



COMPRESSED GAS ASSOCIATION, INC.

TECHNICAL BULLETIN

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REQUIREMENTS FOR THE POST MANUFACTURE TARE WEIGHT MARKING OF CYLINDERS

Scope

This technical bulletin defines terminology, requirements, and procedures for the post manufacture marking of tare weights on cylinders of 1000 lb (454 kg) or less water capacity to be filled with liquefied compressed gas and other gases where the cylinder may require a tare weight. This bulletin does not apply to cylinders used in acetylene service.

The information contained in this bulletin will enhance the safety of packagings that are offered for transportation. These recommendations in no way supersede any existing state or local regulations or regulations of any other jurisdictions.

This bulletin does not address the requirements of filling cylinders with a liquefied gas. For liquefied gas filling, see Parts 173.304, 173.304a, and 173.304b of Title 49 of the U.S. *Code of Federal Regulations* (49 CFR) or CSA B340, *Selection and Use of Cylinders, Spheres, Tubes, and Other Containers for the Transportation of Dangerous Goods, Class 2*, for specific requirements [1, 2].

Also, this bulletin does not specifically address the following issues:

- Determination of maximum fill densities (49 CFR 173.304, 173.304a, 173.304b, or CSA B340) [1, 2];
- Determination of water capacities;
- Proper CGA outlets (CGA V-1, *Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections* and V-7, *Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures*) [3, 4];
- Cylinder types and ratings (49 CFR 173.304, 173.304a, 173.304b, or CSA B340) [1, 2]; and
- Pressure relief device requirements (49 CFR 173.301(f) refers to CGA S-1.1, *Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases*, which then refers to CGA S-7, *Method for Selecting Pressure Relief Devices for Compressed Gas Mixtures in Cylinders*) [1, 5, 6].

Definitions

Tare weight—The mass of an empty cylinder including:

- the valve;
- the valve guard (when affixed to the valve or directly to the cylinder);
- the valve outlet cap/plug if permanently attached by a chain;
- an eductor tube (if applicable);
- all permanent attachments (e.g., collar, neckring, or footring); and
- coatings.

NOTE—The tare weight does not include the cylinder cap or any outlet cap/plug not permanently attached by a chain.

Mass weight—The weight of the empty cylinder including all permanent attachments (collar, neckring, or footring) but not including:

- the cylinder cap;
- the valve;
- the valve outlet cap/plug; or
- an eductor tube.

NOTE—Mass weight, where used, is indicated by the letter “M” instead of the letter “T” on the cylinder.

Liquefied compressed gas—A gas that under the filled pressure is partially liquid at a temperature of 68 °F (20 °C).

Requirements for marking cylinders with tare weight

All cylinders that will be filled with a liquefied compressed gas shall be marked with a tare weight as permitted by 49 CFR 173.301(b) or required by CSA B339, *Cylinders, Spheres, and Tubes for the Transportation of Dangerous Goods* [1, 7].

In some instances gases that are not considered liquefied compressed gases as defined in this bulletin, such as silane, are filled gravimetrically. In these instances, the cylinder shall be marked with a tare weight.

Each time an operation that may change the tare weight is performed on the cylinder such as a valve change, shot blasting, footring replacement, etc., the tare weight shall be verified. If the weight differs from the marked tare weight by more than 1%, it shall be adjusted.

Determination of tare weight

To determine a proper tare weight, proceed as follows:

- a) If the cylinder is valved, remove the valve as outlined in CGA P-38, *Guidelines for Devalving Cylinders* [8];
- b) Visually inspect the cylinder internally and externally as per CGA C-6, *Standards for Visual Inspection of Steel Compressed Gas Cylinders*, CGA C-6.1, *Standards for Visual Inspection of High Pressure Aluminum Compressed Gas Cylinders*, or CGA C-6.3, *Guidelines for Visual Inspection and Requalification of Low Pressure Aluminum Compressed Gas Cylinders* [9, 10, 11]. Additionally, verify that no product remains in the cylinder. After visual inspection is complete, it should be determined if it is necessary or appropriate at this time to subject a cylinder to regulatory periodic requalification. For DOT 4 Series cylinders that have lost 5% or more of their original tare weight, refer to 49 CFR 180.209(c) for specific directions;
- c) After determining the cylinder is fit for continued service, reinstall the valve into the cylinder. Valves are to be reinstalled and torqued (or seated) into cylinders per regulatory or manufacturer’s recommended values and requirements. Valves should be reinstalled into aluminum cylinders in accordance with CGA V-11, *General Guidelines for the Installation of Valves into High Pressure Aluminum Alloy Cylinders* [12];
- d) Weigh the cylinder, valve (and valve outlet cap/plug if permanently attached and eductor tube if applicable) on a calibrated scale that has an accuracy of +1% of the tare weight;

NOTE—Higher accuracy may be required by local/state/federal bureaus of weights and measures or for contractual purposes.

NOTE—The scales should be calibrated in accordance with local/state/federal bureaus of weights and measures.

- e) Mark the tare weight, as determined previously, on the cylinder as described in the following marking sections; and
- f) Stamp one diagonal line through the obsolete, original tare weight(s), if present, so that it is still legible for future reference.