

# EXPERIMENTAL INVESTIGATION OF AEROSPACE GRADE COMPOSITES POROSITY LAMINATES UNDER HYGRO-THERMAL ENVIRONMENT CONDITION

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## Abstract

The effect of porosity has been studied by developing different levels of porosity laminates through a new autoclave based manufacturing technique known as Diverse Cure System (DCS). Further assessment of porosity levels by mechanical characterization (Inter-laminar Shear Strength), microscopic studies and acid digestion method have been achieved in Carbon Fiber Epoxy laminates. Correlations are obtained on the different levels for porosity laminates of two different thicknesses. ILSS test results are compared with the literature results. Assessment of porosity effect on ILSS is performed at room temperature and environmentally conditioned specimens. Strength degradation of 20 to 30% has been noticed on porosity laminates. Hygro-thermal specimens are tested at room temperature, elevated temperature and hot wet condition. A large reduction in the range of 45 to 53% in ILSS has been noticed on the moisture conditioned specimens tested at elevated temperature of 150°C.

**Keywords:** Advanced composite; Strength properties; ILSS; Hygro-thermal effect; Ultrasonic inspection; Process induced defect; Porosity