Study on Impact Behaviors of Composite Reinforced Aluminum Tubes

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ABSTRACT

The research studies the impact behavior of the carbon composite reinforcedaluminum tubes, and also investigates the effects of laminated carbon composite onthe tubes. In the past, the thin walled tubular structures were often used as the absorbingenergy mechanism. And the aluminum is often used as the main component becauseof its good ductility and cheaper price. In order to achieve the goal of the lightweight,the carbon composite are most commonly used as materials to reduce the weight. The CAE simulations and experiments of drop testing were performed in thisresearch. For experiments, the data acquisition system was used to capture all of thestrain data during the drop testing. The CAE (Computer Aided Engineering) software,ANSYS/LS-DYNA was used to analyze dynamic simulations. The study shows that the composite structures possess the good impact resistance.Also, the results show that composite tubes have the different stiffness and impactresistance due to the different stacking sequence. The 0° ply will offer the betterstiffness for the structures, but the 90° ply will offer a better ability of the absorbingenergy.

Keywords: Impact, Composite, Tube, ANSYS/LS-DYNA.

Table of Contents

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