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The shock response of TWCP DAVID WOOD, PAUL HAZELL, GARETH APPLEBY-THOMAS, Cranfield University, NICK BARNES, AWE — The combination of high strength and low density, combined with good thermal resistance, has led to carbon-fibre composites (CFCs) becoming increasingly important in the design and construction of vehicles in the aerospace industry. However, the extreme working environment of such CFC based vehicle components makes subjection to significant transient loading events likely during their lifetime. Consequently, knowledge of the high-rate response of CFCs is crucial if the safety and performance of such aerospace systems is to be ensured. In this study the shock response of a tape wrapped CFC with a phenolic resin matrix was investigated via the plate-impact technique. The shock response of this material, with the carbon-fibre weave aligned both parallel, and perpendicular to, the impact axis was interrogated. Hugoniot relationships in the U_S - u_P and P - v/v_0 planes were obtained and compared with similar relationships for both matrix materials and other similar CFC systems from the literature.

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