

# Table of Contents

## Preface

## Chapter 1: Materials and Technologies in Electronics and Energy Conversion

|                                                                                                                                                                                                      |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Ray Tracing of Thin PERC Silicon Solar Cells with Cone Textures</b><br>M.Z. Pakhuruddin and N.A. Md. Noor                                                                                         | 3  |
| <b>Synthesis and Characterization of Sm/Zr Co-Doped CeO<sub>2</sub> Ceramic for Solid Electrolyte Application</b><br>S.S. Che Abdullah, J.X. Soong, M.Z. Bin Mohd Yusoff, S.H. Salleh and R.A. Malek | 9  |
| <b>Mechanical Properties and Characterization of Graphene Nanoparticles Conductive Ink at Different Pattern</b><br>A.N.S. Fizal, H. Saad, M.A. Salim, N.A. Khalil, M. Zulkifli and A.N. Ahmad Yahaya | 15 |

## Chapter 2: Corrosion and Metal Failure

|                                                                                                                                                                                                       |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>The Failure Analysis of Crankshaft of Four Cylinder Diesel Engine Using Experimental Method</b><br>Husaini, A. Rizqullah, I. Hasanuddin and S. Muammar                                             | 25 |
| <b>A Comparative Study on Corrosion Rate of Carbon Steel in NaCl Solution with Continuous and Discontinuous Weight Loss Methods</b><br>N. Ali, M.S. Mustapa, Z.I. Vega, T. Sulaiman and I. Hasanuddin | 35 |
| <b>Analysis of the Leaf Spring Failure in Light Duty Dump Truck</b><br>Husaini, M. Farhan, N. Ali, T.E. Putra, R. Anshari and K. Suherman                                                             | 43 |

## Chapter 3: Composites

|                                                                                                                                                                                                                      |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Effect of Silane Coupling Agent on the Mechanical Properties of Oil Palm Frond Fiber Composite</b><br>Sabri, Z. Fuadi, R. Kurniawan, S. Rizal and H. Homma                                                        | 55 |
| <b>Finite Element Analysis of the <i>Jaloe kayoh</i> Boat Structure with Load Variations by Using E-Glass and Ramie Fiber Composite Materials</b><br>A. Tamlichia, S. Rizal, I. Hasanuddin, M.M. Noor and Nazaruddin | 61 |
| <b>Characterization of Eggshell Composition at Different Size and Concentration in Fire-Retardant Application</b><br>A.F. Muhammad, M.H. Hassan, A. Anjang and M.S. Zainol Abidin                                    | 71 |
| <b>Geometrical Parameters Optimization of Malaysia Rubber Wood through Honeycomb Structure as Composite Sandwich Core</b><br>T.T.T. Jennise, M.Y. Yuhazri, A.M. Kamarul and M.Z. Azreen                              | 77 |

## Chapter 4: Technologies in Environmental Engineering and Bioprocessing

|                                                                                                                                                                                                                                                                  |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Studies on Antifouling Characteristic of the Magnetic Field Induced-PES-Fe<sub>3</sub>O<sub>4</sub> Membrane for Water Remediation</b><br>N.N. Tan, Q.H. Ng, E.A.R. Siti Kartini, C.W. Heah, T.L. Chew, H.P. Yong and T.W. Sigit                              | 91  |
| <b>Glycerolysis of Lauric Acid with Strontium Enhanced 12-Tungstophosphoric Acid Incorporated SBA-15: Material Characterization and Reusability Elucidation</b><br>N.S. Samsun, H.P. Yong, A.Z. Abdullah, E.A.R. Siti Kartini, Y.P. Teoh, S.H. Shuit and Q.H. Ng | 97  |
| <b>Extraction and Characterization of Natural Calcium Phosphate Materials from <i>Lutjanus johnii</i> and <i>Lutjanus sebae</i> Fish Bone Bio-Wastes</b><br>S.L. Bee, A. Ul-Hamid and Z.A.A. Hamid                                                               | 105 |

## Chapter 5: Materials and Structural Elements

|                                                                                                                                                                                                                                             |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Finite Element Analysis of the Beam-Bond Test of Steel and GFRP Bars with Concrete</b><br>M. Štefanovičová, R. Sonnenschein and K. Gajdošová                                                                                             | 113 |
| <b>Comparison of the Test Results on Flat Slabs Weakened by Openings with Punching Shear Capacities Assessed by the Model in the 2<sup>nd</sup> Generation of EC2</b><br>Ľ. Kormosova, T. Augustín and J. Halvonik                          | 119 |
| <b>Interaction Diagram of Steel-Concrete-Steel Sandwich Structure</b><br>R. Kubát and P. Bílý                                                                                                                                               | 127 |
| <b>Static Analysis of Sandwich Composite Panels</b><br>P. Zlamalova, P. Štěpánek, F. Girgle, V. Kostiha and P. Daněk                                                                                                                        | 133 |
| <b>Experimental and Numerical Comparison of the Concrete Slabs Reinforced with Composite Rebars</b><br>V. Benko, M. Kováčik and A. Valašík                                                                                                  | 141 |
| <b>Verification of the Effect of Concrete Overlay for Strengthening Flat Slabs against Punching</b><br>D. Čereš and K. Gajdošová                                                                                                            | 151 |
| <b>Proposal to Increase Resistance of Masonry Structures Low-Storey Buildings</b><br>L. Vejvara                                                                                                                                             | 157 |
| <b>Design of Concrete Columns by prEN1992-1-1/2021</b><br>Ľ. Fillo and V. Benko                                                                                                                                                             | 163 |
| <b>Flexural Strength and Physical Properties of Cement Board Reinforced with Abaca Fiber</b><br>M. Iqbal, S.A. Azan, R. Rahmadtullah and L.B. Abhang                                                                                        | 169 |
| <b>Assessment on Optimal Level of Reactive Biosilica Affected by Incineration Conditions in Perlis Rice Husk Ash as Supplementary Cementitious Materials in Concrete</b><br>R.A. Malek, G. Subramaniam, N. Kamaruddin and S.S. Che Abdullah | 179 |
| <b>The Effectiveness Evaluation of Sacrificial Anode in Reinforced Concrete that has been Installed for One Year</b><br>M. Isra, S. Huzni, B.M.I. Israr and S. Fonna                                                                        | 187 |
| <b>Recycled Materials and their Use in Road - Concrete Recycling as an Aspect of Sustainability</b><br>V. Tatýrek and D. Měšťanová                                                                                                          | 197 |

## Chapter 6: Construction Structures

|                                                                                                                                                           |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>The Role and the Importance of Technical Supervision in Czech Construction Industry Focused on Concrete Structures</b><br>P. Suchánek and A. Kosturová | 205 |
| <b>Diagnostics and Evaluation of Two Atypical Girder Bridges on Railway Line</b><br>P. Koteš, P. Kotula, J. Odrobinak and J. Prokop                       | 211 |
| <b>Diagnostics and Evaluation of Selected Concrete Vaulted Rail Bridges</b><br>P. Kotula, P. Koteš, J. Odrobinak and J. Prokop                            | 217 |