

## Characterisation of the woven fabric of jute, ramie and roselle for reinforcement material for polymer composite

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### ABSTRACT

The current research aims to describe the natural woven of jute, ramie and roselle as a reinforcement material for the future applications. On the woven jute, ramie and roselle, four (4) forms of mechanical testing were conducted consisting of grab strength, tearing strength, puncture strength, and fibre pull-out testing. Additionally, the unsaturated polyester resin (UPE) was reinforced with all the woven fabric to determine its effect on the properties of the tensile. The test result for jute and ramie is 103.5N and 137.9N from multiple fiber pull-out, so more force is required in the warp direction to pull the fiber out than in the weft direction which is 102.5N and 124.3N. The result of grab test is opposite from multiple fibre pull-out test. Woven fabric in weft direct required more force which is about 1.4-29.2%. Less than 115N needed for splitting ramie in warp and weft direction compared jute and roselle fabric. The different energy provided by rosselle compared to jute and ramie fabric is 1-1.5Nm based on the puncture resistance test. Result of fibre reinforced UPE is obtained are in range of 21.4 - 27.9MPa which analogous to yarn and textile testing.

### KEYWORDS

Fibre characterisation; Mechanical properties; Reinforcement materials; Woven fabric

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