



# Reduce Embodied Carbon with CarbonCure's Concrete Solution



Information package for owners, developers, architects, structural engineers and contractors



## The Embodied Carbon Challenge

You may already know that buildings are the source of 40% of the world's annual greenhouse gas emissions; but did you know that by 2060, the world's building stock is expected to double? That means we're building a new New York City every month for the next 40 years. On top of that, between now and 2060, embodied carbon levels are predicted to account for almost half of the emissions from the built environment. And since concrete is the most abundant building material, innovation in concrete offers the biggest potential solution for embodied carbon reduction. The embodied carbon challenge has a concrete solution.

## Why CarbonCure?

CarbonCure's solution enables the production of the same reliable concrete but with a reduced carbon footprint. The technology injects a precise dosage of carbon dioxide (CO<sub>2</sub>) into concrete during mixing where it mineralizes. The mineralized CO<sub>2</sub> improves the concrete's compressive strength, enabling producers to safely reduce cement content in their mixes and achieve further carbon reductions without compromising quality. CO<sub>2</sub> mineralization is compliant with ASTM C494 Type S and building with CO<sub>2</sub> mineralized concrete can contribute to a project's LEED points, as concrete made with CarbonCure provides a 4-6% reduction to Global Warming Potential (GWP).

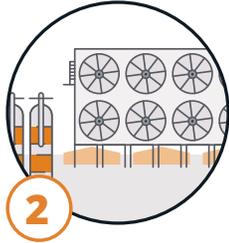


## CarbonCure's Solution: How it Works



1

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



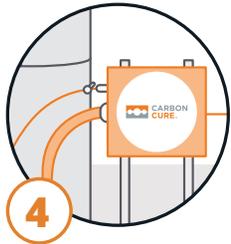
2

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.



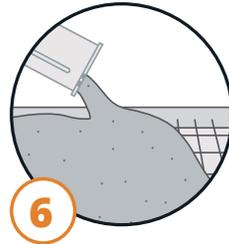
4

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



5

Batching is controlled by a simple interface that's 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 nano-sized mineral

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



## A Win-Win Solution for All



### **Developers & Owners:** Meet Sustainability Goals

By building with low-carbon building materials—such as CO<sub>2</sub> mineralized concrete—building owners and developers are able to reduce embodied carbon in buildings and thereby establish themselves as leaders who prioritize sustainability.

Interested in examples of sustainable projects built with CO<sub>2</sub> mineralized concrete? View CarbonCure's [reference projects](#).



### **Architects:** Reduce GWP

CarbonCure reduces the GWP (CO<sub>2</sub>e) of concrete, which contributes to your ability to earn points in the following Materials & Resources LEED credits:

1. Building Life-Cycle Impact Reduction
2. Building Product Disclosure and Optimization – Environmental Product Declarations

Learn more in the [LEED infosheet](#).



### **Structural Engineers:** No Compromises

Millions of cubic yards of CO<sub>2</sub> mineralized concrete have been produced to date, and testing concludes that CO<sub>2</sub> mineralized concrete has a neutral impact on durability properties. Plus, CO<sub>2</sub> mineralization is compliant with ASTM. Ready to get started? Download and review CarbonCure's CO<sub>2</sub> mineralized concrete [spec language inserts](#).



### **Contractors:** Same Reliable Quality

Countless studies and field demonstrations have shown that CO<sub>2</sub> has no impact on the fresh or hardened properties of concrete, including colour, texture, durability, workability, pump-ability and finishability. Nor does it impact cycle time or set time. Want to dive deeper? See CarbonCure's detailed [FAQ document](#) for a summary of a variety of testing results.



## Reference Project: 725 Ponce

### Atlanta, GA United States

Thomas Concrete delivered 48,000 yd<sup>3</sup> (36,700 m<sup>3</sup>) of concrete made with CarbonCure for every application of this building. As a result, 1.5 million pounds (680 tonnes) of CO<sub>2</sub> were avoided; which is equivalent to 888 acres (360 hectares) of trees sequestering CO<sub>2</sub> for a year.

“Uzun+Case, with input from Thomas Concrete, specified CarbonCure 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

**Building Description:**  
360,000 ft<sup>2</sup> (33,445 m<sup>2</sup>)  
mid-rise, mixed-use

**Developer:**  
New City Properties

**Concrete Supplier:**  
Thomas Concrete

**Architect:**  
Cooper Carry

**Structural Engineer:**  
Uzun+Case

**General Contractor:**  
Brasfield & Gorrie

**Completion:**  
2018



## Reference Project: Cedar Creek Distribution Center Lebanon, TN United States

This tilt-up project just outside of Nashville includes an estimated 8,250 yd<sup>3</sup> (6,308 m<sup>3</sup>) concrete made with CarbonCure supplied by Irving Materials, Inc., saving an estimated 140,000 pounds (63,503 kilograms) of CO<sub>2</sub>. That's equivalent to the CO<sub>2</sub> that 82 acres (33 hectares) of trees would sequester in a year.

“MDH develops and manages traditional industrial real estate properties with an entrepreneurial mindset. We believe that social responsibility as it relates to our communities and environment is a core principle of good business. We're proud to have reduced the carbon footprint of Cedar Creek Distribution Center, and intend to continue to use CarbonCure in future construction across the country.”

**Arun Singh**  
Chief Financial Officer, MDH Partners

**Building Description:**  
226,000 ft<sup>2</sup> (20,996 m<sup>2</sup>)  
warehouse facility

**Developer:**  
MDH Partners

**Concrete Supplier:**  
Irving Materials, Inc.

**Architect:**  
Ware Malcomb

**Structural Engineer:**  
Haines Gibson

**Concrete Subcontractor:**  
Southeast Concrete Systems

**Completion:**  
2021



## Reference Project: Amazon's Second HQ (HQ2)

### Arlington, VA United States

Thornton Tomasetti specified CO<sub>2</sub> mineralized concrete as part of its low embodied carbon concrete spec to meet Amazon's sustainability goals. Miller & Long will deliver an estimated 106,555 yd<sup>3</sup> (81,467 m<sup>3</sup>) of concrete made with CarbonCure; which will save approximately 2,522,000 pounds (1,144 tonnes) of CO<sub>2</sub>.

*"We are looking forward to lowering the carbon footprint of many of our buildings by using CarbonCure concrete, including in Amazon's HQ2 building in Virginia."*

**Kara Hurst**

Vice President of Sustainability, Amazon

**Building Description:**

2.8 million ft<sup>2</sup> (260,129 m<sup>2</sup>) office space in total over 3 high-rises

**Owner:**

Amazon

**Concrete Supplier:**

Miller & Long

**Architect:**

ZGF Architects

**Structural Engineer:**

Thornton Tomasetti

**General Contractor:**

Clark Construction

**Completion:**

Estimated 2022

# Build for the Future. Build with CarbonCure.

CarbonCure has been used on thousands of projects ranging from healthcare to higher education, home developments, and corporate campuses.

For more information about building with CarbonCure concrete, please contact an ASTEC representative.

## **ASTEC**

4101 Jerome Ave | Chattanooga, TN United States 37407  
Phone: (423) 899-5898

