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Spall Response of Additive Manufactured Ti-6Al-4V ANDREW BROWN, ADAM GREGG, JP ESCOBEDO, PAUL HAZELL, School of Engineering and Information Technology, The University of New South Wales, Canberra, DANIEL EAST, CSIRO Manufacturing Flagship, ZAKARIA QUADIR, Microscopy and Microanalysis Facility, John de Laeter Centre, Curtin University — Additive manufactured (AM) Ti-6Al-4V was produced via electron beam melting (EBM) and laser melting deposition (LMD) techniques. The dynamic response of AM varieties of common aerospace and infrastructure metals are yet to be fully characterized and compared to their traditionally processed counterparts. Spall damage is one of the primary failure modes in metals subjected to shock loading from high velocity impact. Both EBM and LMD Ti-6Al-4V were shock loaded via flyer-target plate impact using a single-stage light gas gun. Target plates were subjected to pressures just above the spall strength of the material (3-5 GPa) to investigate the early onset of damage nucleation as a function of processing technique and shock orientation with respect to the AM-build direction. Post-mortem characterization of the spall damage and surrounding microstructure was performed using a combination of optical microscopy, scanning electron microscopy, and electron backscatter diffraction.

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