

CONFINED SHOCK WAVES BENCHMARK EXPERIMENTS FOR THE VALIDATION OF NUMERICAL CODES

Jerôme Renard, Claude Desrosier, Isabelle Sochet
Laboratoire Energetique - Explosions - Structures

The study presents experiments on shock waves in air, inside a confined structure, in a laboratory. This study was aimed at addressing two issues, i.e. the validation of numerical codes and the use of scaled models.

It is not necessary to underline the interest of a predictive calculation in the case of an explosion risk, nevertheless the prediction of the pressure field which results from it, is, in many cases, doubtful.

A first convenient way for the estimation of this pressure is to use specialised numerical codes. These cannot easily take into account complicated geometry and manage precisely the reflection of successive shock waves. So, it is advisable to have reliable tools, which enable the testing of numerical codes.

A second way to obtain the required pressure consists in doing experiments at a small-scale reproduction. This technique has the advantage of transposing itself, in an exact manner, at a different scale, in the case of detonations.

An experimental process permitting the generation of the required pressure in an enclosure confining an explosion is accurately described in this study. A contractual study with the C.E.A. (Commissariat à l'Energie Atomique) has used a whole series of results furnished by this experimental process to test its numerical code "TONUS"^[1].