

Experimental Determination of Aluminum 7075-T6 Parameters Using Stabilized Cycle Tests to Predict Thermal Ratcheting

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Abstract : In this paper the thermal ratcheting, kinematic hardening parameters C , γ , isotropic hardening parameters and also k , b , Q combined isotropic/kinematic hardening parameters have been obtained experimentally from the monotonic, strain controlled cyclic tests at room and elevated temperatures of 20°C, 100°C, and 400°C. These parameters are used in nonlinear combined isotropic/kinematic hardening model to predict better description of the loading and reloading cycles in the cyclic indentation as well as thermal ratcheting. For this purpose, three groups of specimens made of Aluminum 7075-T6 have been investigated. After each test and using stable hysteretic cycles, material parameters have been obtained for using in combined nonlinear isotropic/kinematic hardening models. Also the methodology of obtaining the correct kinematic/isotropic hardening parameters is presented.

Keywords : combined hardening model, kinematic hardening, isotropic hardening, cyclic tests

Conference Title : ICMDPE 2015 : International Conference on Mechanical Design and Power Engineering

Conference Location : Paris, France

Conference Dates : January 23-24, 2015