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IN-SITU REPAIR OF COMPOSITE SANDWICH STRUCTURES USING CYANOACRYLATES

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Abstract

A novel method for the in-situ repair of composite sandwich structures using microvascular networks and cyanoacrylate (CA) adhesive systems has been presented. Upon a damage event, the vasculature becomes ruptured, providing a route for the introduction of adhesive directly into the damage site. The efficacy of the two repair agents was first assessed under static and fatigue conditions using a modified double cantilever beam (DCB) method. Once baseline fracture behaviour of the cyanoacrylates has been established, they were further assessed by injection into a series of pre-damaged T-joint specimens. The presence of the vasculature was shown to have no detrimental impact on mechanical performance, whilst both of the cyanoacrylates were shown to be highly effective in the recovery of stiffness and ultimate strength of the T-joint specimens.

Keywords: A. Sandwich Structures, B. Fatigue, B. Damage Tolerance, Self-Healing

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