

# Working principle of EDM machine

## Detail Introduction :

Electrical Discharge Machining or, as it is most commonly referred to as, EDM, is a piece of computer numerically controlled machinery that uses electricity instead of a cutting tool to cut away unwanted material.

## How Does an EDM Machine Work?

An EDM machine works by removing material by applying a high-voltage electric spark discharge. The electrode tool is made of an electrically conductive material and is dipped into a dielectric fluid (usually kerosene or deionised water) during the electrode setting.

There is a GAP between the tool and the work-piece, so there is a constant gap. The resulting electro-thermal heat liquefies the materials and flushes them away. The work-piece is then left with a small percentage of partially-melted material that cannot be removed from the work-piece's surface. This layer is called the recast layer or white layer.

An EDM machine works by applying an electric current to a single electrode. The electrodes are separated by a dielectric fluid, which acts as an insulator under normal conditions.

However, under high-pressure, the fluid is ionized and is ready to conduct electricity. This electrical discharge removes the material from the workpiece. An EDM machine uses a negative and a positive power supply to carry out this process.



The wire electrode on an EDM machine breaks the dielectric fluid barrier, melting microscopic particles and eroding material. This process is repeated hundreds of thousands of times per second. The EDM machine controls the movement of the electrode and a dielectric fluid to cool the workpiece and electrode.

Once the desired dimensions are achieved, the wire EDM machine may perform additional 3-D orbiting passes. There are many different types of EDM machines, each with its own advantages and disadvantages.

The EDM machine produces thousands of sparks per second. Each spark originates from a specific point in the gap, which shifts continuously over the workpiece surface.

This process reproduces the tool's profile on the workpiece surface. A small portion of the tool is eroded by each spark. The process is also known as sinker EDM. In this way, the machine can be used for both metal and plastic parts.

An EDM machine works by applying a high-frequency electric current. This is an efficient way of removing tiny pieces of material. It is a good tool for making parts, but it can be expensive.

An EDM machine is the best option if you want to make accurate, precision cuts. It is capable of cutting even the smallest particles. This is the reason it is so popular. With the right parameters, it can be used for various applications.

In the EDM process, a negative and a positive voltage are used to apply the current. A workpiece is fixed in a dielectric container. The dielectric fluid acts as an insulator under normal conditions, but under high pressure, the fluid becomes ionized and can conduct electricity.

It is a good choice for machining different types of materials. Its high precision allows it to produce various kinds of workpieces.

The material removal process in an EDM machine involves physical and chemical processes. A series of rapidly recurring discharges causes a breakdown in the material between the electrodes. This leads to a plasma channel and high-temperature material.

The EDM process is a combination of chemical and mechanical processes. A combination of both types of energy can be used to produce a variety of shapes. The two main types of electrodes are attached to the workpiece with a nut.

The EDM machine uses a dielectric fluid to remove material from workpieces. The process also improves the surface finish of the workpiece. Its high temperature creates a layer that is resistant to wear.

Its machining efficiency can be enhanced when combined with other manufacturing processes. A wire EDM will also reduce the risk of oxidation. The wires used in the EDM process are very durable.

The electrodes are made of copper or graphite. These materials are pressed into the workpiece. The electrodes are made of a dielectric fluid. The material chosen will depend on its conductivity and its resistance to erosion.



A graphite electrode is easier to machine than copper, which is stronger. A conductive electrode is more effective at cutting down metals. A high-quality machine will also be easier to maintain.

In a nutshell, the FANUC CNC servo amplifier uses at least four different signals to calculate the position of the tool tip. The motion controller incorporates this information into its algorithms. The upshot is that hand-held electronic tools can achieve accuracies of 0.05 to 0.2mm, even in tricky applications like drilling and turning.