

Abstract Submitted
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Understanding Spark formation and Growth in Inert Porous Media and the Implications for the Response of Low Density PETN to ESD. RODNEY DRAKE, DANIEL CHESTER, ANTHONY GLAUSER, JOHN RICHARDSON, NEIL WATKINS, LEE WEBB, Atomic Weapons Establishment — Electrostatic discharges can readily initiate energetic materials. The detonation thresholds are dependent on complex interacting mechanisms. As a first step to unravelling the mechanisms, an integrated experimental and modelling study has been undertaken to characterise spark formation and growth characteristics in air and inert porous beds as a function of the circuit parameters (capacitance, resistance, inductance, voltage). An electrical model of the circuit was developed which enabled the various time dependent properties of the spark (for example, resistance and energy) to be calculated. As part of this study alternative spark resistance, including the Braginski-Martin and the Rompe-Weizel models were evaluated. The experimental and modelling results are discussed together with the implications for the spark initiation response of low density PETN. British Crown Owned Copyright 2019.

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