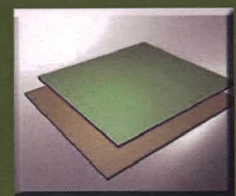


# ADVANCES IN COMPOSITE MATERIALS

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Iskandar Idris Yaacob  
Md Abdul Maleque  
Zahurin Halim



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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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**Iskandar Idris Yaacob  
Md Abdul Maleque  
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## Effect of Compaction Time on the Properties of Coir Fiber Reinforced Cement-Albumen Composite

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**Keywords:** Coir fibers, cement, compaction, albumen, flexural strength, compressive strength.

**Abstract:** The effect of compaction time on the physical and mechanical properties of the coir fibre reinforced concrete with utilization of egg albumen as the matrix material was the main focus of this chapter. The idea was to produce denser coir fiber reinforced cement-albumen composite (CFRCAC) with significant strength. The compaction test on the freshly placed cement composite was done via vibrating table (3000/3600 vpm, 50 Hz, 1 ph) for 5, 10, 15, 20 and 25 minutes. The optimum weight fractions of coir fibers, cement and albumen were 5 wt%, 30 wt% and 65 wt% respectively. Investigation resulted in denser CFRCAC and less moisture content compared to non-compacted samples with significant mechanical properties, namely flexural and compressive strength with longer compaction time.

### Introduction

The versatility of coir fibers would be an excellent natural reinforcing material in the production of cement application [1-4]. Coir fibers contain a high lignin and hemicelluloses that makes the fibers stiffer and tougher. They are cheap, strong, and durable too [2,5]. Fortunately, this is an appropriate moment to consider a more efficient use of cement involving the use of coir fibers as reinforcement and biopolymer such as albumen as the matrix material.

It is essential for concrete mixture to completely fill the formwork, otherwise air pockets or honeycomb structure is introduced as an end result which ultimately enhances crack propagation. Compaction is one of the methods in developing high workability performance on fresh state concrete. The application of vibration in concrete mixture slightly increases the strength [6] as it makes the particles in the material to be bonded closely. Hence compaction eliminates material void content such as entrapped air which eventually produces a denser product [7]. Density is one of the important parameters which can control many physical properties in cement composite [8]. Furthermore, adequate and proper compaction method increases concrete abrasion resistance and durability.

One goal of this study is to gain better understanding on the influence of compaction period on the physical and mechanical properties of CFRCAC by varying the time of compaction as well as comparative test with non-compacted samples.