

## **BLAST EFFECTS OF CONFINED EXPLOSIONS**

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In order to know blast effects of confined explosions, it is necessary to study the characteristic parameters of blast wave in terms of overpressure, impulsion and arrival time.

Experimental studies are conducted in two laboratories to get different results for three different scales of a pyrotechnic workshop. In a first hand, the experiments at laboratory scale (1/10<sup>ème</sup>) concern gaseous explosions and are realised at PRISME Institute. In a second hand, the tests at small and real scales (1/5<sup>ème</sup> and 1) are conducted with solid explosives at DGA Techniques Terrestres. The solid explosive is Plastrite and the gaseous detonation is realised with a stoichiometric mixture of propane and oxygen.

The main purpose of these studies is to compare the TNT equivalent for solid and gaseous explosives in term of mass to get a TNT equivalent in a reflexion field and to validate the similitude between real and small scales. Additional work is conducted to study the influence of the height of burst (HOB) in order to analyse the Mach stem and the triple point trajectory. The influence of burnt gases on the shock waves propagation and interaction is studied by varying the volume of the confined room (or the volume of initial gaseous mixture). All results are analysed and compared to validate existing data and to introduce new laws and processes to validate the similitude law of Hopkinson in confined explosions.