

Table of Contents

Preface

Chapter 1: Metalworking

Laser Surface Hardening of Advanced High-Strength Steel Grade 980	
W. Julsri, N. Jhonthong, D. Suwannasopa, V. Saetang and W. Charee	3
Mixed Taguchi-Genetic Algorithms for Multiple Objectives Optimization Based on Mild Steel Turning Parameters	
N. Khammongkhon, P. Khumma, C. Pomusa and B. Suksawat	9

Chapter 2: Wire Arc Additive Manufacturing

Investigation of Distribution of Mechanical Properties inside of Wire Arc Additive Manufacturing Parts	
K. Sommer, F. Sammler, R. Heiler and A. Pfennig	21
Bending Fatigue Strength of WAAM AISI 316L with Severe Shot Peening Applied to as-Built Surface	
M. Hietala, T. Rautio, M. Jaskari, M. Keskitalo and A. Järvenpää	27
Influence of Process Parameters on Microstructure and Mechanical Behavior in Wire Arc Additive Manufacturing of 316L Stainless Steel: A Dual-System Study	
T. Rautio, M. Hietala, M. Jaskari and A. Järvenpää	35

Chapter 3: Materials for Energy Storage Technologies

Improved Electrochemical Performance of Bifunctional Electrocatalysts Based on Prussian Blue Analogues for Zn-Air Batteries	
N. Khoirina, T. Nurtono, W. Widiyastuti and H. Setyawan	45
Zinc-Manganese Electrodeposition on Aluminum Alloys 3003 and 6061 for Enhanced Aluminium-Air Battery Performance	
L.E. Wahyuningtyas, T. Nurtono, W. Widiyastuti and H. Setyawan	51
Sustainable Development of Graphene Electrodes for Supercapacitors through Laser Scribing of Agrowaste Derived Lignin	
S. Katwesigye, M.E. El-Khouly, N. López-Salas and A.S.G. Khalil	57

Chapter 4: Specialised Materials and Engineering Approaches

Evolution of Mn-Doped ZnO and Simonkolleite Phases from Thermally Oxidized Zinc Metal Sheets under MnCl₂ Mist	
C.L.E. Aquino, S.B. Orgen, D.M.B. Alfeche and M.D.L. Balela	65
Cellulose Derived from Banana Peels	
E.N. Scott, M. Calhoun and V. Rangari	71
Hysteresis in Approach-Retraction Frictional Contacts with Geometric and Material Nonlinearity	
M. Ceglie, G. Violano, L. Afferrante and N. Menga	77
Bilayer Graphene Optical Modulator Based on Metal-Nanoribbon Integrated Hybrid Plasmonic Waveguide	
Y.J. Xu, C.R. Zhang and Q.L. Wang	85

Chapter 5: Industrial Engineering and Product Quality

Additive Manufacturing Section Image Features for Magnetic Processing Characteristics Prediction

L.K. Chang, T.W. Chang, J.C. Huang, D.Q. Liu, M.C. Tsai and M.H. Horng

93

Utilizing Six Sigma for Effective Pore Defect Reduction in Plastic Water Tanks

P. Kankaew and P. Chutima

99

Chapter 6: Green Building Materials

Improving the Properties of the Masonry Produced Using Hemp Stalk with Bark Fibre to Meet Standard Strength and Properties of Energy Conserving Construction Material

S. Phetcharat, R. Buntan, K. Thaiying, P. Silawong, T. Sinsiri and H. Maskong

109

Microstructure and Engineering Properties of New and Aged Bamboo as a Construction Material: The Effects of Borax/Boric Solution Treatment

S. Pompuek, T. Suwan, C. Hansapinyo, S. Kamdee and M. Kaewmoracharoen

117

Enhancing Hemcrete and Hemp Concrete Properties through Surface Treatment and Additives

K. Thaiying, S. Phetcharat, R. Buntan, P. Silawong, H. Maskong and T. Sinsiri

123

Investigation of Optimal Ratios of EPS Foam Waste and Solvents as Alternative Green Polymer-Based Additives for Enhancing Cement Properties

C. Boonpeng, T. Suwan, P. Siriput and W. Tantrapongsaton

129