

Abstract Submitted
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The effect of fibre orientation on a TWCP composite NICHOLAS BARNES, AWE, DAVID WOOD, GARETH APPLEBY-THOMAS, JAMES LEIGHS, ANDREW ROBERTS, Cranfield University, PAUL HAZELL, The University of New South Wales — Multiple authors have shown that orientation can greatly affect the shock profiles seen in composites. Carbon fibre composites are employed in multiple sectors, with their use in the aerospace industry becoming more prevalent. An angle of 20° between the outer surface and the weave direction provides a good compromise between strength and ablation. Using a single stage gas gun with manganin pressure gauges the shock response of both a 90° and 45° layup TWCP composite were investigated up to a particle velocity of c.a. $1 \text{ mm}\mu\text{s}^{-1}$, in both the U_S - u_p and pressure-volume plane. Comparisons in terms of shock propagation were also made with previously investigated TWCP orientations of 0° and 20° as well as other carbon fibre based composites from the literature. This allowed a detailed interrogation of the effects of weave orientation in this important TWCP composite to be made.

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