

MATERIALS AND STRUCTURES SYMPOSIUM (C2)  
New Materials and Structural Concepts (4)

Author: Mr. zhang zhongwei  
Aerospace, China, zhangzhongw@sina.com

PREPARATION OF MESOPHASE PITCH-BASED CARBON FIBERS WITH RIBBON SHAPE AND  
HIGH THERMAL CONDUCTIVE CARBON/CARBON COMPOSITES**Abstract**

Utilizing ribbon-shaped pitch-based carbon fibers as reinforcement and meso-phase pitch as carbon resources, carbon/carbon (C/C) composites with high thermal conductivity were fabricated by hot-pressing, carbonizing, graphitizing treatment method. The bulk density and electrical resistivity of the C/C composites treated at various temperatures were researched, and the microstructure and morphology were observed by scanning electron microscopy. The results show that the width and thickness of the ribbon-shaped fibers at the transverse section are about 1.5mm and 18 $\mu$ m, respectively, and the shape and structure can be nearly maintained integrity without damage in the process of hot-pressing. The bulk density and electrical resistivity of the C/C composites are respectively increasing and decreasing with the rising of heat-treatment temperature. For the samples graphitized at 2800 C, the bulk density and electrical resistivity reach 1.81g/cm<sup>3</sup> and 1.6 $\mu$ ohm.m. Whereas the thermal conductivity along the axial fiber direction at room temperature is found to be as high as 545W/m.K, which are much higher than those of traditional metal materials, and the corresponding value for copper is only 398W/m.K. Thus-obtained C/C composites are shown to have low density and high thermal conductivity and hence will find potential applications as thermal management in the field of aerospace.