

Danish expert centre for infrastructure constructions

In 2010 a new expert centre for constructions to the infrastructure was established. The centre's activities are focused on durability aspect of reinforced concrete constructions exposed to severe environmental conditions, e.g. tunnels, bridges and off shore windmills subjected to sea water, de-icing salts and freeze/thaw. . These structures are difficult and costly to construct and maintain. Denmark as well as other European countries face huge future challenges not only regarding the construction of new infrastructure, but also with respect to maintenance and repair of the existing worn down infrastructure. It is estimated that the annual turnover in EU related to the physical infrastructure is around 0,3 trillion EURO, corresponding to 2-3 % of the GNP.

The research topics of the expert centre include:

- Seawater affected concrete structure's long-term durability
- Models for chloride binding
- The influence of casting defects as well as unavoidable structural weaknesses on long-term durability
- Influence of rheology and casting method on durability of structures cast with SCC
- The influence of micro defects on durability
- Chloride threshold values for initiation of corrosion and corrosion rates in the propagation phase. Influence of binder system and environmental conditions
- Models for cracks, including understanding damage formation in and through the interface between reinforcement and concrete
- Numerical service life models based on chloride driven reinforcement corrosion and later expanded to other degradation mechanisms.

The centre is based on a close cooperation between the Concrete Centre at Danish Technological Institute and the Department of Civil Engineering at the Technical University of Denmark. The aim is to combine and utilize complementary competences and laboratory facilities and to carry out collaborative PhD, post-doc and master projects.

A number of external cooperation partners are related to the expert centre with an advisory role. These are the Femern Belt building owner, the Danish Road Directorate, Banedanmark, Metroselskabet, Cowi, Grontmij Carl Bro, RAMBØLL, MT Højgaard, Pihl, Aalborg Portland and Dansk Konstruktions og Betoninstitut A/S.

The expert centre is co-financed by the Danish Ministry of Science, Technology and Innovation for 2½ years. It is the ambition is to continue the cooperation based on funding from EUs 7th and 8th framework programme after the national grant period. The expert centre will seek influence from an active participation in official EU lobby networks related to the infrastructure (current working title: Refine).

More information can be seen on www.concreteexpertcentre.dk.

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