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Dynamic Response of Soda-Lime Glass¹

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Soda-lime glass (SLG) is a highly available low cost glass formulation commonly used in window applications and it may have potential use in transparent ceramic armor. While there has been a great deal of work done to characterize the shock response of fused silica, the primary component of SLG, comparatively little is known about SLG itself. This paper will report the results of characterization experiments conducted at Sandia National Laboratories on a low iron content soda-lime glass commercially available from PPG Industries. Data have been collected over a wide range of stress levels from 4 to 65 GPa. Topics will include the Hugoniot response including non-linear elastic behavior, support for a high stress phase transition, material strength, and evidence for failure of the material under certain conditions. Further, the results will be compared and contrasted with related findings in fused silica as well as work on similar soda-lime glass formulations reported by other researchers.

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