

Abstract Submitted
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A study of the effect of potting voids on the fragmentation of an explosively driven Nitinol Shell. ROBIN MUKERJI, SAM MYERS, GLENN WHITEMAN, AWE — An experimental geometry was designed to determine the effect of potting voids on the fragmentation of a Nitinol (Ni 55% Ti 45%) Shell. The nitinol shell was subjected to a shock loading using a HE drive such that it would experience an near bi-axial expansion. The region between the HE and the nitinol was filed with a thin layer of potting (Sylgard 184 elastomer), in which two circular voids were positioned. Presented here and results from high speed framing camera and flash x-radiography that were recorded. It was observed that as the shock wave sweeps across the coupon from the centre to the edge, the potting voids cause premature fracture of the nitinol on the outer most point from detonation. The coupon then proceeded to fracture around the void from this point. It is believed that this was due to the build up of detonation products on the outer edge of the void. In addition, a strong effect of the orientation of the fragments was also noticed. This was believed to be due to the directional rolling of the material prior to it being pressed into the coupon.

Robin Mukerji
AWE

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