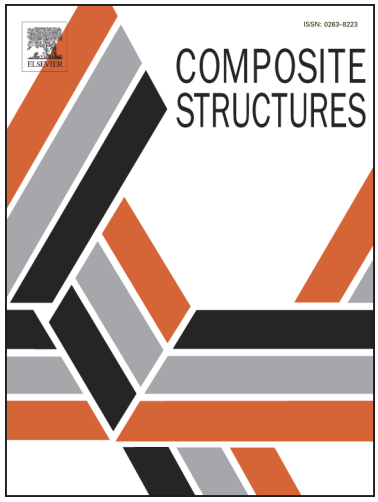

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The temperature-dependent fracture models for fiber-reinforced ceramic matrix composites

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Abstract

In this paper, based on a temperature-dependent fracture strength model and the theory of composite materials, two temperature-dependent fracture strength models for unidirectional and short random fiber reinforced ceramic matrix composites are developed. The effects of temperature, fiber content, fiber distribution, and matrix strength on the strength of fiber-reinforced ceramic matrix composites are included in the models. Furthermore, considering the effects of oxidation reaction for some kinds of fiber and size effect of unidirectional fiber on the strength of composites, a new temperature-dependent fracture strength model considering size effect and oxidation of reinforcing fiber is established. And good agreement between model predictions and experimental data indicates the applicability and rationality of our models. So the models can be used to predict the temperature-dependent fracture strength of fiber-reinforced ceramic matrix composites.

Keywords: Fiber, Ceramic-matrix composites, Temperature-dependent, Fracture strength, Model

1. Introduction

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