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Frictional heating and ignition of energetic materials PETER DICKSON, GARY PARKER, LAURA SMILOWITZ, BLAINE ASAY, JONATHAN ZUCKER, Los Alamos National Laboratory — For many years, powder friction tests have been an integral part of explosives sensitivity and safety testing. More recently, oblique impact tests have been used in the hazard assessment of monolithic charges. However, these tests are simply threshold tests for reaction, and relatively little work has been done to try to examine the processes that lead to frictional heating and ignition of energetic materials. We report the results from a series of experiments in which energetic materials and simulants are subjected to frictional heating under closely-controlled conditions (normal load, sliding speed, grit quantity and composition, substrate). The response of the energetic material (or simulant) and grit, if present, is observed by optical and infrared high-speed photography to determine the nature of the interactions between the test material, grit and substrate, and the mechanisms by which the energetic material may be heated to ignition.

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