ABSTRACT

The need to suppress the appearance of the ploughing phenomenon in micromachining machining processes, especially microturning, is important. The ploughing phenomenon occurs due to incomplete cutting of the cutting tool when the depth of cut is smaller or equal to the tool nose radius of the cutting tool, resulting in the removal of chips from the workpiece. The chips then accumulate during cutting, causing an increase in cutting force. In addition to the influence of the ploughing phenomenon, the cutting force is also influenced by the machining parameters during the cutting process. Providing vibration in vibration-assisted machining can reduce the cutting force that occurs during the cutting process. This is due to the intermittent cutting that occurs during the VAM machining process, so that the contact between the cutting tool and the workpiece (TWCR) is reduced. With reduced TWCR, the cutting force value will decrease and increase the cutting tool life. This study examines how the machining parameters and the application of vibration during cutting affect the cutting force. In the experiment, it was found that the machining parameters affect the cutting force value. The application of vibration in this experiment can reduce up to 24% of the cutting force value of microturning cutting.

Key word: ***Micromachining, ploughing, vibration-assisted machining, machining parameters, cutting force, uncut chip thickness*.**