



Stress State Dependent Damage Modeling with a Focus on the Lode Angle Influence

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Shaker Verlag Okt 2011, 2011. Buch. Condition: Neu. Neuware - Numerical fracture prediction of metals is of great interest in automotive industry, since it is an effective way to improve crashworthiness of car body parts. In the present thesis, the effect of stress state on damage modeling with the focus on the Lode angle parameter (or third deviatoric stress invariant) is discussed and validated by experimental and numerical studies. The numerical implementation is integrated to the damage model GISSMO (Generalized Incremental Stress State dependant damage MOdel) as an extension, which was proposed by Neukamm et al[1-4]. The model is extended for 3D usage by utilization of Lode angle parameter. The stress state is defined with two stress state parameters, stress triaxiality and Lode angle parameter uniquely. The material ductility (or fracture strain) is considered as a function of the stress triaxiality and Lode angle parameter. The stress triaxiality and Lode angle parameter space is covered with a series of tests for the dual-phase steel DP600. Tests of axisymmetric notched round specimens, grooved flat specimens and Nakazima were conducted to study the material behavior for Lode angle parameter equal to 1, 0 and -1, respectively. Additionally, for the intermediate stress states,...



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