

EXPERIMENTAL INVESTIGATION AND VALIDATION OF CNC TURNING ON MILD STEEL

A Project Report Submitted to

In partial fulfillment of the requirements for the award of the

DEGREE OF BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

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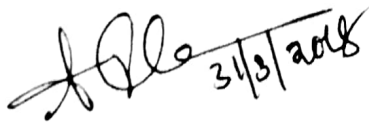
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CERTIFICATE

This is to certify that the thesis entitled "EXPERIMENTAL INVESTIGATION AND VALIDATION OF CNC TURNING ON MILD STEEL" has been submitted by **CHAIKIRAN KESHAVAN (P. SANTHOSH KUMAR (REG. NO. 17010100115001) PRATHI (RITHA 96))** in partial fulfilment of requirements for the award degree of "BACHELOR OF TECHNOLOGY in MECHANICAL ENGINEERING" is a record of bonafide work done by them under my guidance and supervision during academic year 2017-2018


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EXTERNAL EXAMINER

ABSTRACT

In this study, the effect of the machining parameters like spindle speed, feed, depth of cut on material removal rate is investigated. Machining is the most important of the manufacturing processes which involves the process of removing material from a work piece in the form of chips. Machining is necessary where tight tolerances on dimensions and finishes are required. Being such an important process in manufacturing industry, a machining process is considered for investigation in the present work. This paper presents the experimental investigations on the effects of cutting variables like Spindle speed, Feed and Depth of cut on the Material removal rate and spindle load. The experiments were conducted on Mild steel on a CNC turning machine using ceramic insert. The experiments were conducted as per the design of experiments. Initial trial experiments were conducted to fix the ranges for the control parameters. After conducting the experiments, the MRR measured and recorded. The effects were studied after plotting the graphs between the Input process parameters versus the responses using Design expert software. The results obtained in this study can be further used for optimizing the process parameters there by the optimized results help the operator to enhance the quality as well as machining rate. The experimental results are compared with predicted results in neural network software easy NN+, the parameters are considered as optimized parameters for better material removal rate. There are several techniques available to determine the optimum values of these parameters, in this paper machining parameters cutting speed, feed, depth of cut, are considered for optimization. The neural networks were developed for predicting the optimized results theoretically. To validate the results experimentally trials are then carried out a CNC turning using carbide tool by continuous running condition under wet run on the Mild steel work piece. The predicted results match well with experimental values. Thus, proves the neural network is used for optimization of machining parameters.

Keywords: Turning, Machining, MRR, Spindle speed, Depth of Cut, Feed rate, Spindle load, Experimental, CNC Lathe, ANN