Smart CNC Metal Machining: Solid Modeling Techniques for Advanced CAM High Speed Machining of Mechanical Components

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ABSTRACT

The CNC machining of mechanical components such as housings, bearing pockets, and other mechanical components is changing with the onset of new high speed machining techniques which are being built into CAM packages. Dynamic milling uses the cutter at full depth which is faster than a series of individual cuts when it is supported with the CNC parameters to break and remove chips efficiently. Trochoidal tool-paths achieve high speed cutting through a series of CAM driven high swirl cuts. These high speed tool-paths and others will be presented along with the implications for quicker production of electrical component prototypes and small run manufacturing. High speed machining and feature based machining [FBM] are giving the electrical designer enhanced control over the design and production of electrical components. FBM can allow a designer to produce prototypes and other components without an extensive CNC machining background. Other smart or intelligent machining concepts such as *look ahead machining* will be presented as CNC controllers are using artificial intelligence in the machining process.

BIOGRAPHY

Dr. Todd C. Waggoner is a professor of Engineering Technologies and Associate Dean for Undergraduate Affairs in the College of Technology, Architecture, and Applied Engineering at Bowling Green State University, Bowling Green, Ohio. His research is focused on reverse engineering techniques and he specializes in 3D Scanning, 3D Printing, and Additive Manufacturing. As an Associate Dean for Undergraduate Affairs he has worked extensively with accreditation. He recently became an ABET IDEAL accreditation scholar. He can be contacted by e-mail at wtodd@bgsu.edu.

Proceedings of the 2016 IAJC-ISAM Joint International Conference
ISBN 978-1-60643-379-9