Screening of absorbing materials for blast mitigation technology based on sandwich claddings

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Abstract

The sandwich cladding is a blast mitigation technique which focus on lowering the load generated by an explosion on a target by increasing its duration of application. It is composed of three components: an absorber, called crushable core, sandwiched between two thin plates (front and rear plate). The applied blast load accelerates the front plate which compresses the crushable core. The core stores the energy of the blast and transmits it to the rear plate at a lower level, the plateau stress, over a longer time span, thus mitigating the load. Consequently, the core must tbe chosen carefully. Using our explosively driven shock tube, several class of materials have been characterized and a database has been created. The classes of material includes cellular, granular, and fibrous materials. The plateau stress of these materials has been compared.

Keywords: Blast mitigation, Dynamic testing, Sandwich cladding, Cellular materials, Granular materials

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