

MULTI OBJECTIVE GENETIC ALGORITHM BASED OPTIMIZATION OF PROCESS PARAMETERS FOR HARD PART TURNING

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ABSTRACT

The paper outlines an experimental study to explain the effect of various process parameters on hard turning of EN19, is a high quality alloy steel which is heat treated to 50HRC. Four parameters were chosen as process variables: Speed, Feedrate, and Depth of cut and coolant flow rate. Surface roughness, tool-work piece interface temperature, and Material removal rate are selected as responses. Design of experiment is prepared using Box-Behnken designs in Response surface methodology and 28 experiments were performed on a CNC lathe. Minitab-17, a software environment for statistical computing and graphics is applied successfully for analyzing the effect of different process parameters. An attempt is be made to optimize the cutting parameters using Multi Objective Genetic Algorithm in the focus of attaining minimum surface roughness, minimum work piece temperature and maximum material removal rate. Confirmation experiments were performed in order evaluate the effectiveness of the generated result