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Suitability of magnesium oxide as a VISAR window GERALD STEVENS, LYNN VEESER, Bechtel Nevada, PAULO RIGG, ROBERT HIXSON, Los Alamos National Laboratory — Impedance matching of a VISAR window to a material under study helps simplify a shock experiment by effectively allowing one to measure an in situ particle velocity. The shock impedance of MgO falls roughly midway between those of sapphire and LiF, two of the most frequently used VISAR window materials. A series of symmetric impact experiments were performed to characterize the suitability of single crystal, [100] oriented magnesium oxide as a VISAR window material. These experiments yielded good results and show the viability of MgO as a VISAR window up to 23 GPa. Results from these experiments were used to determine window correction factors, and subsequently to estimate the pressure induced change in index of refraction. In many of the shots in this work we exceeded the Hugoniot elastic limit, and both elastic and plastic waves are evident in the velocity profiles. The presence of both waves within the VISAR window complicates the typical VISAR window correction analysis. Preliminary analysis of the elastic and plastic contributions to the window correction is presented.

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