

NEW JERSEY DEPARTMENT OF COMMUNITY AFFAIRS  
DIVISION OF FIRE SAFETY  
OFFICE OF THE STATE FIRE MARSHAL



# SAFETY ALERT

PO Box 809, Trenton, NJ 08625-0809 (609) 633-6070

SAFETY ALERT 14-1

## Potential of Carbonated Beverage Systems to Create a Life Threatening Atmosphere Issued January, 2014

The Division of Fire Safety has received reports of injuries and deaths caused by Carbon Dioxide (Co<sub>2</sub>) poisoning as a result of leaking carbonated beverage systems. While we are not aware of any deaths we are aware of incidents that have occurred in New Jersey. Because gaseous Co<sub>2</sub> is 1.5 times heavier than air, leaking Co<sub>2</sub> can accumulate at floor level in improperly ventilated or unventilated rooms not necessarily limited to the cylinder's location and in low areas, such as basements.

Co<sub>2</sub> makes up approximately 0.0397% of the atmospheric air that we breathe and should not be confused with the toxic gas Carbon Monoxide (CO). At normal levels, Co<sub>2</sub> is non-toxic and is safe to be added to beverages to carbonate them. It is possible however, to suffer anoxia or asphyxiation from breathing higher levels of Co<sub>2</sub> because increased levels of Co<sub>2</sub> may be related to decreased concentration of oxygen. It should be understood that increased levels of Co<sub>2</sub> need not be accompanied by reduced oxygen levels to create a toxic atmosphere.

As the concentration of Co<sub>2</sub> increases, people start to experience Carbon Dioxide intoxication, which may progress to Carbon Dioxide poisoning and sometimes death. Elevated blood and tissue levels of Co<sub>2</sub> are termed hypercapnia and hypercarbia.

### SYMPTOMS OF CARBON DIOXIDE INTOXICATION AND POISONING INCLUDE:

- Deeper breathing;
- Twitching of muscles;
- Increased blood pressure;
- Headache;
- Increased pulse rate;
- Loss of judgment;
- Labored breathing;
- Unconsciousness (occurs in under a minute when Co<sub>2</sub> concentration rises about 10%);
- Death.

Fire and EMS personnel should be aware and particularly cautious when responding to incidents that may involve elevated levels of Co<sub>2</sub> and treat them as they would Carbon Monoxide (CO) incidents by utilizing appropriate PPE including respiratory protection. Suspicion of Co<sub>2</sub> poisoning rather than CO poisoning should be raised in occupancies where Co<sub>2</sub> systems are present. It is also important to note that many of the gas metering devices used by fire departments do not measure Co<sub>2</sub> levels. Responders should not depend on measuring the oxygen content of the air because Co<sub>2</sub> can be dangerous even when adequate oxygen levels are present.

While not required by the NJ Uniform Fire Code, fire inspectors should suggest that Co<sub>2</sub> detectors be installed in occupancies where Co<sub>2</sub> systems are present. **Fire prevention personnel should make fire suppression forces aware of locations that have Co<sub>2</sub> systems.**

**PLEASE POST IMMEDIATELY**