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Assessment of flank wear and tool life in high speed face milling under dry and near dry machining (Conference Paper)

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Abstract

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One of the leading environmental pollution sources related to machining industry is the massive amount of cutting fluids used. However, coolant performs many advantages, such as chip removal and reducing the cutting zone temperature. This research aims to analyze the effect of dry machining and near dry machining on flank wear progress in high-speed face milling. Two sets of experiments using Box Behnken Design (BBD) as a part of Response surface methodology (RSM) have been conducted for both dry machining and near dry machining on milling AISI 1050 using five coated carbide inserts (TNGA 160408) for each treatment. The flank wear in both dry and near dry machining was measured using Hisomet II Tool Maker Microscope. The boundaries of the variables in this research are 613-817 (m/min) cutting speed, 100-200 (mm/min) feed rate, and 0.1-0.2 (mm) depth of cut. The results show that at high speed near dry milling, the flank wear and the tool life was better as compared with the dry machining. A new mathematical model for flank wear and tool life has been developed. In conclusion, near dry machining proved to be a better option at high speed. © IEOM Society International.

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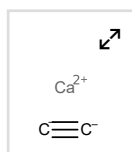
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