

The Global Challenge

The depletion of natural resources is currently a topic of serious concern globally. As concrete production continues to expand to accommodate population growth and increased urbanization, the construction industry is called upon to ensure a responsible use of the natural resources. Avoiding waste and utilizing locally available materials to minimize transportation distances will contribute to solving the global challenges related to the environment and preservation of the planet.

Together MasterCO₂re, Master X-Seed STE and MasterMatrix LF offer a package solution for customers striving to reduce the carbon footprint of concrete

ECO²NOW™ Concrete Calculator

Unlock Hidden Savings with Master Builders Solutions

We can calculate the significant savings in CO₂ emissions, water and costs through mix design optimization. Contact our experts today.



Master Builders Solutions® for the Construction Industry

MasterAir®

Complete solutions for air entrained concrete

MasterCast®

Solutions for the manufactured concrete product industry

MasterCem®

Solutions for cement manufacture

MasterCO₂re™

Solutions for low-clinker concrete

MasterEase®

Low viscosity for high performance concrete

MasterFinish®

Solutions for formwork treatment and surface improvement

MasterFiber®

Comprehensive solutions for fiber reinforced concrete

MasterGlenium®

Solutions for high performance concrete

MasterKure®

Solutions for concrete curing

MasterLife®

Solutions for enhanced durability

MasterMatrix®

Advanced rheology control for concrete

MasterPel®

Solutions for hydrophobization, anti-efflorescence and surface protection

MasterPolyheed®

Solutions for mid-range concrete

MasterPozzolith®

Solutions for water-reduced concrete

MasterRheobuild®

Solutions for high strength concrete

MasterRoc®

Solutions for underground construction and surface improvement

MasterSet®

Solutions for set control

MasterSphere®

Solutions for guaranteed freeze-thaw resistance

MasterSuna®

Solutions for sand and gravel in concrete

MasterSure®

Solutions for extraordinary workability retention

Master X-Seed®

Advanced accelerator solutions for concrete

Discover MasterMatrix LF, the innovative viscosity modifying agent that improves concrete stability and homogeneity.

info.master-builders-solutions.com/en/mastermatrix-lf



www.master-builders-solutions.com

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MASTER®
» BUILDERS
SOLUTIONS

**Build sustainable
Build better**

**MasterMatrix LF
compensates for
up to 50-70Kg
of fines in concrete**



Improve stability and homogeneity of concrete with reduced content of fines or paste

MasterMatrix LF is a new stabilizer which has been developed by Master Builders Solutions to **improve concrete stability and homogeneity**.

A dose of only 1 to 1.5 Kg of MasterMatrix LF can compensate for up to 70Kg of fines (particles with a diameter $< 250 \mu$) per m^3 of concrete or alternatively for up to 40 liters of paste.

Good concrete requires a certain amount of fines for ideal homogeneity, ease of use, and desired quality. Scarcity of fines leads to segregation and pumpability issues, making application and finishing more complex. Today, concrete often lacks fines due to various factors:

- The availability of fly ash and slag is constantly being reduced
- The availability of high-quality sand is diminishing, forcing concrete producers to find ways to use lower quality but easily available sands.
- Cement dosage is kept at a minimum to reduce the associated CO_2 emissions

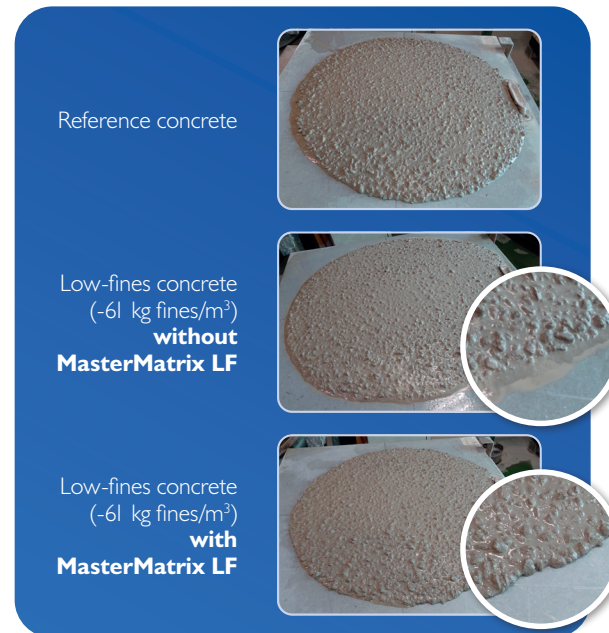


MasterMatrix LF Crushed sand scenario

By optimizing the plastic viscosity and rheology, MasterMatrix LF prevents the instability of the concrete when the fines content is limited and ensures homogeneity, good pumpability and ease of placing.

In the example below, MasterMatrix LF was used to increase the proportion of crushed sand, even when the mix was scarce in fines (fineness modulus 3.69) in order to avoid the use of natural sand (fineness modulus 3.11), that is scarce and expensive.

The concrete mixes have the same concrete consistency, measured according to EN 12350-5 (Flow table test). The photos below demonstrate the result:



The Low Fines Concrete without MasterMatrix LF bleeds at the border, a symptom of instability: upon the introduction of MasterMatrix LF no water is released, and the overall concrete aspect is very homogeneous and stable, comparable to the reference concrete, despite the reduced amount of fines.

Mechanism of action of MasterMatrix LF

The performance of MasterMatrix LF is ensured by the synergistic combination of two working mechanisms:

- Viscosity modification**, obtained thanks to the action of engineered polymers in MasterMatrix LF, ensuring stability and homogeneity with minimal plastic viscosity increase. Unlike conventional viscosity modifying agents, MasterMatrix LF exhibits shear-thinning behaviour: concrete is very stable when standing still and at the same time flows very easily upon movement initiation. MasterMatrix LF forms a network bridging all particles, adjusting viscosity based on shear. This maintains desired rheology from placement to finishing.
- Tribological effect or friction dissipation**, that is a lubrication effect working in a similar way to mechanical bearings where MasterMatrix LF envelopes the solid particles inside the concrete mix to reduce inter-particle friction and dissipate energy.

MasterMatrix LF Mechanism: Viscosity & Tribology

