



# Clark County Department of Building & Fire Prevention

4701 West Russell Road, Las Vegas, NV 89118

(702) 455-7316 FAX (702) 455-7347

Ronald L. Lynn Director/Building & Fire Official  
 Samuel D. Palmer, PE., Assistant Director · Girard Page, Fire Marshal

## 105.6.8 – IFC - 2012

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For comments email Robert Williams at: [RWilliams@clarkcountynv.gov](mailto:RWilliams@clarkcountynv.gov)

**TITLE: CARBON DIOXIDE LIQUID IN RESTAURANTS**

**SCOPE:** The following guideline covers the requirements for the submittal of permit applications for providing carbonation in beverages via liquid carbon dioxide.

**DEFINITIONS:**

- a) Carbon Dioxide: Carbon Dioxide typically used in restaurants for beverage carbonation service.
- b) Carbon Dioxide - Liquid: Carbon Dioxide that is provided as a refrigerated liquid typically at approximately -109F degrees.
- c) Carbon Dioxide Sensor: An electronic instrument that can detect the presence and concentration of Carbon Dioxide.
- d) Dewar: A vacuum-insulated container designed to hold very cold refrigerated liquids.

**SUBMITTAL SPECIFICATIONS AND REQUIREMENTS FOR LIQUID CARBONDIOXIDE SYSTEMS:**

**Permitting Notes:**

- All installations with 100 lbs. of liquid CO2 must get an operational permit;
- CO2 systems that were installed after July 7, 2014, must also have a monitoring system as described below:

<b>Prepared By</b>	<b>Concurred By</b>		<b>Approved By</b>
<i>Robert Williams</i>	<i>Girard W. Page</i>		<i>Ronald L. Lynn</i>
Robert Williams, Fire Chemical Engineer	Girard W. Page, Fire Marshal		Ronald L. Lynn, Building & Fire Official
<b>Reviewed By</b>	<b>Initials</b>	<b>Reviewed By</b>	<b>Initials</b>
Adolf Zubia, Assistant Fire Chief	<i>AZ</i>	Fulton Cochran, Assistant Fire Chief	<i>FC</i>
<b>Reviewed By</b>	<b>Initials</b>	<b>Reviewed By</b>	<b>Initials</b>
Kurt Gottschalk, Deputy Fire Marshal	<i>KG</i>	Julia Staples, Deputy Fire Marshal	<i>JS</i>

- Sensor(s) are not required for facilities that have their liquid CO2 tank outdoors;

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- Sensor set point(s) will change from 30,000 ppm to 5,000 ppm on Jan 1, 2017, for new installations only. This change will coincide with base code changes in the 2018 International Fire Code.
  - Indoor Storage: Centralized Dewar of liquid carbon dioxide (typically 300 – 750 lbs. of liquid CO<sub>2</sub>), must be installed and operated as follows:
    - a. The Dewar is normally connected to a piping network to supply gaseous carbon dioxide to various areas in the restaurant facility. The piping material must be certified by the manufacturer as suitable for gaseous carbon dioxide service. Examples of approved piping include: “K” copper, black piping, and most commonly, reinforced polyethylene tubing.
    - b. An indoor room that houses the Liquid Carbon Dioxide Dewar must be equipped with a carbon dioxide sensor. The carbon dioxide sensor shall be installed near the Dewar, 3 feet AFF + or – 6”, unless the manufacturer specifies a different height.
    - c. The sensor(s) shall be connected to a visible/audible local alarm warning device which will warn occupants of the room or area to evacuate, and warn occupants outside the room or area, not to enter. The visible alarm light is to be a different color other than clear, to avoid confusion with the fire alarm. The audible alarm must be at least 15 dB louder than ambient. Signage outside the room or area will warn occupants outside the room or area, to not enter when alarms are activated.
    - d. The sensor(s) must have a set point not to exceed 30,000 ppm, which is the OSHA ceiling limit for carbon dioxide. Sensors must:
      - 1. At the set point, activate the visual/audible local alarms;
      - 2. Be operational 24-hrs/day, whenever carbon dioxide is being utilized for the room/area.
    - e. All monitors, at initial commissioning, and at least once per year prior to permit renewal, shall be tested with a 30,000 ppm CO<sub>2</sub> challenge gas. The documentation for the test shall show that at 30,000 ppm CO<sub>2</sub>, the monitor will trigger the audible and visual alarms. (Set point and challenge gas to change to 5,000 ppm on Jan 1, 2017, for new installations)
    - f. Alarms are local and not required to be connected to the fire alarm system or monitored by an approved supervising station, as in NFPA 72.
    - g. The building shall be equipped with an NFPA 704 placard for CO<sub>2</sub> that will read at least 3,0,0,SA.

**PURPOSE:**

- 1) To adequately describe the expectations of the Fire Prevention Bureau for submittals involving use of liquid CO<sub>2</sub> in a restaurant.
- 2) All portions of the liquid CO<sub>2</sub> system must be integrated to work properly. This includes the source tank(s), distribution piping, monitor/sensors, and audible/visual alarms. All these items will be approved under the Cryogen permit (for liquid CO<sub>2</sub> as a source).

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## **PERMIT REVISIONS AND RESUBMITTALS:**

Revisions to approved plans are required to be submitted and approved. A copy of the previously approved plan shall accompany the revised submittal to facilitate the review. Clearly indicate all changes to the revised plans by cloud and delta number. When several changes have been made, the Plans Checker may also require a detailed list of changes.

Re-submittals to address a Letter of Correction will require a full submittal. These plans require a copy of the red lined plan from the previous submittal to facilitate the review. Clearly indicate all changes by cloud and delta number.

**PLANS CHECK STATUS INSTRUCTIONS:** The status of the review can be checked by logging on to:

<http://www.clarkcountynv.gov> →Departments→Building Fire Prevention Bureau →Plan Status Information

Or call: (702) 455-7139

## **INSPECTIONS SCHEDULING:**

<http://www.clarkcountynv.gov> →Departments→Building Fire Prevention Bureau→Inspection Schedule/Cancel Information.

Or call: (702) 455-7316

A fire inspector will review your site in accordance with the approved plans and this guideline.

Clark County Building and Fire Prevention may witness and accept inspection, testing and maintenance of fire and life safety systems conducted by approved individuals as required by and within the scope and authority of the Clark County Fire Code.

This Guideline does not take the place of the Fire Code and does not take precedence over any Fire Code requirement or position taken by the Fire Code Official. When a conflict exists between the requirements of this Guideline and the Fire Code or the opinion of the Fire Code Official, the Fire Code or opinion of the Fire Code Official prevails.