

Abstract Submitted
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Sample Preheating Capabilities for Shock and Isentropic Loading Experiments at the DICE Facility¹ R.J. HICKMAN, M.D. WILLIS, J.L. WISE, Sandia National Laboratories, J.L. LYNCH, A.W. SHAY, Ktech Corporation, M.I. KAUFMAN, National Security Technologies — A system for preheating test specimens prior to shock or isentropic loading was developed at Sandia's Dynamic Integrated Compression Experimental (DICE) Facility. A dual-output, proportional-integral-derivative (PID) controller using feedback from thermocouples regulated power supplied independently to one or two resistive heaters so as to achieve the desired temperature(s) at selected position(s) within the test assembly. Thermal isolation features validated by finite element heat-transfer analyses afforded temperature uniformity across samples mounted in electrode panels for the Veloce pulsed electromagnetic driver. The preheat system was demonstrated during Veloce experiments on samples (e.g., tin) preheated up to 200 C, and during gas-gun tests. Temperatures exceeding 600 C for Veloce tests are possible, pending identification and qualification of an appropriate high-temperature insulator for the gap between the electrode panels.

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