AUSTIN FIRE DEPARTMENT
6310 WILHELMINA DELCO DR. AUSTIN, TX 78752
P: 512.974.0160 **E:** FirePrevention@austintexas.gov

Guideline for Carbon Dioxide used for Beverage Dispensing

This document is intended to inform business owners, design professionals, contractors, and carbon dioxide (CO2) system installation installers of the requirements for CO2 systems. CO2 is an asphyxiation hazard due to the toxic nature with which it affects breathing.

I Scope

This document covers the requirements for CO2 systems used for beverage dispensing that are 101 lbs. or greater in capacity.

II Definitions

Carbon Dioxide System: An assembly of equipment consisting of one or more carbon dioxide supply containers, interconnected piping, pressure regulators, and pressure relief devices.

Existing system: A system installed but not permitted by the City of Austin as part of a commercial building review process.

Fire Code: The version of the International Fire Code currently adopted by the City of Austin including Local Amendments and applicable standards. As of September 1, 2021, the City of Austin has adopted the 2021 International Fire Code.

High Pressure Carbon Dioxide Tank: A compressed gas cylinder containing carbon dioxide at a high pressure.

Insulated Carbon Dioxide Tank: An insulated tank containing carbon dioxide that is stored at subfreezing temperatures as a liquid/gas mixture.

Indoor Installation: Installations that do not allow for natural ventilation due to the systems physical location. They include:

1) Rooms within buildings
2) Enclosures sheltered from weather with a roof and enclosed on two or more sides with a solid wall.
3) Enclosures sheltered from weather with a roof and exceeding 1500 sq. ft.
4) Enclosures with walls on all sides and no roof when the walls or fencing do not allow natural ventilation. Fencing or enclosed walls that are 25% open at the ground level on 2 opposite sides are considered to provide natural ventilation.

Outdoor enclosures too small for human occupancy are not considered indoors regardless of amount of enclosure.

Small Rooms: Rooms less than 45 ft by 45 ft with a 10 ft ceiling or rooms with a volume of less than 20,250 cu.ft.

System Capacity: The capacity of the tank supplying the system or, when tanks are manifolded together, the aggregate quantity of all tanks supplying the system. Tanks in storage are not considered part of the system capacity.

III Plan Submittals

A. Types of submittals:

1) New carbon dioxide (CO2) beverage dispensing systems must be permitted through the Development Services Department (DSD) permitting process.
2) Existing CO2 systems that are being modified to increase capacity must be permitted as a new CO2 beverage dispensing system.
3) Existing CO2 systems not previously permitted through DSD will be reviewed by AFD to determine if they should go through the DSD permitting process. Scaled or dimensioned plans must be submitted to AFDHazmat@gmail.com .

B. Plan Submittal Requirements:

1) Specification sheet for the container(s), piping, hoses, fittings, and CO2 detectors
2) A scaled plan with the following
    a. Location of the container(s)
    b. Container size(s)
    c. Hose line routing
    d. Detector locations
    e. Fill location

IV Operational Permits:

Carbon Dioxide systems 101 lbs in capacity or greater are required to obtain an Aboveground Hazardous Materials Permit (HMP) for the storage and use of the carbon dioxide. The fee for an HMP varies depending on the type of material and quantity stored. An estimate of the permit cost will be provided at the time of submission, and a bill with the final fee will be provided once the application is reviewed and approved.

The HMP Application can be found at http://www.austintexas.gov/department/hazmat-permit

V Carbon Dioxide System Requirements:

A. Containers and cylinders shall:

1) Meet the requirements of DOT or ASME.
2) Be provided with pressure relief devices and must
    a. Discharge outdoors and not create a hazardous concentration of carbon dioxide
    b. Be protected from the intrusion of water or moisture
3) Be provided with pressure and level indicators
4) Be labeled with the name of the gas
5) Be protected from damage and unauthorized use
6) Not be set directly on the soil and must be protected from water accumulation at the base.
7) Have fill connections located outdoors
8) Be protected from vehicular damage if located outdoors

B. Piping systems shall:

Meet the requirements of ASME B31.3 and be designed for the temperatures and pressure of the material it will contain.

1) For insulated liquid systems piping/hoses/tubing be able to withstand a temperature of -109.3 F
2) Have manual or automatic shutoffs at the point of use and the source connection
3) Be labeled with the contents and direction every 20 ft and at every change in direction.
4) All hoses and tubing used in insulated liquid service shall be designed for 4 times their design pressure.
5) Be provided with pressure relief devices anywhere that liquid CO2 can potentially be trapped
6) All hoses and tubing used in liquid carbon dioxide service shall be designed to burst pressure 4 times their design pressure.
7) All fittings for insulated liquid service shall be designed for a pressure no less than 125% of the design pressure of the hose or tubing. As an alternative to providing fitting documentation, we will accept a gas detection system.
8) Be field tested to 110% of operating pressure for a minimum of 10 minutes. AFD will need to witness testing or receive documentation from testing company on company letterhead showing date of the test and the test results.

C. Mechanical Ventilation:

Continuous mechanical ventilation is required where storage tanks, cylinders, piping, and equipment are located indoors unless an emergency alarm system is provided. Mechanical Exhaust ventilation systems shall comply with all the following:

1) Installation shall be in accordance with the *Uniform Mechanical Code*.
2) 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.
3) Systems shall operate continuously
4) A manual shutoff control shall be provided outside of the room in a position adjacent to the access door to the room or in an *approved* location. The switch shall be a break-glass or other *approved* type and shall be *labeled*: "VENTILATION SYSTEM EMERGENCY SHUTOFF."
5) Exhaust shall be taken from a point within 12 inches of the floor.
6) Exhaust air shall not be recirculated to occupied areas

D. Emergency Alarm Systems must meet the following requirements:

1) Indoor installations of CO2 systems require an emergency alarm system that complies with the following:
    a. Continuous gas detection at:
        i. indoor container location
        ii. each termination point for CO2 gas
        iii. the lowest floor level if the installation is above grade level and communicates with the lower level
        iv. basement levels
        v. in small rooms where CO2 is routed over the room
    b. Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm (9000 mg/m^3).

c. Activates an audible and visible alarm within the room or immediate area where the system is installed upon detection of a carbon dioxide concentration of 30,000 ppm (54 000 mg/m^3).
d. Plug in type alarms are acceptable if the plug is visible from the detector location. A sign shall be provided indicating unplugging of the detector is prohibited. The use of extension cords is prohibited.

D. Warning Signs

Warning signs shall below is posted at the entrance to any room, enclosure, and confined space where a container or cylinder is located. The sign shall be at least 8 inches long and 6 inches tall.

CAUTION – CARBON DIOXIDE GAS

Ventilate the area before entering.

A high carbon dioxide (CO2) gas concentration in this

Area can cause suffocation

VI Maintenance:

Carbon dioxide equipment, mechanical ventilation systems, and detection systems shall be maintained in proper working order and shall be inspected and tested per the manufacturer's instructions.

VII Assistance:

For technical or engineering assistance please email fireprevention@austintexas.gov

For administrative or Aboveground Hazardous Materials Permit assistance please email AFDHazmat@austintexas.gov or call 512-974-0160, Option 3.