

Abstract Submitted
for the SHOCK07 Meeting of
The American Physical Society

Effect of Transverse Electric Field on Sensitivity of an 88% by Weight HMX Based Energetic Material RICHARD LEE, JERRY FORBES, NSWC Indian Head, EDWARD PALERMO, University of Michigan, WILLIAM WILSON, DTRA — Thresholds for shock sensitivity were determined for explosive samples with and without applied fields using a variation of the Navy's modified gap test. Rectangular charges (76 mm wide x 12.7 mm long x 5 mm thick) confined on two sides by 50.8 mm thick bars of Teflon were shock loaded using the Navy's standard large scale gap test donor system. Free surface velocity at the opposite end of the sample (12.7 mm from input surface) was measured using a high-speed camera. Velocity versus input pressure plots highlight thresholds for first reaction, deflagration, and detonation. In addition the use of an intensified high-speed electronic camera provided a clear differentiation of when the products were self-luminous, directly confirming initiation. Electric fields were applied transverse to the shock direction via thin foil electrodes. These electrodes were held in place by the Teflon insulation. The data shows that this energetic material requires less input pressure to ignite the reaction with voltages of 5 kV applied across the 5 mm thick sample as compared to results without a field.

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Date submitted: 23 Feb 2007

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