

Abstract Submitted
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Damage Development in Rod-on-Rod Impact Test on 1100 Pure Aluminum GIANLUCA IANNITTI, TECHDYN Engineering, NICOLA BONORA, University of Cassino and Southern Lazio, NEIL BOURNE, University of Manchester, ANDREW RUGGIERO, GABRIEL TESTA, University of Cassino and Southern Lazio — Stress triaxiality plays a major role in the nucleation and growth of ductile damage in metals and alloys. Although, the mechanisms responsible for ductile failure are the same at low and high strain rate, in impact dynamics the time resolved stress triaxiality and plastic strain accumulation at the material point establish the condition for ductile failure to occur. In this work, ductile damage development in 1100 commercially pure aluminum was investigated by means of rod-on-rod (ROR) impact tests. Based on numerical simulations, using a CDM model that accounts for the role of pressure on damage parameters and stochastic variability of such parameters, the impact velocity for no damage, incipient and fully developed damage were estimated. ROR tests at selected velocities were performed and damage distribution and extent was investigated by sectioning of soft recovered samples. Comparison between numerical simulations and experimental results is presented and discussed.

Nicola Bonora
University of Cassino and Southern Lazio

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