

# Experimental and simulation studies on compressive properties of brazed aluminum honeycomb plate and a strength prediction method

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## Abstract

To study the compressive mechanical properties of a new type of brazed aluminum honeycomb plate (BAHP), tensile tests on single- and brazed-cell walls as well as compression tests in the out-of-plane, in-plane longitudinal, and transverse directions were conducted. Compared to the material properties of a traditional glued aluminum honeycomb plate (GAHP), those of the single- and brazed-cell walls of the BAHP are entirely different. Therefore, their characteristics should be considered separately when performing theoretical and simulation analysis. Under out-of-plane compression, the core of the BAHP did not debond, owing to its higher strength than that of the GAHP. In comparison, under in-plane compression in the longitudinal and transverse directions, the load–displacement characteristics, ultimate load, and failure modes also differed, and there was no large-scale cracking. Considering the characteristics of the BAHP, a strength prediction method was proposed. The simulation results demonstrated that the model built based on the new method was highly consistent with the experimental results.

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