Surface Roughness Optimization in Milling Aluminium Alloy by Using the Taguchi´s Design of Experiment

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A unique combination of properties makes aluminium one of the most versatile engineering and construction materials. The aluminium alloys can be machined easily and economically if suitable practice and proper tools are used. A statistical design of experiments was performed to investigate the effect of selected cutting parameters and a cutting fluid on the surface roughness of AlMgSi1 aluminium alloy (EN AW 6082) machined by end milling. For the experimental procedure, three cemented carbide end milling cutters of diameter 12 mm with 3 cutting edges were used. The input parameters taken into consideration were helix angle, cutting speed, and using a cutting fluid. With application of ANOVA, the helix angle was investigated as the most significant parameter. The other ones were not statistically significant. To eliminate the negative impact of the cutting fluid on the health and environment, dry machining is recommended in this research.

Keywords: surface roughness, aluminium alloy, design of experiment, end milling

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