

Abstract Submitted  
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**A High-Purity Alumina for Use in Studies of Shock Loaded Samples** DAVID LACINA, University of Dayton Research Institute, CHRISTOPHER NEEL, Air Force Research Laboratory-Munitions Directorate — We report the results of plate impact experiments on a potential new “standard” material, Coorstek Plasmasure-UC (99.9% purity) polycrystalline alumina, for use in non-conduction, impact environment, shock loading studies. This work was motivated by a desire to find a 99.9% purity alumina to replace the now unavailable Coors Vical (99.9%) alumina, as it was hoped the Hugoniot elastic limit (HEL) of the new standard would match the 9-11 GPa value of Vical. Shock response data, including the HEL, Hugoniot particle velocities, Hugoniot shock velocities, stress vs volume, and release wave speeds, was obtained up to 14 GPa. This data will be compared with Hugoniot curve data for other high purity alumina to contrast differences in the shock response, and is intended to be useful in impedance matching calculations. We will show that the HEL of Plasmasure-UC alumina is 5.5 GPa and speculate on causes for this lower than expected value. We will also explore why the elastic-plastic response for Plasmasure-UC alumina differs from what has been observed from other high purity alumina. The final result of this work is to recommend a well-characterized, lower purity alumina (Coorstek AD-995) as a potential new “standard” material.

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