
Modelling of Damage Behaviour using The Rousselier Model in 7075 Aluminium Alloy

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Abstract

This paper presents the damage model to predict the material behaviour on the basis of the micromechanical processes leading to failure. Rousselier's model is used as a constitutive damage model for describing the material behaviours of the studied aluminium alloys based on the continuum damage mechanics (CDM). In order to demonstrate the nature of damage formulation, a flat tensile specimen is considered in the analysis, where the Rousselier's model was applied using a MATLAB user subroutine. The modified model is proposed to predict the material behaviours of damage in 7075 aluminium alloy and the strain rate and temperature dependence are introduced into a model. The results show that a good agreement between measured and predicted result is obtained, which confirms that the established of Rousselier's model can give an accurate and precise estimate of the damage of material behaviours for 7075 aluminium alloy.

Keywords: Damage, Rousselier model, material behaviour, strain rate, temperature dependent

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