

ABSTRACT

The application of computer programs on machines can be used for various activities, one of which is as a machine control system and machine automation system. The combination of computer and machine technology is called CNC (Computer Numerically Controlled). The research began when operators who had little experience (new operators) operated the FC 1325 CNC router machine with a trial and error approach. Trial and error activities result in low quality products. The use of trial and error approach in CNC machine operation is divided into several types, namely assumptions in using methods, assumptions in material selection, assumptions in machine settings, and assumptions in processing situations (human factors). Based on the above problems, it is necessary to propose the right settings on the FC 1325 CNC machine, especially in determining the combination of parameters in order to get quality machining results. The design in the implementation of the experiment uses the design of experiment (DoE) with the 2^3 full factorial method. The machining factors used in this study are depth of cut (DoC), feed rate, and spindle speed. After the experiment was carried out, the data was processed using two-way ANOVA to find factors that significantly affect surface roughness. The results obtained were that the parameters that had a significant effect were feedrate and spindle speed. Then a Post-Hoc test was carried out to obtain a combination of parameters with a low surface roughness value. The results obtained were a combination of a feedrate of 500 mm/rev, a spindle speed of 4000 rpm, and an unbound DoC value (in this study 1 mm and 1.5 mm).

Keywords: CNC, Design of Experiment, Full Factorial, Surface Roughness