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DEVELOPMENT OF *BERAPAK* COMPOSITE AS A CORE MATERIAL FOR HIGH RESILIENT SPORTS EQUIPMENT

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The *berapak* (bamboo internal skin) is a material produced from bamboo that has the potential to be made as the alternative materials to replace timber and polymers. Studies by researchers have shown that *berapak* material is suitable for manufactured products with high endurance like bicycle frameworks and automotive components. Research identifying the potential of this material is still at its early stages. Experiments with different types of adhesives have shown variations in terms of strengths and compression levels. There are three samples produced to test the *berapak* material resistance level. The first sample consists of 100% *berapak* material, the second sample is of a carbon fibre composite and the third sample is of a glass fibre composite. Results from the tests carried out indicate there are differences in the resistance level, sample weight and test graphs.

Keywords: *berapak*, composite, potential, resilience

1. INTRODUCTION

'Berapak' is a term in the Bidayuh which refers to the internal layers of the skin of bamboo or bamboo inner skin, (Figure 1). *Berapak* is usually obtained from a young bamboo and from zollingeri Schizostachyum (buluh lemang) genus variety, or also known as pansuh bamboo among the people in Sarawak. It consists of various sizes depending on the size of the bamboo, and the common size that is used to produce the *berapak* by entrepreneurs is 40 cm to 60 cm long, while the width is within 15 cm to 20 cm. The *berapak* size depends on how big and how long the bamboo segment is. Usually, the *berapak*'s thickness is around 2mm. However, it is not consistent because process of peeling the bamboo skin is done manually. This research discusses the results of *berapak* strength using different composites, adhesives, arrangements.

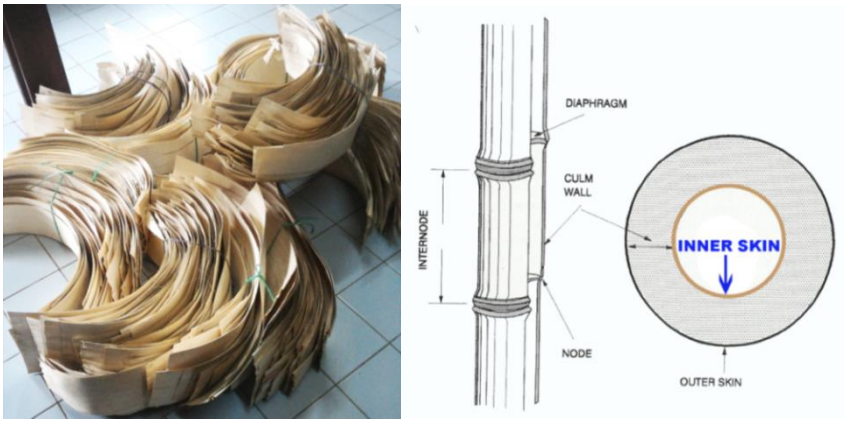

Figure 1: *Berapak*

1.1 The use of composite materials

Currently composite materials are used in many field, generally composite materials are used to make various items and tools (Idowu et al., 2015). In the automotive field, especially composite materials are widely used in the auto parts division due to its lightweight and durable properties (Ragahavendra, Varada, Ramachandra & Hemachandra, 2010). The properties of this composite material can meet vehicle manufacturing criteria which require minimum weight for oil savings and other factors (Seki et al., 2014). In addition, this material is also used to make vehicle brakes due to its heat-resistant properties and also good grip strength (Ma et al., 2012).