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**Small-scale Explosives Sensitivity Safety testing-A Departure from Bruceton** DANIEL PRESTON, GEOFFREY BROWN, CARY SKIDMORE, BETTINA REARDON, DAVID PARKINSON, Los Alamos National Laboratory — In order to safely work with explosives, their sensitivity to external stimuli needs to be characterized. The Bruceton method for evaluating sensitivity results has been used for over six decades. This has included the skid test on the large scale, and the friction and drop weight impact tests on the small scale. The result was a 50 percent probability of reaction, useful for ranking the comparative responses of explosives in order to make a practical assessment of handling safety. This paper summarizes the limitations of the Bruceton method and introduces the efficacies of the D-optimal test method. A comparison of the two approaches is provided using results for PETN, HMX, and other explosives. Los Alamos Type 12 Drop Weight Impact apparatus is used to generate and compare 50 percent drop heights using the Bruceton and D-optimal methods. The results show that the means obtained by the Bruceton or D-optimal methods are not statistically different, alleviating concerns about departing from a historical database. The D-optimal method uses a larger step size between consecutive tests to converge on the 17 percent and 83 percent probability points. In the presentation we will also discuss details of our historical Bruceton testing for impact and friction sensitivity and how these tests are currently evolving in our facilities.

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