

Abstract Submitted  
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**Shock Behavior of 2139-T8 Aluminum** DANIEL CASEM, DATTA-TRAYA DANDEKAR, US Army Research Laboratory — Plane shock wave experiments have been conducted on an aluminum alloy, Al 2139-T8, to determine its response under high rates of loading. The alloying elements, copper, magnesium, and silver, have been found to improve the fatigue life and fracture toughness of Al 2139 and mitigate impact induced damage. The present suite of experiments provide measurements of the Hugoniot Elastic Limit (HEL), compression, shear strength, and spall threshold to 5 GPa. Longitudinal measurements are made with a VISAR system and shear strength is determined through direct measurements of lateral stress with manganin gages. Preliminary results indicate an HEL of approximately 0.9 GPa, a value consistent with yield stress measured at rates as high as 40k/s, and a constant spall pull-back velocity of approximately 180 m/s. The results also show that it continues to retain shear strength like other aluminum alloys. The EPIC code (Elastic Plastic Impact Calculations) is used to simulate the experimental results.

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