FIRE-MEDICAL DEPT
Guidelines

Date: February 27, 2013 (revised 04/15/2020)

To: Compressed Gas CO-2 Users

From: City of Peoria Fire-Medical Department – Fire Prevention Division

Subject: Compressed Gas CO-2 Permitting and Safety Guidelines

Because of recent incidents involving Carbon Dioxide when used as a compressed gas for beverage dispensing, construction permits are now required for all new and existing systems installed. Additionally, all new and existing systems in use will be required to apply for and maintain an Annual Operational Permit with the Fire Department. **The requirements in this guideline are effective immediately.**

Pursuant to City of Peoria Ordinance Number 2019-11, §5308 and the 2018 *International Fire Code* (IFC), the following are the requirements for Operational and Construction Permits. All Fire Code references are from the 2018 edition of the *International Fire Code* (IFC).

Operational Permits

Pursuant to City of Peoria Ordinance Number 2019-11, §5308.2.1 and §105.6.8 of the IFC, and after an approved construction permit has been finaled, an Annual Operational Permit is required to store, use or handle a compressed gas system utilizing carbon dioxide in excess of 500 cubic feet NTP whether new or existing. Operational Permits are issued for a period of one (1) year and must be renewed on an annual basis. A permit application is to be completed and submitted to the Fire Prevention Division along with the appropriate fee for this permit.

Construction Permit Requirements

Pursuant to City of Peoria Ordinance Number 2019-11, §5308.2.2 and §105.7.3 of the IFC, a construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, close or substantially modify a compressed gas system utilizing carbon dioxide in excess of 500 cubic feet NTP. **Existing locations that do not have a construction permit issued by the Fire Department are required to comply with the same requirements as a new project.** A permit application, floor plan and data sheets are to be completed and submitted to the Building Development Division. Applications are then routed to the Fire Prevention Division for review and permitting. Fire Department permit fees are per Table 9-33(b) and are assessed when the permit is issued.

The following provisions are to be incorporated into the system design. This will apply whether the carbon-dioxide for the system is stored as a gas or in a liquid form. The submittals are to address the following requirements and are to include a floor plan drawing showing the location of all major components along with providing data sheets for the equipment provided.

1. A carbon dioxide gas detection system is to be provided. The detector is to be installed per the manufacturer's instructions. A minimum of one (1) detector is required to be placed by the cylinder or where the pressure regulators are located, if the cylinder is located outside. If the building has areas that are lower than the grade level, additional detection devices

are to be provided. Additional detection devices are required where pure CO-2 (CO-2 that is mixed with product; i.e.: after the carbonator, is exempt) is piped to in the building. This can include beer storage areas or remote serving locations.

2. A local alarm and strobe are to be provided. The alarm device is to provide a minimum 75 dBA at 10 feet. The strobe is to provide a minimum 100 Cd. The devices are to be located in an area that will alert the occupants of the building.
3. Where carbon dioxide containers or cylinders are located inside the building, ventilation (whether mechanical or natural) is to be provided. The exhaust rate is to be a minimum of one (1) cubic foot per minute per square foot of the floor area of the storage area (where container or cylinders are stored). The exhaust system is to be designed and installed to meet the requirements of the 2012 edition of the *International Mechanical Code*. The review, permitting and fees for the exhaust system will be provided by the Building Development Division.
4. The carbon-dioxide gas detection system is to be monitored in one of the following manners. Every building must fall into one of these options (a through d).
   a. For buildings that are constructed new, the building fire alarm system shall be designed to monitor two (2) points on the gas detection system. The building fire alarm system shall be capable of reporting specific signals to the Central Station for the following alarms. These signals are in addition to the other required signals to be sent to the Central Station.
      i. A supervisory signal is to be sent when the gas detector activates at 1.5%. This shall provide a supervisory signal at the fire alarm control panel and shall report a supervisory signal to the Central Station.
      ii. An alarm signal is to be sent when the gas detector activates at 3%. This shall provide an alarm signal at the fire alarm control panel, provide full building evacuation and shall report a "**CO-2 Alarm**" signal to the Central Station.
   b. For buildings that are existing, the building fire alarm system is to be evaluated to determine the capability of monitoring the gas detection system. If capable, the building fire alarm system shall be designed to monitor two (2) points on the gas detection system. The building fire alarm system shall be capable of reporting specific signals to the Central Station for the following alarms. These signals are in addition to the other required signals to be sent to the Central Station.
      i. A supervisory signal is to be sent when the gas detector activates at 5000 ppm. This shall provide a supervisory signal at the fire alarm control panel and shall report a supervisory signal to the Central Station.
      ii. An alarm signal is to be sent when the gas detector activates at 30,000 ppm This shall provide an alarm signal at the fire alarm control panel, provide full building evacuation and shall report a "**CO-2 Alarm**" signal to the Central Station.
   c. For buildings that are existing, the building fire alarm system is to be evaluated to determine the capability of monitoring the gas detection system. If the building fire alarm system is not capable of monitoring and transmitting a separate signal to the Central Station, the building fire alarm system shall report the following signals to the Central Station for the following alarms. These signals are in addition to the other required signals to be sent to the Central Station.
      i. A supervisory signal is to be sent when the gas detector activates at 5000 ppm. This shall provide a supervisory signal at the fire alarm control panel and shall report a supervisory signal to the Central Station.
      ii. An alarm signal is to be sent when the gas detector activates at 30,000 ppm. This shall provide an alarm signal at the fire alarm control panel, provide full building evacuation and shall report an alarm signal to the Central Station.
      iii. An alarm device is to be installed outside the building at the Fire Department entrance to notify personnel of a CO-2 activation. This device shall be labeled as a CO-2 alarm and shall activate upon activation of the CO-2 sensor.

d. For buildings that do not have a building fire alarm system, the following is to be provided.
   i. In addition to the CO-2 alarms inside the building, an alarm device is to be located outside the building at the Fire Department entrance to notify personnel of a CO-2 activation. This device shall be labeled as a CO-2 alarm and shall activate upon activation of the CO-2 sensor.

General Carbon Dioxide System Requirements

The following requirements apply to all compressed gas systems utilizing carbon dioxide. These requirements are to be incorporated into the submittal process for the construction permits and are subject to inspection comments.

1. The fill port is to be piped to the outside atmosphere.
2. All venting (normal or emergency) is to be piped to the outside atmosphere.
3. When used, insulated liquid carbon dioxide containers are to be anchored to the slab.
4. When used, high pressure compressed gas carbon dioxide cylinders are to be properly secured from movement.
5. All hoses and fittings used on the system are to be manufacturer approved.
6. Warning signs are to be provided.
7. When using high pressure compressed gas cylinders, only one (1) cylinder can be connected into the beverage system at a time. A second cylinder can be connected as long as a three way transfer switch is used so that no more than one (1) cylinder can be used at a time. This option will not require a permit from the Fire Department.
8. Battery back-up is required for CO-2 detectors that reset to an alarm condition upon a loss of primary power.

Permit Submittal Requirements

The following items are to be provided when submitting for the Construction Permit. Submittals that are not complete will not be accepted. The submittals will need to coordinate with the installing company provider and the Fire Alarm company.

1. Floor plan of the building showing the following major components.
   a. Carbon Dioxide cylinder/container location.
   b. Mixing valve location.
   c. Fill port location.
   e. Carbon Dioxide sensor and alarm device locations.
   f. Method for fire alarm connection. **NOTE:** This work is to be performed by a contractor with an approved Fire Protection Contractors Permit with the Fire Department. The fire alarm work can be shown on the same floor plan as the CO-2. The fire alarm contractor information will need to be included on the plans.
2. If the CO-2 cylinder/container is located inside the building, floor plan showing the mechanical ventilation system to include any electrical connections is required. When using the natural ventilation option inside the building, calculations will need to be provided to support using that option.
3. Data sheets for all major components.
4. Completed Permit Application (400-G) for each.
   a. Installing company.
   b. Fire Alarm company.

For questions regarding the requirements for the Carbon Dioxide Compressed Gas permits, contact the City of Peoria Fire-Medical Department – Fire Prevention Division at (623) 773-7279.