



# Recycling CO<sub>2</sub> to Make Simply Better Concrete

Same Reliable Concrete, Less Carbon



## About CarbonCure

CarbonCure is a retrofit technology installed at concrete plants that injects a precise dosage of carbon dioxide (CO<sub>2</sub>) into fresh concrete during mixing. Once injected, the CO<sub>2</sub> reacts with calcium ions from cement to form a nano-sized mineral, calcium carbonate, which becomes embedded in the concrete. This CO<sub>2</sub> mineralization process improves the concrete's compressive strength, enabling producers to reduce cement content in their mixes and achieve further carbon reductions without compromising the concrete's quality.



## A Win-Win Solution

### Did you know that 50% of the construction industry has gone green?

In 2005, only 2% of the construction industry was considered green. In today's world, 50% of commercial building developers are looking for sustainable solutions. CarbonCure's technology helps ready mix concrete producers improve their operations while growing their business with the green building market.



### Improve your operations without incurring capital costs

Injecting CO<sub>2</sub> into concrete can improve the compressive strength, enabling you to optimize your mix designs. CarbonCure's technology has no upfront capital costs, allowing you to quickly see a positive return on your investment.



### Reduce your carbon footprint and grow your business with the green building market

CarbonCure's team provides cutting-edge marketing and sales support to help your team attract business from the growing community of architects and engineers seeking sustainable building products.



### Make better concrete, simply

CarbonCure's technology is seamlessly integrated into your plant's existing batching system, with no disruptions to the operations during installation. Batching is controlled by the producer's batching software in the same manner as other admixtures. CarbonCure's technology precisely injects carbon dioxide into the concrete for optimal results.



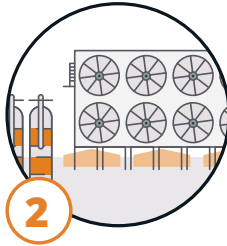


## CarbonCure's Concrete Solution



1

CarbonCure's technology is retrofitted to an existing concrete plant.



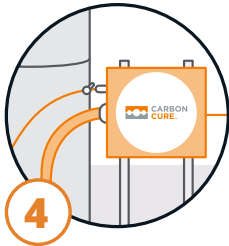
2

Carbon dioxide (CO<sub>2</sub>) gas is primarily sourced as a by-product from industrial processes.



3

The purified CO<sub>2</sub> gas is delivered in pressurized vessels by commercial gas suppliers.



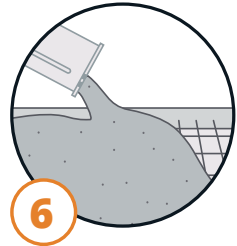
4

CarbonCure's proprietary delivery system precisely injects the CO<sub>2</sub> into the concrete mix.



5

Batching is controlled by a simple interface integrated with the batch computer.



6

Once injected, CO<sub>2</sub> reacts with cement to form a nano-sized mineral that becomes permanently embedded in concrete.

### Formation of nanomaterial

The nanocrystalline carbonate material, as seen in this scanning electron micrograph, accelerates the cement hydration and improves the compressive strength of concrete



# Project Case Study



## 725 Ponce de Leon Avenue Atlanta, GA

Thomas Concrete delivered 48,000 cubic yards of concrete made with the CarbonCure Technology, diverting **680 tonnes of CO<sub>2</sub> from the atmosphere**. That's equivalent to 888 acres of forest sequestering CO<sub>2</sub> for a year.

*"Uzun+Case, with input from Thomas Concrete, specified the CarbonCure Technology to reduce the carbon footprint of 725 Ponce. We're proud to have saved 1.5 million pounds of CO<sub>2</sub> while maintaining our high-quality standards for concrete."*

**Rob Weilacher Engineer of Record, Uzun+Case**

**Supplier:**

Thomas Concrete

**Architect:**

Cooper Carry

**Engineer:**

Uzun+CaseGeneral

**Contractor:**

Brasfield & Gorrie

**Building Description:**

360,000 ft<sup>2</sup> mixed use building

**Completion:**

2018

## The Effects of CO<sub>2</sub> on Fresh Properties

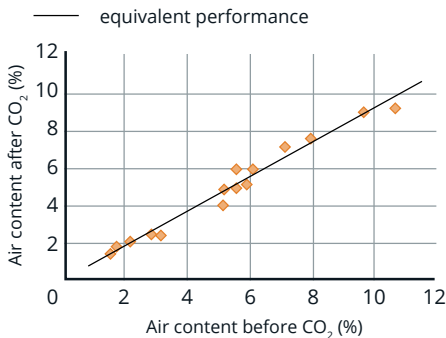
CarbonCure conducted concrete durability testing in collaboration with leading academic partners. The testing compared plastic, hardened and durability properties between a reference concrete batch and a batch subjected to CO<sub>2</sub> addition. Concrete durability test results indicated that the carbon dioxide process did not compromise the expected performance of the treated concrete.

Batches of concrete were prepared for which the slump and air content were measured both before and after the addition of CO<sub>2</sub>. It was found that the carbon dioxide had little to no effect on the air content and slump of the concrete. Producers using the technology can realize the compressive strength benefits without impacting fresh properties.

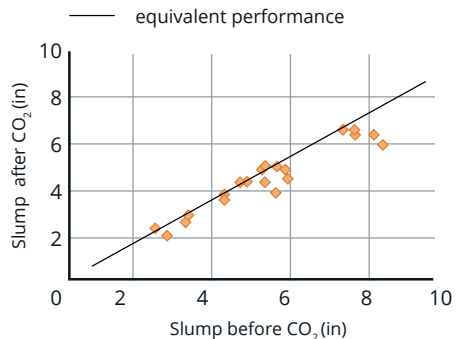
### How does the addition of CO<sub>2</sub> affect pH and rebar corrosion

Weathering carbonation occurs in concrete when calcium hydroxide compounds react with CO<sub>2</sub> from the atmosphere and form solid calcium carbonate. The depletion of calcium hydroxide will cause the concrete pore solution pH to drop below 13, which can cause rebar corrosion.

When CO<sub>2</sub> is injected into fresh concrete using CarbonCure's technology, the CO<sub>2</sub> reacts immediately with cement to form a solid calcium carbonate mineral. Calcium carbonate does not impact rebar corrosion. Research has shown that a CO<sub>2</sub> utilization process has a negligible effect on the pH of the pore solution of mature concrete, and therefore suggests no risk of rebar corrosion.



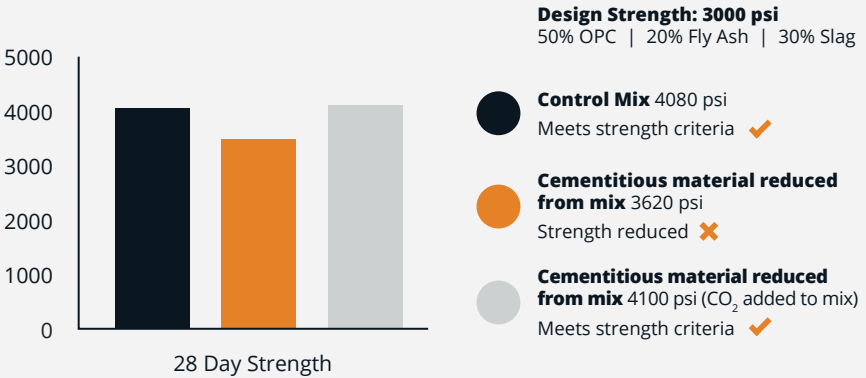
**Conclusion:** equivalent air content



**Conclusion:** equivalent slump

# Unaffected Propertie

**Case study:** Field data from a CarbonCure customer with reduced cementitious content, with and without CO<sub>2</sub>



**Conclusion:** Adding CO<sub>2</sub> using CarbonCure enables concrete producers to remove their cementitious content and maintain compressive strength requirements.

**Want to learn more?**

Contact us at [sales@carboncure.com](mailto:sales@carboncure.com) or call **+1 (902) 442-4020**.



**CARBON  
CURE™**