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Title: Experimental validation of micromechanical models for brittle aluminium alloy foam

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Abstract: Micromechanical models used to predict mechanical and fracture properties of brittle metallic foams are validated experimentally for closed-cell aluminium foam (AlSi12Mg0.6) prepared by powder metallurgy route. Compression, tensile, tensile on notched specimens and fracture toughness tests were carried on, and the results are presented together with micromechanical models from literature. Moreover, the Digital Image Correlation technique was applied to identify the failure mechanisms of aluminium foams. Finally, the Theory of Critical Distances was employed to predict the fracture load of notched specimens. The novelty of the study is that the inherent stresses and critical distances were obtained by employing micromechanical analysis. (C) 2016 Elsevier Ltd. All rights reserved.

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