Optimization of Surface Roughness by Taguchi's Method for Turning Process

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Abstract : Study aimed at evaluating the best process environment which could simultaneously satisfy requirements of both quality as well as productivity with special emphasis on reduction of cutting tool flank wear, because reduction in flank wear ensures increase in tool life. The predicted optimal setting ensured minimization of surface roughness. Purpose of this paper is focused on the analysis of optimum cutting conditions to get lowest surface roughness in turning SCM 440 alloy steel by Taguchi method. Design for the experiment was done using Taguchi method and 18 experiments were designed by this process and experiments conducted. The results are analyzed using ANOVA method. Taguchi method has depicted that the depth of cut has significant role to play in producing lower surface roughness followed by feed. The Cutting speed has lesser role on surface roughness from the tests. The vibrations of the machine tool, tool chattering are the other factors which may contribute poor surface roughness to the results and such factors ignored for analyses. The inferences by this method will be useful to other researches for similar type of study and may be vital for further research on tool vibrations, cutting forces etc.
Keywords : surface roughness (ra), machining, dry turning, taguchi method, turning process, anova method, mahr perthometer