CARBON CURE™

ASTEC®

Recycling CO_2 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_2) into fresh concrete during mixing. Once injected, the CO_2 reacts with calcium ions from cement to form a nano-sized mineral, calcium carbonate, which becomes embedded in the concrete. This CO_2 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_2 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

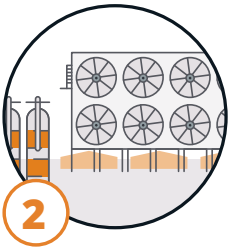
CarbonCure's team provides cutting-edge marketing and sales support to help your team attract business from the growing community of architects and engineers seeking sustainable building products.

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.

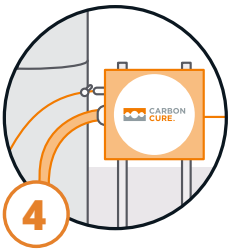
CarbonCure's Concrete Solution

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



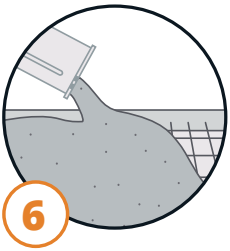
Carbon dioxide (CO_2) gas is primarily sourced as a by-product from industrial processes.

The purified CO_2 gas is delivered in pressurized vessels by commercial gas suppliers.



CarbonCure's proprietary delivery system precisely injects the CO_2 into the concrete mix.

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



Once injected, CO_2 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_2 from the atmosphere.** That's equivalent to 888 acres of forest sequestering CO_2 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_2 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^2 mixed use building

Completion:
2018

The Effects of CO_2 on Fresh Properties

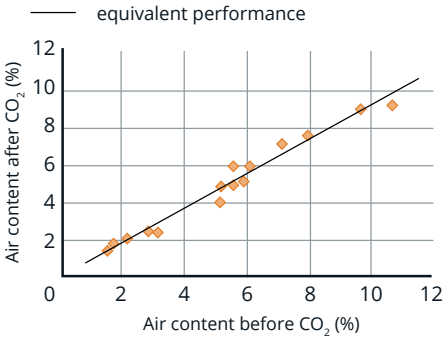
CarbonCure conducted concrete durability testing in collaboration with leading academic partners. The testing compared plastic, hardened and durability properties between a reference concrete batch and a batch subjected to CO_2 addition. Concrete durability test results indicated that the carbon dioxide 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_2. 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.

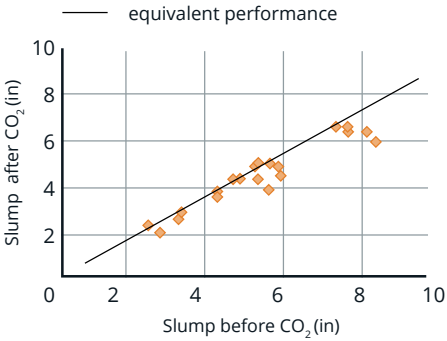
How does the addition of CO_2 affect pH and rebar corrosion

Weathering carbonation occurs in concrete when calcium hydroxide compounds react with CO_2 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_2 is injected into fresh concrete using CarbonCure's technology, the CO_2 reacts immediately with cement to form a solid calcium carbonate mineral. Calcium carbonate does not impact rebar corrosion. Research has shown that a CO_2 utilization process has a negligible effect on the pH of the pore solution of mature concrete, and therefore suggests no risk of rebar corrosion.



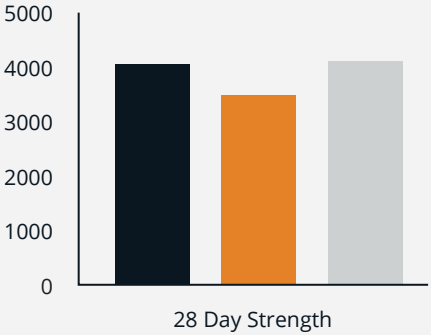
Conclusion: equivalent air content



Conclusion: equivalent slump

Unaffected Propertie

Case study: Field data from a CarbonCure customer with reduced cementitious content, with and without CO_2



Design Strength: 3000 psi
50% OPC | 20% Fly Ash | 30% Slag

Control Mix 4080 psi
Meets strength criteria ✔

Cementitious material reduced from mix 3620 psi
Strength reduced ✖

Cementitious material reduced from mix 4100 psi (CO_2 added to mix)
Meets strength criteria ✔

Conclusion: Adding CO_2 using CarbonCure enables concrete producers to remove their cementitious content and maintain compressive strength requirements.

Want to learn more?
Contact us: **ASTEC** at 4101 Jerome Ave, Chattanooga, TN United States 37407 or call **+1 (423) 899-5898**.

CARBONCURE™ STRATEGIC PARTNER

ASTEC