Transportation of Dangerous Goods Directorate
L'Esplanade Laurier
300 Laurier Avenue West
Ottawa, Ontario
K1A 0N5

Direction générale du transport des marchandises dangereuses
L'Esplanade Laurier
300, avenue Laurier Ouest
Ottawa (Ontario)
K1A 0N5

Equivalency Certificate
(Approval issued by the competent authority of Canada)

Certificate No.: SU 4781 (Ren. 9)

Template Number: N/A

Certificate Holder: Welker, Inc.

Mode of Transport: Road, Rail, Air, Marine

Effective Date: June 16, 2021

Expiry Date: September 30, 2026

LEGEND

For the purposes of this equivalency certificate, documents referred to by an abbreviation have the following meaning:

TDG Act*: *Transportation of Dangerous Goods Act, 1992

TDG Regulations*: *Transportation of Dangerous Goods Regulations

CSA B339-18: CSA Standard B339-18, "*Cylinders, spheres, and tubes for the transportation of dangerous goods*", June 2018, published by the Canadian Standards Association (CSA)

CSA B340-18: CSA Standard B340-18, *"Selection and use of cylinders, spheres, tubes, and other containers for the transportation of dangerous goods, Class 2",* June 2018, published by the Canadian Standards Association (CSA)

NOTES

Note 1: Subsection 31(4) of the *TDG Act* stipulates that any non-compliance with the conditions of this equivalency certificate will result in the provisions of the *TDG Act* and *TDG Regulations* to apply as though this equivalency certificate did not exist.

Note 2: This equivalency certificate provides no regulatory relief other than specifically stated herein. Therefore, all other requirements of the *TDG Act* and the *TDG Regulations* apply.

PURPOSE

This equivalency certificate authorizes the manufacture and use of constant pressure sample cylinders designed for use in the oil and gas industry. The cylinders are piston-equipped receptacles constructed from seamless stainless steel tubing. The applicant demonstrated that when manufactured under the conditions stipulated herein, the cylinders could be used with equivalent safety.

CONDITIONS

This equivalency certificate authorizes **Welker, Inc.** to sell, offer for sale, distribute, or deliver in Canada and authorizes any person to handle, offer for transport, transport, or import into Canada, by road or railway vehicle, by cargo aircraft or by vessel, cylinders in a manner that does not comply with:

- sections 5.1.1 and 5.2 of the *TDG Regulations*,
- subparagraphs 5.10(1)(a)(ii), 5.10(1)(b)(iii), 5.10(1)(c)(ii), and 5.10(1)(d)(iii) of the *TDG Regulations*, and
- subsection 5.10(2) of the *TDG Regulations*,

if the following conditions are met:

Selection and Use

(a) Subject to conditions (b) and (c) of this equivalency certificate, the requirements applicable to specification TC-3EM cylinders in *CSA B340-18* are complied with;

(b) The cylinders contain only the following dangerous goods:

UN Number	Shipping Name and Description
UN1002	AIR, COMPRESSED, with not more than23.5 per cent oxygen, by volume
UN1010	BUTADIENES, STABILIZED; or BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED, containing more than 40% butadienes
UN1011	BUTANE
UN1013	CARBON DIOXIDE
UN1035	ETHANE
UN1046	HELIUM, COMPRESSED
UN1066	NITROGEN, COMPRESSED
UN1075	LIQUEFIED PETROLEUM GASES; or PETROLEUM GASES, LIQUEFIED
UN1203	GASOLINE
UN1265	PENTANES, liquid
UN1267	PETROLEUM CRUDE OIL
UN1268	PETROLEUM DISTILLATES, N.O.S.; or PETROLEUM PRODUCTS, N.O.S.
UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.
UN1964	HYDROCARBON GAS MIXTURE, COMPRESSED. N.O.S.
UN1965	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.
UN1971	METHANE, COMPRESSED; or NATURAL GAS, COMPRESSED WITH HIGH METHANE CONTENT
UN1978	PROPANE
UN3161	LIQUEFIED GAS, FLAMMABLE, N.O.S.
UN3295	HYDROCARBONS, LIQUID, N.O.S.

(c) Despite clause 4.3.7 of *CSA B340-18*, the pressure-relief device on the product side of the cylinder may be in direct contact with the liquid phase;

(d) Subject to conditions (e) to (t) of this equivalency certificate, each cylinder is in compliance with the requirements applicable to Specification TC-3EM set out in *CSA B339-18*;

(e) Each cylinder is manufactured by Welker, Inc. at 13839 West Bellfort Street, Sugar Land, Texas U.S.A., in accordance with the procedures, calculations, photographs, sketches, and drawings specified for Model CP-2-150cc, CP-2-300cc, CP-2-500cc, CP-2-800cc, or CP-2-1000cc Constant Pressure Sample Cylinders filed in July 1995 by the Welker Engineering Company, with the Executive Director, Regulatory Frameworks and International Engagement, Regulatory Affairs Branch, Transportation of Dangerous Goods Directorate, Transport Canada;

(f) The cylinder is a piston-equipped receptacle constructed from seamless stainless steel tubing, with flanged flat head end caps restrained by tie rods. The cylinder is divided into two chambers (pre-charge and product) by means of a floating piston within the cylinder;

(g) The cylinder has an outside diameter of 51 mm, a service gauge pressure of 12.4 MPa, and a length of 168 mm for Model CP-2-150cc, 270 mm for Model CP-2-300cc, 381 mm for Model CP-2-500cc, 610 mm for Model CP-2-800cc, or 677 mm for Model CP-2-1000cc;

(h) All cylinder components are manufactured from Type 316 stainless steel specified in ASTM Standard A213/A213M-18, "*Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes*, ASTM Standard A240/A240M-17, "*Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications"*, or ASTM Standard A479/A479M-18, "*Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels*". The stainless steel is of uniform quality conforming to the chemical composition specified for Grade H Stainless Steel in Tables 7 and 9 of *CSA B339-18*;

(i) The maximum water capacity does not exceed 150 cm^3 for Model CP-2-150cc cylinders, 300 cm^3 for Model CP-2-300cc cylinders, 500 cm^3 for Model CP-2-500cc cylinders, 800 cm^3 for Model CP-2-800cc cylinders, and 1000 cm^3 for Model CP-2-1000cc cylinders;

(j) The cylinder has a minimum sidewall thickness of 2.1 mm;

(k) The openings at each end have flanged flat head end caps restrained by 6 tie rods. The tie rods are secured at each end by nuts or are threaded into one end cap and secured by nuts at the other end. Each tie rod has an outer diameter of 9.5 mm. The threaded ends of the tie rods have 3/8”-16 2A threads with a minor diameter of 7.5 mm, and the length of engagement is no less than 7.9 mm;

(l) Each flanged flat head end cap has a thickness of 22.2 mm;

(m) The tube body of the cylinder is designed to burst at a gauge pressure of at least 49.6 MPa;

(n) In addition to the pressure-relief devices required by Clause 4.16 of *CSA B339-18*, the design of the cylinder provides over-pressure protection by allowing for expansion of the cylinder over the o-rings thereby losing seal integrity at gauge pressures greater than 42.0 MPa;

(o) Each flanged flat head end cap is equipped with a pressure-relief device. The pressure-relief device is either a rupture disk designed to burst at a gauge pressure of 12.4 MPa ± 0.7 MPa or a pressure relief valve with a set pressure of 12.4 MPa ± 0.7 MPa;

(p) Both chambers of each cylinder are tested pneumatically to a gauge pressure of at least 3446 kPa. Cylinders that leak are rejected;

(q) The hydrostatic tests are as follows:

(i) one cylinder, complete but without the piston, from each lot of 500 cylinders or less is hydrostatically tested to failure. The pressure at which the cylinder fails is recorded. The cylinder bursts at a gauge pressure greater than 34.5 MPa without fragmenting or otherwise showing a lack of ductility. The rate of pressurization does not exceed 1.4 MPa per second. Failure of the test cylinder is cause for the rejection of the entire lot, and

(ii) each cylinder, complete but without the piston, is inspected under a test gauge pressure of 24.8 MPa and shows no defect. Cylinders that fail the hydrostatic test are rejected;

(r) The tube body of one cylinder selected from each lot that has passed the tests prescribed in condition (q) of this certificate is flattened to at least 6 times its wall thickness without cracking. The flattening test procedure is in compliance with Clause 4.11 of *CSA B339-18*. Failure of the test cylinder is cause for the rejection of the entire lot;

(s) Each cylinder is visually re-inspected at least once a year for deterioration of seals, scratches, dents, and gouges, in accordance with the manufacturer's guidelines for maintenance, inspection, and cleaning. At this time, the end caps, tie rods, and indicating rods are also thoroughly cleaned with an appropriate solvent recommended by the manufacturer. Cylinders with scratches or pitting that allow for migration of inert gas from one side of the piston to the other are returned to the manufacturer for re-hone and inspection. Cylinders with any damage to the outside shell that may compromise cylinder sidewall thickness as specified in the design are returned to the manufacturer for inspection and dimensional verification;

(t) Despite the marks specified in Clause 8.8(a) of *CSA B339-18*, the Transport Canada mark, the specification designation, and the service pressure (expressed in bar) marked on each cylinder is:

"**TC-SU 4781 - 124**";

(u) The certificate holder, cylinder owner or user reports any incident involving loss of contents or failure of the cylinders to the Executive Director, Regulatory Frameworks and International Engagement, Regulatory Affairs Branch, Transportation of Dangerous Goods Directorate, Transport Canada.

This equivalency certificate serves as the registration of **Welker, Inc.** pursuant to clause 25.2 of *CSA B339-18*, to manufacture cylinders of the designs specified herein. **Welker, Inc.**'s registered mark pursuant to *CSA B339-18*, is

WELKER ENG. CO., or

M5701.

Signature of Issuing Authority

David Lamarche, P.Eng., ing.

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Chief, Approvals and Special Regulatory Projects

Contact Person:	Tracy Peebles Welker, Inc. 13839 West Bellfort Street Sugar Land TX 77498-1671 USA
Telephone:	281-491-2331 ext. 13401
E-mail:	certifications@welker.com

Contact Person:	Mallory Wooldridge Welker, Inc. 13839 West Bellfort Street Sugar Land TX 77498-1671 USA
Telephone:	281-491-2331 ext. 11012
E-mail:	mallory.wooldridge@welker.com

Legend for Certificate Number

SH - Road, SR - Rail, SA - Air, SM - Marine
SU - More than one Mode of Transport
Ren - Renewal

For more information:

Approvals and Special Regulatory Projects
Transportation of Dangerous Goods,
Transport Canada
300 Laurier Avenue West
Ottawa, Ontario K1A 0N5
E-mail: tdgpermits-permistmd@tc.gc.ca

TDG regional offices:

Atlantic
TDG-TMDAtlantic@tc.gc.ca

Quebec
TMD-TDG.Quebec@tc.gc.ca

Ontario
TDG-TMDOntario@tc.gc.ca

Prairie & Northern
TDG-TMDPNR@tc.gc.ca

Pacific
TDGPacific-TMDPacifique@tc.gc.ca