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Transport
Dangerous Goods
Directorate

Direction générale du
transport des marchandises
dangereuses

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Ottawa, Ontario
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344, rue Slater
Ottawa (Ontario)
K1A 0N5

Your file *Votre référence*

Our file *Notre référence*

ASD4067-26-2-15

September 17, 1990

Mr. Ken Oldfield
Chesterfield Cylinders Limited
Chesterfield, Derbyshire
S40 2EA
England

Dear Sir:

Please refer to recent requests and enquiries with this Directorate regarding the renewal of Special Permits 1897 and 2269 and approval for the manufacturing of compressed gas cylinders of specification CTC 3AA.

After careful review of our files and related correspondence, and in accordance with the new procedures in place at Transport Canada, a Certificate of Registration has been issued to your company. This certificate covers all previously authorized designs and is deemed to supersede any previous letters, Orders or Special Permits issued by Transport Canada or the Canadian Transport Commission.

Please confirm your understanding and concurrence with the terms of the certificate by return letter.

The present documents do not cover the high strength cylinders described in your recent application. This application will be dealt with separately and correspondence on this matter will be sent to you shortly. If we grant approval for these cylinders, it will be in the form of an Appendix C to the attached Certificate of Registration.

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Should you have any further questions on this matter, please do not hesitate to write or call the undersigned at (613) 998-5267.

Yours truly,



J.P. Gagnon
Senior Specialist, Tank Cars
Regulatory Affairs Branch

Attachments

c.c.: S. Agutter, British Inspecting Engineers Ltd.

JPG/jd



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Certificate of Registration

This is to certify that: Chesterfield cylinders Limited, Derbyshire, S40 2EA, England, pursuant to its application on file with Transport Canada has been granted the registration No. M15 in accordance with the provisions of Special Permit No. 3263 and section 25 of CAN/CSA B339-88 for the purpose of manufacturing compressed gas cylinders and tubes under the following conditions and limitations:

- 1) The cylinders and tubes shall be manufactured in complete accordance with specifications 3AA or 3AAX, part 78 of the "Regulations for the Transportation of Dangerous Commodities by Rail", or with the requirements prescribed in appendices "A" or "B" to this certificate.
- 2) The cylinders and tubes shall be in accordance with the drawings listed in the revised list dated August 16, 1990 and corresponding designs and additional information provided with previous applications on file with this Directorate.
- 3) The manufacturing must be supervised by a duly authorized Independent Inspection Agency under inspection procedures conforming to the prescribed requirements and filed with this Directorate.
- 4) The manufacturer's symbol to be marked on the cylinders and tubes shall be either "M15" or a symbol prescribed by the U.S. Department of Transportation or any other acceptable mark registered with this Directorate.
- 5) Within two years after the Registration date of this certificate, a quality assurance manual shall be submitted to the Director. The manual shall indicate that the operations in the plant are in accordance with CAN3-Z299.3-85 standard or equivalent.

Not later than 20 days after any changes occur in the information submitted in support of the application, the holder shall advise this Directorate of any such changes.

Failure to comply with the above mentioned requirements or any applicable regulations may result in the suspension or revocation of this Certificate of Registration.

This Certificate of Registration shall expire on: September 30, 1995 or on such previous date as this Directorate may decide.

Registration Date: Sept 18/90 Signed: Jean Bouchard for JRM.
 Director, Regulatory Requirements
 Transport Dangerous Goods Directorate



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APPENDIX "A" TO CERTIFICATE OF REGISTRATION NO. M15

The following requirements apply to cylinders made in accordance with drawing Nos. 47604P, 47605P, 47626P and 48334P on file with this Directorate.

The cylinders shall be manufactured in accordance with DOT Specification 3T(49 CFR 178.45) except as specifically modified hereunder:

i) 178.45-2 Type, Size and Service Pressure.

(a) **Type:** Each cylinder must be of seamless construction with one end concave to pressure, the bottom to be convex to pressure.

(b) **Size:** The maximum water capacity is 120 pounds.

ii) 178.45-3 Inspection by Whom and Where.

Inspections and verifications must be performed by an Independent Inspection Agency authorized for such purpose by this Directorate or by the Canadian Transport Commission.

iii) 178.45-4 Duties of the Inspector

* * *

(c)(6) Preparation of the required report and filing a copy with Transport Canada.

iv) 178.45-5 Material, Steel.

(a) Only open hearth, basic oxygen, or electric furnace process steel of uniform quality is authorized. The steel analysis must conform to the following:

ANALYSES TOLERANCES

Element (percent)	Ladle analysis	Check analysis	
		Under	Over
Carbon.....	0.33 to 0.40	0.03	0.04
Manganese.....	0.60 to 1.05	0.04	0.04
Phosphorus (max).....	0.015	0.01
Sulfur (max).....	0.015	0.003
Silicon.....	0.15 to 0.35	0.02	0.03
Chromium.....	0.80 to 1.15	0.05	0.05
Molybdenum.....	0.15 to 0.25	0.02	0.02
*	*	*	*

v) 178.45-6 Manufacture.

(a) thru (e) * * *

(d) The thickness of the bottoms of cylinders is, under no condition, to be less than two times the minimum wall thickness of the cylindrical shell; such bottom thickness to be measured within an area bounded by a line representing the points of contact between the cylinder and floor when the cylinder is in a vertical position.

(e) Welding or brazing is prohibited.

(f) Each new design and any significant change to any acceptable design must be qualified for production by testing prototype samples as follows:

1. Three samples must be subjected to 100,000 pressure reversal cycles between zero and service pressure or 10,000 pressure reversal cycles between zero and test pressure, at a rate not to exceed 10 cycles per minute without failure.
2. Three samples must be pressurized to destruction and failure must not occur at less than 2.5 times the marked cylinder service pressure. Each cylinder must remain in one piece. Failure must initiate in the cylinder sidewall in a longitudinal direction. Rate of pressurization must not exceed 200 psi per second.

- (g) In this Appendix "significant change" means a 10 percent or greater change in cylinder wall thickness, service pressure, or diameter; a 30 percent or greater change in water capacity or base thickness; any change in material; over 100 percent increase in size of openings; or any change in the number of openings.
- (h) After all shell forming operations and prior to closing in, the cylindrical section of each shell must be examined in accordance with ASTM Standard A-388-80 using the angle beam technique. The equipment used must be calibrated to detect a notch equal to five percent of the design minimum wall thickness. Any discontinuity indication greater than that produced by the five percent notch shall be cause for rejection of the shell unless the discontinuity is repaired within the requirements of this specification.

(vi) 178.45-7 Wall Thickness.

- (a) The minimum wall thickness must be such that the wall stress at the minimum specified test pressure does not exceed 67 percent of the minimum tensile strength of the steel as determined by the physical tests required in 178.45-14 and 178.45-15. A wall stress of more than 90,500 psi is not permitted. In no case may wall thickness be less .210 inch.
- (b) * * *
- (c) Does not apply.

(vii) 178.45-12 Ultrasonic Examination.

* * *

Wet magnetic particle examination for detecting the presence of quench cracks may be substituted for the ultrasonic examination prescribed in this section. When magnetic particle examination is performed it must be done after the hydrostatic test on the cylindrical section of each cylinder in accordance with ASTM Standard E 709-80. Any cylinder found to have a quenching crack must be rejected and may not be requalified.

(viii) 178.45-17 Markings.

a) * * *

b) Required markings are as follows:

1. "TC SP 3263-M15A" in lieu of "DOT 3T" followed by the service pressure.

Note: This sequence can be placed before the prescribed DOT markings.

2. The serial number.
3. The manufacturer's symbol.
4. The inspector's official mark near the serial number.
5. Not required.
6. * * *

c) Markings must be at least $\frac{1}{4}$ inch high if space permits.

* * *

ix) 178.45-18 Inspector's Report.

Applies except that "DOT 3T" must be replaced by "TC SP 3263-M15A".

SPECIAL REQUIREMENTS

- (a) The cylinders shall be maintained and used in accordance with applicable sections of the "Regulations for the Transportation of Dangerous Commodities by Rail" and filled only with gases compatible with and authorized by CFR 49 in DOT 3T cylinders except carbon monoxide and gases having any free hydrogen or sulphides.
- (b) Prior to the initial shipment of cylinders made to any specific design, a report of test results specified in 178.45-6(f) shall be submitted to this Directorate.
- (c) These cylinders must not be used for the carriage of gases that would cause hydrogen embrittlement of the steel.
- (d) The filling limits specified in 73.302(c) are authorized. The average wall stress limitations and the maximum wall stress limitation values shall be respectively 87,000 psi and 94,000 psi.
- (e) Each cylinder shall be hydrostatically retested at least every five years as prescribed in section 73.34(e).
- (f) The Director, Regulatory Requirements shall be advised of any change in design of the cylinders.
- (g) The Director, Regulatory Requirements shall be advised of any incident involving loss of contents and shall be provided with a summary of experience on a yearly basis.

APPENDIX "B" TO CERTIFICATE OF REGISTRATION NO. M15

The following requirements apply to tubes made in accordance with drawing No. 35962C and additional design and performance data on file with this Directorate.

The tubes shall be manufactured in accordance with DOT Specifications 3T(49 CFR 178.45) except as specifically modified hereunder:

i) 178.45-3 Inspection by Whom and Where.

Inspections and verifications must be performed by an Independent Inspection Agency authorized for such purpose by this Directorate or by the Canadian Transport Commission.

ii) 178.45-4 Duties of the Inspector

* * *

(c)(6) Preparation of the required report and filing a copy with this Directorate.

(iii) Markings.

a) * * *

b) Required markings are as follows:

1. "TC SP 3263-M15B" in lieu of "DOT 3T" followed by the service pressure.

Note: This sequence can be placed before the prescribed DOT markings.

2. * * *

3. The manufacturer's symbol.
* * *

ix) 178.45-18 Inspector's Report.

SPECIAL REQUIREMENTS

- (a) The tubes shall be maintained and used in accordance with applicable sections of the "Regulations for the Transportation of Dangerous Commodities by Rail" and filled only with following gases:

<u>Commodity</u>	<u>Identification Number</u>
Helium	1046
Neon	1065
Argon	1006
Krypton	1056
Xenon	2036
Nitrogen	1066
Oxygen	1072

- (b) The tubes shall be retested at least once every five years as prescribed in section 73.34(e) for CTC specifications 3AAX.
- (c) The Director, Regulatory Requirements shall be advised of any change in design of the tubes.
- (d) The Director, Regulatory Requirements shall be advised of any incident involving loss of contents and shall be provided with a summary of experience on a yearly basis.