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# Failure Load Prediction of Composite Bolted Joint with Clamping Force

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## Abstract

Clamping force significantly affects the failure mechanisms of bolted joints. In order to predict the failure load of bolted joints, the effect of clamping force must be considered. In this paper, failure load prediction for composite joints with clamping force was conducted using a characteristic length method combined with Tsai-Wu failure criteria. Tensile and bearing tests and stress analyses were conducted to determine tensile and compressive characteristic lengths. A characteristic curve was used to perform failure load prediction for single lap-shear bolted joints. This prediction was accompanied by experiments and stress analysis. The predicted failure load was compared with the actual failure obtained from experiments, and the results were found to be in good agreement.

**KEY WORDS:** Mechanically fastened joint; clamping force; characteristic length method; strength prediction; composite material.

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