

EMI 2016, Nashville

Constitutive Models for Mortars of Bonded Anchors

Marco Marcon¹, Jan Vorel¹ and Roman Wendner^{1*}

Keywords:

Anchor, mortar, epoxy, vinyl-ester

Abstract:

The efficient and permanently safe design of anchor system requires a thorough understanding of complex load carrying mechanisms and processes. Considering the required design life time of at least 50 years in combination with the demanded small failure probability, especially for the ultimate limit case, a suitable framework for the service-life prediction and assessment is critical. In general, accurate modelling concepts for all involved materials and processes, taking into account the associated model and prediction uncertainties, should be utilized. In case of bonded anchors three basic components - steel rod, mortar and concrete – are of relevance. In this paper, constitutive models of two different types of mortars (epoxy or vinyl-ester based) are presented. According to the preliminary experiments, the investigated epoxy based system is characterized by a pronounced ductile behaviour whereas the vinyl-ester based system is quite brittle. The proposed numerical approach, formulated in the framework of discrete particle and continuum models, is utilized to capture the aforementioned characteristics. The numerical results obtained by the proposed models are compared with the available experimental data.

¹ IKI-BOKU Vienna, Austria, roman.wendner@boku.ac.at

* corresponding author