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Abstract

The experimental study presented herein, investigated the effects of bolt torque tightening on the strength and fatigue design of bolted AS7/8552 fibre reinforced polymer laminates. Damage initiation and final failure manifestation on the joints was investigated and presented using optical microscopy. Subsequent experimental result analysis explored the application domain of bolted joints within the airframe design sector, bound by the current airworthiness certification requirements and expected airframe design life. The reasons for the static strength of the joint laminates or the fatigue failure of the bolt being the main design drivers for the tested joints were highlighted. The study concluded with comments and suggestions on the application of bolt torque tightening in relation to the strength, fatigue life and damage tolerance characteristics of joints on similar fibre reinforced polymer laminate composite material systems.

Keywords: fatigue; fracture; strength; mechanical testing; optical microscopy;

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