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Modeling of large scale and expanded large scale gap tests using the CTH hydrocode GERRIT SUTHERLAND, Indian Head Division, NSWC — CTH calculations are performed to calculate the shock and particle velocities in the Plexiglas (PMMA) gap of large and expanded scale gap tests to determine which PMMA and Pentolite material models best replicate measured calibration data. This effort is in support of simulations in which the reactive response of the test explosive is calculated. A gap test consists of a Pentolite donor explosive charge that drives a shock wave into a PMMA attenuator or gap and then into a test explosive acceptor charge. A thicker attenuator will mean that less pressure and energy is put into the explosive. The greater the PMMA gap, the more sensitive the test explosive. To model the response of the test explosive, the simulations must first accurately determine the magnitude and shape of the shock wave driven into the gap by the donor explosive and the subsequent shock attenuation in the PMMA gap. Material models looked at include a tabular Pentolite equation of state generated by the PANDA thermo chemical code, viscoelastic models for PMMA and pressure dependent strength models for PMMA.

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