Carbon Dioxide Beverage Systems

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Learning Objectives

• Information sheet review
  – Why info sheet and not interpretation?
• 2015 International Fire Code
• What can you do?
2015 IFC Section 5307

- Applies when over 100 pounds of CO₂
- Equipment comply with Chapter 53
  - and NFPA 55 Chapter 13
- Protect from damage
- Required protection – 2 choices
  - Ventilate the room per Mechanical Code
  - Emergency alarm system to detect CO₂

Local Unit of Government

- Adopt language from 2015 IFC
- Require permits for installation

Questions
Carbon Dioxide Systems: Beverage Dispensing

Fire Code Information Sheet

PURPOSE

- To provide guidance to fire code officials for dealing with the hazards of carbon dioxide (CO2) beverage dispensing systems.
- Codes can be years behind new technologies and processes. Fire code officials need resources to address these emerging issues.

RATIONALE

- The 2015 edition of the International Fire Code (IFC) now requires mechanical ventilation or an emergency alarm system when the quantity of CO2 exceeds 100 pounds.
- The new requirements in the 2015 IFC came about after several fatal carbon dioxide poisonings occurred in the United States in restaurants where CO2 leaked from large storage containers and displaced oxygen in the area. CO2 is an odorless and colorless gas heavier than air and will fill a room from bottom to top displacing the oxygen, creating a potential life-safety hazard to building occupants and emergency responders.
- Although the 2015 IFC contains new language regarding CO2 systems, this language is not part of the current Minnesota State Fire Code, which adopts the 2012 edition of the IFC. At this time Minnesota will not adopt a new fire code until early 2020.

LINKS TO 2015 IFC LANGUAGE

- 2015 IFC Section 5307 addresses protection for CO2 systems used in beverage dispensing.
- 2015 IFC Section 908.7 addresses emergency alarm systems for CO2 beverage dispensing.

SOLUTION

- For those local units of government wanting to apply the 2015 IFC provisions for CO2 beverage dispensing systems, local adoption of the IFC language via ordinance is recommended.

QUESTIONS

- Contact SFMD code specialists at 651-201-7221 or email firecode@state.mn.us

Developed May 16, 2016
SECTION 5307
CARBON DIOXIDE (CO\textsubscript{2}) SYSTEMS USED IN BEVERAGE DISPENSING APPLICATIONS

5307.1 General. Carbon dioxide systems with more than 100 pounds of carbon dioxide used in beverage dispensing applications shall comply with Sections 5307.2 through 5307.5.2.

5307.2 Permits. Permits shall be required as set forth in Section 105.6.

105.6.4 Carbon dioxide systems used in beverage dispensing applications. An operational permit is required for carbon dioxide systems used in beverage dispensing applications having more than 100 pounds of carbon dioxide.

5307.3 Equipment. The storage, use, and handling of liquid carbon dioxide shall be in accordance with Chapter 53 and the applicable requirements of NFPA 55, Chapter 13. Insulated liquid carbon dioxide systems shall have pressure relief devices vented in accordance with NFPA 55.

5307.4 Protection from damage. Carbon dioxide systems shall be installed so the storage tanks, cylinders, piping and fittings are protected from damage by occupants or equipment during normal facility operations.

5307.5 Required protection. Where carbon dioxide storage tanks, cylinders, piping and equipment are located indoors, rooms or areas containing carbon dioxide storage tanks, cylinders, piping and fittings and other areas where a leak of carbon dioxide can collect shall be provided with either ventilation in accordance with Section 5307.5.1 or an emergency alarm system in accordance with Section 5307.5.2.

5307.5.1 Ventilation. Mechanical ventilation shall be in accordance with the International Mechanical Code and shall comply with all of the following:

1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot \([0.00508 \text{ m}^3/(s \cdot \text{m}^2)]\).
2. Exhaust shall be taken from a point within 12 inches (305 mm) of the floor.
3. The ventilation system shall be designed to operate at a negative pressure in relation to the surrounding area.

5307.5.2 Emergency alarm system. An emergency alarm system shall comply with all of the following:

1. Continuous gas detection shall be provided to monitor areas where carbon dioxide can accumulate.
2. The threshold for activation of an alarm shall not exceed 5,000 parts per million \((9,000 \text{ mg/m}^3\))
3. Activation of the emergency alarm system shall initiate a local alarm within the room or area in which the system is installed.

908.7 Carbon dioxide (CO\textsubscript{2}) systems. Emergency alarm systems in accordance with Section 5307.5.2 shall be provided where required for compliance with Section 5307.5.