ABSTRACT

This paper presents the results of experimental work carried out in the process of turning on the S530 X 1000 Lathe with research objects are C45 Steel. This study aims to optimize the cutting parameters of the research object in order to minimize surface roughness using the Taguchi method. In this study, the orthogonal array used L_9 (3^3) array with 3 levels and 3 factors. The factors used are derived from cutting parameters such as spindle speed, feed rate, and depth of cut. In this study, using cutting parameters on C45 Steel objects such as the following: spindle speed 120, 280 and 440 rpm, feed rates 0.05, 0.10, 0.21 mm / rev, and depth of cut 0.5, 0.75, and 1 mm. In this study, using cutting parameters on C45 Steel objects as follows: spindle speed 855, 1350, and 2000 rpm, feed rates 0.13, 0.17, and 0.21 mm/rev, and depth of cut 0.3, 0.4, and 0.5 mm. The use of Signal to Noise Ratio (S / N Ratio) uses a "smaller is better" approach to find optimal experimental results in minimizing surface roughness. After that, an analysis of variance (ANOVA) test is performed in order to prove that there are significant differences in each parameter. The researcher will test a number of experiments, an analysis will be carried out on each experiment that has been tested and then one of the optimal experiments will be chosen to minimize surface roughness.

Keywords: Optimize, Taguchi method, Surface roughness, Signal to Noise Ratio, ANOVA.