POST IMPACT FATIGUE OF

FIBRE METAL LAMINATE (FML)

ABDUL ADZIM BIN ABDUL MUBIN

(2005607200)

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Faculty of Mechanical Engineering

MARA University of Technology

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"I declare that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

Signed :
Date :

Abdul Adzim bin Abdul Mubin
UiTM No: 2005607200

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ABSTRACT

Fibre metal laminates (FMLs) are a family of hybrid materials currently being considered for use in airframe structural applications. Post-impact fatigue strength tests were carried out on kenaf short fibre polypropylene aluminum laminates on three different energy level. Three type of kenaf short fibre polypropylene composite are prepared consist of three different weight ratio. The ratios of the composite prepared are 15% wt kenaf fibre and 85% wt PP (Composite A), 20%wt kenaf fibre and 80% wt PP (Composite B) and 25%wt kenaf fibre and 75% wt PP (Composite C). The composites specimens are then subjected to tensile test to see which ratio of specimen hold the best tensile strength properties. The results revealed that Composite C holds the best tensile strength by 24% than Composite A and 16% than Composite B. Then Composite C is chosen for fabrication of the FML. The specimens then are impacted at three different energy levels using post impact fixture. The energy levels that are used during this experiment are 0.55 J, 0.94 J and 2.23 J. The impacted specimens are then subjected to tensile and fatigue test until failure to determine the residual strength of the FML. The results revealed that even low energy impact could seriously impair the tensile properties. Low velocity impact also reduced the fatigue lives of the FML and this reduction could be related to the degradation in tensile strength.

TABLE OF CONTENTS