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Influence of Composite Adherents Properties on the Dynamic Behavior of Double Lap Bonded Joint

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Abstract : In this paper 3D FEM analysis was carried out on double lap bonded joint with composite adherents subjected to dynamic shear. The adherents are made of Carbon/Epoxy while the adhesive is epoxy Araldite 2031. The maximum average shear stress and the stress homogeneity in the adhesive layer were examined. Three fibers textures were considered: UD; 2.5D and 3D with same volume fiber then a parametric study based on changing the thickness and the type of fibers texture in 2.5D was accomplished. Moreover, adherents' dissimilarity was also investigated. It was found that the main parameter influencing the behavior is the longitudinal stiffness of the adherents. An increase in the adherents' longitudinal stiffness induces an increase in the maximum average shear stress in the adhesive layer and an improvement in the shear stress homogeneity within the joint. No remarkable improvement was observed for dissimilar adherents.

Keywords : adhesive, composite adherents, impact shear, finite element
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