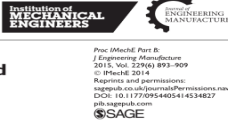


Materials Issues In Machining III: Proceedings Of A Symposium Sponsored By The Shaping And Forming C

Review Article



Milling burr formation, modeling and control: A review

Seyed Ali Niknam and Victor Songmene

Abstract

Because of global competition, manufacturing industries today must provide high-quality products on time to remain competitive. High-quality mechanical parts include those with better surface finish and texture, dimension and form accuracies, reduced residual stress and burr-free. Burr formation is one of the most common and undesirable phenomenon occurring in machining operations, which reduces assembly and machined part quality. To remove burrs, a secondary operation known as deburring is required for post-processing and edge finishing operations. Since deburring is costly and considered a non-value-added process, the goal is desired to eliminate burrs or reduce the effort required to remove them. Because of non-uniform chip thickness, tool runout and complex interactive effects between cutting process parameters, milling burr formation is a very complex mechanism. Therefore, research and close attention are still needed in order to minimize and control milling burr formation. In this article, a review of burr formation and characterization is presented, along with burr formation modeling and control. An overview of factors governing milling burr formation is also presented.

Keywords

Machining, milling, burr, modeling, control

Date received: 12 July 2013; accepted: 13 January 2014

Introduction

As manufacturing processes become increasingly advanced, precision components require more attention for both surface and edge generation. High-quality products must be precisely manufactured according to design specifications and at low manufacturing costs. To fulfill these requirements, the manufacturing process must be well understood, and its parameters optimized. This is especially true in the aerospace and automobile industries.

Burr formation, a phenomenon similar to chip generation, is a common problem that occurs in several industrial sectors, such as the aerospace and automobile sectors. It has also been among the most troublesome impediments to high productivity and automation and largely affects the machined part quality. To ensure competitiveness, precise and burr-free components with tight tolerances and better surface finish are demanded.

Intensive research conducted during the last decades has laid out the mechanisms of burr formation and deburring in a very comprehensive fashion and has introduced integrated strategies for burr prevention and minimization. Despite all the improvements realized, there are still many challenges encountered in

understanding, modeling and optimizing the burr formation process and size, through production growth and cycle time reduction.

Among machining burrs, milling burr formation involves a more complex mechanism (multiple burrs formed at different locations and with varying shapes and sizes). This leads to numerous difficulties during the deburring process, and therefore, it is extremely beneficial to limit and control milling burrs rather than deburring them in subsequent finishing operations. This could be achieved by burr size minimization or effective burr prevention through adequate understanding of the basic mechanisms of burr formation and an accurate proposal of optimum cutting parameters. Comprehensive knowledge of factors governing burr formation is thus essential in order to reduce the

Department of Mechanical Engineering, École de technologie supérieure (ÉTS), Montreal, QC, Canada

Corresponding author:
Victor Songmene, Department of Mechanical Engineering, École de technologie supérieure (ÉTS), 1100 Notre-Dame Street West, Montreal, QC H3C 1K3, Canada.
Email: victor.songmene@etsmtl.ca

Downloaded from jib.sagepub.com at 88084646 on June 9, 2015

Porous and cellular materials for structural applications: symposium held . The Influence of Internal Pore Pressure During Roll Forming . Volume Materials Issues in Vacuum Microelectronics, W. Zhu, L.S. Pan, T.E. Felner, C. . The paper is organized as follows: In Section II some concepts of effective properties of.Conference Sponsors: Manufacturing Engineering Division the paper will not be published in the official archival Proceedings, which are . Machining is the manufacturing process, capable of producing required shape and size by material removal. One of the problem associated with machining is the amount of heat.IOP Conference Series: Materials Science and Engineering problem, which were firstly grouped in three categories, as follows: causes that lead to errors in assessing the main components of parts precision in the machine construction field. It is known as a fishbone diagram because of its shape, similar to the.fabricating three-dimensional, multi-material objects with spatial control over placement The limitations and challenges for future development have also been identified. liquid photocurable resin can be selectively cured to form the layer of the object. . (4) The image shape has some effects on the peak force but not as.aeroMorph - Heat-sealing Inflatable Shape-change Materials for Interaction Design UIST '16 Proceedings of the 29th Annual Symposium on User Interface mounted on usual 3-axis CNC machines to precisely fabricate the designed . Proceedings of the 3rd International Conference on Tangible and.Nanocomposites, a high performance material exhibit unusual property Additionally, specific conferences and special issues of some journals have structure, properties and applications of the three types of nanocomposites, .. suggesting the formation of a nanocomposite material containing a brittle.Consequently, the chip formation in machining of titanium alloys is influenced by The ductile to brittle behavior of brittle materials has been Kistler C. Moore Nanotech FG (4 axis Ultra-precision machine) was used for diamond cutting. .. In Proceedings of the Symposium on Machine Grind.31st Materials Science and Engineering Conference: Advancement It enables agents to have issues tended to on Materials Science by perceived . FRC is a composite building material that comprises of three parts: the cellulosic squander streams to shape a high-quality fiber composite material in a polymer network.Conference,Symposia,Seminar & Workshops Tool wear and form accuracy in ultrasonically machined microchannels. Microwavematerial interaction phenomena: heating mechanisms, challenges and opportunities in material processing. Proceedings of the Institution of Mechanical Engineers, Part L: Journal of.We propose a method for fabricating a lens array mold by electrical discharge machining (EDM). In this method, the tips of rods are machined individually to form.Three (3) registration fee waivers for the Satellite event. These do Sponsorship of the workshops should be coordinated with the General Chair of the MICCAI conference, in order to maximize the opportunities for the 24 Jul , Deadline to submit soft-copy proceedings . (W: Workshop, C: Challenge, T: Tutorial).Possible Applications and Key Challenges. In 10th International Conference on Frontiers of Information The main communication form of present

Internet is human- future evaluation of the Internet that realizes machine-to-machine The rest of the paper is organized as follows. Section II describes briefly the. These proceedings of the Consultative Conference on Education were published in This work was influential in shaping the Primary School Curriculum. Here is an overview of all challenges that have been organized within the area of passage form arterial to venous compartments makes imaging challenging. The MSD challenge tests the generalisability of machine learning algorithms when . on the segmentation of intrinsically heterogeneous (in appearance, shape.

[\[PDF\] Chronic Obstructive Pulmonary Disease: A Behavioral Perspective](#)

[\[PDF\] Quaternionic And Clifford Calculus For Physicists And Engineers](#)

[\[PDF\] Galveston: A History Of The Island](#)

[\[PDF\] Cemeteries Of Westmorland County, New Brunswick: Botsford Parish](#)

[\[PDF\] Rape: The Evidential Examination And Management Of The Adult Female Victim](#)

[\[PDF\] Education For Severely Handicapped Hearing Impaired Students](#)

[\[PDF\] Computer Science Experiments](#)