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Mechanical Properties and Shock Response of PMMA JENNIFER JORDAN, Air Force Office of Scientific Research, DANIEL CASEM, PAUL MOY, TIMOTHY WALTER, U.S. Army Research Laboratory — Polymethylmethacrylate (PMMA) is used widely in shock experiments as a window material and in explosive characterization tests, e.g. gap tests, as a shock mitigation material. In order to simulate the complex loading present in a gap test, the constitutive response of the PMMA must be well understood. However, it is not clear what characterization must be done when the PMMA material is changed, e.g. changing supplier, and the Rohm and Haas Type II UVA PMMA, which was used for many of the calibration experiments, is no longer available. In this paper, we will present characterization results on legacy Rohm and Haas Type II UVA in comparison with new PMMA grades proposed for use in gap tests. The materials are characterized in compression quasi-statically and dynamically. The quasi-static tests include simultaneous digital image correlation to determine local strain and temperature measurements. Planar shock experiments are performed to determine the compression and release response.

Jennifer Jordan
Air Force Office of Scientific Research

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