

CFRP vessels for self-healing of laminated GFRP

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The vessels of self-healing system are made of CFRP micropultruded tubes. The system consists of a package of five CFRP pultruded micro-tubes (1 mm diameter), placed in the symmetry plane of the GFR/epoxy laminate stack. The healing agent is a mixture of the epoxy resin and hardener. The healing agent releases and penetrates into the cracks if the composite is damaged by the quasi-static indentation. The specimens are healed at 30 °C for 24 hours. Rectangular specimens notched under ASTM D2733 have been subjected to tensile test to determine interlaminar composite shear strength. Shear strength of specimens has been compared in three states (virgin, damaged and healed) and various ways of healing have been examined. After the most effective self-healing, the interlaminar shear strength of the specimens has been recovered to 70 ± 15 % of the strength of virgin specimens, that about twice exceeds the residual strength of the damaged specimens.

Keywords: A. Carbon fibre; B. Strength; D. Mechanical testing; Self-healing.