Abstract Submitted for the SHOCK07 Meeting of The American Physical Society

Dynamic Shock Compression Response of Ta + Fe₂O₃ Powder Mixtures DAVID A. FREDENBURG, NARESH N. THADHANI, JOE COCHRAN, Georgia Institute of Technology — The dynamic shock compression response of stoichiometric and equivolumetric mixtures of varying particle sizes of tantalum and iron oxide powder is investigated to determine their applicability for potential use as a structural energetic material. Compression data gathered in the quasi-static regime is combined with ambient pressure reaction energetics of powder mixtures to determine the optimal mixture configuration for investigation of the dynamic response. Instrumented parallel plate impact experiments are conducted to determine the compaction behavior, reaction threshold conditions, and aid in the development of a heterogeneous compaction model encompassing particle shape, configuration, and individual material properties. This information will be used to study the interactions and stress transfer characteristics in the case of linear cellular alloy structures filled with Ta + Fe₂O₃ powder mixtures upon their impact onto rigid targets.

> David A. Fredenburg Georgia Institute of Technology

Date submitted: 22 Feb 2007

Electronic form version 1.4