Makertech

DSE Stage 10 - X/Y Calibration and First Print

Written By: Makertech

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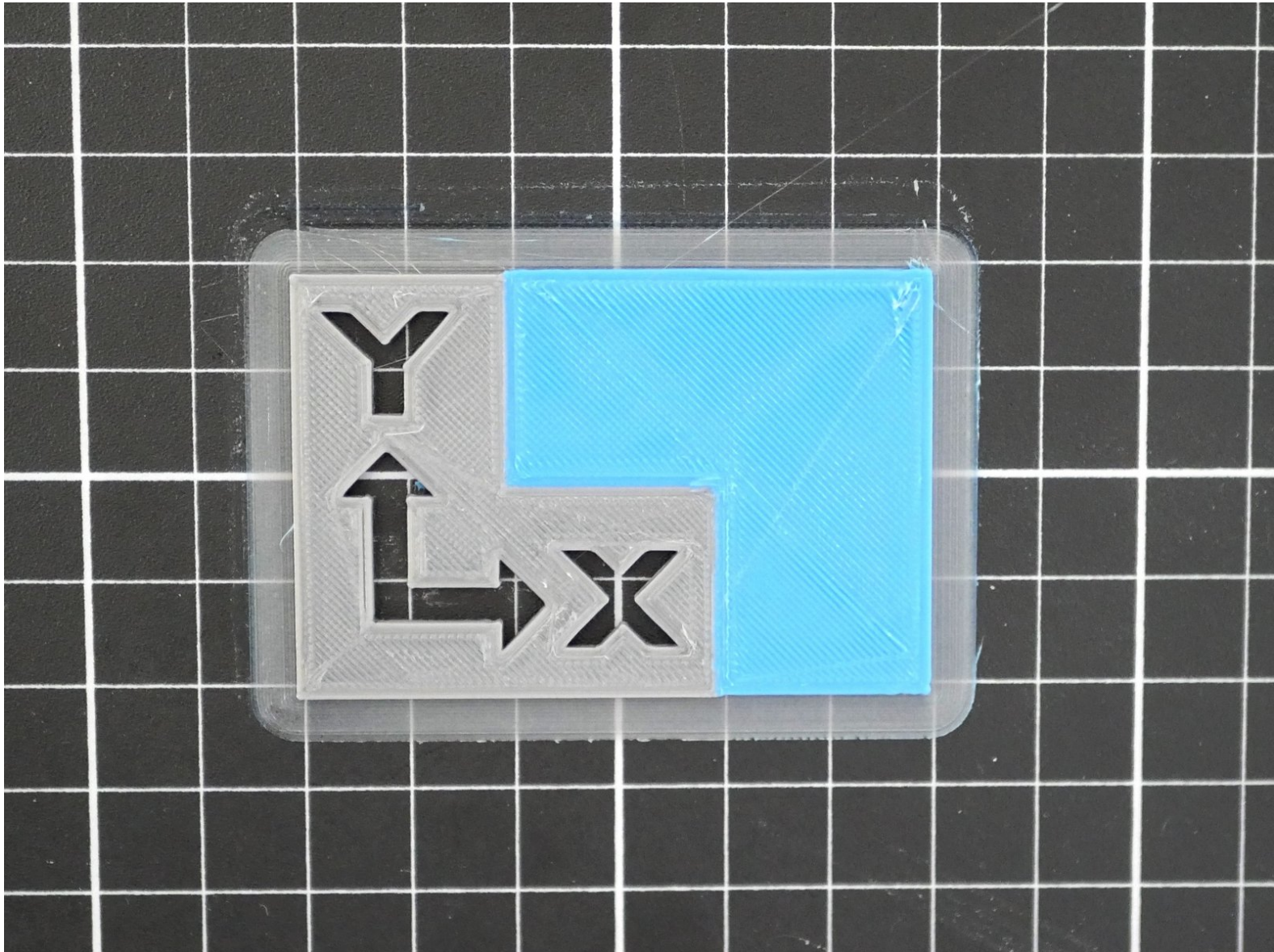
Step 1 — Makertech CURA and Calibration Model

(i) Download the [Makertech Edition of CURA](#) for either PC or Mac.

(i) Run through the setup wizard and install the software on to your computer.

(i) Also download the [DSE Calibration Model.](#)

(📌) Note, the newer version of Cura will still run through in the same way as is outlined by this guide.

Step 2 — Installing Cura
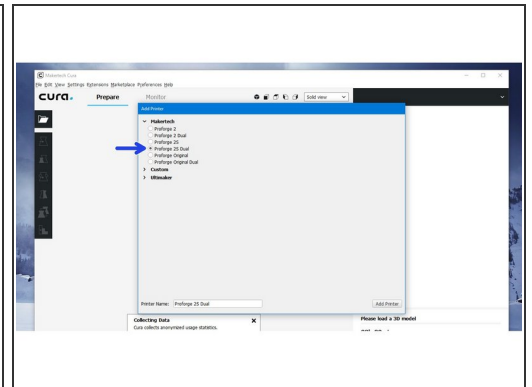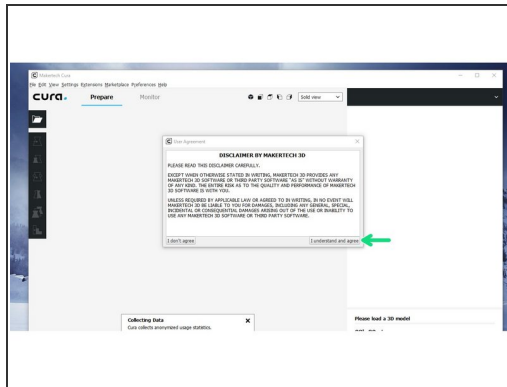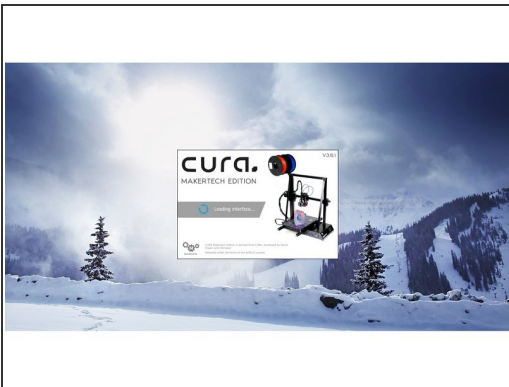
(i) On MAC you may get an error when trying to install the software, here's a great [how-to](#) on how to get around it.

● Launch the Makertech Cura software. Click *I understand and agree.*

● On first start up you will need to add your printer.

(📌) Depending on your build select either the Proforge 2 Dual or Proforge 2S Dual.

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Step 3 — Setting up the DSE Calibration Model
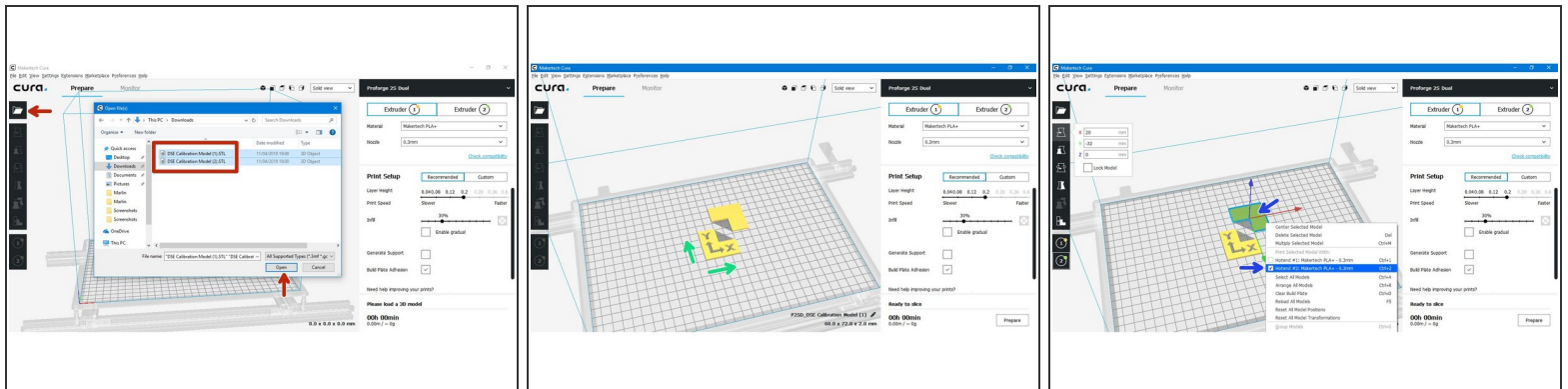
- Load the included *DSE Calibration Model* model into CURA.

  📌 There are two files, you will need to load both.

- The model should automatically be aligned with the Printers axes.

- Right click on this part of the model and choose **Hotend #2.**

Step 4 — Merging the DSE Calibration Model
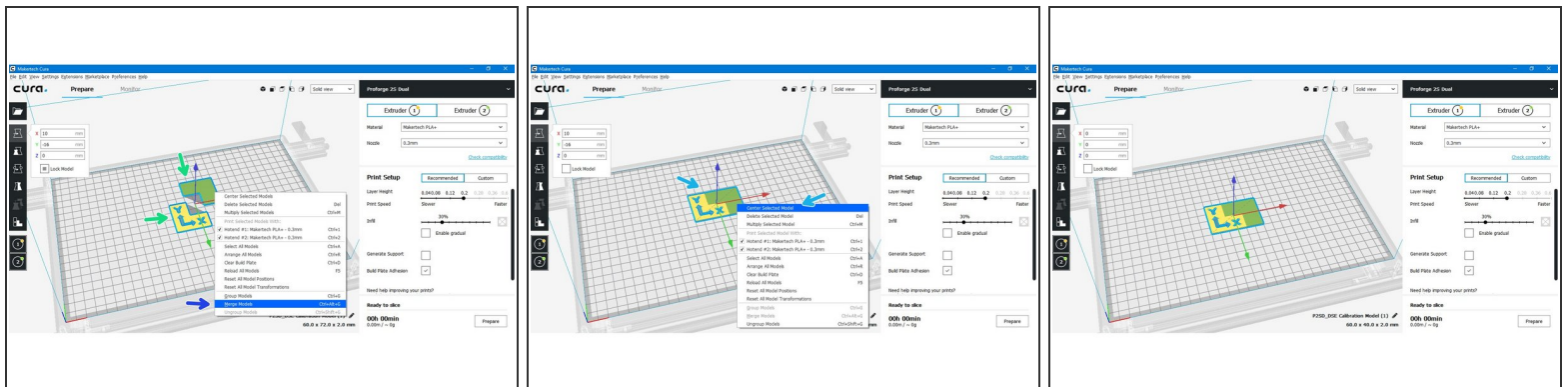
- Hold shift and select both parts of the model.

- Right click on either model, click on Merge Models.

- Right click on the single model and click on Center Selected Model.

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Step 5 — Cura Settings - Defaults
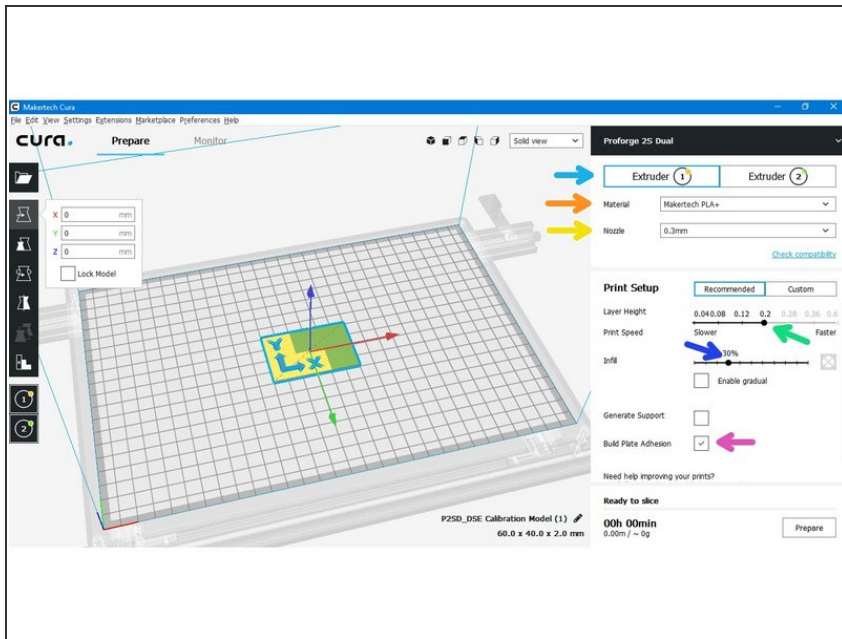
- ⓘ For the calibration model we suggest using the default settings in CURA.

  - Extruder: Select the Hotend you would like the changes in the settings to affect.

  - Material: Makertech PLA+ (the included sample filament)

  - Nozzle size: Set the nozzle size to match your setup, the default is 0.3mm.

  - 0.2mm Layer Height: A good compromise between speed and quality.

  - 30% infill - 30% of the inside of the part will be plastic.

  - Build Plate Adhesion - Brim: A single layer around the base of your model to prevent warping.

Step 6 — Z-Offset
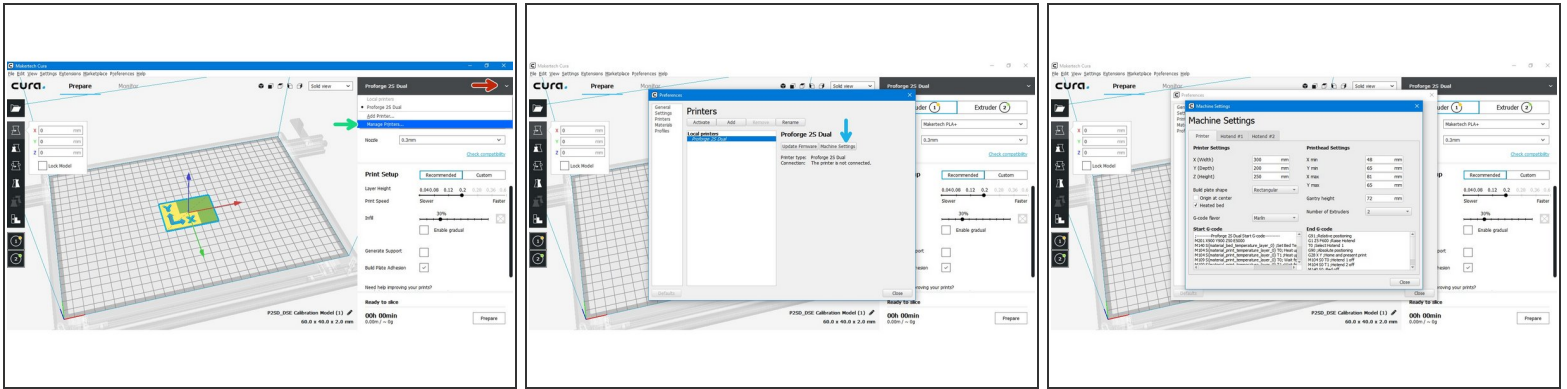
- Click the down arrow next to the printer name.

- Click on *Manage Printers...*

- Go to *Machine Settings*

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Step 7 — Z-Offset Cont.
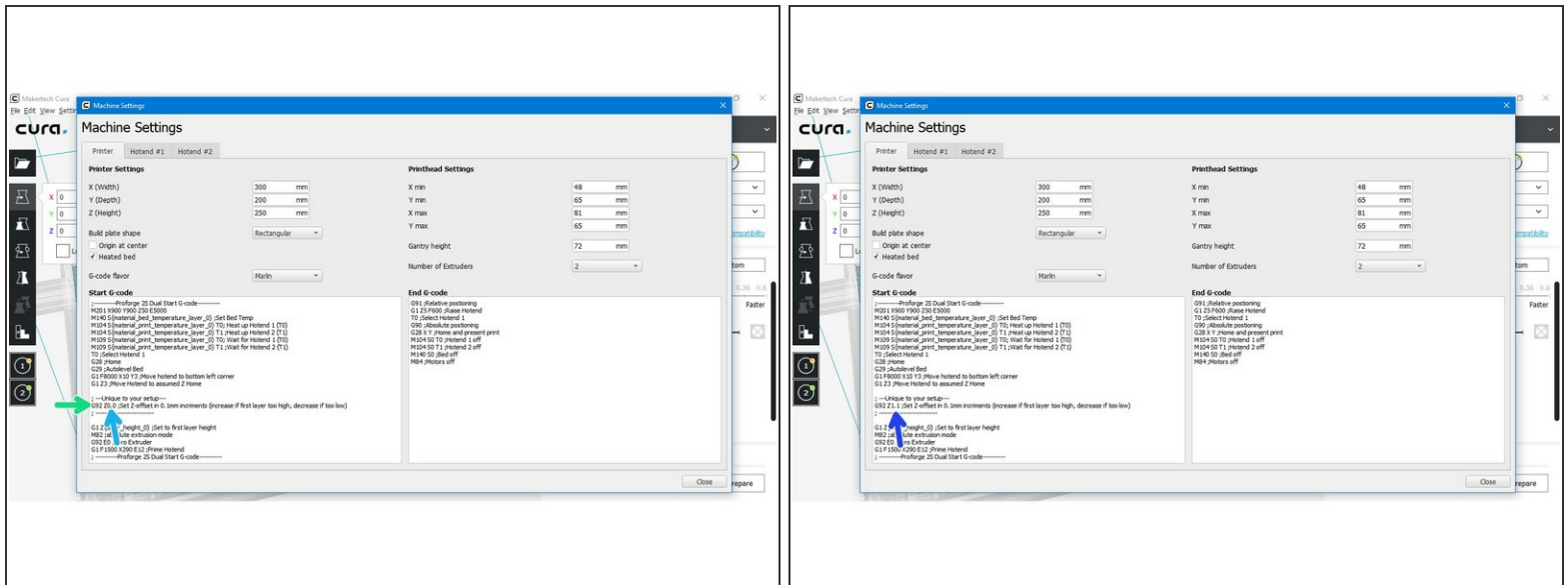
- Enlarge the Machine Settings window or scroll down the *Start G-code* box until you get to the *; ---- Unique to your setup*----- section

- Take the Z-offset distance that you made a note off from [DSE Stage 07](#) and subtract it from 3.
  - ⬆ So in this case the noted distance was 1.9mm, so our offset will be **3 - 1.9 = 1.1**

- Enter your calculated offset in place of the *0.0* like shown in the second image.

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Step 8 — Slice and Save to SD Card
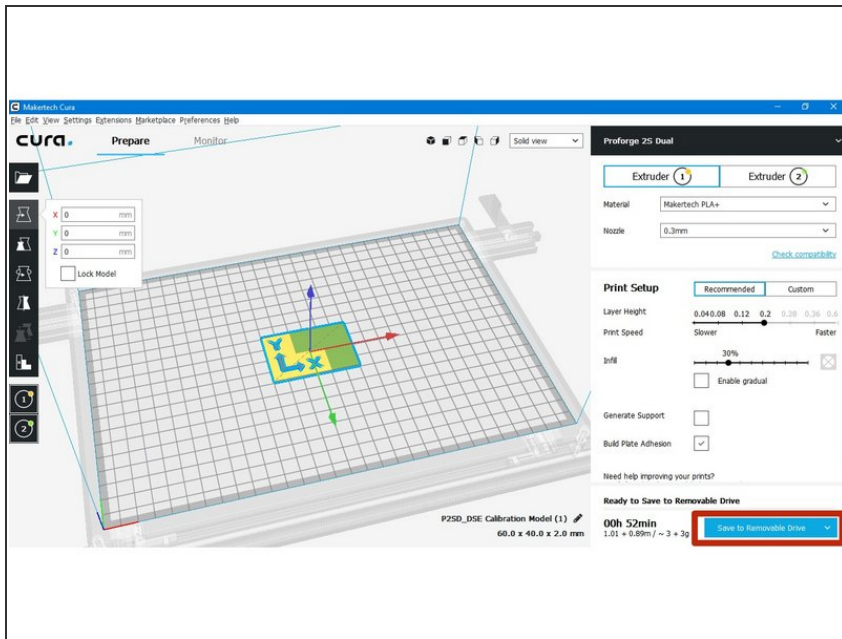
- Next hit prepare to turn the .stl model into *.gcode* that the printer can read.

- Save the .gcode to the included SD card.

## Step 9 — Print from SD Card

- Insert the SD card into the printer.

- Go to *Printing*

- Load the saved *.gcode file*

- Press *confirm* to start the print.

- 📌 The printer will pause for a moment between the first few switches, this is normal. It is because of the way Cura handles temperature control for the first layer.

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Step 10 — First layer
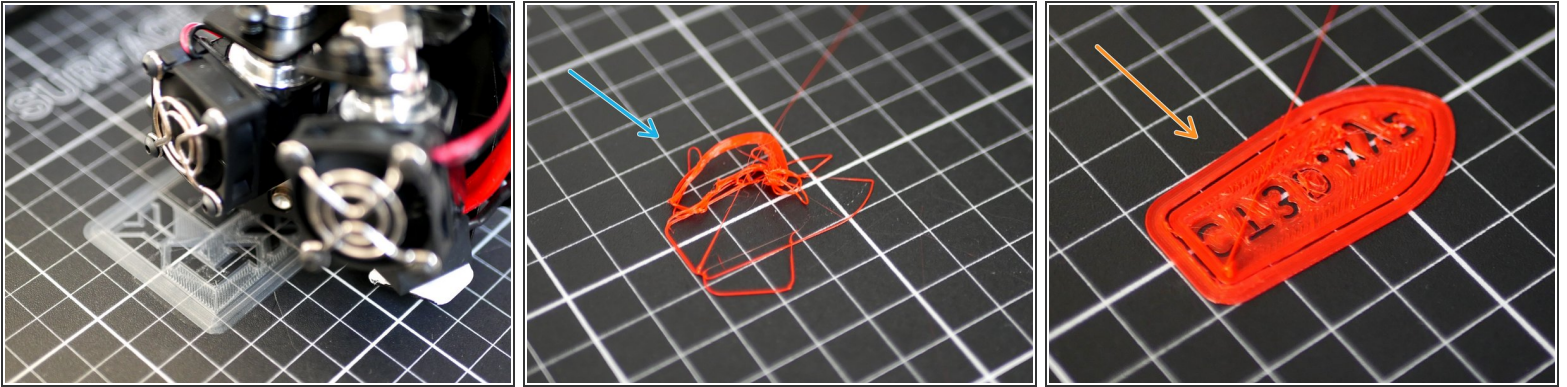
ⓘ Check the first layer, it should look like the first image, but it's likely that on the first go the nozzle will be either too high or too close to the print surface.

ⓘ For Example:

- Too high - the first layer isn't sticking or the model has peeled off.

- Too low - the nozzles is pressing the plastic down too much, or at worst digging into the bed.

ⓘ To stop the print from the touch screen.

　ⓘ Options -> Stop -> Confirm.

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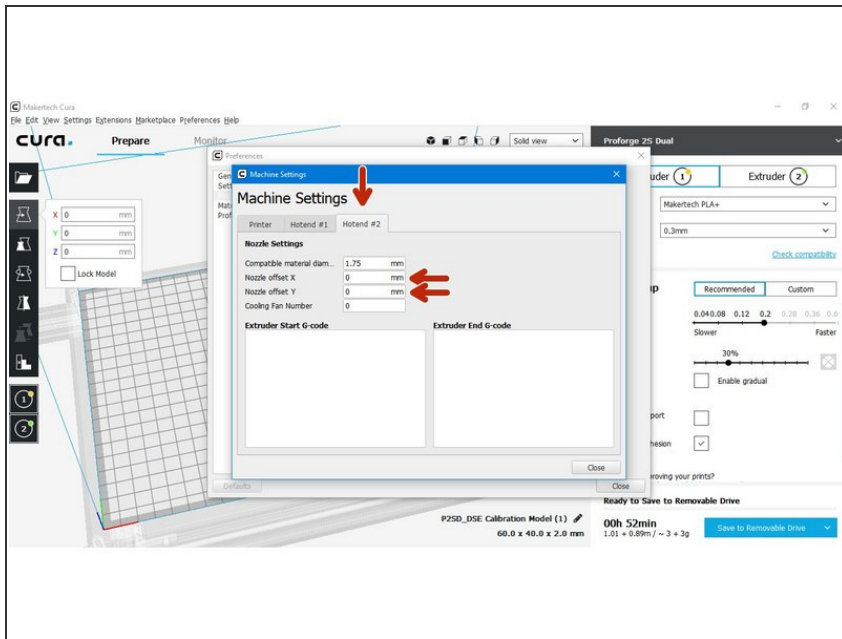
Step 11 — Adjusting the Z-offset

(i) In order to get the nozzle closer to the bed for the first layer to properly stick we'll need to adjust the z-offset value. **This value will only need to be dialled in once.**

(i) As in step 6/7 go back into machine settings and either increase or decrease the Z-offset by 0.1:

- First layer too high: Increase Z-offset

- First layer too low: Decrease Z-offset

(i) Re-slice the model and save again to the SD card.

Step 12 — Calibration Print
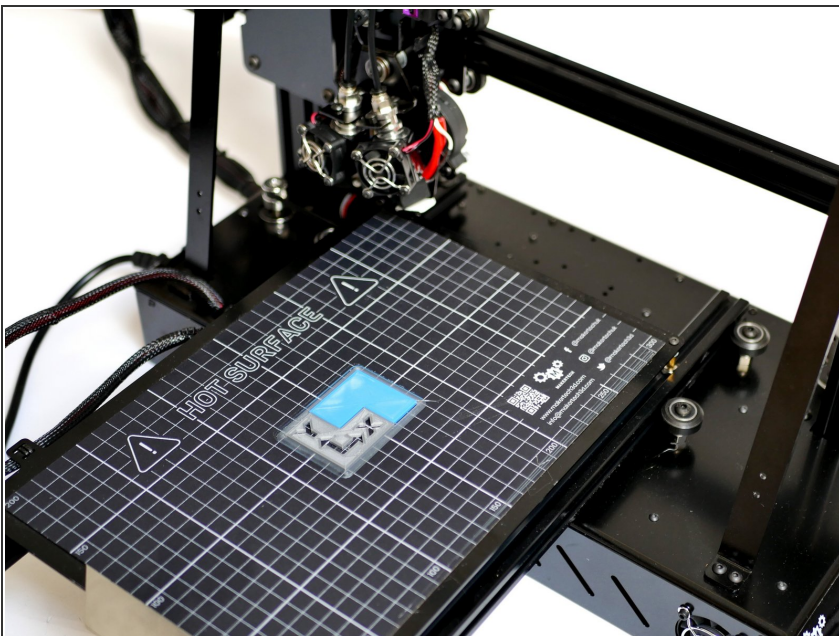
(i) With the First layer offset now dialled in you should have a print that is correctly adhering to the print surface.

(i) Let the Calibration print finish.

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Step 13 — Inspecting the Callibration Print

- ⓘ The two parts of the Calibration Print will likely be either over-lapping each other or be leaving a gap.

- ⓘ Depending on how the print looks we will adjust the X/Y offsets in Cura with the aim of getting the two parts to line up.

- Offsets are entered in Machine Settings under the **Hotend #2** Tab.

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Step 14 — Deciding X Offset Value
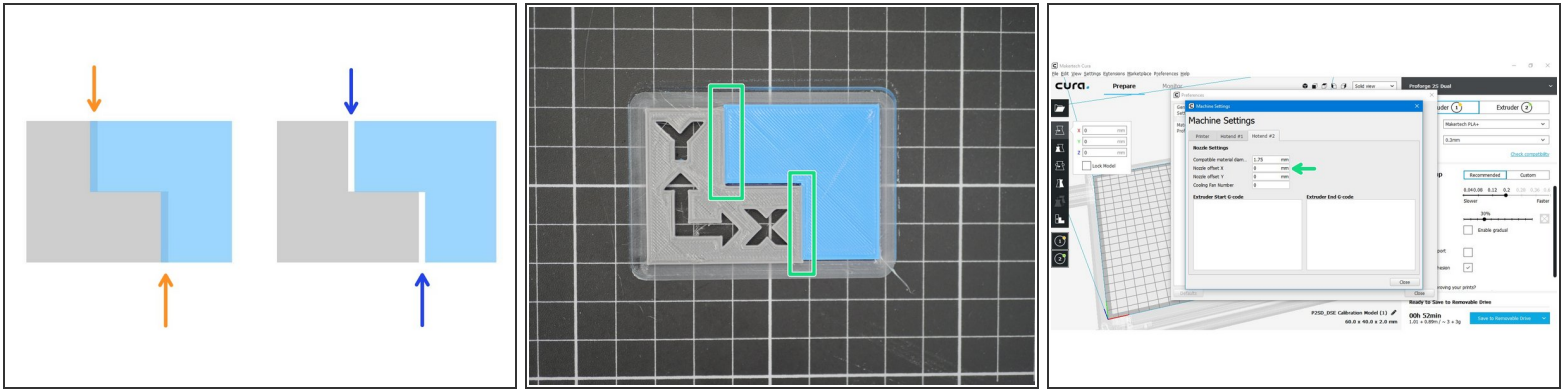
- Overlapping in X Direction:
  - 📌 Decrease/Negative X-Offset

- Gap in X Direction:
  - 📌 Increase/Positive X-Offset

- In our case the print was fine in the X-Direction, so we left our X-offset as 0.

- 📌 For example, if there had been a gap of 0.25mm, our offset would have been **0.25mm**.
  - 📌 An overlap of 0.25mm would have meant an offset of **-0.25mm.**

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Step 15 — Deciding Y-Offset Value
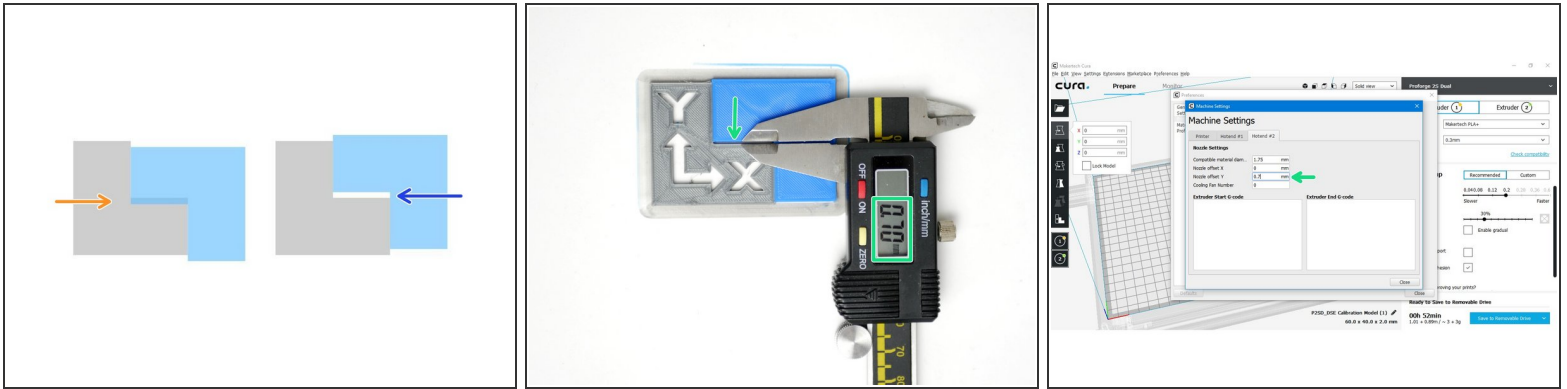
- Overlapping in Y Direction:
  - Decrease/Negative X-Offset

- Gap in Y Direction:
  - Increase/Positive X-Offset

- In our case the print had a gap in the Y Direction, so we set our Y-offset to **0.7mm.**

- If there had been an overlap of 0.7mm, our offset would have been **-0.7mm**.

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Step 16 — 2nd Calibration Print
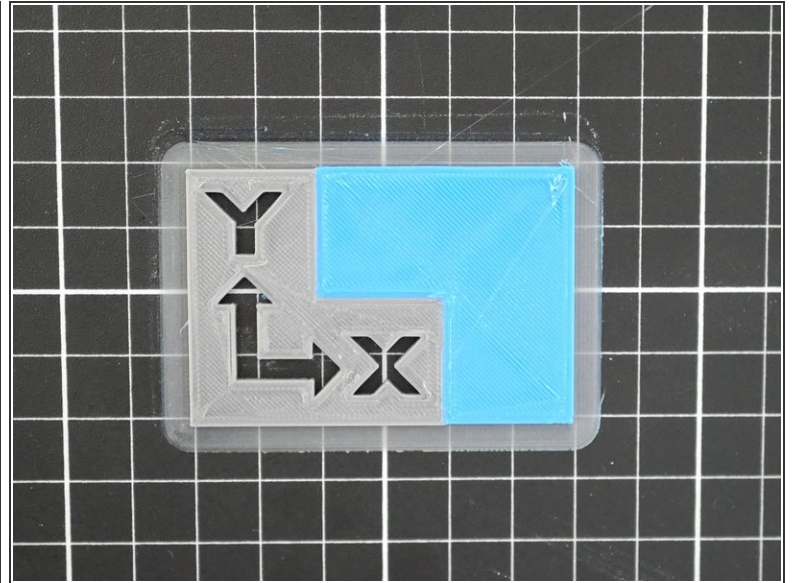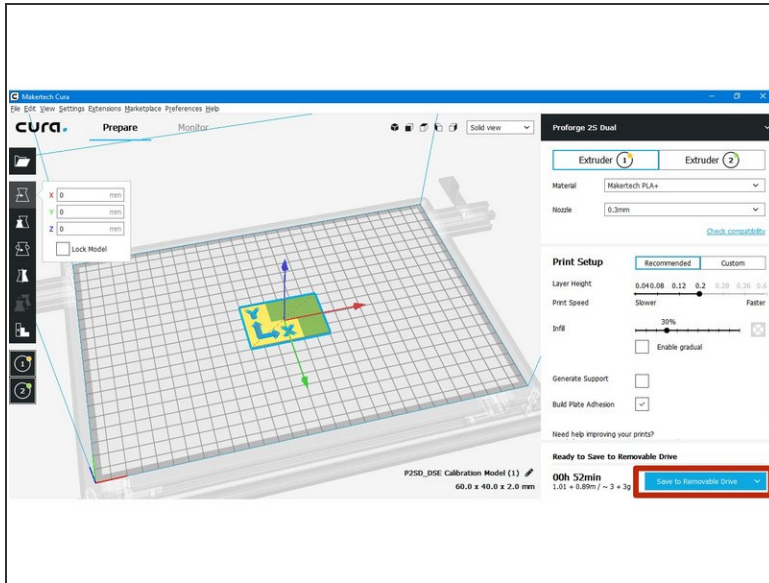
- Re-slice the model in Cura and copy it onto the SD Card.

ⓘ Congratulations! After printing the model again with the dialled in offsets you should have the DSE all setup.

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