

Abstract Submitted
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Effect of subcritical damage on sensitivity of a plastic bonded explosive¹ GEORGE SUNNY, THOMAS KRAWIETZ, JOHN COX, Munitions Directorate, Air Force Research Laboratory, JENNIFER JORDAN, Air Force Office of Scientific Research, CHAD RUMCHIK, Munitions Directorate, Air Force Research Laboratory — As energetic materials are subjected to increasingly extreme environments, a more thorough understanding of the relationships between mechanical insult and changes in explosive sensitivity is desired. To that end, a Shock Wave Apparatus, originally developed at TDW (Schrobenhausen, Germany), has been employed to induce subcritical shocks of up to 0.7 GPa in a plastic bonded explosive sample while preserving the sample for further study. Changes in density due to the subcritical shocks are measured, and the sensitivity of the damaged explosive is determined through a TDW/AFRL Modified Gap Test configuration that allows the run-to-detonation (RTD) to be determined for a given shock loading. Changes in sensitivity are determined by comparing the RTD for each damaged sample with corresponding RTD for pristine (i.e. undamaged) samples. Confined Split-Hopkinson Pressure Bar experiments are also conducted in order to understand the effects of damage at lower strain-rates and pressures. Finally, the effects on sensitivity due to multiple shocks are also investigated in this study.

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