

Table of Contents

Preface

Chapter 1: Properties and Processing of Steel and Alloys

Experimental Investigations for Assessment of Carbon Emissions and Tool Temperature in Dry Turning Operation Using Al1070 Alloy T.U. Siddiqui, Z.A. Khan, A.N. Siddiquee and V. Kumar	3
Investigation of Microstructure and Mechanical Properties of Al Alloys Lap Joints by Friction Stir Welding A. Trivedi and S.N. Pandya	13
Exploring the Effects of Open-Air Cooling on the Formation of Microstructure in Cast A356 Aluminum Alloy M. Pati, A. Dahiya and S. Chakraborty	21
Novel Process Approach for Extrusion-Based Metal Wire Additive Manufacturing Using Induction Heating as a Heat Source R.K. Choubey and P.K. Jain	31
Effect of Build Height on Microstructure and Mechanical Properties of Hollow Tubes Fabricated Using Arc-DED Process S. Amritbir and S. Shiva	39
Determination of Crack Limits in Sinter Components by Compaction Process Performance Analysis S. Mustafa, E. Ganthaler, T. Villgrattner, F. Concli and A. Peer	47
Experimentation Evaluation of Dynamics of Steel Wire Rope B. Bhashi, S. Sreejath and S.P. Singh	57

Chapter 2: Applied Materials

Experimental Investigations on Strength of a Nano Doped 3D Printed Circuit Board for Application in Electronics Industry B. Gautam, S. Sharma, A.S. Baghel and R. Dua	69
Characterizations of Some Selected Clay Types for Cost Effective Wastewater Treatments S. Aluvihara, C.S. Kalpage and B.S. Chauhan	75

Chapter 3: Technologies for Renewable Energy Production

Comparative Study of Four Transparent Hydrophobic Coatings for Water Saving Potential in Dust Cleaning Context of Solar Power Plants N. Sengar and K. Shringi	95
Experimental Study of Steam Generation through Solar Parabolic Trough Collector for Prospective Use in Small Industries A. Sharma and N. Sengar	105

Chapter 4: Research and Design in Mechanical Engineering

Design and Numerical Modelling of Highway Vertical Axis Wind Turbine G. Kapoor, G. Saini and M. Zunaïd	119
Fabrication of a Hand Gesture Controlled Wheelchair A. Shukla, A.K. Jha, S. Pahal, V. Tyagi and A. Solanki	133

Chapter 5: Heat and Mass Transfer Processes

Lattice Boltzmann Solution of Transient Heat Conduction Problem in an Infinite Slab Coupled with Non-Linear Heat Generation A. Sahu and S. Bhowmick	149
Coalescence Dynamics of Oil Droplets on an Air-Water Interface Driven by Surface Waves P.N. Panday, A. Kumar, A. Bandopadhyay and P. Kumar Das	159

Chapter 6: Road Safety and Vehicle Research

Side Impact Crashworthiness of EVs: A Numerical Study in Material Efficacy F. Shahid, H. Tiwari, M. Panwar and V. Gautam	173
Braking Dynamics of a Tadpole Type Three-Wheeler M. Sahani, B. Keerthi, A. Srikanth, M. Mandara and S.S. Patil	185