Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

An overview on the effect of manufacturing on the shock response of polymers GUILLAUME KISTER, DAVID WOOD, GARETH APPLEBY-THOMAS, ANDREW ROBERTS, JAMES LEIGHS, MICHAEL GOFF, AMER HAMEED, Cranfield University — Polymers are widely employed in areas as diverse as consumer goods and explosives (matrix materials). The consequent commercial interest has led to a continual drive to improve material properties - e.g. via either manufacturing techniques or more fundamental improvements in the understanding of the underlying chemistry. It has been shown previously that chemical compositions can affect the shock profile of the polymer Poly-Methyl Methacrylate (PMMA). To this end the composition will change over time as new formulations are brought to market, for example due to the inclusion of additives that will increase the lifetime of the product. Significantly such changes may not affect the material properties at lower strain rates. At the higher strain rates these subtle difference can lead to larger discrepancies in the shock profiles. In this study comparisons of PMMA have been made between newly sourced and "legacy" material studied previously in the literature.

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Date submitted: 26 Feb 2013 Electronic form version 1.4