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AN OVERVIEW OF ADHESIVELY BONDED JOINTS IN FIBRE-REINFORCED PLASTIC COMPOSITE MATERIALS

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ABSTRACT

A review of the investigations that have been made on adhesively bonded joints of fibre-reinforced plastic (FRP) composite structures is presented. The effects of surface preparation, joint configuration, adhesive properties and environmental factors on the joint behaviour are described briefly for FRP composite structures adhesively bonded. The analytical and numerical methods of stress analysis required before trying to predict failure are discussed. Several methods that have been used to predict failure in bonded joints are described. There is no general agreement about the method that should be used to predict failure as the failure strength and mode are different according to various bonding methods and parameters, but progressive damage models are quite promising since important aspects of the joint behaviour can be modelled using this approach. However, a lack of reliable failure criteria still exists, limiting in this way a more widespread application of adhesively bonded joints in principal load bearing structural applications. An accurate strength prediction of the adhesively bonded joints is essential to decrease the amount of expensive testing at the design stage.

KEYWORDS: Adhesively bonded joints, FRP composite materials

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