

Fabrication and preliminary assessment of aramid reinforced polymer composite material

ABSTRACT

A knowledge of the material constituents and fabrication process is generally required for easing the composite material properties study and characterization. This paper presents the methodology of aramid reinforced polymer composite material preliminary assessment and fabrication. The demonstration is carried out through the development of mechanical properties characterization specimen. The composite material specimen is fabricated by utilizing the open mould with hand lay-up method, where three types of laminates include of unidirectional, orthotropic, quasi-isotropic cross plies are demonstrated. A template is applied for preparing specific fibre orientation 45° angle. Plies are lay accordingly with guided by a square guide for minimizing the off-orientation angle defect. Preliminary assessment is included of verification of unidirectional aramid fabric quality, cured specimen physical defect, internal defect through micrography analysis and material volume fraction prediction. Average specimen fibre volume fraction of 0.64 is predicted by determined the fibre filament geometry detail through micrography analysis. There are several fabrication defects had been identified. The defect identification findings shall be referred for further improvement of material preparation and fabrication method.