

Abstract Submitted
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Strain Rate Behavior of HTPB-Based Magnetorheological Materials¹ CHAD STOLTZ, KENNETH SEMINUK, VASANT JOSHI, Naval Surface Warfare Center, Indian Head Division — It is of particular interest to determine whether the mechanical properties of binder systems can be manipulated by adding ferrous or Magnetostrictive particulates. Strain rate response of two HTPB/Fe (Hydroxyl-terminated Polybutadiene/ Iron) compositions under electromagnetic fields has been investigated using a Split Hopkinson Pressure bar arrangement equipped with aluminum bars. Two HTPB/Fe compositions were developed, the first without plasticizer and the second containing plasticizer. Samples were tested with and without the application of a 0.01 Tesla magnetic field coil. Strain gauge data taken from the Split Hopkinson Pressure bar has been used to determine what mechanical properties were changed by inducing a mild electromagnetic field onto each sample. The data reduction method to obtain stress-strain plots included dispersion corrections for deciphering minute changes due to compositional alterations. Data collected from the Split Hopkinson Pressure bar indicate changes in the Mechanical Stress-Strain curves and suggest that the impedance of a binder system can be altered by means of a magnetic field.

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