

Abstract Submitted  
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**Hugoniot and Properties of Diesel Fuel Used in ANFO** DAVID L. ROBBINS, STEPHEN A. SHEFFIELD, DANA M. DATTELBAUM, DAVID B. STAHL, Los Alamos National Laboratory, SHOCK AND DETONATION PHYSICS TEAM — One of the more common ammonium nitrate (AN) based explosive is called ANFO, which is a mixture of AN prills and diesel fuel oil (FO) in a 94:6 ratio by weight. Since there is no available shock data on FO, a series of shock compression experiments have been completed on a two-stage light gas gun with a sealed liquid target cell. We have chosen a representative grade of fuel oil (diesel) for our experiments. Knowing that all FO is not the same, we decided to study this material, assuming it is representative. Density and sound speed data were measured, and used to predict the unreacted Hugoniot. The data were found to compare well with a universal liquid Hugoniot. In-situ magnetic gauges in the target cell were used to measure the particle velocity, shock velocity, and shock wave profiles. Impact velocities ranged from 1.5 to 3.2 km/s generating shocked pressures between 3 and 17 GPa, depending on the impactor material being used. The FO Hugoniot is being used in conjunction with ongoing ammonium nitrate (AN) shock compression measurements to further understand the unreacted Hugoniot of the ANFO mixture. Additionally, wave profiles and the Hugoniot are analyzed to determine if shock-induced reaction occurs, within the pressure range studied.

Stephen Sheffield  
Los Alamos National Laboratory

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