

A SHOCK TUBE SIMULATION OF PERSONNEL BLAST PROTECTION!

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For many years there has been uncertainty as to the cause of primary blast injuries to personnel. The problem relates to whether the injuries are initiated by the transmission of high velocity stress waves through the body tissues or by gross deformation of the chest wall. This paper reports a shock tube simulation in which case two phenomena can be separately identified. >The experiments support other recent evidence that the stress wave effects predominate.

It is well known that some materials such as plastic foams, can actually exacerbate the extent of blast injury when they are placed in front of the body as an apparent means of protection. The shock tube experiments described in this paper give a measure of the pressure response to blast loading in a system comprising "protective" material and flat simulant. A series of tests using materials of similar total mass but differing acoustic impedances is reported. These experiments enable materials with better protective properties to be identified. Further tests on plastic foams demonstrate the importance of foam composition in determining the degree to which blast effects are increased.