

Statistical Analysis of Surface Roughness and Tool Life Using (RSM) in Face Milling

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Abstract : Currently, higher production rate with required quality and low cost is the basic principle in the competitive manufacturing industry. This is mainly achieved by using high cutting speed and feed rates. Elevated temperatures in the cutting zone under these conditions shorten tool life and adversely affect the dimensional accuracy and surface integrity of component. Thus it is necessary to find optimum cutting conditions (cutting speed, feed rate, machining environment, tool material and geometry) that can produce components in accordance with the project and having a relatively high production rate. Response surface methodology is a collection of mathematical and statistical techniques that are useful for modelling and analysis of problems in which a response of interest is influenced by several variables and the objective is to optimize this response. The work presented in this paper examines the effects of cutting parameters (cutting speed, feed rate and depth of cut) on to the surface roughness through the mathematical model developed by using the data gathered from a series of milling experiments performed.

Keywords : Statistical analysis (RSM), Bearing steel, Coating inserts, Tool life, Surface Roughness, End milling.

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