

Article Abstract

Title:	A study on the machining parameters optimization of micro-end milling process
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Abstract:	Micro-machining is the basic technology of micro-engineering for the production of micro-sized parts and components. Micro-end milling is the most important micromachining process, widely used for the manufacturing industries due to its capability of producing tedious geometric surfaces with good accuracy and surface finish. In micro end milling material removal rate is one of the important aspects, which require attention both from industry personnel as well as in Research and development. In modern industry one of the trends is to manufacture low cost product in short time. MRR which indicates processing time of the work piece and it is an important factor that greatly influences production rate and cost. MRR greatly vary with the change of cutting process parameters. This paper focuses the taguchi technique for the optimization in micro-end milling operation to achieve maximum metal removal rate (MRR) considering the spindle speed, feed rate and depth of cut as the cutting parameters. An orthogonal array, signal-to-noise (S/N) ratio and Pareto analysis of variance (ANOVA) are employed to analyze the effect of these milling parameters. The analysis of the result shows that the optimal combination for higher metal removal rate (MRR) is medium cutting speed, high feed rate and high depth of cut. Using Taguchi method for design of experiment (DOE), other significant effects such as the interaction among milling parameters are also investigated. The study shows that the Taguchi method is suitable to solve the stated problem. Based on the verification experiment it is concluded that the percentage of error of response was less.
Keywords:	Taguchi method of DOE, optimization, micro-end milling, MRR, Pareto ANOVA