CERTIFICATION OF APPROVAL

Study of Drop Impact Resistance on Fiber Reinforced Composite Plates

by

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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ABSTRACT

Lightweight materials are much used in many engineering application such as automotive and aircraft parts and building structure. So the rise of fiber reinforced composite had answered the call whereby these materials can provide lightweight and strength to withstand the force. Low impact velocity damage normally cannot be detected by visual inspection have becomes an issue because the material may fail without any notice or precautions to users.

The project has improved the testing jig by adding guiding tubes, release mechanism and other support structures. Three different fiber reinforced composite plates are glass fiber woven & chopped and carbon woven undergo a series of impact test by using a 25 Joule and 50 Joule impact energies. Ultrasonic test trace the damage area of the composite plate by variation of sound waves which cause by internal delamination and data transfer from transparent grid to CATIA to compute the damage area.

Glass chopped fiber composite show the best impact resistance in both 25 J and 50 J impact energy and following by glass woven and carbon woven fiber. Glass woven composite sustain greater impact damage compare to glass chopped composite is because the brittle characteristic of epoxy resin has reduce the fiber woven composite ductility and become brittle and less resistance to impact. Carbon fiber composite sustain unpredictable collapse when increasing of impact energy or fiber content so it’s not suitable for aerospace and automotive parts.

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