

Corrosion of metallic anchors in concrete

Prof. Dr.-Ing. Sylvia Kessler

Abstract

Civil infrastructures are deteriorating over time; bridges, tunnels, marine facilities, etc. are all affected. Thus the durability design of reinforced concrete structures is of increasing importance when considering the required service life of our infrastructure. One of the major deterioration mechanisms is corrosion with a huge economic impact. About a fifth of the world's annual steel production goes towards simply replacing steel parts damaged by corrosion. For fastening systems, it's even more critical as safety is key. Failure due to corrosion may have dramatic consequences. Even though it may involve higher up-front cost, correct and efficient corrosion protection at the source helps save money and resources in the long run.

This lecture focuses on the design of fastening systems in concrete structures with regard to corrosion protection. Background is provided on the mechanisms of electrochemical corrosion under atmospheric condition and in concrete. The current system in standards for specifying and ensuring the durability of fastening systems is commonly of a prescriptive type. In prescriptive specifications, adequate durability is assumed to be guaranteed indirectly by ensuring compliance with limiting values for fastening materials. This parameter defines the corrosion resistance to withstand actions from the surrounding environment. Advantages and disadvantages of this approach are discussed.



Prof. Dr.-Ing. Sylvia Kessler is Chair of the Institute for Construction materials and building maintenance at the Helmut-Schmidt-University / Universität der Bundeswehr Hamburg. Prior to this she was Head of working group "Steel and Corrosion" at the Centre for Building Materials of the Technical University in Munich (TUM). Her education includes a master degree in civil engineering from RWTH Aachen University and a PhD from TUM. Her research interests include durability and service life design of reinforced concrete structures, and they cover probability-based service life design, numerical simulation of corrosion processes, non-destructive testing and assessment and repair of concrete structures.

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Fakultätsraum GB II

Campus Süd

Information:

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