

Abstract Submitted
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An Experimental study of Corner Turning in a Granular Ammonium Nitrate Based Explosive SUSAN SORBER, PETER TAYLOR, AWE Plc
— A novel experimental geometry has been designed to perform controlled studies of corner turning in a “tap density” granular explosive. It enables the study of corner turning and detonation properties with high speed framing camera, piezo probes and ionization probes. The basic geometry consists of a large diameter PMMA cylinder filled with the granular explosive which is initiated on axis from below by a smaller diameter cylinder of the same explosive or a booster charge. Four experiments have been performed on a granular Ammonium Nitrate based non ideal explosive (NIE). Two experiments were initiated directly from a PE4 booster charge and two were initiated from a train including a booster charge and a 1” diameter Copper cylinder containing the same NIE. Data from the four experiments was reproducible and observed detonation and shock waves showed good 2-D symmetry. Detonation phase velocity on the vertical side of the main container was observed and both shock and detonation velocities were observed in the corner turning region along the base of the main container. Analysis of the data shows that the booster initiated geometries with a higher input shock pressure into the NIE gave earlier detonation arrival at the lowest probes on the container side. The corner turning data is compared to a hydrocode calculation using a simple JWL++ reactive burn model.

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