

Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Fabrication of Nd-Fe-B/ α -Fe nanocomposite magnets by shock compaction and heat treatment of amorphous alloys CHRISTOPHER WEHRENBURG, Georgia Institute of Technology, BRIAN ZANDE, S.G. SANKAR, Advanced Materials Corp., NARESH THADHANI, Georgia Institute of Technology — Bulk nanocomposite magnets based on the Nd-Fe-B system were fabricated using mechanical alloying and shock compaction. A high energy ball mill was used to combine Magnaquench MQA-T type Nd-Fe-B powder with varying amounts of pure Fe powder. The resulting mechanically amorphized powders were shock compacted to near full density. Bulk temperature increase during compaction was suppressed by chilling the target fixture with liquid nitrogen prior to compaction. A range of heat treatments were applied to the recovered samples, and the resulting magnetic properties and crystallization behavior were recorded. The presence of additional iron increases magnetization saturation linearly, but decreases coercivity. The coercivity of the shock consolidated compacts showed an increase to a maximum value upon heat treatment of 550 C.

Christopher Wehrenberg
Georgia Institute of Technology

Date submitted: 22 Feb 2011

Electronic form version 1.4