

SHOCK WAVE ATTENUATION BY DIFFERENT MATERIALS

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ABSTRACT

To protect a facility from an explosion, the equipment and walls can be covered by a layer of absorbing materials. This study presents the capacity of different materials to attenuate the blast wave. For that, an experimental investigation has been conducted. It consists of an explosive charge located at some distance upstream to a simple wall defined by the absorbing materials. Two types of explosion are considered: deflagration and detonation of gaseous charge.

Several pressure gauges are located in front of and behind the attenuation wall. The form of pressure wave and characteristics of blast wave in terms of arrival time, overpressure, positive time duration, positive impulse are defined.

We have tested four different samples of polymer foams: two types of expanded polyethylene and two types of polystyrene. Furthermore we have investigated the shock wave attenuation with denser materials as samples of cellular concrete and wood. Hence, a panel of materials with different densities and acoustic impedances is proposed to protect a facility against explosions.