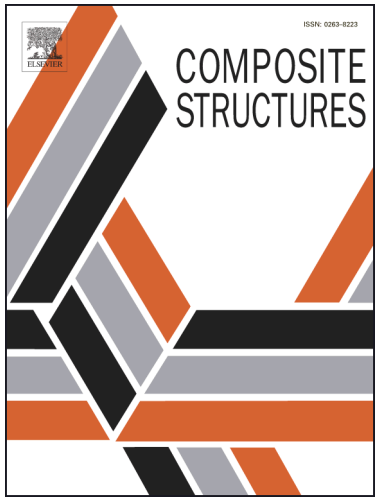

Experimental investigation of composite pyramidal truss core sandwich panels with lightweight inserts

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Experimental investigation of composite pyramidal truss core sandwich panels with lightweight inserts

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Abstract

Composite sandwich structures with lattice truss cores have both lightweight characteristics and multifunctional potential, which attract a large number of studies on topological optimization, manufacture process and performance evaluation in recent years. However, reliability study on the joint is an inevitable research subject for engineering application, and few studies on inserts within sandwich panels with lattice truss cores are published. In this paper, composite pyramidal truss core sandwich panels with lightweight metallic quadrangular-prism inserts are designed and fabricated. Pull-out and shear tests are carried out to investigate their load capability and failure behaviors, respectively. It is observed that, compared to the honeycomb panels, the present sandwich panels with quadrangular-prism inserts normally can obtain a similar level of pull-out strength but a higher level of shear load capabilities.

Keywords: pyramidal truss core; sandwich panels; inserts; load capability; failure behavior

1. Introduction

Composite sandwich structures consisting of two thin but stiff face-sheets and ultra-low-density cellular material cores (foam, honeycomb, fold, corrugated, lattice,

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