

Abstract Submitted
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Isentropic Compression of Nitroplastized Estane to 40 KBAR on the Sandia Z-Machine RICK GUSTAVSEN, DAN HOOKS, BRUCE ORLER, DANA DATTELBAUM, RICK ALCON, Los Alamos National Laboratory, CLINT HALL, MEL BAER, Sandia National Laboratories — Nitroplasticized Estane is the plastic binder used to hold HMX grains together in the plastic bonded explosive PBX 9501. As part of an effort to characterize PBX 9501, we isentropically compressed the explosive and its constituents to ~ 40 kbar on the Sandia Z-Machine. Nitroplasticized Estane binder samples were prepared as follows: A mixture of 49 wt. % Estane[®]5703 (BF Goodrich), 49 wt. % Nitroplasticizer (a 50/50 eutectic mixture of bis(2,2-dinitropropyl)formal and bis(2,2 dinitropropyl)acetal), and 2 wt. % Irganox[®] 1010 stabilizer was prepared as for PBX 9501 binder. Samples were compression molded into 0.1 – 2 mm thick films at 110°C. These were then mounted between 6061 Aluminum Z panels and PMMA or LiF VISAR widows. PMMA washers between the panel and window stabilized the binder thickness. Profiles of ramp waves transmitted through several sample thicknesses were measured and compared with a reference profile. A simple analysis of the results indicates that the binder behavior can be described using the Universal Liquid Hugoniot with an ambient sound speed of 1.7 km/s.

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