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Abstract

The aim of this study was to develop a novel fibre reinforced plastic which employed a biomimetic approach to undertake self-repair and visual enhancement of impact damage by a bleeding action from filled hollow fibres. The results of flexural testing have shown that for the lay-up investigated, a significant fraction of flexural strength lost after impact damage can be restored by the self-repairing effect of a healing resin stored within hollow fibres.

The release and infiltration of an UV fluorescent dye from fractured hollow fibres into damage sites within the internal structure of the composite has been successfully demonstrated. It has been correlated with respect to the ultrasonic C-scan NDT/NDE technique and shown to be an effective method of quickly and easily highlighting damage

at the surface that requires further investigation. This could be of particular benefit where rapid visual inspection of large surface areas (e.g., wing skins) is required.



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Keywords

A. Polymer matrix composites; A. Smart materials; A. Fibres; C. Damage tolerance; Self-repair

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