PENGARUH VARIASI JENIS PENDINGIN DAN KEDALAMAN POTONG PADAPROSES BUBUT DENGAN MATERIAL BAJA ST37 TERHADAP UMUR PAHAT *HIGH SPEED STEEL*(HSS)

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ABSTRAK

Penelitian ini menganalisis pengaruh variasi jenis pendingin dan kedalaman potong pada proses bubut dengan material baja ST 37 terhadap umur pahat High Speed Steel (HSS). Tujuan dari penelitian ini yaitu Menentukan metode pendinginan dan kedalaman potong yang memberikan keseimbangan terbaik untuk meningkatkan umur pahat. Penelitian ini menggunakan tiga variasi pendingin: *solube oil and water* dengan perbandingan 1:30, 1:40, dan udara (tanpa pendingin), serta variasi kedalaman potong (0,5, 1, 1,5). Metode eksperimen laboratorium dengan pengukuran keausan pahat dan analisis data menggunakan metode Taguchi serta perangkat lunak Minitab diterapkan. Hasil penelitian ini menunjukkan bahwa variasi jenis pendingin dan kedalaman potong memiliki pengaruh signifikan terhadap umur pahat HSS. Pendingin *solube oil and water* dengan perbandingan 1:40 dengan kedalaman 0,5 paling efektif dalam mengurangi keausan pahat dan meningkatkan umur pahat yaitu 68.39 menit. Kedalaman potong yang optimal juga ditemukan dapat meminimalkan keausan pahat. Penelitian ini memberikan panduan praktis bagi industry manufaktur dalam pemilihan metode pendinginan dan pengaturan kedalaman potong untuk meningkatkan efisiensi proses bubut dan mengurangi biaya produksi.

Kata Kunci: Proses bubut, Baja ST 37, *High Speed Steel* (HSS), Variasi jenis pendingin, Kedalaman potong, Umur pahat.

THE EFFECT OF VARIATIONS IN TYPES OF COOLANT AND CUT DEPTH IN TURNING PROCESS WITH ST 37 STEEL MATERIAL ON HIGHSPEED STEEL (HSS) TOOL LIFE

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ABSTRAC

This research analyzes the effect of variations in coolant type and cutting depth in the turning process with ST 37 steel material on High Speed Steel (HSS) tool life. The aim of this research is to determine the cooling method and depth of cut that provides the best balance to increase tool life. This research used three variations of coolant: soluble oil and water with a ratio of 1:30, 1:40, and air (without coolant), as well as variations in cutting depth (0.5, 1, 1.5). Laboratory experimental methods with tool wear measurements and data analysis using the Taguchi method and Minitab software were applied. The research results show that variations in coolant type and depth of cut have a significant influence on HSS tool life. Cooling soluble oil and water with a ratio of 1:40 with a depth of 0.5 is most effective in reducing tool wear and increasing tool life that is 68.39 minute. Optimal cutting depth was also found to minimize tool wear. This research provides practical guidance for the manufacturing industry in selecting cooling methods and setting cutting depth to increase turning process efficiency and reduce production costs.

Keywords*: Turning process, ST 37 Steel, High Speed Steel (HSS), Variations in coolant type, Cutting depth, Tool life*