

TECHNICAL STANDARDS & SAFETY AUTHORITY  
345 CARLINGVIEW DRIVE  
TORONTO ON M9W 6N9

**Date:** December 3, 2019  
**Account #:** 35231  
**Journal #:** 74727

**Attn:** TANYA FRANCIS

**Re:** Application for Design Registration

The design, as detailed in your, CRN: 0D21781.5, for a Fitting is accepted for registration as follows:

**Registered To:** SWAGELOK COMPANY                      **CRN:** 0D21781.51

**Drawing #:** Scope of Registration

**Drawing Revision:** N/A

This design was registered based on a technical review performed by the province of initial registration in accordance with the Association of Chief Inspectors policy on reciprocal recognition of design review.

**Reviewer's Notes:**

As required by CSA B51 4.2.1, this registration expires on 15-Sep-2029. This CRN is valid until the expiry date as long as the Manufacturer maintains a valid quality control program verified by an acceptable third-party agency until that date. Should the certification of the quality control program lapse before the expiry date, this registration shall become void. Any additional conditions of registration stated in TSSA CRN# 0D21781.5 registration shall apply to BC registration.

Contact me if you have any questions. The invoice for registration will be forwarded under separate cover.

Janina Mihailescu

janina.mihailescu@technicalsaftybc.ca  
Design Administration

**cc:**



Technical Standards and Safety Authority  
 345 Carlingview Drive  
 Toronto, Ontario M9W 6N9  
 www.tssa.org

Show facsimile of manufacturer's logo or trademark, as it will appear on the fitting, in the space below

Swagelok

## STATUTORY DECLARATION Registration of Fittings

I, Joel Feldman, Vice President of Engineering  
(Name and Position, e.g. President, Plant Manager, Chief Engineer)

of Swagelok Company  
(Name of Manufacturer)

Located at 29500 Solon Road, Solon, Ohio 44139 USA (440) 248-4600 (440) 349-5970  
(Plant Address) (Telephone No.) (Fax No.)

do solemnly declare that the fittings listed hereunder, which are subject to the **Technical Standards and Safety Act**, Boilers and Pressure Vessels Regulation, comply with all of the requirements of ASME B31.3 for unlisted components

(Title of recognized North American Standard)

which specifies the dimensions, materials of construction, pressure/temperature ratings, identification marking the fittings and service;

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, material of construction, pressure/temperature ratings and the basis for such ratings, the marking of the fitting for identification and service.

I further declare that the manufacture of these fittings is controlled by a quality system meeting the requirements of ISO 9001:2015 which has been verified by the following authority, BSI

The items covered by this declaration, for which I seek registration, are category D. Hose type fittings. In support of this application, the following information and/or test data are attached as follows:

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

(drawings, calculations, test reports, etc.)

Declared before me at Solon in the State of Ohio  
 the 18<sup>th</sup> day of July AD 2019.

Commissioner for Oaths:

Brenda Hammel  
(Printed name)

Brenda Hammel  
(Signature)

[Signature]  
(Signature of Declarer)

**FOR OFFICE USE ONLY**

To the best of my knowledge and belief, the application meets the requirements of the **Technical Standards and Safety Act**, Boilers and Pressure Vessels Regulation, and CSA Standard B51 and is accepted for registration in Category D

Boilers and Pressure Vessels Safety Program

REGISTERED

C.R.N.: 0D21781.5

Signed: [Signature]

Date: Sept 15, 2019

CRN: 0D21781.5

Registered by: [Signature]

Dated: Sept 15, 2019

NOTE: This registration expires on: Sept 15, 2029

*\*Information provided in this application is releasable under the Freedom of Information and Privacy Protection Act and may be disclosed upon request.*

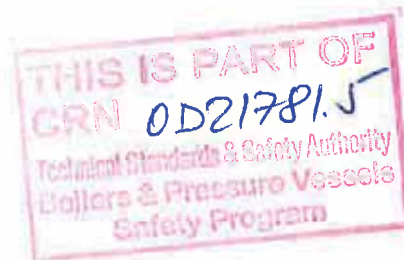
*For scope of registration see attached stamped docs. Attachment A and B/K*

## 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	<b>Core</b> 316L SS (ASTM A240)  <b>Braid</b> 316L SS (ASTM A580)  <b>End Connections</b> 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"  ISO/BSP Tapered (ISO 7) [MT][FT] 1/4" – 1/2"	3100	2170 @400°F	



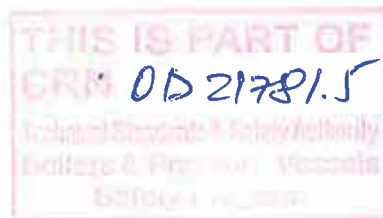
**Summary Table (cont'd)**

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	<b>Core</b> 316L SS (ASTM A240)  <b>Braid</b> 316L SS (ASTM A580)  <b>End Connections</b> Strain-Hardened 316 SS, 316L SS, or 316LV SS (ASTM A479)	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"					
		Male Pipe Threads, NPT [PM] 1/4" – 3/4"	1800	1260 @400°F				
		Female Pipe Threads, NPT [PF] 3/8" – 1/2"						
		ISO/BSP Tapered (ISO 7) [MT][FT] 3/8" – 1/2"						

THIS IS PART OF  
 CRN 0D21781.5  
 Technical Standards & Safety Authority  
 Lubricants & Pressure Vessels  
 Safety Programs

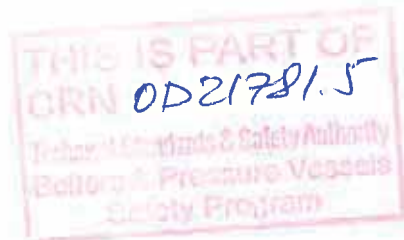
**Summary Table (cont'd)**

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)	3/4	Tube Fitting [TA, TM, SL, SM] 1/2" – 1" (12mm – 25mm)	1500	840 @850°F	ASME B31.3 (Unlisted Components)
			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"			
			Female VCO O-Ring Face Seal Fittings [VF] 1/2" – 3/4"	1500	975 @500°F	
			Male Pipe Threads, NPT [PM] 1/2" – 1"			
			Female Pipe Threads, NPT [PF] 1/2" – 3/4"	1500	1050 @400°F	
			ISO/BSP Tapered (ISO 7) [MT][FT] 3/4" – 1"			



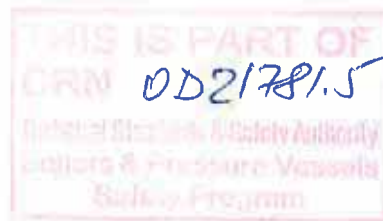
**Summary Table (cont'd)**

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	<p><b>Core</b> 316L SS (ASTM A240)</p> <p><b>Braid</b> 316L SS (ASTM A580)</p> <p><b>End Connections</b> Strain-Hardened 316 SS, 316L SS, or 316LV SS (ASTM A479)</p>	1	Tube Fitting [TA, TM, SL, SM] 1/2" – 1" (16mm – 25mm)	1200	672 @850°F	ASME B31.3 (Unlisted Components)
			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"			
			Female VCO O-Ring Face Seal Fittings [VF] 1"	1200	780 @500°F	
			Male Pipe Threads, NPT [PM] 1/2" – 1"	1200	840 @400°F	
			Female Pipe Threads, NPT [PF] 1"			
			ISO/BSP Tapered (ISO 7) [MT][FT] 1"			



**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"			





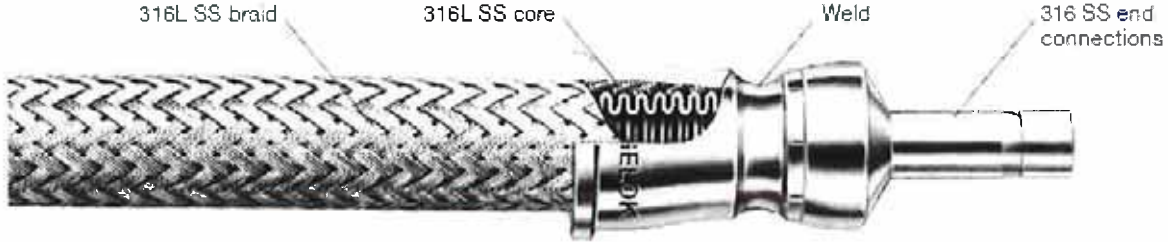
# Swagelok

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

September 4, 2019  
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## Product Illustration

### Swagelok FM Series Assembly (1" and under)



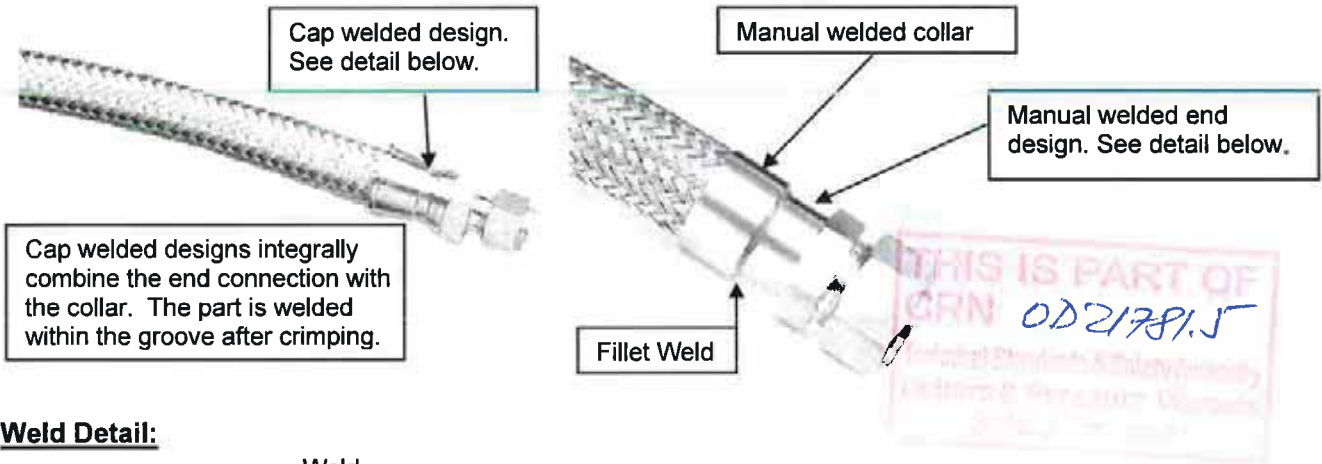
### Swagelok FM Series Assembly (1 1/4" and larger)



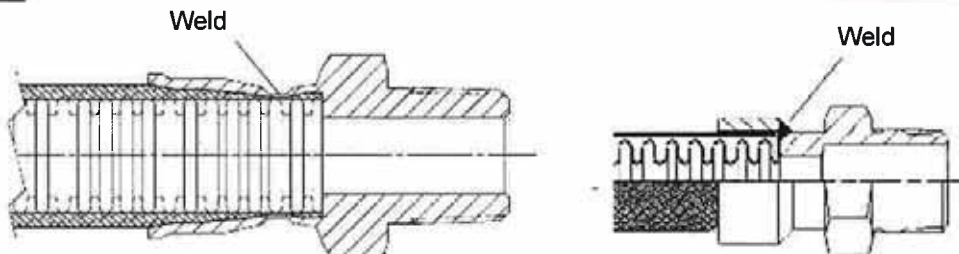
## Configuration Example:

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:





## 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.)

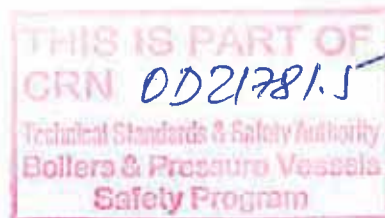
## Quality System

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



**Attachment A. Swagelok Manufacturing Locations**

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

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

