International Journal of Mechanical Engineering (IJME)
ISSN(P): 2319-2240; ISSN(E): 2319-2259
Vol. 5, Issue 4, Jun - Jul 2016; 45-52

International Academy of Science, Engineering and Technology
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"OPTIMIZATION OF PROCESS PARAMETERS IN ELECTRIC DISCHARGE MACHINING PROCESS"

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ABSTRACT

Electro Discharge Machining (EDM) is an extremely prominent machining process among newly developed non-traditional machining techniques for "difficult to machine" conducting materials such as heat treated tool steels, composites, super alloys, ceramics, hastelloys, nitralloy, nemonic alloys, carbides, heat resistant steels etc. In EDM, the material removal of the electrode is achieved through high frequency sparks between the tool and the work-piece immersed into the dielectric. The Material Removal Rate (MRR) is the important performance attributes of EDM process. The machining parameters that achieve the highest MRR strongly depend on the size of the machining surface i.e. the engaged electrode and work-piece surface. With upcoming worldwide applications of Titanium grade-2, machining has become an important issue which needs to be investigated in detail.

A well-designed experimental were conducted with L18 Orthogonal Array (OA) based on the design of experiment (DOE) with input factors like Peak Current (Ip), Pulse Time On (Ton), Duty Cycle (TAU) and Voltage Gap (V) was considered for investigation. The effect of the machining parameters on the responses such as MRR was investigated. In this research work, Regression analysis was used to find out the optimal levels of the parameters.

KEYWORDS: Electric Discharge Machining (EDM), Titanium Grade-2, Design of Experiment (DOE), Regression Analysis, Material Removal Rate