

Abstract Submitted
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The Release Behavior of Diamond Shocked to 15 Mbar M.C. GREGOR, C.A. MCCOY, D.N. POLSIN, T.R. BOEHLI, D.D. MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester, D.E. FRATANUONO, P.M. CELLIERS, LLNL — Ultrananocrystalline diamond (UNCD) is used as an ablator material for inertial confinement fusion experiments at the National Ignition Facility. Both the Hugoniot and the release behavior of the UNCD ablators are needed to accurately model the implosion process. The OMEGA laser was used to perform experiments in which two types of high-density carbon released into sample materials with known Hugoniot (quartz, 200 mg/cm³ SiO₂ foam, liquid deuterium, and polystyrene). We present preliminary results of the release behavior of both UNCD and single-crystal diamond in the 5- to 15-Mbar regime. Models for the release isentropes of UNCD and single-crystal diamond will be developed using a Mie–Grüneisen equation of state. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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