

A plastic indentation model for sandwich beams with metallic foam cores

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Abstract

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Abstract Light weight high performance sandwich composite structures have been used extensively in various load bearing applications. Experiments have shown that the indentation significantly reduces the load bearing capacity of sandwiched beams. In this paper, the indentation behavior of foam core sandwich beams without considering the globally axial and flexural deformation was analyzed using the principle of virtual velocities. A concisely theoretical solution of loading capacity and denting profile was presented. The denting load was found to be proportional to the square root of the denting depth. A finite element model was established to verify the prediction of the model. The load-indentation curves and the profiles of the dented zone predicted by theoretical model and numerical simulation are in good agreement.

Keywords: Indentation Sandwich beam Metallic foam

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