Practical failure criterion of spot weld for crash simulation

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Abstract

This paper proposed a failure criterion of spot welds for combined loading condition for crash simulation. The tests were designed to obtain the failure load of a spot weld under combined loading condition. The seven types of experimental test were conducted for the component of spot weld failure criterion. The failure criterion of this paper consists of moment component including normal and shear force. The each component of spot weld failure of test is obtained from finite element analysis results. The proposed criterion was considered to use Wung model except torsion term. It was found that the criterion of mild steel was expressed as a function of previous researches, however failure criterion of high strength steel and advanced high strength steel were newly proposed. The proposed failure criterion was well-estimated for hat-specimen test result.