

# **STANDARD OPERATING PROCEDURE**

## **ULTIMAKER 2 3D PRINTER**

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**Also see:** <https://ultimaker.com/en/support/ultimaker-printers/ultimaker-2>

### **IF a polymer filament is already loaded into Ultimaker2:**

- 1) If glass plate appears dusty, dirty, or otherwise needs cleaning, please refer to the "Cleaning the Build-Plate" section below.
- 2) Turn on the Ultimaker2 by flipping the switch on the back, left-hand side of the machine.
- 3) Insert the SD card into the Ultimaker2 SD card slot on the front of the machine (may already be loaded).
- 4) Select "Print" from the main screen on the printer by rotating the wheel on the front, and pressing in on the center to select an option.
- 5) Scroll through the available models to find and select yours. The length of polymer filament required and print time should be displayed by each model.
- 6) The printer will then begin heating up the nozzle. A progress bar will be shown on the printer screen.
- 7) When the print is done, the printer will start cooling down. Temperatures of the nozzle and the build-plate will be displayed on the screen.
- 8) The screen will read "Print finished. You can remove the print." when the print is ready to be removed from the build-plate. DO NOT remove the print until then.
- 9) Remove any excess polymer strands that may be on the plate and throw them away.
- 10) Turn off the Ultimaker2 by flipping the switch in the back left-hand side of the machine.

**To Change Filaments:** (please contact Connor Daily if this is your first time changing filaments!)

- 1) Turn on the Ultimaker2 by flipping the switch on the back, left-hand side of the machine.

- 2) Select "Material" from the main screen using the wheel. On the next screen select "Change". The nozzle will begin heating up the material, as will be displayed on the screen.
- 3) When the nozzle is hot enough, the screen will read "Reversing Material" and the filament feeder will pull the filament out and roll it up onto the filament wheel.
- 4) When the filament is out, the screen will read "Remove Material". Pull out any excess material from the feeder, and then remove the filament wheel from the spool holder. If there is filament stuck by the nozzle (if the filament snapped) please inform your supervisor or the lab coordinator.
- 5) Place your new filament onto the spool holder so that the filament end will spin up into the feeder (filament wheel will spin counter-clockwise). Then, select "Ready" on the display.
- 6) Take the end of the filament, insert it into the bottom of the material feeder and push it until the filament is being grabbed by the knurled wheel. This may require **SOME** force. Once the knurled wheel has grabbed the filament, it will slowly move it further into the bowden tube.
- 7) Wait till the filament reaches the first black bowden tube clip above the feeder and then press the button to continue. The Ultimaker 2 will automatically load the filament through the bowden tube, into the print head.

Now you just have to wait until the filament is coming out of the nozzle. You may notice a ticking sound at the feeder; this is nothing to worry about. If **NECESSARY** you can manually push the filament in order to get it through the nozzle with a bit more force.

### **Cleaning the Build-Plate and Calibration**

- 1) Remove the plate by turning the metal clips on the front of the plate out, and sliding the glass plate out.
- 2) Wipe down the glass plate with warm water (small amount of soap if necessary) and dry.
- 3) Return the dried glass plate into the machine and turn the clips onto the plate to lock it in place.
- 4) Turn on the Ultimaker2 by flipping the switch on the back, left-hand side of the machine.
- 5) Perform the build-plate calibration by moving the wheel on the front of the machine to "Maintenance" and then "Build-plate". Press the center of the wheel to select an option. Wait for the Ultimaker 2 to do its homing procedure and continue when the print head is in the center at the back of the build plate.
- 6) The first step is to roughly level the build plate by rotating the button at the front of your Ultimaker 2 until there is approximately 1 mm distance between the nozzle and build plate. The measurement here is not critical, just make sure that the nozzle is close to the build plate without touching it.

7) Next, a rough adjustment will be done on the front left and right side by turning the build plate screws. Turning the build plate screws to the left means that the build plate will get closer to the nozzle. Again there should be a distance of approximately 1 mm between the nozzle and build plate.

8) The last step will be fine-tuning of the build plate with a plain sheet of paper. Place the paper in between the nozzle and build plate on all 3 points and adjust the build plate screws until you feel slight friction when moving the card. **DO NOT** push on the build plate while fine-tuning with the calibration card; this will lead to inaccuracies. After fine-tuning each point, select “Continue...” with the front wheel to advance to the next point.

Calibration Complete!