

Abstract Submitted
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Mechanical Properties of PZT 52/48 under Shock and Ramp Wave Compression¹ J.L. WISE, S.T. MONTGOMERY, D.P. JACKSON, G.E. CLARK, E.B. DUCKETT, Sandia National Laboratories — Complementary gas-gun and electromagnetic pulse experiments have yielded data regarding the dynamic mechanical behavior for poled and unpoled specimens of a PZT (52 wt% lead zirconate plus 48 wt% lead titanate) ferroelectric ceramic subjected to shock and intermediate-strain-rate ramp wave (*i.e.*, quasi-isentropic) loading. For each experiment, velocity interferometer (VISAR) diagnostics provided time-resolved measurements of sample response for conditions nominally involving one-dimensional (*i.e.*, uniaxial strain) compression and release. Wave profiles obtained during the shock experiments have been analyzed to assess the Hugoniot Elastic Limit (HEL), Hugoniot equation of state, spall strength, and high-pressure yield strength of PZT. Profiles from the ramp wave experiments have been processed to determine the locus of isentropic stress-strain states generated in PZT for deformation rates substantially lower than those associated with shock loading.

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