

## C616622 : MAJOR INDUSTRIAL ENGINEERING  
KEY WORD: GREY CAST IRON/CUTTING TOOLS

SUKCHEEP LOPHANSRI : TURNING CONDITIONS OF GREY CAST IRON WITH CARBIDE COATED AND CERAMIC CUTTING TOOLS. THESIS ADVISOR : SOMCHAI PUAJINDANETR , Ph.D. 120 pp. ISBN 974-636-769-2.

This research studied turning conditions of grey cast iron using cutting tools being carbide coated and ceramic. The objectives were 1) to study the influence of feed rate and cutting speed on cutting tool wear and workpiece's surface roughness in finishing cut, 2) to study tool life criterion considered by tool wear and workpiece roughness in order to find the optimal point being maximum profit.

This research used workpiece material as grey cast iron FC25 standard by JIS G 5501 on different conditions such as cutting speed 150 to 350 m/min. and feed rate between 0.1 to 0.4 mm/rev. at constantly depth of cut 0.3 mm and study relative of tool wear and workpiece roughness and the life of tool with time to find out turning conditions with maximum profit and considering base on minimum production cost and maximum production rate.

The results showed that cutting speed and feed rate were effect on the tool life. Tool wear increased with cutting speed and feed rate. However, the feed rate was effect on workpiece's surface roughness : increasing with feed rate, increasing with roughness.

The experimental results of the carbide tools found that the parameters used for the Taylor's equation were 0.251 of constant (n), 8.5 m/sec of cutting speed ( $V_r$ ) for 60 seconds of tool life. Whereas, the results of ceramic tools provided the parameters that the constant (n) was 0.301 and the cutting speed ( $V_r$ ) for 60 seconds of tool life was 8.5 m/sec. The optimal cutting speed for carbide coated tool and ceramic tool was 234 m/min with the maximum profit rate of 0.037 baht/second, and 186 m/min with the maximum profit rate of 0.01baht/second, respectively, where the sale price of workpiece was 37.5 baht. Therefore, the carbide coated tool provided the profit more than ceramic tool.

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