



Stress triaxiality effect on ductile damage activation in metals

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ABSTRACT. In the framework of CDM, the evolution of the plastic strain, at which damage processes initiates, as a function of stress triaxiality, making the assumption of constant damage dissipated work is derived. Based on this, the CDM model proposed by Bonora (*Eng. Frac. Mech.*, 58, 1-2, 1997) has been used to predict the occurrence of ductile failure at different stress triaxiality conditions, under both quasi-static and dynamic loading conditions. This solution allows the possibility to correctly predict the conditions for which ductile damage can initiate under uniaxial strain (such as that for the flyer plate impact test) and mixed conditions such as those in the Taylor impact test. The solution offers the possibility to correlate continuum damage model parameters to microstructural features such as grain size and purity grade.

KEYWORDS. Continuum damage mechanics; Stress triaxiality; Spall; Copper.