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A comparative study on optimization of machining parameters by turning nickel based super alloys according to Taguchi method

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In this paper, the effects of cutting tool coating material and cutting speed on cutting forces and surface roughness were investigated on a Taguchi experimental design by turning Hastelloy X and Inconel 625. Main cutting force, F_z is considered to be cutting force as a criterion. The effects of machining parameters were investigated using Taguchi L18 orthogonal array. Optimal cutting conditions were determined using the Signal-To-Noise (S/N) ratio, which is calculated for average surface roughness and cutting force according to the "the smaller is better" approach. Using the results of Analysis of Variance (ANOVA) and Signal-To-Noise (S/N) ratio, effects of parameters of both average surface roughness and cutting forces were statistically investigated. It has been seen that while feed rate and cutting speed has a higher effect on cutting force in Hastelloy X, the cutting tool and cutting speed has a higher effect on cutting force in Inconel 625 while the depth of cut and feed rate has a higher effect on average surface roughness on Hastelloy X, cutting speed and cutting tool has a higher effect on average surface roughness in Inconel 625.

Biography

Abdullah Altin is an Assistant Professor Doctor in Van Vocational of Higher School Mechanical and Metal Technology Department, from Van Yuzuncu Yil University in Turkey. His field of study is Manufacturing and Construction and has been working on CAD/CAM (Computer aid Design/Computer Aid Manufacture), Solid Edge, Master Cam and Production Technics. He has been in Germany Zittau-Gorlitz University, Mechanical Engineering Department for research and access to training in CAD/CAM by Erasmus Project. And he has also been invited for Teaching Staff Mobility By Erasmus Program to France, Nancy University of Lorraine, Mechanical Engineering Department in May 2013 and June 2014. Since 1996, he has been working at Yuzuncu Yil University as a Lecturer and then as an Assistant Professor. Presently he is the Head of Department.

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