

FEA & Experiments in Aluminium Butt Cold Welding Case – Mechanically Affected Zone Description

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ABSTRACT

The paper presents several theoretical and experimental results regarding the deformation process in butt cold welding case of Aluminium bars. The approach is based on a finite element model capable to predict the material behaviour during the up-setting, considering several constrains introduced by the FEA code: non-linear static analysis, large strain and large deflection, prescribed displacements. The theoretical data obtained at 75% global deformation rate of the material, corresponding to the cold-joint achievement, were compared with practical experiments carried out in Robotics and Welding Department of Dunarea de Jos University of Galati, Romania. The *Mechanical Affected Zone* – MAZ (developed in the material due to the up-setting process) dimension and characteristics are identified. The research results are useful for future studies regarding the possibility of obtaining dissimilar cold-joints or for the optimization of the pressing equipment.

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