

## OPTIMIZATION OF THE TOOL PARAMETERS IN ULTRASONIC VIBRATION ASSISTED DRILLING BY TAGUCHI METHOD

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### ABSTRACT

Today the world is developing very fast and through to achieve the goal of precisely machined jobs and instruments. Be it, defense instruments or surgical tools there is a need of precisely machined tools in each and every field. For fulfilling this growing demand of market, the advanced machining technologies are developed and improvised since last few decades. These advanced machining techniques involves Electric Discharge Machining, Electro-Chemical Machining, Ultrasonic Machining etc. This can be combined with conventional turning, drilling or milling processes to obtain better results in terms of surface finish, material removal rate and. tool wear rate. In this research paper an attempt is made to optimize the tool wear parameters and surface roughness parameters by varying the machining parameters like power rating, abrasive grit size, slurry material, and also tool material in ultra -sonic drilling process. Also, the process is optimized by Taguchi method and graphical interpretation of Tool wear rate (TWR) and SR (surface roughness) is done against variables by ANOVA (analysis of variance). Finally ,the impact of each parameter is plotted in bar chart separately for Tool Wear Rate and Surface Roughness using raw data and S/N ratio analysis data to determine the error in each case.

**KEYWORDS:** ANOVA, Surface Roughness, Taguchi ,Tool Wear Rate, Ultra-Sonic Drilling

**Received:** Feb 11, 2016; **Accepted:** Feb 18, 2016; **Published:** Feb 23, 2016; **Paper Id.:** IJMPERDAPR20161