The behavior of Aluminium Carbon/Epoxy fibre metal laminate under quasi-static loading


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One of major concerns that related to the flight safety is impact of birds. To minimize the risks, there is need to increase the impact resistance of aircraft by developing a new material and has the good structural design of aircraft structures. The hybrid laminates are potential candidate material to be applied for the aircraft structures susceptible to bird strikes. The fibre metal laminate was fabricated by a compression moulding technique. The carbon fibre and aluminium alloy 2024-0 was laminated by using thermoset epoxy. A compression moulding technique was used for the FML fabrication. The aluminium sheet metal has been roughening by a metal sanding method which to improve the bonding between the fibre and metal layer.

The main objective of this paper is to determine the failure response of the laminate under five variations of the crosshead displacement in the quasi-static loading. The FML was modelled and analysed by using Explicit solver. Based on the experimental data of the quasi-static test, the result of 1 mm/min was 11.85 kN and higher than 5, 10, 50 and 100 mm/min which because of the aluminium ductility during the impact loading response. The numerical simulations were generally in good agreement with the experimental measurements.