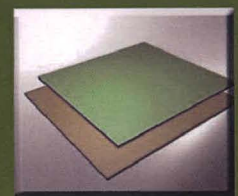
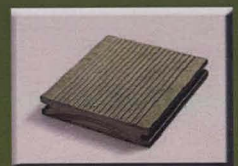
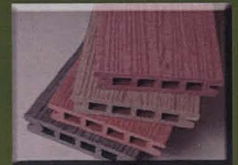


ADVANCES IN COMPOSITE MATERIALS



Iskandar Idris Yaacob
Md Abdul Maleque
Zahurin Halim



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Table of Content

Chapter 1	1
A Critical Review of Metal Matrix Composite Brake Rotor	
	<i>Md Abdul Maleque</i>
Chapter 2	7
Technology of Moulding for Composite Auto Brake Rotor	
	<i>Md Abdul Maleque</i>
Chapter 3	13
Fabrication of Nickel Aluminide (Ni ₃ Al) by Hot Isostatic Pressing (HIP)	
	Faizal Abu Zarim, Iraj Alaei, I.I. Yaacob
Chapter 4	17
Investigation of Mechanically Alloyed Nd-Fe-B Powder	
	I.I. Yaacob and H.K. Jun
Chapter 5	23
Synthesis And Characterization Of Nanocrystalline Ni ₃ Al Intermetallic Produced by Mechanical Alloying And Reaction Synthesis	
	<i>R. Ismail and I.I. Yaacob^b</i>
Chapter 6	29
The Effect of Hard Nanofillers on Mechanical Properties of PVC Nanocomposites	
	<i>Noorasikin Samat, Muhammad Alif Mohd Yusoff and Mohd Shahrul Rizal Bin Zakaria</i>
Chapter 7	34
Fatigue Fracture Mechanism of PVC/CaCO ₃ nanocomposite	
	<i>Noorasikin Samat, Alan Whittle and Mark Hoffman</i>
Chapter 8	40
Mechanical Behaviour of Eco Core Composite Sandwich Structure	
	<i>Norhasnidawani Johari Safiyah Hazwani Abd. Rahim and Zahurin Halim</i>
Chapter 9	45
Characteristics of Oil Palm Biomass via Mixture of Empty Fruit Bunch (EFB) Fiber and Mesocarp Fiber	
	<i>Zahurin Halim, Nabiha Mohd Noh and Nurshazana Mohamad</i>
Chapter 10	49
Mechanical Behaviour of Oil Palm Empty Fruit Bunch (OPEFB) Alumen-Composites Concrete	

Afiqah Omar, Nur Humairah A. Razak and Zuraida Ahmad

Chapter 11	55
The Influence of Biopolymer and Natural Fiber on the Physical and Mechanical Properties of Cement Composite	
<i>Norshahida Sarifuddin and Zuraida Ahmad</i>	
Chapter 12	62
Thermal and Morphological Study of Biopolymer Cotton-Albumen Clay (BCAC) Composites	
<i>Zuraida Ahmad, Teoh Swin Le and Kumaran A/L Samannamuthaliar</i>	
Chapter 13	68
Effect of Compaction Time on the Properties of Coir Fiber Reinforced Cement-Albumen Composite	
<i>Amir Zakwan Roslin, Nur Humairah A. Razak and Zuraida Ahmad</i>	
Chapter 14	74
Oil Palm Empty Fruit Bunch (OPEFB) for Lightweight Composites Concrete	
<i>Afiqah Omar, Nur Humairah A. Razak and Zuraida Ahmad</i>	
Chapter 15	80
Fabrication of Metal Matrix Composite Automotive Brake Rotor (Part 1)	
<i>Md Abdul Maleque</i>	
Chapter 16	86
Fabrication of Metal Matrix Composite Automotive Brake Rotor (Part 2)	
<i>Md Abdul Maleque</i>	
Chapter 17	90
Wear of Aluminium Matrix Composite – Effects of Reinforcement Combination	
<i>Md Abdul Maleque and Rezaul Karim</i>	
Chapter 18	96
Mechanical Properties of Wood Plastic Composites	
<i>Ooi Chong Jin and Shahjahan Mridha</i>	
Chapter 19	101
Properties of Wood Fiber Reinforced Polypropylene Composite	
<i>Shahjahan Mridha and Nafis Sarwar Islam</i>	

Chapter 20		108
The effects of chemical and mechanical treatments on coir fibre to mechanical properties of coir-albumen-concrete		
	<i>Zuraida Ahmad and Nurizan Omar</i>	
Chapter 21		114
Architecture of Chopped Fiber Glass in Plastic Composite Processed Under Different Loads		
	<i>Ahmed Nazrin Md Idriss and Shahjahan Mridha</i>	
Chapter 22		119
Variation of Fiber Architecture on Loads applied in Fabrication of Epoxy/Woven Fiber Glass Composite		
	<i>Ahmed Nazrin Md Idriss and Shahjahan Mridha</i>	
Chapter 23		125
Impact Behavior of Carbon/ Epoxy Composite in Moisture and Temperature environments		
	<i>Shahjahan Mridha</i>	
Chapter 24		132
Impact Strength Behaviour of the Woven and Chopped Fiber Glass Composites at Different Temperatures		
	<i>Ahmed Nazrin Md Idriss and Shahjahan Mridha</i>	
Chapter 25		138
An Investigation of Hybrid Composites Tubes Subjected to Quasi-Static Loading		
	<i>Farrah Yussof¹ and Zuraida Ahmad</i>	
Chapter 26		144
Mechanical Behaviour of Biopolymer Cotton Albumen Clay (BCAC) Composites		
	<i>Teoh Swin Le, Kumaran A/L Samannamuthaliar and Zuraida Ahmad</i>	
Chapter 27		150
The Effect of Processing Parameters on Tensile Properties Empty Fruit Bunch (EFB) Fiber Reinforced Thermoplastic Natural Rubber Composites		
	<i>Noor Azlina Hassan, Norita Hassan, Sahrim Hj. Ahmad and Rozaidi Rasid</i>	
Chapter 28		155
Manganese Doped Hydroxyapatite Powder through Hydrothermal Method		
	<i>Asep Sofwan Faturohman, Alqap, Iis Sopyan and Niur Izzati Mazmaa</i>	

Chapter 29	161
Synthesis and Characterization of Sol-Gel Method Derived Zinc Doped Hydroxyapatite Powder	
<i>Asep Sofwan Faturohman Alqap, Nor Hidayu and Iis Sopyan</i>	
Chapter 30	167
Synthesis and Characterization of Nickel Iron–Silicon Nitride Nanocomposite	
<i>Iskandar I. Yaacob</i>	
Chapter 31	172
Fabrication of Nickel Aluminide Intermetallic-Alumina Nanocomposite	
<i>Roslina Ismail and Iskandar I. Yaacob</i>	
Chapter 32	178
Investigation on the Effect of Water Immersion on Cotton Albumen Composite	
<i>Zahurin Halim, Zuraida Ahmad and Fauziah Md Yusof</i>	
Chapter 33	182
Numerical and Experimental Investigation of Peel Strength of Composite Sandwich Structures	
<i>Zahurin Halim , Shahnor Basri and Mohd Ramli Ajir</i>	
Chapter 34	190
Finite Element Analysis of Interlaminar Stresses in Edge Delamination	
<i>Zahurin Halim and Meor Mohd. Adli Taib</i>	

Wear of Aluminium Matrix Composite – Effects of Reinforcement Combination

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Keywords: Aluminium matrix composite, double particle size (DPS), triple-particle size (TPS).

Abstract: Aluminum metal matrix composite (AMC) exhibits promising properties enhancement in the field of metal matrix composite. Improved wear properties of reinforced-AMC can be determined by varying the nature of reinforcement and their volume fraction. In this investigation, AMCs with double particle size (DPS) and triple-particle size (TPS) SiC reinforcement combination using 20 wt% SiC were developed using stir-casting process on a special oil-tempered sand mould. The result shows that wear property of aluminium matrix composite with triple-particle size SiC exhibited better results (i.e. lower wear) than double particle size SiC reinforcement as a result of proper shielding effect of base metal and the fine particles by the coarse particles. This study could be use to optimise the wear rate of structural applications developed with triple-particle size aluminium matrix composite.

Introduction

Properties of composite materials are of interest because of their excellent mechanical and wear resistance in automotive applications such as brake rotor, cylinder head, piston etc. Reinforced silicon carbide AMC is a family of composites materials whose stiffness, strength, density, and thermal and electrical properties can be tailored. The matrix alloy, the reinforcement material, the volume and shape of the reinforcement, the location of the reinforcement, and the fabrication method can all be varied to achieve required properties. Regardless of the variations, however, Al composites offer excellent thermal conductivity, high shear strength, excellent abrasion resistance, high temperature operation.

Skolianos and Kiourtsidis [1] and Lim et al. [2] have shown that aluminum alloy-based metal matrix composites (MMCs) with ceramic particulate reinforcement exhibited great promise and are seen as alternative to conventional materials. Moreover, these advanced materials have the potential performance to perform better under severe service conditions such as, higher speed and load which are increasingly being encountered in modern tribo-components. Manufacturing process plays a big role in developing the multiple-particle size SiC_p light-weight material with effective cost and environmental factors. Many researchers found that among the various MMC manufacturing processes, stir casting process is the most