Studies On Recast Layer In Edm Using Aluminium Powder

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The Use of Small-scale Specimens for Testing Irradiated Material - W. R. Corwin 1986

Proceedings of the 37th International MATADOR Conference - Srichand Hinduja 2012-10-09
Presented here are 97 refereed papers given at the 37th MATADOR Conference held at The University of Manchester in July 2012. The MATADOR series of conferences covers the topics of Manufacturing Automation and Systems Technology, Applications, Design, Organisation and Management, and Research. The Proceedings of this Conference contain original papers contributed by researchers from many countries on different continents. The papers cover the principles, techniques and applications in aerospace, automotive, biomedical, energy, consumable goods and process industries. The papers in this volume reflect: the importance of manufacturing to international wealth creation; the emerging fields of micro- and nano-manufacture; the increasing trend towards the fabrication of parts using lasers; the growing demand for precision engineering and part inspection techniques, and the changing trends in manufacturing within a global environment.

Advances in Micro and Nano Manufacturing and Surface Engineering - M. S. Shunmugam 2019-11-30
This volume presents research papers on micro and nano manufacturing and surface engineering which were presented during the 7th International and 28th All India Manufacturing Technology, Design and Research conference 2018 (AIMTDR 2018). The papers discuss the latest advances in miniature manufacturing, the machining of miniature components and features as well as improvement of surface properties. This volume will be of interest to academicians, researchers, and practicing engineers alike.
Metals: Advances in Research and Application: 2011 Edition - 2012-01-09
Metals: Advances in Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Metals. The editors have built Metals: Advances in Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Metals in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of

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Development of Cylindrical Wire Electrical Discharge Machining Process and Investigation of Surface Integrity and Mechanical Property of EDM Surface Layers - 2002

The cylindrical wire Electrical Discharge Machining (EDM) process was developed to generate precise cylindrical forms on hard, difficult-to-machine materials. A precise, flexible, and corrosion-resistant underwater rotary spindle was designed and added to a conventional two-axis wire EDM machine to enable the generation of free-form cylindrical geometries. A detailed spindle error analysis identified the major source of error at different frequencies. The mathematical models for material removal rate and surface finish were derived. Experimental results indicated that higher maximum material removal rate might be achieved in the cylindrical wire EDM than the 2D wire EDM. Effects of some key process parameters, wire feed rate, pulse on-time and part rotational speed, on the surface finish and roundness are explored. For WC-Co parts, an arithmetic average surface roughness and roundness as low as 0.68 and 1.7 mm, respectively, can be achieved. Surfaces of the cylindrical EDM parts were examined using Scanning Electron Microscopy (SEM) to identify the macro-ridges and craters on the surface. Cross-sections of the EDM parts are examined using the SEM to quantify the recast layer and heat-affected zone under various process parameters. This study also used nanoindentation to investigate the influence of cylindrical wire EDM process on the mechanical properties of WC-Co composite. Multiple indents were conducted on the cross-section of the recast layer, heat-affected zone, and bulk material. The SEM micrographs were used to correlate the individual nano-indent to the measured hardness and modulus of elasticity. The experimental results showed that the heat-affected zone had more compact microstructure less indentation cracking. The recast layer had lower hardness and modulus of elasticity than the original material and heat-affected zone. EDS X-ray and X-ray diffraction were used to analyze the material compositions of the heat-affected zone and recast layer and to unders.

Ninth Conference on Production Research and Technology - 1981

Recent Advances in Smart Manufacturing and Materials - Rajeev Agrawal 2021-07-22

This book presents select proceedings of the International Conference on Evolution in Manufacturing (ICEM 2020), and examines a range of areas including internet-of-things for cyber manufacturing, data analytics for manufacturing systems and processes and materials. The topics covered include modeling simulation and decision making in cyber physical systems for supporting engineering and production management, innovative approach in materials development, biomaterial applications, and advancement in manufacturing and material technologies. The book also discusses sustainability in manufacturing and supply chain management including circular economy. The book will be a valuable reference for beginners, researchers, and professionals interested in smart manufacturing in engineering, production management and materials technology.

Non-Conventional Machining in Modern Manufacturing Systems - Kumar, Kaushik 2018-09-21

Continuous improvements in machining practices have created opportunities for businesses to develop more streamlined processes. This not only leads to higher success in day-to-day production, but also increases the overall success of businesses.

Non-Conventional Machining in Modern Manufacturing Systems provides emerging research exploring the theoretical and practical aspects of technological advancements in industrial environments and applications in manufacturing. Featuring coverage on a broad range of topics such as optimization techniques, electrical discharge machining, and hot machining, this book is ideally designed for business managers, engineers, business professionals, researchers, and academicians seeking current research on non-conventional and technologically advanced machining processes.

Comprehensive Materials Finishing - Saleem Hashmi 2016-08-29

Finish Manufacturing Processes are those final stage processing techniques which are deployed to bring a product to readiness for marketing and putting in service. Over recent decades a number of finish manufacturing processes have been newly developed by researchers and technologists. Many of these developments have been reported and illustrated in existing literature in a piecemeal manner or in relation only to specific applications. For the first time, Comprehensive Materials Finishing integrates a wide body of this knowledge and understanding into a single, comprehensive work. Containing a mixture of review articles, case studies and research findings resulting from R & D activities in industrial and academic domains, this reference work focuses on how some finish manufacturing processes are advantageous for a broad range of technologies. These include applicability, energy and technological costs as well as practicability of implementation. The work covers a wide range of materials such as ferrous, non-ferrous and polymeric materials. There are three main distinct types of finishing processes: Surface Treatment by which the properties of the material are modified without generally changing the physical dimensions of the surface; Finish Machining Processes by which a small layer of material is removed from the surface by various machining processes to render improved surface characteristics; and Surface Coating Processes by which the surface properties are improved by adding fine layer(s) of materials with superior surface characteristics. Each of these primary finishing processes is presented in its own volume for ease of use, making Comprehensive Materials Finishing an essential reference source for researchers and professionals at all career stages in academia and industry. Provides an interdisciplinary focus, allowing readers to become familiar with the broad range of uses for materials finishing Brings together all known research in materials finishing in a single reference for the first time Includes case studies that illustrate theory and show how it is applied in practice

Electrical Discharge Machining. Optimization of Chromium Powder Mixed EDM Parameters During Machining of H13 Tool Steel - Chandan Deep Singh 2018

In the present study, optimization of chromium powder mixed EDM parameters is studied during machining of H13 tool steel. Four input parameters of powder mixed EDM, namely peak current, pulse on time, duty cycle and powder concentration, are varied, each at three levels, to get the optimum responses. Material removal rate (MRR), Tool wear rate (TWR) and Surface Roughness (Ra) are considered as performance measures. Copper electrode of 16 mm is used as the tool. Response Surface Methodology is used to correlate input and output parameters. The variation of responses due to variation in input parameters has been studied and shown in the form of surface plots and contour plots.

Product/Process Fingerprint in Micro Manufacturing - Guido Tosello 2019-05-31

The continuous miniaturization of products and the growing complexity of their embedded multifunctionalities necessitates continuous research and development efforts regarding micro components and related micro manufacturing technologies.

Highly miniaturized systems, manufactured using a wide variety of materials, have found application in key technological fields, such as healthcare devices, micro implants, mobility, communications, optics, and micro electromechanical systems. Innovations required for the high-precision manufacturing of micro components can specifically be achieved through optimizations using post-process (i.e., offline) and in-process (i.e., online) metrology of both process input and output parameters, as well as geometrical features of the produced micro parts. However, it is of critical importance to reduce the metrology and optimization efforts, since process and product quality control can represent a significant portion of the total production time in micro manufacturing. To solve this fundamental challenge, research efforts have been undertaken in order to define, investigate, implement, and validate the so-called "product/process manufacturing fingerprint" concept. The "product manufacturing fingerprint" concept refers to those unique dimensional outcomes (e.g., surface topography, form error, critical dimensions, etc.) on the produced component that, if kept under control and within specifications, ensure that the entire micro component complies to its specifications. The "process manufacturing fingerprint" is a specific process parameter or feature to be monitored and controlled, in order to maintain the manufacture of products within the specified tolerances. By integrating both product and process manufacturing fingerprint concepts, the metrology and optimization efforts are highly reduced. Therefore, the quality of the micro products increases, with an obvious improvement in production yield. Accordingly, this Special Issue seeks to showcase research papers, short communications, and review articles that focus on novel methodological developments and applications in micro- and sub-micro-scale manufacturing, process monitoring and control, as well as micro and sub-micro product quality assurance. Focus will be on micro manufacturing process chains and their micro product/process fingerprint, towards full process optimization and zero-defect micro manufacturing.

Advances in Abrasive Based Machining and Finishing Processes - S. Das 2020-05-10

This book presents the advances in abrasive based machining and finishing in broad sense. Specifically, the book covers the novel machining and finishing strategies implemented in various advanced machining processes for improving machining accuracy and overall quality of the product. This book presents the capability of advanced machining processes using abrasive grain. It also covers ways for enhancing the production rate as well as quality. It fulfills the gap between the production of any complicated components and successful machining with abrasive particles.

Proceedings of Fourth International Conference on Soft Computing for Problem Solving - Kedar Nath Das 2014-12-24

The Proceedings of SocProS 2014 serves as an academic bonanza for scientists and researchers working in the field of Soft Computing. This book contains theoretical as well as practical aspects using fuzzy logic, neural networks, evolutionary algorithms, swarm intelligence algorithms, etc., with many applications under the umbrella of 'Soft Computing'. The book is beneficial for young as well as experienced researchers dealing across complex and intricate real world problems for which finding a solution by traditional methods is a difficult task. The different application areas covered in the Proceedings are: Image Processing, Cryptanalysis, Industrial Optimization, Supply Chain Management, Newly Proposed Nature Inspired Algorithms, Signal Processing, Problems related to Medical and Healthcare, Networking Optimization Problems, etc.

Proceedings of Innovative Research and Industrial Dialogue 2016 - 2017-06-07

The Innovative Research and Industrial Dialogue 2016 (IRID'16)

organized by Advanced Manufacturing Centre (AMC) of the Faculty of Manufacturing Engineering of UTeM which is held in Main Campus, Universiti Teknikal Malaysia Melaka on 20 December 2016. The open access e-proceeding contains a compilation of 96 selected manuscripts from this Research event.

Data-Driven Optimization of Manufacturing Processes - Kalita, Kanak 2020-12-25

All machining process are dependent on a number of inherent process parameters. It is of the utmost importance to find suitable combinations to all the process parameters so that the desired output response is optimized. While doing so may be nearly impossible or too expensive by carrying out experiments at all possible combinations, it may be done quickly and efficiently by using computational intelligence techniques. Due to the versatile nature of computational intelligence techniques, they can be used at different phases of the machining process design and optimization process. While powerful machine-learning methods like gene expression programming (GEP), artificial neural network (ANN), support vector regression (SVM), and more can be used at an early phase of the design and optimization process to act as predictive models for the actual experiments, other metaheuristics-based methods like cuckoo search, ant colony optimization, particle swarm optimization, and others can be used to optimize these predictive models to find the optimal process parameter combination. These machining and optimization processes are the future of manufacturing. Data-Driven Optimization of Manufacturing Processes contains the latest research on the application of state-of-the-art computational intelligence techniques from both predictive modeling and optimization viewpoint in both soft computing approaches and machining processes. The chapters provide solutions applicable to machining or manufacturing process problems and for optimizing the problems involved in other areas of mechanical, civil, and electrical engineering, making it a valuable reference tool. This book is addressed to engineers, scientists, practitioners, stakeholders, researchers, academicians, and students interested in the potential of recently developed powerful computational intelligence techniques towards improving the performance of machining processes.

Additive, Subtractive, and Hybrid Technologies - Chander Prakash 2022-05-14

This book provides readers with the comprehensive insights of the recent research breakthroughs in additive, subtractive, and hybrid technologies. Further, the book examines incomparable design and manufacturing independences, as well as strategies to upgrade the product performance characteristics through collaborating additive and subtractive technologies. Indeed, the intrinsic benefits and limitations of both additive and subtractive manufacturing technologies could be merged to obtain appreciable hybridizations. The editorial team members and contributors to Additive, Subtractive, and Hybrid Technologies are highly motivated experts committed to and the advance of hybrid manufacturing technologies.

Composite Materials - Deborah D. L. Chung 2010-04-03

The first edition of "Composite Materials" introduced a new way of looking at composite materials. This second edition expands the book’s scope to emphasize application-driven and process-oriented materials development. The approach is vibrant yet functional.

Intelligent Energy Field Manufacturing - Wenwu Zhang 2018-10-03

Edited by prominent researchers and with contributions from experts in their individual areas, Intelligent Energy Field Manufacturing: Interdisciplinary Process Innovations explores a new philosophy of engineering. An in-depth introduction to Intelligent Energy Field Manufacturing (EFM), this book explores a fresh engineering methodology that not only integrates but goes beyond methodologies such as Design for Six Sigma, Lean

Manufacturing, Concurrent Engineering, TRIZ, green and sustainable manufacturing, and more. This book gives a systematic introduction to classic non-mechanical manufacturing processes as well as offering big pictures of some technical frontiers in modern engineering. The book suggests that any manufacturing process is actually a process of injecting human intelligence into the interaction between material and the various energy fields in order to transfer the material into desired configurations. It discusses technological innovation, dynamic M-PIE flows, the generalities of energy fields, logic functional materials and intelligence, the open scheme of intelligent EFM implementation, and the principles of intelligent EFM. The book takes a highly interdisciplinary approach that includes research frontiers such as micro/nano fabrication, high strain rate processes, laser shock forming, materials science and engineering, bioengineering, etc., in addition to a detailed treatment of the so called "non-traditional" manufacturing processes, which covers waterjet machining, laser material processing, ultrasonic material processing, EDM/ECM, etc. Filled with illustrative pictures, figures, and tables that make technical materials more absorbable, the book cuts across multiple engineering disciplines. The majority of books in this area report the facts of proven knowledge, while the behind-the-scenes thinking is usually neglected. This book examines the big picture of manufacturing in depth before diving into the details of an individual process, demonstrating how innovations are achieved. It lowers barriers to technical innovation, meets new engineering challenges, and systematically introduces manufacturing processes.

Innovations in Mechanical Engineering - G. S. V. L. Narasimham 2022-03-02

This book comprises select proceedings of the International Conference on Innovations in Mechanical Engineering (ICIME 2021). It presents innovative ideas and new findings in the field of mechanical engineering. Various topics covered in this book are aerospace engineering, automobile engineering, thermal engineering, renewable energy sources, bio-mechanics, fluid mechanics, MEMS, mechatronics, robotics, CAD/CAM, CAE, CFD, design andoptimization, tribology, materials engineering and metallurgy, mimics, surface engineering, nanotechnology, polymer science, manufacturing, production management, industrial engineering and rapid prototyping. This book will be useful for the students, researchers and professionals working in the various areas of mechanical engineering.

Experiments and Simulations in Advanced Manufacturing - Panagiotis Kyratsis 2021-04-29

This book presents the latest advances in manufacturing from both the experimental and simulation point of view. It covers most aspects of manufacturing engineering, i.e. theoretical, analytical, computational and experimental studies. Experimental studies on manufacturing processes require funds, time and expensive facilities, while numerical simulations and mathematical models can improve the efficiency of using the research results. It also provides high level of prediction accuracy and the basis for novel research directions.

Advances in Manufacturing Engineering and Materials II - Sergej Hloch 2021-03-16

This book reports on cutting-edge research and technologies in the field of advanced manufacturing and materials, with a special emphasis on unconventional machining process, rapid prototyping and biomaterials. It gathers contributions to the International Conference on Manufacturing Engineering and Materials (ICMEM 2020), which was originally planned in June 2020, but will actually take place in 2021, in Nový Smokovec, Slovakia, because of the Covid-19 pandemic. Despite the challenging times, submitted contributions were peer-reviewed, and upon a careful revision, included in this book, which covers advances that are expected to increase the industry’s

competitiveness with regard to sustainable development and preservation of the environment and natural resources. Condition monitoring, industrial automation, and diverse fabrication processes such as welding, casting and molding, as well as tribology and bioengineering, are just a few of the topics discussed in the book's wealth of authoritative contributions. A special emphasis is given to problems connected to climate change and solution manufacturer and engineers may adopt and develop to prevent and cope with them.

Advances in Unconventional Machining and Composites - M. S. Shunmugam 2019-11-22

This volume presents research papers on unconventional machining (also known as non-traditional machining and advanced manufacturing) and composites which were presented during the 7th International and 28th All India Manufacturing Technology, Design and Research conference 2018 (AIMTDR 2018). The volume discusses improvements on well-established unconventional machining processes and novel or hybrid machining processes as well as properties, fabrication techniques and machining of composite materials. This volume will be of interest to academicians, researchers, and practicing engineers alike.

Computational Intelligence in Manufacturing - Kaushik Kumar 2022-05-28

Computational Intelligence in Manufacturing addresses applications of AI, machine learning and other innovative computational techniques across the manufacturing supply chain. The rapid development of smart or digital manufacturing known as Industry 4.0 has swiftly provided a large number of opportunities for product and manufacturing process improvement. Selecting the appropriate technologies and combining them successfully is a challenge this book helps readers overcome . It explains how to prepare different manufacturing cells for flexibility and enhanced productivity with better supply chain management, e.g., calibrating design machine tools for automation and agility. Computational intelligence applications for non-conventional manufacturing processes such as ECM and EDM are covered alongside recent advances in traditional processes like casting, welding and metal forming. As well as describing specific applications, this practical guide also explains the computational intelligence paradigm for enhanced supply chain management. Includes hot topics such as augmented and virtual reality applications in manufacturing Provides details of computational techniques, such as nature inspired algorithms for manufacturing process modeling Gives practical technical advice on how to calibrate processes and tools to work efficiently in an industry 4.0 system

Electric Discharge Hybrid-Machining Processes - Basil Kuriachen 2022-01-19

This book provides the knowledge and insight into the fundamental aspects of Electric Discharge Machining (EDM) processes and various hybrid machining technologies derived to improve the machining efficiencies. Fundamental theory of material removal, recent research trends and future research directions have been covered in each chapter. After explaining EDM, Dry and Near-dry EDM processes, Electrochemical Spark Machining, Arc Machining processes, Electric Discharge Hybrid-Turning processes, Electrical Discharge Grinding, Electric Discharge Milling, and various assisted EDM processes have been discussed. Finally, modeling and simulation of hybrid machining processes are also included. The book reflects the recent developments and trends in electric discharge hybrid machining processes. It covers in detail the basics of EDM, various hybrid and assistive technologies in EDM. It includes the updated discussion on the significance of process parameters in various hybrid EDM processes. An overview of modelling and simulation of hybrid EDM process is provided. This book is aimed at Graduate students, researchers in manufacturing engineering,

production engineering, and materials engineering.

Proceedings of the 2nd Annual International Conference on Material, Machines and Methods for Sustainable Development (MMMS2020) - Banh Tien Long 2021-03-26

This book presents selected, peer-reviewed proceedings of the 2nd International Conference on Material, Machines and Methods for Sustainable Development (MMMS2020), held in the city of Nha Trang, Vietnam, from 12 to 15 November, 2020. The purpose of the conference is to explore and ensure an understanding of the critical aspects contributing to sustainable development, especially materials, machines and methods. The contributions published in this book come from authors representing universities, research institutes and industrial companies, and reflect the results of a very broad spectrum of research, from micro- and nanoscale materials design and processing, to mechanical engineering technology in industry. Many of the contributions selected for these proceedings focus on materials modeling, eco-material processes and mechanical manufacturing.

Friction and Wear of Ceramics - Bikramjit Basu 2020-05-19

This book covers the area of tribology broadly, providing important introductory chapters to fundamentals, processing, and applications of tribology. The book is designed primarily for easy and cohesive understanding for students and practicing scientists pursuing the area of tribology with focus on materials. This book helps students and practicing scientists alike understand that a comprehensive knowledge about the friction and wear properties of advanced materials is essential to further design and development of new materials. The description of the wear micromechanisms of various materials will provide a strong background to the readers as how to design and develop new tribological materials. This book also places importance on the development of new ceramic composites in the context of tribological applications. Some of the key features of the book include: Fundamentals section highlights the salient issues of ceramic processing and mechanical properties of important oxide and non-oxide ceramic systems; State of the art research findings on important ceramic composites are included and an understanding on the behavior of silicon carbide (SiC) based ceramic composites in dry sliding wear conditions is presented as a case study; Erosion wear behavior of ceramics, in which case studies on high temperature erosion behavior of SiC based composites and zirconium diboride (ZrB2) based composites is also covered; Wear behavior of ceramic coatings is rarely discussed in any tribology related books therefore a case study explaining the abrasion wear behavior of WC-Co coating is provided. Finally an appendix chapter is included in which a collection of several types of questions including multiple choice, short answer and long answer are provided.

Micro-electrical Discharge Machining Processes - Golam Kibria 2018-12-15

This book offers a comprehensive collection of micro electrical discharge machining (EDM) processes, including hybrid processes. It discusses the theory behind each process and their applications in various technological as well as biomedical domains, and also presents a brief background to various micro EDM processes, current research challenges, and detailed case studies of micro-manufacturing miniaturized parts. The book serves as a valuable guide for students and researchers interested in micro EDM and other related processes.

Advances in Industrial and Production Engineering - Kripa Shanker 2019-04-23

This book comprises select proceedings of the International Conference on Future Learning Aspects of Mechanical Engineering (FLAME 2018). The book discusses different topics of industrial and production engineering such as sustainable manufacturing systems, computer-aided engineering, rapid prototyping, manufacturing management and automation, metrology, manufacturing process optimization, casting, welding,

machining, and machine tools. The contents of this book will be useful for researchers as well as professionals.

Next Generation Materials and Processing Technologies - Swarup Bag 2021

This book presents the select proceedings of Conference on Research and Developments in Material Processing, Modelling and Characterization (RDMPMC 2020). It highlights the new technologies developed in the generation of rational materials for various applications with tailored properties. It covers fundamental research in emerging materials which includes biomaterials, composites, ceramics, functionally graded materials, energy materials, thin film materials, nanomaterials, nuclear materials, intermetallic, high strength materials, structural materials, super alloys, shape memory alloys and thermally enhanced materials. It includes the numerical modeling and computer simulation to investigate the properties and structure of materials. Few of the most relevant manufacturing techniques highlighted in this book are welding, coating, additive manufacturing, laser-based manufacturing, advanced machining processes, casting, forming and micro and nanoscale manufacturing processes. Given its contents, this book is beneficial to students, researchers and industry professionals. .

Micro Electro-fabrication - Tanveer Saleh 2021-05-14

Micro Electro-fabrication outlines three major nanoscale electro-fabrication techniques, including electro-discharge machining, electrochemical machining and electrochemical deposition. Applications covered include the fabrication of nozzles for automobiles, miniature hole machining for aerospace turbine blade cooling, biomedical device fabrication, such as stents, the fabrication of microchannels for microfluidic application, the production of various MEMS devices, rapid prototyping of micro components, and nanoelectrode fabrication for scanning electron microscopy. This comprehensive book discusses the fundamental nature of the various electro-fabrication processes as well as mathematical modelling and applications. It is an important reference for materials scientists and engineers working at the nanoscale. Provides state-of-the-art research investigations on various topics of micro/nano EDM, micro LECD, micro/nano ECM and ECDM techniques Compares a variety of electro-fabrication techniques, outlining which is best in different situations Outlines a variety of modeling and optimization techniques relating to micro/nano EDM, micro LECD, micro/nano ECM and ECDM

Recent Advances in Mechanical Infrastructure - Ajit Kumar Parwani 2021-03-01

This book contains high-quality papers presented in the conference Recent Advances in Mechanical Infrastructure (ICRAM 2020) held at IITRAM, Ahmedabad, India, from 21-23 August 2020. The topics covered in this book are recent advances in thermal infrastructure, manufacturing infrastructure and infrastructure planning and design.

Advances in Engineering Research and Application - Duy Cuong Nguyen 2022-01-12

This book covers the International Conference on Engineering Research and Applications (ICERA 2021), which took place at Thai Nguyen University of Technology, Thai Nguyen, Vietnam on December 1–2, 2021, and provided an international forum to disseminate information on latest theories and practices in engineering research and applications. The conference focused on original research work in areas including mechanical engineering, materials and mechanics of materials, mechatronics and micromechatronics, automotive engineering, electrical and electronics engineering, information and communication technology. By disseminating the latest advances in the field, the Proceedings of ICERA 2021, Advances in Engineering Research and Application, helps academics and professionals alike to reshape their thinking on sustainable development.

Advances in Modern Machining Processes - M. S. Shunmugam 2022-12-14

The book presents select proceedings of the 8th International and 29th All India Manufacturing Technology, Design and Research (AIMTDR 2021) conference. It covers recent advances in the realms of electro- physical and chemical machining, machining optimization, surface morphology and sustainable machining. The contents also include precision engineering, metrology and quality, automation and smart systems, enterprise manufacturing intelligence, among others. This book will evoke interest among academicians, researchers, and practicing engineers who aspire to comprehend advances pertaining to the domain of modern machining processes

Intelligent Manufacturing - Sunil Pathak 2020-07-21

This book sheds light on the development of traditional and advanced optimization methods. Their use in various tradition and non-tradition manufacturing and machining processes for an improved manufacturability is reported. This includes key elements of implementing conventional statistical methods, multi-objective and multi-criteria decision-making methods and evolution of single and multi-target optimization techniques using soft computing to enhance production performance, efficiency and sustainability in manufacturing. The latest research in this area as well as possible avenues of future research are also highlighted.

SPE/ANTEC 1998 Proceedings - Spe 1998-03-31

More than 700 presentations at ANTEC?98, the Annual Technical Conference of the Society of Plastics Engineers, comprise an encyclopedic compilation of the newest plastics technology available. This is the single most comprehensive annual presentation of new plastics technology!

Advances in Materials Processing - Sunpreet Singh 2020-06-22

This book presents the select proceedings of the International Conference on Functional Material, Manufacturing and Performances (ICFMMP) 2019. The book primarily covers recent research, theories, and practices relevant to surface engineering and processing of materials. It focuses on the lesser-known technologies and advanced manufacturing methods which may not be standardized yet but are highly beneficial to material and manufacturing industrial engineers. The book includes current advances in the field of coating, deposition, cladding, nanotechnology, surface finishing, precision machining, processing, and emerging advanced manufacturing technologies which enhance the performance of materials in terms of corrosion, wear and fatigue. The book can be a valuable reference for beginners, researchers, and professionals interested in materials processing and allied fields.

Analysis of Material Removal Rate and Recast Layer in Micro-EDM of Non-conductive Zirconia - Asfana Banu binti Mohamad Asharaf 2014

Inconsistency in material removal rate (MRR) and minimizing recast layer are critical issues in non-conductive ceramic machined using micro-EDM. Thus, this research presents the analysis of MRR and recast layer of zirconium oxide (ZrO2) due to micro-EDM using EDM-3 dielectric fluid and tungsten tool electrode. The investigation was performed using multi-process micro machine tools. The two main parts of this research are process development and the analysis of MRR and recast layer. For process development, assisting electrode (AE), polarity, flushing, feed rate, gap voltage, and rotational speed were the control parameters. The machined parts were observed using scanning electron microscope. The better machinability of ZrO2 was found to be with copper adhesive as AE, positive polarity of workpiece, feed rate 3 µm/s, and workpiece submerged in dielectric fluid with one way circulation. The best conditions in process development were used as the fixed parameters. Rotational speed and gap voltage were the control parameters for the analysis of MRR and recast layer. The results of MRR were obtained by measuring the mass of material removed over

machining time. The recast layer hardness was measured using micro-Vickers hardness tester. The MRR and hardness data were analyzed and empirical models were developed using design expert software. The optimum parameters for maximum MRR found to be 375 rpm rotational speed and 80 V gap voltage. The optimum value for minimum recast layer hardness was 874.8 Hv with rotational speed of 378 rpm and gap voltage of 110 V.

Micro Electro Discharge Machining - Ajay M. Sidpara 2019-08-20

Micro Electro Discharge Machining (EDM) is a prominent technology for the fabrication of micro components in many fields. Nowadays, it is used like a conventional machine tool due to favorable characteristics. This book provides the fundamental knowledge of the principles of the process and its variants, the different process parameters, the role of machine components and systems, the challenges, and how to eliminate processing errors. It also includes real life applications of micro EDM in different areas with the most relevant examples.

Micro and Nano Machining of Engineering Materials - Kaushik Kumar 2018-09-26

This book covers the recent developments in the production of micro and nano size products, which cater to the needs of the industry. The processes to produce the miniature sized products with unique characteristics are addressed. Moreover, their application in areas such as micro-engines, micro-heat exchangers, micro-pumps, micro-channels, printing heads and medical implants are also highlighted. The book presents such microsystem-based products as important contributors to a sustainable economy. The recent research in this book focuses on the development of new micro and nano manufacturing platforms while integrating the different technologies to manufacture the micro and nano components in a high throughput and cost effective manner. The chapters contain original theoretical and applied research in the areas of micro- and nano-manufacturing that are related to process innovation, accuracy, and precision, throughput enhancement, material utilization, compact equipment development, environmental and life-cycle analysis, and predictive modeling of manufacturing processes with feature sizes less than one hundred micrometers.

Advances in Applied Mechanical Engineering - Hari Kumar Voruganti 2020-02-01

This book presents select peer reviewed proceedings of the International Conference on Applied Mechanical Engineering Research (ICAMER 2019). The books examines various areas of mechanical engineering namely design, thermal, materials, manufacturing and industrial engineering covering topics like FEA, optimization, vibrations, condition monitoring, tribology, CFD, IC engines, turbo-machines, automobiles, manufacturing processes, machining, CAM, additive manufacturing, modelling and simulation of manufacturing processing, optimization of manufacturing processing, supply chain management, and operations management. In addition, recent studies on composite materials, materials characterization, fracture and fatigue, advanced materials, energy storage, green building, phase change materials and structural change monitoring are also covered. Given the contents, this book will be useful for students, researchers and professionals working in mechanical engineering and allied fields.