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Individual contributions of friction and impact on non-shock initiation of high explosives PAUL PETERSON, GABE AVILUCEA, ROBERT BISHOP, JOHN SANCHEZ, LANL — Throughout the years a variety of tests have been designed which provide insight into the sensitivity of high explosives (HE) to non-shock initiation. Various standard tests such as the LANL drop weight impact, LLNL drop hammer, drop tower and skid tests have been developed to measure energetic response of explosives subjected to a combination of friction and oblique impact. In addition, the BAM test (for HE powders on roughened ceramic) and ABL friction test (powders or solids on roughened metal) have been developed for testing HE under frictional loading. In an effort to understand first principles of non-shock initiation, we have designed a series of tests to try to isolate friction and impact during the insult of HE. An initial series of tests have been completed with PETN, HMX, and as-pressed pellets of PBX 9501 (95 wt. percent HMX, 5 wt. percent inert binder), PBX 9502 (95 wt. percent TATB, wt. percent inert binder), Cyclotol (75 wt. percent RDX/25, wt. percent TNT), and Comp B3 (60 wt. percent RDX, 40 wt. percent TNT). The results suggest that some types of high explosives are relatively insensitive to pure impact and pure friction but relatively sensitive to insults involving a combination of impact and friction.

> Paul Peterson LANL

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