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Title: The temperature and anisotropy effect on compressive behavior of cylindrical closed-cell aluminum-alloy foams

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Abstract: In this paper, the main mechanical properties of the closed-cell aluminum-alloy foams under different quasi-static loading conditions and different temperatures (25,150, 300 and 450 degrees C) were experimentally investigated. In order to illustrate the effect of anisotropy, two loading positions of the cylindrical foam samples, axial and lateral (20 mm diameter and 20 mm height), during the compressive loads, were considered. The results showed a decrease in mechanical properties of the foam material, for both axial and lateral loading conditions, with increasing the temperature during compression tests. Also, it was found that at all tested temperatures, the porous structure, when compressed laterally, tolerates the lower level of loads and energy absorption in comparison to axial loading. Finally, it was observed that the main mechanical properties in axial loading direction are more affected by the increase of the testing temperature than lateral one. (C) 2018 Elsevier B.V. All rights reserved.

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