

Numerical Modelling of Reinforcement Corrosion in Concrete at Microscale in a Multiscale Framework

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Key Words: Chloride inhibition, Reinforcement Corrosion, Finite Element Method (FEM)

The degradation of structural concrete due to chloride ingress is a well-known issue in the Infrastructure community. The study at hand focusses on the continuum modelling of transport and corrosion processes inside concrete [1, 2] with further possibilities to account for chloride binding and effect of chloride entrapping inhibitors. The continuum corrosion model couples transport processes with electrochemical processes and is applied on steel in high performance concrete (HPC) and its exposure to chloride ingress in submerged conditions, thereby incorporating the main chemical species present in such an environment. The model is an integral part of a multiscale material modelling (M3) framework.

The final approach will produce a more realistic picture of the corrosion process inside concrete. The talk reports the present state of our work towards accurate service life prediction of reinforced concrete structures in terms of rebar loss more accurately and precisely.

Acknowledgement: This research is a part of multi scale modelling approach under EU-LORCENIS project under grant number: 685445

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