

## **Abstract**

The punch shear properties of three-dimensional carbon/epoxy braided composites were studied at quasi-static and high strain rates with finite element method at microstructure level. A microstructure model was developed to analyze the stress distribution and progressive damage of the braided composite panel with different thickness. The braiding yarns were considered as an elastic and transversely isotropic material. Ductile and shear criterion were used in finite element model to obtain the damage evolution. It was found that the braided composite exhibited high strain rate sensitivity under punch shear loading. The thickness influences the punch shear strength significantly. The braiding yarns at surface and corner parts have tensile and pullout failure modes, while at inner part have shear damage mode.