

## **A STUDY OF OPTIMIZATION OF DRILLING PROCESS PARAMETERS USING TAGUCHI METHOD.**

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### **ABSTRACT**

The aim of this work is utilize Taguchi method to investigate the effects of drilling parameters such as spindle speed, feed rate and drill diameter on surface roughness and material removal rate in drilling of gray cast iron using solid carbide tool. The Taguchi method, a powerful tool to design optimization for quality, is used to find optimal cutting parameters. Orthogonal arrays, the signal- to- noise ratio, the analysis of variance are used to analyze the effect of drilling parameters on the quality of drilled holes. Number of experiments based on L 9 orthogonal array is conducted using CNC vertical machining centre. Statistical software Minitab18.1 is used to analyze experiment results. ANOVA is used to determine the most significant control factors affecting the surface roughness and material removal rate. ANOVA has shown that the drill diameter has significant role to play in producing higher material removal rate and lower surface roughness. The optimum levels of various parameters obtained in present work for MRR are Spindle speed 800 rpm, feed rate 90 mm/min and Drill diameter is 12.7 mm. The optimum levels of various parameters obtained in present work for SR are, Spindle speed 1000 rpm, feed rate 70 mm/min and Drill diameter is 10 mm.

**KEYWORDS:** Drilling optimization, surface roughness, material removal rate, signal-to-noise ratio, ANOVA.