

STATUTORY DECLARATION Registration of Fittings

In this space, show facsimile of manufacturer's logo or trademark as it will appear on the fitting. Swagelok

I, Joel Feldman, Vice President, Engineering of Swagelok Company

located at 29500 Solon Road, Solon, Ohio 44139 USA (see Attachment A)

do solemnly declare that the fittings listed hereunder, which are subject to the Safety Codes Act (check one)

- comply with the requirements of ASME B31.3 which specifies the dimensions, materials of construction, pressure/temperature ratings and identification marking of the fittings, or are not covered by the provisions of a recognized North American standard and are therefore manufactured to comply with as supported by the attached data which identifies the dimensions, materials of construction, pressure/temperature ratings and the basis for such ratings, and the marking of the fittings for identification.

I further declare that the manufacture of these fittings is controlled by a quality control program which has been verified by the following authority, BSI as being suitable for the manufacture of these fittings to the stated standard. The fittings covered by this declaration, for which I seek registration, are

Category D Type Fittings

In support of this application, the following information, calculations and/or test data are attached:

ISO 9001:2015 Certificate, Attachment A, Attachment B, Catalog Information and other Support Documents

DECLARED before me at Solon in the state of Ohio this 18th day of July, 2019

(print) Brenda Hammel (a Commissioner of Oaths or Notary Public) (sign) Brenda Hammel (a Commissioner of Oaths or Notary Public)

(signature of applicant)

For ABSA Office Use Only:

NOTES:

To the best of my knowledge and belief, the application meets the requirements of the Safety Codes Act and CSA Standard B51, Clause 4.2, and is accepted for registration in Category D

Registration Number: 0D21781.52 (Signature of the Administrator/SCO)

Date Registered: SEP 24 2019 Expiry Date: Sept 15 2029

SEP 24 2019

Swagelok

0D21781.52

Canadian Registration Number Submittal
 Category D Submission # FM-HOSE-2019

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Attachment B: Scope of Registration for Swagelok FM Series Hose Assemblies (Category D)

The table below represents the scope of Swagelok FM series hose assemblies covered by this submission for CRN approval. These hose assemblies have been evaluated in accordance with ASME B31.3:2016 Process Piping as unlisted components. The referenced port connections and product catalog(s) do not represent the full scope of the submission but rather detail some of the most common options.

Summary Table

| Product Series | Pressure Retaining Material | Nom. Hose Size (in) | End Connections & Sizes | Maximum Working Pressure (psig) | | Design Code of Construction |
|----------------------|---|---------------------|---|---------------------------------|--------------|----------------------------------|
| | | | | Up to 100°F | @ Max. Temp. | |
| FM Series Metal Hose | <u>Core</u> 316L SS (ASTM A240) <u>Braid</u> 316L SS (ASTM A580) <u>End Connections</u> Strain-Hardened 316 SS, 316L SS, or 316LV SS (ASTM A479) | 1/4 | Tube Fitting [TA, TM, SL, SM] 1/4" - 1/2" (6mm - 10mm) Male & Female VCR Metal Gasket Face Seal Fittings [RM, RF] 1/4" - 1/2" SAE 37° (JIC) Female Swivel [AS] 1/4" - 3/8" Tube Butt Welds [TB] 1/4" | 3100 | 1736 @850°F | ASME B31.3 (Unlisted Components) |
| | | | Female VCO O-Ring Face Seal Fittings [VF] 1/4" | 3100 | 2015 @500°F | |
| | | | Male & Female Pipe Threads, NPT [PM, PF] 1/4" - 1/2" | 3100 | 2170 @400°F | |
| | | | ISO/BSP Tapered (ISO 7) [MT][FT] 1/4" - 1/2" | | | |

ABSA

SAFETY CODES ACT - PROVINCE OF ALBERTA
 REGISTRATION OF FITTINGS

REGISTRATION NO. 0D21781.52

DWG. NO. or CAT. NO. Attachment B: Scope of Registration

TYPE OF FITTINGS FM Series Hose Assemblies

SEP 24 2019

Date _____ INITIALS [Signature]

T. M. (ASHLING) DICK, P.ENG
 DESIGN SURVEY ENGINEER



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Summary Table (cont'd)

| Product Series | Pressure Retaining Material | Nom. Hose Size (in) | End Connections & Sizes | Maximum Working Pressure (psig) | | Design Code of Construction |
|----------------------|---|---------------------|--|---------------------------------|--------------|----------------------------------|
| | | | | Up to 100°F | @ Max. Temp. | |
| FM Series Metal Hose | <u>Core</u> 316L SS (ASTM A240) <u>Braid</u> 316L SS (ASTM A580) | 3/8 | Tube Fitting [TA, TM, SL, SM] 1/4" – 1/2" (6mm – 10mm) Male & Female VCR Metal Gasket Face Seal Fittings [RM, RF] 1/4" – 1/2" SAE 37° (JIC) Female Swivel [AS] 3/8" – 1/2" Tube Butt Welds [TB] 3/8" – 1/2" | 2000 | 1120 @850°F | ASME B31.3 (Unlisted Components) |
| | | | Female VCO O-Ring Face Seal Fittings [VF] 3/8" | 2000 | 1300 @500°F | |
| | | | Male & Female Pipe Threads, NPT [PM, PF] 1/4" – 1/2" | 2000 | 1400 @400°F | |
| | | | ISO/BSP Tapered (ISO 7) [MT][FT] 3/8" | | | |
| | | | Tube Fitting [TA, TM, SL, SM] 1/4" – 3/4" (6mm – 18mm) Male & Female VCR Metal Gasket Face Seal Fittings [RM, RF] 1/4" – 3/4" SAE 37° (JIC) Female Swivel [AS] 1/2" – 5/8" Tube Butt Welds [TB] 1/2" | 1800 | 1008 @850°F | |
| | | | Female VCO O-Ring Face Seal Fittings [VF] 1/2" | 1800 | 1170 @500°F | |
| | Male Pipe Threads, NPT [PM] 1/4" – 3/4" | | | | | |
| | Female Pipe Threads, NPT [PF] 3/8" – 1/2" | 1800 | 1260 @400°F | | | |
| | ISO/BSP Tapered (ISO 7) [MT][FT] 3/8" – 1/2" | | | | | |

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Summary Table (cont'd)

| Product Series | Pressure Retaining Material | Nom. Hose Size (in) | End Connections & Sizes | Maximum Working Pressure (psig) | | Design Code of Construction |
|---|---|---------------------|--|---------------------------------|--------------|----------------------------------|
| | | | | Up to 100°F | @ Max. Temp. | |
| FM Series Metal Hose | Core 316L SS (ASTM A240) Braid 316L SS (ASTM A580) End Connections Strain-Hardened 316 SS, 316L SS, or 316LV SS (ASTM A479) | 3/4 | Tube Fitting [TA, TM, SL, SM] 1/2" – 1" (12mm – 25mm) Male VCR Metal Gasket Face Seal Fittings [RM] 1/2" – 3/4" Female VCR Metal Gasket Face Seal Fittings [RF] 1/2" – 1" SAE 37° (JIC) Female Swivel [AS] 3/4" Tube Butt Welds [TB] 3/4" | 1500 | 840 @850°F | ASME B31.3 (Unlisted Components) |
| | | | Female VCO O-Ring Face Seal Fittings [VF] 1/2" – 3/4" | 1500 | 975 @500°F | |
| | | | Male Pipe Threads, NPT [PM] 1/2" – 1" | 1500 | 1050 @400°F | |
| | | | Female Pipe Threads, NPT [PF] 1/2" – 3/4" | | | |
| ISO/BSP Tapered (ISO 7) [MT][FT] 3/4" – 1" | | | | | | |



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Summary Table (cont'd)

| Product Series | Pressure Retaining Material | Nom. Hose Size (in) | End Connections & Sizes | Maximum Working Pressure (psig) | | Design Code of Construction |
|----------------------|---|---------------------|--|---------------------------------|---------------|-------------------------------------|
| | | | | Up to 100°F | @ Max. Temp. | |
| FM Series Metal Hose | <u>Core</u> 316L SS (ASTM A240) <u>Braid</u> 316L SS (ASTM A580) <u>End Connections</u> Strain-Hardened 316 SS, 316L SS, or 316LV SS (ASTM A479) | 1 | Tube Fitting [TA, TM, SL, SM] 1/2" – 1" (16mm – 25mm) Male & Female VCR Metal Gasket Face Seal Fittings [RM, RF] 1" SAE 37° (JIC) Female Swivel [AS] 1" Tube Butt Welds [TB] 3/4" – 1" | 1200 | 672 @850°F | ASME B31.3 (Unlisted Components) |
| | | | Female VCO O-Ring Face Seal Fittings [VF] 1" | 1200 | 780 @500°F | |
| | | | Male Pipe Threads, NPT [PM] 1/2" – 1" Female Pipe Threads, NPT [PF] 1" ISO/BSP Tapered (ISO 7) [MT][FT] 1" | 1200 | 840 @400°F | |



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Summary Table (cont'd)

| Product Series | Pressure Retaining Material | Nom. Hose Size (in) | End Connections & Sizes | Maximum Working Pressure (psig) | | Design Code of Construction |
|----------------------|---|---------------------|---|---------------------------------|---------------|-------------------------------------|
| | | | | Up to 100°F | @ Max. Temp. | |
| FM Series Metal Hose | <u>Core</u> 316L SS (ASTM A240) <u>Braid</u> 316L SS (ASTM A580) <u>Weld Collar</u> Strain-Hardened 316 SS (ASTM A479) <u>End Connections</u> Strain-Hardened 316 SS, 316L SS, or 316LV SS (ASTM A479) | 1 1/4 | Tube Fitting [TA, TM, SL, SM] 1 1/4" (32mm) | 950 | 532 @850°F | ASME B31.3 (Unlisted Components) |
| | | | Male Pipe Threads, NPT [PM] 1" – 1 1/4" | 950 | 665 @400°F | |
| | | | Female Pipe Threads, NPT [PF] 1 1/4" | | | |
| | | | ISO/BSP Tapered (ISO 7) [MT][FT] 1 1/4" | | | |
| | | 1 1/2 | Tube Fitting [TA, TM, SL, SM] 1 1/2" (38mm) | 900 | 504 @850°F | |
| | | | Male Pipe Threads, NPT [PM] 1" – 1 1/2" | 900 | 630 @400°F | |
| | | | Female Pipe Threads, NPT [PF] 1 1/2" | | | |
| | | | ISO/BSP Tapered (ISO 7) [MT][FT] 1 1/2" – 2" | | | |
| | | 2 | Tube Fitting [TA, TM, SL, SM] 2" (50mm) | 500 | 280 @850°F | |
| | | | Male Pipe Threads, NPT [PM] 1 1/2" – 2" | 500 | 350 @400°F | |
| | | | Female Pipe Threads, NPT [PF] 2" | | | |
| | | | ISO/BSP Tapered (ISO 7) [MT][FT] 2" | | | |

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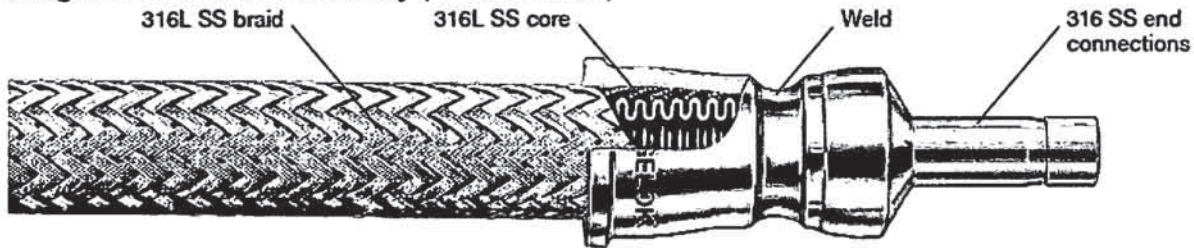
Swagelok

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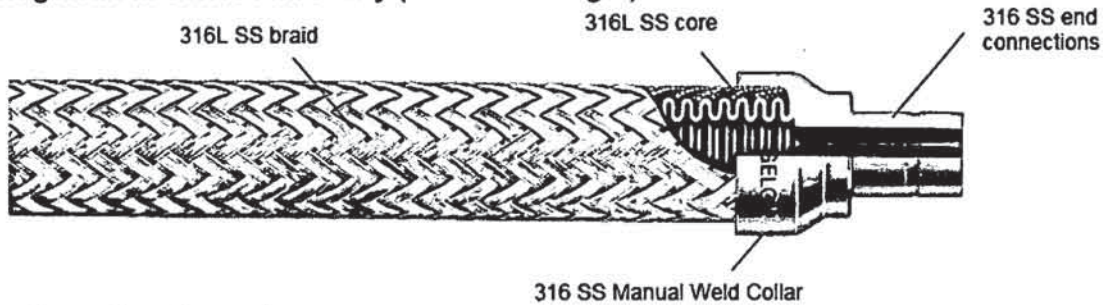
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Product Illustration

Swagelok FM Series Assembly (1" and under)



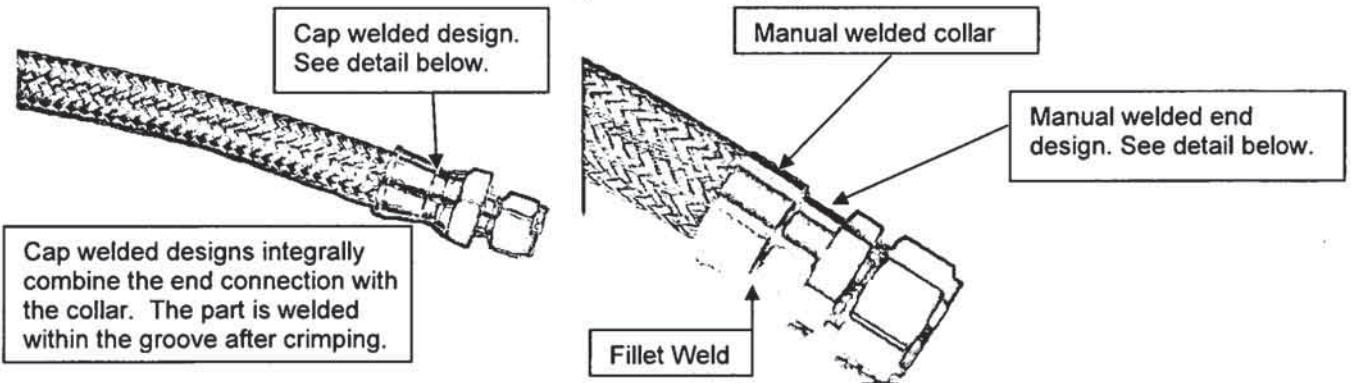
Swagelok FM Series Assembly (1 1/4" and larger)



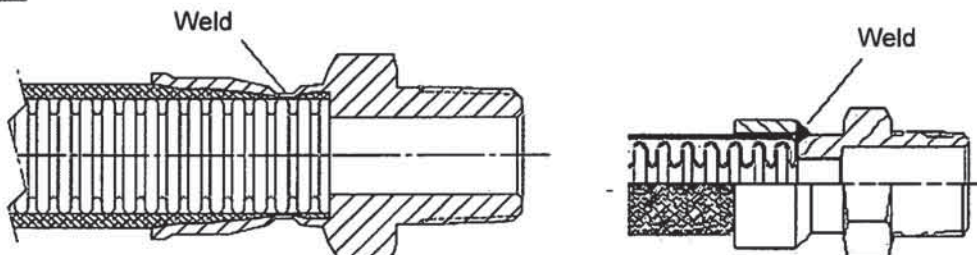
Configuration Example:

FM hoses are available in two styles with many end types, end sizes, and possible overall lengths. There are two ways the hose end connections are attached to the tube and braid depending on the size of the hose:

- Gas Tungsten Arc Weld (GTAW) Cap Weld with Integral Weld Collar (1" and under)
- Manual Weld with Manual Weld Collar (1 1/4" and larger)



Weld Detail:



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Product Options:

Additional options and non-pressure boundary alterations that do not affect pressure ratings may be made available within the scope of this approval. Examples of these would include, but are not limited to:

- Cover Options (ex. fire jacket, thermosleeve, spring guard, etc.)
- Tag and Marking Options (ex. tags, lanyards, retaining clamps, etc.)
- Special Testing Options (ex. hydrostatic pressure test, inboard helium leakage test, nitrogen leak test, etc.)
- Other Options (ex. traceable certificates for product)

Additional options that may affect pressure and/or temperature ratings may be made available within the scope of this approval. Examples of these would include the following:

- End Connection Seals or Sealant Options (ex. VCO O-rings, VCR gaskets, pipe thread sealant, etc.)

Quality System

The Swagelok Company quality system complies with the requirements of ISO 9001:2015. The Swagelok Company maintains BSI Certificate of Registration Number FM 01729, which applies to all locations listed on the Certificate.

References

The below product catalog does not represent the full scope of the registration but rather details some of the most common options.

- Hose Assemblies, Bulk Hose, and End Connections Product Catalog MS-01-180, Rev. S

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Attachment A. Swagelok Manufacturing Locations

This document lists the Swagelok locations where end item or component level manufacturing activities take place.

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|---|--|
| Swagelok Company 29500 Solon Road Solon, Ohio 44139 USA | Swagelok Company (Falon 1) 348 Bishop Road Highland Heights, Ohio 44143 USA |
| Swagelok Company (Highland) 318 Bishop Road Highland Heights, Ohio 44143 USA | Swagelok Company (Falon 2) 358 Bishop Road Highland Heights, Ohio 44143 USA |
| Swagelok Company (OFC) 29495 F.A. Lennon Drive Solon, Ohio 44139 USA | Swagelok Company (HPF) 6050 Cochran Road Solon, Ohio 44139 USA |
| Swagelok Company (Atlantic) 26651 Curtiss Wright Parkway Willoughby Hills, Ohio 44092 USA | Swagelok Company (Snow Metal) 6060 Cochran Road Solon, Ohio 44139 USA |
| Swagelok Company (Micro) 26653 Curtiss Wright Parkway Willoughby Hills, Ohio 44092 USA | Swagelok Company (Alfred) 29500 Ambina Drive Solon, Ohio 44139 |
| Swagelok Hose Services Company (SHSC) 29900 Solon Industrial Parkway Solon, Ohio 44139 | Swagelok Company (Strongsville) 15400 Foltz Road Strongsville, Ohio 44119 |
| Swagelok (China) Fluid System Technologies Ltd. Changshu Export Process Zone Changshu Economic Development Zone Changshu, Jiangshu 215513 China | Swagelok Limited Ballafletcher Road Tromode IM4 4RA Isle of Man |