ABSTRACT

Small and medium industries are using turning process to produce automotive, agriculture and farming parts. The process still use coolant fluid with commercial base and heat treatment process for the workpiece after machined. The side effects of use coolant fluid are not environmental friendly, harm the operator’s health, increase the cost production in recycle the used coolant fluid. The side effects of heat treatment workpiece after machined was raised the distortion and change of workpiece’s geometry. Therefore at this study conducted dry turning and hard turning to know the performance of tool, tool life and increase small and medium industries’ productivity. The workpiece was dry and hard turned is AISI 1045 steel which already hardened (40 – 45 HRc). The tools will be used in turning process is coating CVD insert carbides. The turning process done at 12 cutting conditions which combined with low, medium, and high condition. The result of turning process like 12 cutting conditions and tool life are being analyzed and regressed with Design Expert’s software. At the final result of analysis will be obtained math models of tool life based Taylor equation. The Taylor’s tool life equation will be expanded with adding the variable of metal cutting like feeding (f) and depth of cut(a).

Keyword: Turning process, tool life, hard turning, dry turning, design expert