM12 | 13.3 (33.8) |
| | | | 48.0 (122) | SS-FM12SL12SL12-48 | | 43.3 (110) |
| 1 | 0.87 (22.1) | 1 3/4 in. | 24.0 (61.0) | SS-FM16SL16SL16-24 | FM16 | 18.7 (47.5) |
| | | | 60.0 (152) | SS-FM16SL16SL16-60 | | 54.7 (139) |

Tube Adapter End Connections



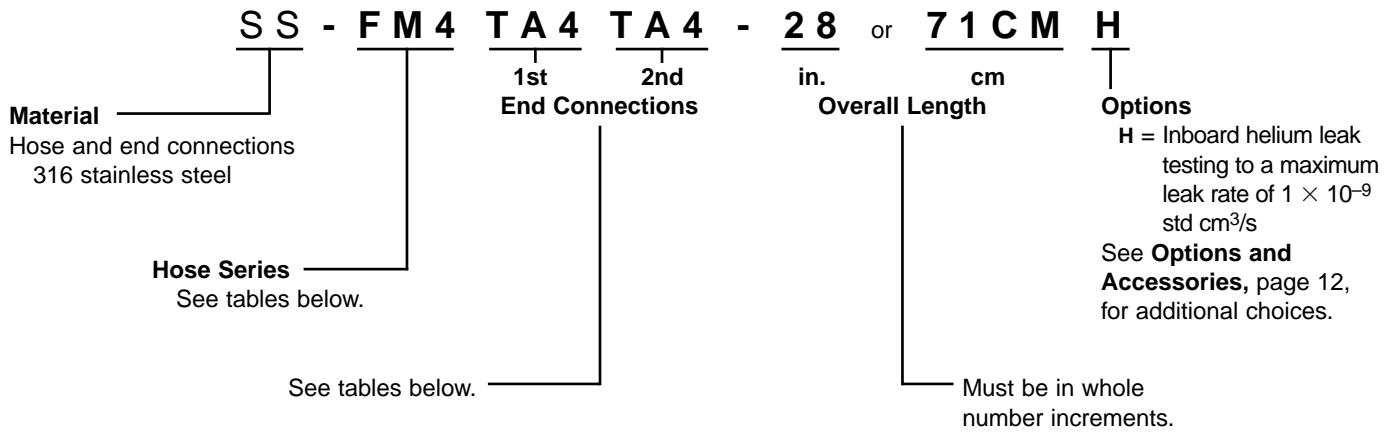
| Tube OD in. | Minimum Inside Diameter in. (mm) | Maximum Outside Diameter in. (mm) | A in. (cm) | Ordering Number | Hose Series | L in. (cm) |
|-------------|----------------------------------|-----------------------------------|-------------|-----------------|-------------|-------------|
| 1/4 | 0.19 (4.8) | 0.81 (20.6) | 12.0 (30.5) | SS-FM4TA4TA4-12 | FM4 | 8.48 (21.5) |
| | | | 24.0 (61.0) | SS-FM4TA4TA4-24 | | 20.5 (52.1) |
| | | | 36.0 (91.4) | SS-FM4TA4TA4-36 | | 32.5 (82.6) |
| | | | 48.0 (122) | SS-FM4TA4TA4-48 | | 44.5 (113) |

See **Custom Assemblies**, next page, for other end connections.

FM Series Metal Flexible Hose Custom Assemblies

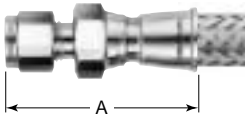
Typical Ordering Number

Build a hose assembly ordering number by combining the designators in the sequence shown below.

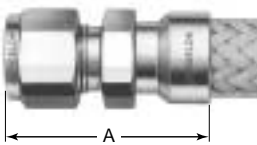


Swagelok Tube Fittings

**Cap Weld Style—
1 in. and Under**

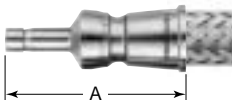


**Manual Weld Style—
Over 1 in.**



| Fitting Size | Minimum Inside Diameter | Maximum Outside Dimension | Hose Series Designator | End Connection Designator | A in. (mm) |
|-----------------------------|-------------------------|---------------------------|------------------------|---------------------------|----------------------------|
| Dimensions, in. (mm) | | | | | |
| 1/4 | 0.19 (4.8) | 13/16, hex flat | FM4 | SL4 | 1.94 (49.3) |
| 3/8 | 0.28 (7.1) | | FM6 | SL6 | 2.00 (50.8) 2.02 (51.3) |
| 1/2 | 0.41 (10.4) | 1 1/16, hex flat | FM8 | SL8 | 2.24 (56.9) |
| 5/8 | 0.50 (12.7) | | | SL10 | 2.27 (57.7) |
| 3/4 | 0.63 (16.0) | 1 1/2, hex flat | FM12 | SL12 | 2.35 (59.7) |
| 1 | 0.88 (22.4) | 1 3/4, hex flat | FM16 | SL16 | 2.64 (67.1) |
| 1 1/4 | 1.09 (27.7) | 2, hex flat | FM20 | SL20 | 4.04 (103) |
| 1 1/2 | 1.34 (34.0) | 2 1/4, hex flat | FM24 | SL24 | 4.75 (121) |
| 2 | 1.88 (47.8) | 3, hex flat | FM32 | SL32 | 5.72 (145) |
| Dimensions, mm (in.) | | | | | |
| 6 | 4.8 (0.19) | 20.6 (0.81), dia | FM4 | SM6 | 62.2 (2.45) |
| 8 | 6.4 (0.25) | | | SM8 | 63.2 (2.49) |
| 10 | 7.9 (0.31) | 24, hex flat | FM6 | SM10 | 51.6 (2.03) |
| 12 | 9.7 (0.38) | 27, hex flat | FM8 | SM12 | 56.9 (2.24) |

Tube Adapters



| Tube OD | Minimum Inside Diameter | Maximum Outside Diameter | Hose Series Designator | End Connection Designator | A |
|-----------------------------|-------------------------|--------------------------|------------------------|---------------------------|-------------|
| Dimensions, in. (mm) | | | | | |
| 1/4 | 0.16 (4.1) | 0.81 (20.6) | FM4 | TA4 | 1.76 (44.7) |
| 3/8 | 0.27 (6.9) | 0.98 (24.9) | FM6 | TA6 | 1.82 (46.2) |
| 1/2 | 0.37 (9.4) | 1.06 (26.9) | FM8 | TA8 | 2.22 (56.4) |
| 3/4 | 0.58 (14.7) | 1.44 (36.6) | FM12 | TA12 | 2.35 (59.7) |
| 1 | 0.80 (20.3) | 1.75 (44.4) | FM16 | TA16 | 2.69 (68.3) |
| Dimensions, mm (in.) | | | | | |
| 6 | 4.1 (0.16) | 20.6 (0.81) | FM4 | TM6 | 44.4 (1.75) |
| 10 | 7.1 (0.28) | 24.9 (0.98) | FM6 | TM10 | 47.0 (1.85) |
| 12 | 8.9 (0.35) | 26.9 (1.06) | FM8 | TM12 | 57.2 (2.25) |

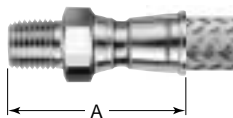
Female NPT



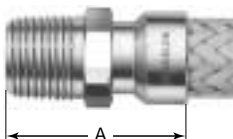
| Pipe Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|---------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.28 (7.1) | 13/16 in. | FM4 | PF4 | 1.81 (46.0) |
| 3/4 | 0.72 (18.3) | 1 1/2 in. | FM12 | PF12 | 2.21 (56.1) |

Male Pipe Threads

Cap Weld Style—
1 in. and Under

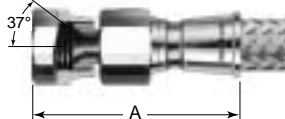


Manual Weld Style—
Over 1 in.



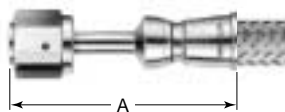
| Pipe Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|-----------------------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| Male NPT | | | | | |
| 1/4 | 0.28 (7.1) | 13/16 in. | FM4 | PM4 | 1.80 (45.7) |
| 3/8 | 0.38 (9.7) | 15/16 in. | FM6 | | PM6 |
| 1/2 | 0.28 (7.1) | 7/8 in. | FM4 | PM8 | 1.99 (50.5) |
| | 0.47 (11.9) | 1 1/16 in. | FM8 | | 2.15 (54.6) |
| 3/4 | 0.63 (16.0) | 1 1/2 in. | FM12 | PM12 | 2.22 (56.4) |
| 1 | 0.88 (22.4) | 1 3/4 in. | FM16 | PM16 | 2.54 (64.5) |
| 1 1/4 | 1.09 (27.7) | | FM20 | PM20 | 3.06 (77.7) |
| 1 1/2 | 1.34 (34.0) | 2 1/8 in. | FM24 | PM24 | 3.72 (94.5) |
| 2 | 1.81 (46.0) | 2 3/4 in. | FM32 | PM32 | 4.19 (106) |
| Male BSP/ISO Tapered | | | | | |
| 1/4 | 0.28 (7.1) | 13/16 in. | FM4 | MT4 | 1.80 (45.7) |
| 1/2 | 0.47 (11.9) | 1 1/16 in. | FM8 | MT8 | 2.16 (54.9) |

**Female JIC (AN) 37°,
Female Swivel**



| Fitting Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|------------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.17 (4.3) | 13/16 in. | FM4 | AS4 | 1.87 (47.5) |
| 3/8 | 0.28 (7.1) | 15/16 in. | FM6 | AS6 | 1.97 (50.0) |
| 1/2 | 0.42 (10.7) | 1 1/16 in. | FM8 | AS8 | 2.15 (54.6) |

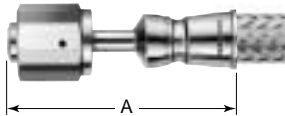
**VCO O-Ring
Face Seal Fittings,
Female Swivel**



| VCO Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.18 (4.6) | 11/16 in. | FM4 | VF4 | 2.11 (53.6) |
| 1/2 | 0.41 (10.4) | 1 in. | FM8 | VF8 | 2.14 (54.4) |

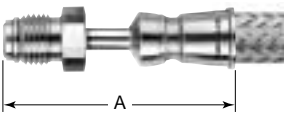
See next page for more end connections.

VCR Metal Gasket Face Seal Fittings, Female Swivel



| VCR Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.19 (4.8) | 13/16 in. | FM4 | RF4 | 2.00 (50.8) |
| 1/2 | 0.40 (10.2) | 1 1/16 in. | FM8 | RF8 | 2.16 (54.9) |
| 3/4 | 0.65 (16.5) | 1 1/2 in. | FM12 | RF12 | 4.14 (105) |
| 1 | 0.87 (22.1) | 1 3/4 in. | FM16 | RF16 | 4.76 (121) |

VCR Metal Gasket Face Seal Fittings, Male Swivel



| VCR Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.19 (4.8) | 13/16 in. | FM4 | RM4 | 2.60 (66.0) |
| 1/2 | 0.40 (10.2) | 1 1/16 in. | FM8 | RM8 | 2.16 (54.9) |
| 3/4 | 0.65 (16.5) | 1 1/2 in. | FM12 | RM12 | 4.14 (105) |
| 1 | 0.87 (22.1) | 1 3/4 in. | FM16 | RM16 | 4.76 (121) |

Options and Accessories

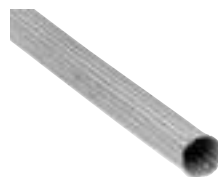
Options and accessories do not change hose technical data. Hose operating parameters must be considered when selecting a cover.

Acryl-Saturated Fiberglass Cover

- resists abrasion and UV light.

To order, add **F1** to a hose assembly ordering number.

Example: SS-FM4TA4TA4-28F1



Silicone-Coated Fiberglass Cover

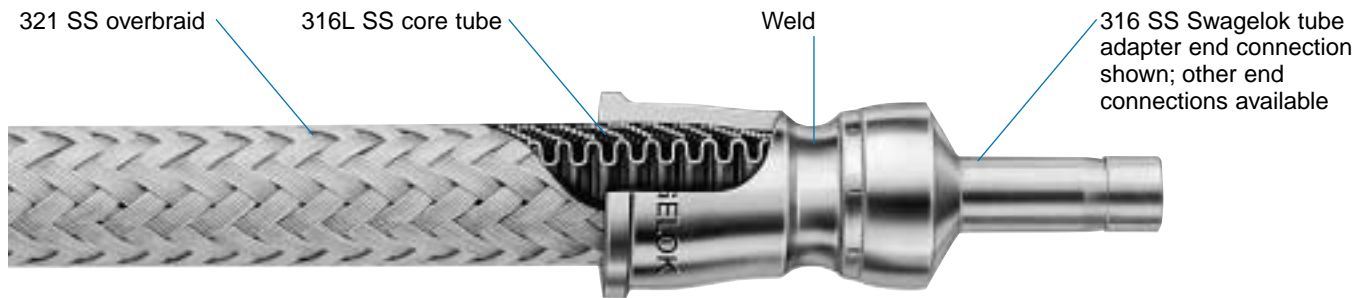
- maintains flexibility down to -65°F (-53°C).

To order, add **F** to a hose assembly ordering number.

Example: SS-FM4TA4TA4-28F



Low-Pressure, Metal Flexible Hose (FL Series)



Features

- Hose can be used in vacuum and positive pressure service.
- Stainless steel end connections are available in 1/4 to 1/2 in. and 6 to 12 mm sizes.
- End connections are welded in accordance with ASME Boiler and Pressure Vessel Code Section IX.
- Standard and custom lengths are available.

Technical Data

| Nominal Hose Size in. (mm) | Minimum Bend Radius ^① in. (cm) | | Temperature Range °F (°C) | Working Pressure at -325 to 100°F (-200 to 37°C) psig (bar) | Impulse Pressure ^② at 70°F (20°C) psig (bar) | Minimum Burst Pressure 70°F (20°C) psig (bar) | Hose Series |
|-------------------------------|--|-------------|------------------------------|--|---|---|-------------|
| | Static | Dynamic | | | | | |
| 1/4 (6.4) | 1.00 (2.54) | 5.50 (14.0) | -325 to 850 (-200 to 454) | 1500 (103) | 500 (34.4) | 6000 (413) | FL4 |
| 1/2 (12.7) | 1.75 (4.44) | 7.00 (17.8) | | 1200 (82.6) | 400 (27.5) | 4800 (330) | FL8 |

① Measured to inside of bend.

② Rapid changes in pressure above or below normal base pressure can cause excessive wear between overbraid and core tube convolutions and is often associated with reciprocating-type pumps.

Pressure-Temperature Ratings

To determine pressure-temperature ratings at elevated temperatures, follow these steps:

1. Find the working pressure at 70°F (20°C) in the **Technical Data** table above.
2. Multiply this by the appropriate factor listed in the **Pressure-Temperature Rating Factors** table.

Example: 1/4 in. hose at 500°F (260°C)

1. The working pressure rating at 70°F (20°C) is 1500 psig (103 bar).
2. The temperature factor for 500°F (260°C) is 0.65:
1500 (103) × 0.65 = 975 psig (67.1 bar)

The 1/4 in. hose pressure rating at 500°F (260°C) is 975 psig (67.1 bar).

Pressure-Temperature Rating Factors

Ratings maintain a minimum factor of 4:1 between working pressure and minimum burst pressure.

| Temperature °F (°C) | Factor |
|------------------------|--------|
| -325 (-200) | 1.00 |
| 100 (37) | 1.00 |
| 200 (93) | 0.84 |
| 300 (148) | 0.76 |
| 400 (204) | 0.70 |
| 500 (260) | 0.65 |
| 600 (315) | 0.62 |
| 700 (371) | 0.59 |
| 800 (426) | 0.57 |
| 850 (454) | 0.56 |

Testing

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

Helium leak testing to a maximum leak rate of 1×10^{-9} std cm³/s is available. See **Custom Assemblies**, next page.

Cleaning and Packaging

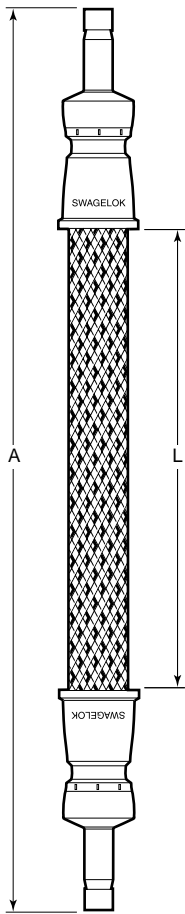
Swagelok FL series metal flexible hose components are cleaned in accordance with Swagelok standard cleaning and packaging specification (SC-10). Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed.

Ordering Information

Dimensions are for reference only and are subject to change.

FL Series Metal Flexible Hose Standard Assemblies

Select an ordering number.



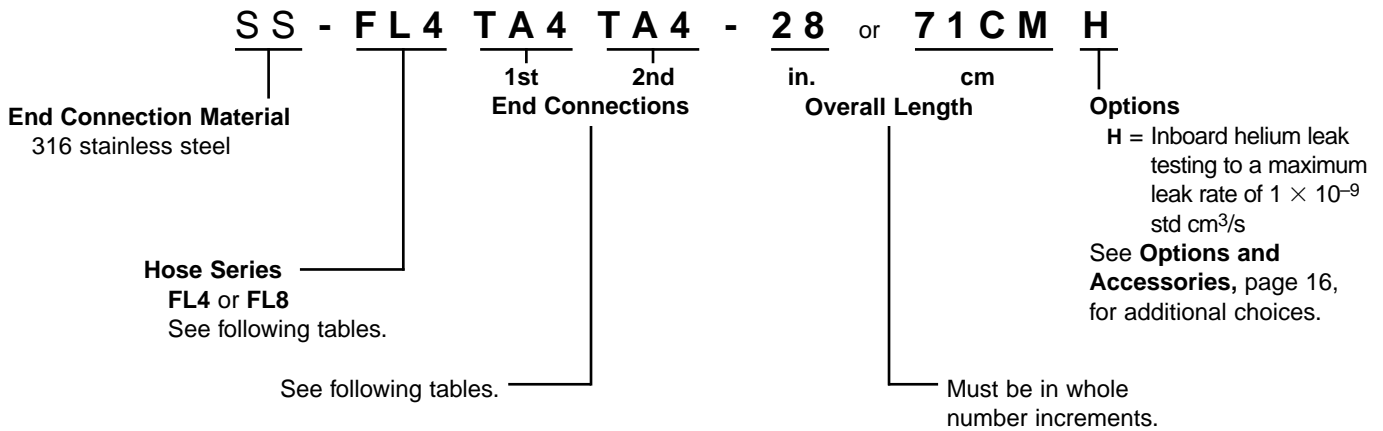
Tube Adapter End Connections

| Tube OD | Minimum Inside Diameter | Maximum Outside Diameter | A | Ordering Number | Hose Series | L |
|-----------------------------|-------------------------|--------------------------|-----------------|----------------------|-------------|-------------|
| Dimensions, in. (mm) | | | in. (cm) | | | |
| 1/4 | 0.15 (3.8) | 0.67 (17.0) | 12.0 (30.5) | SS-FL4TA4TA4-12 | FL4 | 8.48 (21.5) |
| | | | 24.0 (61.0) | SS-FL4TA4TA4-24 | | 20.5 (52.1) |
| | | | 36.0 (91.4) | SS-FL4TA4TA4-36 | | 32.5 (82.6) |
| | | | 48.0 (122) | SS-FL4TA4TA4-48 | | 44.5 (113) |
| 1/2 | 0.37 (9.4) | 1.02 (25.9) | 12.0 (30.5) | SS-FL8TA8TA8-12 | FL8 | 7.50 (19.0) |
| | | | 24.0 (61.0) | SS-FL8TA8TA8-24 | | 19.5 (49.5) |
| | | | 36.0 (91.4) | SS-FL8TA8TA8-36 | | 31.5 (80.0) |
| | | | 48.0 (122) | SS-FL8TA8TA8-48 | | 43.5 (110) |
| Dimensions, mm (in.) | | | cm (in.) | | | |
| 6 | 3.8 (0.15) | 17.0 (0.67) | 50.0 (19.7) | SS-FL4TM6TM6-50CM | FL4 | 41.1 (16.2) |
| | | | 100 (39.4) | SS-FL4TM6TM6-100CM | | 91.2 (35.9) |
| | | | 150 (59.1) | SS-FL4TM6TM6-150CM | | 141 (55.6) |
| 12 | 8.9 (0.35) | 25.9 (1.02) | 50.0 (19.7) | SS-FL8TM12TM12-50CM | FL8 | 38.6 (15.2) |
| | | | 100 (39.4) | SS-FL8TM12TM12-100CM | | 88.6 (34.9) |
| | | | 150 (59.1) | SS-FL8TM12TM12-150CM | | 139 (54.7) |

FL Series Metal Flexible Hose Custom Assemblies

Typical Ordering Number

Build a hose assembly ordering number by combining the designators in the sequence shown below.

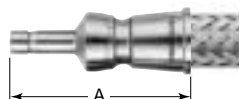


Swagelok Tube Fittings



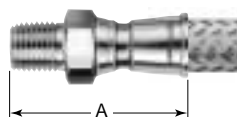
| Fitting Size | Minimum Inside Diameter | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A |
|-----------------------------|-------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| Dimensions, in. (mm) | | | | | |
| 1/4 | 0.18 (4.6) | 11/16 | FL4 | SL4 | 1.94 (49.3) |
| 3/8 | 0.28 (7.1) | 1 1/16 | FL8 | SL6 | 2.22 (56.4) |
| 1/2 | 0.40 (10.2) | | | SL8 | 2.33 (59.2) |
| Dimensions, mm (in.) | | | | | |
| 6 | 4.6 (0.18) | 11/16 in. | FL4 | SM6 | 49.3 (1.94) |
| 10 | 7.9 (0.31) | 1 1/16 in. | FL8 | SM10 | 56.4 (2.22) |
| 12 | 9.9 (0.39) | | | SM12 | 59.2 (2.33) |

Tube Adapters



| Tube OD | Minimum Inside Diameter | Maximum Outside Diameter | Hose Series Designator | End Connection Designator | A |
|-----------------------------|-------------------------|--------------------------|------------------------|---------------------------|-------------|
| Dimensions, in. (mm) | | | | | |
| 1/4 | 0.15 (3.8) | 0.67 (17.0) | FL4 | TA4 | 1.76 (44.7) |
| 3/8 | 0.27 (6.9) | | | TA6 | 1.79 (45.5) |
| 1/2 | 0.37 (9.4) | 1.02 (25.9) | FL8 | TA8 | 2.25 (57.2) |
| | | | | | |
| Dimensions, mm (in.) | | | | | |
| 6 | 3.8 (0.15) | 0.67 (17.0) | FL4 | TM6 | 44.4 (1.75) |
| 8 | 5.6 (0.22) | | | TM8 | 45.2 (1.78) |
| 10 | 7.1 (0.28) | 1.02 (25.9) | FL8 | TM10 | 51.3 (2.02) |
| 12 | | | | 8.9 (0.35) | TM12 |

Male Pipe Threads



| Pipe Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat | Hose Series Designator | End Connection Designator | A in. (mm) |
|-----------------------------|----------------------------------|-------------------------------------|------------------------|---------------------------|-------------|
| Male NPT | | | | | |
| 1/4 | 0.28 (7.1) | 11/16 in. | FL4 | PM4 | 1.80 (45.7) |
| 3/8 | 0.37 (9.4) | 1 1/16 in. | FL8 | PM6 | 2.02 (51.3) |
| 1/2 | 0.47 (11.9) | | | PM8 | 2.21 (56.1) |
| Male BSP/ISO Tapered | | | | | |
| 1/4 | 0.28 (7.1) | 11/16 in. | FL4 | MT4 | 1.80 (45.7) |
| 1/2 | 0.47 (11.9) | 1 1/16 in. | FL8 | MT8 | 2.21 (56.1) |

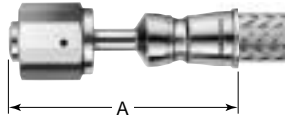
VCO O-Ring Face Seal Fittings, Female Swivel



| VCO Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension in. (mm) | Hose Series Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|------------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.18 (4.6) | 11/16, hex flat | FL4 | VF4 | 2.50 (63.5) |
| 1/2 | 0.40 (10.2) | 1.02 (25.9), dia | FL8 | VF8 | 2.69 (68.3) |

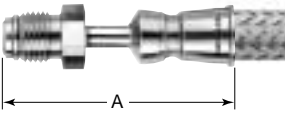
See next page for more end connections.

VCR Metal Gasket Face Seal Fittings, Female Swivel



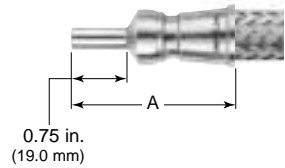
| VCR Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Diameter in. (mm) | Hose Series Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|-----------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.18 (4.6) | 0.67 (17.0) | FL4 | RF4 | 2.00 (50.8) |
| 1/2 | 0.40 (10.2) | 1.02 (25.9) | FL8 | RF8 | 2.21 (56.1) |

VCR Metal Gasket Face Seal Fittings, Male Swivel



| VCR Size in. | Minimum Inside Diameter in. (mm) | Maximum Outside Dimension, Hex Flat in. | Hose Series Designator | End Connection Designator | A in. (mm) |
|--------------|----------------------------------|---|------------------------|---------------------------|-------------|
| 1/4 | 0.19 (4.8) | 3/4 in. | FL4 | RM4 | 2.60 (66.0) |
| 1/2 | 0.40 (10.2) | 1 1/16 in. | FL8 | RM8 | 2.88 (73.2) |

Tube Butt Welds



| Tube OD in. | Wall Thickness in. | Minimum Inside Diameter in. (mm) | Maximum Outside Diameter in. (mm) | Hose Series Designator | End Connection Designator | A in. (mm) |
|-------------|--------------------|----------------------------------|-----------------------------------|------------------------|---------------------------|-------------|
| 1/4 | 0.035 | 0.18 (4.6) | 0.67 (17.0) | FL4 | TB4 | 1.90 (48.3) |
| 1/2 | 0.049 | 0.40 (10.2) | 1.02 (25.9) | FL8 | TB8 | 2.09 (53.1) |

Options and Accessories

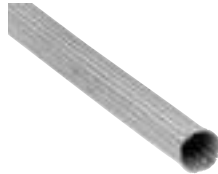
Options and accessories do not change hose technical data. Hose operating parameters must be considered when selecting a cover.

Acryl-Saturated Fiberglass Cover

■ resists abrasion and UV light.

To order, add **F1** to a hose assembly ordering number.

Example: SS-FL4TA4TA4-28**F1**



Silicone-Coated Fiberglass Cover

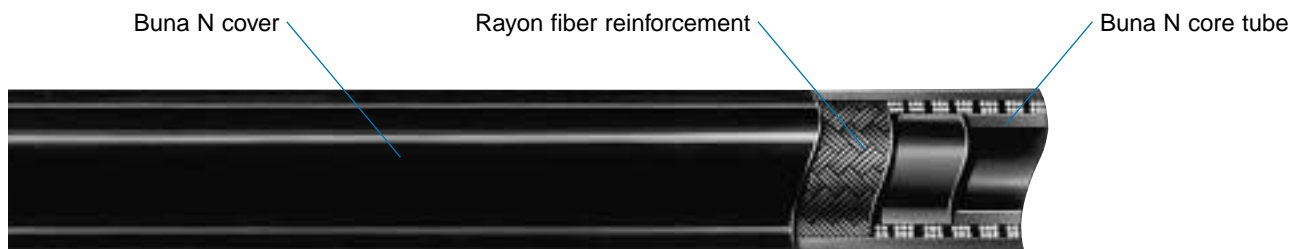
■ maintains flexibility down to -65°F (-53°C).

To order, add **F** to a hose assembly ordering number.

Example: SS-FL4TA4TA4-28**F**



Multipurpose Push-On Hose (PB Series)



Features

- Cover is flame-resistant in accordance with 30CFR, Part 18.
- Single-braid rayon fiber reinforcement is woven for maximum strength and end connection retention.
- Stainless steel and brass end connections are available in 1/4 to 3/4 in. and 6 to 18 mm sizes.
- End connections are reusable.
- Assembly does not require clamps or special tools.
- Hose is available in blue, black, green, gray, red, and yellow.

Technical Data

| Nominal Hose Size in. (mm) | Minimum Bend Radius ^① in. (cm) | Temperature Range °F (°C) | Working Pressure at 70°F (20°C) psig (bar) | Minimum Burst Pressure at 70°F (20°C) psig (bar) |
|-------------------------------|--|------------------------------|---|---|
| 1/4 (6.4) | 2.50 (6.35) | -40 to 200 (-40 to 93) | 350 (24.1) | 1400 (96.4) |
| 3/8 (9.7) | 3.00 (7.62) | | 300 (20.6) | 1200 (82.6) |
| 1/2 (12.7) | 5.00 (12.7) | | 300 (20.6) | 1200 (82.6) |
| 3/4 (19.0) | 7.00 (17.8) | | 300 (20.6) | 1200 (82.6) |

① Measured to inside of bend.

Pressure-Temperature Ratings

Ratings maintain a minimum factor of 4:1 between working pressure and minimum burst pressure.

| Nominal Hose Size, in. | Working Pressure | |
|------------------------|------------------|---------------|
| | 1/4 | 3/8, 1/2, 3/4 |
| Temperature °F (°C) | psig (bar) | |
| -40 (-40) | 350 (24.1) | 300 (20.6) |
| 70 (20) | 350 (24.1) | 300 (20.6) |
| 100 (37) | 315 (21.7) | 270 (18.6) |
| 150 (65) | 210 (14.4) | 180 (12.4) |
| 200 (93) | 100 (6.8) | 80 (5.5) |

Cleaning and Packaging

Swagelok PB series multipurpose push-on hose components are cleaned in accordance with Swagelok standard cleaning and packaging specification (SC-10). Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed.

⚠ Caution:
Do not reuse hose.

Ordering Information and Dimensions

Bulk Multipurpose Push-On Hose

To order a 250 ft (76 m) reel of standard blue hose, select an ordering number.

Example: **PB-4**

For hose of another color, add a hose color designator.

Example **PB-4-BK**



| Nominal Hose Size in. | Ordering Number |
|--------------------------|-----------------|
| 1/4 | PB-4 |
| 3/8 | PB-6 |
| 1/2 | PB-8 |
| 3/4 | PB-12 |

| Hose Color | Designator |
|------------|------------|
| Black | -BK |
| Gray | -GY |
| Green | -GR |
| Red | -RD |
| Yellow | -YW |

Reels may contain more than one piece of hose.

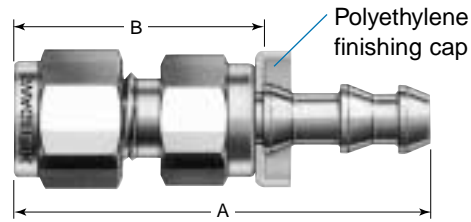
Multipurpose Push-On Hose End Connections

Select a basic ordering number and add **SS** for 316 SS or **B** for brass.

Example: **SS-PB4-SL4**

To determine the length to cut bulk hose for field assembly, subtract dimension *B* for each end connection from the desired overall assembly length.

Dimensions are for reference only and are subject to change.



Swagelok Tube Fittings



| Fitting Size in. | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | Dimensions in. (mm) | |
|---------------------|--------------------------------|-----------------------------|--|------------------------|-------------|
| | | | | A | B |
| 1/4 | 1/4 | -PB4-SL4 | 9/16 in. | 1.97 (50.0) | 1.21 (30.7) |
| 3/8 | 3/8 | -PB6-SL6 | 3/4 in. | 2.11 (53.6) | 1.24 (31.5) |
| 1/2 | 1/2 | -PB8-SL8 | 7/8 in. | 2.47 (62.7) | 1.42 (36.1) |

Dimensions shown with Swagelok nuts finger-tight.

Tube Adapters



| Tube OD | Nominal Hose Size | Basic Ordering Number | Maximum Outside Diameter | A | B |
|-----------------------------|-------------------------|-----------------------------|--------------------------------|-------------|-------------|
| Dimensions, in. (mm) | | | | | |
| 1/4 | 1/4 | -PB4-TA4 | 0.68 (17.3) | 1.93 (49.0) | 1.17 (29.7) |
| 3/8 | 3/8 | -PB6-TA6 | 0.84 (21.3) | 2.03 (51.6) | 1.16 (29.5) |
| 1/2 | 1/2 | -PB8-TA8 | 0.99 (25.1) | 2.47 (62.7) | 1.42 (36.1) |
| 3/4 | 3/4 | -PB12-TA12 | 1.27 (32.3) | 3.14 (79.8) | 1.48 (37.6) |
| Dimensions, mm (in.) | | | | | |
| 6 | 1/4 in. | -PB4-TM6 | 17.3 (0.68) | 49.0 (1.93) | 29.7 (1.17) |
| 8 | | -PB4-TM8 | | 48.8 (1.92) | 29.5 (1.16) |
| 10 | 3/8 in. | -PB6-TM8 | 21.3 (0.84) | 52.1 (2.05) | 30.0 (1.18) |
| 12 | | -PB6-TM10 | | 51.6 (2.03) | 29.5 (1.16) |
| 18 | 1/2 in. | -PB8-TM12 | 25.1 (0.99) | 62.7 (2.47) | 36.1 (1.42) |
| | 3/4 in. | -PB12-TM18 | 32.3 (1.27) | 79.8 (3.14) | 37.6 (1.48) |

Male Pipe Threads



| Pipe Size in. | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Diameter in. (mm) | Dimensions in. (mm) | |
|-----------------------------|--------------------------------|-----------------------------|--|------------------------|-------------|
| | | | | A | B |
| Male NPT | | | | | |
| 1/4 | 1/4 | -PB4-PM4 | 0.68 (17.3) | 1.68 (42.7) | 0.92 (23.4) |
| | 3/8 | -PB6-PM4 | 0.84 (21.3) | 1.80 (45.7) | 0.93 (23.6) |
| -PB6-PM6 | | | | | |
| 1/2 | 1/2 | -PB8-PM8 | 0.99 (25.1) | 2.19 (55.6) | 1.14 (29.0) |
| 3/4 | 3/4 | -PB12-PM12 | 1.27 (32.3) | 2.81 (71.4) | 1.15 (29.2) |
| Male BSP/ISO Tapered | | | | | |
| 1/4 | 1/4 | -PB4-MT4 | 0.68 (17.3) | 1.68 (42.7) | 0.92 (23.4) |
| 3/8 | 3/8 | -PB6-MT6 | 0.84 (21.3) | 1.80 (45.7) | 0.93 (23.6) |
| 1/2 | 1/2 | -PB8-MT8 | 0.99 (25.1) | 2.19 (55.6) | 1.14 (29.0) |
| 3/4 | 3/4 | -PB12-MT12 | 1.27 (32.3) | 2.81 (71.4) | 1.15 (29.2) |

Unions

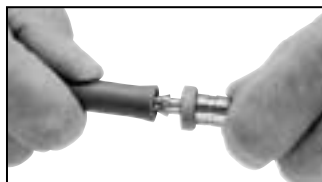


| Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Diameter in. (mm) | Dimensions in. (mm) | |
|--------------------------|-----------------------|--------------------------------------|------------------------|-------------|
| | | | A | B |
| 1/4 | -PB4-6 | 0.68 (17.3) | 2.07 (52.6) | 0.55 (14.0) |
| 3/8 | -PB6-6 | 0.84 (21.3) | 2.25 (57.2) | 0.51 (13.0) |
| 1/2 | -PB8-6 | 0.99 (25.1) | 2.61 (66.3) | |
| 3/4 | -PB12-6 | 1.27 (32.3) | 3.83 (97.3) | |

Multipurpose Push-On Hose Assembly



1. Cut a clean, square edge on end of hose.



2. Cover first barb of end connection with hose. (Lubricating fitting stem with light oil [10W40] may ease assembly.)



3. Hold end connection against flat surface. Grip hose and push with a steady force until hose seats into blue finishing cap.

⚠ Ensure hose is pushed fully into finishing cap.

⚠ Do not use a hose clamp.

Multipurpose Push-On Hose Disassembly



1. Slit hose lengthwise from blue finishing cap to end of barb. Do not damage barbs.



2. Bend hose to expose barbs, then remove hose with a quick pull.

⚠ Do not reuse hose.

Assembly and disassembly illustrated with old-style, round-body Swagelok tube adapter end connections.

Tools



Hose Cutter

For use with push-on hose or soft plastic tubing.

Ordering number: **MS-HC-SC**

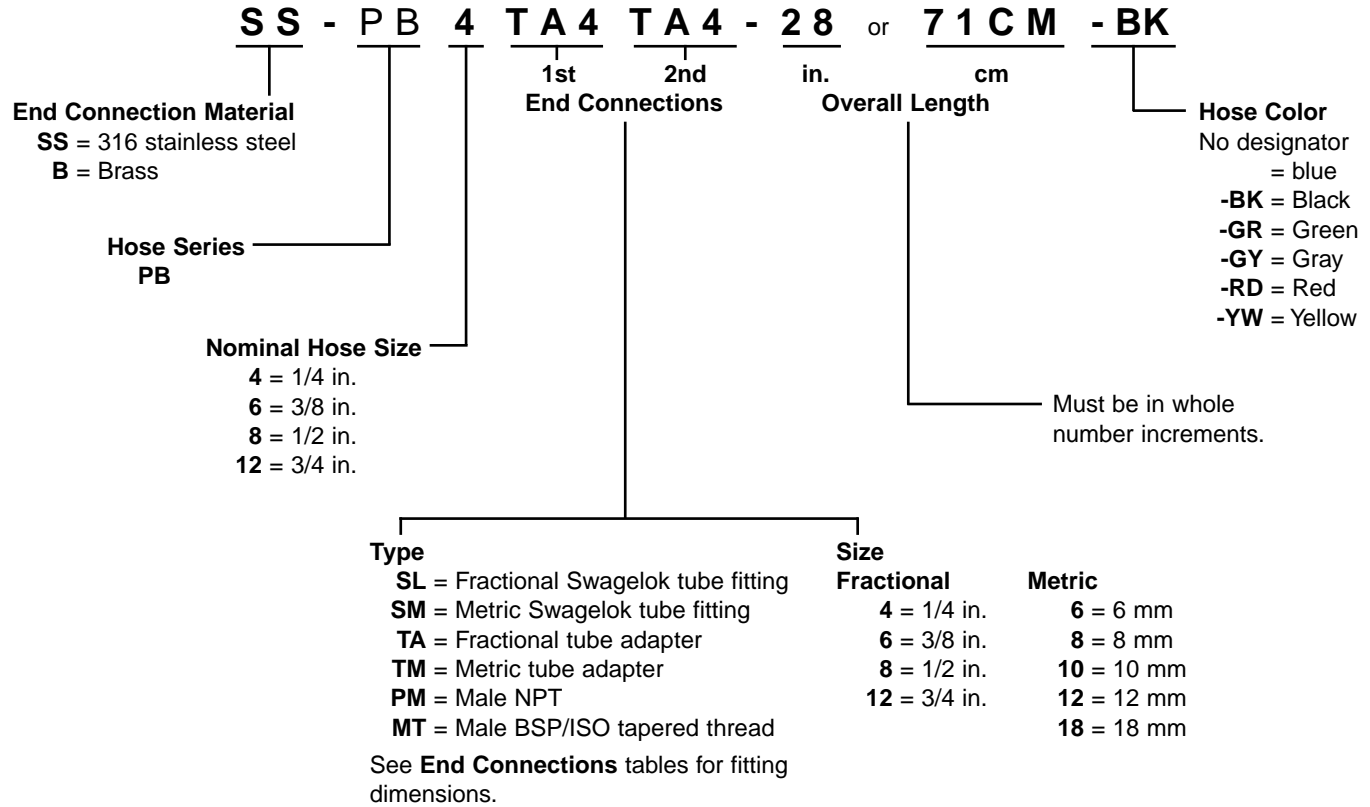
See *Custom Assemblies*, next page, for assembled hoses.

Multipurpose Push-On Hose Custom Assemblies

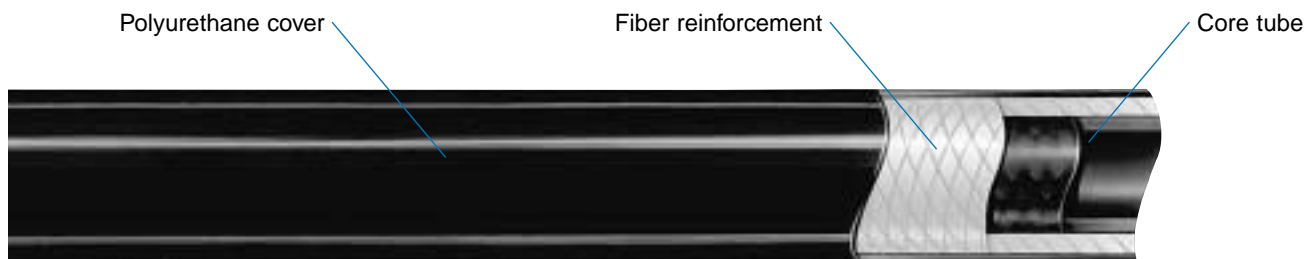


Typical Ordering Number

Build a hose assembly ordering number by combining the designators in the sequence shown below.



Thermoplastic Hose (7R, 8R, 7N, and 7P Series)



Features

- Stainless steel and carbon steel end connections are available in 1/4 to 1 in. and 6 to 22 mm sizes.
- Polyurethane cover resists abrasion and does not postcure.

Nylon Core Hose (7R and 8R Series)

- Nylon core tube is designed for use with petroleum-based and synthetic hydraulic fluids.
- Black polyurethane cover is perforated to prevent blistering.

Nonconductive Nylon Core Hose (7N Series)

- Nylon core tube is designed for use with petroleum-based and synthetic hydraulic fluids.
- Hose passes electrical conductivity test of SAE J343/SAE J517 100R7. Hose is not intended for exposure to continuous electrical current.
- Orange polyurethane nonperforated cover helps prevent moisture from entering the hose.

Polyethylene Core Hose (7P Series)

- Polyethylene core tube complies with FDA regulation 21CFR Part 177.1520 and NSF Standard 51 for contact with water, food, and beverages.
- Cover is nonperforated blue polyurethane.

Technical Data

| Description | Specification | Nominal Hose Size in. (mm) | Minimum Bend Radius ^① in. (cm) | Temperature Range ^② °F (°C) | Working Pressure at 70°F (20°C) psig (bar) | Minimum Burst Pressure at 70°F (20°C) psig (bar) |
|---|--------------------------------|-------------------------------|--|---|---|---|
| Nylon core hose (7R series) | SAE J517 100R7 | 1/4 (6.4) | 1.25 (3.18) | -40 to 200 (-40 to 93) | 2750 (189) | 11 000 (757) |
| | | 3/8 (9.7) | 2.00 (5.08) | | 2250 (155) | 9 000 (620) |
| | | 1/2 (12.7) | 3.00 (7.62) | | 2000 (137) | 8 000 (551) |
| Nylon core hose (8R series) | SAE J517 100R8 | 1/4 (6.4) | 2.00 (5.08) | -40 to 200 (-40 to 93) | 5000 (344) | 20 000 (1378) |
| | | 3/8 (9.7) | 2.50 (6.35) | | 4000 (275) | 16 000 (1102) |
| | | 1/2 (12.7) | 4.00 (10.2) | | 3500 (241) | 14 000 (964) |
| | | 3/4 (19.0) | 6.50 (16.5) | | 2250 (155) | 9 000 (620) |
| | | 1 (25.4) | 10.0 (25.4) | | 2000 (137) | 8 000 (551) |
| Nonconductive nylon core hose (7N series) | SAE J517 100R7 (nonconductive) | 1/4 (6.4) | 1.25 (3.18) | -40 to 200 (-40 to 93) | 2750 (189) | 11 000 (757) |
| | | 3/8 (9.7) | 2.00 (5.08) | | 2250 (155) | 9 000 (620) |
| | | 1/2 (12.7) | 3.00 (7.62) | | 2000 (137) | 8 000 (551) |
| Polyethylene core hose (7P series) | — | 1/4 (6.4) | 1.25 (3.18) | -10 to 150 (-23 to 65) | 2750 (189) | 11 000 (757) |
| | | 3/8 (9.7) | 2.00 (5.08) | | 2250 (155) | 9 000 (620) |
| | | 1/2 (12.7) | 3.00 (7.62) | | 2000 (137) | 8 000 (551) |
| | | 3/4 (19.0) | 5.00 (12.7) | | 1500 (103) | 6 000 (413) |
| | | 1 (25.4) | 8.00 (20.3) | | 1500 (103) | 6 000 (413) |

① Measured to inside of bend.

② For additional pressure-temperature data, contact your authorized Swagelok representative.

Cleaning and Packaging

Swagelok thermoplastic hose components are cleaned in accordance with Swagelok standard cleaning and packaging specification (SC-10). Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed.

⚠ Caution:

Nonconductive hoses can be conduits for electricity if they contain conductive fluids. Verify fluid conductive properties prior to use.

Nonperforated covers may blister in gas service.

User must evaluate compatibility in systems containing heated, water-based fluids—some conditions may affect the nylon core.

Ordering Information and Dimensions

Bulk Thermoplastic Hose

Select an ordering number.



Coils of nominal hose sizes smaller than 1 in. may contain more than one piece of hose.

| Hose Series | Nominal Hose Size, in. | Ordering Number | Reel Length ft (m) |
|-------------|------------------------|-----------------|--------------------|
| 7R | 1/4 | 7R-4 | 250 (76) |
| | 3/8 | 7R-6 | |
| | 1/2 | 7R-8 | |
| 8R | 1/4 | 8R-4 | 250 (76) |
| | 3/8 | 8R-6 | |
| | 1/2 | 8R-8 | |
| | 3/4 | 8R-12 | 125 (38) |
| | 1 | 8R-16 | 50 (15) |

| Hose Series | Nominal Hose Size, in. | Ordering Number | Reel Length ft (m) |
|-------------|------------------------|-----------------|--------------------|
| 7N | 1/4 | 7N-4 | 250 (76) |
| | 3/8 | 7N-6 | |
| | 1/2 | 7N-8 | |
| 7P | 1/4 | 7P-4 | 250 (76) |
| | 3/8 | 7P-6 | |
| | 1/2 | 7P-8 | |
| | 3/4 | 7P-12 | 125 (38) |
| | 1 | 7P-16 | 50 (15) |

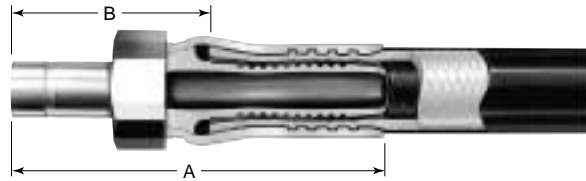
Thermoplastic Hose End Connections

Select an ordering number and add **SS** for 316 stainless steel or **S** for carbon steel. Example: **SS-TP4-TA4**

For field assembly, also select the corresponding pusher and die ordering numbers. Examples: **MS-P-TA4** and **MS-7R8R-4**

To determine the length to cut bulk hose for field assembly, subtract dimension **B** for each end connection from the desired overall assembly length.

Dimensions are for reference only and are subject to change.



Tube Adapters



| Tube OD | Nominal Hose Size | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | A | B | Pusher Ordering Number | Die Ordering Number |
|-----------------------------|-------------------|-----------------------|-------------------------------------|-------------|-------------|------------------------|---------------------|
| Dimensions, in. (mm) | | | | | | | |
| 1/4 | 1/4 | -TP4-TA4 | 11/16 | 2.49 (63.2) | 1.43 (36.3) | MS-P-TA4 | MS-7R8R-4 |
| 3/8 | | -TP4-TA6 | | | | MS-P-4TA6 | MS-7R8R-4 |
| | | 3/8 | -TP6-TA6 | 3/4 | 2.81 (71.4) | 1.50 (38.1) | MS-P-TA6 |
| 1/2 | 1/2 | -TP8-TA8 | 15/16 | 3.35 (85.1) | 1.79 (45.5) | MS-P-SLTA8 | MS-7R8R-8 |
| 5/8 | | -TP8-TA10 | | | | MS-P-8TA10 | MS-7R8R-8 |
| 3/4 | 3/4 | -TP12-TA12 | 1 1/8 | 3.65 (92.7) | 1.89 (48.0) | MS-P-TA12 | MS-8R-12 |
| 1 | 1 | -TP16-TA16 | 1 3/8 | 4.43 (113) | 2.18 (55.4) | MS-P-TA16 | MS-8R-16 |
| Dimensions, mm (in.) | | | | | | | |
| 6 | 1/4 in. | -TP4-TM6 | 11/16 in. | 63.2 (2.49) | 36.3 (1.43) | MS-P-TA4 | MS-7R8R-4 |
| 8 | | -TP4-TM8 | | | | MS-P-4TM8 | MS-7R8R-4 |
| 10 | 3/8 in. | -TP6-TM10 | 3/4 in. | 71.4 (2.81) | 38.1 (1.50) | MS-P-TA6 | MS-7R8R-6 |
| 12 | 1/2 in. | -TP8-TM12 | 15/16 in. | 85.1 (3.35) | 45.5 (1.79) | MS-P-SLTA8 | MS-7R8R-8 |

Swagelok Tube Fittings



| Fitting Size | Nominal Hose Size | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | A | B | Pusher Ordering Number | Die Ordering Number |
|-----------------------------|-------------------|-----------------------|-------------------------------------|-------------|-------------|------------------------|---------------------|
| Dimensions, in. (mm) | | | | | | | |
| 1/4 | 1/4 | -TP4-SL4 | 11/16 | 2.60 (66.0) | 1.54 (39.1) | MS-P-SL4 | MS-7R8R-4 |
| 3/8 | 3/8 | -TP6-SL6 | 3/4 | 2.94 (74.7) | 1.63 (41.4) | MS-P-SL6 | MS-7R8R-6 |
| 1/2 | 1/2 | -TP8-SL8 | 15/16 | 3.30 (83.8) | 1.72 (43.7) | MS-P-SLTA8 | MS-7R8R-8 |
| Dimensions, mm (in.) | | | | | | | |
| 6 | 1/4 in. | -TP4-SM6 | 11/16 in. | 66.0 (2.60) | 39.1 (1.54) | MS-P-SL4 | MS-7R8R-4 |
| 8 | | -TP4-SM8 | | 66.3 (2.61) | 39.4 (1.55) | MS-P-4SM8 | MS-7R8R-4 |
| 10 | | -TP4-SM10 | 3/4 in. | 72.6 (2.86) | 45.7 (1.80) | MS-P-4SM10 | MS-7R8R-4 |
| | 3/8 in. | -TP6-SM10 | | 74.9 (2.95) | 41.7 (1.64) | MS-P-SL6 | MS-7R8R-6 |
| 12 | 1/2 in. | -TP8-SM12 | 15/16 in. | 83.8 (3.30) | 44.2 (1.74) | MS-P-SLTA8 | MS-7R8R-8 |

Dimensions shown with Swagelok nuts finger-tight.

Male Pipe Threads



| Pipe Size in. | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | Dimensions in. (mm) | | Pusher Ordering Number | Die Ordering Number |
|------------------------------|--------------------------------|-----------------------------|--|------------------------|-------------|------------------------------|---------------------------|
| | | | | A | B | | |
| Male NPT | | | | | | | |
| 1/4 | 1/4 | -TP4-PM4 | 11/16 in. | 2.31 (58.7) | 1.25 (31.8) | MS-P-PM4 | MS-7R8R-4 |
| | 3/8 | -TP6-PM4 | 3/4 in. | 2.65 (67.3) | 1.34 (34.0) | MS-P-PM6 | MS-7R8R-6 |
| -TP6-PM6 | | MS-P-PM6 | | | | MS-7R8R-6 | |
| 1/2 | 1/2 | -TP8-PM8 | 15/16 in. | 3.09 (78.5) | 1.53 (38.9) | MS-P-PM8 | MS-7R8R-8 |
| Male BSP/ISO Tapered | | | | | | | |
| 1/4 | 1/4 | -TP4-MT4 | 11/16 in. | 2.31 (58.7) | 1.25 (31.8) | MS-P-PM4 | MS-7R8R-4 |
| 3/8 | 3/8 | -TP6-MT6 | 3/4 in. | 2.65 (67.3) | 1.34 (34.0) | MS-P-PM6 | MS-7R8R-6 |
| 1/2 | 1/2 | -TP8-MT8 | 15/16 in. | 3.09 (78.5) | 1.53 (38.9) | MS-P-PM8 | MS-7R8R-8 |
| Male BSP/ISO Parallel | | | | | | | |
| 1/4 | 1/4 | -TP4-MS4 | 11/16 in. | 2.56 (65.0) | 1.50 (38.1) | MS-P-MS4 | MS-7R8R-4 |
| 3/8 | 3/8 | -TP6-MS6 | 3/4 in. | 2.69 (68.3) | 1.38 (35.1) | MS-P-MS6 | MS-7R8R-6 |
| 1/2 | 1/2 | -TP8-MS8 | 1 1/16 in. | 3.00 (76.2) | 1.44 (36.6) | MS-P-MS8 | MS-7R8R-8 |



**Female JIC (AN) 37°,
Female Swivel**



| Fitting Size in. | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | Dimensions ^① in. (mm) | | Pusher Ordering Number | Die Ordering Number |
|------------------------|--------------------------------|-----------------------------|--|-------------------------------------|-------------|------------------------------|---------------------------|
| | | | | A | B | | |
| 1/4 | 1/4 | -TP4-AS4 | 11/16 in. | 2.65 (67.3) | 1.59 (40.4) | MS-P-AS4 | MS-7R8R-4 |
| 3/8 | 3/8 | -TP6-AS6 | 3/4 in. | 3.03 (77.0) | 1.71 (43.4) | MS-P-AS6 | MS-7R8R-6 |
| 1/2 | 1/2 | -TP8-AS8 | 15/16 in. | 3.34 (84.8) | 1.77 (45.0) | MS-P-AS8 | MS-7R8R-8 |

① Measured with swivel nut pulled toward hex.

**60° Male Cone,
Female Swivel
(BSP/ISO Parallel Thread)**



| Fitting Size in. | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | Dimensions ^① in. (mm) | | Pusher Ordering Number | Die Ordering Number |
|------------------------|--------------------------------|-----------------------------|--|-------------------------------------|-------------|------------------------------|---------------------------|
| | | | | A | B | | |
| 1/4 | 1/4 | -TP4-BM4 | 3/4 in. | 2.48 (63.0) | 1.42 (36.1) | MS-P-BM4 | MS-7R8R-4 |
| 3/8 | 3/8 | -TP6-BM6 | 7/8 in. | 2.87 (72.9) | 1.57 (39.9) | MS-P-BM6 | MS-7R8R-6 |
| 1/2 | 1/2 | -TP8-BM8 | 1 1/16 in. | 3.23 (82.0) | 1.67 (42.4) | MS-P-BM8 | MS-7R8R-8 |

① Measured with swivel nut pulled toward hex.

**30° Female Cone,
Female Swivel
(BSP/ISO Parallel Thread)**



| Fitting Size in. | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | Dimensions ^① in. (mm) | | Pusher Ordering Number | Die Ordering Number |
|------------------------|--------------------------------|-----------------------------|--|-------------------------------------|-------------|------------------------------|---------------------------|
| | | | | A | B | | |
| 1/4 | 1/4 | -TP4-BS4 | 3/4 in. | 2.59 (65.8) | 1.53 (38.9) | MS-P-BS4 | MS-7R8R-4 |
| 3/8 | 3/8 | -TP6-BS6 | 7/8 in. | 3.00 (76.2) | 1.69 (42.9) | MS-P-BS6 | MS-7R8R-6 |
| 1/2 | 1/2 | -TP8-BS8 | 1 1/16 in. | 3.38 (85.9) | 1.81 (46.0) | MS-P-BS8 | MS-7R8R-8 |

① Measured with swivel nut pulled toward hex.

See next page for more end connections.

**Universal Globe Seal,
Metric Female Swivel Nut**



| Fitting Size mm | Nominal Hose Size in. | Basic Ordering Number | Maximum Outside Dimension, Hex Flat | Dimensions ^① in. (mm) | | Pusher Ordering Number | Die Ordering Number |
|--------------------|-----------------------------|-----------------------------|--|-------------------------------------|-------------|------------------------------|---------------------------|
| | | | | A | B | | |
| 14 | 1/4 | -TP4-MC14 | 3/4 in. | 2.41 (61.2) | 1.35 (34.3) | MS-P-MC14 | MS-7R8R-4 |
| 18 | 3/8 | -TP6-MC18 | 7/8 in. | 2.77 (70.4) | 1.46 (37.1) | MS-P-MC18 | MS-7R8R-6 |
| 22 | 1/2 | -TP8-MC22 | 1 1/16 in. | 3.08 (78.2) | 1.52 (38.6) | MS-P-MC22 | MS-7R8R-8 |

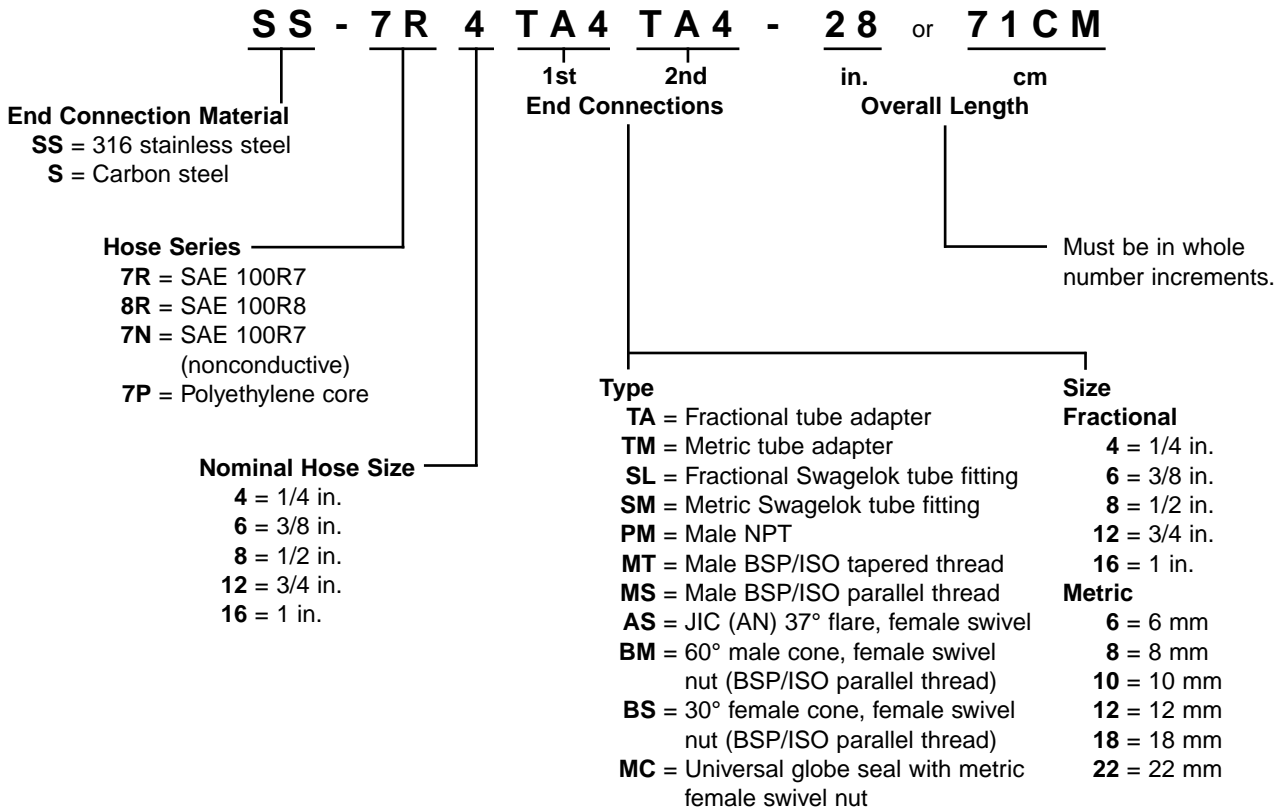
① Measured with swivel nut pulled toward hex.

Custom Thermoplastic Hose Assemblies



Typical Ordering Number

Build a hose assembly ordering number by combining the designators in the sequence shown below.



See **End Connections** tables for fitting dimensions.

Options and Accessories

Options and accessories do not change hose technical data. Hose operating parameters must be considered when selecting a cover.

302 Stainless Steel Spring Guards

Hose-Length Spring Guard

- covers entire hose to protect against kinking and abrasion.



To order, add **S** to a hose assembly ordering number.

Example: SS-7R4TA4TA4-28**S**

6 in. Long Spring Guard

- protects ends of hose.

To order, add **S2** to the hose assembly ordering number.

Example: SS-7R4TA4TA4-28**S2**



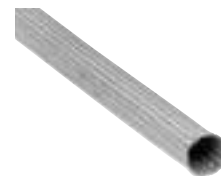
For hose size designators 4 and 6.

Acryl-Saturated Fiberglass Cover

- resists abrasion and UV light.

To order, add **F1** to a hose assembly ordering number.

Example: SS-7R4TA4TA4-28**F1**



Silicone-Coated Fiberglass Cover

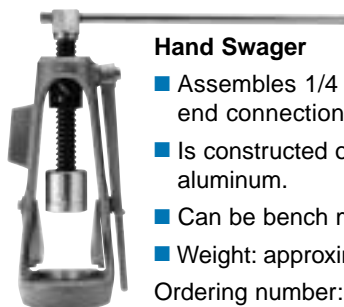
- maintains flexibility down to -65°F (-53°C).

To order, add **F** to a hose assembly ordering number.

Example: SS-7R4TA4TA4-28**F**



Assembly Tools



Hand Swager

- Assembles 1/4 to 1 in. and 6 to 22 mm end connections.
- Is constructed of rugged, die-cast aluminum.
- Can be bench mounted.
- Weight: approximately 8 lb (3.6 kg).

Ordering number: **MS-HSR**



Case

Can accommodate hand swager and other tools and accessories.

Ordering number: **MS-HSR-CASE**



Power Swager

- Assembles 1/4 to 1 in. and 6 to 22 mm end connections.
- Is ready to use; instructions included.
- Opens and closes dies automatically.
- Can be bench mounted.
- Height: 30 in. (76 cm)
Width: 19 in. (48 cm)
Depth: 28 in. (71 cm)
Weight: approximately 140 lb (64 kg)
Motor: Single-phase 1 hp, 60 Hz, 115/208/230 V.

Ordering number: **MS-PSR-110**



Dies

See **End Connections** tables for ordering numbers.



Pushers

See **End Connections** tables for ordering numbers.

Depth Insertion Gauges



Ordering numbers:
MS-IGB-1 for hose size designators 4, 6, and 8

MS-IGB-2 for hose size designators 12 and 16.

Hand Cutter



Ordering number:
MS-HC-SC-1

Vise Blocks



Ordering numbers:
MS-VB-1 for hose size designators 4, 6, and 8

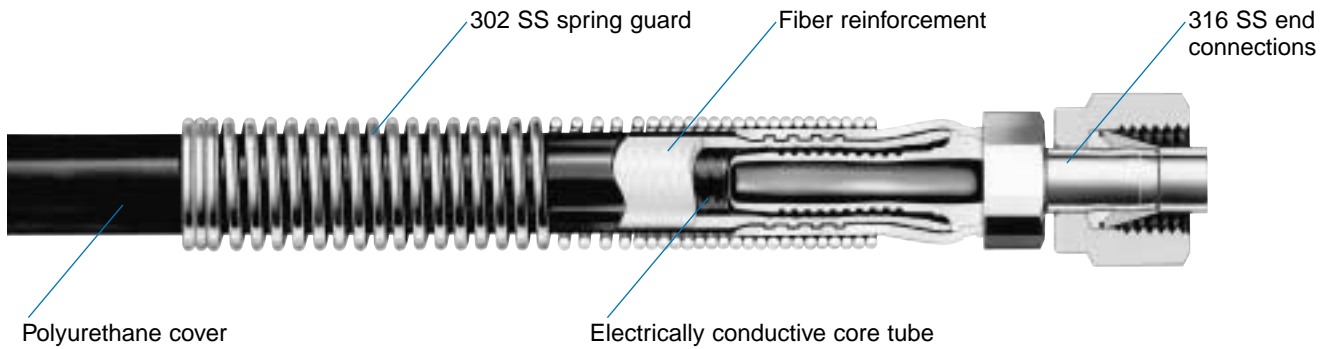
MS-VB-2 for hose size designators 12 and 16.

Lubricant



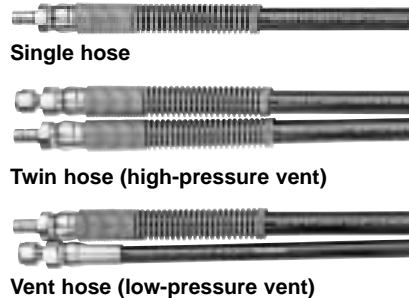
Ordering number:
MS-TP-LUBE

Conductive Core Hose



Features

- Single, twin, and vent hoses are available in custom lengths.
- Stainless steel end connections are available in 1/4 and 3/8 in. and 8 and 10 mm sizes.
- Electrically conductive core tube and 316 SS end connections maintain electrical continuity while in use.
- Polyurethane cover resists abrasion.
- Blue stripe provides easily visible indicator of conductive core tube hose, differentiating it from other Swagelok thermoplastic hose.



Technical Data

| Hose Style | Nominal Hose Size in. (mm) | Inside Diameter in. (mm) | Minimum Bend Radius ^① in. (cm) | Temperature Range ^② °F (°C) | Working Pressure at 70°F (20°C) psig (bar) | Minimum Burst Pressure at 70°F (20°C) psig (bar) | Hose Series |
|-------------------|-------------------------------|------------------------------------|--|---|---|---|-------------|
| Single | 1/4 (6.4) | 0.26 (6.6) | 2.00 (5.08) | -40 to 150 (-40 to 65) | 5000 (344) | 20 000 (1378) | NGS |
| | 3/8 (9.7) | 0.38 (9.7) | 4.00 (10.2) | | | | |
| Twin | 1/4 (6.4) | 0.26 (6.6) | 2.00 (5.08) | | Fill and vent 5000 (344) | Fill and vent 20 000 (1378) | NGT |
| | 3/8 (9.7) | 0.38 (9.7) | 4.00 (10.2) | | | | |
| Vent ^③ | 1/4 (6.4) | Fill 0.26 (6.6) Vent 0.26 (6.6) | 2.00 (5.08) | | Fill 5000 (344) Vent 1500 (103) | Fill 20 000 (1378) Vent 6 000 (413) | NGV |
| | 3/8 (9.7) | Fill 0.38 (9.7) Vent 0.26 (6.6) | 4.00 (10.2) | | | | |

① Measured to inside of bend.

② For additional pressure-temperature data, contact your authorized Swagelok representative.

③ Low-pressure vent line does not have conductive core tube.

Testing

Every Swagelok conductive core hose assembly is factory tested for electrical conductivity.

Cleaning and Packaging

Swagelok conductive core hose components are cleaned in accordance with Swagelok standard cleaning and packaging specification (SC-10). Each hose is bagged individually and boxed; longer hoses are coiled, bagged, and boxed.

⚠ Warning:

All equipment must be properly grounded to prevent static sparking.

Spring guards must be firmly attached to couplings on both ends of hose.

Electrical resistance must not exceed 5 MΩ.

Ordering Information

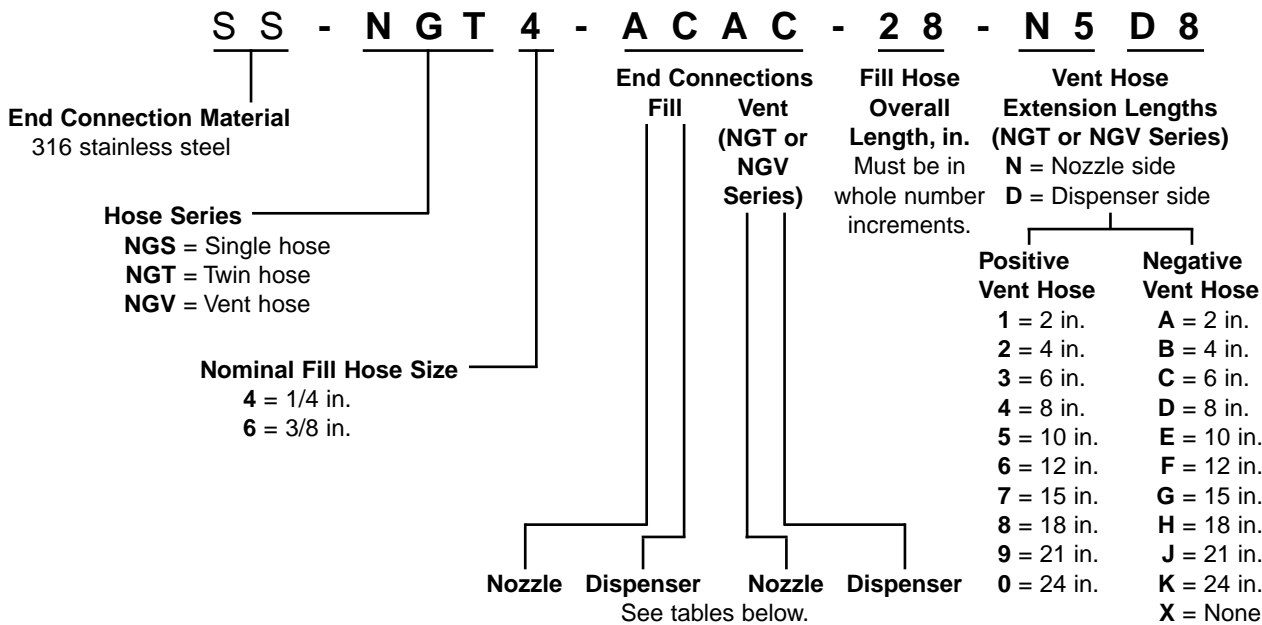
Dimensions are for reference only and are subject to change.

Conductive Core Hose Custom Assemblies



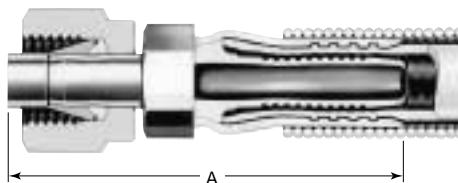
Typical Ordering Number

Build a hose assembly ordering number by combining the designators in the sequence shown below.



Conductive core hose is supplied with a spring guard at each end connection. Spring guards may be omitted for static nondispensing applications. To order hose without spring guards, replace the dash following the fill hose overall length designator with **X**.

Example: SS-NGT4-ACAC-28XN5D8



Swagelok Tube Fittings



| Fitting Size | Nominal Hose Size | End Connection Designator | Maximum Outside Dimension, Hex Flat | A |
|-----------------------------|-------------------|---------------------------|-------------------------------------|-------------|
| Dimensions, in. (mm) | | | | |
| 1/4 | 1/4 | C | 11/16 | 2.60 (66.0) |
| 3/8 | 3/8 | D | 3/4 | 2.94 (74.7) |
| Dimensions, mm (in.) | | | | |
| 8 | 1/4 in. | G | 11/16 in. | 66.3 (2.61) |
| 10 | 3/8 in. | H | 3/4 in. | 74.9 (2.95) |

See next page for more end connections.

Tube Adapters



| Tube OD | Nominal Hose Size | End Connection Designator | Maximum Outside Dimension, Hex Flat | A |
|-----------------------------|-------------------|---------------------------|-------------------------------------|-------------|
| Dimensions, in. (mm) | | | | |
| 1/4 | 1/4 | B | 11/16 | 2.49 (63.2) |
| 3/8 | | A | | |
| | | 3/8 | A | 3/4 |
| Dimensions, mm (in.) | | | | |
| 8 | 1/4 in. | E | 11/16 in. | 63.2 (2.49) |
| 10 | 3/8 in. | F | 3/4 in. | 71.4 (2.81) |

Male Pipe Threads



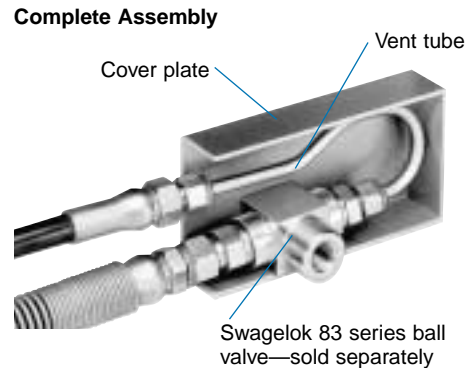
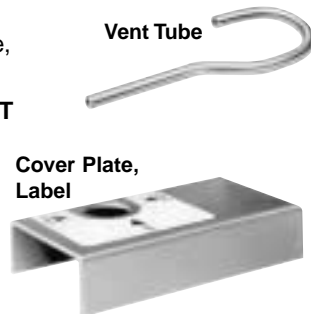
| Pipe Size in. | Nominal Hose Size in. | End Connection Designator | Maximum Outside Dimension, Hex Flat | A in. (mm) |
|-----------------------------|-----------------------|---------------------------|-------------------------------------|-------------|
| Male NPT | | | | |
| 1/4 | 1/4 | M | 11/16 in. | 2.31 (58.7) |
| 3/8 | 3/8 | N | 3/4 in. | 2.65 (67.3) |
| Male BSP/ISO Tapered | | | | |
| 1/4 | 1/4 | K | 11/16 in. | 2.31 (58.7) |
| 3/8 | 3/8 | L | 3/4 in. | 2.65 (67.3) |

Options and Accessories

Nozzle End Components

Kit contains vent tube, cover plate, and label.

Ordering number: **NG-COVER-KIT**



See SAE J1273, *Recommended Practices for Hydraulic Hose Assemblies*, for information on installation and use of hose.

See NAHAD ASC 001.01, *Flexible Metal Hose Assembly Standard*, for common hose routing guidelines.

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.

Caution: Do not mix or interchange parts with those of other manufacturers.