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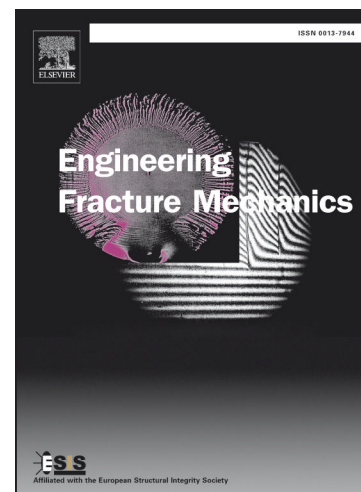
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Mechanical Behaviour of 2D and 3D Weaved SiC-Matrix, Carbon-Continuous-Fibre-Reinforced Composites:

Part 2. Fracture Toughness Under Static Loading Conditions

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Abstract: Advanced materials such as Continuous Fibre-reinforced, Ceramic-matrix Composites (CFCCs) offer significant enhancements in variety of properties, especially tensile stress to fracture, flexural stress and most importantly, the fracture toughness (especially the propagation fracture resistance), as compared to their bulk monolithic counterparts. However till date, there are hardly any scientific studies reported in the open literature on the effects of fibre weaving conditions on the fracture toughness of carbon-fibre based advanced ceramic composites, where SiC is used as the matrix. The present paper discusses the fracture toughness behavior of these CFCCs in 2D and 3D woven conditions, obtained by static loading conditions using 3-point bend/flexural testing. Fracture behavior and principal fracture modes are also evaluated and analyzed to account for the differences in the fracture toughness properties. The variation in plain strain fracture toughness and elastic plastic fracture toughness is also compared. The study showed that the relative difference in the fracture toughness is more or less controlled by the nature of fracture, which is dictated by the

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