A USER INTERFACE TO PROVIDE THE PHYSICAL PROPERTIES OF BLAST WAVES FROM PROPANE EXPLOSIONS

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ABSTRACT

At MABS21, Dewey and Dewey presented a re-analysis of the blast wave produced by a stoichiometric propane/oxygen explosion that provided a measure of all the physical properties of the wave as functions of time and radial distance. The results showed excellent agreement with pressure-time histories at those radii similar to the ones provided by the analysis. However, the presented information did not provide simple mechanisms to scale the results to other masses of propane and atmospheric conditions, or to provide interpolations between the radii provided in the analysis.

To overcome these deficiencies an Excel© user interface has been developed that permits the input of a specified amount of propane, and the ambient atmospheric conditions. Three forms of output are available: the peaks of the physical properties immediately behind the primary shock as functions of radius; time histories at any specified distance, and wave profiles at any specified time after detonation. The output physical properties include: hydrostatic overpressure; dynamic pressure; over density; particle velocity; temperature; reflected pressure, and total pressure.