

THE SIGNIFICANCE OF THE THICKNESS OF A PLATE WHEN SUBJECTED TO LOCALISED BLAST LOADS

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The significance of the thickness of a plate when subjected to localised blast loads with particular respect to the material failure is presented. A series of experimental results on built-in mild steel plates of different thicknesses subjected to a localised blast load is reported. Explosive of load diameter 25mm, 33mm or 40mm is centrally positioned on circular plates of diameter 100mm and thickness of 1.6mm, 2.6mm or 3.6mm to provide the impulse required to give deformations in the range from four plate thicknesses up to plate tearing.

Observations show that there is a reduction in the plate thickness over the central part of the plate (inner dome) over a diameter smaller than the load diameter. Thinning in the form of necking is visible before tearing occurs at the inner dome for the 1.6mm and 2.6mm plates for all three load cases. Thinning is also observed at the boundary but is not as pronounced as at the inner dome area. This suggests shear failure- at the boundary rather than tensile tearing. Tearing at the boundary occurs for all three thicknesses for load diameters 33mm and 40mm only.