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A Study of Aluminum Combustion in Solids, Powders, Foams, Additively-Manufactured Lattices, and Composites JAMES BLACK, NORMAN TRAMMELL, JAD BATTEH, NICHOLAS CURRAN, JOHN ROGERS, Science Applications International Corporation, DONALD LITTRELL, Air Force Research Laboratory — This study examines the fireball characteristics, blast parameters, and combustion efficiency of explosively-shocked aluminum-based materials. The materials included structural and non-structural aluminum forms – such as solid cylinders, foams, additively-manufactured lattices, and powders – and some polytetrafluoroethylene-aluminum (PTFE-Al) composites. The materials were explosively dispersed in a small blast chamber, and the blast properties and products were measured with pressure transducers, thermocouples, slow and fast ultraviolet/visible spectrometers, and high-speed video.

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