

MATERIALS AND STRUCTURES SYMPOSIUM (C2)

Poster Session (P)

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MECHANICAL PROPERTIES TEST OF 2D C/C COMPOSITES

Abstract

Using 2D needled-carbon fiber felt as the perform, carbon fiber reinforced carbon(C/C) composites were fabricated by isothermal chemical vapor infiltration(ICVI).The strength with flexuralshear and tensile were test, while influence of temperature and sample size on performance were studied, and the microstructure of composites was studied by X-ray diffraction and scanning electron microscopy. The results show that flexural strength in X-Y direction was higher than that of Z direction for higher volume fraction of carbon fiber in X-Y direction, and composites show pseudo-plastic in the X-Y direction and show brittle fracture in the Z direction due to more carbon filer debonding and pullout in the X-Y direction. C/C composites have higher flexural strength above 1875K, while the maximum fracture displacement increases with temperature, since porosity were the major factors which make the interface have different properties which exists between fiber and matrix. Within a certain range, the tensile properties of the material with lower interface shear strength are higher.