7 Steps To Effectively Use A Plasma Cutter

Step 1: Understanding Plasma Cutting Basics

1. What is Plasma Cutting?

Plasma cutting uses an electrically conductive gas (plasma) to cut through metals. A plasma cutter passes compressed air or another gas through a nozzle, creating an arc that ionizes the gas and generates plasma to cut through metals like steel, stainless steel, and aluminum.

2. When to Use Plasma Cutting?

Plasma cutters are ideal for cutting thick, conductive metals with precision. They can cut complex shapes and work well in fabrication, repair, and metal art.

Step 2: Gather Safety Gear

1. Personal Protective Equipment (PPE)

Eye Protection: Wear safety goggles with at least a shade 5 lens to protect from bright arc light.

Gloves: Use heavy-duty welding gloves to protect your hands from heat and sparks.

Clothing: Wear flame-resistant clothing to protect from sparks and hot metal debris.

Face Shield: Consider using a full face shield for added protection.

2. Work Area Setup

Ensure the workspace is clear of flammable materials.

Use a sturdy, grounded workbench.

Have a fire extinguisher nearby.

Step 3: Setting Up the Plasma Cutter

1. Choose the Right Plasma Cutter

Select a plasma cutter with the appropriate power (amps) based on the thickness of the material you'll be cutting. Higher amperage allows for thicker cuts.

2. Check Power Source and Connections

Ensure your plasma cutter's power supply is suitable for your workshop (110V or 220V).

Connect the cutter's grounding clamp to the metal workpiece securely.

3. Prepare the Air Compressor

Ensure the air compressor is set to the required pressure for your plasma cutter (often between 60-120 PSI).

Some plasma cutters come with built-in air compressors, simplifying setup.

Step 4: Prepare the Metal

1. Clean the Metal Surface

Clean the metal to remove rust, oil, paint, and dirt to ensure a smooth cut.

2. Position the Workpiece

Secure the metal on a stable surface. Consider elevating the metal slightly if cutting through, to protect your work surface.

Step 5: Operating the Plasma Cutter

1. Turn on the Plasma Cutter and Set Amperage

Adjust the amperage based on the metal thickness. Higher settings are for thicker materials, and lower settings are for thinner metals.

2. Position the Torch Correctly

Hold the torch perpendicular to the metal's surface for a straight cut. Angle the torch slightly for beveled edges if needed.

3. Initiate the Arc

Press the trigger to start the arc. Some cutters have a pilot arc feature to make it easier to start the cut without direct contact.

4. Begin Cutting

Start at the edge of the metal and move the torch steadily. For interior cuts, pierce the metal first by holding the torch over the area until the plasma arc cuts through.

Keep a consistent distance between the torch tip and the metal for clean cuts.

5. Maintain Speed and Angle

Move at a steady pace. If moving too slowly, the cut may be rough, and the metal may melt. Moving too fast could result in incomplete cuts.

6. Complete the Cut

Release the trigger after completing the cut, allowing the arc to extinguish, then remove the torch carefully.

Step 6: Post-Cutting Process

1. Check and Clean the Edges

Inspect your cut for rough edges and burrs. Use a metal file or grinder if necessary to smooth any rough edges.

2. Allow the Metal to Cool

The metal will be very hot after cutting, so allow it to cool before handling.

Step 7: Maintenance and Storage

1. Clean the Torch Tip

Inspect and clean the nozzle and electrode to prevent buildup and ensure longevity.

2. Check Consumables

Regularly replace torch consumables like nozzles, electrodes, and shields, as they wear down with use.

3. Store Safely

Unplug and store the plasma cutter in a dry, secure location. Ensure all cables are coiled and any sharp consumables are safely stored.

Tips for Beginners

Practice on Scrap Metal: Before starting on your actual project, practice on scrap metal to get a feel for the speed and distance control.

Use a Guide: For straight lines, use a metal ruler or edge guide.

Adjust Air Pressure: If your cuts are not clean, check the air pressure and amperage settings.

Following these steps will help you use your plasma cutter safely and effectively, giving you clean, professional results on your metalwork projects.