Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Taylor Anvil Impact CHARLES ANDERSON, Southwest Research Institute, ARTHUR NICHOLLS, SIDNEY CHOCRON — G. I. Taylor showed that dynamic material properties could be deduced from the impact of a projectile against a rigid boundary [1]. The Taylor anvil test became very useful with the advent of numerical simulations [2], and has been used to infer material constitutive constants [3]. A new experimental facility has been developed to conduct Taylor anvil impacts for validating constitutive constants used in numerical simulations. A 37-mm diameter Hopkinson bar apparatus was adapted to conduct the Taylor anvil experiments. Techniques were developed to separate the sabot from the impacting projectile, yet maintain high-precision impact planarity. The anvil is made from Vascomax steel, and backed by a 1.82-m steel bar to provide inertial mass to the anvil and ensure deceleration of the projectile solely from elastic waves within the projectile. Ultra-high speed photography provides time-resolved data, while a digital imaging system was adapted to determine radial deformation as a function of length. Details of the experimental techniques, along with examples of experiments using 6061-T6, are discussed. Numerical simulations are used to complement the experimental results. [1] G. I. Taylor, Proc. R. Soc. A, 194, 289 (1948); [2] M. L. Wilkins & M. W. Guinan, J. Appl. Phys., 44(3), 1200 (1973); [3] T. J. Holmquist & G. R. Johnson, private communication.

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Date submitted: 05 Apr 2005 Electronic form version 1.4