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Title: Double Shock Initiation of the Explosive EDC-37

Authors: [Gustavsen, R. L.](#); [Sheffield, S. A.](#); [Alcon, R. R.](#); [Winter, R. E.](#); [Taylor, P.](#); [Salisbury, D. A.](#) — C A C C A W E

Affiliation: AA(Los Alamos National Laboratory) AB(Los Alamos National Laboratory) AC(Los Alamos National Laboratory) AD(Atomic Weapons Establishment, Aldermaston, U.K.) AE(Atomic Weapons Establishment, Aldermaston, U.K.) AF(Atomic Weapons Establishment, Aldermaston, U.K.)

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Abstract

We have completed a series of double shock initiation experiments on EDC-37. EDC-37 is a unique HMX based explosive because it has an energetic liquid binder, is composed primarily of fine (less than 40 micron) particles, and has a very low void content ($< 0.3\%$ versus $1.5 - 2.0\%$ for other HMX based explosives). It is also considerably less sensitive than other HMX based explosives such as PBX 9501. Double shocks were created by impacting the EDC-37 with gas gun launched sapphire impactors faced with a 1 - 1.5 mm layer of Kel-F. The magnitude of the shock was controlled by varying the impact velocity, and the length of the first wave was controlled by varying the thickness of the Kel-F layer. Wave profiles were measured using embedded electromagnetic particle velocity gauges. Results show buildup to detonation commencing after the first and second waves coalesce into a single shock, provided there is not significant reaction in the first wave. That is, in the

doubly shocked region, the explosive is completely desensitized by the first shock. If there is significant reaction in the first wave, the explosive is only partially desensitized.

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