



GUIDELINES FOR THE SAFE USE AND STORAGE OF STATIONARY LIQUID CARBON DIOXIDE TANKS

To provide for uniformity and to ensure public and worker safety, the Hayward Fire Department has established these guidelines for the proper use and storage of liquid carbon dioxide (CO₂) in stationary tanks. They are based on the National Fire Protection Association (NFPA) Standard 55 (Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks) and on other applicable codes, including the 2013 California Fire Code, Chapter 50 (Hazardous Materials) and Chapter 53 (Compressed Gases).

Permits

- A permit is required to install or modify stationary liquid carbon dioxide (CO₂) tanks. Submit an application for a permit to the City's Permit Center.
- Provide installation/modification plans, installation instructions from the manufacturer and cut sheets for the tank and other equipment with the permit application.
- The plans must show how the tank shall be bolted for seismic restraint. Contact the Building Division at (510) 583-4140 for details on this requirement.
- If the system contains 200 cubic feet or more of CO₂ at normal temperature and pressure (NTP), equivalent to 22.7 pounds or more of CO₂, then the business owner or operator is required to submit a Hazardous Materials Business Plan (HMBP). Contact the Hayward Fire Department at (510) 583-4910 for more information.

Other Requirements

- All liquid carbon dioxide tanks shall comply with NFPA 55.
- Tanks shall satisfy the design and construction requirements in NFPA Standard 55, Chapter 13.
- Vent and 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.
- Vent piping systems serving pressure relief devices shall be protected from water intrusion to prevent moisture or solid carbon dioxide from collecting and freezing, thus interfering with the operation of the pressure relief valve (NFPA 55-1.1.2 and 55-13.1.1.2.2).
- Each tank shall be provided with a pressure gauge and a level gauge or device for indicating the quantity of liquid CO₂ it contains (NFPA 55-13.1.2).

- Where containers are in a location remote from the filling connection, a means to determine when a container has been filled to its design capacity shall be provided and shall be verifiable from the filling connection (NFPA 55-13.1.2.3).
- Piping (fill, vent and supply) shall be located and supported to protect against damage from strain on piping and fittings; the effects of expansion, contraction and vibration; mechanical damage; and heat sources (NFPA 55-13.1.3.1).
- Rooms or areas where container systems are filled and used indoors or in enclosed outdoor locations (including indoor tanks with remote outdoor fill locations) **shall be provided with an approved carbon dioxide detection system** that is capable of detecting and notifying the building occupants of a gas release that creates CO₂ vapors in excess of its Permissible Exposure Limit (PEL) of 5,000 ppm (NFPA 55-13.2.2 and 55-13.2.2.3).
- A warning sign - at least 8 inches wide and 6 inches high - shall be posted at the entrance to the building, room, enclosure or confined space where the CO₂ container is located. The sign shall state:

CAUTION – CARBON DIOXIDE GAS

Ventilate the area before entering.

A high carbon dioxide (CO₂) gas concentration in this area can cause suffocation.

- NFPA 704 placards shall be provided in approved locations (CFC 2703.5). CO₂ is a simple asphyxiant (SA). The placard shall be labeled as follows:

Blue/Health – 3; Red/Flammability – 0;
Yellow/Reactivity – 0; White/Other – SA

