

Abstract Submitted
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Taylor Impact Tests and Simulations on PBX 9501 BRAD CLEMENTS, Physics and Chemistry of Materials Group, T-1, LANL, DARLA G. THOMPSON, HE Science and Technology Group, WX-7, LANL, D.J. LUSCHER, Fluid Dynamics and Solid Mechanics Group, T-3, LANL, RACCI DELUCA, HE Science and Technology Group, WX-7, LANL — Taylor impact tests have been conducted previously on plastic bonded explosives (PBXs) to characterize the stress state of these materials as they impact smooth and flat steel anvil surfaces at speeds of ~ 100 m/s (i.e. Christopher, et al, 11th Detonation Symposium). In 2003, C. Liu and R. Ellis (unpublished, Los Alamos National Laboratory) performed Taylor tests on PBX 9501 up to speeds of 115 m/s, capturing impact images. In the work presented here, we have extended these tests to velocities of 200 m/s using a composite-lined gun barrel and no specimen sabot. Specimen images are used to validate the thermo-mechanical constitutive model ViscoSCRAM. ViscoSCRAM has been parameterized for PBX 9501 in uniaxial stress configurations. Simulating Taylor impact experiments tests the model in situations undergoing extreme damage. In addition, experimental variations to specimen confinement and friction are introduced in an attempt to establish ignition thresholds in this velocity regime.

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