



SPECIAL PERMIT 1897 REVISION NO. 4

This Special Permit is issued pursuant to the terms of Section 71.6(a) of the "Regulations for the Transportation of Dangerous Commodities by Rail" to authorize the shipment of flammable gas 2.1 and non-flammable gas 2.2 in non-CTC specification cylinders by rail in Canada, under conditions prescribed herein, and does not relieve any shipper or carrier from compliance with any requirement of the said Regulations, except as specifically stated.

1. BASIS

Telex dated June 24, 1988 from TI Chesterfield Limited, Chesterfield, Derbyshire, S40 2EA England.

2. COMMODITY CLASSIFICATION

Flammable gas 2.1 and Non flammable gas 2.2.

3. COMMODITY NAME

Commodities are those authorized for U.S. D.O.T. Specification 3T cylinders, except carbon monoxide and gases having any free hydrogen or sulphides.

4. IDENTIFICATION NUMBER

As appropriate.

5. REGULATION AFFECTED

73.302.

6. AUTHORIZED SHIPPER

T.I. Chesterfield Limited, its agents, distributors and customers.

7. PACKAGING DESCRIPTION

a) Non CTC Specification high pressure cylinder made of definitely prescribed material.

1) Design and construction shall be in accordance with drawing 47604P, 47605P, 47626P, 48334P and additional design and performance data on file with the Director of Operation, and D.O.T. Specification 3T except as follows:

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.

(c) \*\*\*

ii) 178.45-3 Inspection by whom and where

Inspections and verifications must be performed by an independent inspection agency approved in writing for such purposes by the National Transportation Agency.

iii) 178.45-4 Duties of the Inspector

(c)(6) Preparation of the required report and sending a copy to the National Transportation Agency.

iv) 178.45-5 Material, steel

(a) Only open hearth, basic oxygen, or electric furnace process steel or 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 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 specification "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 than .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) \* \* \*

(1) "CTC SP1897" followed by the service pressure

(2) \* \* \*

(3) Identifying symbol

(4) \* \* \*

(5) Not required

(6) \* \* \*

(c) markings must be at least 1/4 inch high if space permit.

8. SPECIAL REQUIREMENTS


- a) These cylinders may not be used for carriage of gases that would cause hydrogen embrittlement of the steel.
- b) One cylinder per each 1000 produced shall be subjected to a cycling test at test pressure to destruction. Cycling rate shall not exceed 10 cycles per minute. The results of the test shall be reported to the Director of Operation.
- c) The filling limits specified in 73.302(c) are authorized. The average wall stress limitation and the maximum wall stress limitation values shall be respectively 87000 psi and 94000 psi.
- d) Each cylinder shall be requalified for use every five years at a minimum retest pressure of 5/3 times the service pressure and in accordance with section 73.34(e) of the Regulations.
- e) The Director of Operation shall be advised of any change in design of the cylinders mentioned in 7(a)(1). A new application shall be submitted for any new design cylinder.
- f) All cylinders manufactured prior to the issuance of Special Permit 1897 Revision No. 3 and bearing the marking "CTC SP 1897" are acceptable for transportation by rail providing they comply with these provisions.

9. REPORTING REQUIREMENTS

The Director of Operation shall be advised of any incident involving loss of contents and shall be provided with a summary of shipping experience before the expiration date of the Special Permit.

10. EXPIRY DATE

This Special Permit shall remain in effect until July 8, 1989 and may be revoked at any time by the Director of Operation prior to this date.

  
Director of Operation  
Rail Safety Branch

Issued at Hull, Quebec  
this 8th day of July, 1988

Address all inquiries to:

Director of Operation  
Rail Safety Branch  
National Transportation Agency  
25 Eddy Street, 14th Floor  
Hull, Quebec  
K1A 0N9