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One-Dimensional Shock and Detonation Characterization of Ultrafine Hexanitrostilbene STEPHEN GOVEAS, Atomic Weapons Establishment, Aldermaston, Reading, RG7 4PR, United Kingdom., JEREMY MILLETT, IVAN KNAPP, Defence Academy of the United Kingdom, Cranfield University, Shrivenham, Swindon, SN6 8LA, United Kingdom., NEIL BOURNE, University of Manchester, P.O. Box 88, Sackville Street, Manchester, M60 1QD, United Kingdom.
— A series of plate impact experiments was performed, using a single-stage gas gun, on die-pressed, high density (92% theoretical maximum) samples of ultrafine hexanitrostilbene (HNS). This enabled investigation of the inert shock response and subsequent detonation of the material. Shock magnitudes up to ca. 6 GPa were investigated by varying the flyer and target plate materials, and impact velocities. In each case, the shock length was chosen to be longer than the pellet (ca. 3 mm). Shock wave profiles and transit times were diagnosed using embedded miniature (1 mm^2) manganin stress gauges placed at the front and rear of the shock assemblies. The results have been interrogated to establish the non-reactive Hugoniot of the HNS and deduce information on its run-to-detonation. Analysis of measured stresses and calculated pressures suggests that pressed HNS possesses little strength behind the shock front. These and other features are discussed and compared with existing data.

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