




**STUDY ON MACHINING OF ASSAB 718HH  
WITH AND WITHOUT COOLER DEVICE**

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“I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree.”

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## ABSTRACT

Electrical discharge machining (EDM) is one of the most widely applied non-conventional processes. Its most important advantage is that its effectiveness is regardless of the mechanical properties of the machined materials. Hence, titanium, which is a difficult-to-machine material, can be machined effectively by EDM. However, EDM machined surfaces have defects of micro cracks and pores formed by the strong temperature gradient during machining. These defects result not only in poor surface precision, but also in a shortened service life of machinery parts. Crack can be found under the machined surface when detail analysis was conducted. Crack tip tend to follow the temperature isotherm. Therefore, the study aims to reduce the crack formation by introducing cooler method. This study focus on the behavior of machining ASSAB 718HH using EDM die sinking which has undergo machining with and without cooler device. The investigation were conducted cover the area such as material removal rate (MRR), tool wear rate (TWR), and surface integrity such as hardness, surface roughness (SR), white layer thickness (WLT), roundness, and microstructure. Furthermore, this study discusses the relationship between parameters selected with the effect on the EDM performance and surface integrity exhibits after EDM process. Based on the result obtained, the machining with cooler device helps in improving the MRR and the hardness of the machined specimen.

## AUTHOR DECLARATION

“I declare that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. This report has not been accepted for any degree and is not concurrently submitted in candidature of any degree”

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