

IMPROVING BALLISTIC IMPACT RESISTANCE OF FRP COMPOSITE SHIELDS

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ABSTRACT

This research will be focused on developing stronger, safer and more cost-effective structures for the new generation nanoparticle reinforced glass/carbon/Kevlar polymeric based laminated fibre reinforced polymer (FRP) composites and structural sandwich for blast, shock and impact mitigation. Improving the impact resistance of laminated FRP composite materials have many applications in civil aviation, space craft and blast protection. The main factor for measuring the vulnerability of the various structures to ballistic impact is residual velocity of the projectile which is the threat to the structure and passengers. Part of the impact energy will be absorbed by the shielding structure is related to the velocity drop between the impact velocity and the residual velocity of the projectile after the perforation.

Experimental work and explicit finite element modelling will be used to study and improve the structural response of the FRP panels. The matrix of the FRP will be modified with various suitable nanoparticles to improve the impact resistance of the structure and the residual velocity of the sample structures at normal and oblique impact will be measured.