

Study of magazine breakup and debris ejection through small scale test

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An accidental detonation of ammunition magazine will lead to breakup of the structure and ejecting its debris at high speed. Very often, small scale field tests are carried out due to cost constraint. So it is important to understand the scale rules governing the breakup and debris ejection between a full-sized structure and its scaled model. In this study, a simple internal detonation model is established to investigate the scale relationship under different loading densities, say 0.5kg/m^3 , 2.5kg/m^3 , 10kg/m^3 respectively. Focus will be on the deformation, damage and velocity parameters. It was found that compliance with the scale rule may not be the norm. For the cases of 0.5kg/m^3 and 10kg/m^3 , the deformation, damage and velocity parameters agree well to the scale law. However, in the case of 2.5kg/m^3 , the damage and velocity parameters deviate from the scale law. The result is likely influenced by the extent of local response.

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