Endurcrete

Environmentally friendly and durable conCrete

Dr Arnaud Muller
HeidelbergCement

Main goal

By integrating industrial by-products and hybrid systems, EnDurCrete develops new environmentally friendly and durable concretes for harsh environmental applications using new types of eco-friendly Portland composite cements. For many years, concrete based on ordinary Portland cement has been the principal structural material for building durable construction. Current state-of-the-art concrete types based on Portland cement—with very high substitution by supplementary cementitious materials—tend to fall behind in terms of performance and durability, which is particularly critical when applied in harsh environmental conditions. Moreover, the cement production process is responsible for almost 5-7% of the worlds man-made CO_2 emission.

The EnDurCrete project aims to develop a new cost-efficient, sustainable reinforced concrete for long-lasting and added-value applications. The concept is based on the integration of novel and optimised low-clinker cement, new nano- and micro-technologies and hybrid systems ensuring enhanced durability of concrete structures with high mechanical properties, self-healing and self-monitoring capacities.

The research focusses on several topics, from the development of new ecological low-clinker cements, innovative corrosion inhibitors, conductive additions enhancing self-sensing capabilities of concrete, special reinforcement and self-healing solutions, to the testing of durability in the laboratory and on large-scale demonstrations in real environment conditions. Data collected during the testing will be further used as an input for the modelling of concrete performance and development of service life prediction models. Furthermore, the knowledge and experience gathered by the project is supporting the preparation of novel standards for more eco-friendly cements and concretes.

Demonstration sites

Following the concrete development stage, full-scale demonstrators will be cast and placed in working sites of tunnels, ports, bridges and offshore structures. The aim of the demonstrators is to prove the enhanced durability and the improved long-term cost efficiency of the new concrete structures in such critical applications. However, EnDurCrete is not only about developing concrete but also about pushing forward test methods and analysis tools. Advanced non-destructive continuous monitoring and testing tools and procedures will be developed and used, including technologies tuned for providing concrete with self-sensing capabilities. They are intended to complement the conventional durability testing procedures in laboratories.

Figure 1: Project demo sites where technology applications will be tested

Adobe Stock © Grooveriderz

endurcrete

SUMMARY

The EnDurCrete project - New Environmentally friendly and Durable conCrete, integrating industrial by-products and hybrid systems, for civil, industrial and offshore applications.

The EnDurCrete project aims to develop a new cost-efficient, sustainable reinforced concrete for long-lasting and added-value applications. The project started in January 2018 and ends in summer 2021.

PROJECT LEAD PROFILES

HeidelbergCement is one of the world's largest building materials companies. With the takeover of the Italian cement producer Italcementi, HeidelbergCement became the number one in aggregates production, number two in cement, and number three in ready-mixed concrete. The core activities of HeidelbergCement include the production and distribution of cement and aggregates, the two essential raw materials for concrete.

PROJECT PARTNERS

The EnDurCrete project involves 16 European partners, including industry leaders in the fields of cement and concrete production, construction companies, chemical admixture producers, universities and technological research institutes as well as service providers.

CONTACT DETAILS

Dr Arnaud Muller
HeidelbergCement
+49 6221 4811 3676
arnaud.muller@heidelbergcement.com
www.endurcrete.eu

FUNDING

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 760639.