

## عنوان مقاله:

An Investigation to Reduce the Cutting Force in CNC Slot Milling Operation by Forecasting Optimum Process Parameters and Develop Precise Mathematical Model for It

## محل انتشار:

ماهنامه بین المللی مهندسی، دوره 37، شماره 3 (سال: 1403)

تعداد صفحات اصل مقاله: 11

## نویسندگان:

L. S. Patel - *Mechanical Engineering Department, Government Engineering College Sura, Gujarat Technological University, Gujarat, India*

V. P. Parekh - *Mechanical Engineering Department, SVIT-Vasad, Gujarat Technological University, Gujarat, India*

A. S. Vagh - *Liquid Terminal Department, Adani Hazira Port Limited, Surat, Gujarat, India*

## خلاصه مقاله:

Industries frequently encounter several difficulties during milling operations, especially with cutting forces. Slot milling involves the machining of slots in materials using a milling cutter, and the challenges related to cutting forces can significantly impact the efficiency and quality of the milling process. CNC milling is widely used for machining of different types of materials in the manufacturing industry. Therefore, it is required to study process parameters and its behavior on materials which is not only to enhance the process but also make an effective and efficient path in metal cutting process. This research includes the effect of three input parameters i.e. feed rate, cutting speed and depth of cut on cutting force for Mild Steel. An empirical study gives the significant behavior of process or input parameter on machining properties. A mathematical study viz. ANOVA (Analysis of variance) gives the correlation in-between input or process parameters and machining or output properties for Mild Steel. It is also developed an equation for cutting force using a Regression model for the prediction of feed, speed and depth of cut. Values obtained from the mathematical models and Regression model was found to be very close to the data obtained from the experimental studies. The lowest cutting forces were obtained at high cutting speed and low feed rate and depth of cut.

## کلمات کلیدی:

machining, DOE (Design of Experiment), Taguchi, S/N ratio, ANOVA, Regression Model

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1905867>

