

**THE EFFECT OF PARTICLE SIZE OF ANGEL-WING CLAM SHELL (ACS)  
POWDER AS A NATURAL REINFORCING FILLER ON PHYSICAL AND  
MECHANICAL PROPERTIES OF EPDM RUBBER**

**HANNAN BINTI AHMAD MAZIAN**

**BACHELOR OF SCIENCE (Hons.)  
POLYMER TECHNOLOGY  
FACULTY OF APPLIED SCIENCES  
UNIVERSITI TEKNOLOGI MARA**

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## AUTHOR'S DECLARATION

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Name of Student : HANNAN BINTI AHMAD MAZIAN

Student I.D. : 2016674834

Programme : Bachelor of Science (Hons.) Polymer Technology  
(AS243)

Faculty : Applied Sciences

Thesis title : The Effect of Particle Size of Angle-wing Clam Shell  
(ACS) Powder as a Natural Reinforcing Filler on Physical and  
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Signature of Student :   
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## **ABSTRACT**

### **THE EFFECT OF ANGEL-WING CLAM SHELL (ACS) POWDER AS REINFORCING FILLER ON PHYSICAL AND MECHANICAL PROPERTIES OF EPDM RUBBER**

In this study, the effect of Angel-wing Clam Shell (ACS) powder as filler on physical and mechanical properties of Ethylene Propylene Diene Monomer (EPDM) rubber have been experimentally investigated in different particle sizes (100, 300 and mixture). The preparation of ACS filler has been done by a few methods which are collected, cleaned, brushed, dried, crush, sieved and undergo particle size analysis by using Particle Size Analyzer (PSA). The ACS powder then was mixed with EPDM rubber during mastication process. A few testing have been done to test the rubber samples in order to determine the best particle size that can increase the performance EPDM rubber. The physical testing that has been done is density test and for mechanical testing are tensile test, abrasion test and hardness test. From overall results of testing, the optimum particle size of ACS filler is 100  $\mu\text{m}$  due to high density ( $1.00\text{g}/\text{cm}^3$ ), tensile strength (1.628MPa), and hardness (53.4 IRHD) with low ARI value for abrasion resistance (2209.97%). In the other words, 100 $\mu\text{m}$  size of ACS filler can be considered as the best particle size as it record as the highest value for percentage of elongation at break (327.71%) to be compared with other unfilled EPDM.