

English summary

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Fatigue assessment of welded joints under variable loading using 3R-method

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Summary. In this study experimental fatigue test results of as-welded, HFMI treated and LTT welded joints were analyzed using a novel 3R-method which takes into account the base material strength, residual stress state and local stress ratio. The focus of this paper was investigate the validity of the 3R-method on welded joints subjected to variable amplitude loading. The equivalent constant amplitude loading ranges leading to failure were derived using a mean “master” $S-N$ -curve and the linear cumulative damage sum of Palmgren-Miner. Using a simplified estimate of residual stresses in welded joints the linear damage sums matched closely to cases where the calculation was based on nominal mean constant amplitude $S-N$ -curves that were derived experimentally from respective variable amplitude loading test results. All calculated equivalent constant amplitude notch stress ranges were above the characteristic “master” $S-N$ -curve in the case-independent reference notch stress system. The characteristic “master” $S-N$ -curve corresponded to a damage sum of 0.174 at failure.

Key words: fatigue, welded joints, effective notch stress, variable amplitude loading, local stress ratio

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Material models for armor steels

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Summary. In this article material models for armor steel are presented. At first properties and applications of armor steels are discussed. Then experimental facts concerning ductile fracture of steels are discussed. In the final part of the article six different material models suitable for fracture prediction of armor steels are reviewed. The purpose of the paper is to give an overview for the reader of material models suitable for predicting ductile failure of armor steels.

Key words: rolled homogeneous armor, material modelling, ductile fracture

Effect of secondary moment to the strength of weld

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Summary. In this article, the strength of fillet weld is studied when the secondary moment of weld root was varied. The study includes tests and analytical calculations. Used steel grade was S960. In tubular joints, the strength of fillet welds has shown unexpected high capacity and in other hand, the critical failure path was often distinguishing from assumed critical weld plane. From those tests with tubular joints, it is dangerous to withdraw conclusions of the strength of fillet welds. Further study was needed to have better understanding of the factors of good results of tubular joint weld capacities. By using FE-analysis, the effect of local flexibility to the strength of weld, was studied

Key words: fillet weld, high strength steel, FEA, welded joints