Fatigue life estimation of clinched joints from wrought aluminium alloy with Local Strain Approach considering cold working of joining process

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Abstract

Mechanical clinching is an efficient joining technique frequently used in the automotive industry to join sub-assemblies of the car body. During mechanical clinching, the material in the joint is cold worked altering the cyclic material properties and affecting the performance of the joint under cyclic loading. The paper presents an approach for fatigue life estimation of clinched joints using the Local Strain Approach. Numerical simulation is utilized to retrieve local stresses and strains in the critical region. Experimental investigation is presented to validate the crack initiation location and an assessment of the fatigue life estimation is carried out.

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