

## NUMERICAL BENCHMARK FOR CRACKING BEHAVIOUR

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For years and years the use of smeared cracking models is quite popular for numerical simulations of brittle behaviour. Softening model, fracture energy ( $G_f$ ) and crack band width ( $h$ ) define together the softening curve in the  $\sigma$ - $\varepsilon$ -relation. For situations with localised cracking (e.g. notched beams) the literature provides recommendations for a proper choice of the crack band width. For situations in which the cracking zone will be more widespread en multiple cracks will develop, the correct determination of  $h$  is more difficult and less straightforward.

This lecture recommends and illustrates a numerical benchmarking procedure for calibrating the softening behaviour. Starting point is a detailed benchmark calculation with accurately modelled interaction between reinforcement and concrete. In this calculation, the crack distance is determined by the bond-slip behaviour rather than by the crack band width. The results of benchmark calculation form the basis for an iterative process in which the softening behaviour for the integral calculations is fine-tuned. As will be illustrated, this approach leads to good results in a practicable way.

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