LORCENIS

LOng Lasting Reinforced Concrete for ENergy Infrastructure under Severe Operating Conditions

What?

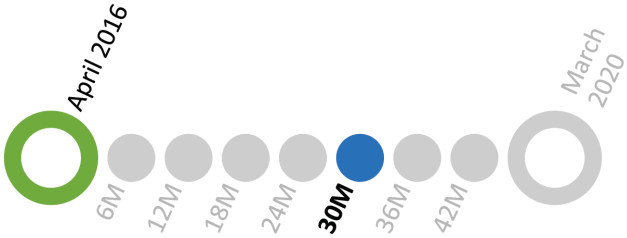
The main goal of the LORCENIS project is to develop long lasting reinforced concrete for energy infrastructures under severe operating conditions with lifetime extended up to a 100%.

Why?

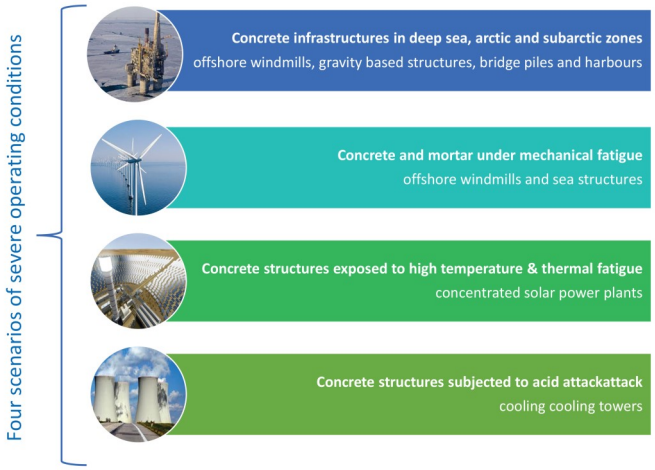
As population is steadily growing, there will be an **increasing demand for energy** worldwide in the coming 30 years. New infrastructure projects for energy require long service life spans (up to 100 year), even under **extreme operating conditions** like acid attack, chloride attack etc. However, conventional concretes are not able to withstand these severe conditions, leading to **high maintenance costs** and even **failure** of the construction.

How?

1. Development of multi-responsive **nano-materials** based on 4 technology groups (self-sensing, internal curing, self-sealing and self-healing)
2. Incorporation of the nano-additives into the **concrete**, resulting in **tailored properties** and improved performance of the final bulk reinforced-concrete working under severe conditions.



3. Development of advanced multi-scale (from atom- to macroscale) software for **modelling** and **end-of-life prediction** of the tailored reinforced concretes under the severe condition of chloride ingress.
4. **prototypes** will be designed, built, tested and monitored under severe operating conditions
5. assessment of **environmental impacts**, **costs** from cradle to grave and **risks** based on Safe-by-Design principles.



Website for public dissemination

A user-friendly website is essential to promote the project visibility and its dissemination worldwide. SINTEF has coordinated the creation and maintenance of the project website, in close collaboration with UGent and the WP leaders, in order to update the website contents regularly.

All the partners are actively asked to update their activity on the website. A homepage for public dissemination was launched 1. June 2016.

www.lorcenis-eu.com

LORCENIS workshop related to corrosion

Corrosion of steel rebars is a major cause of the deterioration and limited service life of reinforced concrete structures. The high alkalinity of concrete provides an ideal environment for protecting embedded steel by passivating it. However, carbonation and chloride ingress disrupt the passive layer on steel, triggering its corrosion. The voluminous corrosion products generate internal stresses, leading to cracking and spalling of concrete and, ultimately, to the early failure of the structure.

The Workshop on Corrosion of Steel in Concrete was organized in the frame of the European project LORCENIS and intended to be a public forum for an open discussion on corrosion of steel in concrete from the basic concepts to the state-of-the-art measurement and prevention techniques.

It was also an opportunity for LORCENIS partners to present recent results obtained in the ambit of the project.

MODA tables

Modelling Data Elements (MODA) have been setup by the European Materials Modelling Council – EMMC in joint interaction with the EC Directorate-General for Research and Innovation, Directorate D — Key Enabling Technologies, Unit D.3 — Advanced Materials and Nanotechnologies towards the establishment of modelling interaction and application in a standardized way. So called MODA tables allow third parties (industry, academics, etc.) the understanding and the usage of a modelling/simulation chain and data.

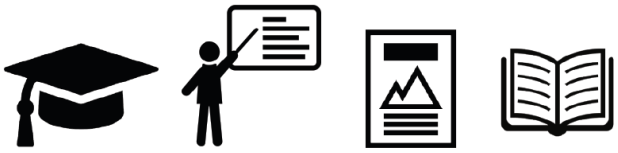
Materials data, data formats, materials relations and even post-processing data become accessible more easily. LORCENIS is one of the pilots towards the usage of MODA tables.

The used workflow is already available:

https://emmc.info/wp-content/uploads/2016/03/LORCENIS_Workflow.pdf

Awareness and dissemination plan

LORCENIS outcomes of a non-confidential nature, and not the subject of patent application(s), are disseminated by the consortium through the publication of scientific papers and other routes such as formal conference presentations or posters. Moreover, some project partners also aim to allow one or more students to obtain a PhD degree by writing down their findings related to the LORCENIS project in a doctoral thesis.

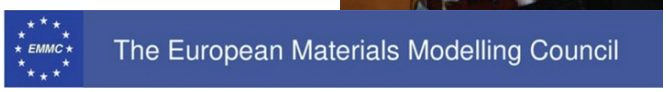


LORCENIS contribution to a training workshop on modelling in frame of the EMMC activities

Modelling and simulation activities are very often driven by academics. In LORCENIS, academic partners interact with industrial stakeholders from the construction engineering sector, including material suppliers to develop a software tool allowing to estimate the service life of a concrete based infrastructure operating under severe conditions. Complementary, the tool should be able to cover the aspect of additives in cements etc. towards prolongation of maintenance cycles or even the entire service life.

These non-trivial requirements make the modelling activities even more difficult, especially due to the problems dedicated to multiscale aspects and simulation performance. During the workshop, such technical points were discussed and capabilities were figured out.

Data vs. hysics-based modeling capabilities were compared and highlighted.



Conference

It is a pleasure to invite you to the Conference on Durable Concrete for Infrastructure under Severe Conditions in the framework of the LORCENIS project.

Date: 10th - 11th September, 2019

Place: Ghent, Belgium

TOPICS:

Conference on Durable Concrete for Infrastructure under Severe Conditions

Smart admixtures, self-responsiveness and nano-additions

REGISTRATION

Registration will be open soon.

Questions regarding the conference can be emailed to lorcenis2019@ugent.be

More info on www.lorcenis-eu.com

Consortium

LORCENIS is a well-balanced consortium of multidisciplinary experts from 9 universities and research institutes and 7 industries whose 2 are SMEs from 8 countries who will contribute to training by exchange of personnel and joint actions with other European projects and increase the competitiveness and sustainability of European industry by bringing innovative materials and new methods closer to the marked and permitting the establishment of energy infrastructures in areas with harsh climate and environmental conditions at acceptable costs.

Contact

Project leader: Christian Simon

Email: Christian.R.Simon@sintef.no

Phone: +47 93811275

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