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Effect of hot dip galvanization on the fatigue behaviour of steel bolted connections

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Abstract

This short technical note summarizes some recent data from hot dip galvanized steel bolted connections under fatigue loading. In particular the effect of a galvanizing coating on the fatigue strength of S355 structural steel is analyzed in detail showing that the decrease of the fatigue life is very limited if compared with that of uncoated joints and the results are in good agreement with Eurocode detail category, without substantial reductions. The procedure for the preparation of the specimens is systematically described in this note providing a useful tool for engineers involved in similar practical applications. The results are compared with previous data from notched galvanized specimens weakened by a central hole and not treated specimens characterized by the same geometry.

Keywords: galvanized steel, high cycle fatigue, notch effect, stress concentration factor

Nomenclature

$\Delta\sigma$ Nominal stress range due to tensile loading

$\Delta\sigma_C$ Reference value of the fatigue strength at $N_C = 2$ million cycles

k Inverse slope of the fatigue curves

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