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â€™ Bleeding compositesâ€™™â€™ damage detection and self-repair using a biomimetic approach

J.W.C. Pang ... I.P. Bond

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Abstract

The aim of this study is to develop a novel composite system which employs a biomimetic approach to perform a self-repairing function. Such a system can perform two functions; the visual enhancement of impact damage by the bleeding action of a highly conspicuous medium such as fluorescent dye, and the restoration of mechanical properties by a healing agent, stored within hollow fibres, infiltrating the damaged area and acting to ameliorate the effect of the damage. Impact indentation followed by four-point bend flexural testing was conducted to evaluate the strength restoration after self-repair. The results of mechanical testing have shown that a significant fraction ($\hat{\wedge}^{1/4}97\%$) of strength is restored by the self-repairing effect.



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Keywords

A. Polymer-matrix composites (PMCs); A. Smart materials; B. Damage tolerance; A. Fibres

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