

## ABSTRAKT

### STUDY OF TEMPERATURE CUTTING TURNING MACHINING USING A ROTARY CUTTING TOOL ON AZ31 MAGNESIUM ALLOY MATERIAL

By

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*Magnesium is a lightweight material and has the characteristics of a good cut on the machining process. However, the conventional lathe machining process has the disadvantage of magnesium easy to get burned due to a low flash point. To overcome this commonly used coolant, but the use of coolant is now trying to be minimized because the resulting environment pollution. One method to lower the temperature of the cutting is to use a rotary cutting tool. With this cutting method, blade cooling during periods without cutting in one round tool cutting. Test results using the type AZ31 magnesium materials on the workpiece parameters cutting speed ( $V_w$ ) 120, 140, 160, 180 and 200 m / min, tool rotational speed ( $V_t$ ) 10, 35 and 50 m / min, the feeding ( $f$ ) 0.05 mm / rev and depth of cut ( $d$ ) of 0.05 mm and 0.1 mm with cutting temperatures seen using thermovision application results obtained 83.5882 ° C minimum temperature and maximum temperature of 176.235 ° C. These results indicate that the cutting temperature using a rotary cutting tool decreased by 70 ° C or approximately 45% compared to the cutting temperature using a non-rotating tool. Other results showed that there is an influence of variations in the parameters used. The higher the tool rotational speed ( $V_t$ ), the cutting temperature will decrease and the higher the rotational speed of the workpiece ( $V_w$ ), the cutting temperature will increase. Thermovision also shows that there are differences in the temperature distribution, which are the largest temperature on the cutting area (cutting point), then the temperature decreases causes of the rotation far away from the tool cutting point.*

**Keywords:** *Cutting temperature, rotary cutting tool, AZ31 magnesium alloy, thermovision.*