

ABSTRACT

The occurrence of plow during micro-turning has a negative impact on the cutting force and therefore must be minimized. Plowing occurs because the workpiece cuts imperfectly that it does not produce chips. This results in the need for high cutting forces to generate chips during cutting. The cutting force increases when the machining parameters are not suitable. Therefore, this article aims to find out the influence of machining parameters on the cutting force of the turning tool.

On the other hand, vibration-assisted machining has been shown to improve the results of conventional machining by minimizing cutting forces. This capability reduces the tool's workpiece cutting rate through discontinuous movement between the bit and the workpiece. The discontinuous cutting mechanism in 2D-UVAT could be an alternative to reduce ploughing during micro turning. The vibration of the tool tips will reduce the appearance of plastic flow that occurs at the thickness of the uncut chip during cutting. This study successfully found a positive effect of reducing VAM cutting effort on micro turning by 13% at 26 kHz. The influence of each machining parameter (feed, spindle speed) on the cutting force is also observed in this study. Therefore, information related to the influence of machining parameters and VAM on the turning force can be used as a reference in the study.

Keywords: *Micro turning, ploughing, Elliptical Vibration Assisted Turning (EVAT), machining parameters, cutting force.*