



CarbonCure Precast: Frequently Asked Questions for Precast Producers

What is CarbonCure?

CarbonCure helps precast producers reduce the carbon footprint of their concrete components without compromising quality or performance. The technology allows producers to inject captured carbon dioxide (CO₂) into concrete during mixing, where it converts to a solid mineral, calcium carbonate (CaCO₃).

The addition of CO₂ improves the compressive strength of precast concrete panels and components without impacting other fresh or hardened properties of concrete. CarbonCure allows producers to reduce their cementitious material content while achieving equivalent—or greater—performance. CarbonCure is fully compliant with ASTM C494 Type S requirements.

What mix design adjustments are made for a CarbonCure concrete mix?

Cement Reduction

Strength improvements attributable to the CO₂ addition can be leveraged to create a more efficient or optimized concrete mix. Often the adjustment involves a reduction in the cement content of the mix by an average of 3% to 7%. Where the concrete mixes contain supplementary cementitious materials, the total cementitious content is reduced (rather than just a reduction of the cement).

For example, if the cementitious materials used in a concrete mix is 20% fly ash and 80% cement, and the use of CO₂ enables a reduction of 20 pounds per cubic yard (11.9 kilograms per cubic meter) of cementitious material, the adjusted mix would have 4 pounds (1.8 kilograms) less of fly ash and 16 pounds (7.3 kilograms) less of cement in keeping with the original ratio of cement to fly ash. Alternatively, a cement reduction can be paired with an increase in or addition of another binder or filler (e.g., fly ash, slag, limestone) that has a lower carbon footprint.

Admixture Loading

Where admixtures are dosed on the basis of cement, a reduced cement loading may reduce the quantity of admixtures required to achieve the same performance outcome.

Comprehensive testing and customer feedback have indicated that CarbonCure is compatible with commonly used admixtures available on the market. The CO₂ addition has not been associated with any performance changes for plasticizing, high-range water reducing, air entraining or set accelerating admixtures. These admixtures have been regularly used in concrete made with CarbonCure.

Have you tested CarbonCure in prestressed concrete with higher strengths, i.e. C50/60?

CarbonCure has been used in concretes with strengths up to C50/C60. CarbonCure has been successfully proven in concrete applications with up to 10,000 - 14,000 psi (68.9 - 96.5 MPa).

Does equipment require any modifications to protect against acid corrosion from injected CO₂?

CarbonCure mineralization does not impact structural performance or durability and does not increase risk of corrosion. Late stage and early stage mineralization affect corrosion differently. CarbonCure's reaction is early stage, resulting in nanoparticles within the mix design with the same pH as a typical coarse aggregate, so there is no increased risk of corrosion.

How does CarbonCure account for transportation of the industrial CO₂ to the precast facility?

CarbonCure's [Technical Services & Support team](#) helps producers to develop each specific mix design, which are then accessible via the online platform called myCarbonCure. All mix design inputs allow for the CO₂ impact of transportation from your local industrial supplier, and the final calculation reflects this variable.

Who else in our industry is using CarbonCure?

To date, North American precast customers have produced 413,569 cubic yards (316,196 cubic meters) of concrete using CarbonCure. Reporting data from these organizations indicates that performance and quality are not impacted by using CO₂ in mixing, and have resulted in a total of 4,092 metric tons of CO₂ saved instead of being released into Earth's atmosphere.

Can CarbonCure be used with other materials, technologies, and approaches to reducing the carbon footprint of concrete?

CarbonCure has been used in thousands of different concrete mixes across continents. Concrete mixes made with traditional Ordinary Portland Cement and commonly used supplementary cementitious materials like fly ash and blast furnace slag are being placed every day.

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How can I use CarbonCure on my project?

Regulations, codes, and standards that govern the purchasing of concrete often rely on the use of prescriptive specifications which set specific limits on how concrete can be made. Although these specifications do not directly restrict the use of CO₂, they can inadvertently create barriers by using requirements that prevent innovation by concrete producers. Common restrictions include:

- Mandated minimum cement requirements
- Overly strict water to cement ratio requirements

Updating specifications to meet the performance needs of owners, designers, contractors and producers is critical to empowering innovation and achieving lower carbon concrete products. Promote sustainable concrete production by adopting performance-based specifications. Recommendations and guidance are provided by the National Ready Mixed Concrete Association and Structural Engineers 2050.

Get in Touch

For any other questions about CarbonCure Precast that were not addressed in this document, visit carboncure.com/precast, reach out to us at sales@carboncure.com or give us a call at **+1 (844) 407-0032**.