

Abstract Submitted
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The Effect of Heat Treatment on the Shock Response of the Aluminium Alloy 6061 MING CHU, IAN JONES, University of Birmingham, JEREMY MILLETT, NEIL BOURNE, AWE, Aldermaston, RUSTY GRAY, Los Alamos National Laboratory — The mechanical response of aluminium alloys such as 6061 is manipulated through heat treatment to create a fine distribution of inter-metallic particles. Post shock recovered microstructures of similar alloys has shown that in the solution treated (T0) state, with all alloy additions dissolved in the aluminium, deformation occurs via the formation of dislocation cells, in a similar manner to other face centred cubic metals such as copper or nickel. Further, a significant post shock hardening has also been observed, in agreement with the observed increase in dislocation density. In contrast, in the fully aged (T6) material, deformation occurs results in a random distribution of dislocations, with no enhanced hardening. From these previous observations, it is expected that the variation of shock induced shear strength, both with shock amplitude and pulse duration will be significantly different between the two heat treated states, and thus it is these features that this investigation addresses.

Jeremy Millett
AWE, Aldermaston

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