

ABSTRACT

One of the most important things in the cutting process is cutting temperature. High temperature rise can affect the cutting process in terms of material properties such as modulus young, coefficient of thermal expansion, specific heat and thermal conductivity. Overheating can adversely affect tool life and shape dimensions of material surfaces, which will shorten tool life and increase production costs. UVAT has been shown to be able to produce lower cutting temperatures compared to conventional machining. In this study the optimization process is carried out using a UVAT holder. Machining parameters give effect to the size of the temperature. In this study the Taguchi method is used to obtain optimal machining parameters. The parameters used are four, namely (spindle speed, feedrate, depth of cut) and there are additional vibrations (frequency). Material Al 6061 is selected by machining process based on orthogonal array $L_{27} (3^4)$. Minimum temperature data is obtained based on S / N Ratio calculation, namely spindle speed = 635 Rpm, feedrate = 0.17 mm / min, depth of cut = 0.1 mm and frequency = 20,000 Khz. Based on ANOVA Test parameters that affect the spindle speed of 60.47% then for the feedrate of 24.67% for a depth of cut of 12.35% and a frequency of 0.01%.

Key word: UVAT, *temperature*, *UVAT holder*, Taguchi Method