

# Concrete Absorbs Carbon Dioxide Permanently from the Atmosphere

Concrete and live trees share something in common; **they both absorb CO<sub>2</sub>.**

Every exposed concrete surface – buildings, roads, bridges – is absorbing CO<sub>2</sub> from the air.

## It's Called Carbonation

Concrete is a carbon sink, meaning it permanently stores CO<sub>2</sub> through carbonation. Carbonation is a naturally occurring process where CO<sub>2</sub> in the air reacts with the calcium hydroxide in concrete forming calcium carbonate, a naturally occurring mineral that is a common ingredient in everything from toothpaste to antacids.

In addition to passive carbon capture, CO<sub>2</sub> can also be injected into fresh concrete or introduced under pressure in chambers containing concrete products as a solution for storing captured carbon.

## How much CO<sub>2</sub> can be absorbed by concrete?

Over the course of its service life, a concrete structure can reabsorb approximately 10% of CO<sub>2</sub> generated during the production of cement and concrete. A ratio that will increase as the industry continues to implement more sustainable manufacturing methods and materials.

How much CO<sub>2</sub> is sequestered depends on the surface area of exposed concrete, the amount of water and moisture available, the permeability of the concrete and the length of exposure.

## Concrete plays an integral role in addressing climate change and solving climate challenges

The many life cycle benefits of concrete should be factored into sustainability planning across the public policy, design, and construction sectors. **Concrete supports societal sustainability goals by:**



Delivering a construction material that can be locally sourced and produced, and is 100% recyclable



Providing resilient structures that can withstand the realities of climate change – concrete does not rust, rot or burn



Complementing existing carbon sinks (like forests) by passively absorbing CO<sub>2</sub> and offering a place to permanently trap captured CO<sub>2</sub>

Manufacturers of cement and concrete have committed to carbon neutrality across the value chain and are on the front line of implementing innovative carbon reduction solutions in the built environment.

Learn more at [ShapedbyConcrete.com](https://shapedbyconcrete.com).

CO<sub>2</sub>



## The Carbonation Cycle

Cement is the key ingredient in concrete – the material that we see all around us – and the production of cement releases CO<sub>2</sub>. Cement is mixed with water and aggregates and hardens to form concrete. As a part of the curing process, calcium hydroxide is formed in the concrete.

Concrete is a porous material, like a sponge. CO<sub>2</sub> is absorbed by any exposed concrete surface and when that CO<sub>2</sub> reacts with the calcium hydroxide, it forms a mineral and the carbon is permanently captured. This is carbonation.