Benchmark for deemed-to-satisfy rules

The current system for specifying and ensuring durability of new concrete structures in standards is commonly of a prescriptive type. In prescriptive specifications, durability is guaranteed indirectly by ensuring compliance with limiting values for concrete composition and construction details. These empirical provisions have typically evolved from local experience and the local availability of concrete constituents. They are based on the individual preferences on safety without any type of mathematical or scientific verification. One of the practical results is that there is an enormous variation in requirements between the various countries all over the world and even in Europe when close regional proximity is given. However, the different national provisions cannot be explained on a rational basis and it is likely that they do not lead to a consistent exposure resistance. The aim of this work is to perform a benchmark for deemed-to-satisfy rules for the exposure classes XD and XS. Within the benchmark it is determined which reliabilities against chloride-induced depassivation of rebars can be expected if the deemed-to-satisfy rules of different countries are considered. This includes not
only calculations mainly based on short term laboratory data, but also an independent assessment of existing structures. The calculated reliability ranges determined are compared with the target reliabilities proposed by current specifications and, based on the above comparison, a proposal for improving deemed-to-satisfy rules and specifications is made.

Stichworte: Durability, deemed-to-satisfy rules, performance based rules, chloride, reliability design, assessment of existing structure

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