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Shock Response of PMMA – Does Material Pedigree Matter? DAVID LACINA, University of Dayton Research Institute, CHRISTOPHER NEEL, Air Force Research Lab-Munitions Directorate, DANA DATTELBAUM, BRITTANY BRANCH, Los Alamos National Laboratory, MARIO FAJARDO, Air Force Research Lab-Munitions Directorate — We report the results of plate impact experiments on both Spartech Polycast II and Rohm & Haas type II poly methylmethacrylate (PMMA) as part of an effort to determine if material pedigree of PMMA alters shock response, as well as which material properties could be used to differentiate PMMA from different commercial sources. This work is motivated by a desire to obtain accurate models of shock loaded material behavior, which typically assume the shock response of all PMMA is the same as that determined for the no longer available Rohm & Haas PMMA. We describe our approach of measuring the shock response using electromagnetic particle velocity gauges, which were embedded at different depths in the sample. We discuss how the Hugoniot curve, FTIR spectroscopy, and index of refraction data were obtained for Spartech PMMA up to previously unexplored stresses, 10.7 GPa. We report that Spartech PMMA is suitable for use as a shock standard and that there are no significant differences in shock response when compared with data for Rohm & Haas PMMA. Finally, we speculate on whether these findings can be interpreted broadly as an indication that *all* PMMA is equivalent for use in shock studies.

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