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Reaffirmed March 2024



Reconditioning, remanufacturing and repair of drums for the transportation of dangerous goods

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Reconditioning, remanufacturing and repair of drums for the transportation of dangerous goods

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Preface

This National Standard of Canada CAN/CGSB-43.126-2019 has been reaffirmed by the Committee on Reconditioning of Drums for the Transport of Dangerous Goods in March 2024.

Changes since the previous edition

The safety standard sets out the requirements for the reconditioning, remanufacturing, and repair of steel and plastic drums for the transportation of dangerous goods. Minor changes have been made to improve the clarity of the requirements for facilities registered with Transport Canada. This updated version of the standard also aligns with requirements of the 20th edition of the UN Recommendations. However, no new technical requirements have been introduced.

The following definitions apply in understanding how to implement this National Standard of Canada:

- "shall" indicates a **requirement**;
- "should" indicates a **recommendation**;
- "may" is used to indicate that something is **permitted**;
- "can" is used to indicate that something is **possible**, for example, that an organization is able to do something.

Notes accompanying clauses do not include requirements or alternative requirements. The purpose of a note accompanying a clause is to separate explanatory or informative material from the text. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

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Introduction

This is the fourth edition of CAN/CGSB-43.126, *Reconditioning, remanufacturing and repair of drums for the transportation of dangerous goods*. It supersedes the previous edition published in 2019.

This standard is intended for incorporation by reference into the *Transportation of Dangerous Goods Regulations* (TDG Regulations). Where there are differences between the requirements of the TDG Regulations and this standard, the TDG Regulations prevail.

This standard specifies the requirements for the reconditioning, remanufacturing, and repair of steel and plastic drums for the transportation of dangerous goods. This standard is based on the *Recommendations on the Transport of Dangerous Goods, Model Regulations*, 20th revised edition, published by the United Nations.

Reconditioning, remanufacturing and repair of drums for the transportation of dangerous goods

1 Scope

1.1 Organization and content

This standard specifies the requirements for the reconditioning, remanufacturing and repair of steel and plastic drums for the transportation of dangerous goods. This standard consists of three parts and an annex.

Part I specifies the general requirements for drum eligibility, and a registered facility's quality management system.

Part II specifies the requirements for the reconditioning, remanufacturing and repair of steel drums.

Part III specifies the requirements for the reconditioning and remanufacturing of plastic drums.

Annex A specifies the requirements for the registration of reconditioning, remanufacturing and repair facilities with Transport Canada.

1.2 Application

This standard applies to standardized drums (UN/TC/DOT/CTC).

1.3 Additional requirements

1.3.1 Conflict

The *Transportation of Dangerous Goods Act, 1992* (TDG Act) and the *Transportation of Dangerous Goods Regulations* (TDG Regulations) may set out additional requirements regarding the design, construction, qualification, selection, use and testing of drums. Where there is an inconsistency between the requirements of this standard and those of the TDG Act or TDG Regulations, the TDG Act or TDG Regulations prevail to the extent of the inconsistency.

It is recommended to read the standard in conjunction with the TDG Regulations.

1.3.2 Safety

The reconditioning, remanufacturing and repair of a drum in accordance with this standard may require the use of materials and/or equipment that could be hazardous. This standard does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use.

1.3.3 Units

Quantities and dimensions used in this standard are given in metric units, mainly SI units.

2 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this National Standard of Canada. The referenced documents may be obtained from the sources noted below.

Note: The contact information provided below was valid at the date of publication of this standard.

An undated reference is to the latest edition or revision of the reference or document in question, unless otherwise specified by the authority applying this standard. A dated reference is to the specified revision or edition of the reference or document in question.

2.1 Transport Canada (TC)

Transportation of Dangerous Goods Act, 1992 (including amendments)

Transportation of Dangerous Goods Regulations (including amendments)

TP 14850 – *Small Containers for Transport of Dangerous Goods, classes 3, 4, 5, 6.1, 8, and 9, a Transport Canada Standard* (October 2010)

2.1.2 Contact information

The above may be obtained from Transport Canada. Web site: <https://tc.canada.ca/en/dangerous-goods>. The above may also be obtained from the Government of Canada Publications, Public Services and Procurement Canada. Telephone: 1-800-622-6232. Web site: <https://publications.gc.ca/site/eng/home.html>.

The Transport Canada publication TP 14850 may be downloaded from <https://tc.canada.ca/en/dangerous-goods/small-containers-transport-dangerous-goods-classes-3-4-5-61-8-9-transport-canada-standard>.

2.2 United Nations (UN)

Recommendations on the Transport of Dangerous Goods - Model Regulations, 20th edition

2.2.1 Contact information

The above may be obtained from distributors of United Nations Publications or from the United Nations Publications Customer Service. E-mail: order@un.org. Web site: <https://unece.org/rev-20-2017>.

2.3 United States Department of Transportation (US DOT)

Code of Federal Regulations (CFR), Title 49, Parts 171 to 185, *Hazardous Materials Regulations*

2.3.1 Contact information

The above may be obtained from U.S. Department of Transportation. Telephone: 202-366-4488. Web site: <https://www.phmsa.dot.gov/about-phmsa/offices/office-hazardous-materials-safety>.

3 Terms and definitions

In addition to the definitions, terms and abbreviations given in the TDG Act and TDG Regulations, the following definitions and abbreviations apply in this standard:

closure

device that closes an opening of a receptacle.

crazing

fine lines that indicate separation on the surface of a plastic drum. They usually run in a parallel or radial pattern and often have similar lines running perpendicular to them, producing an uneven checkerboard pattern.

crease

displacement in the surface of the drum, generally linear in shape and characterized by a fold in the metal or plastic.

dangerous goods

dangerous goods as defined in the TDG Act and TDG Regulations.

dedenting

process that removes a dent from a steel drum.

dent

displacement of the surface of a steel drum, generally round in shape.

Director

Executive Director, Regulatory Frameworks and International Engagement, Regulatory Affairs Branch, Transportation of Dangerous Goods Directorate, Transport Canada (ASDD).

drum

flat-ended or convex-ended cylindrical packaging made of metal, fibreboard, plastics, plywood or other suitable materials.

Note: It also includes packagings of other shapes (e.g. round taper-necked packagings or pail-shaped packagings) but does not include wooden barrels and jerricans.

durable mark

mark placed on a drum that remains legible until the drum is reconditioned or remanufactured.

fading

colour loss on all or part of the plastic drum surface.

flange

opening in a drum into which bungs are threaded to seal the drum.

Note: A flange in a plastic drum may be moulded as part of the drum or a separate fixture that is attached to the drum after the moulding process is complete.

ISO

International Organization for Standardization.

marking

application by paint, printing, decal, or stamping of symbols or words required by this standard.

maximum capacity

maximum volume of water, normally expressed in litres (L), that the container can hold at 15 °C and at an absolute pressure of 101.3 kPa, excluding the portion of the container that remains empty when the container is filled in its normal position for filling through the intended filling orifice.

ovalization

oval shaped distortion.

permanent mark

mark placed on a drum that is not removable by the reconditioning processes specified in this standard (e.g. embossment).

quality management system

systematic programme of controls, inspections and documented activities aimed at providing confidence that conformity to this standard is consistently achieved in practice.

reconditioned drum

steel or plastic drum that has been successfully processed in conformance with the applicable reconditioning requirements specified in this standard.

remanufactured drum

steel or plastic drum that has been successfully processed in conformance with the applicable remanufacturing requirements specified in this standard.

repair

reconstruction or restoration of a steel drum to its original function.

staining

colour that was not part of the original plastic drum.

Note: Staining may indicate absorption of the previous content and is often a precursor of environmental stress cracking.

TC

Transport Canada.

TDG Act

Transportation of Dangerous Goods Act.

TDG Regulations

Transportation of Dangerous Goods Regulations.

thoroughly emptied drum

drum from which all materials have been removed using the most effective method for the type of content (e.g. can include pouring, upending, pumping, aspirating, scraping, rinsing).

Part I

Drum eligibility and quality management system requirements

4 General requirements

4.1 Drum eligibility

4.1.1 Application

The requirements set out in this part apply to the reconditioning, remanufacturing and repair of steel drums and the reconditioning and remanufacturing of plastic drums used in the handling, offering for transport, or transporting of dangerous goods. The drums shall

- a) conform to the requirements of the TDG Act and TDG Regulations, and this standard;
- b) have an original permanent compliance mark that conforms with the requirements specified in any of the following:
 - 1) TP14850 (UN standardized drum);
 - 2) UN Recommendations on the Transport of Dangerous Goods, Model Regulations, and the regulations of the country of approval; or
 - 3) is a TC, DOT or CTC specification listed in Table 3 of this standard.

4.2 Quality management system

4.2.1 Application

Each reconditioning, remanufacturing and repair facility shall have and adhere to a quality management system.

4.2.2 Specific elements and processes of the quality management system

The quality management system of a drum reconditioning, remanufacturing and repair facility shall include all of the following elements and processes.

4.2.2.1 Management commitment

Facility management shall appoint a member of management who, irrespective of other responsibilities, has the authority and responsibility for overseeing the quality management system of the facility, including:

- a) ensuring the quality management system is established and maintained;
- b) reporting to management on the performance of the quality management system;
- c) promoting awareness of the importance of the requirements of this standard and the TDG Regulations throughout the facility.

4.2.2.2 Human resources

A human resources management process that:

- a) assigns quality responsibilities to personnel deemed competent on the basis of applicable education, training, skills, and experience;
- b) determines personnel's competency needs affecting quality;
- c) provides effective training to ensure competency of personnel;
- d) creates and maintains records of education, training, qualification and certification as required;
- e) creates and maintains awareness of the importance of the quality management system to all employees.

4.2.2.3 Purchasing

A purchasing control process shall be established and maintained to ensure that purchased replacement parts conform to the requirements of this standard.

4.2.2.4 Program documentation manual

A Program documentation manual shall be developed, with the following components:

- a) **Title page** with the company name, facility location, and name and position of the person responsible for compliance with this standard;
- b) **Flow chart** depicting the operation of the facility with specific reference to the equipment and its use, inspection and test points, and sequence of operations;
- c) **Description of the process** used for implementing and documenting the quality management system;

- d) **List of all written instructions or procedures**, where they are located in the facility and who is responsible for performing them. The instructions and procedures shall include all activities to ensure that the work performed conforms to this standard. They shall include but are not limited to the following:
- 1) Internal inspection;
 - 2) External inspection;
 - 3) Leak testing;
 - 4) Performance testing for remanufactured drums;
 - 5) Calibration of leak testing equipment;
 - 6) Statement concerning how drums that do not conform to the requirements of this standard are to be handled;
 - 7) Statement indicating who is responsible for keeping the program documentation manual up to date and the procedure for initiating and implementing a change in the manual;
 - 8) Statement confirming that closure instructions will be kept for each drum type and will be available upon request.

Part II

Requirements for reconditioning, remanufacturing and repair of steel drums

5 General requirements

5.1 Application

The requirements specified in this part apply to the reconditioning, remanufacturing and repair of steel drums.

5.2 Quality management system

The quality management system requirements specified in 4.2 apply to the reconditioning, remanufacturing and repair of steel drums.

5.3 Compliance

The steel drum reconditioning, remanufacturing and repair facility shall be registered with Transport Canada in accordance with Annex A to conduct the functions specified in this standard.

5.4 Sorting

A steel drum shall not be accepted for reconditioning, remanufacturing or repair if

- a) it obviously contains materials other than the contents declared by the dangerous goods marks;
- b) it is not a thoroughly emptied drum;
- c) it has unsecured closures;
- d) the original metal thickness is not permanently marked on the bottom of the drum;
- e) for a drum having a capacity greater than 150 L, the marked metal thickness of the top, body and bottom is less than 1.0 mm, 0.8 mm, 1.0 mm;
- f) it meets any of the damage criteria listed in Column 4 of Table 1.

Table 1 — List of damage criteria for steel drums

Column 1	Column 2	Column 3	Column 4
Criteria	Degree of damage	Drum is eligible for remanufacturing or reconditioning	Drum is not eligible for remanufacturing or reconditioning
Apparent leaks	Minor (can be corrected by chime straightening)	X	—
	Major	—	X
Flanges	Major rusting or pitting	—	X ^a
	Loose in head	—	X ^a
	Ovalization	—	X ^a
	Minor thread damage	—	X ^a
Distorted ends	Minor (can be corrected by dedenting)	X	—
	Major (creasing or stretching, or head extending past chimes)	—	X ^a
Holes	Any	—	X ^a
Ovalization	Minor (can be corrected by dedenting)	X	—
	Major	—	X
Dents and creases	Surface displacement does not affect the integrity of the steel drum and can largely be corrected by dedenting	X	—
	Surface displacement affects the integrity of the steel drum, or has significant involvement with the chime	—	X
Chime damage	Minor (not cut or creased, fold does not extend past chime into body)	X	—
	Major (creased or flattened)	—	X
Corrosion	Minor (surface rust which is removable)	X	—
	Major (pitting or deep corrosion which is unremovable)	—	X ^a

^a The steel drum can be remanufactured or repaired if the defect is confined to the head or bottom of the drum.

6 Detailed requirements: Reconditioning

6.1 General

6.1.1 Application

A steel drum conforming to the requirements specified in 5.4 is eligible for reconditioning.

6.2 Reconditioning process

The reconditioning process shall consist of all the italicized steps below. The non-italicized steps may be performed if required. Steps need not be performed in the sequence specified.

a) *Wash the interior of the steel drum to remove previous content.*

b) *Rinse the interior of the steel drum to remove washing materials.*

c) Dry the interior of the steel drum.

Note: While this is not a required step, the drum shall be dry before the internal inspection in 6.2.2.

d) Clean the interior of the steel drum to remove any rust.

e) *Clean the exterior of the steel drum to substantially remove paint (if applicable), rust, durable labels and adhesives.*

Note: The original paint on the drum is not required to be removed in this step.

f) *Substantially remove all dents and creases.*

g) *Straighten chimes that are not equipped with a separate chime reinforcement hoop.*

h) *Clean all closures or replace with new ones equivalent in performance to the original and suitable for the intended use.*

i) *Inspect all used closures and gaskets for defects. Defective non-integral gaskets shall be replaced with new ones that ensure an equivalent performance of the completed drum. Defective closures shall be replaced with new ones that ensure an equivalent performance of the completed drum.*

j) *Perform an internal inspection in conformance with the requirements specified in 6.2.2.*

k) *Perform an external inspection in conformance with the requirements specified in 6.2.3.*

l) *Perform a leak test in conformance with the requirements specified in 6.2.4.*

m) Coat or line the interior of the steel drum.

n) Coat or paint the exterior of the steel drum.

o) *Ensure all closures are installed or supplied.*

6.2.1 Thermal cleaning

For steel drums with removable heads, the interior and exterior cleaning steps referred to in 6.2 a) to e) inclusive may be replaced by a thermal process in conformance with the following requirements:

- a) Remove the lid and ring from the steel drum. Burn the drum body and lid in a furnace to oxidize any content, coatings, durable labels and adhesives;
- b) Clean the drum body, lid and ring and remove any ash or abrasive materials by air blasting, washing and drying, or another equivalent method.

6.2.2 Internal inspection

The interior of the steel drum shall be inspected after cleaning, but before painting or coating. To successfully pass the internal inspection, the drum shall

- a) be dry and free from contaminants;
- b) show no visual evidence of significant defects that may affect its integrity (e.g. pitting, reduction in original metal thickness, metal fatigue, damaged threads, etc.).

6.2.3 External inspection

The exterior of the steel drum shall be inspected after external cleaning, but before painting and coating. To successfully pass the external inspection, a drum shall

- a) have straight and smooth chimes;
- b) have surface imperfections limited to insubstantial dents and creases;
- c) have external paint, durable labels and adhesives substantially removed;
- d) show no visual evidence of significant defects that may affect its integrity (e.g. pitting, reduction in original metal thickness, metal fatigue, damaged threads, etc.).

6.2.4 Leak testing

6.2.4.1 Steel drums shall be tested for leaks after all internal and external cleaning and inspection processes, chime straightening, remanufacturing processes [see 7.2.1 a) to d)] or repair have been performed, but before any internal or external coating, lining, or painting is performed.

6.2.4.2 Steel drums shall be tested for leakage using the constant pressure method set out in 6.2.4.3 or by an equivalent test method. Equivalent test methods shall be validated by the reconditioning facility, the test equipment manufacturer or a third party. All validation data shall be retained for thirty-six months after the test method is no longer used by the facility.

6.2.4.3 Constant pressure test method

Air pressure (gauge) shall be applied and maintained in a sealed drum for 5 min while the drum is completely immersed in water. All seams and surfaces shall be examined for escaping air bubbles indicating leakage. The method of restraint shall not affect the results of the test. Depending on the packing group rating indicated in the original or remanufactured compliance mark displayed on the steel drum, the air pressure (gauge) to be applied shall be as shown in Table 2 below.

Table 2 – Constant pressure values for leak testing – Steel drum

Packing group I	Packing group II	Packing group III
Mark “X”	Mark “Y”	Mark “Z”
Not less than 30 kPa (0.3 bar)	Not less than 20 kPa (0.2 bar)	Not less than 20 kPa (0.2 bar)

6.2.4.4 Pressure gauge

The pressure shall be measured by use of a gauge of suitable range and accuracy. Various means of pressure measurement calibration may be used as long as the facility develops a quality control procedure [see 4.2.2.4 d) 5)] for ensuring that instruments are maintained and calibrated, and that they operate within suitable parameters.

6.2.4.5 Result

To successfully pass the leak test, the steel drum shall not show any evidence of leakage.

6.2.5 Reconditioning success criteria

A steel drum successfully passes the reconditioning process if all required steps specified in 6.2 have been completed and have revealed no defect that could render the drum unsafe for transporting dangerous goods.

6.3 Compliance mark

6.3.1 Reconditioning mark

Reconditioned steel drums meeting the requirements specified in 6.2.5 shall be durably and legibly marked on the top head or side wall in conformance with the requirements specified in 6.3.1.1. The mark shall remain legible until the drums are reconditioned or remanufactured again. For a drum with a fully removable head, the mark shall appear on the side wall and, optionally, on the top head.

6.3.1.1 The reconditioned steel drums shall be marked with the following information, in the sequence specified. The mark shall be in characters not less than 12 mm in height and in contrasting colours to the background. When stencilling or similar techniques are used to apply the mark, including the circle in the UN symbol, small gaps necessary for their application are permitted. Embossed marks are not required to appear in contrasting colours to the background of the drum. Each section shall be separated from the next by a slash and include:

- a) The country designation “CAN”;
- b) Transport Canada Registration number issued to the reconditioning facility. The name or symbol of the reconditioning facility may also be included;
- c) Last two digits of the year of reconditioning;
- d) “RL” indicating that the drum has been reconditioned.

For example, for a drum reconditioned in 2018 by the facility having the code ABCD and holding the registration number 29-XX, the reconditioning mark can either be:

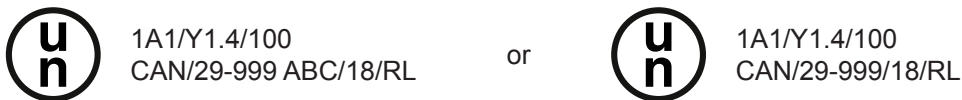
CAN/29-XX/18/RL or CAN/29-XX ABCD/18/RL.

6.3.2 Compliance mark (UN mark)

If the UN mark for the steel drum is not displayed on the top head or side wall, the reconditioning facility shall display the mark specified in clause 5.2 a) to d) of standard TP14850 above the mark specified in 6.3.1 of this standard in a durable form. Each element specified in clause 5.2 a) to d) of standard TP14850 shall be separated from the next by a slash and characters shall be at least 12 mm high. Unless the drum has been remanufactured and meets the requirements of 7.2.3 of this standard, the compliance mark shall not indicate a higher level of performance than that indicated by the original or remanufactured mark permanently displayed on the bottom of the drum.

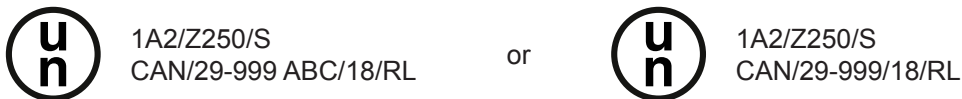
For example:

A steel drum with a non-removable head intended for liquids, rated for a relative density of 1.4 and hydraulic test pressure of 100 kPa, tested at the Packing group II performance level, and reconditioned in 2018 at the facility ABC, under the certificate 29-999:



or

A steel drum with a removable head intended for solids, rated for a maximum gross mass of 250 kg, tested at the Packing group III performance level, and reconditioned in 2018 at the facility ABC, under the certificate 29-999:



Note 1: The first row of the UN mark in the examples above is the reproduction of the original or remanufactured mark and the second row is the reconditioning mark.

Note 2: The UN mark may indicate a lower level of performance than that indicated by the original or remanufactured mark permanently displayed on the bottom of the drum.

7 Detailed requirements: Remanufacturing

7.1 General

7.1.1 Application

A steel drum conforming to the requirements specified in 5.4 is eligible for remanufacturing.

7.1.2 Compliance

Steel drum reconditioning, remanufacturing and repair facilities shall be registered with Transport Canada in accordance with Annex A to conduct the functions specified in this standard.

7.2 Remanufacturing process

7.2.1 The remanufacturing of a steel drum consists of one or more of the following processes:

- a) Replacing any integral structural components (such as non-removable heads);
- b) Creating one or more new rolling hoops;

- c) Converting a UN standardized steel drum from one specification to another (e.g. converting a type 1A1 to a type 1A2);
- d) Converting a TC, DOT or CTC standardized drum to a UN standardized drum.

7.2.1.1 A representative sample of a remanufactured steel drum design type shall be tested in conformance with the requirements specified in Part 1 of TP14850 to verify its performance level. The test method and results shall be recorded and retained for as long as the facility intends to remanufacture that design type. The test results shall be available to users of the drum.

7.2.2 Steel drums remanufactured as specified in section 7 shall be subsequently reconditioned in accordance with the requirements set out in section 6.

7.2.3 A steel drum remanufactured as specified in section 7 shall meet the following requirements:

- a) The requirements of 7.2.1.1 shall have been met.
- b) The cover gasket of a removable head steel drum shall remain in place after the head is installed.
- c) The closing ring of a removable head steel drum shall be uniformly tight around the entire circumference of the steel drum.

7.3 Compliance mark

7.3.1 General

If there is no change to the drum type (e.g. 1A1 to 1A2) and no replacement or removal of integral structural components (e.g. replacing the head of the drum), the original compliance mark shall be reproduced in accordance with 6.3.2.

7.3.2 Converting TC/DOT/CTC standardized drums

If a TC/DOT/CTC standardized steel drum is converted to a UN standardized steel drum or the specification of a UN drum changes during remanufacturing, the remanufacturer shall display the mark specified in clause 5.2 a) to e) of standard TP14850 for the new specification in durable form above the reconditioning mark referred to in 6.3.1. Each element specified in clause 5.2 a) to e) of standard TP14850 shall be separated from the next by a slash and characters shall be at least 12 mm high.

7.3.2.1 Corresponding UN marks for converted steel drums

Column 3 of Table 3 lists the UN marks that correspond to the marks for various TC specification steel drums, listed in Column 1. The mark shall not identify a higher level of performance than that for which the original design type had been tested and marked.

For example, the mark for a TC-17E converted to UN1A1 by the facility holding the Transport Canada registration number 29-XX in 2018 would be:



1A1/Y1.2/100/18
CAN/29-XX/18/RL

7.3.3 Change of metal thickness

If the remanufacturer has decreased the thickness of any of the steel drum parts, then the new thickness shall be permanently marked below the mark specified in 7.3.2. If the thickness of any of the steel drum parts has been increased, then the new thickness may be durably marked below the mark specified in 7.3.2. Characters shall be at least 12 mm high.

For example, a non-removable head steel drum that has been remanufactured with a change in thickness of the head would be marked as follows:



1A1/Y1.2/100/18
CAN/29-XX/18/RL
1.2 – 1.0 – 1.0

Table 3 – Corresponding UN marks

Column 1	Column 2	Column 3
TC specification ^a	Type of steel drum	Corresponding UN mark
TC-17C	Non-removable head	UN1A1/Y1.2/270
	Removable head	UN1A2/Y1.2/130 or UN1A2/Y***/S
TC-17E	Non-removable head	UN1A1/Y1.2/100
TC-17F	Non-removable head	UN1A1/X1.2/550
TC-17H	Removable head	UN1A2/Y1.2/100 or UN1A2/Y***/S
TC-5	Non-removable head	UN1A1/Y1.2/270
	Removable head	UN1A2/Y1.2/130 or UN1A2/Y***/S
TC-5A	Non-removable head	UN1A1/X1.2/550
TC-5B	Non-removable head	UN1A1/Y1.2/270
	Removable head	UN1A2/Y1.2/130 or UN1A2/Y***/S
TC-5C	Non-removable head	UN1A1/X1.2/550

^a The drum may also be marked as a DOT or CTC specification drum equivalent to the TC specification. CTC stands for the “Regulations for the Transportation of Dangerous Commodities by Rail” set out by the Canadian Transport Commission, the predecessor of Transport Canada.

*** The gross mass, calculated by multiplying the maximum capacity of the drum by the relative density of 1.2.

8 Detailed requirements: Repair

8.1 General

8.1.1 Compliance

The steel drum reconditioning, remanufacturing and repair facility shall be registered with Transport Canada in accordance with Annex A to conduct the functions specified in this standard.

8.1.2 Application

The requirements set out in this section apply to steel drums that require repair (e.g. welding holes, repairing flanges, adding reinforcing rings, etc.). Repair to a drum shall be performed in compliance with the specification of its original design and construction.

8.1.3 Following any repair, the steel drum shall be subsequently reconditioned in accordance with the requirements set out in section 6.

Part III

Requirements for reconditioning and remanufacturing of plastic drums

9 General requirements

9.1 Application

The requirements specified in this part apply to the reconditioning and remanufacturing of plastic drums.

9.2 Quality management system

The requirements for quality management systems specified in 4.2 of this standard apply to the reconditioning and remanufacturing of plastic drums.

9.3 Compliance

The plastic drum reconditioning and remanufacturing facility shall be registered with Transport Canada in accordance with Annex A to conduct the functions specified in this standard.

9.4 Sorting

A plastic drum shall not be accepted for reconditioning or remanufacturing if

- a) it obviously contains materials other than the contents declared by the dangerous goods marks;
- b) it is not a thoroughly emptied drum;
- c) it has unsecured closures;
- d) for a drum having a capacity greater than 150 L, the marked plastic thickness is less than 2.2 mm;
- e) the external surface of the drum shows damage, cracks, faults, holes or distortions that threaten the drum's integrity and cannot be repaired;
- f) sixty months have passed since its date of manufacture.

10 Detailed requirements: Reconditioning

10.1 General

10.1.1 Application

A plastic drum conforming to the requirements specified in 9.4 is eligible for reconditioning.

10.2 Reconditioning process

10.2.1 Process steps

The reconditioning process shall consist of all the italicized steps below. The non-italicized steps may be performed if required. Steps need not be performed in the sequence specified.

- a) *Wash the exterior of the plastic drum to remove any coatings, adhesives, durable labels.*
- b) *Wash the interior of the plastic drum to remove previous content.*
- c) *Rinse the entire plastic drum to remove washing materials.*
- d) Dry the interior of the plastic drum.

Note: While this is not a required step, the drum shall be dry before the internal inspection in 10.2.2.

- e) *Clean all closures or replace with new ones equivalent in performance to the original and suitable for intended use.*
- f) *Inspect all flanges and used closures (bung) in conformance with the requirements specified in 10.2.4.*
- g) *Perform an internal inspection in conformance with the requirements specified in 10.2.2.*
- h) *Perform an external inspection in conformance with the requirements specified in 10.2.3.*
- i) *Perform a leak test in conformance with the requirements specified in 10.2.5.*
- j) Apply external treatment, if applicable.
- k) *Ensure that all bungs are installed or supplied.*

10.2.2 Internal inspection

The interior of the plastic drum shall be visually inspected. To successfully pass the internal inspection, the drum shall

- a) be dry and free from contaminants;
- b) show no visual evidence of cracking, crazing, staining, or other defects that may affect its integrity.

10.2.3 External inspection

The exterior of the plastic drum shall be inspected. To successfully pass the external inspection, the drum shall

- a) have the shape and contour of a new plastic drum, with no bulging or collapsing;

- b) have external coatings, adhesives and durable labels substantially removed;
- c) show no visual evidence of cracking, crazing, fading, damaged threads or closures, or surface damage that may affect its integrity.

10.2.4 Flange, bung and gasket inspection

The flanges and used bungs of a plastic drum shall be visually inspected. To successfully pass the inspection:

- a) flanges and bungs shall show no visual evidence of cracking, cross-threading, significant thread wear, or other damage or defects that affects their integrity;
- b) flanges and bungs shall not require significant force for re-installation due to flange ovalization or else the flange shall be considered defective;
- c) drums with flange defects shall be remanufactured in accordance with section 11;
- d) defective non-integral gaskets shall be replaced with new ones that ensure an equivalent performance of the completed drum. Defective bungs shall be replaced with new bungs that ensure an equivalent performance of the completed drum.

10.2.5 Leak testing

10.2.5.1 Plastic drums shall be tested for leaks after all internal and external cleaning and inspection processes, or remanufacturing processes have been performed, but before any external or internal treatment (coating or lining) is performed.

10.2.5.2 Plastic drums shall be tested for leakage using the constant pressure method set out in 10.2.5.3 or an equivalent test method. Equivalent test methods shall be validated by the reconditioning facility, test equipment manufacturer or a third party. All validation data shall be retained for thirty-six months after the test method is no longer used by the facility.

10.2.5.3 Constant pressure test method

Air pressure (gauge) shall be applied and maintained in a sealed plastic drum for 5 min while the drum is completely immersed in water. All seams and surfaces shall be examined for escaping air bubbles indicating leakage. The method of restraint shall not affect the results of the test. Depending on the packing group rating indicated in the original or remanufactured compliance mark displayed on the plastic drum, the air pressure (gauge) to be applied shall be as shown in Table 4 below.

Table 4 — Constant pressure values for leak testing – Plastic drum

Packing group I	Packing group II	Packing group III
Mark “X”	Mark “Y”	Mark “Z”
Not less than 30 kPa (0.3 bar)	Not less than 20 kPa (0.2 bar)	Not less than 20 kPa (0.2 bar)

10.2.5.4 Pressure gauge

The pressure shall be measured by use of a gauge of suitable range and accuracy. Various means of pressure measurement calibration may be used as long as the facility develops a quality control procedure [see 4.2.2.4 d) 5)] for ensuring that instruments are maintained and calibrated, and that they operate within suitable parameters.

10.2.5.5 Result

To successfully pass the leak test, the plastic drum shall not show any evidence of leakage.

10.2.6 Reconditioning success criteria

A plastic drum successfully passes the reconditioning process if all required steps specified in 10.2 have been completed and have revealed no defect that could render the drum unsafe for transporting dangerous goods.

10.3 Compliance mark

10.3.1 Reconditioning mark

Reconditioned plastic drums meeting the requirements specified in 10.2.6 shall be durably and legibly marked on the top head or side wall in conformance with the requirements specified in 10.3.1.1. The mark shall remain legible until the drums are reconditioned or remanufactured again. For a drum with a fully removable head, the mark shall appear on the side wall and, optionally, on the top head.

10.3.1.1 The reconditioned plastic drums shall be marked with the following information, in the sequence specified. The mark shall be in characters not less than 12 mm in height and in contrasting colours to the background. When stencilling or similar techniques are used to apply the mark, including the circle in the UN symbol, small gaps necessary for their application are permitted. Each section shall be separated from the next by a slash and include:

- a) The country designation “CAN”;
- b) Transport Canada Registration number issued to the reconditioning facility. The name or symbol of the reconditioning facility may also be included;
- c) Last two digits of the year of reconditioning;
- d) “RL” indicating that the plastic drum has been reconditioned.

For example, for a drum reconditioned in 2018 by the facility having the code ABCD and holding the registration number 29-XX, the reconditioning mark can either be:

CAN/29-XX/18/RL or CAN/29-XX ABCD/18/RL.

11 Detailed requirements: Remanufacturing

11.1 General

11.1.1 Application

A plastic drum conforming to the requirements specified in 9.4 is eligible for remanufacturing.

11.2 Compliance

The plastic drum reconditioning and remanufacturing facilities shall be registered with Transport Canada in accordance with Annex A to conduct the functions specified in this standard.

11.3 Remanufacturing process

11.3.1 The remanufacturing of a plastic drum consists of one or more of the following processes:

- a) Replacing flanges;
- b) Converting a UN standardized plastic drum from one specification to another (e.g. converting a type 1H1 to a type 1H2).

11.3.1.1 A representative sample of a remanufactured plastic drum design type shall be tested in conformance with the requirements specified in Part 1 of TP14850 to verify its performance level. The test method and results shall be recorded and retained for as long as the facility intends to remanufacture that design type. The test results shall be available to users of the drum.

11.3.1.2 Plastic drums remanufactured as specified in section 11 shall be subsequently reconditioned in accordance with the requirements set out in section 10.

11.3.1.3 A plastic drum remanufactured as specified in section 11 shall meet the following requirements:

- a) The requirements of 11.3.1.1 shall have been met.
- b) The cover gasket of a removable head plastic drum shall remain in place after the head is installed.
- c) The closing ring of a removable head plastic drum shall be uniformly tight around the entire circumference of the plastic drum.

11.4 Compliance mark

11.4.1 General

If the remanufacturing process does not change the original compliance mark (e.g. replacement of a flange), the original compliance mark does not need to be reproduced.

11.4.2 Converting UN standardized drums

If the specification of the drum changes during remanufacturing, the remanufacturer shall display the mark specified in clause 5.2 a) to e) of standard TP14850 for the new specification in durable form above the reconditioning mark referred to in 10.3.1.

Annex A (normative)

Registration of reconditioning, remanufacturing and repair facilities

A.1 Certificate of Registration

A.1.1 A facility is registered upon issuance, by the Director, of a Certificate of Registration. The Certificate of Registration remains valid until its expiry or its revocation for cause.

A.2 Registration and compliance

A.2.1 A Certificate of Registration shall be issued by the Director, if the Director is satisfied that:

- a) The facility's reconditioning, remanufacturing and repair procedures conform to the requirements of this standard, and
- b) The facility is capable of consistently complying with the requirements of this standard.

A.3 Registration by the Director

A.3.1 Only facilities that are registered with the Director shall perform the remanufacturing, reconditioning and repair functions specified in this standard. The registered facility shall perform its functions at the location stipulated on the Certificate of Registration unless the Certificate authorizes the facility to conduct these activities elsewhere.

A.4 Application for registration

A.4.1 An application for registration shall be submitted to the Director and shall include, at a minimum, the following information:

- a) The facility's name and address;
- b) A copy of the Program documentation manual in accordance with 4.2.2.4; and
- c) A sample of the proposed mark as required in 6.3 and/or 10.3.

A.5 Revocation for cause

A.5.1 The Director may revoke the Certificate of Registration of the facility if the Director is satisfied that the facility is not capable of or is not complying with the applicable requirements of this standard.

A.6 Renewal of Certificate of Registration

A.6.1 Remanufacturing, reconditioning and repair of drums shall not continue past the expiration date on the Certificate of Registration unless:

- a) an application for renewal is received by the Director at least 90 calendar days prior to the expiry date;
- b) a new Certificate of Registration has not been issued;
- c) the application for renewal has not been rejected by the Director; and
- d) the Certificate of Registration due to expire has not been revoked by the Director.

A.7 Application for renewal

A.7.1 An application for renewal of a Certificate of Registration shall be submitted to the Director at least 90 calendar days prior to the certificate's expiry. The renewal application will be subject to the same process and conditions as the initial application for the Certificate of Registration.