

## ***Abstract***

*Synthetic fibres such as glass and carbon have been used for several years in many applications varying from aerospace components to civil infrastructures. However, the high production and material costs of these fibres limit their wider use for the development of composite materials. As a result, there is an increasing interest in utilising the less expensive natural fibres as reinforcement in composites because of their added advantages such as lightweight, renewability and biodegradability. Composites are materials composed of a mixture of two or more combined materials at a macroscopic level with different chemical and physical properties, producing a new material that has different properties from the constituent materials. Composite material consists of two constituent materials, namely matrix and reinforcement. Generally the reinforcement used in a composite is synthetic fiber and natural fiber, and the matrix used was resin polymer. The research phase starts with finding some journals that discuss about polyester matrix composites by using three different types of reinforcement with alkaline treatment. The composite manufacturing process uses the hand lay-up method. The tensile strengths data will be compare and analyzed. The mechanical properties tested included tensile test according to ASTM D638 for napier grass fiber, ASTM D3039 for jute fiber, and ISO527-1:1995 for bamboo fiber, and tensile test fracture results were observed using Scanning Electron Microscope. The results of comparison suggest that the bamboo fiber reinforced polyester composites gives the highest tensile strength of 21 MPa.*

***Keyword:*** *natural fibre, alkaline treatment, polyester, tensile strength, composite.*