

## The blast resistance of a woven carbon fiber-reinforced epoxy composite

### Abstract:

The blast resistance of a carbon fiber-reinforced epoxy (CFRE) resin has been investigated through experiments on a range of panels. The panels were subjected to blast loading by detonating small quantities of plastic explosive at a fixed stand-off distance. A ballistic pendulum was used to provide a measure of the impulse imparted to the specimen. Tests were undertaken at impulses up to those required to completely destroy the laminates. An examination of the damaged panels highlighted a number of different fracture mechanisms including delamination, top surface fiber buckling, fiber fracture, and shear failure along the edges of the plates. The impulses associated with the onset of fiber fracture and complete target failure were found to increase in a linear fashion for the range of panels considered here. The experimental data are compared with previously published results from similar tests on a woven carbon fiber-reinforced poly-ether-imide. Here, it was demonstrated that the CFRE offered a similar blast resistance to that of the thermoplastic-matrix composite.