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Combined fragment recovery and overpressure measurements from a reactive material cased charge JOSEPH HOOPER, JACOB KLINE, Naval Postgraduate School — The fragmentation of a reactive material on impact or explosive launch has proven challenging to model but critical to understanding its lethality. Here we fabricate simple, pure metal reactive cases made from isostatically pressed aluminum powder, and directly measure their fragmentation and combustion via three combined tests. In the first, the charge is detonated in an artificial snow medium to recover all debris produced by explosive launch. Second, an identical charge is detonated in an argon-filled chamber and the debris is again recovered, to measure fragmentation after both explosive launch and impact on the walls. Finally, a third identical charge is detonated in an air-filled chamber and allowed to burn. We present trends in the fragment distribution and simple analytic models for predicting the breakup and subsequent combustion energy release. Particular focus is given to the question: what is the main factor that limits how much aluminum can combust?

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