DEBONDING OF ADHESIVELY BONDED JOINTS

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ABSTRACT

In this paper a method to assure easy debonding of adhesive joints by combining the inductive heating method and the use of Thermally Expandable Particles (TEPs) was developed. A commercially structural polyurethane adhesive system used in the automotive industry was used. First, single lap joints (SLJs) with different adherend materials (i.e. aluminium and hard steel) were fabricated and tested to assess the influence of TEPs content on the lap-shear strength of the adhesive joints. Further, a parametric study was performed in order to understand the influence of the SLJ specimen's geometry (i.e. adherend and adhesive thickness) on the debonding parameters (temperature and time). Finally, the ability of the TEPs-modified joints to support temperature controlled debonding was evaluated. It was found that debonding of adhesive joints is possible. The weight fraction of TEPs used and the temperature were found to be the major factors in determining the debondability of the joints.

KEYWORDS: Adhesives, debonding, thermally expandable particles, induction heating.

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