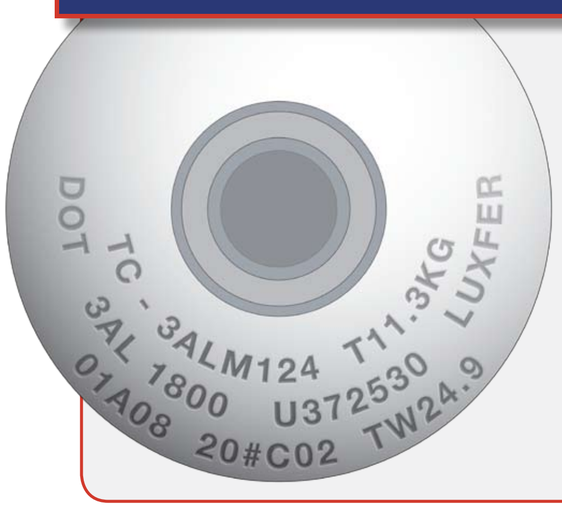
Luxfer
Gas Cylinders

Care & Maintenance

A guide to beverage cylinder safety

CYLINDER MARKINGS

What they mean



TC or CTC ..... Transport Canada
3ALM ..... Aluminum specification (Canada)
124 ..... Service pressure (bar)
T11.3KG ..... Tare weight (Kilograms)
DOT ..... U.S. Department of Transportation
3AL ..... Aluminum specification (U.S.A.)
1800 ..... Service pressure (PSI)
U372530 ..... Serial number
LUXFER or M#### ..... Manufacturing plant identifier
01 ..... Month of manufacture
A ..... Mark of independent inspector
08 ..... Year of manufacture
20#C02 ..... CO_2 capacity
TW24.9 ..... Tare weight (lbs)

Cylinder stamping layouts have changed slightly over the years. If in doubt, please contact Luxfer Customer Service in the U.S. by calling toll-free: 800-764-0366

INSPECTION

Visual inspection of cylinder & valve

- The United States Department of Transportation (USDOT) requires that aluminum cylinders be requalified every five years by a licensed requalifier in accordance with Code of Federal Register (CFR) Title 49, 170-179 and Compressed Gas Association (CGA) publication C-6.1. (In other countries, an authorized requalifier will conduct inspections according to industry standards and local regulations.)
- Inspections should be conducted in clean, well-lit, well-organized surroundings, free from grease and other hydrocarbons. Required inspection equipment: an internal inspection light of extra-low voltage, 2x magnification mirror, suitable cylinder clamping and cleaning equipment.
- Always wear safety gear, including protective gloves, eye protection and safety shoes.
- The cylinder must be emptied before inspection. Check to see if the cylinder has a siphon tube (which screws into the valve and extends to a point slightly above the cylinder bottom). If the cylinder has a siphon tube, let the cylinder stand undisturbed in an upright position for five minutes to allow gas to settle. Then empty the cylinder, allowing liquid CO_2 to flow from the bottom of the cylinder. If the cylinder does not have a siphon tube, invert the cylinder (valve down) and keep it undisturbed in this position for five minutes to allow gas to settle. Then, with the valve facing away from you, slowly open the valve and allow remaining gas to escape completely. Make sure that you have discharged any moisture or sediment—nothing should remain in the cylinder.
- Using a wrench, turn the valve counter-clockwise to loosen it. If the valve seems stuck, spray a small amount of Molykote 557 (or an equivalent lubricant) into the threaded joint and allow it to penetrate. Applying torque carefully, rock the wrench gently back and forth until the joint loosens. If necessary, reapply the lubricant until the joint loosens.
- Inspect the valve carefully for defects (such as damaged threads, burrs, dings or gouges) in accordance with the valve manufacturer's recommendations. The hand wheel should move freely, and the pressure-relief device must be intact. *Warning:* Never use a pressure-relief device that has been modified and no longer meets its manufacturer's original specifications. Use of such modified devices may result in catastrophic failure, property damage, personal injury or death! *Don't take chances!*

Reinserting the valve

- Use great care when installing valves on aluminum cylinders. Apply a new O-ring compatible with CO_2 (Luxfer recommends a 90-Shore buna-N O-ring).
- If you used Molykote 557 or an equivalent lubricant, make sure that all traces of it are cleaned from cylinder and valve threads before inserting the valve. Sparingly use Dow Corning Compound III or its equivalent to lubricate the lower five valve threads—using too much lubricant may interfere with proper seating of the O-ring and cause leakage.
- Reinsert the valve and tighten it by hand. If the valve fails to screw in easily, reinspect the threads on both the valve and the cylinder. If cylinder threads are damaged, the cylinder should not be refilled, but removed from service immediately and sent to a requalifier for inspection.
- Place the cylinder in a holding fixture suitable for aluminum cylinders and use a torque wrench to tighten the valve to Luxfer's recommended torque (see below). Be careful not to over-torque the valve, which could damage cylinder neck threads.
- Recommended maximum torque:
  - 75 ft.lbs. (101.7 Nm) for 750-16 UNF threads (C1.25-C2.5).
  - 100 ft.lbs. (135.6 Nm) for 1.125-12 UNF threads (C5-C50).
- Luxfer recommends applying 60% of the maximum torque for a new valve/cylinder assembly.

FILLING

Before every fill

- Inspect the valve, looking for corrosion, a broken handle and worn or damaged components. Inspect the pressure-relief device (PRD), which must be intact. (The PRD is also sometimes called the safety-relief device, safety disc or burst disc.)
- Inspect the cylinder wall for dents, gouges or corrosion. Look for signs of electrical arcing or burn marks that could indicate exposure to high temperatures. Make sure the valve protector, carrying handle, valve and handwheel are in good condition.
- Check valve operation by opening the valve slightly with the outlet pointing away from you. Let a small amount of gas blow freely through the valve to confirm that the valve is not clogged. (If the cylinder is empty, add a small amount of CO_2 and then check valve operation.)
- If no gas blows through the valve, the valve may by clogged by corrosion, sediment or moisture, or it may have water frozen in it. Refer to the valve manufacturer's instructions for corrective procedures.
- Before emptying remaining contents, let the cylinder stand undisturbed for five minutes to allow gas to settle. Check to see if the cylinder has a siphon tube (also called an eductor), which screws into the valve and extends to a point slightly above the cylinder bottom. If the cylinder has a siphon tube, empty the cylinder in an upright position, allowing liquid CO_2 to flow from the bottom of the cylinder. If the cylinder does not have a siphon tube, invert it (valve down) and keep it undisturbed in this position for five minutes to allow gas to settle. Then, with the valve facing away from you, slowly open the valve and allow remaining gas to escape completely. If you notice an unusual or foul odor, it may indicate that the cylinder is contaminated and requires internal inspection and cleaning.

How to do it safely

- Place a cylinder equipped with a valve onto a calibrated scale.
- Record the weight of the empty cylinder and valve. Luxfer's cylinder weights are very consistent. Connect the filling hose and note the combined weight of the cylinder, valve and hose.
- Add this number (cylinder + valve + hose) to the CO_2 weight stamped on the cylinder crown (or otherwise specified) and calculate a total target weight, which will include the empty cylinder, valve, hose and the CO_2 itself.
- Open the cylinder valve and slowly begin filling the cylinder. Closely watch the scale to make sure it responds properly as the weight of the CO_2 is added.
- When you reach the total desired target weight, stop filling. *Never overfill!* Overfilling, even by a small amount, can cause premature activation of the pressure-relief device and loss of contents. If overfilling occurs, slowly release CO_2 until the target weight is reached.
- Close the valve firmly and disconnect the hose. Observe the reading on the scale to make sure that it drops to the correct weight when the hose is removed.
- Make sure that required safety labels are on the cylinder. These labels (which vary by country) help protect cylinder users and the public at large.

Warnings!

- **Never** overfill a cylinder! Fill only to the rated capacity stamped on the cylinder crown. Overfilling can cause the pressure-relief device on the valve to activate, which can cause personal injury and property damage!
- **Never** fill a cylinder if it leaks!
- **Never** fill a cylinder that shows signs of damage (gouges, dings, cuts, dents or bulges), contamination or corrosion. Set the cylinder aside and send it to a certified requalification station to be inspected and retested in accordance with regulatory requirements.
- **Never** fill a cylinder that is "out of test," i.e., past its required requalification date (sometimes called the "hydro date" or "hydrostatic test date"). The most recent requalification date will be stamped on the cylinder crown. If necessary, send the cylinder to a certified requalifier to be retested.
- **Never** tamper with the cylinder valve, pressure-relief device or other cylinder attachments. Replace these attachments as necessary only with manufacturer-approved components.
- **Never** remove, obscure or alter labels or markings.
- **Never** expose cylinders to a temperature exceeding 265°F (130°C).

GENERAL SAFETY

Storage & handling

- Store the cylinder in a dry, well-ventilated area at a room temperature of 70°F (21°C).
- Keep the cylinder away from any heat source.
- Keep the cylinder above ground to avoid possible contact with caustic cleaning agents.
- The cylinder can be stored vertically or horizontally, but should always be restrained from movement. The Cylinder must always be used in the upright position at all times to prevent liquid CO_2 from interfering with the pressure-relief device and possibly causing catastrophic failure.

Cleaning & painting

- **Interior cleaning:** To remove normal moisture and light soil, steam clean and blow dry the cylinder. If an odor is present rinse the cylinder interior with a sodium bicarbonate (baking soda) solution, then rinse with a mild acetic acid (vinegar) solution, and finally steam clean then blow dry.
- **Exterior cleaning:** Use mild soap and water to remove most grime, soil and scuff marks. For more resistant soil, use a mildly abrasive, non-metallic scrubbing pad and a mild cleanser labeled as "acceptable for aluminum." Never use harsh abrasives, corrosives, solvents or cleaning products that are not recommended for aluminum—doing so could remove metal from the cylinder and lead to catastrophic failure.
- **Painting:** Use only air-drying paints labeled suitable for aluminum. Never use paints that require baking or heating (e.g., baked enamel). Never use corrosive paint strippers or cleaners, which will damage the cylinder.

For your safety

Follow these precautions when using a high-pressure aluminum CO_2 cylinder:

Explosion Hazard: Improper use, filling, storage or disposal of a Luxfer CO_2 cylinder or failure to heed this warning may cause property damage, serious injury or death. Use and maintain the cylinder in strict accordance with the following instructions and applicable Compressed Gas Association (CGA) guidelines. Keep the cylinder out of reach of children. Do not alter or modify the cylinder or related components. Do not over-pressurize the cylinder. Only properly trained personnel should fill the cylinder. Fill only to the capacity specified (see CGA Video AV-7 for additional information on proper filling procedures). Overfilling can cause the pressure-relief device to activate with a loud noise, and the cylinder may spin or fall, resulting in injury or property damage. Always fill and use the cylinder in an upright position to avoid rupture of the regulator or connections or failure of the pressure-relief device. Check for leaks, and do not fill the cylinder if it is leaking. Never fill a cylinder if it has not been requalified within the last five years (see the latest test or retest date on cylinder crown). Cylinders that have been refinished must meet guidelines and requalification requirements specified in the latest edition of CGA C-6.1. Aluminum cylinders subject to action of fire or heated to temperatures of 350°F (175°C) or more must be withdrawn from service and condemned. Cylinders exhibiting fire damage, arc burns or torch burns must be condemned. Inspect for damage each time a cylinder is to be filled. Do not fill a damaged cylinder; remove it from service and have it inspected in accordance with CGA C-6.1 by a certified requalifier. Do not alter or change a valve or pressure-relief device. Only trained personnel should remove and replace pressure-relief devices and valves with complete assemblies supplied by valve manufacturers. Do not use corrosive paint strippers or corrosive cleaners, which will damage cylinders. Protect cylinders from heat, damage and corrosion.

For more information, visit www.luxfercylinders.com or contact Luxfer Customer Service: toll-free telephone: 800-764-0366; fax: 951-781-6598.