

Abstract Submitted  
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**The Los Alamos Gap Stick Test** DANIEL PRESTON, LARRY HILL, Los Alamos National Laboratory, CARL JOHNSON, Los Alamos National Laboratory — In this paper we describe a novel shock sensitivity test, the Gap Stick Test, which is a generalized variant of the ubiquitous Gap Test. Despite the popularity of the Gap Test, it has some disadvantages: multiple tests must be fired to obtain a single metric, and many tests must be fired to obtain its value to high precision and confidence. Our solution is a test wherein multiple gap tests are joined in series to form a rate stick. The complex re-initiation character of the traditional gap test is thereby retained, but the propagation speed is steady when measured at periodic intervals, and initiation delay in individual segments acts to decrement the average speed. We measure the shock arrival time before and after each inert gap, and compute the average detonation speed through the HE alone (discounting the gap thicknesses). We perform tests for a range of gap thicknesses. We then plot the aforementioned propagation speed as a function of gap thickness. The resulting curve has the same basic structure as a Diameter Effect (DE) curve, and (like the DE curve) terminates at a failure point. Comparison between experiment and hydrocode calculations using ALE3D and the Ignition and Growth reactive burn model calibrated for short duration shock inputs in PBX 9501 is discussed.

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