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Plate impact experiments on the TATB based explosive PBX 9502 at pressures near the Chapman-Jouguet state R.L. GUSTAVSEN, T.D. ASLAM, B.D. BARTRAM, B.C. HOLLOWELL, Los Alamos National Laboratory — We have completed a series of two-stage gas-gun driven plate-impact experiments on PBX 9502 (95 wt.% tri-amino-trinitro-benzene, 5 wt.% Kel-F800 plastic binder). The ultimate goal of these experiments is to provide, in the neighborhood of the Chapman-Jouguet state, overdriven product Hugoniot data that can be untangled from the transients leading up to a steady wave. Our approach is to do sets of experiments in which the thickness of the PBX 9502 is varied (6, 9, and 12 mm) while holding the flyer material (oxygen free high conductivity copper) and impact velocity constant. Sets of experiments have been conducted with flyer velocity 3.0 km/s ($\approx$ 34 GPa), 2.8 km/s ($\approx$ 31 GPa) and 2.6 km/s ($\approx$ 28 GPa). Wave profiles of the transmitted shock wave are measured at the interface of the back of the sample and a Lithium Fluoride (LiF) window. From each of these sets of experiments, a steady shock wave velocity can be extracted. Particle velocity and pressure are calculated by way of impedance matching. Finally, the wave profiles can be compared with reactive-burn – equation-of-state models using direct numerical simulations.

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