Failure Prediction of Adhesive Joint with RTV88

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Summary

In this study, finite element analysis of adhesive joint with RTV88 was performed and failure characteristics were investigated. First of all, tensile test of RTV88 was conducted to obtain material properties and finite element material model was suggested. As results of tests, RTV88 was proved to be an elastomeric material and it can be modeled using Hyperfoam material property in ABAQUS. Then, tensile test and shear test of single lap joint were performed and simulated with Hyperfoam material model in ABAQUS. The behavior of load-displacement curve resulted from FEM shows good agreement with that of the shear test. Finally we analyzed failure characteristics of adhesive joint and considered failure criteria proposed before by previous researchers. It is not easy to predict an exact failure load at break using general failure theory of solid mechanics. After carefully observing the cohesive failure propagation and final surface shape, we selected an appropriate and practical criterion representing failure of adhesive RTV88.

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