

Article Abstract

Title:	Parametric optimization of CNC end milling using entropy measurement technique combined with grey-Taguchi method
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Abstract:	End milling is the most important milling operation, widely used in most of the manufacturing industries due to its capability of producing complex geometric surfaces with reasonable accuracy and surface finish. However, with the inventions of CNC milling machine, the flexibility has been adopted along with versatility in end milling process. In order to build up a bridge between quality and productivity and to achieve the same in an economic way, the present study highlights optimization of CNC end milling process parameters to provide good surface finish and high material removal rate (MRR). The surface finish of the machined surface has been identified as quality attribute whereas MRR has been treated as performance index directly related to productivity. Attempt has been made to optimize quality and productivity in a manner that these multi-criteria could be fulfilled simultaneously up to the expected level. This has invited a multi-objective optimization problem which has been solved by Taguchi method coupled with grey relational analysis. Depending on relative importance, the priority weights of individual quality and performance attributes have been estimated by entropy measurement technique. Multi-objectives related to quality and productivity has been accumulated to evaluate an equivalent single quality index (called grey relational grade); which has been optimized finally by Taguchi method. Application feasibility of the aforesaid optimization technique has been illustrated in this reporting.
Keywords:	CNC end milling, surface finish, material removal rate (MRR), entropy measurement technique, Taguchi method