How to achieve Hight-difinition cutting effect --

The following reference guide offers several solutions to help improve cut quality.

➔ Consider the following factors when evaluating plasma cut quality.

- ◆ The machine factors
    1. Machine stability and machine flatness;
    2. Grounding of the machine;
    3. Stability of the material table support plate-to ensure the stability of the workpiece;
- ◆ Plasma Cutting System
    4. Plasma power supply;
    5. Plasma torch installation;
    6. Matching of wearing parts;
    7. Gas purity and pressure;
- ◆ Process variables
    8. Cutting Speed;
    9. Cutting Height →Set arc-voltage;
- ◆ External variables
    1. Material variability;
    2. Operator experience;

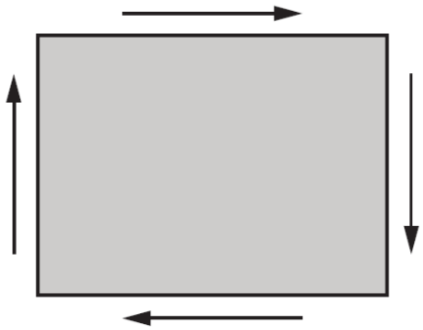
All of these factors can affect the appearance of a cut.

In summary: We provide twelve steps for commissioning.

➔ Step→1： Is the plasma arc cutting in the appropriate direction? Need to be considered when nesting;

- ◆ The squarest cut angles are always on the right side in relation to the forward motion of the torch.
- ◆ Make sure that the direction of the cut is correct.
- ◆ Adjust the cutting direction, if necessary. The plasma arc typically spins clockwise with standard consumables

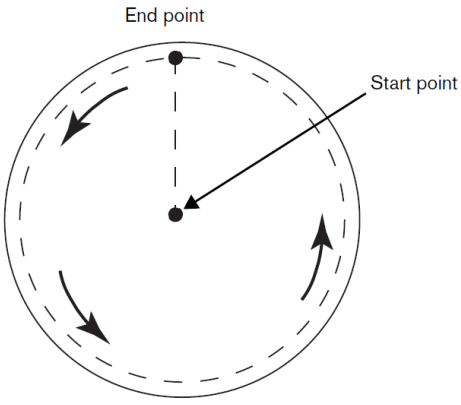
Contour



- ◆ The torch travels clockwise.
- ◆ The good side of the cut is to the right side of the torch, as it travels forward.

Internal feature (hole)

- ◆ Torch travels counterclockwise.



- ◆ Good side of the cut is to the right side of the torch as it travels forward.

➔ Step→2: Was the correct process selected for the material and thickness?

Refer to the cut charts. On the CNC, choose the Cut Chart soft key on the Main screen to view the cut chart for the selected torch type, material, and thickness.

Follow the specifications in the cut charts. →The following information is in the Hypertherm Plasma instruction manual and system description.

- Select the appropriate process for:
  - Material type
  - Material thickness
  - Desired cut quality
  - Productivity goals
- Select the correct plasma and shield gas.
- Select correct parameters for:
  - Gas pressures (or flow rates)
  - Cut height and arc voltage
  - Cutting speed
- Make sure that the correct consumables are being used, and make sure that the part numbers are correct.

 Generally, lower amperage processes offer better angularity and surface finish. However, cutting speeds are slower and dross levels are higher.

➔ Step→3: Are the consumables worn?

- ◆ Inspect consumables for wear.
- ◆ Replace worn consumables.
- ◆ Always replace the nozzle and electrode at the same time.
- ◆ Avoid over-lubricating O-rings.

Use genuine Hypertherm consumables to maximize cutting performance.

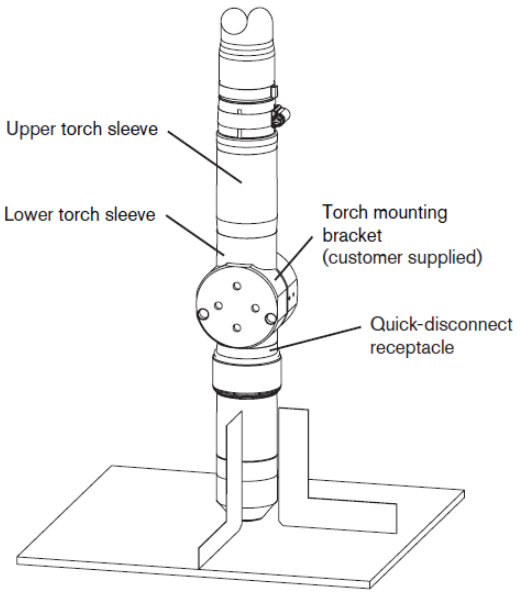
➔ Step→4: Is the torch square to the workpiece?

- ◆ Level the workpiece.
- ◆ Square the torch to the workpiece, both from the front and side of the torch.

Examine the material to see if it is bent or warped. In extreme cases this limitation cannot be corrected.

Torch mounting and alignment

Mounting the torch



Installation

1. Install the torch (with torch leads attached) in the torch mounting bracket.
2. Position the torch below the mounting bracket, so that the bracket is around the lower portion of the torch sleeve but not touching the torch quick-disconnect.
3. Tighten the securing screws.

Note: The bracket should be as low on the torch sleeve as possible to minimize vibration at the tip of the torch.

Torch alignment

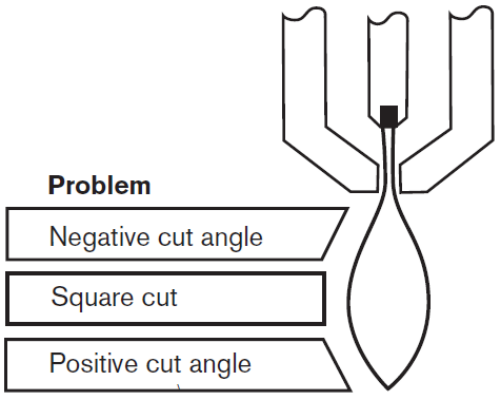
To align the torch at right angles to the workpiece, use a square. See figure above.

➔ Step→5: Is the cut height set at the proper height? Important

- ◆ Adjust the cut height to the correct setting.
- ◆ If you are using arc voltage control, adjust the voltage.

As consumable parts wear, arc voltage settings need continual adjustment to maintain cut height.

- ◆ Cut height can impact angularity.
  - ● Negative cut angle: torch too low; increase cut height.
  - ● Positive cut angle: torch too high; decrease cut height.



Problem	Cause	Solution
Negative cut angle	The torch is too low.	Increase arc voltage to raise the torch.
Square cut		
Positive cut angle	The torch is too high.	Decrease arc voltage to lower the torch.

A slight variation in cut angles can be normal if the variation is within tolerance.

➔ Step→6: Is the cutting speed set too fast or too slow? Important

- ◆ Adjust the cutting speed as needed.

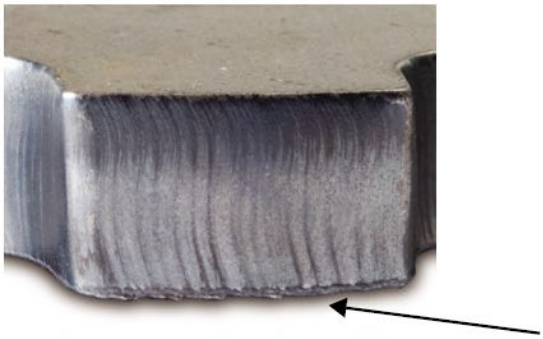
Cutting speed can also impact your dross levels.

- ◆ High-speed dross: The cutting speed is too fast and the arc lags behind. Reduce the cutting speed.
- ◆ Low-speed dross: The cutting speed is too slow and the arc shoots ahead. Increase the cutting speed.
- ◆ Top spatter: The cutting speed is too fast. Reduce the cutting speed.

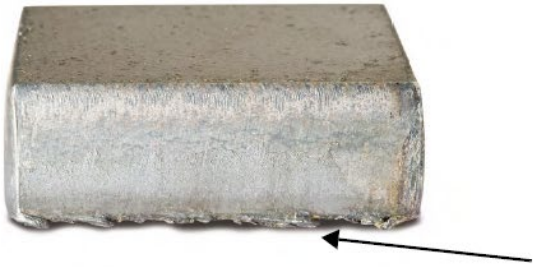
In addition to speed, both material chemistry and surface finish can impact dross levels. When the workpiece heats up, more dross can form on subsequent cuts.

Dross

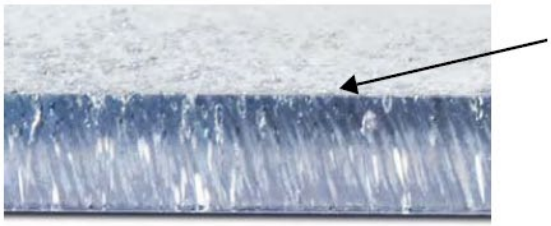
High-speed dross: A small, linear bead of molten material attaches and hardens along the bottom edge of the cut. In addition, S-shaped lag lines are present; dross is difficult to remove and requires grinding.



Low-speed dross: A bubbly or globular accumulation of molten material attaches and hardens along the bottom edge of the cut. In addition, vertical lag lines may be present; dross is easy to remove and flakes off in large chunks.



Top spatter: A light spatter of molten material collects on the top edges of the cut. Usually, this spatter is inconsequential and is most common with air plasma.



➔ Step→7： Are there problems with the gas delivery system?

- ◆ Identify and repair any leaks or restrictions.
- ◆ Use correctly sized regulators and gas lines.
- ◆ Use pure, high-quality gas.
- ◆ If a manual purge is required, confirm that the purging cycle was completed.

➔ Step→8: Is there torch vibration?

◆ Make sure that the torch is tightly attached to the machine.