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DSD-Consistent JWL Equations of State for EDC35 ALEXANDER HODGSON, AWE Aldermaston — The Detonation Shock Dynamics model (DSD) allows the calculation of curvature-dependent detonation propagation. It is of particular use when applied to insensitive high explosives, such as EDC35, since they have a greater non-ideal behaviour. The DSD model has been used in conjunction with an experimental cylinder test to obtain the JWL Equation of State (EoS) for EDC35. Adjustment of parameters in the JWL equation changes the expansion profile of the simulated wall expansion. The parameters are iterated until the best match can be made between simulation and experiment. Previous DSD models used at AWE have no energy release mechanism to adjust the release of chemical energy to match the detonation conditions. Two JWL calibrations are performed using the DSD model, with and without Hetherington's energy release model (these proceedings). Also in use is a newly-calibrated detonation speed-curvature relation that is much closer, compared to previous calibrations, to Bdzil's equivalent for PBX9502. This paper discusses the possible improvements that this approach makes to the EDC35 JWL EoS.

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