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Experimental characterization of the shock to detonation transition in TX1 HMX-TATB based explosive using embedded electromagnetic particle velocity gauges ARNAUD SOLLIER, CEA, DAM, DIF, F-91297 Arpajon, France, PHILIPPE HEBERT, ROLAND LETREMY, VINCENT MINEAU, XAVIER BOISSY, ERIC PIONNEAU, MICHEL DOUCET, ERIC BOUTON, CEA, DAM, Le Ripault, F-37260, Monts, France — We have completed a series of 1-D single shock and double shock initiation experiments on TX1 (45 wt % HMX, 52 wt % TATB, 3 wt % binder). These experiments were performed on the 60 mm bore powder gun located at CEA Le Ripault. Samples were prepared with eleven embedded electromagnetic particle velocity gauges to measure the evolution of the wave leading up to a detonation. Additionally, three shock tracker gauges were used to track the position of the shock front with time and determine the point where detonation was achieved. Particle velocity wave profiles are characterized by a small amount of growth in the shock front and a growing following wave behind the shock front, which is common to all HMX based explosives. Run distances and times to detonation as a function of initial pressure are consistent with published data on EDC-37, which is the less sensitive HMX based explosive due to its very low void content. All these results demonstrate that the reactivity of TX1 is mainly driven by HMX, despite a higher content of TATB.

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