CO$_2$-Cured Concrete based on Calcium Silicate Cement

Presented at the American Concrete Institute (ACI) Fall 2015 Convention & Exposition
Denver, Colorado
November 9, 2105

Authors: Sada Sahu, Jitendra Jain, Vahit Atakan and Nick DeCristofaro, Solidia Technologies

Abstract
Ordinary Portland cement (OPC)-based concrete gains its strength through the hydration process. However a new type of cement developed by Solidia Technologies gains its strength through the carbonation process. This is a low-lime containing calcium silicate cement (CSC) that emits 30% less CO$_2$ during production process compared to OPC. CSC can consume up to 300 kg of CO$_2$ per ton of cement during the curing process of the concrete resulting in up to 70% reduction in CO$_2$ emission. CSC is commercially known as Solidia Cement™ (SC). Water is not consumed during the CO$_2$ curing process, and the mix water can be recovered and recycled. The reaction products of the cement are CaCO$_3$ and SiO$_2$ and do not contain any hydrating phase. The cement matrix is very stable and durable.