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CAN/CGSB-43.147-2005

Supersedes CGSB-43.147-2005

Construction, Modification, Qualification, Maintenance, and Selection and Use of Means of Containment for the Handling, Offering for Transport, or Transporting of Dangerous Goods by Rail

ICS 03.220.30, 13.300, 45.060.20

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**CONSTRUCTION, MODIFICATION, QUALIFICATION,
MAINTENANCE, AND SELECTION AND USE
OF MEANS OF CONTAINMENT FOR THE HANDLING,
OFFERING FOR TRANSPORT, OR TRANSPORTING
OF DANGEROUS GOODS BY RAIL**

Prepared by the

Canadian General Standards Board 

Approved by the

Standards Council of Canada



Published December 2005 by the
Canadian General Standards Board
Gatineau, Canada K1A 1G6

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Acknowledgment is made for the translation of this National Standard of Canada by the Translation Bureau of Public Works and Government Services Canada.

FOREWORD

This version of the standard has a National Standard of Canada designation and supersedes the previous CGSB 2005 version of the standard with the designation CGSB-43.147-2005. There are no changes in the body of CAN/CGSB-43.147-2005 as compared to the previous CGSB-43.147-2005.

The standard has been incorporated 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.

Conformity assessment requirements are contained in this standard. Tank car facilities must be registered with the Director and hold a valid certificate of registration. As well, any new design or modification to an existing design must conform to the requirements of this standard and be approved by the Director.

The standard consists of four parts and six appendices. Part I is an introductory part that specifies requirements of general application with respect to the handling, offering for transport, or transporting of dangerous goods by rail in Canada. Part II specifies requirements for the construction and modification of tank cars and ton containers. Part III specifies requirements for the qualification and maintenance of tank cars, ton containers, and Specification 107 tanks. Finally, Part IV specifies requirements for the selection, use, and handling of means of containment, including ton containers, portable tanks, tank cars, hopper cars, and other large containers or transport units used in the handling, offering for transport, or transporting of dangerous goods by rail of Classes 2, 3, 4, 5, 6.1, 8, and 9 of the *Transportation of Dangerous Goods Act, 1992*.

Appendices A and B specify procedures and set out acceptance criteria for the measurement of liquefied petroleum gas and anhydrous ammonia emissions for tank cars in transportation. Appendix C specifies a procedure to test the tank car head puncture resistance. Appendix D specifies test procedures and sets out acceptance criteria for simulated pool-fire and torch-fire. Appendix E specifies procedures and sets out acceptance criteria for the dynamic longitudinal impact test of tank containers. Finally, Appendix F sets out in Schedule 1 the requirements applicable to special provisions 1 to 92, and Schedule 2 lists dangerous goods and specifies the special provisions that are applicable to each of the listed dangerous goods.

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CANADIAN GENERAL STANDARDS BOARD

**CONSTRUCTION, MODIFICATION, QUALIFICATION, MAINTENANCE,
AND SELECTION AND USE OF MEANS OF CONTAINMENT FOR THE
HANDLING, OFFERING FOR TRANSPORT, OR TRANSPORTING
OF DANGEROUS GOODS BY RAIL****PART I****GENERAL****1. SCOPE**

- 1.1 **Organisation and Content** — This standard consists of four parts and six appendices. Part I is an introductory part that specifies requirements of general application with respect to the handling, offering for transport, or transporting of dangerous goods by rail in Canada. Part II specifies requirements for the construction and modification of tank cars and ton containers. Part III specifies requirements for the qualification and maintenance of tank cars, ton containers, and Specification 107 tanks. Finally, Part IV specifies requirements for the selection, use, and handling of means of containment, including ton containers, portable tanks, tank cars, hopper cars, and other large containers or transport units used in the handling, offering for transport, or transporting of dangerous goods by rail of Classes 2, 3, 4, 5, 6.1, 8, and 9 of the *Transportation of Dangerous Goods Act, 1992*. Appendices A and B specify procedures and set out acceptance criteria for the measurement of liquefied petroleum gas and anhydrous ammonia emissions for tank cars in transportation. Appendix C specifies a procedure to test the tank car head puncture resistance. Appendix D specifies test procedures and sets out acceptance criteria for simulated pool-fire and torch-fire. Appendix E specifies procedures and sets out acceptance criteria for the dynamic longitudinal impact test of tank containers. Finally, Appendix F sets out in Schedule 1 the requirements applicable to special provisions 1 to 92, and Schedule 2 lists dangerous goods and specifies the special provisions that are applicable to each of the listed dangerous goods.
- 1.2 **Application** — The standard applies to both standardized and non-standardized means of containment but does not apply to means of containment with a capacity equal to or less than 450 L (116 US gallon).
- 1.3 **Minimum Requirements** — This standard sets out certain minimum requirements regarding the design, construction, qualification, selection, and use, or testing of means of containment. It is essential to exercise competent technical and engineering judgment in conjunction with this standard.
- 1.4 **Additional Requirements** — The *Transportation of Dangerous Goods Act, 1992*, and the *Transportation of Dangerous Goods Regulations* may call for additional requirements regarding the design, construction, qualification, selection, and use, or testing of means of containment.
- 1.5 Quantities and dimensions used in this standard are given in metric units with yard/pound equivalents shown in brackets where appropriate. The metric units shall be regarded as official in the event of a dispute.
- 1.6 The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This document 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.

2. REFERENCED PUBLICATIONS

2.1 The following publications are referenced in this standard:

2.1.1 Canadian General Standards Board (CGSB)

CAN/CGSB-43.146-94 — Intermediate Bulk Containers for the Transportation of Dangerous Goods, as amended by Amendment No. 2 dated June 1997 and the Corrigendum dated August 1998.

2.1.2 Canadian Standards Association (CSA)

CAN/CSA-B340-02 — Selection and Use of Cylinders, Spheres, Tubes and Other Containers for the Transportation of Dangerous Goods, Class 2

CAN/CSA-B620-03 — Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods

CAN/CSA-B621-03 — Selection and Use of Highway Tanks, Portable Tanks, Cargo Compartments and Containers for the Transportation of Dangerous Goods, Classes 3, 4, 5, 6.1, 8 and 9

CAN/CSA-B622-03 — Selection and Use of Highway Tanks, Multi-Unit Tank Car Tanks and Portable Tanks for the Transportation of Dangerous Goods, Class 2.

2.1.3 Department of Transport (Transport Canada)

Transportation of Dangerous Goods Act, 1992, Chapter 34, Statutes of Canada (including amendments)

Transportation of Dangerous Goods Regulations.

2.1.4 ASTM International

A20/A20M-01 — Standard Specification for General Requirements for Steel Plates for Pressure Vessels

A240/A240M-01 — Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels

A262-98 — Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

A285/A285M-90(2001) — Standard Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength

A302/A302M-97e1 — Standard Specification for Pressure Vessel Plates, Alloy Steel, Manganese-Molybdenum and Manganese-Molybdenum-Nickel

A370-97a — Standard Test Methods and Definitions for Mechanical Testing of Steel Products

A515/A515M-92(1997) — Standard Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service

A516/A516M-90(2001) — Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service

A537/A537M-95(2000) — Standard Specification for Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel

B162-99 — Standard Specification for Nickel Plate, Sheet, and Strip

B209-01 — Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

B209M-01 — Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)

2.1.5 American Society of Mechanical Engineers (ASME)

Boiler and Pressure Vessel Code, Section VIII, 1998 Edition.

2.1.6 Association of American Railroads (AAR)

Manual of Standards and Recommended Practices

Section B — Couplers, Cushion Units, and Freight Car Draft Components

M-901-2000 — Series for Draft Gears E, G, H, K