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Shock and High Strain Rate Characterization of HTPB with Varying Plasticizer DIDIER MONTAIGNE, CHRISTOPHER NEEL, Air Force Research Laboratory, Eglin AFB, FL 32542, PETER GOULD, QinetiQ, Bristol Business Park, Bristol BS16 1FJ, UK, CHRISTOPHER MOLEK, JENNIFER JORDAN, Air Force Research Laboratory, Eglin AFB, FL 32542 — Hydroxy-terminated polybutadiene (HTPB) has long been used as a binder in propellants and explosives. However, cured HTPB rubbery polyurethanes have not been characterized in a systematic fashion as function of plasticizer content. In this study, four isocyanate-cured HTPB variants with different amounts of plasticizer have been formulated. The materials were characterized using dynamic mechanical analysis and quasi-static and dynamic compression experiments. Additionally, the shock Hugoniot was measured on the two extremes of the material – no plasticizer and maximum plasticizer. The properties of the HTPB were predicted using the Porter-Gould model for polymers.

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