

Practical Task Assignment 1 – EDM Die sinking

Electro-Discharge Machining (EDM) is a metal removal process by means of electrical energy released by spark discharges occurred between an electrode and the workpiece with electrical conductivity to produce a desired -shaped form in a work-piece. EDM can be classified into die-sinking and wire-cutting. Die-sink uses a copper or graphite to produce an electrode that is a reversed shape of the final product.

Objectives:

- ♦ To understand the basic principle of Electro-Discharge Machining process;
- ♦ To understand the application of the EDM die-sinking
- ♦ To familiar with the typical specification and structure of a EDM die-sinking machine;
- ♦ To familiar with the operation procedures;
- ♦ To be able to prepare parameters setting for different applications;
- ♦ To be able to set the alignment of the electrode and workpiece;
- ♦ To be able to appreciate the quality of the result product.

Training content

This assignment is required to produce a mini watch casing mould product, as the following figures shown by an EDM die-sinking machine FORM 20 and a combination of several different shaped electrodes. The process can be divided into three main steps including preparation of electrode, machine presetting, Operating the system and EDM processing.

1. Electrode preparation

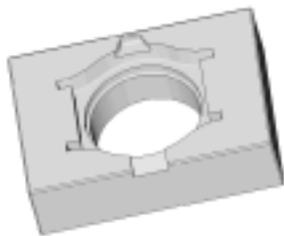
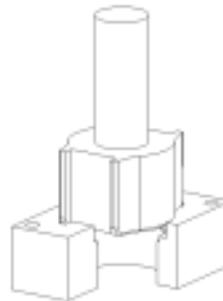
First of all, trainees need to manufacture some different required shape of electrodes from copper rods or cubes by milling and fitting process.

2. Machine presetting

Having understood the machine parameters definition, the trainees should decide an appropriate setting of voltage, current density, pulsed duration, frequency of flushing and intervals based on the dimensional and surface finish requirement. A graph of setting guide is used as reference for interpret the machine own parameter code. (See the graph in the following page)

3. Operating the system and EDM processing

Then the workpiece is aligned with the machine table with aid of a dial indicator. And a magnetic chuck is used to secure it on the EDM table. When using EDM technology, the polarity of electrode must be taken into consideration. For die-sinking EDM roughing cut, the copper electrode is positive. EDM fluid is poured in the EDM and the workpiece is immersed and Finally, after setting the depth of cut and start the EDM processing.



Specification of EDM Die-Sinking Machine Form 20

Table dimension		400 × 300 mm
Travels:	X axis	300 mm
	y axis	250 mm
	Z axis	250 mm
Min. increment		2 μm
Max. workpiece		200 kg
Max. electrode weight		10 kg
Machining peak current		32 A
Discharge times		0.8 μs to 3.2 μs
Interval times		0.8 μs to 1.6 ms