COMPARATIVE ANALYSIS OF MILLING OF COPPER AND GRAPHITE ELECTRODES FOR EDM AND IDENTIFYING MACHINE CAPABILITIES

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ABSTRACT

Copper and graphite are the two mostly used materials in Electrical Discharge Machining electrodes in injection mould making. Though several research papers found on comparative analysis of copper and graphite milling, they are not applicable to the selected tool manufacturing company, since the machines used are different and it is totally applications-driven and so much depends on what you have to work with on the shop floor in the way of support equipment. In this work a tool (cost calculator) is developed to be used on the shop floor for a plastic injection mould manufacturing company for the comparative analysis of milling of copper and graphite electrodes for EDM. Machine capabilities of copper and graphite milling are analysed by experimental methods with the optimum parameters set in the machines. Material removal rate for rough milling and surface finishing rate for fine milling are found to be indicators of machine capabilities.

An experienced tool maker can use the cost calculator, providing necessary inputs to calculate the cost and time of producing electrodes, leads to a proper comparison of EDM electrode milling in economical terms rather than a guess, which is the current practice.With the use of the cost calculator the costs and time of producing electrodes are analysed and recommendations made based on the data available with EDM machines in general. Also flexibility is provided in the cost calculator to change the values fed in the calculator, so that it can be customized for the use of any other tool shop.

KEYWORDS: CNC Milling, Copper Electrodes, Cost Calculator,Graphite Electrodes, Machine Capabilities, Sinking EDM