



Concrete moves...



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Concrete contribution to
a changing world

ERMCO
EUROPEAN READY MIXED CONCRETE ORGANIZATION

READY MIXED CONCRETE PRODUCTION USING CO₂ WASTE

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Abstract

Concrete is the world's most important and most widely used building material. However, cement production remains a significant industrial source of CO₂ emissions. The industry searches for ways to meet increasing demand while at the same time to reduce the carbon footprint of the concrete produced. One approach is to upcycle CO₂ into concrete applications. The beneficial use of carbon dioxide in ready mixed concrete production has been developed and installed as a retrofit technology with industrial users.

The CO₂ utilization approach adds an optimum dose of carbon dioxide to concrete during mixing and batching. As added CO₂ increases the compressive strength of the concrete, producers may optimize their mix designs. Testing has shown that 5 to 8% cement reductions paired with the carbon dioxide addition can be achieved without compromising compressive strength.

The use of carbon dioxide along with a lower cement usage reduces the carbon footprint of concrete without reducing performance. The potential to pair the concrete industry CO₂ utilization with the cement industry CO₂ production was investigated. A carbon dioxide capture technology was installed at a cement plant. A slipstream output of carbon dioxide was then used at a ready mixed concrete plant. A year of an industrial production test in a concrete plant utilizing 13 tonnes of CO₂ added has saved more than 500 tonnes of cement and 175 tonnes of slag, and avoided more than 550 tonnes of CO₂ emissions.

Carbon dioxide utilization in concrete production is a viable, synergistic and beneficial approach to meet today industry sustainability goals.

Keywords: Concrete, carbon dioxide addition, carbon footprint.