

Abstract Submitted  
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**Failure Kinetics in Borosilicate Glass During Rod Impact** DENNIS L. ORPHAL, International Research Associates, Inc., CHARLES E. ANDERSON, JR., Southwest Research Institute, THILO BEHNER, VOLKER HOHLER, MATTHIAS WICKERT, Ernst-Mach-Institut, DOUGLAS W. TERMPLETON, RDECOM-TARDEC — At the last shock physics conference [1], failure front and penetration velocities as functions of impact velocity for gold rods into lead glass (5.19 g/cm<sup>3</sup>) were presented. Similar experiments have been completed for a borosilicate glass (2.2 g/cm<sup>3</sup>). Data are obtained by visualizing simultaneously failure propagation in the glass with a high-speed camera and rod penetration with flash radiography. At a given impact velocity, the velocity of the failure front is significantly higher during early penetration than during steady-state penetration of the rod. For steady-state penetration, the failure front velocity is considerably less than the shear wave velocity of the glass. It was found that the ratio of average failure front velocity to rod penetration velocity decreases with increasing impact velocity ( $v_p$ ) in the range of  $v_p = 0.4$  to 2.8 km/s. As a consequence, the distance between the rod tip and the failure front is reduced with increasing  $v_p$ . [1] Orphal DL, Behner Th, Hohler V, Anderson CE Jr, and Templeton DW, “Failure wave in DEDF and soda-lime glass during rod impact,” Shock Compression of Condensed Matter-2005, (M. D. Furnish, et al., Eds.), 1391-1394, AIP Conf. Series 845, Melville, NY, 2006.

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