



An Experimental Technique for Developing Intermediate Strain Rates in Ductile Metals

By Hugh E. Gardenier

Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x12 mm. This item is printed on demand - Print on Demand Neuware - Quantifying the strain-rate sensitive dynamic properties of structural materials is an important area of research in the solid mechanics field. Property evaluation is typically accomplished using dynamic tests which involve rapid loading or impact of specimens. In these tests, inertial forces and wave propagation make it difficult to accurately record the material response to a loading condition at an equivalent location. Furthermore, these tests typically generate high strain rates (in excess of 10^3 s^{-1}) and an experimental method for generating rates of strain in the intermediate strain rate regime which is relatively simple, low cost, and reliable is still lacking. This research effort develops an experimental technique for generating tensile plastic strain rates up to 10^2 s^{-1} in ductile metals. The technique relies on an impact from a load cell instrumented drop weight machine capable of delivering a suitable impact velocity and energy to globally deform a slotted beam specimen. At impact, a state of plastic uniaxial tensile stress is created in the ligament underneath a slot. The ligament is instrumented with an...

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