

Abstract Submitted
for the SHOCK05 Meeting of
The American Physical Society

Unreacted Hugoniot of Three Plastic Bonded Explosives A.M. MILNE, Fluid Gravity Engineering Ltd, N.K. BOURNE, University of Manchester, J.C.F. MILLETT, Cranfield University — There is a continuing interest in determining the detonation characteristics of loaded plastic-bonded explosives (PBXs). The UK licensing agency for explosives, DOSG, wishes to better understand the response of insensitive high explosives. This has required more detailed investigation of the transit of reaction from the unreacted state to products. The starting condition, before application of a kinetic scheme to describe reaction, is thus the unreacted Hugoniot for the material. In this work three PBXs, manufactured by BAE LandSystems, are investigated and modelled. All contain RDX in differing quantities in an HTPB binder. One of them contains aluminium. Two of the materials have the same weight percentage of filler and binder but differ in the grain size distribution entrained. The experimental Hugoniot are presented, and a composite equation of state is derived using an engineering model and shown to describe the measurements well. Further applications of the technique are described and future application is outlined.

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Date submitted: 08 Apr 2005

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