

## **Automated spray up process for pineapple leaf fibre hybrid biocomposites**

### **ABSTRACT**

This paper investigates the fabrication of hybrid biocomposites of Pineapple Leaf Fibre (PALF)-glass-vinyl ester (VE) utilizing automated spray up process. This method can be applied for components in interior aircraft and automotive industry. In this study, the manual chop spray gun is integrated with industrial robotic arm to produce random discontinuous fibre composite (DFC) from PALF roving (273 tex) and vinyl ester resin. The characterization includes mechanical (tensile, and flexural test), thermal (DMA and TGA) and a morphological analysis (SEM) of the surface fractures from the tensile test samples. For each mechanical result, coefficient of variance (COV) is calculated to measure the variability of the mean distribution. The comparison is made among the glass (100% glass), PALF-vinyl ester (100% PALF), and glass-PALF-vinyl ester (PALF 50%, Glass 50%) hybrid biocomposites on the mechanical strength and consistency of the outcome. The result showed that hybridization increased the tensile strength by 171% compared to PALF-VE composite, reduced the composite density and increase thermal properties compared to PALF-VE and glass-VE composites.

**Keyword:** Automated spray up; Bio composite; Natural fibre; Direct fibre compounding; Pineapple leaf; Vinyl ester