FPB POLICY 2018-1: Carbon Dioxide Systems for Beverages  
Created: January 1, 2018 Revised: April 1, 2020 Effective Date: Immediately  
From the Office of the Fire Prevention Bureau – Phone (515) 283-4240

This policy is promulgated in accordance with Section 105.6 of the 2018 International Fire Code (IFC) and is an official notification of Section 5307 of the 2018 IFC.

Per Section 5307 of the 2018 IFC adopted by the City of Des Moines:

Carbon Dioxide, CO₂, is a colorless odorless gas that asphyxiates by displacing oxygen in the air. Several fatal carbon dioxide incidents have occurred in restaurants where CO₂ leaked from large storage tanks serving carbonated beverage dispensers. These incidents led to the additional permitting and detection requirements for large CO₂ storage tanks being added to the IFC beginning in the 2015 edition.

As of January 1, 2018, during regular fire inspections DMFD Fire Prevention Inspectors include CO₂ storage, dispensing, permitting, and detection as part of their inspections. Insulated liquid carbon dioxide systems with more than 100 lbs of CO₂ used in beverage dispensing applications shall comply with the permitting and detection requirements. The 100 lbs refers to the total CO₂ in use and stored within a building. Systems with more than 100 lbs shall require a permit, protection from damage, and detection or ventilation. The permit will be issued by the inspector once compliance with regards to the protection, detection, and ventilation requirements is demonstrated.

Carbon dioxide systems with more than 100 lbs of CO₂ are required to provide protection in the form of either ventilation or emergency CO₂ alarms.

- If ventilation is chosen as the method of protection and compliance, mechanical ventilation is required to be at a rate of not less than 1 cfm/ft², exhaust be taken from a point within 12” from the floor, and the system shall be designed to operate at a negative pressure in relation to the surrounding area.
- If emergency alarms are chosen as the method of protection and compliance continuous CO₂ detection is required in within 12” of the floor in areas where the gas is expected to accumulate. The system shall be designed as follows:
  - Activates an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm.
  - 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.

For purposes of inspection and enforcement the following interpretations of the requirements will be applied:

- Any tank(s) in-use or stored within a building will count towards the 100 lb threshold.
- Any tank(s) in-use outside the building will contribute towards the 100 lb threshold.
- Any tanks stored, but not in-use, outside the building will not count towards the 100 lb threshold.
  - If one 100 lb CO₂ tank is located inside the building and connected to the system and in use, but two more 100 lb CO₂ tanks are stored inside, in the same or other location, a permit and ventilation or alarms are required.
  - If one 100 lb CO₂ tank is located inside the building, connected to the system, and in use, and two more 100 lb CO₂ tanks are stored (not in-use or connected to the system) outside the building, neither a permit nor ventilation or alarms are required.

When emergency alarms are chosen as the method of compliance, alarms are required in the room or area where tanks are stored indoors, connected in use, system fittings exits, and where dispensing occurs.

- If a CO₂ tank(s) is stored in a closet at the rear or the building and dispensed at stations behind the counter and in the dining room CO₂ alarms would be required in the closet, behind the counter area, and in the dining area.
- If the CO₂ tank(s) is located outdoors, piped inside, and dispensed only in the dining room then an alarm would only be required in the dining room.

Any comments or questions regarding the above information may be submitted to:
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Fire Prevention Bureau  
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