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Vishal S. Sharma · Uday S. Dixit ·  
Knut Sørby · Arvind Bhardwaj ·  
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# Manufacturing Engineering

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## Contents

1	Investigations on the Development of Heated Build Platform for Additive Manufacturing of Large-Size Parts	1
	Sagar Kailas Gawali, Narendra Kumar, and Prashant K. Jain	
2	On the Numerical Investigation of Material Deposition in Fused Filament Fabrication	19
	Anand Singh Yadav, Narendra Kumar, and Prashant K. Jain	
3	An Experimental Investigation on Fabricating Objects for Origami Applications Through Fused Filament Fabrication (FFF)	37
	Jitesh Katre and Prashant K. Jain	
4	Study of Microstructure, Hardness and Dimensional Accuracy in Al-6061 Centrifugally Cast Pipe	51
	Abdul Rouf Ganai and Balbir Singh	
5	Micro-hardness Study of Ni-P, Ni-W-P, and Ni-P/Ni-W-P Electroless Coating	61
	Rishav Kumar Baranwal, Arghya Mukherjee, Souparna Bunerjee, Subhashish Sarkar, and Gautam Majumdar	
6	Mechanical Stability of Fabricated Superhydrophobic Aluminium Alloy and Enhancement of Its Oleophobic Characteristics	73
	Rishabh Raj, Saurabh Kango, and Sarbjot S. Sandhu	
7	Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig	85
	Anuj Bansal, Jonny Singla, Shivam Pandey, and Prem Raj	
8	Development of Durable Super-Hydrophobic Surface on WC-Co-Cr Coated ASTM A988 Stainless Steel Substrate	95
	Vijay Kumar and Rajeev Verma	

v

Contents

vii

22	Performance Analysis of ECDM Process Using Surfactant Mixed Electrolyte	285
	Vivekshel Rajput, Mudimallana Goud, and Narendra Mohan Suri	
23	Effect of Welding Processes on the Mechanical Properties of Hardox 400 Steel Welded Joints	301
	Ranbir Singh Multani, Varun Sharma, Ajay Gupta, and Jaswant Singh	
24	Effect of Lubrication on Energy Requirement and Joint Properties During FSSW of AA5052-H32 Aluminium Alloy	315
	N. Bhardwaj, R. Ganesh Narayanan, and Uday S. Dixit	
25	Investigation of Weld Bead Shape Parameters in Relation to Heat Input During Submerged Arc Welding	329
	Satish Kumar Sharma, Dinesh W. Rathod, Himanshu Payal, and Sachin Maheshwari	
26	Investigating the Mechanical Properties and Pitting Potential of Heat-Treated AISI 4340 Steel in Various Corrosive Environments	341
	Shailendra Singh Bhadauria, Varun Sharma, and Ajay Gupta	
27	Analyzing the Properties of Medium Carbon Steel Alloys Prepared by Powder Metallurgy Technique	357
	Sunil Kumar Katheria and Manvendra Kumar Singh	
28	Mechanical and Wear Properties of Aluminium Alloy Composites: A Review	369
	Ravi Butola, Lakshay Tyagi, Luckshaya Kem, M. S. Ranganath, and Qasim Murtaza	
29	Investigation of Mechanical Properties in Silicon Carbide-Filled Carbon Fiber Composites	393
	Monika Khurana, J. K. Purohit, R. Gupta, and Bhuvnesh Bhardwaj	
30	Air Erosion Behavior of SiC-Filled Carbon Fiber-Epoxy Composites	407
	Monika Khurana and Bhuvnesh Bhardwaj	
31	On Performance Evaluation of Triplex Hybrid Process of UA-ECDTrepanning: An Experimental Investigation, Modeling and Optimization	415
	Tarlochan Singh and Akshay Divedi	
32	Acoustical Properties of Secondary Fibre-Based Natural Materials and Their Composites—A Brief Study	431
	K. M. Rakesh, N. S. Sujith, and Srinidhi Ramachandracharya	

vi

Contents

9	Experimental Validation of Thermal Properties on Composite Thermal Barrier Coating	109
	Muhammed Naseem O and Rajeev Verma	
10	Surface Modification of Al-4.5% Cu/MoS <sub>2</sub> Composites by Laser Surface Melting	121
	Praveen Kumar Bannaravuri, Anil Kumar Birru, and Uday S. Dixit	
11	Configuration Design Development of Internal Bore GTAW Welding	139
	Harsh Radadiya, Ashish Yadav, Jaydeep Joshi, Arun Kumar Chakraborty, and Navneet Khanna	
12	Effect of Tool Rotation on Metal Removal Rate During Electro-Discharge Machining of Hastelloy C-276	159
	Nikhil Jain, Jitesh Kumar Jain, and Bhuvnesh Bhardwaj	
13	Vibration Analysis of BTA Deep Hole Drilling Machine	173
	Ahmed M. Zakwan and Nilesh Raykar	
14	Influence of Process Parameters on Tool Wear Rate for Rotary Cu Tool Electrode in Electrical Discharge Drilling	183
	Rakesh Kumar, Anand Pandey, Pooja Sharma, Ashish Goyal, and Satish Namdev	
15	Machinability Study of Zirconia Material by Micro-ECDM	195
	Manoj Kumar, Rahul Omprakash Vaishya, and Narendra Mohan Suri	
16	Experimental Investigation on the Effect of Grinding Infeed and Pass Counts on Grindability of Mild Steel	211
	Pranab Kumar Kundu, Bishan Raj Rai, and Manish Mukhopadhyay	
17	Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410	221
	Amrinder Singh, Anuj Bansal, Jagtar Singh, and Anil Kumar Singla	
18	Effect of Tool Rotation on Surface Roughness During Electro Discharge Machining of Hastelloy C-276	231
	Nikhil Jain, Jitesh Kumar Jain, and Bhuvnesh Bhardwaj	
19	Advances in Electrical Discharge Machining: State-of-the-Art	245
	Krishnakant Dhakar, Milind Dandekar, and Mohit Tyagi	
20	Effect of Re-normalizing and Re-tempering on Inter-critical Heat Affected Zone(S) of P91B Steel	255
	Modassir Akhtar, Akhil Khajuria, and Raman Bedi	
21	Joining of Dissimilar Materials—Aluminium to Steel—Using CMT + P Weld-Brazing Process	271
	Jaivindra Singh, Kunwer Singh Arora, and Dinesh Kumar Shukla	

viii

Contents

33	Design and Development of Retrofittable Fixture to Enhance the Effectiveness of LN <sub>2</sub> Delivery During Drilling Operation	449
	Harsh Radadiya and Navneet Khanna	
34	Effect of Temperature on Creep Stresses in Thick Spherical Vessels Made of Composite Material	465
	Sukhjinder Singh Sandhu, Tejeet Singh, and V. K. Gupta	
35	Adiabatic Analysis of Spherical and Cylindrical Textured Hydrodynamic Journal Bearing	479
	Mohammad Arif, Saurabh Kango, Dinesh Kumar Shukla, and Nitin Sharma	
36	Analysis of Aluminum AA6061 in Electromagnetic Forming	497
	Nilesh Tiwari and Megha Nagrale	
37	Finite Element Modeling of Autoclave Aerated Concrete (AAC) Masonry for Estimation of Strength	511
	Amit Raj, Arun Chandra Borsalkia, and Uday S. Dixit	
38	FE Analysis of Cup Plugin HHP (NH/NT) Cylinder Head	525
	Dorgaprasad Picha, Jagjit Singh Randhawa, Jawed Ali, and Ashfaq Ali	
39	Design and Analysis of I <sub>ON</sub> and Ambipolar Current for Vertical TFET	541
	Shailendra Singh and Balwinder Raj	
40	Finite Element Based Simulation Model for Micro Turning of Nanoparticle-Reinforced Aluminium Alloy (7075-T6) Composite	561
	Sant Ram Chauhan, U. Gokul Krishna, and Sunil Setia	
41	Implementation of Yield Criteria in ABAQUS for Simulations of Deep Drawing: A Review and Preliminary Results	575
	Arpit Tripathi, R. Ganesh Narayanan, and Uday S. Dixit	
42	Multiphysics Simulation of ECM for the Machining of Al-SiC Composites	589
	S. Venu, K. V. J. Bhargav, and P. S. Balaji	
43	Corrosion Behavior of Microwave Clad Material Under Different Acidic Environment	603
	Amit Kumar, Neeraj Kumar Bhoi, and Harpreet Singh	
44	Numerical and Experimental Investigation on Heat Transfer Performance of Ferrofluid-Based Cooling System	613
	Jaswinder Singh Mehta, Rajesh Kumar, Harnesh Kumar, and Harry Garg	

45	<b>Fault Detection in Complex Mechanical Systems Using Wavelet Transforms and Autoregressive Coefficients</b> .....	629
	Amrinder Singh Minhas, Gurpreet Singh, P. K. Kankar, and Sukhjeet Singh	
46	<b>Designing of the PID and PI<sup>λ</sup> D<sup>μ</sup> Controller for DC Motor</b> .....	639
	Parvendra Kumar and Degu Menna Eligo	
47	<b>Sustainable Manufacturing-Related Aspects in Turning Operation: A Review Based Study</b> .....	657
	Ravi Pratap Singh, Ravinder Kataria, and Amit Kumar Tiwari	



# Chapter 30

## Air Erosion Behavior of SiC-Filled Carbon Fiber–Epoxy Composites



Monika Khurana and Bhuvnesh Bhardwaj

**Abstract** The carbon fiber-reinforced composites have all the ideal properties and have been widely used in many applications over the last decade. The objective of the present research is to optimize the erosion conditions for minimum erosion rate of SiC particulate-filled carbon-reinforced polymer composites. An attempt has also been to investigate the effect of erosion conditions on erosion rate. It has been found that erosion rate increases with increase in erodent size and impact velocity, while it decreases with increase in impingement angle and SiC loading. The minimum erosion rate is achieved at highest level of SiC loading, lowest level of erodent size, lowest level of impact velocity, and highest level of impingement angle.

**Keywords** SiC · Carbon fiber · Erosion · Optimization

### 30.1 Introduction

In the present era, carbon fiber polymer composites are replacing metals in many applications such as aircraft, space, satellites, automobiles, ships, and civil infrastructure because of its excellent mechanical, physical, and thermal properties [1]. The failure in machine parts takes place because of the wear. The wear is the main influencing factor for the failure of the machine parts. In the past, a number of researchers investigated the effect of different wear conditions on tribological properties of fabricated fiber reinforcement composites.

Vina et al. [2] examined the wear behavior of glass fiber fabric-reinforced polyetherimide composites. The study concludes that wear rate of composite

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M. Khurana (✉)  
Department of Mechanical Engineering, SKIT, Jaipur, India  
e-mail: khurana.monika2009@gmail.com

B. Bhardwaj  
Department of Mechanical Engineering, JECRC, Jaipur, India  
e-mail: bhuvnesh.bhardwaj@gmail.com

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