

## Breakthrough Technology

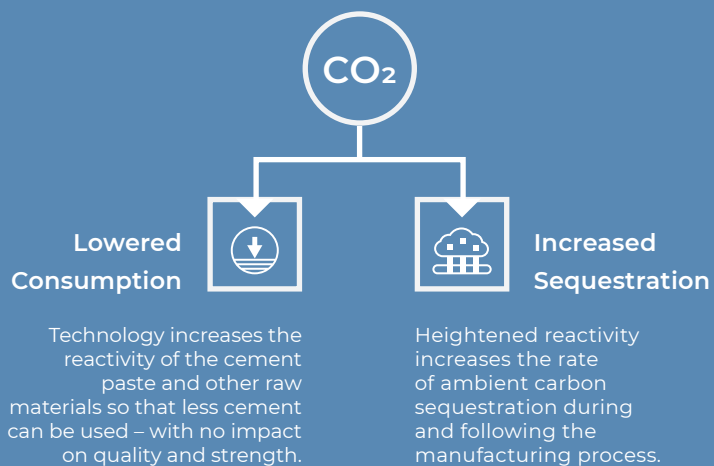
Lowers Embodied Carbon in Concrete Masonry Units and Veneers

CarbonX technology lowers carbon in CMU by up to 50%



### CarbonX™ Technology Process

Implemented during the manufacturing process, the CarbonX technology reduces embodied carbon in two ways:



### Answering a Market Need

In response to the overwhelming desire of designers to lower greenhouse gas emissions in the built environment, the Concrete Products Group, a group of market leaders in the concrete products industry, has developed a technology – the CarbonX CMU technology – to lower the embodied carbon of various concrete masonry units (CMU) and select veneers.

During the manufacturing process, use of the CarbonX CMU technology lowers the embodied carbon in a CMU by up to 50%, compared with an industry average mix design. With verified EPDs showing the lowered GWP, designers will have new options to meet their targets, such as the Architecture 2030 Challenge.

## Why Concrete Masonry Units?

### Overview

Concrete Masonry Units are one of the most versatile products in the construction industry. They can provide the structure of a building as single wythe walls or by providing a strong back up wall for many types of veneers. Concrete masonry walls can even be the veneer system itself with options such as smooth face, split face, ground face, polished, sculptured units.

### Advantages

- ◆ Design flexibility
- ◆ Lower initial and lifetime costs
- ◆ Lower maintenance requirements
- ◆ Safer structure: fire resistance, blast and bullet resistance
- ◆ High resiliency: protects from high wind events and tornadoes, floods and hurricanes
- ◆ Long lasting and durable
- ◆ Energy efficiency: due to their heat capacity, mass walls offer thermal storage and aid with the passive survivability of a structure
- ◆ Sound insulating properties: STC ratings 40-63
- ◆ Plus: environmental impact benefits with the introduction of the CarbonX technology

## CarbonX Technology: Delivering A Lower Carbon CMU

The Concrete Products Group is known for its extensive research developing innovative products, from high performing insulated CMUs to sculptured veneers. With CarbonX, we have developed a revolutionary technology, utilized in the manufacturing process, which increases the reactivity of the raw materials – including cement. This increased reactivity not only reduces the consumption of cement, but also increases the amount of CO<sub>2</sub> sequestration that occurs during and following production. Carbon dioxide from ambient air reacts with the constituents of the CMU and is permanently sequestered as calcium carbonate within the block, creating a carbon sink. This reaction does not affect the performance or strength of the block, and in some cases increases it.

### Highlights

- ◆ Breakthrough technology reduces embodied carbon by reducing cement content and increasing sequestration.
- ◆ Less cement PLUS sequestration (the CMU acts as a carbon sink) results in lowering the embodied carbon by up to 50%, depending on the product.
- ◆ Industry test method developed to measure carbon sequestration.
- ◆ Third party verified EPDs available for products manufactured with the CarbonX technology.

### Technological Innovations

#### No Cement Replacements Needed

The technology re-engineers the generally accepted mixing, batching and curing methods used in the industry. This allows the production of concrete products that meet accepted strength and performance standards while using significantly less cement. The reduction is made without relying on cement substitutes – a significant departure from prior industry attempts at cement reduction. As a result, there is a significant reduction in carbon emissions solely due to source reduction in the usage of cement.

## Technology Creates Carbon Sink

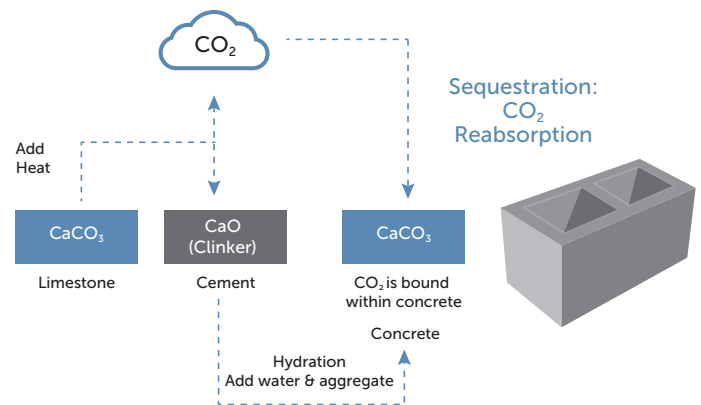
The CarbonX technology enhances the amount of carbon dioxide the concrete product can sequester during the curing and storage phases of the manufacturing process. As a result, the resulting product can demonstrate significant amounts of sequestration from “cradle to gate” even before it is delivered to the customer. This is an unprecedented advancement in the concrete products industry.

#### Innovation Yields Benefits Beyond Environmental Performance

The manufacturing process is very cost-effective and yields other product quality enhancements, beyond the environmental benefits. The technology allows manufacturers to avoid leaving excess unhydrated cement in the finished concrete product. Unhydrated cement can cause problems such as efflorescence.

#### Measurement You Can Trust

For the first time, a masonry industry-vetted protocol now exists for easy measurement of the amount of carbon sequestration that occurs. As a result, all CarbonX-based products have documented performance characteristics regarding their cement content and carbon sequestration rate, along with standard test results for strength and other required characteristics. This peer reviewed test protocol has been published in *The Masonry Society (TMS) Journal*.<sup>1</sup>



The implications of using CarbonX technology include: more efficient use of raw materials, improved quality, and the significant reduction of the global warming potential of our products.

1. The Masonry Society (TMS) Journal, Vol. 34, No 1, December 2016



The CarbonX technology is brought to you by the Concrete Products Group (CPG), a group of regional market leaders in the concrete product industry. The CPG is organized to provide consistent, top-quality products to regional and national customers.

For more information contact:



Heidi Jandris  
Technical Services  
heidi@ajandris.com  
(978) 632.0089