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

Date: November 16, 2016
Account #: 35231
Journal #: 66801
Our File #: 5607880

Attn: TANYA FRANCIS

Re: Application for Design Registration

The design, as detailed in your, TSSA SR# 1971754, for a Fitting is accepted for registration as follows:

Registered To: SWAGELOK COMPANY **CRN:** 0C18853.51

Drawing #: Attachment C Scope Sheet

Conditions Of Registration:

Registrationof SK Series Ball Valves as per scope of registration sheet (1 pg + 2 pg mfg locs).

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 October 17, 2026. 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.

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

SHARON PETERS

boiler.designregistration@safetyauthority.ca
Design Administration

cc:

Attachment C. Scope of Registration for Swagelok SK Series Ball Valves (Category C)

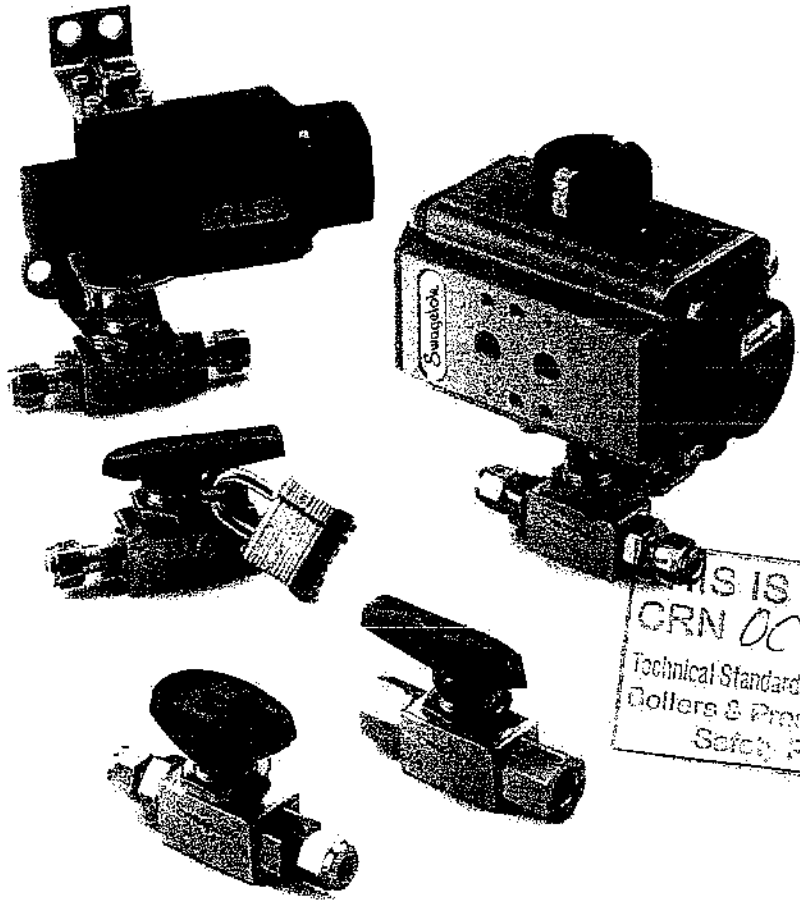
Product Scope

This document represents the scope of Swagelok SK Series Ball Valves covered by this submission for CRN approval. The Swagelok SK Series Ball Valves were designed and evaluated in accordance with ASME B31.3 for unlisted components.

Summary Table

Product Description or Series	Main Pressure Containing Boundary Part Name	Material	Port Connections and Sizes	Maximum Allowable Working Pressure (psig) at -20°F to 250°F	Maximum Allowable Working Pressure (psig) at 302°F	Design Code Used for Pressure Containing Boundary
4SK	Body	316 SS ASTM A479	Swagelok Tube Fitting: ¼ in., 3/8 in., 6 mm, 8 mm Female NPT: ¼ in. Female ISO: ¼ in. Male NPT: ¼ in. Male VCO Fitting: ¼ in. Female SAE/MS: ¼ in.	6000	3000	ASME B31.3 (Unlisted Components)

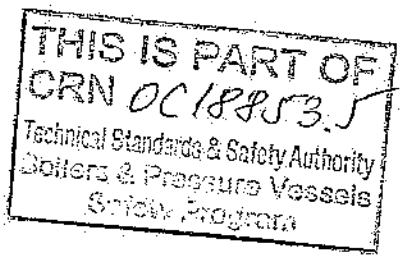
Product Illustration



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 Company A.G. (European Technology Center) St. GallerstraBe 84 Lachen, Switzerland 8853 Switzerland
Swagelok Limited Tromode IM4 4RA Isle of Man	



Relevant Updates to the 2007 SK Series Valves CRN Application

Attachment C. Scope of Registration for Swagelok SK Series Ball Valves (Category C)

1.) A minimum temperature rating was added to scope.

2.) The product pressure rating is listed as 3000 psi at a maximum temperature of 302°F.
   a. The 2007 Attachment C scope document did not provide the maximum pressure at the maximum temperature (302°F).
   b. The 2007 Pressure Code Compliance summary listed a 6000 psi pressure rating at 302°F. This was consistent with the stress calculations and the burst tests.

The Pressure Code Compliance Summary

1.) 316 Stainless Steel annealed bar material is now a listed material in ASME B31.3 (Table A-1) and it is not de-rated at 300°F.
   a. In 2007, 316 Stainless Steel annealed bar was an unlisted material for ASME B31.3. Pressure calculations were done based on material stresses from ASME B31.1. Per B31.1, 316 Stainless Steel annealed bar is de-rated at 302°F (from 20 ksi to 15.6 ksi).
   b. In sum: The 2007 pressure calculations based on ASME B31.1 are more conservative than if calculated based on current values in ASME B31.3.

Product Test Report PTR-1330

1.) A temperature derating factor would not be applied for 316 Stainless Steel annealed bar material. Therefore, the actual burst pressures attained indicate an even greater product safety factor.