

Oklahoma Department of Labor



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COMMISSIONER OF LABOR

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INDUSTRY NOTICE

The Oklahoma Department of Labor (“ODOL”) is statutorily obligated to inspect all high-pressure boilers, low-pressure steam and water boilers, and certain other pressure vessels, including Liquid Carbon Dioxide Storage Vessels (“LCDSV”). LCDSVs in use within the State of Oklahoma are inspected to ensure proper and safe installation, maintenance, repair, and operation.¹ The ODOL takes this obligation seriously as LCDSVs have the potential of causing significant property damage, bodily harm, and/or death, if improperly installed, maintained, repaired, and/or operated.

To protect against this potential for harm, the ODOL would like to bring the following safety measures to facility operators/owners’ attention. This is not a comprehensive list; please refer to the National Board Inspection Code (“NBIC”), Part 1 – Installation, Supplement 3: Installation of Liquid Carbon Dioxide Storage Vessels for a complete list of LCDSV installation requirements.

Failure to follow mandatory installation requirements, and/or failure to timely correct noted deficiencies, may result in corrective action, up to and including but not necessarily limited to, the suspension of certificates of operation.

¹ In accordance with the “Boiler and Pressure Vessel Safety Act” found at Title 40, Oklahoma Statutes, Section 141.1 *et seq.*, and the “Boiler and Pressure Rules” found at Title 380, Oklahoma Administrative Code, Chapter 25.

GENERAL REQUIREMENTS FOR LIQUID CARBON DIOXIDE STORAGE VESSELS

LCDSVs Shall:

- ▶ Be installed with sufficient clearance for:
 - Filling;
 - Operation;
 - Maintenance;
 - Inspection; and
- ▶ Be safely supported with vessel supports, foundations, and settings in accordance with jurisdictional requirements, manufacturer recommendations, and/or applicable industry standards.
- ▶ Be equipped with isolation valves.

LCDSVs Shall NOT:

- ▶ Be located within 10 feet (3,050 mm) of the following:
 - Elevators;
 - Unprotected platform ledges; and/or
 - Areas where falling would result in distances exceeding half the container height.
- ▶ Be installed within 36 inches (915mm) of an electrical panel.
- ▶ Be installed on roofs.

Outdoor Installations:

- ▶ Shall have vehicles impact protections (i.e., guards or bollards) in accordance with local building codes.
- ▶ LCDSVs exposed to the elements may require additional protections. *Contact the ODOL for questions regarding such additional requirements.*
- ▶ For outdoor installations inside an enclosure, the enclosure shall not cover more than three sides of the perimeter. At least 25% of the perimeter area shall be open to the atmosphere and shall be in direct conveyance at ground level.

Indoor Installations:

- ▶ CO₂ gas detection and alarm systems with low-level pre-alarm activation at 5,000 ppm and full high alarm at 30,000 ppm concentration of CO₂ shall be located in rooms or areas where carbon dioxide storage vessel(s) are located.
- ▶ The fill connection for LCDSVs shall be separated by a minimum of 3 feet from any door or operable window and separated by at least 10 feet from any air intake or stairwell on the same level or lower level from a LCDSV.

Fill Box Location / Safety Relief / Vent Valve Circuit Termination:

- ▶ Fill boxes and/or vent valve terminations shall be installed above grade, outdoors, in an unenclosed, free airflow area.
- ▶ Fill connections shall be located so not to impede means of egress or the operation of sidewalk, cellar entrance doors, including during the delivery process and:
 - Shall be at least 36 inches (915 mm) from any door or operable windows;
 - Shall be at least 36 inches (915 mm) above grade;
 - Shall not be located within 10 feet (31 m) of any air intakes, from the side at the same level or below; and
 - Shall not be located within 10 feet (31 m) from stairwells that go below grade.

Signage:

- ▶ The warning sign shown shall be posted at the entrance to any building, room, enclosure, or enclosed area where a LCDSV is located.
- ▶ Additional instructional signage shall be posted outside the vessel area and shall:
 - Indicate the low and high concentrations that will trigger the gas detection alarms, (5,000 ppm and 30,000 ppm respectively);
 - Indicate that personnel may only enter the area for no more than 15 minutes at the Low-Level Alarm (5,000 ppm); and
 - Indicate that personnel should immediately evacuate the area if a High-Level Alarm (30,000 ppm) is activated.

