INITIAL PRESSURE DECAY RATES OF HOB BLAST WAVES

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The initial slope of the pressure time curve just behind the shock front can be derived analytically from shock trajectories, calculated by hydrocodes and evaluated directly from pressure measurements. Sadeck and Gottlieb (1983) have mentioned that the initial decay rate is an important parameter in order to get a set of internally consistent blast data. For the case of planar, cylindrical and spherical shock fronts to derive expressions for the overpressure decay for the case of a shock front trajectory known. No initial pressure decay rages for HOB Explosions are avail able in the literature.
An experimental small scale test program was designed at the Ernst Mach Institute in order to contribute to a standard set of blast parameters of HOB explosions. The gathered data allows to generate time histories for the positive phase of side-on overpressure. Accurate curve fits for the trajectory of the blast front in term of the radius versus time are available, that can be differentiated for subsequent use to get decay rate expressions.
By assuming that the overpressure-time signature of the HOB blast waves near to the shock front can be approximated by simple exponential functions, the initial decay rate can be directly evaluated from pressure measurements and scaled to the 1 kg-standard under sea-level ambient conditions. It will be shown that this type of decay rate is more meaningful than initial slope data derived from Friedlander equations by Baker (1973). The correspondence between directly evaluated decay rates and those derived from shock trajectories will be discussed.