

ATTN: TSSA BPV NATIONAL REGISTRATION -
TECHNICAL STANDARDS & SAFETY AUTHORITY
345 CARLINGVIEW DR
TORONTO ON M9W 6N9

Date: 06-Jul-2026
TSBC Account #: 061440
TSBC Admin Number: 126145
Canadian Registration Number: 0D21781.51

Re: Application for Design Registration

The design, as detailed in your Design Portal application 0D21781.5ADD1 - Swagelok Company for a Pressure Fitting is registered with the following notes and considerations:

Registered To:	Swagelok Company
Project Name:	0D21781.5ADD1 - Swagelok Company
Drawing #:	Attachment B: Scope of Registration for Swagelok FM Series Hose Assemblies (Category D)
Drawing Revision:	N/A

Conditions of Registration:

(1) Fitting Registration Expiry Date: 15-Sep-2029 (2) The registration is valid until the indicated expiry date only if the Manufacturer maintains a valid quality management system approved by an acceptable third-party agency until that date. Should the approval of quality management system lapse before the expiry date indicated above, this registration shall become void.

Reviewer's Notes:

Any additional conditions and considerations from the initial province of registration shall apply to this BC registration.

Full details of this submission including the scope of registration, design conditions, fabrication details, and calculations pertaining to this design are located in the above Admin Number on the Design Portal. For all other enquiries, please contact eim@technicalsaftybc.ca.

The Engineering Information Management Team



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- 2026 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)	1/4	Tube Fitting [TA, TM, SL, SM] 1/4" – 1/2" (6mm – 10mm)	3100	1736 @850°F	ASME B31.3 (Unlisted Components)
	<u>Braid</u> 316L SS (ASTM A580)		Male & Female VCR Metal Gasket Face Seal Fittings [RM, RF] 1/4" – 1/2"			
	<u>End Connections</u> Strain-Hardened 316 SS (ASTM A479)		SAE 37° (JIC) Female Swivel [AS] 1/4" – 3/8"			
			Tube Butt Welds [TB] 1/4"			
			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"			



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 (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" ISO/BSP Tapered (ISO 7) [MT][FT] 3/8"	2000	1400 @400°F	
		1/2	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" ISO/BSP Tapered (ISO 7) [MT][FT] 3/8" – 1/2"	1800	1260 @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	Core 316L SS (ASTM A240) Braid 316L SS (ASTM A580) End Connections Strain-Hardened 316 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"	1500	975 @500°F	
			Female VCO O-Ring Face Seal Fittings [VF] 1/2" – 3/4"			
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"						



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 (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	

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 (ASTM A479)	1 1/4	Tube Fitting [TA, TM, SL, SM] 1 1/4" (32mm)	1200	672 @850°F	ASME B31.3 (Unlisted Components)
			Male Pipe Threads, NPT [PM] 1" – 1 1/4"	1200	840 @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)	1100	616 @850°F	
			Male Pipe Threads, NPT [PM] 1" – 1 1/2"	1100	770 @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)	700	392 @850°F	
			Male Pipe Threads, NPT [PM] 1 1/2" – 2"	700	490 @400°F	
			Female Pipe Threads, NPT [PF] 2"			
			ISO/BSP Tapered (ISO 7) [MT][FT] 2"			

Product Illustration

Swagelok FM Series Assembly (1" and under)



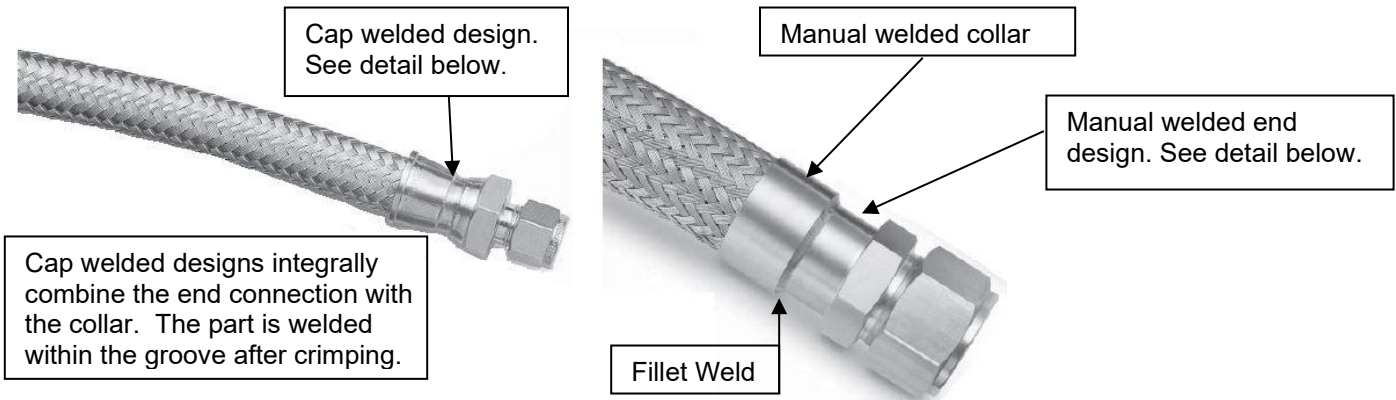
Swagelok FM Series Assembly (1 1/4" and larger)



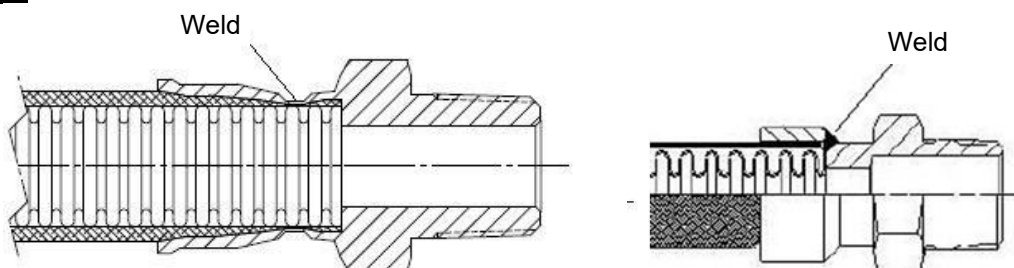
Configuration Example:

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. The Swagelok FM series hose assemblies are manufactured at Hose Master LLC and at the Swagelok Company locations in Solon, Ohio.

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.