

# Design and properties of sustainable concrete

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*Abstract*

Sustainable structural engineering follows the basic principle that the energy and resources consumption due to the construction and operation of a structure must be minimized. Relating to concrete structures this principle can be realized by the use of the material in the most efficient way considering its strength and durability within the service life of the structure. Against this background the present paper outlines methods to assess and reduce the environmental impact of concrete and means to increase its performance. The presented concept is applied to the concrete type with the greatest potential in sustainability, i. e. green concrete. Thereby, the basic principles of green concrete mix design are introduced and a systematic study of the influence of the cement content on the fresh and hardened concrete properties as well as on durability parameters is presented. From the results it can be seen, that green concretes possess a very high sustainability and, depending on the attack scenario, even might show acceptable durability characteristics when they are subjected to corrosive exposures.

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