

CARBON UPTAKE:

CLINKER
Key chemically
reactive ingredientCEMENT
The binderCONCRETE
Critically useful
material to societyCONSTRUCTION
Service life /
use phase impactsCARBON UPTAKE
Concrete is
a CO₂ sink

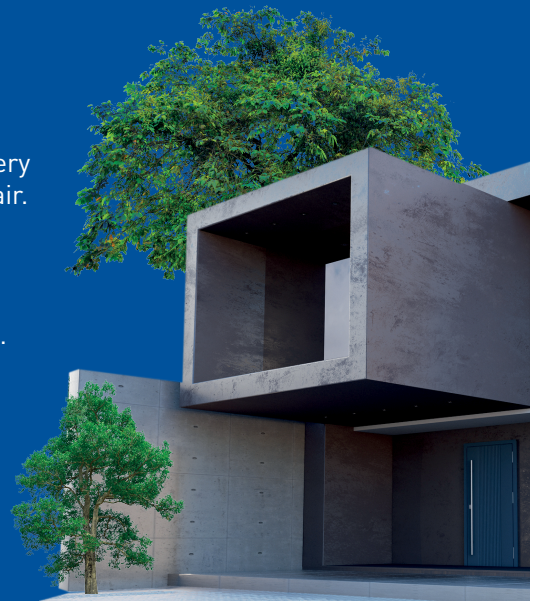
Concrete absorbs carbon dioxide permanently from the atmosphere.

Concrete and live trees share something in common: **they both absorb CO₂**. Every exposed concrete surface—buildings, roads, bridges—is absorbing CO₂ from the air.

It's called carbonation.

Concrete is a carbon sink, meaning it permanently stores CO₂ through carbonation. Carbonation is a naturally occurring process where CO₂ 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 uptake, CO₂ 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 CO₂ can concrete absorb?

Over the course of its service life, a concrete structure can absorb at least 10% of CO₂ 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 CO₂ 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:



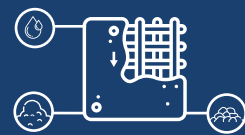
Delivering a construction material that can be locally sourced and produced and is 100% recyclable



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 CO₂ and offering a place to permanently trap captured CO₂



The Carbon Uptake Cycle

Cement is the key ingredient in concrete—the material that we see all around us—and the production of cement releases CO₂. 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. CO₂ is absorbed by any exposed concrete surface. When that CO₂ reacts with the calcium hydroxide, it forms a mineral, and the carbon is permanently captured. This is carbonation.