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Behavior of Sandwich Core Under Extreme Temperature Conditions

Mikayla L. Aowad
mla66@zips.uakron.edu

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Behavior of Sandwich Core Under Extreme Temperature Conditions

Mikayla Aowad

For more information: mla66@zips.uakron.edu

Composite sandwich structures are commonly employed in various industries including aerospace, marine and wind energy. Composite sandwich structures have high stiffness and low weight. This work studies the foam core materials used in composite sandwich structures. Three types of foam core are being studied at various densities: H60, H100, F50, F90, PN115, PN200, PN250. Three-point bending test, MATLAB calculation and X-ray micro-computed tomography are utilized to determine relationships between material properties and temperature conditions. Low temperature testing is used to determine properties under arctic conditions. Although both strength and stiffness increase as temperature decreases, results revealed that temperature has greater impact on the strength than the stiffness of the material. Flexural energy is found to decrease as temperature decreases. Lastly, cell wall thickness increases as density increases.