

Abstract Submitted
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Structure / Property (Constitutive and Dynamic Strength / Damage) Characterization of Additively Manufactured (AM) Tantalum
GEORGE GRAY III, VERONICA LIVESCU, CAMERON KNAPP, CARL TRUJILLO, ROBERTA BEAL, DAVID JONES, Los Alamos National Laboratory, MATERIALS SCIENCE AND TECHNOLOGY COLLABORATION — Certification requirements generally involve meeting engineering and physics requirements tied to the functional requirements of the engineering component and finally process and product qualification. In this presentation, the results of a study quantifying the constitutive behavior of Tantalum (Ta) fabricated using an EOS laser-powder-bed machine is presented. The microstructure of the AM-Ta is detailed and compared / contrast to wrought Ta. The mechanical behavior of the AM build methods was characterized using compression testing as a function of strain rate. The dynamic damage evolution and failure response of the AM-Ta material, as well as wrought Ta, was probed using flyer-plate impact driven spallation experiments. The damage evolution of the AM and wrought Ta were characterized using optical metallography and electron-back-scatter diffraction (EBSD).

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