

SHOCK19-2019-000143

Abstract for an Invited Paper
for the SHOCK19 Meeting of
the American Physical Society

Progress toward development of a predictive dynamic compaction model framework

D FREDENBURG¹, Los Alamos National Laboratory

The shock densification of initially porous materials is a complex process that is influenced by properties of the bulk material, as well as characteristics of the grains and pores. However, modeling and simulation of the densification process is often required at the continuum level, which by definition, treats both the grains and pores as a single component. As such, the multi-scale nature of the densification process presents challenges in the development of a predictive continuum-level compaction model. In the present work, the authors present an examination of several continuum compaction models within the context of their ability to be predictive. A single model form is selected as having the requisite characteristics, and is explored further with respect to its ability to capture various aspects of initially porous systems. Finally, a predictive dynamic compaction model framework is presented, within a set of bounds, and is applied to several data sets.

¹Ted Carney is a contributing author.