

# ***ANALYSIS OF COOLING MEDIA VARIATIONS AND DRILLING PARAMETERS ON DRILL BIT WEAR IN THE ST37 STEEL PLATE DRILLING PROCESS***

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## ***ABSTRACT***

*Wear on the drill bit is the main factor that affects the efficiency and quality of drilling results. This study aims to analyze the effect of cooling media variations and drilling parameters on the wear rate of High Speed Steel (HSS) drill bits in the ST37 steel plate drilling process. The variation in the parameters studied included feeding motion (0.045, 0.086, 0.142 mm/rev), rotation speed (1100, 1460, 1860 rpm), and the type of cooling medium used, namely Drromus oil, mineral water, and coconut oil. The drilling process is carried out using a milling machine, and the wear of the drill bit is measured using a USB microscope. The Taguchi method with the orthogonal array design of L9 was used to design the experiment, while ANOVA analysis was applied to determine the significant influence of each parameter. The results showed that the combination of parameters with a rotation speed of 1100 rpm, feeding motion of 0.045 mm/rev, and Dromus oil cooling medium resulted in the smallest wear, amounting to 0.21192 mm. In contrast, the greatest wear occurred at a combined rotation speed of 1860 rpm, feeding motion of 0.142 mm/rev, and mineral water cooling media, with a wear of 0.48975 mm. It can be concluded that the selection of the cooling medium and the right drilling parameters can significantly reduce the wear of the drill bit, thereby improving the efficiency and service life of the cutting tool.*

**Keywords:** *Drill bit wear, cooling medium, drilling parameters, ST37 steel plate, taguchi method, ANOVA, HSS.*