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Application of the shock reverberation technique to determine Grüneisen gamma for float glass MICHAEL GIBSON, GARETH APPLEBY-THOMAS, ANDREW ROBERTS, Cranfield University, PAUL HAZELL, University of New South Wales — Determination of high strain-rate material properties following loading from a non-principle Hugoniot ground state requires detailed knowledge of the shape of a materials equation-of-state. The material-specific variable Grüneisen gamma, $\gamma(v)$, defines the shape of "off-Hugoniot" points in energy-volume-pressure space. Comparison between experimental and simulated results of "ring-up" experiments, where shock reflection allows a material to be loaded successively into a series of off-Hugoniot states, has the potential to allow ready access to values of gamma. However, previous attempts to determine γ_1 via comparison to ANSYS Autodyn® simulations for the temperature-resistant polymer polyether ether ketone (PEEK) only produced a partial success, due to the highly non-linear nature and poorly defined residual deviatoric (strength) effects inherent in the material response. Consequently, in this study an attempt is made using a similar approach to calculate γ_1 for the well-defined material float glass (whose high elastic limit should also minimise deviatoric effects).

Gareth Appleby-Thomas
Cranfield University

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