



Our Admixture Technologies Reduce Embodied Carbon in Concrete by 30 to 50 Percent

The solution to lower embodied carbon lies in the planning and design of a better concrete mixture. Playing a vital role in partnership with concrete producers and contractors, Master Builders Solutions and its admixture technologies is capable of reducing embodied carbon by 30 to 50 percent without sacrificing strength and durability requirements.

**MASTER[®]
BUILDERS**
SOLUTIONS

Master X-Seed[®] Admixtures

The Solution for
Carbon Reduction
in Concrete



About Master Builders Solutions

Master Builders Solutions is a leading global manufacturer of concrete admixtures, as well as other sustainable solutions for the construction industry, focussed on delivering its vision: **Inspiring people to build better.** Master Builders Solutions provides value-added technology and market-leading R&D capabilities to improve the performance of

construction materials and to enable the reduction of CO2 emissions in the production of concrete. Founded in 1909, Master Builders Solutions has ca. 1600 employees operating 35 production sites globally, supporting their customers in mastering their building challenges of today – for a decarbonised future.

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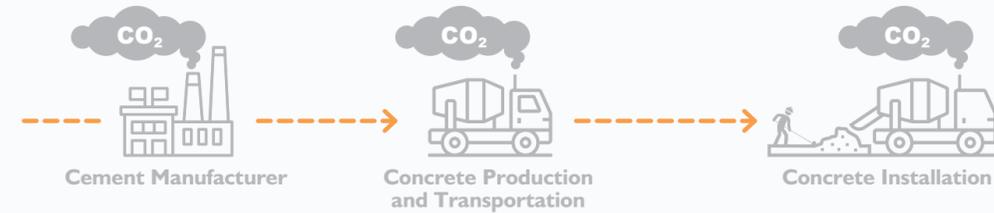
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Pier 27, Toronto, Ontario, recipient of the 2019 Ontario Concrete Award for Material Development and Innovation, utilized Master X-Seed 55 for carbon reduction and enhanced strength development.

Concrete and Its Impact on Carbon Emissions



Embodied carbon: CO₂ associated with concrete production from the cradle to grave.

Given its strength, durability and versatility, concrete is by far the most widely used building material in homes, buildings, roads, tunnels, bridges and more. However, in terms of addressing climate change, this predominant use of concrete does have a downside, due to one of its key components: cement.

Cement—The Primary Source of Embodied Carbon

Portland Cement accounts for 7 to 15 percent of concrete's volume but is responsible for as much as 95 percent of the carbon emissions. Therefore, the opportunity to reduce cement content is key to reducing embodied carbon.

Methods to Reduce Embodied Carbon

- Utilize strength-enhancing admixtures
- Reduce and control water content
- Use Supplementary Cementing Materials (SCMs)
- Utilize lower carbon cements such as Portland limestone cements (Type IL / Type GUL)
- Incorporate recycled aggregates
- Quantify and certify your lower carbon solution

The construction industry continues to make significant efforts toward reducing embodied carbon in concrete production. **At Master Builders Solutions, we are hard at work every day helping the industry to ultimately achieve the global goal of “Net Zero Carbon by 2050.”**

Master X-Seed® Technology. The Solution for Reducing Carbon.

Exclusive to Master Builders Solutions, this proprietary technology is capable of reducing embodied carbon in concrete mixtures by 5 to 20 percent! Master X-Seed admixture is the only stand-alone admixture capable of enhancing concrete strength while lowering cement content.

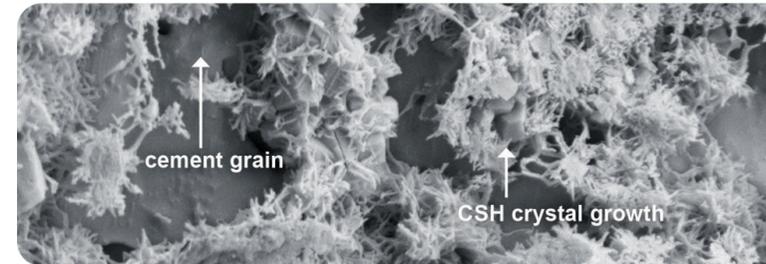


Image from CryoSEM with portland cement paste treated with Master X-Seed® admixture shows active crystal growth between the cement grains

How it Works

Incorporating Master X-Seed admixture in a concrete mixture improves overall hydration by facilitating the growth of calcium silicate hydrate (CSH) crystals between cement grains. The result is a more effective utilization of cement.

Quantifying and Certifying a Lower Carbon Solution

From iconic structures to residential foundations, sidewalks and driveways, Master Builders Solutions has been quantifying sustainable concrete solutions for more than a decade.

Our sustainability experts are adept at reviewing concrete specification language to ensure that the required performance characteristics are met based on standard industry guidelines, such as in ACI and CSA documents.

We also lead the industry in providing Life Cycle Analysis (LCA) documentation for concrete products through externally-verified Environmental Product Declarations (EPDs) and Eco-Efficiency Analysis (EEA) reports—a validated, third-party methodology for quantifying sustainable solutions.

Rely on the Experts

If you're looking to achieve the best solution for reducing embodied carbon and doing your part in working toward the ultimate goal of 'Net Zero Carbon' concrete, it makes sense to enlist Master Builders Solutions and the carbon-reducing potential of Master X-Seed admixtures.

Our 100+ years of global concrete technology expertise, along with a decade of working to develop cleaner concrete mixtures and quantifying results, make us the ideal partner for your path to Net Zero Carbon concrete.

