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Electrical Discharge Machining Electrical Discharge Machining (EDM) Electrical Discharge Machining (EDM) of CFRP Composites *Micro-electrical Discharge Machining Processes* **A Pictorial Journal of (1) Electrical Discharge Machining (EDM) and (2) Electro Chemical Machining (ECM) Electrical Discharge Machining (EDM) of an Aluminium Based MMC** Micro Electro Discharge Machining **Spark Erosion Machining Electric Discharge Hybrid-Machining Processes** Process Characterization of Electrical Discharge Machining of Highly Doped Silicon The EDM Handbook Analysis of Electrical Discharge Machining (EDM) Process Effect of Hole Geometry and Electric-discharge Machining (EDM) on Airflow Rates Through Small-diameter Holes in Turbine-blade Material **Effect of Hole Geometry and Electric-discharge Machining (EDM) on Airflow Rates Through Small-diameter Holes in Turbine-blade Material Electrical Discharge Machining. Optimization of Chromium Powder Mixed EDM Parameters During Machining of H13 Tool Steel Prediction of Surface Roughness in Wire Electric Discharge Machining (EDM) of Aluminum Alloy Based on Experimental Results Effect**

of Pulse Duration and Current on Machining Performance During Electrical Discharge Machining (EDM) of Allegheny Ludlum D2 Tools Steel (UNS T30402) Electric Discharge Machining (EDM) of Titanium Alloy *ELECTRICAL DISCHARGE MACHINING PROCESS DESIGN FOR POST-PROCESSING STAINLESS STEEL 316L ADDITIVELY MANUFACTURED PARTS.* **Complete EDM Handbook** *Development of the Cylindrical Wire Electrical Discharge Machining Process* Effect of Electrode Cooling on the Performance of Electrical Discharge Machining (EDM) of Titanium Alloy Ti-6A1-4V Effects of Electrical Discharge Machining (EDM) Jet Flushing Setting on the Machining of Tool Steel Workpiece **A Development of Recycled-electrode in Electrical Discharge Machining (EDM) of Aluminium Alloy 6061 - A Preliminary Study** Electrical Discharge Machining (EDM). *Erosion Rate, Surface Finish and Electrode Wear in Electric Discharge Machining (EDM) of Dental Alloys* Single Objective Optimization of EDM Machining on Titanium Workpiece Using Taguchi Method Environmental Constituents of Electrical Discharge Machining *Simulator for Electrical Discharge Machining (EDM) Process* Build an EDM *Prediction of Surface Roughness Base on Experimental in Wire-electric Discharge Machining (EDM) of Titanium Alloy* **Spark Erosion Machining Build an EDM** Effect of Electrical Discharge Machining (EDM) on Charpy Test Results from Miniaturized Steel SpecimensContribution of the National Institute of Standards and Technology (NIST), an Agency of

the U.S. Government; Not Subject to Copyright in the United States **Relationship Between Electrode Size and Machined Surface in the EDM Machining Process Study of Electrical Discharge Machining (EDM) Mechanic Behavior Traveling Wire Electrode Increases Productivity of Electrical Discharge Machining (EDM) Equipment Electrical Discharge Machining of Non-conductive Advanced Ceramics Electrical Discharge Machining of Beryllium Copper Alloys Using Graphite Electrode Using Divided Pulses to Avoid Open Circuits in EDM**

Effect of Hole Geometry and Electric-discharge Machining (EDM) on Airflow Rates Through Small-diameter Holes in Turbine-blade Material Apr 24 2022

Spark Erosion Machining Sep 05 2020 This book bridges the gaps where limited resources are available on comprehensive coverage of spark erosion machining (SEM) based processes. It provides researchers and scholars a vast amount of information on recent research on the subject. It also serves as a resource of novel and specialized applications of spark erosion machining and its variants, for students and faculties involved with advanced machining processes. Some salient features of the book: Describes various important aspects of spark-erosion based processes including their derived and hybrid processes. Includes a broad scope of SEM applications from industrial, commercial, and scientific to aerospace, automobiles and biomedical domains. Covers a

wide range of materials applications of SE-based processes to different exotic and difficult-to-machine materials, i.e. superalloys, composites, ceramics, shape memory alloys, etc. Provides details micro version of EDM and WEDM processes and their specialized applications.

Electrical Discharge Machining (EDM). Apr 12 2021 The objectives of this program were to increase the efficiency of the electrical discharge machining process, decrease manufacturing costs, increase reliability and structural integrity of production parts, and extend the utilization of EDM manufacturing processes. Optimization of the EDM parameters in order to obtain the maximum efficiency was accomplished by a study of the parameters using multivariable regression analyses. This study has shown the quantitative effects of the independent variables and certain interactions on the machining results. The conditions for obtaining maximum metal removal rates consistent with specified surface integrity were established for eight materials. It was determined that the on-time influences the surface integrity more than the peak current. The recognition of this has permitted increasing metal removal rates by using higher peak currents in finishing operations and maintaining low on-times to limit surface degradation. As a result the efficiency of the EDM process is increased and the costs can be decreased.

Electrical Discharge Machining (EDM) of an Aluminium Based MMC Dec 01 2022

Effect of Pulse Duration and Current on Machining

Performance During Electrical Discharge Machining (EDM) of Allegheny Ludlum D2 Tools Steel (UNS T30402)

Dec 21 2021 Electrical discharge machining (EDM) is a process for shaping hard metals and forming deep complex-shaped holes by arc erosion in all kinds of electrical conductive materials. In the present day, there is a huge demand for the advanced materials with high strength, high hardness and temperature resistance in automobile, aeronautics, nuclear, mould and dies making industries. The purpose of this research is to study the effect of pulse duration and current on performance of EDM process of Allegheny Ludlum D2 Tool Steel (UNS T30402). The effect of varying the machining parameters on the machining responses such as material removal rate (MRR), electrode wear rate (EWR), wear ratio (WR) and surface roughness (Ra) have been investigated. In addition, this research also emphasizes on the study related to the effect of shape configuration of electrodes on the performance of EDM. The electrodes were made with circular and triangular shape with constant cross-sectional area of 100mm2. It was found that the pulse duration and current give significant effect on MRR, EWR, WR and Ra. An increase in the pulse durations causes an increase in the MRR and Ra, but a decrease in the EWR and WR. Meanwhile, the effect of currents on EDM performance shows that the increasing currents led to an increase in the MRR, EWR, WR and Ra. Finally, from all the results obtained, several analyses have been made to compare the machining performance results

between circular shaped electrode and the triangular shaped electrode. It was found that the value of MRR for circular shaped electrode was higher than that of triangular shape electrode. Meanwhile, the higher value for EWR, WR and Ra was found at the triangular shaped electrode.

Using Divided Pulses to Avoid Open Circuits in EDM Dec 29 2019

Electrical Discharge Machining of Beryllium Copper Alloys Using Graphite Electrode Jan 28 2020 Electrical Discharge Machining (EDM) is commonly used to produce molds and dies, to drill small, burr-free holes and to make prototype quantities of contacts for the aerospace and electronics markets. Most of EDM machines are manufactured and equipped with built-in 'machining technology' for steels. Apart from steel, beryllium copper alloys are amongst essential material for mould and die making. Therefore, the present study elucidates the die-sinking EDM characteristics of beryllium copper alloys with graphite as an electrode. Experiments were conducted on EDM Die Sinking Charmilles Robofom 35P. The output responses investigated were Material Removal Rate (MRR) and Surface Roughness (Ra). Full factorial and Linear Regression analysis of Design of Experiment (DOE) module in Minitab was employed as a principal methodology to examine the effects of current, polarity, pulse duration and voltage over output responses. The significant and optimum machining parameters for each output responses was also identified and established. Experiment

results indicate that the Material Removal Rate (MRR) was mainly affected by current, pulse duration, voltage and interaction between current*pulse duration. For the Surface Roughness (Ra), the significant factors were current, voltage and pulse duration. Confirmation tests were carried out and used to compare results obtained by theoretical predication with those experimentally. It was found that the error margin of factors influenced between the predicted and actual results is 5% for Material Removal Rate (MRR) and 4.2% for Surface Roughness (Ra).

Electric Discharge Hybrid-Machining Processes Aug 29 2022 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.

Electrical Discharge Machining. Optimization of Chromium Powder Mixed EDM Parameters During Machining of H13 Tool Steel Feb 20 2022 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.

Prediction of Surface Roughness in Wire Electric Discharge Machining (EDM) of Aluminum Alloy Based on Experimental Results Jan 22 2022 Surface roughness is one of the most important requirements in machining process. In order to obtain better surface roughness, the proper setting of cutting parameters is crucial before the process take place. The aim of this research is to develop first order and second order

prediction mathematical model for Surface roughness using response surface methodology (RSM) when machining using Wire-EDM for aluminum alloy 6061-T6 and compare both mathematical modeling to find the most effective prediction model. SODICK AQ353L machine was used to cut Aluminum Alloy 6061-T6 and PERTHOMETER to measure surface roughness. By using Response Surface Method (RSM) of experiment, first and second order models were developed with 95% confidence level. The machine parameters that had been considered in this study are ON-time, OFF-time, peak discharge current and wire speed. It was established that the surface roughness is most influenced by On-time. The percentage error of surface roughness predicted is calculated to obtain the accuracy of mathematical model build, the second order prediction model gives less percentage error which is 3.29% compare to first order prediction model 3.68%. So, the second order mathematical modeling is more suitable for prediction of surface roughness.

Complete EDM Handbook Sep 17 2021

Effect of Electrode Cooling on the Performance of Electrical Discharge Machining (EDM) of Titanium Alloy Ti-6A1-4V Jul 16 2021

Micro Electro Discharge Machining Oct 31 2022 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.

Analysis of Electrical Discharge Machining (EDM) Process May 26 2022 ELECTRICAL DISCHARGE MACHINING (EDM) This book is meant for the students, research scholars and teachers using EDM process. The author presented the detailed study of Input energy parameters include peak current, pulse duration and polarity. Output in the form of surface integrity has been explained in detail, which includes surface roughness, micro hardness and microstructure. The key interest of scientists and technologist is for the higher rates of metal removal with excellent surface finish and low tool wear. The detail study on effect of processing parameters, the nature of cracks observed at the surface and on structural features of cermet after EDM is precisely described. In order to improve the technological performance during EDM process it is essential to understand the formation of cracks, distribution of cracks, size of the cracks, and the structure of cracks to distinguish between fatigue cracks and EDM cracks. The amount of energy available for this process is generated through plasma. Account of the total energy input and out put is explained. It is an ideal text book on practical EDM.

The EDM Handbook Jun 26 2022

Environmental Constituents of Electrical Discharge Machining

Jan 10 2021 Electrical Discharge Machining (EDM) is a non-traditional process that uses no mechanical forces to machine metals. It is extremely useful in machining hard materials. With the advantages EDM has to offer and its presence as a common and useable technique, along with the other machining processes available to the industrial world, there is an added strain on the environment. The scope of this thesis includes analyzing the various inputs into EDM and the resulting outputs into the environment. A simplified model is used to analyze the process. The main categories of flow scrutinized in the model are material flow and energy flow. The most hazardous effect to the environment is found in the resin interaction of the wire EDM process where depending on the type of material machined, there is a potential presence of hazardous materials. There are efforts to recycle all salvageable materials such as wire and metal wastes, but currently no accountability system exists as manufacturers are responsible for their actions.

Study of Electrical Discharge Machining (EDM) Mechanic Behavior May 02 2020

Electrical Discharge Machining May 06 2023 "In writing this book, the author focused on EDM fundamentals. These are the items common to all EDM machines, such as the spark, how the spark is controlled, what causes overcut, and the importance of the dielectric fluid. With regard to the workplace, covered are the affect the spark has on the metallurgy and how the surface finish is produced and

controlled. The book also describes the development of Electrical Discharge Machining (EDM), the EDM system and process, the EDM sparking systems, the power supply (generator), spark voltage, electrode servo systems, di-electric systems, ionization and electrode wear, chips, the EDM surface, DC arcing, different kinds of EDM, autormatic servo systems operation, and electromagnetic radiation. It is the author's intent that this text will serve as the primer on the EDM process, allowing the people using EDM to become more efficient and the machines more productive."--Back cover.

Electrical Discharge Machining of Non-conductive Advanced Ceramics Feb 29 2020

Simulator for Electrical Discharge Machining (EDM) Process Dec 09 2020

Micro-electrical Discharge Machining Processes Feb 03 2023 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.

Build an EDM Aug 05 2020

Spark Erosion Machining Sep 29 2022 This book bridges

the gaps where limited resources are available on comprehensive coverage of spark erosion machining (SEM) based processes. It provides researchers and scholars a vast amount of information on recent research on the subject. It also serves as a resource of novel and specialized applications of spark erosion machining and its variants, for students and faculties involved with advanced machining processes. Some salient features of the book: Describes various important aspects of spark-erosion based processes including their derived and hybrid processes. Includes a broad scope of SEM applications from industrial, commercial, and scientific to aerospace, automobiles and biomedical domains. Covers a wide range of materials applications of SE-based processes to different exotic and difficult-to-machine materials, i.e. superalloys, composites, ceramics, shape memory alloys, etc. Provides details micro version of EDM and WEDM processes and their specialized applications.

Electric Discharge Machining (EDM) of Titanium Alloy Nov 19 2021

A Pictorial Journal of (1) Electrical Discharge Machining (EDM) and (2) Electro Chemical Machining (ECM) Jan 02 2023

Effects of Electrical Discharge Machining (EDM) Jet Flushing Setting on the Machining of Tool Steel Workpiece Jun 14 2021 Electrical Discharge Machining (EDM) is one of the most accurate manufacturing process for creating complex or simple shape and geometries within parts and assemblies. EDM works

by eroding material in path of electrical discharges that form an arc between an electrode tool and the work piece. The objective of this thesis project is to determine effect of EDM jet flushing setting on the machining of tool steel workpiece. The most important parameters of EDM are the material removal rate (MRR) and surface roughness (Ra). The non-electrical factors are considered in this experiment where the electrical factor has been fixed. In this thesis the influence of electrode material, flushing, electrode dimension and depth of cut on EDM performance is discussed. The analysis of the influence of these factors was carried out by adopting a complete factorial experiment. Graphite and Copper are used as electrode to machine the workpiece. Flushing is used in EDM to remove the eroded particle from the gap for efficient cutting. There are two level of flushing setting, for low level flushing is not used and at high level flushing is used. Electrode dimension for low level is 10 mm and high level is 30 mm. the factor for depth of cut is 10 mm at low and 20 mm at high level. The dielectric fluid is used kerosene. The effects of jet flushing was analyzed and discussed. The result had proved that flushing is very important to influence MRR and Ra result.

Development of the Cylindrical Wire Electrical Discharge Machining Process Aug 17 2021 Results of applying the wire Electrical Discharge Machining (EDM) process to generate precise cylindrical forms on hard, difficult-to-machine materials are presented. 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 identifies the major source of error at different frequency. The mathematical model for the material removal of cylindrical wire EDM process is derived. Experiments were conducted to explore the maximum material removal rate for cylindrical and 2D wire EDM of carbide and brass work-materials. Compared to the 2D wire EDM, higher maximum material removal rates may be achieved in the cylindrical wire EDM. This study also investigates the surface integrity and roundness of parts created by the cylindrical wire EDM process. For carbide parts, an arithmetic average surface roughness and roundness as low as 0.68 and 1.7 [mu]m, respectively, can be achieved. Surfaces of the cylindrical EDM parts were examined using Scanning Electron Microscopy (SEM) to identify the craters, sub-surface recast layers and heat-affected zones under various process parameters. This study has demonstrated that the cylindrical wire EDM process parameters can be adjusted to achieve either high material removal rate or good surface integrity.

Process Characterization of Electrical Discharge Machining of Highly Doped Silicon Jul 28 2022 Electrical Discharge Machining (EDM) is an advanced machining process that removes material via thermal erosion through a plasma arc. The machining process is accomplished through the application of high frequency current (typically through a fine wire or some other electrode) to a conductive workpiece. The

electrode is physically separated from the workpiece by some small distance and the potential difference is commonly discharged through an insulating dielectric material such as deionized water or oil. This short duration application of current produces a spark across the gap between the electrode and workpiece, causing vaporization and melting of local material in both the electrode and workpiece. The EDM process is most frequently used for conductive substrates (i.e. metals); however, research has shown that the process may be successfully used on semiconductor substrates such as doped silicon wafers'. The purpose of this research was to characterize the EDM process using Design of Experiments (DOE) statistical methodology on highly doped silicon wafer workpieces for material removal rate (MRR) and surface roughness (Ra) for both Wire EDM (WEDM) and die sinker EDM machines. Once process characterization was completed, confirmation testing was conducted for each machine. The applied spark energy had a significant impact on processing speed for both machines as expected, with the WEDM processing also heavily dependent on selected control speed. Surface roughness was also found to be highly dependent on spark energy for both machines. Evaluation of minimum obtainable feature sizes for some specific geometries as well as evaluation of various effects on the processing of silicon were also conducted.

Effect of Hole Geometry and Electric-discharge Machining (EDM) on Airflow Rates Through Small-

diameter Holes in Turbine-blade Material Mar 24 2022

A Development of Recycled-electrode in Electrical Discharge Machining (EDM) of Aluminium Alloy 6061 - A Preliminary Study May 14 2021

Build an EDM Nov 07 2020

Erosion Rate, Surface Finish and Electrode Wear in Electric Discharge Machining (EDM) of Dental Alloys Mar 12 2021 A precise fit of dental restorations is critical in all aspects of prosthetic dentistry. Fabrication of a prosthesis with a high degree of accuracy is difficult due to the dimensional changes of different dental materials. EDM is an extremely accurate non-contact machining process with a precision as small as 0.002 mm. The objectives of this study were to investigate how changes in amperage and on-time of the EDM process affect the metal removal rate (MRR) and surface finish (Ra) of representative dental materials. The percentage of electrode wear (PEW) of representative electrode materials in different metal- electrode combinations was also studied. Three representative dental metals (workpieces) were used; Type III gold (Ney), Olympia ceramo-metal Alloy (Jelenko) and titanium (Ti) (Rematitan). Type III gold and ceramometal alloy were cast in bars 6mm square and 30 mm in length. Ti ingots were used as provided by manufacturer.

Effect of Electrical Discharge Machining (EDM) on Charpy Test Results from Miniaturized Steel SpecimensContribution of the National Institute of Standards and Technology (NIST), an Agency of the U.S. Government; Not Subject to Copyright

in the United States Jul 04 2020 Electrical discharge machining (EDM) is a manufacturing process whereby a desired shape is obtained through electrical discharges between an electrode and a workpiece, which are separated by a dielectric fluid. EDM produces a recast layer on the surface of the workpiece, which in carbon steels is typically harder and more brittle than the base metal, and is often characterized by microcracks. This type of damage, particularly in the notch region of a steel specimen, can adversely affect impact test results. The objective of this investigation is to assess the possible influence of EDM on miniaturized Charpy test results. We tested Kleinstprobe (KLST)-type Charpy specimens of two reactor pressure vessel (RPV) steels, machined with different combinations of two machining processes (EDM and milling). Comparison of the impact results, combined with metallographic observations and microhardness measurements on the recast layers and the base metals, indicated no detrimental effect of EDM on the impact toughness of the materials investigated. The maximum thickness of the recast layer was about 16 ?m, and the magnitude of the EDM-induced hardening varied between 34 % and 84 % with respect to the hardness of the base material, depending on the carbon content of the steel. No microcracks were observed.

ELECTRICAL DISCHARGE MACHINING PROCESS DESIGN FOR POST-PROCESSING STAINLESS STEEL 316L ADDITIVELY MANUFACTURED PARTS. Oct 19 2021 Wire electrical discharge machining (EDM) is a non-traditional

subtractive manufacturing process. This process works by bringing a charged wire in close proximity to a conductive workpiece. When the wire is close enough to the workpiece, an electrical arc forms between the wire and the workpiece. The electrical arc melts away material from the workpiece, and the wire continues moving through the workpiece, leaving behind a slit slightly wider than the width of the wire. Wire EDM is a high-precision process that can meet very tight tolerances and is employed in several industries including the aerospace and automotive industries. Recently, wire EDM has been used in the additive manufacturing (AM) industry for metal part post-processing and removal from build plates. While wire EDM is increasingly being used in the AM industry, very little research has been conducted on the wire EDM of additively manufactured parts. This thesis discusses three studies performed on the wire EDM of additively manufactured stainless-steel 316L parts. The first study is a comparison of wrought and AM stainless-steel 316L with respect to the wire EDM process. This research tested and optimized different wire EDM process parameters for the machinability of wrought and AM 316L. The second study explored the interaction between the wire EDM process and AM stainless-steel 316L lattice support structures. Selected EDM parameters were measured while machining the support structures, and optimal support structure designs were identified for AM part removal from build-plate via wire EDM. The final study explored the interaction between the wire EDM process and

stainless-steel AM parts containing pockets of trapped, un-melted powder. This study optimized wire EDM process parameters for machining trapped powder pockets and outlined a potential explanation for the high incidence of wire breakage that occurs when machining through pockets of trapped powder.

Single Objective Optimization of EDM Machining on Titanium Workpiece Using Taguchi Method Feb 08 2021 Electrical discharge machining (EDM) is a process for shaping hard metals and forming deep complex shaped holes by arc erosion in all kinds of electro-conductive materials. The objective of this paper is to investigate how the polarity, peak current, pulse on duration, pulse off duration and servo voltage in EDM effect on material removal rate (MRR), electrode wear ratio (EWR) and surface roughness (SR). The effectiveness of EDM process with titanium alloy (Ti-6Al-4V)through electrical discharge machining (EDM) using copper tungsten (CuW)as an electrode.It is observed that copper tungsten (CuW) is most suitable for use as the tool electrode in EDM of Ti-6Al-4V .Better machining performance is obtained generally with the electrode as the cathode and the workpiece as an anode. In this research, a study was carried out on the influence of the parameters such as polarity, peak current, pulse on duration, pulse off duration and servo voltage. The surface quality that was investigated in this experiment was surface roughness using perthometer machine. Material removal rate (MRR) and electrode wear (EW) in this

experiment was calculated by using mathematical method. The result of the experiment then was collected and analyzed using MINITAB software. This was done by using the technique of design of experiments (DOE) and technique such as ANOVA analysis. This analysis was purposed to select the optimal machining condition for use in confirmation test.

Traveling Wire Electrode Increases Productivity of Electrical Discharge Machining (EDM) Equipment Mar 31 2020

Relationship Between Electrode Size and Machined Surface in the EDM Machining Process Jun 02 2020

Electro-Discharge Machining (EDM) has found widespread application in the fabrication of Micro-Electro Mechanical Systems (MEMS), tool and mold industries and aerospace industries. The machining technique now plays an indispensable role in the fabrication of a wide variety of components. However due to rapid heating and cooling during machining, a thermally affected layer will form on the machined surface. A close inspection reveals the presence of many surface defects such as void, cracks, shallow crater and debris on this layer. Tungsten carbide (WC) with 15% of cobalt content is selected as the workpiece material and the copper tungsten as the electrode in this experiment. The electrodes are consisting in three different sizes are 3mm, 6mm and 8mm of diameter. Since EDM has been shown to be a versatile method for machining difficult-to-work materials, it is believed that the EDM process will open up an opportunity

for the machining of tungsten carbide (WC). The aim of this study is to analyzes the machined surface in term of surface roughness that influenced by the different size of electrodes. After completion the experiment process, scanning electron microscope (SEM) will be employed to analyze the surface topography and the surface roughness tester will be used to measure the surface roughness on the machined surface.

Prediction of Surface Roughness Base on Experimental in Wire-electric Discharge Machining (EDM) of Titanium Alloy Oct 07 2020 This thesis deals with machining Titanium alloy workpiece using Wire-Electrical Discharge Machining (EDM). The objective of this thesis is to determine the relationship between the machining parameters which is Current Pulse Duration, Voltage Off-Time, Peak Discharge Current, and Wire speed with Surface roughness (Ra). This thesis use the response surface methodology techniques to turn out the equation the equation that use to predict the Ra. The machining of Titanium alloy workpiece was performs using the Wire-EDM SODICK AQ535L. Then the analysis was done using the MINITAB software. From the result, it is observed that the second order modal give more accurate prediction data for Ra and less percent of error compare to linear model. From the previous researchers found that machining parameters had a large effect on machining performance outputs. By doing the prediction for surface roughness in Wire-EDM for Titanium alloy it will aid people to estimate the surface roughness for their selected parameters and avoid using try and error method.

By considering all of these parameters, the good machining condition can be performed. This result also can significantly reduce the cost of operation and cost of product.

Electrical Discharge Machining (EDM) of CFRP Composites Mar 04 2023

Electrical Discharge Machining (EDM) Apr 05 2023

Electrical Discharge Machining (EDM) is one of the earliest and most widely used non-conventional machining processes. In recent years, the use of EDM has increased significantly in industries, mainly due to the extensive use of hard and difficult-to-cut materials, i.e. hardened steels, carbides, titanium alloys, nickel super alloys and so on. The EDM process is being used extensively for many important applications in die and mold, aerospace, automotive, micro-electronic and biomedical industries. As a result, extensive research has been carried out on various aspects of EDM. Taking those facts into consideration, this book aims to provide a comprehensive overview of the various types, technologies and applications of EDM. The book starts with chapters on the two major types of EDM: die-sinking EDM and wire-EDM. Subsequently, several EDM-based hybrid machining processes, such as: ultrasonically aided EDM, powder-mixed EDM, and simultanous micro-EDM/ECM have been discussed in detail. This book includes chapters on the detail of EDM surface and modeling and simulation of the EDM process. This book also contains chapters on the novel and innovative applications of EDM as well as machining of newer materials, such as: shape memory

alloy, reaction-bonded silicon carbide, metal metrix composites, silicon based semiconductors, and non-conducting polymers. It is a useful resource for students and researchers who are planning to start their research on the area of EDM and related processes. It can also serve as a reference for students, academics, researchers, engineers, and working professionals in non-traditional manufacturing processes related industries.