3DP1000 Fine Tuning a 0.6mm Nozzle

Setting the Extrusion Multiplier

1. Prepare for calibration
    a. Heat the nozzle to 225c
    b. Heat the bed to 70c
    c. Raise the print head to Z10
    d. Move the print head to X500 Y500
    e. Home Z
2. Set the nozzle height
    a. Loosen the (2) M5 BHCS that hold the extruder bracket
    b. Put a .015" shim or a business card under the nozzle
    c. Hold the extruder bracket with one hand and slide the shim under the nozzle
        i. You should feel a slight drag on the shim
        ii. Tighten the (2) M5 BHCS
    d. Repeat on the back extruder if installed
    e. DO NOT spend too much time on this step. This will be set properly in the next phase.
3. Prepare to print
    a. Raise the Z axis to 10mm
    b. Home all axis
4. Prepare calibration block for printing
    a. Simplify 3D settings
        i. Open the part named 40x40x15.STL
        ii. Click ADD under Processes and open the file named CSTMR-0.6.FFF
        iii. Go to the Layer tab
            1) Set Top Solid Layers to "0"
            2) Set Bottom Solid Layers to "2"
            3) Set Outline / Perimeter Shells to "1"
        iv. Go to the Infill tab
            1) Set Infill to "0%"
    b. Click Prepare to Print
5. Print the calibration block

Analysis of the printed part

1. Using calipers measure the side wall thickness
    a. This number needs to be very close to 0.7mm
    b. If the wall measures above 0.7mm
        i. Lower the Extrusion Multiplier
    c. If the wall measures below 0.7mm
        i. Raise the Extrusion Multiplier
    d. Make small adjustments ~5% and reprint until the wall is 0.7mm

1st Layer Calibration

1. Prepare for calibration
   a. Heat the nozzle to 225c
   b. Heat the bed to 70c
2. Prepare calibration block for printing
   a. Simplify 3D settings
      i. Open the part named 40x40x0.5.STL
      ii. Use the same settings in the previous step
   b. Click Prepare to Print
   c. Print the part

Analysis of the printed part

The offset of the nozzle to the glass is critical.

If the nozzle is too close to the glass the first layer will be very rough.
In this image the nozzle is too close to the glass-

If the nozzle is too far away from the glass there will be gaps between the lines or the material will not stick to the glass.
In this image the nozzle is too far away from the glass-
(img pending)

When the nozzle is at the proper height all lines will be smooth and adhered to each other.

The easiest way to adjust this offset is with a software correction.

1. Go to the G-Code tabe
   a. Under G-Code Offsets
   b. Adjust the Z-Axis offset

     c. Use very small adjustments of +/- 0.05mm
     d. Reprint the part until it is correct.

Top Solid Infill Calibration

1. Prepare for calibration
    a. Heat the nozzle to 225c
    b. Heat the bed to 70c
2. Prepare calibration block for printing
    a. Simplify 3D settings
        i. Open the part named 40x40x15.STL
        ii. Use the same process as before.
        iii. Go to the Layer tab
            1) Set Top Solid Layers to "4"
            2) Set Bottom Solid Layers to "2"
            3) Set Outline / Perimeter Shells to "2"
        iv. Go to the Infill tab
            1) Set Infill to "15%"
    b. Click Prepare to Print
3. Print the calibration block

Analysis of the printed part

The top of the part is what to look at.
The lines should be uniform and touching each other.

If there are gaps between the lines-
Adjust the extrusion width DOWN in small increments and reprint.

If there are ridges and/or overlapping lines-
Adjust the extrusion width UP in small increments and reprint.

Extrusion width needs to be lower in this image notice the gaps.

This image shows a properly calibrated Extrusion Width.

The machine is now calibrated and ready for printing

On the fly tuning-

Each material and vendor will print a little differently.
The best way to combat this on the fly is to adjust the FLOW RATE.
On the LCD screen simply go to TUNE and adjust the FLOW up or down to achieve the desired results.