

Abstract Submitted
for the SHOCK07 Meeting of
The American Physical Society

Study of Underwater Shock Compaction Device for Compaction of Titanium Diboride Powder G.B. KENNEDY, Y.K. KIM, K. HOKAMOTO, S. ITOH, Kumamoto University — Shock compaction for powders has been used to study bulk consolidation of powder materials. Shock compaction has the advantage of processing at low temperatures and short duration to limit effects of high temperatures for long times, such as increased grain size and high energy cost. Many methods of shock loading of powders have been employed: direct contact with explosive, explosively driven flyer plates, and flyer plates launched with light gas or propellant gun. Another method, using explosives to create a shockwave in water that is in contact with a powder container, has been used extensively at Kumamoto University. This work presents a study of the development of the underwater shockwave device and investigates the water container geometry for control of parameters for shockwave peak pressure, duration, and distribution through the powder compaction process. Results of simulations for optimization of shock compaction properties are presented along with measurements from input and propagated managanin gauge pressure measurements obtained from underwater shock compaction of titanium diboride. The hardness measurements throughout the bulk of the shock compacted titanium diboride are discussed.

G.B. Kennedy
Kumamoto University

Date submitted: 26 Feb 2007

Electronic form version 1.4