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**Experimental Study of Structure/Behavior Relationship for a Metallized Explosive.** ERIC BUKOVSKY, ROBERT REEVES, ALEXANDER GASH, Lawrence Livermore National Laboratory, NICK GLUMAC, University of Illinois, Urbana-Champaign — Metal powders are commonly added to explosive formulations to modify the blast behavior. Although detonation velocity is typically reduced compared to the neat explosive, the metal provides other benefits. Aluminum is a common additive to increase the overall energy output and high-density metals can be useful for enhancing momentum transfer to a target. Typically, metal powder is homogeneously distributed throughout the material; in this study, controlled distributions of metal powder in explosive formulations were investigated. The powder structures were printed using powder bed printing and the porous structures were filled with explosives to create bulk explosive composites. In all cases, the overall ratio between metal and explosive was maintained, but the powder distribution was varied. Samples utilizing uniform distributions to represent typical materials, discrete pockets of metal powder, and controlled, graded powder distributions were created. Detonation experiments were performed to evaluate the influence of metal powder design on the output pressure/time and the overall impulse. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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