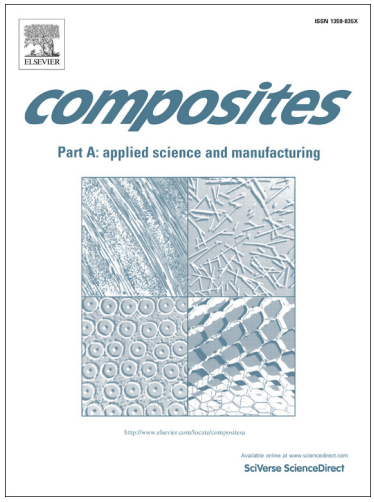


# Damage prediction in composite sandwich panels subjected to low-velocity impact

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# Damage prediction in composite sandwich panels subjected to low-velocity impact

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**Abstract**

The paper illustrates the application of a finite element tool for simulating the structural and damage response of foam-based sandwich composites subjected to low-velocity impact. Onset and growth of typical damage modes occurring in the composite skins, such as fibre fracture, matrix cracking and delaminations, were simulated by the use of three-dimensional damage models (for intralaminar damage) and interfacial cohesive laws (for interlaminar damage). The nonlinear behaviour of the foam core was simulated by a crushable foam plasticity model. The FE results were compared with experimental data acquired by impact testing on sandwich panels consisting of carbon/epoxy facesheets bonded to a PVC foam. Good agreement was obtained between predictions and experiments in terms of force histories, force-displacement curves and dissipated energy. The proposed model was also capable of simulating correctly nature and size of impact damage, and of capturing the key features of individual delaminations at different depth locations.

*Keywords:* B. Impact behaviour; C. Finite element analysis (FEA); C. Delamination; Sandwich Composites