

INVESTIGATION OF FUSION ZONE (FZ) SIZE EFFECT ON MECHANICAL PERFORMANCE OF DISSIMILAR RESISTANCE SPOT WELDS OF DP780 DUAL PHASE STEEL/LOW CARBON STEEL (LCS) JOINTS

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Abstract

The aim of present study is to investigate the effect of fusion zone (FZ) size on the mechanical performance of dissimilar DP780 dual phase steel and low carbon steel (LCS) joints. The results showed that the mechanical efficiency of the DP780/LCS joint is related to the FZ size. Regarding to FZ size two different modes of pullout and interfacial failure were perceived. It was noticed that the conventional recommendation of $d=4t1/2$ (t =sheet thickness) for sizing spot weld is not proper to determine the transition from interfacial to pullout failure in tensile-shear test. A simple analytical model was used to estimate the FZ size to ensure pullout failure in tensile-shear test.

Keywords: Resistance spot welding, dissimilar joint, dual phase steel, low carbon steel, failure mode

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