MAXIMIZING MATERIAL REMOVAL RATE WITH SURFACE ROUGHNESS AS CONTRAINT AT WHITTLE PROCESS OF EDM SINKING MACHINE

Student Name : Bagus Tris Purwanto
NRP : 2102 100 088
Department : Teknik Mesin FTI-ITS
Project Advisor : Ir. Bobby Oedy P. S., M.Sc, PhD.

Abstract
Several desired performances of EDM Sinking process are high material removal rate (MRR) and low surface roughness. The problem is how to set up the process variables in order to maximize material removal rate (MRR) with surface roughness as constrain.

To maximize the process, the relationship between the above mentioned EDM Sinking performances and process variables Pulse Current, Gap-Width, On Time and Off Time were determined using response surface and linear programming method. The models obtained from an experiment that conducted using Box-Behnken Design.

From this research, the second order polynomial empirical models of material removal rate and workpiece surface roughness obtained. The Maximizing was resulted the highest material removal rate (MRR) of 32.80 mm³/min and the lowest workpiece surface roughness of 4.94 µm. These two values were obtained using level of Pulse Current of 7 [21 A], Gap-Width of 27, On Time of 12 [1040 µs] and Off Time of 8 [720 µs].

Keywords: Maximizing, EDM Sinking, response surface, Box-Behnken, non-linear programming.
[halaman ini sengaja dikosongkan]