

SAFE WORK

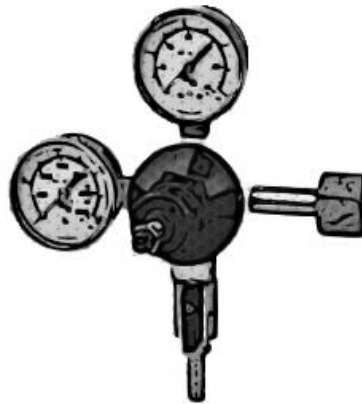
S SPOT THE HAZARD
A ASSESS THE RISK
F FIND A SAFER WAY
E EVERYDAY

No. 269
February 2010

CO₂ Gas Cylinders



Beverage Machine



Regulator



CO₂ Cylinder

Potential Hazard

Carbon dioxide (CO₂) is used for beverage carbonation and dispensing. The gas is most often found in restaurants and beverage rooms in the form of a compressed gas cylinder. There are *two main hazards* associated with CO₂ cylinders:

Leaks

CO₂ gas is an asphyxiant. Asphyxiants are substances which can cause suffocation by displacing oxygen in the available air supply. If a CO₂ cylinder has a leak, the escaping gas can cause oxygen levels in the surrounding air to drop. People who breathe this air can suffocate, leading to possible brain damage or death. CO₂ gas is both colourless and odourless, making it difficult to detect a leak.

CO₂ can also cause frostbite if it is allowed to escape from the cylinder rapidly, such as in the event of a valve failure. This is because compressed gas cools as the pressure it is under drops (when it is let out of the tank).

Explosions

CO₂ cylinders can explode if they become too hot. Pressure inside the cylinder starts to become dangerous when it is stored in areas where the temperature is above 52°C (125°F). The greatest danger of explosion is if a cylinder is caught in a fire.

Reverse flow of the gas into the cylinder can also cause the cylinder to rupture if an empty cylinder is connected to a pressurized system.

Workplace Safety and Health Division Contact Information:

Winnipeg: (204) 945-3446
Toll-Free: 1-866-888-8186 (Manitoba only)
24-Hour Emergency Line: (204) 945-0581

Publications/resources available at: www.safemanitoba.com

How to Control the Hazard

In order to minimize the risk, employers must develop and implement **safe work procedures** for the transportation, storage and use of CO₂ cylinders. Workers using or working around CO₂ cylinders must be trained in these procedures.

Safe work procedures should include the following points (not a complete list):

- When receiving compressed gas cylinders at the workplace always inspect the cylinder for damage and ensure the cylinder is properly labeled. Do not accept cylinders with dirty, rusted, or damaged valves or regulators. Always ensure there is a protective valve cap on each cylinder.
- Never move or transport gas cylinders by rolling, dragging or sliding the cylinder. Do not move the cylinder by the valve cap. Use carts with devices specifically designed to secure cylinders during transport.
- Use the smallest practical cylinder size for the task. In the case of a leak, this will help prevent CO₂ levels in the air from becoming dangerously high.
- Store cylinders in an upright position, only in areas that are dry and well-ventilated. Ensure the cylinders are firmly secured to a solid structure with valve cap in place.
- Store empty and full cylinders separately.
- Follow the gas supplier's recommendation for temperature storage to prevent excessive pressure buildup.
- Never use excessive force when opening or closing the valve. Open the valve slowly to prevent rapid decompression. Make sure valves on cylinders are completely open when using gas.
- Use an appropriate pressure regulator. Use the cylinder valve to shut off the gas flow, not the regulator.
- Do not place yourself in front of the cylinder valve or regulator in case either piece of equipment fails.
- Replace outlet caps or plugs as soon as cylinders are disconnected.
- Most suppliers will provide a client with a wrench designed specifically for connecting the cylinder. This wrench should be used at all times and should be attached to the cylinder.
- Don't use CO₂ cylinders with incompatible materials such as powdered metals. Refer to the material safety data sheet (MSDS).

An alternative to storing and moving individual CO₂ cylinders is to use a bulk storage tank system with connective piping to the beverage dispensing units. The tank is located within the restaurant and is refilled from outside the building by truck using a hose refilling / dispensing system. If you choose this option, the entire system including tanks, piping, fittings and hoses should be regularly inspected to ensure compliance with manufacturer's specifications.

Reference to legal requirements under workplace safety and health legislation:

- Chemical and Biological Substances: Manitoba Regulation 217/2006 Part 36
- Fire and Explosive Hazards: Manitoba Regulation 217/2006 Part 19
- Workplace Hazardous Materials Information System: Manitoba Regulation 217/2006 Part 35

Additional workplace safety and health information available at: www.safemanitoba.com