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Damping performance of novel viscoelastic Double Shear Lap Joint dampers in lightweight honeycomb sandwich panels - simulation and experimental measurement.

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Lightweight sandwich structures, with their excellent density specific properties and often used in transport applications, can tend to suffer from severe dynamic excitation. The Double-Shear Lap Joint (DSLJ) insert is a novel viscoelastic damping device that can be placed inside a vibrating structure, e.g. the cell voids of a hexagonal honeycomb core, avoiding the complications of externally mounted devices. The DSLJ dampers have been investigated as alternatives to existing dampers such as externally mounted Constrained Layer Dampers (CLDs), mainly via simulation. Here we present experimental measurement of damping performance of DSLJ dampers. Prototype DSLJ inserts (manufactured in-house) were mounted in optimal locations and orientations in a variety of honeycomb cored sandwich panels. The frequency response function of these very low density structures was measured both via an accelerometer and a non-contact laser vibrometer. The first two modal loss factors were extracted using the Half-Power Bandwidth method and matched against predicted values from prior numerical optimisation studies.

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