Lubbock Fire Marshal's Office
1205 15th St. 2nd Floor
Lubbock, Texas 79401
806-775-2646 • Fax 806-775-3508
fireprevention@mylubbock.us

Carbon Dioxide Systems Used in Beverage Dispensing Applications

Overview:

The International Fire Code (IFC) requires an operational permit for Carbon Dioxide (CO_2) Beverage Dispensing System utilizing more than 100 pounds of CO_2. The IFC recognized a need for oversight of these larger systems in response to several fatal CO_2 poisoning (asphyxiation) incidents having occurred in restaurants across the nation. CO_2 is a colorless, odorless gas that is heavier than air. As such, leaking CO_2 will fill a room from the floor up, displacing the oxygen and creating a potential asphyxiation hazard to the room's occupants.

Scope:

The intent of this document is to provide information and guidance to ensure the design and installation of these larger systems comply with national standards. These guidelines are to be followed when a business proposes to install or modify a Carbon Dioxide (CO_2) Beverage Dispensing System with more than 100 pounds of CO_2. These systems can be found in restaurants, nightclubs, convenience stores and other similar locations.

Construction Permit:

A construction permit is required prior to installing or modifying CO_2 beverage dispensing systems having more than 100 pounds of CO_2. Construction permits are detailed drawings and component specification sheets submitted to the Fire Marshal's Office for review and approval. Submitted plans will be reviewed within 15 business days on a first come first serve basis.

Operational Permit:
An operational permit is required for CO_2 systems used in beverage dispensing applications having more than 100 pounds of CO_2. Operational permits are obtained by passing a Fire Marshal's Office inspection of their CO_2 beverage dispensing system. Inspection requests may be made by calling the Fire Marshal's Office at 806-775-2646.

New Installations/Modified Installations:
New, retrofit or modified CO_2 beverage dispensing installations with a capacity more than 100 pounds of CO_2 are required to obtain a construction permit prior to installation. Once installed, the applicant must contact the Fire Marshal's Office and request an operational permit inspection of the completed system.

Compliant installation:
1. All equipment and installations shall be in accordance with the IFC (2021 edition), section 5307 and NFPA 55 (2019 edition), Chapter 13.
2. Insulated systems shall have pressure relief devices vented in accordance with NFPA 55.
3. The system shall be installed so that all tanks and components are protected from damage.
4. When cylinders, tanks, piping and equipment are located indoors where leaking CO_2 could collect, these rooms or areas shall be provided with either (option 1) - CO_2 gas ventilation system as specified below in #5 or (option 2) - an emergency alarm CO_2 gas detection system as specified below in #6.
5. <u>Ventilation Option 1</u>: Exhaust ventilation systems shall comply with all the following:
    a) Installation shall be in accordance with the International Mechanical Code.
    b) Mechanical ventilation shall be at a rate of not less than 1 cubic foot per minute per square foot of floor area over the storage area.
    c) Systems shall operate continuously unless alternative designs are approved by the AHJ.
    d) Exhaust shall be taken from a point within 12 inches of the floor.
    e) The ventilation system shall be designed to operate at a negative pressure in relation to the surrounding area.

6. Emergency alarm Option 2: An emergency alarm CO_2 gas detection system shall be provided in rooms or indoors areas and in below-grade outdoor locations with insulated carbon dioxide systems. The system shall be designed as follows:
   a) Carbon dioxide sensors shall be provided within 12 inches of the floor in the area where the gas is expected to accumulate or other location as approved by the AHJ.
   b) The system shall activate an audible and visual supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm.
   c) The system shall activate an audible and visual alarm within the room or immediate area where the system is installed upon detection of a carbon dioxide concentration of 30,000 ppm.

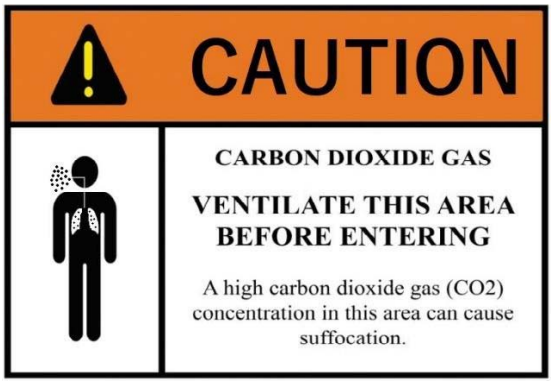
7. Piping, tubing, hoses and fittings shall be designed to a bursting pressure of at least four times the system design pressure. Materials of construction shall be employed for potential exposure to a temperature of -109.3°F (-79.5°C).

8. 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.

9. Containers, cylinders, and tanks shall be provided with a pressure gauge and a level gauge or device for indicating the quantity of liquid carbon dioxide. These devices shall be designed for the temperatures and pressures associated with liquid carbon dioxide service. Where containers, cylinders, and tanks are in locations remote from the filling connection, a means to determine when the containers have been filled to their design capacity shall be provided and shall be verifiable from the filling connection.

10. A warning sign shall be posted at the entrance to the building, room, enclosure or area where the CO_2 container is located. The warning sign shall be at least 8 inches wide and 6 inches 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



Example

11. NFPA 704 diamond sign shall be posted at the exterior door near the CO_2 tank.

Example

Submittal Requirements:

1. Completed form titled "Plans Review Submittal Request". There is a fee of $100 due prior to review.

2. Drawings shall be provided with the correct business name and address of the location (customer) receiving the installation and the company responsible for installing the system.

3. Drawings shall contain the name and phone number of the designing person. This person shall also sign and date all copies of the drawing.

4. Drawings shall be professional, legible and drawn to scale.

5. Submittal shall include a written scope of work including a description of the operation of the systems.

6. A configuration drawing of system equipment and their location to include:
   a) Location of CO_2 tanks
   b) Site plan and/or floor plan of the installation.
   c) Routing of all piping including venting and filling.
   d) Location(s) of all means of egress (exits).

7. A full equipment listing.

8. Manufactures documentation (spec sheets) for all parts and materials used in the project. This is to include all UL or NRTL listings and evaluations.

9. Drawings shall be generated by the installing company specific to the installation, and shall not be copies from previous jobs.

10. All installations shall comply with the approved plans. Any deviation from the approved plans requires a resubmittal to the Fire Marshal's Office.

Lubbock Fire Marshal's Office
1205 15th St. 2nd Floor
Lubbock, Texas 79401
806-775-2646 • Fax 806-775-3508
fireprevention@mylubbock.us

PLANS REVIEW REQUEST

PLEASE PRINT

☐ **Submittal** ☐ **Re-submittal**

Date: _____

Contractor Name: _____

Contact Person: _____ Telephone No.: _____

Email Address: _____

Facility Name: _____

Facility Legal Address: _____

Type of Plan:
☐ Fire Alarm System **(See Below)** ☐ Fire Sprinkler System **(See Below)** ☐ Flow Test **($200)**
☐ Clean Agent System **(See Below)** ☐ Fire Sprinkler Underground **($100)**
☐ Kitchen Hood Suppression System **(See Below)**
☐ Emergency Responders Radio Coverage System **(See Below)**
☐ Other: _____

Paid by: ☐ **Check** (Payable to City of Lubbock) ☐ **Cash** ☐ **Credit/Debit**

Plan Submittal:
$0.01 per Square Foot of system coverage ($100 minimum): _____SQFT x 0.01= $_____

Plan Re-submittal:
$0.02 per Square Foot of system coverage ($100 minimum): _____SQFT x 0.02= $_____

OFFICE USE ONLY

Date Reviewed: _____ Reviewed By: _____

Person Notified: _____ Date: _____

Contractor or Representative: _____ Date: _____
(To be signed at the time plans are picked up)

Revised 10/1/2025