

CarbonCure Safety Recommendations

What is CarbonCure?

CarbonCure equipment injects carbon dioxide, otherwise known as CO₂, that's been recycled from local polluters, into wet concrete during mixing. When the CO₂ is introduced into wet concrete, a chemical reaction takes place where the CO₂ reacts with cement and forms a solid limestone mineral. This is good for two reasons:

1. From an environmental perspective, we're taking what would otherwise be pollution and turning it into a mineral that becomes trapped within the concrete forever
2. The limestone mineral that's formed is smaller than silica fume, and it improves the concrete matrix, making the concrete stronger. CarbonCure Ready Mix customers see an average strength gain of 10% at 28 days – which allows them to remove cement from concrete and save money

Important safety notes when working with Carbon Dioxide

CO₂, as we normally experience it, is generally quite harmless. It's all around us in small quantities and we breathe out CO₂ all day. While low concentrations of CO₂ exposure are not dangerous, a high concentration of CO₂ in an enclosed or partially enclosed environment poses health risks.

CarbonCure takes precautions to ensure that CO₂ does not get into a working environment at a concrete plant – the CarbonCure system has pressure relief valves which dispel CO₂ outdoors instead of indoors in the event of an emergency– these concentrations of CO₂ dissipate quickly and pose limited risk to your health when injected outdoors at these levels. The CarbonCure system is usually installed outdoors in Ready Mix applications, however, it is still important to exercise caution in the event of an outdoor leak and follow the steps listed below.

CO₂ tanks are also vented outdoors and fitted with pressure relief valves in the event of an emergency.

Indoor CarbonCure equipment installations are fitted with CO₂ sensors and the sensors will sound an alarm if the ambient CO₂ reaches 2000ppm and again at 5000ppm. We also encourage masonry and central mixer customers to incorporate their normal lock out/ tag out procedures during equipment cleaning and any time maintenance is being completed on the CarbonCure system or injection nozzle components. CarbonCure staff will identify lock out/ tag out points on the CarbonCure system during the on-site equipment installation.

CarbonCure also recommends that Masonry and Ready Mix customers acquire and utilize a handheld CO₂ sensor to check ambient CO₂ levels in the mixer in advance of entrance to perform maintenance. Upon request, CarbonCure staff would be happy to provide recommendations on where to purchase handheld CO₂ sensors.

In the unlikely event that you experience a major indoor CO₂ leak, the following procedure should be followed:

1. Immediately evacuate all personnel from the release area.
2. Isolate the release area for at least 50 to 80 ft (15 to 25 m) in all directions.
3. Keep unauthorized personnel away.
4. Stay upwind.
5. Before entering the release area, especially a confined area, check the atmosphere with an appropriate device. Use SCBA (self-contained breathing apparatus) when there is a potential for unsafe breathing atmospheres.
6. Before entry, ventilate any closed or confined space.
7. Stop the leak, by shutting off the liquid and gas valves at the tank- but only if without risk. Do not walk into the release area or a visible fog cloud.
8. Allow the area to ventilate for at least two hours after all dry ice snow has sublimated and the frost has disappeared before allowing re-entry to the release zone.
CAUTION: Ensure that all dry ice snow has sublimated and the frost has disappeared prior to re-entry.
9. Test the area with an appropriate device to determine the carbon dioxide concentration. Be sure there is sufficient oxygen content (more than 19.5 percent oxygen) before permitting personnel to re-enter the area.
10. Do not direct water at the dry ice snow, venting safety relief valves, or the leak source.
11. Notify CarbonCure and your CO₂ supplier immediately if your CO₂ tank or CarbonCure lines have sustained damage.

Pressure Vessel Safety

Your CO₂ tank will be a pressurized tank that holds all of the CO₂ required to run your CarbonCure system. A few safety items to keep in mind when dealing with the CO₂ tank:

- Your CO₂ supplier will perform safety inspections your CO₂ tank in accordance with local laws.
- Your CO₂ tank will vent off pressure for short periods of time, this is a safety feature to relieve pressure and it is supposed to happen. If this happens for longer than 60 minutes at a time, notify your CO₂ supplier.
- Do not alter or tamper with labels, tags, or markings on the tank.
- Never fully enclose your tank as the elevated temperatures and confined space may pose a safety risk.
- Place barriers on all sides of your tank to prevent it from being hit by equipment. If the tank is accidentally hit by equipment, call your CO₂ supplier immediately for an inspection.

Frostbite

There is also the potential for frostbite to occur when dealing with CO₂ in its liquid or solid (“snow” or “dry ice”) form. Any employees dealing with cold CO₂ hoses and piping should wear hand protection in the form of insulated cryogenic gloves that are rated for at least -80°F. It should however, be noted that all liquid CO₂ lines for the CarbonCure system will be insulated with 1” thick foam and should pose no immediate risk of frostbite.

Questions about CO₂ Safety?

Please reach out to Diane Praught, Director of Technical Services: dpraught@carboncure.com



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