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Interface Defeat, Dwell and Penetration of Long Rods on Borosilicate Glass Targets

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We have been investigating the impact response of transparent materials during the last several years. We have conducted long-rod impact experiments into a borosilicate glass and measured penetration and rod consumption velocities as a function of impact velocity. We also measured the failure front velocity. At sufficiently low impact velocities, the glass target resists penetration, and there is dwell. In particular, if a copper buffer is placed over the glass to eliminate the impact shock, complete interface defeat can be observed for Bernoulli stresses of 7.3 GPa. In a few cases, dwell was observed at higher Bernoulli stresses, but then the rod began to penetrate the glass, at which point the Bernoulli stress dropped to ~ 1 GPa. The paper will describe the experimental techniques and data, and summarize results and conclusions.