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# 3D FEM Machining Titanium Alloy

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Escamilla-Salazar is Mechanical engineering since 1998, Master of Science in Manufacturing Engineering in Automation since 2004, both from the Universidad Autónoma de Nuevo León, Graduate in Science and Technology phD level terminal option in the disciplines of Manufacturing and Industrial Engineering, studies conducted in the Coorporación Mexicana de Investigación en Materiales in Saltillo Coahuila. She was recognized with the profile of PROMEP. She is active member of the Technical Committee of the School of mechanical engineering. Her experience allowed her to develop her skill in machining area businesses participating in the following GENERAL ELECTRIC MEDICAL SYSTEMS as Sourcing Project Leader, MOTOR WHEEL OF MEXICO, SA DE CV serving as Manufacturing Engineer and FACTORIES MONTERREY, SA DE CV Industrial Engineering and Manufacturing, her area of research is the analysis and optimization of machining processes and simulation development and mechanical design and processes. It has 4 publications in indexed journals, one book chapter and more than 10 participations in international conferences. She had entitled to 6 undergraduate students, 2 Masters. A date has completed more than 3 research projects in the area of Manufacturing and Materials.

**Abstract:** Modeling and simulation of metal cutting processes has the potential for improving cutting tool designs and selecting optimum conditions, especially in advanced applications such as high-speed milling. The milling process is one of the most common metal removal operations. It is widely used in a variety of manufacturing industries including the aerospace and automotive sectors. These industries require an increase in productivity and better quality of the final product. The objective of this study was to develop a methodology for simulating the cutting process in end milling operation to predict workpiece stresses and temperatures using 3D finite element analysis. Rectangular pieces of titanium Ti-6Al-4V were cut, the tool was an endmill coated with Aluminum Titanium Nitride with 4 cutting edges and 3/8" on a diameter of the tool. The milling was carried out over a length of 47 mm. The finite element model considers speed rate, feed and depth as input. Temperature results were compared to those measured experimentally

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