

BULK LIQUIFIED CO₂ TANK REQUIREMENTS

Where there are less than (2) 50lb. DOT approved high pressure cylinders used inside or outside of the structure, per system, gas detection and alarm systems shall not be required

Gas Detection and Alarms

- Rooms or areas where container systems are filled and used indoors or in enclosed outdoor locations shall be provided with a gas detection and alarm system that is capable of detecting and notifying the building occupants of a gas release that creates carbon dioxide vapors in excess of its PEL. **(2013 NFPA 55, 13.2.2)**
- Audible alarm (30,000 ppm) evacuation shall sound, to alert persons of a hazard condition in the area it is installed and shall transmit off-site as a gas specific alarm when the facility has a system capable of monitoring signals off site or established protocols are in place to call 911. **(2013 NFPA 55, 13.2.2.3)**
- A warning sign shall be posted at the entrance to the building, room, enclosure, or confined area where the container is located. **(2013 NFPA 55, 13.2.3)**
- Gas detection system shall be tied into fire alarm monitoring system if provided.

Signage

- Provide NFPA 704 Fire Diamond on each tank and/or outdoor cabinet that stores carbon dioxide. **(2013 NFPA 55, 4.10.2.1)**
- The warning sign shall be at least 8 inches (200 mm) wide and 6 inches (150 mm) high and state the following: ***CAUTION — CARBON DIOXIDE GAS. Ventilate the area before entering. A high carbon dioxide (CO₂) gas concentration in this area can cause suffocation.*** **(NFPA 55, 13.2.3.1)**

Pressure Relief Piping

- Pressure relief devices shall be piped to the outdoors where the discharge will not impinge on the structure, personnel, or means of egress and will not create a hazardous concentration of carbon dioxide **(2013 NFPA 55, 13.1.1.2)**

Piping and Fittings

- Provide label on piping to indicate exact contents and direction of flow. These labels shall be placed every 20 feet, major change in direction and where piping enters and leaving walls. **(2012 International Fire Code Chapter 5303.4.3)**
- Piping, tubing, pressure regulators, valves, and other apparatus shall be kept gastight to prevent leakage. A soap test of all joints will be conducted at the time of inspection by the building owner or contractor and witnessed by the Fire Inspector. **(NFPA 55, 7.3.1.3.1)**

- Piping, tubing, hoses, and fittings shall be designed to a bursting pressure of at least four times the system design pressure. **(2013 NFPA 55, 13.1.3.2)**
- All fittings used in the piping system shall be designed for a working pressure not to exceed 125% of designed pressure of the hose.
- Acceptable piping for Carbon Dioxide shall be the following:
 - Stainless steel A269 grade, which is either seamless or welded drawn over mandrel, the following connection types: flare, welded, brazed or bites type compression.
 - Copper K grade, hard-drawn seamless, with the following connection types; flared, welded, brazed, bite type compression.
 - Copper ACR grade (1/2 in OD or less) annealed seamless with the following types of connections some appraised, flared or bite that can pressure compression.
 - Additional approved piping and fittings can be found in CGA G6.1 Standard for Insulated Liquid Carbon Dioxide System for Consumer Site. A special report, stamped by an Georgia Registered Engineer, on the piping material shall be submitted to the City of Cartersville Fire Department for the installation of material that is not listed in **CGA G6.1** standard, including plastic tubing.
 - Rigid plastic piping shall not be allowed.

Ventilation

- Tanks located inside a building shall be provided with mechanical ventilation. When tanks are located in an area that is not ideal for continuous ventilation, an alternative method for ventilation may be submitted to the Cartersville Fire Prevention Office for review.
- Ventilation systems shall discharge a minimum of 50 ft. from intakes of air handling systems, air-conditioning equipment, and air compressors. **(2013 NFPA 55, 6.16.6)**
- The exhaust system shall be installed in accordance with the requirements of the adopted mechanical code **(2013 NFPA 55, 13.3.1.1.2.1 (1))**
- For gases that are heavier than air, exhaust shall be taken from a point within 12 in. (304.8 mm) of the floor. **(NFPA 55, 6.15.7.2) (2013 NFPA 55, 13.3.1.1.2.1 (2))**
- The location of the exhaust and intake openings shall be designed to allow air movement across all areas to prevent accumulation of vapors **(2013 NFPA 55, 13.3.1.1.2.1 (3))**
- The rate of exhaust ventilation shall not be less than 1 scf/min per square foot of floor area within the enclosure **(2013 NFPA 55, 13.3.1.1.2.1 (4))**
- The termination point of exhaust outlets and ducts discharging to the outdoors shall be located 10 feet from property lines, 3 feet from exterior walls and roofs, 10 feet from operable openings into the building, and 10 feet above adjoining grade. **(International Mechanical Code Section 501.3.1)**
- A manual activation switch shall be provided at the entrance of the area where the ASME vessel or DOT cylinders are located. This manual activation switch shall be clearly marked with its function.

Emergency Shutoff

- Where power ventilation is provided, a manual shutoff switch shall be provided outside the room in a position adjacent to the principal access door to the room or in an approved location. The switch shall be the breakglass or equivalent type and shall be labeled as follows: **WARNING: VENTILATION SYSTEM EMERGENCY SHUTOFF (2013 NFPA 55 6.16.3.3, 6.16.3.3.1)**

Outside Tank and Point of Fill Distances (2013 NFPA 55 Table 13.5.1)

Minimum separation distances for outside tanks and point-of-fill connections:

- Buildings- 2 ft.
- Wall openings other than exits- 2 ft.
- Air intakes- 10 ft.
- Property lines- 5 ft.
- Assembly occupancies- 50 ft.
- Nonambulatory patient areas- 50 ft.
- Combustible materials- 15 ft.
- Incompatible hazardous materials- 20 ft.
- Building exits- 10ft.

This summary is not a complete review of the adopted fire code or other City of Cartersville requirements, laws and ordinances. It is the responsibility of the owner and design professional to ensure that a diligent design and application of the adopted fire code requirements is accomplished. This summary is only intended to offer basic information about particular fire code requirements and is not a comprehensive analysis of all of the requirements contained in the adopted fire code. It is not an official interpretation or an approval to install a CO2 system and it is not a Cartersville Fire Department or Planning and Development Department permit.