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Yield strength of Cu and an engineered material of Cu with 1% Pb WILLIAM BUTTLER, GEORGE GRAY, III, SARYU FENSIN, Los Alamos National Laboratory, MIKE GROVER, GERALD STEVENS, National Securities Technologies, Special Technologies Laboratory, JOSEPH STONE, Los Alamos National Laboratory, WILLIAM TURLEY, National Securities Technologies, Special Technologies Laboratory — To study the effects of engineered elastic-plastic yield on the mass-ejection from shocked materials we fielded explosively driven Cu and CuPb experiments. The Cu and CuPb experiments fielded fully annealed disks in contact with PBX 9501; the CuPb was extruded with 1% Pb that aggregates at the Cu grain boundaries. The elastic-plastic yield strength is explored as a difference of ejecta production of CuPb versus Cu, where the ejecta production of solid materials ties directly to the surface perturbation geometries of wavelengths (fixed at 65 μm) and amplitudes (which were varied). We observed that the Cu performs as expected, with ejecta turning on at the previously observed yield threshold, but the CuPb ejects mass in much larger quantities, at much lower wavenumber ($k = 2\pi/\lambda$) amplitude (h) products (kh), implying a reduced elastic-plastic yield stress of the engineered material, CuPb.

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