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Mechanical Characterization and Experimental Performance of an Aerospace Adhesive

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Abstract

Characterizing an adhesive can be extremely complex because it includes several concepts that can be difficult to handle with. This particular approach has the purpose to simplify these methodologies and to find a practical solution applicable on calculations using adhesively bonded joints. Results found are based on experimental procedures that were adjusted to some of the inaccuracies committed on the manufacture of this type of joints. During the present research, several steps and results were taken to fulfil some needs concerning the mechanical characterization of the adhesive. An elasticity modulus experimental procedure to calculate a practical result for this parameter, a T-peeling test realized to understand the resistance of the adhesive to these critical stresses for adhesives, and a testing campaign that would allowed to find an experimental failure envelope of the adhesive. All the results taken were compared with other sources that allowed to take conclusions about its integrity and applicability. At last, it was prepared a test of adhesively bonded joints samples using dissimilar substrates (composite and aluminium), that would produce results that raise questions about how to apply the existent testing standards but also great results concerning adhesive performance.

Keywords: Adhesive, Experimental Tests, Mechanichal Characterization, Failure Envelope, Adhesively Bonded Joints