Régie du bâtiment Québec

Direction générale de l'inspection

Montréal, 19 juillet 2023.

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

Fabricant : SWAGELOK COMPANY
29500 SOLON ROAD
SOLON OHIO
U.S.A. 44139

Numéro de dossier : 945666
Numéro(s) de dessin(s) : Scope of registration June 15,2022

Objet : Enregistrement des plans et devis – Confirmation de l'enregistrement

Bonjour,

Nous vous informons que votre demande d'enregistrement de plans et devis a été traitée et que cette conception a été enregistrée sous le numéro d'enregistrement canadien (NEC\CRN) suivant : **0D21780.56.**

Nous portons votre attention sur certaines exigences réglementaires concernant les installations sous pression, ainsi que des codes et normes qui y sont associés :

- Le fabricant doit maintenir un programme de contrôle de la qualité valide pour fabriquer un équipement selon ce NEC;
- Ce numéro d'enregistrement demeure valide tant et aussi longtemps que les paramètres de conception demeurent inchangés. Dans le cas d'accessoires, l'enregistrement est valide pour une durée de 10 ans à partir de la date d'enregistrement. Les documents de conception doivent alors être resoumis pour validation;
- Le fabricant doit nous transmettre une copie de la *Déclaration de conformité du constructeur (Manufacturer's Data Report)* pour chaque appareil ou chaudière fabriqué selon ce NEC dans les 30 jours suivant la signature de cette déclaration;
- Le numéro de dessin enregistré et le numéro de révision doivent être indiqués sur la déclaration de conformité pour les équipements fabriqués selon ce NEC.

Le présent avis d'approbation ne dégage pas le fabricant de ses responsabilités quant à la conception ou à la construction des équipements ou d'accessoires fabriqués selon un NEC.

Salutations distinguées,

Bureau d'expertise et d'homologation en équipements sous pression

Montréal
545, boul. Crémazie Est, 7ième étage
Montréal (Québec) H2M 2V2
Téléphone : 514 873-6459
Sans frais : 1 866 262-2084
www.rbq.gouv.qc.ca

Régie du bâtiment Québec

Direction générale de l'inspection

Montréal, le 19 juillet 2023.

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

Manufacturer : SWAGELOK COMPANY
29500 SOLON ROAD
SOLON OHIO
U.S.A. 44139

OUR REFERENCE : 945666
Design number : Scope of registration June 15,2022

Subject: Design registration confirmation

Hi,

We wish to inform you that your design registration application has been evaluated and that it was registered under the following Canadian Registration Number (CRN): **0D21780.56.**

The following is a reminder of your obligations regarding certain requirements of the regulation respecting pressure vessels, and the referenced codes and standards:

- The manufacturer must maintain a valid quality control program to manufacture equipment according to the CRN.
- The CRN remains valid as long as there are no changes to the design calculations that might affect the pressure boundary. The design registration of fittings expires 10 years after acceptance. It must, therefore, be resubmitted for validation.
- The manufacturer shall submit a copy of the *Manufacturer's Data Report* to us for each equipment manufactured according to this CRN within 30 days following the signing of this report.
- The drawing number and the revision number registered under this CRN must be indicated on the *Manufacturer's Data Report* for equipment manufactured according to the CRN.

This notice of approval does not relieve the manufacturer of their responsibilities with respect to the design or fabrication of equipment manufactured according to this CRN.

Yours sincerely,

Bureau d'expertise et d'homologation en équipements sous pression

Montréal
545, boul. Crémazie Est, 7ième étage
Montréal (Québec) H2M 2V2
Téléphone : 514 873-6459
Sans frais : 1 866 262-2084
www.rbq.gouv.qc.ca

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. Hoses 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 31 **day of** JANUARY **AD 20**23.

JEFFREY C. TRUMBULL
Notary Public
State of Ohio
Recorded in Lake County
Certificate # 2020-RE-813693
My Commission Expires
April 15, 2025

Commissioner for Oaths:

JEFFREY C TRUMBULL
(Printed name)

(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 _____.

CRN: _____

Registered by: _____

Dated: _____

Enregistré au Québec
0D21780.56
Régie du bâtiment Québec
07/18/2023
Revue par la RBQ
RÉVISION

NOTE: This registration expires on: _____

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

PV 09553 (04/17)

1. SCOPE

The Swagelok FL series hose assembly product complies with the requirements of ASME B31.3-2016 as an unlisted component. Compliance is supported by burst testing witnessed by an ASME Authorized Inspection Agency.

2. DESCRIPTION OF ADDENDUM

This addendum to CRN 0D21780.5 is to fix a typographical error with the hose core EN standard and to also add an extra source for the bulk hose material in which ASTM standards are specified for the hose core and braid instead of the EN standards.

Regarding the typographical error, the hose core material specification is currently noted as 316L per EN 10088-2, number 1.4404. The material standard that should have been referenced is 316L per EN 10028-7, number 1.4404. The analysis section remains unchanged from this correction since the chemical and mechanical properties are the same between the two EN standards for number 1.4404.

Regarding the extra source for the bulk hose material, the materials of construction for pressure-containing components of the Swagelok FL series hose assemblies are listed in the updated Table 2 below. The updated table includes the EN standards and the newly added ASTM standards, which are comparable to the EN standards. Notation numbers are designated by parentheses ().

Since the allowable stresses between the EN standards and the ASTM standards are the same (reference notations 5 with 7 and notations 6 with 8), the analysis and the allowable pressures at maximum temperature remain unchanged from the original submission.

UPDATED Table 2 – Materials

Component (see Figure 1)	Material Type, Form	UNS / Material Standard	ASME B31.3 Code listing	Tensile Strength	
				Max Allowable Stress (psi) @ -325 to 100°F	Max Allowable Stress (psi) @ 850°F
End Connections with Integral Weld Collar	316 SS Strain-Hardened Bar	S31600 ASTM A479	Not Listed (1)	31,667 (1)(2)	28,567 (1)(2)
	316L SS Strain-Hardened Bar	S31603 ASTM A479	Not Listed (1)	31,667 (1)(3)	28,567 (1)(3)
	316L VAR SS Strain-Hardened Bar	S31603	Not Listed (1)	31,667 (1)(4)	28,567 (1)(4)
Core	316L SS, Strip	1.4404 / EN 10028-7	Not Listed (1)	16,667 (1)(5)	9,400 (1)(5)
Core	316L SS, Strip	S31603 ASTM A240	Listed	16,667 (7)	9,400 (7)
Braid	321 SS, Wire	1.4541 / EN 10088-3	Not Listed (1)	20,000 (1)(6)	12,400 (1)(6)
Braid	321 SS, Wire	S32100 ASTM A580	Not Listed (1)	20,000 (1)(8)	12,400 (1)(8)

Notes:

(1) The material is an unlisted material in ASME B31.3. The allowable stresses shown in the above table are the most conservative values based on Code requirements in ASME B31.3-2016 paragraph 323.1.2 "Unlisted Materials," which allows unlisted materials be used provided they "conform to a published specification covering chemistry, physical and mechanical properties, method and process of manufacture, heat treatment, and quality control…" Paragraph 302.3.2(d) "Basis for design stresses – other materials": the lesser of one-third of the minimum tensile strength or two-thirds of the specified minimum yield strength.

(2) 316 SS strain-hardened bar (ASTM A479) is an unlisted material in ASME B31.3. A 316 SS Grade B8M2 bolt material was selected from the ASME B&PVC, Section II, Part D, Table U as being the most similar: the minimum tensile strength of 95 ksi in this Code matches the Swagelok's proprietary material specification. The maximum allowable tensile stresses at (-20 to 100°F) and at maximum rated temperature (850°F, 85.7 ksi) were calculated based on the stress vs. temperature values listed in Table U for this selected material, using the calculation cited in above Note (1) a.

S31600/ASTM A479 material that Swagelok uses has a carbon content < 0.1% and is in the cold-drawn condition after solution annealing. As such, according to ASME B31.3 Table 323.2.2, no additional impact testing is necessary at temperatures above the value in Table A-1. This low temperature rating (MDMT) of this product is -325°F. This value is the Minimum Temperature listed in Table A-1 for this material (-325°F).

(3) The 316L SS strain-hardened bar material is an unlisted material in ASME B31.3. The material is controlled per Swagelok's proprietary material specification and possesses minimum room temperature tensile and yield strengths equivalent to the 316 SS, strain-hardened bar in the above Note (2). The values used for the 316 SS, strain-hardened bar were used for the 316L SS strain-hardened bar.

(4) The 316L SS VAR strain-hardened bar material is an unlisted material in ASME B31.3. The material is controlled per Swagelok's proprietary material specification and possesses minimum room temperature tensile and yield strengths equivalent to the 316 SS, strain-hardened bar in the above Note (2). The values used for the 316 SS, strain-hardened bar were used for the 316L SS VAR strain-hardened bar.

(5) The 316L SS strip material per EN 10028-7 grade 1.4404 is an unlisted material in ASME B31.3. The EN 10028-7 grade 1.4404 material has a similar chemistry composition to ASTM A240's S31603 316L material, but there are some chemistry differences which push it out of specification regarding Silicone and Chromium. The 316L physical properties fall within ASTM A240 and A479 limits. Even though these differences exist, these are the best matches for this material within the ASME B31.3 and ASME BPVC. Furthermore, compared to the strength at elevated temperatures listed within EN 10028-7, the ASME codes are more conservative. Based on this, an ASME SA-240 specification, plate product form, 316L SS, S31603 material was selected for the stresses within the ASME B&PVC, Section II, Part D (min. tensile of 70ksi from Table U and min. yield of 25ksi from Table Y-1, both at room temperature)..

(6) The 321 SS wire material per EN 10088-3 grade 1.4541 is an unlisted material in ASME B31.3. The chemistry for the material is similar to ASTM A320 321 SS, S32100. The condition of the wire is annealed, and the ASTM A320 321 SS, S32100 material condition is solution treated. The room temperature mechanical properties of ASTM A320 321 SS, S32100 based from ASME BPVC are more conservative than the mechanical properties specified through Swagelok's proprietary material specification for this material. Based on this, an ASME SA-320 specification, B8T/B8TA grades, 321 SS, S32100 material was selected with class 1/1A as the more conservative class for the stresses within the ASME B&PVC, Section II, Part D (min. tensile of 75ksi from Table U and min. yield of 30ksi from Table Y-1, both at room temperature).

(7) The core is made from strip stock using ASTM A240 316L SS, S31603 material, which is listed in ASME B31.3. The allowable stresses are based on ASME B31.3, Table A-1, for 316L ASTM A240 S31603 material for plates and sheets. No assembly-level witness testing occurred for this core material since, per note (5), the ASTM A240 316L SS, S31603 material is comparable to the EN 10028-7 grade, which was tested.

(8) The wire is annealed and meets ASTM A580 321 SS, S32100 material, which is an unlisted material in ASME B31.3. The ASTM A320 321 SS, S32100 material has similar chemistry and mechanical properties to the ASTM A580, B8T/B8TA grades, 321 SS, S32100 material, which is solution treated. Based on this, an ASME SA-320 specification, B8T/B8TA grades, 321 SS, S32100 material was selected with class 1/1A as the more conservative class for the stresses within the ASME B&PVC, Section II, Part D (min. tensile of 75ksi from Table U and min. yield of 30ksi from Table Y-1, both at room temperature). No assembly-level witness testing occurred with this wire material since, per this note and note (6), ASTM A580 321 SS, S32100 is similar to ASTM A320 321 SS, S32100, which is comparable to EN 10088-3 grade 1.4541, which was tested.

Product Engineer: Ben Chan
Date: April 18, 2023

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