

# Optimisation of Cutting Parameters using Taguchi Loss Function for Turning and Milling Process



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**Abstract:**

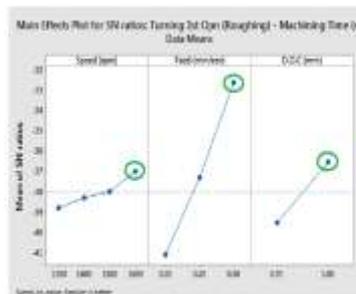
Cutting parameters is one of the important factors in manufacturing process, which plays key role in the output performance of product. Proper selection of cutting parameters needs to be designed in such a way that, which will reduce the machining time, improves the delivery and also meeting customer quality requirements. Before concluding the parameters a thorough investigation has to be made by considering the requirements of customer and working out for better QCD i.e. Quality, Cost and Delivery of the product. This has to be a win – win situation for both the company and the customer.

In current project work existing data of manufacturing retaining nut was collected and analyzed by considering speed, feed and depth of cut as critical parameters. In this process trials were made in selection levels of all critical parameters. Taguchi methodology was followed for optimization of cutting parameters of turning and milling process. Taguchi techniques was implemented by using Minitab software and selecting mixed model level approach, selection of orthogonal array i.e. L16 (OA), analysis of signal-to-noise (S/N) ratio and Analysis of variation (ANOVA) was used for determining the best optimized process parameters in reducing cycle time and improving surface finish of the product.

Variations in output observed in each trial by following L16 array. Results showed the variations in machining time and surface finish. Analysis was made where in the variations were analyzed by considering speed, feed and depth of cut. Signal-to-Noise ratio and ANOVA analysis showed the best combinations of process parameters and its importance in attaining best product output in terms of QCD by improving surface finish and reducing machining time have been made.

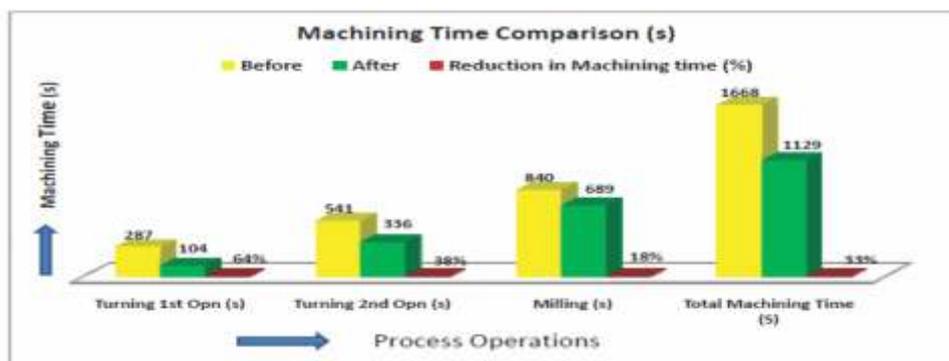


**Retaining nut**



Source	DF	Adj SS	Adj MS	F-Value	P-Value
Speed	3	665.2	221.73	6.6	0.012
Dec	1	561.1	561.12	16.69	0.003
Feed	2	12579.6	6289.81	187.1	0
Error	9	302.6	33.62		
Total	15	15827.4			

**Taguchi analysis (S/N & ANOVA)**



**Machining time comparison (After Taguchi implementation)**