



Transport
Canada
Safety and Security

Transport Dangerous
Goods Directorate
330 Sparks Street
Ottawa, Ontario K1A 0N5

Transports
Canada
Sécurité et sûreté

Direction générale du
transport des marchandises dangereuses
330, rue Sparks
Ottawa (Ontario) K1A 0N5

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FOR INFORMATION ONLY**

Equivalency Certificate

Certificate No.: SU 4422 (Ren. 5)

Certificate Holder: Structural Composites Industries
a Worthington Cylinders Company

Mode of Transport: Road, Rail, Air, Marine

Issue Date: NOV 10 2009


Expiry Date: April 30, 2013

CONDITIONS

This Equivalency certificate authorises Structural Composites Industries, a Worthington Cylinders Company to handle, offer for transport or transport in Canada and authorises any person to handle, offer for transport, transport, or import into Canada, by road or railway vehicle, by aircraft or by ship, cylinders in a manner that does not comply with sections 5.1 and 5.2, subparagraphs 5.10(1)(a)(i) and 5.10(1)(b)(i), paragraph 5.10(1)(c), subparagraph 5.10(1)(d)(i), and subsection 5.10(2) of the *Transportation of Dangerous Goods Regulations*, if:

Selection and Use

(a) subject to paragraphs (b) to (e), the requirements with respect to specification TC-3FCM cylinders in National Standard of Canada CAN/CSA B340-02, entitled "Selection and Use of Cylinders, Spheres, Tubes, and Other Containers for the Transportation of Dangerous Goods, Class 2", dated October 2002, as amended January 2004 and February 2005, cited in the rest of this permit as CAN/CSA B340-02, are complied with;


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(b) each cylinder contains one of the following dangerous goods:

<u>Dangerous Goods</u>	<u>PIN</u>
AIR, COMPRESSED, with not more than 23.5 percent oxygen, by volume	UN1002
NITROGEN, COMPRESSED	UN1066
OXYGEN, COMPRESSED	UN1072
COMPRESSED GAS, N.O.S. (mixture of oxygen and air or nitrogen)	UN1956

(c) each cylinder containing oxygen complies with clause 4.6.1.2. of CAN/CSA B340-02;

(d) each cylinder is packaged in accordance with clause 4.9 of CAN/CSA B340-02;

(e) no more than 15 years has elapsed since the initial test date for each cylinder;

Manufacture

(f) the cylinders were manufactured in accordance with the specific procedures and with drawing No. 7012-001, 7013-001, 7014-001, 7015-001E, 7012-001-HEL, 7013-001-HEL or 7014-001-HEL filed by EFI, a former unit of Structural Composites Industries, Taylor-Wharton Gas Equipment Division, Harsco Corporation with the Transport Dangerous Goods Directorate;

(g) subject to paragraphs (h) to (j), the cylinders are in compliance with the applicable requirements for specification TC-3FCM set out in National Standard of Canada CAN/CSA B339-96, entitled "*Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*", dated July 1996 as amended in December 1999, cited in the rest of the certificate as CAN/CSA B339-96;

(h) the filament material is composed of:

(i) high modulus para-aramid (Kevlar 49) in accordance with the Society of Automotive Engineers, Inc. aerospace material specification AMS 3901, *Organic Fiber (Para-Aramid), Yarn and Roving, High Modulus*, dated September 1998, including the applicable supplementary detail specifications thereto, and

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- (ii) commercial Type-S fiberglass in accordance with the applicable requirements of clause 9.2.2 of CAN/CSA B339-96;
- (i) the para-aramid filament is tested for strand strength in accordance with the American Society for Testing and Materials standard ASTM D2343-95, *Standard Test Method for Tensile Properties of Glass Fiber Strands, Yarns and Rovings Used in Reinforced Plastics*, published in 1995, and the filament strand strength determined in accordance with the aforementioned standard is at least 3100 MPa;
- (j) the Transport Canada mark, the specification designation and the service pressure marked on each cylinder is:
- "TC-SU 4422-"
- followed by the service pressure expressed in bar; and
- (k) the certificate holder reports once per calendar year, a summary of the cylinder performance experience to the Director, Regulatory Affairs Branch, Transport Dangerous Goods Directorate, Transport Canada.

Note:

The issuance of this Equivalency Certificate in no way reduces the certificate holder's responsibility to comply with any other requirements of the *Transportation of Dangerous Goods Regulations* not specifically addressed in this Certificate.

Signature of Issuing Authority



David Lamarche, P. Eng., ing.

Chief

Permits and Approvals Division

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(The following is for information purposes only and is not part of the certificate)

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a Worthington Cylinders Company
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Explanatory Note

The certificate holder has demonstrated that the substitution of Kevlar 49 for Type-S fiberglass filament would result in a cylinder which could be used with equivalent safety to that of a TC-3FCM specification cylinder. The cylinders were manufactured by EFI, a former unit of Structural Composites Industries, in Fremont, CA. The present certificate authorizes the continued use of the cylinders under the *Transportation of Dangerous Goods Regulations*, as amended.

Legend for Certificate Number

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

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NOTE

Under Canadian Law, a foreign manufacturer of non-specification cylinders cannot be charged with an offence under the *Transportation of Dangerous Goods Act, 1992* for failure to comply with the conditions of an Equivalency Certificate. However, certain remedies under the Act are available to Transport Canada in this eventuality.

These include:

1. detention of dangerous goods and consequently the cylinder containing them (subsection 17(1));
2. detention of the cylinders whether full or empty (subsection 17(1));
3. directions not to import the cylinders or to return them to origin (subsection 17(3));
4. inspectors' directions (section 19);
5. directions to importers of the cylinders to issue notices of defective construction or recall (subsection 9(2)); and
6. revocation of the Equivalency Certificate, thereby making any use of the cylinders an offence (subsection 31(6)).

If none of the foregoing are adequate, Protective Directions may be issued to prohibit or to control the use of the cylinders (section 32).