Article Abstract

Title:	Optimization of surface roughness in turning of GFRP composites using genetic algorithm
Author(s):	Syed Altaf Hussain[1*], V. Pandurangadu[2], K. Palani Kumar [3]
Address(es):	[*]Department of Mechanical Engineering, RGM College of Engineering &Technology, Nandyal, A.P, INDIA [2]Department of Mechanical Engineering, JNTUACE-Anantapur, INDIA [3] Department of Mechanical Engineering, Sri Sai Ram Institute of Technology, Chennai, INDIA [*]Corresponding Author: e-mail: rgmaltaf1@gmail.com, Tel +91-9494738100, Fax.+91-08514-275123
Journal:	*International Journal of Engineering, Science and Technology*, Vol. 6, No. 1, 2014, pp. 49-57
Abstract:	Glass fiber reinforced polymer composites are finding its increased applications in variety of engineering applications such as aerospace, automobile, electronics and other industries. However, the users of FRP are facing difficulties to machine it, because of fiber delamination, fiber pull out, short tool life, matrix debonding and formation of powder like chips. The present investigation focuses on the optimization of process parameters for surface roughness of glass fiber reinforced polymer (GFRP) composites using Genetic Algorithm (GA). Experiments are conducted based on the established Taguchi's L_{25} orthogonal array in Design of Experiments (DOE) on an all-geared lathe using poly-crystalline diamond (PCD) tool. The process parameters considered were cutting speed, feed, depth of cut, and work piece (fiber orientation angle). A second order mathematical model was developed for surface roughness prediction using Response Surface Methodology (RSM). An attempt has also been made to optimize the surface roughness prediction model coupling with Genetic Algorithm (GA) to optimize the objective function. Validation of the optimized results was also performed by confirmation experiments.
Keywords:	GFRP composites, Response surface methodology (RSM), Poly crystalline diamond (PCD), surface roughness (R_a), Genetic Algorithm (GA).