Powertech
TEST REPORT

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

Client:
Swagelok Company
29500 Solon Road
Solon, Ohio, 44139, USA

Manufacturer:
Swagelok Company
29500 Solon Road
Solon, Ohio, 44139, USA

Part Type: Check Valve

Part Numbers and Serial Numbers:

Part #	Description
SS-CVT6FK6-H2 (PLI: 3794)	3/8" CV Non-Metallic Material Compound A
SS-CVT6FK6-H2 (PLI: 3795)	3/8" CV Non-Metallic Material Compound B
SS-CVT9FK9-H2 (PLI: 3796)	9/16" CV Non-Metallic Material Compound A
SS-CVT9FK9-H2 (PLI: 3797)	9/16" CV Non-Metallic Material Compound B
SS-CVT12FK12-H2 (PLI: 3794)	3/4" CV Non-Metallic Material Compound A
SS-CVT12FK12-H2 (PLI: 3799)	3/4" CV Non-Metallic Material Compound B

Receipt Date: 2024-10-24
Test Dates: 2025-01-10 to 2025-01-15
Test Medium: Hydrogen gas, tap water

TEST CONDUCTED

The following test was conducted in accordance with:

- ISO 19880-3 – 2018, Gaseous hydrogen — Fuelling stations — Part 3: Valves, Clause 6

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

TEST PROCEDURE

Non-metallic materials test (per ISO 19880-3:2018, Clause 5.10)

The samples were conditioned for at least 1 hour at an ambient temperature of 20±5°C. The samples were then pressurized to 105 MPa, held for at least 70 hours, and then rapidly depressurized to atmospheric pressure. The test setup is shown in Figure 1.

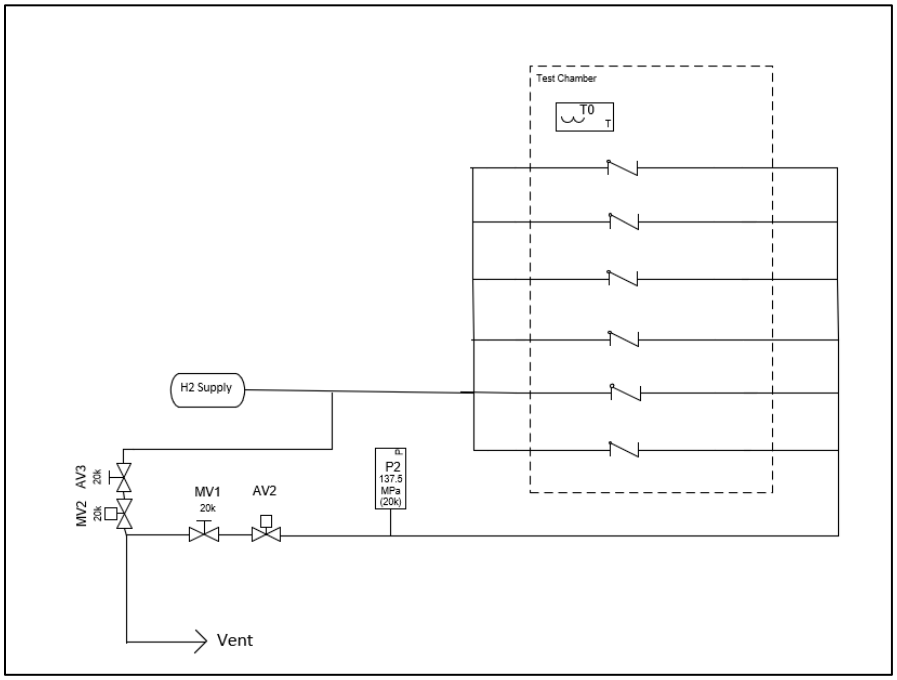

Figure 1. Non-metallic and leakage test schematic

The samples were then removed and examined for deformation & breakage and subjected to external and internal leakage tests per ISO 19880-3:2018 clauses 5.4.2 and 6.4.

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

External and Internal Leakage (per ISO 19880-3:2018, Clause 5.4.2 and 6.4)

The samples were subjected to an external and internal leakage test using hydrogen gas as shown in Figure 1. Samples were conditioned at 31.5 MPa and the test temperature for 1 hour before testing.

The test temperatures and pressure conditions for the external leakage test were as follows:

1. 85°C (+3/-0°C) @ 105 MPa
2. -40°C (+0/-3°C) @ 105 MPa

The test temperatures and pressure conditions for the internal leakage test were as follows:

1. 85°C (+3/-0°C) @ 10.5 MPa
2. 85°C (+3/-0°C) @ 105 MPa
3. -40°C (+0/-3°C) @ 10.5 MPa
4. -40°C (+0/-3°C) @ 105 MPa

External leakage tests were performed using SNOOP® leak detection agent and a handheld detector, whereas internal leakage tests were performed via the bubble leak test method. The leak rate shall not exceed 10 Ncm^3/h.

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

TEST EQUIPMENT AND INSTRUMENTATION

Details of the instrumentation used for the non-metallic material and leakage tests are outlined below in Table 1.

Table 1. Non-metallic material and leakage tests instrumentation summary

Parameter	PLI Asset No.	Instrument Type	Make and Model	Range
P2	01031	Pressure Transducer	Stellar Technology, GT1800-20000G-317	0 to 137.9 MPa
T0	34389	Thermocouple	Omega, TMQ316SS-125U-6	-200°C to 200°C

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

TEST RESULTS

Non-metallic materials test (per ISO 19880-3:2018, Clause 5.10)
Temperature: 20±5°C
Test Date: 2025-01-10 to 2025-01-13
Test Location: Powertech Labs, Surrey, BC
Serial Numbers: 3794 to 3799

The samples were set up in accordance with Figure 2 below.

Figure 2. Non-metallic material test setup

The samples were conditioned at the test temperature for 1 hour. The samples were then pressurized to the component pressure rating and held for 70 hours.

The samples were then rapidly depressurized and then subjected to a leak test.

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

External and Internal Leakage (per ISO 19880-3:2018, Clause 5.4.2 and 6.4)
Test Date: 2025-01-14 to 2025-01-15
Test Location: Powertech Labs, Surrey, BC
Serial Numbers: 3794 to 3799

The samples were then subjected to an external and internal leakage test at -40°C and 85°C. The samples showed no signs of leakage using SNOOP® leak detection agent, a handheld detector, and the bubble leak test method. The results are seen in Table 2.

Table 2. Leakage test results for sample # 3794 to 3799

Sample #	Previous test	External Leakage		Internal Leakage			
		85°C	-40°C	85°C		-40°C	
		105 MPa	105 MPa	10.5 MPa	105 MPa	10.5 MPa	105 MPa
3794 & 3795	Non-metallic material	No leak	No leak	No leak	No leak	No leak	No leak
3796 & 3797	Non-metallic material	No leak	No leak	No leak	No leak	No leak	No leak
3798 & 3799	Non-metallic material	No leak	No leak	No leak	No leak	No leak	No leak

12388 88th Ave.,
Surrey, B.C.,
Canada V3W 7R7
(604) 590-7500
www.powertechlabs.com

Swagelok Company – Check Valve – ISO 19880-3 Section 6 – Non-Metallic Material

Prepared for: Swagelok Company
PO Reference: 4506406901

Project Number: PL-05589
Test Report Number: TR-05589-08-R0

SUMMARY

All tested samples met the criteria of ISO 19880-3:2018, section 6.10 Non-metallic material test, and thus are considered to have passed the test.

Tested By:	Approved By:
Alan Yen, EIT Project Engineer Hydrogen Industry Technology & Testing	Marcus Treacy, P.Eng Senior Engineer Hydrogen Industry Technology & Testing EGBC Permit to Practice: 1002531
Date signed: 2025-05-16	Date signed: 2025-05-16

Revision	Description of changes	Date
0	Initial issue	2025-05-16

This document is subject to the following terms:

- This document and its results pertains only to the items which were specifically tested.
- This document shall not be reproduced except in full, except with written consent from Powertech Labs Inc.

Andre Fregeau

Digitally signed by: Andre Fregeau
DN: CN = Andre Fregeau email = andre.fregeau@tuvsud.com C = US O = TUV SUD
Date: 2025.05.16 15:50:37 -08'00'