Waterjet Cutter

Purpose

Uses a stream of highly pressurized water and abrasive garnet to cut complex 2D contours in a wide variety of materials.

Safety

- Never place hand near cutting head.
- Never leave the water jet while in progress
- Make sure the nozzle has a clear path to traverse before moving it.

Physical Limitations

- Working Area: 5’ 2” x 5’ 2”
- Max Cutting Thickness: ~ 6 in.
- Try to keep parts submerged to prevent splashing

Startup and Running Procedure

1. Turn the waterjet on. This must be done in a specific order or we risk damaging the machine. (2) is water , (3) is air, (4) is pump, (5) is electronics, (6) is waterjet. (see posted numbers on walls and buttons)
2. Click the reset button on the pump to erase any pump faults.

3. Prepare your toolpath. Use **Software Procedure Part A.**
4. Secure your part using an appropriate combination of weights and clamps.
5. Use lever to raise or lower water
6. Check the garnet hopper to see that there is enough garnet to finish your job.
7. Move nozzle to desired X-Y zero location with the nozzle high enough to avoid collision with clamps, weights, or waterjet parts. Use **Software Procedure Part B.**
8. Test height separation by lowering the nozzle until it touches the height gauge
9. Begin Machining. Monitor your job. Pause if need be.

Shutdown Procedure

1. Record your information and the pump hours in the log.
2. Do the the startup procedure in reverse to shutdown the machine completely.
3. After using the waterjet, make sure the nozzle is at its highest position and there is no material in the waterjet.
4. Sign out of SUMS terminal

Tool Usages

- The maximum bed size of the Maxiem 1515 is a little less than 5'x5'.
- This tool has a kerf of 0.021", so features smaller than this will not turn out.
- The Maxiem 1515 can cut up to 6" of mild steel.
- For small parts (narrower than 5”) you will need to add tabs so that cut parts do not fall into the tank

Materials

Because water and garnet are non reactive the water jet can cut any material except for diamond and tempered glass.

Video Link

https://www.youtube.com/watch?v=zwJMHwTqOUA

Troubleshooting

- If the water is not lowering use black drain pump in the back of the basin
- If the water level is not rising through the use of the ballast lever, turn yellow lever near blue reservoir on pump to release water into the tank.
- If the water jet is not moving press green and black button to reset.

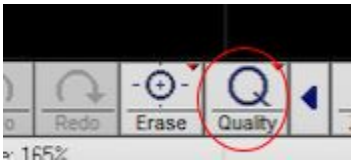
Software Procedure

Symbols Definitions:
Proceed = →
Command Shown in Software = *
Left Click = LC
Right Click = RC

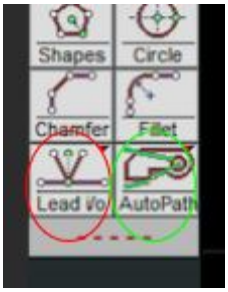
Part A

1. Open OMAX LAYOUT software
2. Upload file
3. Clean the part
   - LC*Clean → LC*Start → LC*OK
     i. Repeat Procedure until all the resulting elements show 0

4. Change Quality
   - RC *Quality → LC *All → LC *3
   - Note: the quality is normally 3 but it can be changed depending on the cut.



5. Create Path
   - LC *Auto Path → RC → LC *Advance Configurations → LC *GO
6. Create Tab
   - RC *Lead i/o → LC *Create Tab → Set the tabs in your img

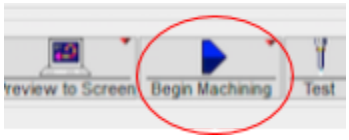


7. Send file
   - LC *Post → LC On the start of the green line → LC *Save
   - RC *Post →LC *Open OMX Path → Select Material, thickness, (uncheck 'uses tilt axies' box)→ Ok

Part B

8. Check Path and Zero Home(Check Step 7 in startup and running procedure)
   - Z axis movement
     i. Up fast = 7
     ii. Down Fast = 1
     iii. Up Slow = Page up
     iv. Down Slow = Page Down
   - X and Y axis movements
     i. Fast = Shit + ←↑→
     ii. Slow = ←↑→
   - Zero home
     i. LC *Zero and the blue icon to zero the home of the X, Y, & Z axis

9. Make a ghost/dry run
   - **RC** *Begin Machine → LC *Go to spot on path (do not enable movement of the A-Jet)



10. Go back home
    - LC *Home X,Y and Z axis