

THE EFFECT OF GEOMETRY AND ADHESIVE ON THE STRENGTH OF T-JOINTS

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ABSTRACT

Adhesive joints have been replacing bolted, welded or riveted joints due to the advantages of ease of manufacture, superior strength and ability to join different materials. One of the joint types having industrial application is the T-joint, for example, in marine applications. This work aims to experimentally and numerically study, by cohesive zone models (CZM), the behaviour of T-joints under peel loads. The strong but brittle Araldite® AV138 and the less strong but ductile and more flexible Araldite® 2015 are the experimentally evaluated adhesives. A joint strength study is performed considering different L-shaped adherends' thickness (t_p). With the numerical analysis, the stress distributions, damage evolution and strength are studied. It was shown that the geometry of the L-parts and the type of adhesive have a direct influence on the joint strength. The experimental tests validated the numerical results and showed that CZM are an accurate technique for the study of T-joints.

KEYWORDS: Finite Element Analysis, joint design, Cohesive Zone Models, structural adhesive.

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