

Deformation of Metallic Foams with Closed Cell at High Temperatures

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Abstract : The aim of this study is to investigate formability of Al based closed cell metallic foams at high temperature. The foam specimens with rectangular section were produced from AlMg1Si0.6TiH20.8 alloy preform material. Bending and free bending tests based on gravity effect were applied to foam specimens at high temperatures. During the tests, the time-angular deformation relationships with various temperatures were determined. Deformation types formed in cell walls were investigated by means of Scanning Electron Microscopy (SEM) and optical microscopy. Bending deformation about 90° was achieved without any defect at high temperatures. The importance of a critical temperature and deformation rate was emphasized in maintaining the deformation. Significant slip lines on surface of cell walls at tensile zones of bending specimen were observed. At high strain rates, the microcrack formation in boundaries of elongated grains was determined.

Keywords : Al alloy, Closed cell, Hot deformation, Metallic foam

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