



Concrete moves...



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Concrete contribution to
a changing world

ERMCO
EUROPEAN READY MIXED CONCRETE ORGANIZATION

ENVIRONMENTAL CONTRIBUTION BY ADMIXTURES

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GCP Applied Technologies

Abstract

Cement additives and concrete admixtures are construction chemicals that reliably improve the sustainability of a broad range of cement-based systems. This improvement can be derived from enhancing durability and strength through water reduction, and catalyzing the cement hydration process to enable replacement of clinker with supplementary cementitious materials.

Cement is the world's most widespread manmade material, with approximately 0.56 tonnes produced annually for every person on Earth. Cement manufacturing produces 0.7-1.0 of CO₂ emissions per tonne of cement, and accounts for approximately 5% of all global greenhouse gas emissions – making it among the largest contributors of greenhouse gases on the planet. Cement Additives and Concrete Admixtures can help reduce this carbon footprint. Grinding Aids and Quality Improvers make cement manufacturing more efficient, while Concrete Admixtures can reduce the amount of cement needed to achieve a given strength specification. Concrete Admixtures are formulated chemicals added to concrete at very low quantities (typically < 0.5 % by weight of cementitious material). Their primary function is to improve the properties of concrete, in its plastic and/or hardened states.

Water reducers and superplasticisers help disperse cement particles evenly, improving the flowability and workability properties of the concrete. With the use of admixtures, less amount of water is needed, resulting in concrete with a lower porosity and therefore a higher load-carrying capacity per unit of cement used. For a given strength requirement, less cement is used, reducing the carbon footprint of the concrete.

For Ready Mix Concrete, if fast setting times can be sacrificed when unnecessary, a reduction of CO₂ emissions can lead to cost savings. Therefore, it would be more economical to be more environmentally conscious.

Keywords: cement additives, concrete admixtures, CO₂ emission reduction, cost savings, Ready mix concrete, sustainability, enhancing durability.