

Abstract Submitted  
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**Equation of State Studies for Leaded Glass<sup>1</sup>** BERNARDO FARFAN, WILLIAM REINHART, SCOTT ALEXANDER, Sandia National Laboratories — Brittle materials such as glasses and polycrystalline ceramics are attractive for armor materials and for aerospace applications because of their high compressive strengths and their lower densities compared to metals. Leaded glasses exhibit lower Young's modulus and slow crack growth exponent as compared to lead free soda-lime glass or high purity glasses such as fused silica making this an excellent candidate for these applications. A series of plate impact experiments utilizing the 90 mm bore single-stage powder gun at Sandia's STAR Facility were conducted to measure the Hugoniot response of leaded silica glass to peak shock stress of 23 GPa. The material studied was a potash-soda-lead glass with approximately 30 percent lead by weight and a density of 3.034 g/cm<sup>3</sup>. Glass samples of 25 mm diameter and of two different thicknesses (3 mm and 7 mm) were used for these experiments. Velocity interferometry data acquired during this investigation have been evaluated to determine the Hugoniot elastic limit and shock Hugoniot of the glass. Results will be presented and placed in context by comparison to other glasses.

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Scott Alexander  
Sandia National Laboratories

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