

Abstract Submitted
for the SHOCK07 Meeting of
The American Physical Society

A comparison of the blast & fragment mitigation performance of several structurally weak materials DOUGLAS KIRKPATRICK, ANDREW ARGYLE, KATHERINE HARRISON, JAMES LEGGETT, Defence Science & Technology Laboratory, EOD GROUP TEAM — Structurally weak materials are attractive for explosive blast and fragment mitigation applications because they break up easily into small particles and do not present a secondary hazards. A range of these materials have been investigated under a mitigation research programme aimed at developing a predictive capability. Experiments using 3kg-7.5kg charges confirmed earlier small scale results that porosity and particle density are dominant factors in reducing airblast. Measurement of incident overpressure however, effectively ignores the momentum acquired by the mitigant which has the potential to cause significant damage. Techniques to measure dynamic particle loading have been investigated and initial results are presented. Fragment mitigation performance has been studied with and without the presence of explosive blast. Indications are that for some materials, shock loading from an explosive blast may change the fragment retarding performance. It has also been shown that small quantities of low-density blast mitigant can significantly influence the effectiveness of ballistic protection materials placed close to an explosive.

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Date submitted: 26 Feb 2007

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