Protohaven

CNC Pro Plasma Tool Tutorial

Manufacturer: Avid CNC
Model: Pro Plasma 4x8
Torch: Hypertherm Powermax 65
Manual: https://www.avidcnc.com/support/instructions/plasma/

CNC Plasma Operations Checklist

Initial Setup: Powering On

- ▢ Reserve a timeslot at protohaven.org/product/equipment-area-reservations/
- ▢ Enclose the plasma cutting area with Welding Curtains
- ▢ Machine Setup:
    - ⬚ Check that water height is within roughly ⅛" to the top of slats
    - ⬚ Verify work area and gantry rails are clear of any obstacles
    - ⬚ Load your material on the water table
    - ⬚ Verify all E-Stop & Proximity Limit Switches are unlocked
    - ⬚ Verify torch mount is aligned with the magnetic base plate
- ▢ Inspect Torch Consumables
    - ⬚ Check for appropriate nozzle type: regular or detail (swap if necessary)
    - ⬚ Check for damage (replace if necessary)
- ▢ Turn on CNC Control Box (red switch) and Plasma Power Unit
    - ⬚ Verify that motor on CNC Control Box is enabled (black switch)
    - ⬚ Set appropriate amperage on the Plasma Power Unit (consult Hypertherm Torch Operator Manual to reference your Material Type & Thickness)
    - ⬚ Set the Plasma Power Unit to the appropriate Operating Mode. (Non-continuous pilot arc is the standard for piercing and cutting metal plate)

- ▢ Attach Grounding Clamp to either the water bed or your material
- ▢ Verify a compressed air line is connected to the Plasma Power Unit

Preparing G-Code: SheetCam

- Create/edit an existing tool for Material Type & Thickness by referencing the Hypertherm Torch Operator Manual to your Material Type & Thickness:
    - Feed Rate
    - Pierce Delay
    - Pierce Height
    - Cut Height
- Import your plasma .DXF file as “new part”
- Select your part
- Create new “Plasma Cut” Operation (Operation>Plasma Cut)
- Select the layer that contains the vectors you want to cut
- Choose Contour Method
    - Outside Offset is typical for jobs with a mix of closed/open profiles
- Enter the feed rate based on your material type and thickness
- Configure lead-in and lead-out settings and press OK
- Verify that the cutting preview shows the appropriate direction & leads
- Run the Post Processor to create your .TAP g-code file

Operation: Mach 3

- Hit flashing red “Reset” button to clear Emergency Stop condition
    - If the button does not reset when clicked, check that E-Stops & Proximity Limit Switches are unlocked
- Select “Reference All Home” (wait until all three axis lights are green)
- Zero X, Y, and Z axis
- Load your file (File>Load G-Code)
- Jog the machine head to the left/front corner of the desired origin (arrow keys)
    - Before zeroing, make note of the coordinates so that, if you need to restart mid-cut, you’ll have the exact location to return to
    - If prefered, select ”MDI Alt 2” to manually jog to the nearest whole number for your desired origin
- Zero X and Y on the left/front corner of the desired origin
- Zero Z with torch approximately ¼” above the material surface (page up/down)
- Trace the job location using jog/arrow keys to ensure your file fits where desired
- Safety Check:
    - Identify nearest fire extinguisher
    - Ensure E-Stop is easily accessible
    - Put on appropriate eye protection
- Select “Cycle Start” to begin cutting

Cleanup

- Wipe down and dry all rails, gear tracks, and machine components
- Select “Reference All Home” to jog the head of the machine
- Jog the machine head slightly away from Home/Proximity Limit Switches
- Turn off the CNC Control Box
- Note any major maintenance needs at protohaven.org/maintenance
- Disconnect the Ground Clamp and place it next to the power unit
- Recycle waste in appropriate scrap bins

Additional Resources

Mach 3 basics, no THC control
https://www.youtube.com/watch?v=jwaOBPTVOvs

A bit more on THC
https://www.youtube.com/watch?v=kf8S3rL3wYw

Sheet Cam tutorial set:
https://www.youtube.com/watch?v=kcJ7QNc6wG4&list=PLIrtbMa8OzSXwUnT-7fsxovjY0vAIu14l

HTML5 Speed Control (change your life)
https://chrome.google.com/webstore/detail/html5-video-speed-control/ejdipbccipeloijefbkiakckfhdbgocg?hl=en