

Abstract Submitted  
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**High Strain Rate Behavior of Polyurea Compositions** VASANT JOSHI, Naval Surface Warfare Center, Indian Head Division, CHRISTOPHER MILBY, Energetics Technology Center — Polyurea has been gaining importance in recent years due to its impact resistance properties. The actual compositions of this viscoelastic material must be tailored for specific use. It is therefore imperative to study the effect of variations in composition on the properties of the material. High-strain-rate response of three polyurea compositions with varying molecular weights has been investigated using a Split Hopkinson Pressure Bar arrangement equipped with titanium bars. The polyurea compositions were synthesized from polyamines (Versalink, Air Products) with a multi-functional isocyanate (Isonate 143L, Dow Chemical). Amines with molecular weights of 1000, 650, and a blend of 250/1000 have been used in the current investigation. The materials have been tested up to strain rates of 6000/s. Results from these tests have shown interesting trends on the high rate behavior. While higher molecular weight composition show lower yield, they do not show dominant hardening behavior. On the other hand, the blend of 250/1000 show higher load bearing capability but lower strain hardening effects than the 600 and 1000 molecular weight amine based materials. Refinement in experimental methods and comparison of results using aluminum Split Hopkinson Bar is presented.

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