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Development of a bendable pyramidal kagome structure and its structural characteristics

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Abstract

A sandwich construction is an effective lightweight structure. Conventionally, sandwich structures have been fabricated as plane panels with limitation of application to curved components. In this work, a bendable structure that can be applied to the curved surface was developed based on the pyramidal kagome (PK) structure. The bending zone adaptable to the curved surface was designed between the neighboring PK structures. The PK sandwich structure was strengthened by developing the cross-sectional design of the strut. The mechanical characteristics were investigated by three-point bending test and compression test. The semi-circular cross-section (SCC)-based PK sandwich structure showed improved bending stiffness and maximum bending load over those of the conventional flat rectangular cross-section (FRC)-based PK sandwich structure. The curved PK sandwich structure was applied to the curved component.

Keywords: Kagome structure, pyramidal kagome, semi-circular, bendable structure, bending stiffness.

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