

# Table of Contents

## Preface

## Chapter 1: Engineering Materials

<b>Effect of Plating Thickness on Fatigue Strength of Galvanized Steel</b> K. Hasegawa, T. Hayashi, M. Morita and S. Motoda	3
<b>Influence of Nano-Silica Dosage on Properties of Cement Paste Incorporating with High Calcium Fly Ash</b> T. Suwan, P. Jitsangiam and P. Chindaprasirt	9
<b>Mechanical and Shrinkage Behaviors of Ductile Fiber-Reinforced Polymer Repair Mortar</b> G.Y. Han and J.L. Luo	14
<b>Development of a TAPE-Agar Liquid Gel Bandage</b> R.F.M. Bautista, M.R.H. Tam, K.A.D. Wong and T. Tumolva	20
<b>Frequent Start-Stop Test Study of Graphene Coatings on Journal Bearings</b> X.B. Wang, Y.F. Zhang and Z.W. Yin	26
<b>A New Technology to Prevent the Formation of Limescale in Hot Water Supply Systems</b> M. Jalilov, A. Jalilova, G. Feyziyeva and M. Azimova	36
<b>Development of a CuFe<sub>2</sub>O<sub>4</sub> - Reduced Graphene Oxide-Based Electrochemical Sensor for Malathion</b> G.A.T. Battad, J.G. Estacio, J.L.C. Indiongco and M.L. Mopon Jr.	41
<b>Nano-Crystallization of Steel Surface by Slide-Burnishing</b> H. Kato, K. Yamamoto and K. Yasunaga	48
<b>Numerical Simulation of Material Plastic Deformation Using the Drawing Forming Process of Contoured Internal Surface Tubes</b> M. Necpal, E. Hodúlová and M. Martinkovič	54
<b>Solvent Absorption and Dissolution Kinetics Modelling for the Chemical Recycling of Waste Plastic Laminates</b> M.S.P. Deang, R.I.C. Alindayu, K.V.H. Escasa, G.M.G. Riña and T. Tumolva	59
<b>Feasibility of Paper Production from Oil Palm Trunk Using Arrowroot Flour as a Binder</b> N. Phruksaphithak and J. Wangprayot	64
<b>Study on Morphology Features and Mechanical Properties of Nanofibers Films Prepared by Different Composite Electrospinning Methods</b> C. He, H. Wang, L.X. Huang, P. Wang and W. Gao	70
<b>Studying the Stability and Conductivity of the Composite Films via Electrospinning/Spray Process</b> L.X. Huang, H. Wang, F.Y. Fang, P. Wang and W. Gao	76
<b>Electrospinning/Spray: The Interaction between Graphene Nanosheets and Different Nanofibers</b> Y.Z. Chen, H. Wang, F.Y. Fang, H. Mei and L. Wang	82
<b>Tensile Properties of Cellulose-Filled Recycled Thermoplastic Composite Filaments for 3D Printing</b> M. Hyvärinen and T. Kärki	87
<b>3D Reconstruction of Microstructure for Centrifugal Casting Babbitt Lining of Bimetallic Bearing Based on Mimics</b> Q. Dong, Z.W. Yin, H.L. Li, Y. Mao and G.Y. Gao	94
<b>X-Ray Powder Diffraction Data and Crystal Refinement of Ternary Compound Ti<sub>4</sub>ZrSi<sub>3</sub></b> L.Q. Liang, Y.Y. Wei and D.G. Li	99
<b>The Green Preparation of Cellulose Fibrils from Oil Palm Leaf Stalk Fibers for Hydrogel Applications</b> N. Srirachya and A. Nido	103
<b>Evaluation of Recycled Aggregate (RAP) Presence Impact under Indirect Tensile Strength of Bitumen Stabilized Mix with Foamed Asphalt for a Base Layer</b> M.A.V. Guzmán, H.D. Alamilla, E.M. Alonso-Guzmán, W. Martínez-Molina, H.L. Chávez-García and R.R. Ruiz	108

<b>Scanning Electron Microscope in Rocks and their Comparison with Physical-Mechanical Properties</b>	
M.A.N. Seras, F.J.D. Mota, E.M. Alonso-Guzmán, W. Martínez-Molina, H.L. Chávez-García, J.G. Tinoco Ruiz and J.A.G. Torres	114
<b>Natural Additive to Retard the Setting of a Mortar and Increase its Resistance</b>	
N. Díaz-González, L.A.G. Luna, E.M. Alonso-Guzmán, W. Martínez-Molina, H.L. Chávez-García and J.A.V. Perez	119
<b>Electrochemical Synthesis of Hydroxyapatite Nanosheet-Assembled Porous Structures with Bipolar Membrane</b>	
A. Nur, A.W. Budiman, A. Jumari, Nazriati and F. Fajarooh	124
<b>The Comparison between Mechanical Properties of Laser-Welded Ultra-High-Strength Austenitic and Martensitic Steels</b>	
M. Hietala, M. Keskitalo and A. Järvenpää	132
<b>Mechanical Properties of Concrete Using Treated Recycled Concrete Aggregate in Marine Environment</b>	
S. Ismail and M. Ramli	138
<b>Failure Analysis of Spur Gears Used in Transmission System Applied on a Hand Tractor</b>	
Husaini, D.M. Dawud, T.E. Putra and N. Ali	144
<b>Biofuel Production from Jatropha Bio-Oil Derived Fast Pyrolysis: Effect of Catalysts Supported</b>	
T. Rodseanglung, T. Ratana, M. Phongaksorn and S. Tungkamani	150
<b>Experimental Investigation and Modelling of Claystone from Mae Moh Coal Mine, Thailand</b>	
P. Wongchana and P. Jitsangiam	155
<b>Preliminary Investigation of Crushed Rock-Based Geopolymer for Road Applications</b>	
H. Thongchua, P. Jitsangiam, T. Suwan, D. Rinchumphu, S. Kwunjai and P. Chindaprasirt	161
<b>Hemp Fiber Reinforced Geopolymer Composites: Effects of NaOH Concentration on Fiber Pre-Treatment Process</b>	
P. Maichin, T. Suwan, P. Jitsangiam and P. Chindaprasirt	166
<b>Crushed Rock Geopolymer as a Future Road Construction Material: An Evaluation on Strength Performance and Compaction Characteristics</b>	
S. Kwunjai, P. Jitsangiam, T. Suwan, D. Rinchumphu, H. Thongchua, P. Chindaprasirt and S. Sampattagul	171
<b>Response Behavior of Local Surface Failure due to Repetitive Impact of Stainless Steel</b>	
M. Sukpat and T. Karuna	177
<b>Study of Properties of 3D Printed Short Carbon Fiber Composite</b>	
N. Saithongkum and T. Karuna	182
<b>High Purity Lime as an Ecologic Alternative for Construction Mortars and Pastes</b>	
E.G. Navarro-Mendoza, J.A. Bedolla-Arroyo, A. Sánchez-Calvillo, E.M. Alonso-Guzmán, V.H. Blancas-Herrera, W. Martínez-Molina and H.L. Chávez-García	188
<b>Cemented Mortar Matrices Densified with Organic Additions</b>	
L.C. Velázquez, E.M. Alonso-Guzmán, W. Martínez-Molina, H.L. Chávez-García, M.C.G. Chiquito and M.A. Sánchez	193
<b>Evaluation of the Electrical Resistivity, Ultrasonic Pulse Velocity and Mechanical Properties in Portland Cement Pastes Type II</b>	
J.A.V. Perez, E.M. Alonso-Guzmán, W. Martínez-Molina, H.L. Chávez-García, I.T. Moreno and M.A. Sánchez	198
<b>Characterization of Hydraulic Concrete with Polystyrene-Based Emulsion</b>	
M.C.G. Chiquito, E.M. Alonso-Guzmán, W. Martínez-Molina, H.L. Chávez-García and N. Díaz-González	203
<b>Preparation and Performance Study of Fluorosilicone Oligomer Anti-Sticking Coatings</b>	
D.B. Guan, X.J. Zhai, Y.N. Biansai, B.J. Cao, Y.F. Zhu and J.L. Li	209
<b>The Effect of Alloying on the Fractional Composition, Shape and Grain Size Distribution of the Structure Alloy GAP the Fe-Nd-B System</b>	
V.A. Chaika, V.V. Savin, M. Sorokovikov and A. Marikhin	214
<b>Optimization of Methylene Blue Adsorption via Functionalized Activated Carbon Using Response Surface Methodology with Central Composite Design</b>	
N. Saafie, M.F.R. Samsudin and S. Sufian	220

<b>Rejection Rate Reduction of the Automotive Thermoplastic Parts in Injection Moulding Using Response Surface Methodology</b>	225
H.R. Ong, I.M. Shah, W.M.E. Iskandar, M.M.R. Khan, S. Hong, R. Ramli and M.K.A. Mohamed	
<b>Simulation of Gap Flow Field in EDM Process Uesd Oil-in-Water Working Fluid</b>	232
W.J. Chang, Y.Y. Xi and H.W. Li	
<b>Synthesis, Preparation and Characterization of Amine-Induced Bacterial Cellulose-Poly(Vinyl Alcohol) Semi-Interpenetrating Network Hydrogel</b>	238
J.E. Arikibe, R. Lata and D. Rohindra	
<b>Effect of Substrate Temperature on the Electronic Properties of MgO Thin Films on Si (100) Grown by Electron Beam Evaporation</b>	243
Y.R. Denny, T. Firmansyah, V. Gustiono and S.S. Lee	
<b>Button of Hydroxyapatite Composite for Craniotomy Flap Fixation: Fabrication and Mechanical Properties</b>	248
A. Raksujarit and S. Punyanitya	
<b>Analysis of Physical and Mechanical Properties of Backhoe's Bucket Repairment with Cladding Methode</b>	254
Y. Purwaningrum, M. Hafiz and R. Suparyanto	
<b>Fabrication Study of Cu-C-Ni for EDM Electrode by a Sintering Technique</b>	259
P. Janmanee, A. Muttamara, R. Saodaen and A. Rodchanarowan	
<b>Synthesis and Characterization of Active Biocarbon Material for Use in Cosmetics and Personal Care Products</b>	266
S.A. Palsan, J.Y. Lim and A. Nor Asfaliza	
<b>Characterization of Adsorbents Derived from Palm Fiber Waste and its Potential on Methylene Blue Adsorption</b>	273
A. Zulkania, M. Iqbal and Syamsumarlin	
<b>Potential Activity Evaluation of Phosphorus on CoMo/Al<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub> Catalysts to Co-Processing Model</b>	278
T. Rodseanglung and J. Paksumut	
<b>Investigation of the Tensile and Flexural Behavior of Polylactic Acid Based Jute Fiber Bio Composite</b>	283
M. Aadithya, V.K. Kirubakar, T. Aakash and C. Senthamaraiakannan	
<b>Fatigue and Fracture Mechanism of Aluminum-Carbon Fiber Reinforced Hybrid Composites</b>	288
S.M.M. Rahman and M.S. Ferdous	
<b>Fatigue-Corrosion of High Strength Steels in Synthetic Seawater under Cathodic Protection</b>	294
S. Lorenzi, C. Testa, M. Cabrini, F. Carugo, L. Coppola and T. Pastore	
<b>Effect of Cr and Si Contents on the Magnetic and Mechanical Properties of Fe-Cr-Si Alloys by MIM Process</b>	300
M. Kimura, T. Shimizu and H. Watari	
<b>Microstructure and Mechanical Properties of Laser Welded 316L SLM Parts</b>	306
T. Rautio, J. Mäkkikangas, M. Jaskari, M. Keskitalo and A. Järvenpää	
<b>The Effect of Calcination Temperature on Metakaolin Characteristic Synthesized from Badau Belitung Kaolin</b>	312
R. Ulfati, D. Dhaneswara, J.F. Fatriansyah and S. Harjanto	
<b>Flavor Quality Changes of Turbot (<i>Psetta maxima</i>) Stored at -2 and 0°C</b>	317
H.L. Zhao, Y.M. Yin, Y. Liu, Y.X. Xu, X.P. Li and J.R. Li	
<b>Investigation on Mechanical Behavior of Sisal Fiber Reinforced Polylactic Acid and Sisal/Epoxy Composites</b>	322
S. Dhannush, S. Aushwin, A.R. Arunagiri and C. Senthamaraiakannan	
<b>Evaluation of Mechanical Properties of Sugarcane Reinforced Hybrid Natural Fibre Composites by Conventional Fabrication and Finite Element Method</b>	327
R.D. S, P.N.B. Kumar, R.S. Kumar and B.V. Ramnath	
<b>Study of Deep Cryogenic Treatment Process Effect on Microstructure and Properties of CuBeZr Alloy</b>	335
N. Wannaprawat and T. Karuna	
<b>Casting of High Aluminum Content AM Series Magnesium Alloys by Using a Horizontal Twin Roll Caster</b>	340
H. Tozuka, K. Seki, H. Watari and T. Haga	

## **Chapter 2: Materials Properties and Application**

### **Analogy of Non-Destructive Tests for the Detection of Defectologies in Aluminium Cylinder Heads**

S.S. Valencia, L.C. Galárraga, H.C. Terán and O. Arteaga 355

### **Surface Roughness Prediction Based on Acoustic Emission Signals in High-Precision Diamond Turning of Rapidly Solidified Optical Aluminum Grade (RSA443)**

Z. Hweju and K. Abou-El-Hossein 363

### **Flow Field Analysis and Experimental Investigation of Electrochemical Etching**

Y.L. Chen, C.H. Guo, P.X. Chen, Z. Liu and A.S. Lv 369

### **3D FEM Study of the Flow Uniformity of Flat Polypropylene Film/Sheet Extrusion Dies**

D. Igali, A. Perveen, D. Wei, D.C. Zhang and A. Mentbayeva 375

### **Prediction of the Fatigue Life of the SAE 5160 Carbon Steel Coil Spring Based on Strain-Life Approach**

T.E. Putra, Husaini and H. Prakasa 381

### **Design and Optimization of Die Body for Polymer Extrusion**

T. Saparov, U. Belgibay, D.C. Zhang, D. Wei, C.N. Sun, A. Mentbayeva and A. Perveen 387