

Carbon Dioxide (CO₂)

Why does Oxnard Fire require a Hazardous Materials Permit for CO₂ storage?

The permit is intended to promote safety for both employees and fire responders. The issuance of a permit is necessary to cover the department's administrative costs for hazardous materials program inspections. Inspections of facilities that store hazardous materials are mandated by the California Environmental Protection Agency. The result of these inspections has identified code violations pertaining to the improper storage of cylinders and tanks, absence of employee hazardous materials awareness training, and posting of chemical warning signs. Employers should be cognizant of the regulatory requirements that are established to ensure a safe working environment for the employees, particularly with the increase in quantities of CO₂ stored. The permit also ensures that the CO₂ inventory and emergency contact information is provided by the businesses to the Fire Department. This information, in addition to the warning signs posted on the exterior building, alerts the responding fire personnel of the potential chemical hazards stored within the subject facility.

Is CO₂ really a hazard?



In January 2005, improper handling and management of CO₂ resulted in the death of two employees at a McDonald's restaurant in Sanford, Florida. Carbon dioxide was being delivered from a delivery tank truck to a stationary storage tank at the restaurant. The investigation report revealed that when the McDonald's employee discovered he did not have the key to the storage area, he scaled the wall of the enclosure in order to make the connection between the tank truck and storage tank. The truck driver then passed the delivery hose over the wall of the enclosure to the McDonald's employee and also climbed over the wall into the enclosure. In the process of connecting the hose, a sufficient amount of CO₂ accumulated in the enclosure causing both employees to lose consciousness and unable to escape from the confined space. Similar to carbon monoxide (CO), CO₂ is a noncombustible, colorless, tasteless and odorless gas. Because there aren't any warning signs, rescues must be made by a person with an oxygen supply mask. Carbon dioxide is heavier than air and it quickly displaces oxygen and one "drowns" in the oxygen-deficient atmosphere. It is often referred to as "drowning without water."

Fire Code requires that cylinders and tanks be secured by chains, belts, or other means to prevent the pressurized containers from falling over and damaging the valves, thereby, creating a potential pressure and chemical release.

How can I minimize the hazardous conditions that may cause accidents or fatalities involving CO₂?

- 1. Training**—Personnel handling liquid CO₂ should be thoroughly familiar with the hazards associated with this product. Training must be done annually and be documented.
- 2. Proper Installation**—When new CO₂ receptacles are installed (as in new construction or remodeling), they should be installed at ground level in an open area. If feasible, it is recommended that existing CO₂ fill stations be relocated to above grade locations in order to prevent dangerous accumulations of CO₂ in below grade areas.
- 3. Proper Ventilation**—Even when CO₂ is delivered in enclosed areas or below grade locations that are not confined spaces, it is necessary to ventilate such areas adequately to maintain a safe working environment for personnel. Since gaseous CO₂ is 1.5 times denser than air, it will be found in greater concentrations at low levels. Therefore, ventilation systems should be designed to exhaust air from the lowest level and allow makeup air to enter at a higher point.
- 4. Consider Monitoring**—Develop and implement a procedure to monitor the atmosphere for CO₂ and provide local ventilation where levels may exceed the Permissible Exposure Levels. Do not depend on measuring the oxygen content of the air because elevated levels of CO₂ can be toxic, even with adequate oxygen for life support.
- 5. Notification**—Fire Code requires that appropriate warning signs be affixed outside of those areas.
- 6. Maintenance**—Establish a procedure for inspection and maintenance, at regular intervals, of all piping tubing, hoses, and fittings. The entire system should be maintained by qualified personnel in accordance with the manufacturer's instructions.

Who needs to apply for a Hazardous Materials Permit for CO₂ storage?

Currently, any business that stores 200 pounds or greater of CO₂ is required to apply for a storage permit. It makes no difference if a bulk tank or multiple high pressure cylinders are used.

What are the future plans for CO₂ in the City of Oxnard?

A new ordinance is being drafted that will require any business which handles CO₂ (liquefied compressed gases) in cylinders and/or tanks of 100 pounds (810 cubic feet equivalent) or greater to submit a business plan to the CUPA and pay the appropriate annual permit fee. If a business stores more than 200 cubic feet, but less than 800 cubic feet (100 pounds) at standard temperature and pressure, it qualifies for a conditional exemption from annual permit fee; however, an initial business plan will be required and a one-time processing fee will be charged to cover the administrative costs.

What about the annual permit fee?

Food facilities that store carbon dioxide in bulk containers (200 pounds or greater) are currently charged an annual permit fee of \$423 in addition to the state surcharge of \$24. The Oxnard Fire/CUPA is working towards creating a special fee structure for restaurants that will reduce the current cost of the annual permit fee. This new fee structure will include cylinders and bulk tank systems.

What is the most common violation observed at CO₂ facility inspections?

The most common violation is the lack of posted exterior and interior warning signs. The Oxnard Fire/CUPA has purchased a significant quantity of NFPA 704 diamonds to distribute to permitted CO₂ facilities upon request. The warning signs will be provided at no cost to the business. The permittee will be responsible to replace, at their expense, any damaged or lost labels.

Who is responsible for compliance?

The owner/operator is responsible for establishing and maintaining compliance with the requirements and conditions of the permits. Business Owners/Operators are responsible for the following:

- Submitting an application for a Hazardous Materials Permit
- Conducting and documenting employee training
- Developing an Emergency Response Plan
- Monitoring basement storage areas and confined spaces (when applicable)
- Making Material Safety Data Sheets (MSDS) available to employees and the public

Representatives from NuCO₂ have consulted with the Oxnard Fire/CUPA and discussed their willingness to assist businesses with the various requirements for the proper storage of CO₂. CO₂ vendors will typically manage the following aspects of the CO₂ system:

- Marking tank(s) or cylinder(s) with contents and capacity.
- Installing a vent line to divert gases to the exterior of the building
- Securing compressed gas containers
- Identifying emergency shutoff tank valves



CITY OF OXNARD FIRE/CUPA TELEPHONE NUMBERS

Steve Mattern, CUPA Coordinator	385-8364
District 1, Greg Abille, Fire Environmental Specialist II	385-7730
District 2, Ines Gonzalez, Fire Environmental Specialist II	385-7657
District 4, Kandace Peaslee, Fire Environmental Specialist I	385-7718
Permit Processing, Darlene Duarte, Environmental Technician.	385-7710
Oxnard Fire Department	385-7722
Licensing Services.....	385-7817
Permit Development Services.....	385-7896
Del Norte Regional Recycling & Transfer Station.....	278-8200
Oxnard Businesses Only - Hazardous Waste Round-ups.....	987-0717
Agricultural Department.....	933-8415

Office of Emergency Services:

Region 1	(310) 795-2901
<i>Reporting Hazardous Materials Release:</i>	
Business Hours	(916) 262-1621
After Hours	(800) 852-7550

California Environmental Protection Agency:

<i>Department Of Toxic Substance Control</i>	
Region 3, Glendale	(818) 551-2800
<i>Regional Water Quality Control Board</i>	
Region 4, Los Angeles	(323) 266-7500