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Reloading Experiment for Aluminum at High Pressure HOU RILI, PENG JIANXIANG, Laboratory for Shock Wave and Detonation Physics Research, Institute of Fluid Physics, ZHANG JIANHUA, TU MINGWU, ZHOU PING, The First Aeronautic Institute of the Air Force — In the traditional AC method to measure material's dynamic strength, the combination flyer is easy to be delaminated due to shock waves produced in the projectile as a result of sudden application of the projectile driving pressure, which always result in the failure of reloading experiment. The maximum reshock experimental pressure for aluminum presented by Huang and Asay in 2005 is only 22GPa. A technique is described for reloading experiment, by which reloading experiments were performed for 2A12 aluminum alloy shocked to 67.6GPa. In our experiment, the oxygen-free copper and TC4 titanium alloy impactors were used with ultrapure LiF interferometer windows, 2A12 aluminum alloy samples were baked by PMMA buffers, and VISAR was used to measure interface particle velocity. Using an approximate double-step-sample method (two shots with different sample thickness at the same impact velocity), the Lagrange longitudinal velocities along reloading path from initial shock state were obtained, and coupled with unloading experimental data, the bulk velocities were determined, as well as the dynamic yield strength of 2A12 aluminum alloy.

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