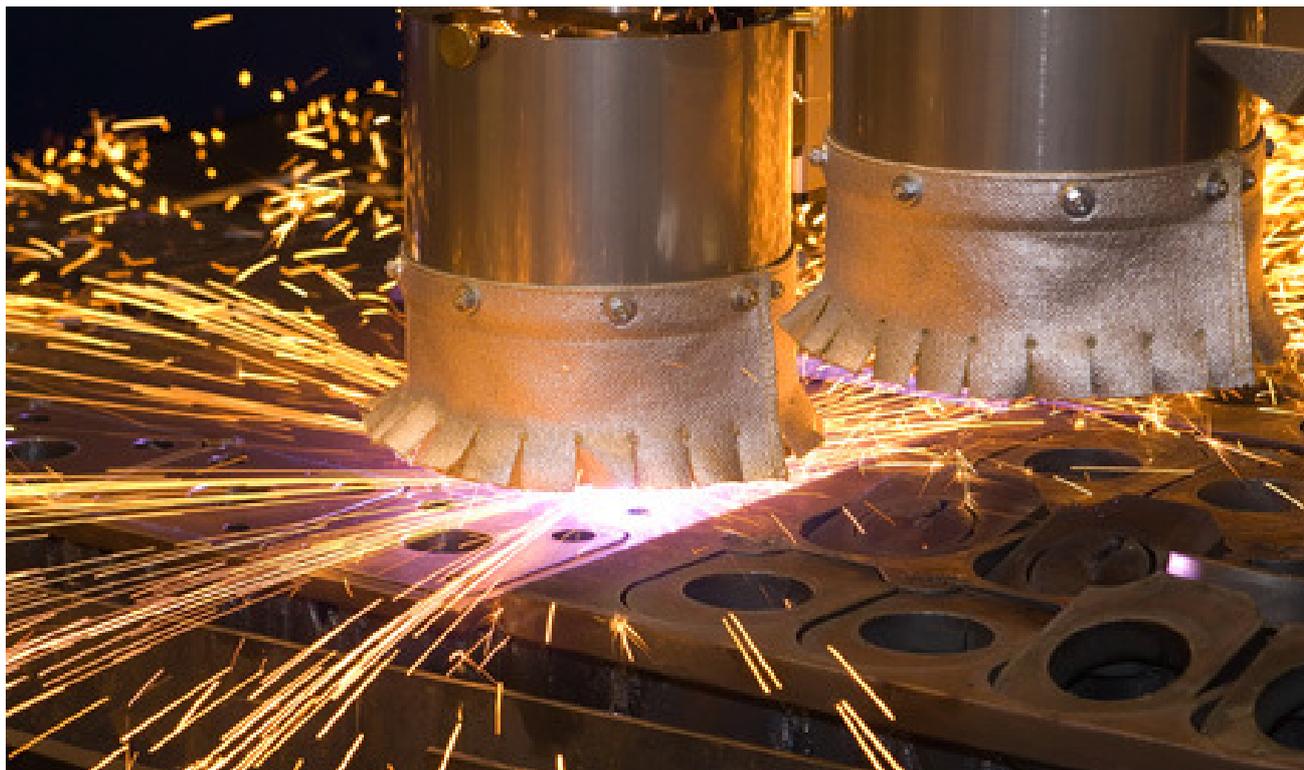


## Plasma Cutting

# FAST, ACCURATE AND HIGH QUALITY



Plasma cutting was originally developed for the thermal cutting of materials which were unsuitable for flame cutting, such as high alloy steels or Aluminium. Today, the process is also used for the economical cutting of thin, low alloyed steels.

### **What is Plasma? The Fourth State of Matter**

One common description of plasma is to describe it as the fourth state of matter. We normally think of the three states of matter as solid, liquid and gas.

For a common element, water, these three states are ice, water and steam. The difference between these states relates to their energy levels. When we add energy in the form of heat to ice, the ice melts and forms water. When we add more energy, the water vaporises into hydrogen and oxygen, in the form of steam. By adding more energy to steam these gases become ionised. This ionisation process causes the gas to become electrically conductive. This electrically conductive, ionised gas is called a plasma.

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### How Plasma Cuts Through Metal

The plasma cutting process, as used in the cutting of electrically conductive metals, utilises this electrically conductive gas to transfer energy from an electrical power source through a plasma cutting torch to the material being cut.

The basic plasma arc cutting system consists of a power supply, an arc starting circuit and a torch. These system components provide the electrical energy, ionisation capability and process control that is necessary to produce high quality, highly productive cuts on a variety of different materials.

The power supply is a constant current DC power source. The open circuit voltage is typically in the range of 240 to 400 VDC. The output current (amperage) of the power supply determines the speed and cut thickness capability of the system. The main function of the power supply is to provide the correct energy to maintain the plasma arc after ionisation.

The arc starting circuit is a high frequency generator circuit that produces an AC voltage of 5,000 to 10,000 volts at approximately 2 megahertz. This voltage is used to create a high intensity arc inside the torch to ionise the gas, thereby producing the plasma.

The Torch serves as the holder for the consumable especially nozzle, and especially electrode, and provides cooling (either gas or water) to these parts. The nozzle and electrode constrict and maintain the plasma jet.

### Characteristics:

- Plate thickness: 0,8 mm up to 160 mm
- Typical: 3 mm up to 40 mm

### Key Features:

- High to very high cut quality
- Smooth, cutting surfaces
- Metallurgical perfect surfaces for welding
- Medium heat input
- Excellent cutting speed
- Low harding on cutting surface