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Impact Response of Thermally Sprayed Metal Deposits J. L. WISE, A. C. HALL, N. W. MOORE, S. D. PAUTZ, B. C. FRANKE, W. M. SCHERZINGER, Sandia National Laboratories*, D. W. BROWN, Los Alamos National Laboratory — Gas-gun experiments have probed the impact response of tantalum specimens that were additively manufactured using a controlled thermal spray deposition process. Velocity interferometer (VISAR) diagnostics provided time-resolved measurements of sample response under one-dimensional (*i.e.*, uniaxial strain) shock compression to peak stresses ranging between 1 and 4 GPa. The acquired wave-profile data have been analyzed to determine the Hugoniot Elastic Limit (HEL), Hugoniot equation of state, and high-pressure yield strength of the thermally deposited samples for comparison to published baseline results for conventionally wrought tantalum. The effects of composition, porosity, and microstructure (*e.g.*, grain/splat size and morphology) are assessed to explain differences in the dynamic mechanical behavior of spray-deposited versus conventional material. *Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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