



COMPRESSED GAS ASSOCIATION, INC.

TECHNICAL BULLETIN

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GUIDELINES FOR THE SAFE FILLING OF LIQUEFIED PETROLEUM GAS CYLINDERS

Purpose

The purpose of this publication is to provide companies and their employees with guidelines for the safe filling of liquefied petroleum gas (LPG) cylinders and to ensure compliance with applicable safety and regulatory requirements. For the purpose of this technical bulletin, LPG includes but is not limited to butane, commercial propane, propylene, and mixtures of these products.

General

The safe filling of LPG cylinders shall be accomplished by qualified personnel trained in proper LPG handling and filling procedures.

LPG cylinders shall be filled only after determining that the cylinders have proper markings, are within the re-qualification date range, and have passed visual inspection requirements. These requirements are found in NFPA 58, CSA B149.2, 49 CFR, and CSA B339 [1, 2, 3, 4].

Training

Employee training on the following subjects shall be provided and documented:

- identification of cylinder markings (such as DOT-4BA240);
- periodic inspection intervals (such as 11-02E);
- filling procedures;
- cylinder labels (such as CGA C-7; NPGA/PERC *Certified Employee Training Program* (CETP); and ANSI/CSA Z21.58) [5, 6, 7];
- prefill inspection (such as NFPA 58 and CGA C-6) [1, 8]; and
- personal protective equipment.

Additional information on training can be obtained through National Propane Gas Association (NPGA). NPGA, in partnership with Propane Education and Research Council (PERC), has developed CETP, which is a comprehensive training program for employees in the propane industry. Specific training modules within CETP focus directly on prefill inspection and filling of LPG cylinders and are available for any individuals employed in this capacity. In Canada, see PTI 100-4, *Cylinder Visual Inspection and Requalification* [9].

For more information on CETP, including a schedule of courses and course descriptions, see NPGA's website at www.npga.org and click on "Safety/Training Programs."

Types of LPG cylinders

There are many different sizes of U.S. Department of Transportation (DOT) and Transport Canada (TC) cylinders for LPG storage. Cylinders with a minimum service pressure of 240 psi shall be stamped with the proper DOT/TC design code, which is illustrated in Table 1.

Cylinders containing propylene or mixtures of propylene shall be evaluated to determine the minimum service pressure. The minimum service pressure of a cylinder is a maximum of 80% of the pressure of the contents at 130 °F (54.4 °C).

Table 1—Typical DOT/TC cylinders

DOT/TC code	Typical cylinder material	Cylinder construction
3A, 3AM	Steel	Seamless
3AA, 3AAM	Steel	Seamless
3B, 3BM	Steel	Seamless
4B, 4BM	Steel	2 or 3 pieces, welded or brazed
4BA, 4BAM	Alloy steel (prescribed)	2 or 3 pieces, welded or brazed
4BW, 4BWM	Steel (prescribed)	3 pieces welded
4E, 4EM	Aluminum	2 pieces welded
ICC 26-240 ¹⁾	Steel	Welded
ICC 26-300 ¹⁾	Steel	Welded
¹⁾ Cylinders are no longer manufactured under this code; however, cylinders manufactured under this code are still in use today.		

Safe filling

Proper filling procedures shall be followed to ensure that an overfill condition does not occur and that the cylinder service pressure is not exceeded. In order to perform safe filling of LPG cylinders, as a minimum, the information in the following shall be reviewed and adhered to:

- NFPA 58 [1];
- CSA B149.2 [2];
- Title 29 of the U.S. *Code of Federal Regulations* (29 CFR) Part 1910 [10];
- applicable Canadian federal or provincial occupational health and safety regulations, including the *Hazardous Products Act* and *Controlled Products Regulations*, and *Workplace Hazardous Materials Information System* (WHMIS) regulations [11, 12];
- 49 CFR [3];
- CSA B339 [4]; and
- employee training (such as CETP and PTI 100-4) [6, 9].

References

Unless otherwise noted, the most current edition shall apply.

[1] NFPA 58, *Liquefied Petroleum Gas Code*, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269. www.nfpa.org

[2] CSA B149.2, *Propane Storage and Handling*, Canadian Standards Association, 5060 Spectrum Way, Mississauga, ON L4W 5N6, Canada. www.csa-america.org

[3] *Code of Federal Regulations*, Title 49 (Transportation) Parts 100-180, Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. www.gpoaccess.gov

[4] CSA B339, *Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods*, Canadian Standards Association, 5060 Spectrum Way, Mississauga, ON L4W 5N6, Canada. www.csa-america.org

[5] CGA C-7, *Guide to Preparation of Precautionary Labeling and Marking of Compressed Gas Containers*, Compressed Gas Association, Inc., 4221 Walney Rd., 5th Floor, Chantilly, VA 20151. www.cganet.com