

# Effect of Cutting Parameters on Sustainable Machining Performance of Coated Carbide Tool in Dry Turning Process of Stainless Steel 316

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**Abstract.** The manufacturing industry aims to produce many products of high quality with relatively less cost and time. Different cutting parameters affect the machining performance of surface roughness, cutting force, and material removal rate. Nevertheless, a few studies reported on the effects of sustainable factors such as power consumed, cycle time during machining, and tool life on the dry turning of AISI 316. The present study aims to evaluate the machining performance of coated carbide in the machining of hard steel AISI 316 under the dry turning process. The influence of cutting parameters of cutting speed, feed rate, and depth of cut with their five (5) levels is established by a central composite design. Highly significant parameters were determined by analysis of variance (ANOVA), and the main effects of power consumed and time during machining, surface roughness, and tool wear were observed. Results showed that the cutting speed was proportional to power consumption and tool wear. Meanwhile, insignificant to surface roughness, feed rate most significantly affected surface roughness and power consumption followed by depth of cut.