

3D Printing – Ultimaker 2

The **Ultimaker 2** 3D printer is suited to larger 3D prints, with a maximum print volume of 23cm x 22.5cm x 20.5cm. It prints models using reels of coloured filament. For smaller, fine-detailed 3D prints like jewellery, consider using the **ProJet 1200** liquid resin printer.

Both 3D printers are located in the **ABVenture Zone** on the 8th floor of the MacRobert Building. If you would like to use a 3D printer, please contact abventurezone@abdn.ac.uk or call **4364**.



Warning: When heating up, printing and cooling down, the **Ultimaker 2** printer is **very** hot.

- Take care not to touch the glass bed and print nozzle until it has cooled down after a print job.
- Do not reach inside while printing is in operation, as the hot parts of the printer move around.
- Use the printer in a well ventilated area.

Before you start

Before you start, you will need an **STL file** ready to print, and an **SD card** on which to save this. Ultimaker recommend using a program called **Cura** to save your model to an SD card.

Downloading and installing Cura

Download Cura for Windows, Mac or Ubuntu Linux: <https://ultimaker.com/en/products/cura-software>

When you install Cura it will ask which printer you have, select **Ultimaker 2**.

Note: If prompted, click **Next** to complete the installation and configuration wizards.

Saving your STL file

When you have sourced an STL file, we recommend that you save a copy to your **Home** drive (**H:**).

Preparing and previewing your model

The first time you open Cura, you may see an example model (*Figure 1*).

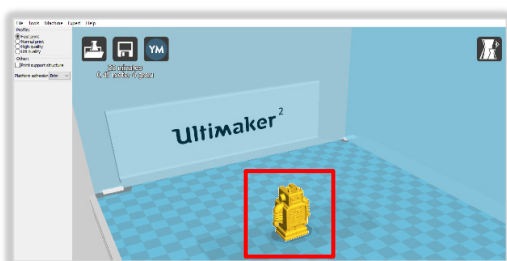


Figure 1: Cura example model

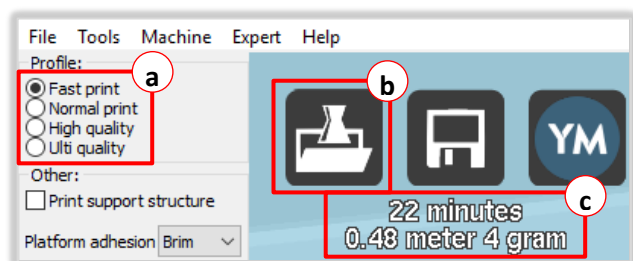


Figure 2: Cura options

1. To delete the example model, click **File**, then **Clear platform** (or press **Ctrl + D**).
2. Click the **Load** icon (*Figure 2, label b*) to select the STL file from your **Home** drive (or **Ctrl + L**). The model will display on the checkered area.

Note: You can load multiple objects as long as they fit on the the checkered area. The checkered area represents the glass build plate on the Ultimaker 2 (*Figure 5, label c*).

3. Cura will estimate how much filament the 3D model will use, how long the print job will take, and how much the model will weigh (Figure 2, label c).
4. Select a **quickprint profile** (Figure 2, label a). Higher quality prints will take longer.
5. You can tick **Print support structure** to give the model extra support if needed.



Figure 3: Transform options



Figure 4: Save icon

6. When you click on your model to select it, additional **Rotate**, **Scale** and **Mirror** icons appear at the bottom left (Figure 3). You can use these to edit your 3D model.
7. Insert your SD card into the reader attached to the PC if you haven't already done so.
8. Click the **Save** icon (Figure 4, label a) and save the file to your SD card, then click the **Eject** icon at the bottom of Cura and take your SD card to the Ultimaker 2 printer.

Ultimaker 2 layout

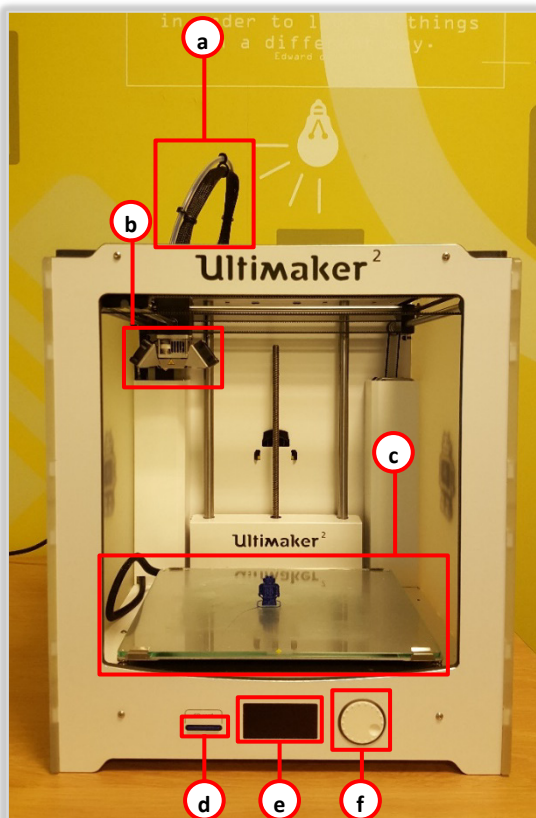


Figure 5: Front of Ultimaker 2

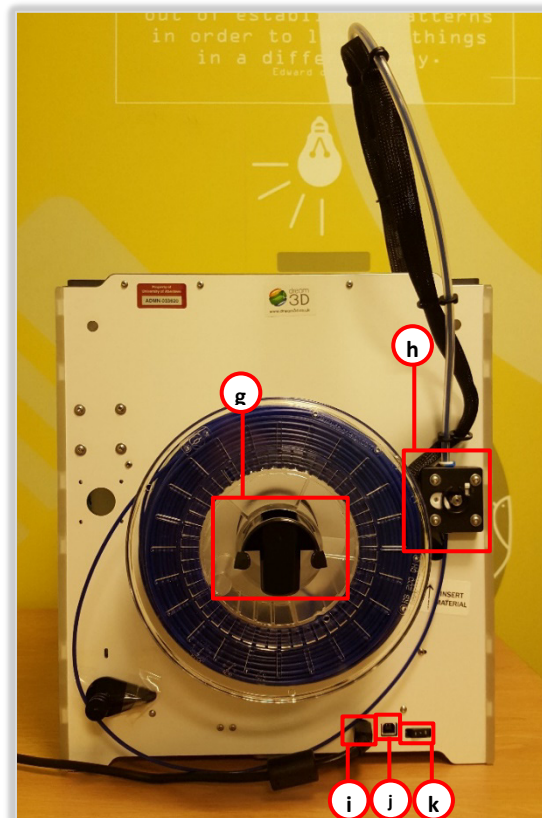


Figure 6: Back of Ultimaker 2

- | | |
|--|---|
| <ol style="list-style-type: none"> a. Print nozzle cable and filament feed tube b. Print nozzle c. Glass build plate d. SD card slot e. LCD Display f. Push and rotate jog wheel | <ol style="list-style-type: none"> g. Filament spool holder h. Material feeder i. Power socket j. USB socket k. Power switch |
|--|---|

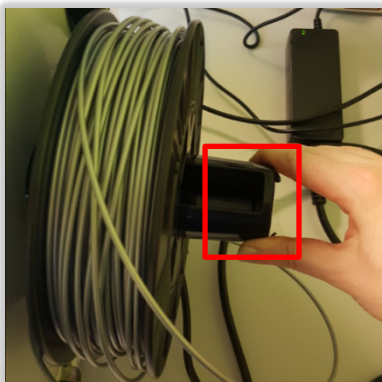
Selecting filament

Before you start printing a 3D model, check that the appropriate filament reel is attached to the back of the Ultimaker 2. There are three main filament types for the Ultimaker 2. These are:

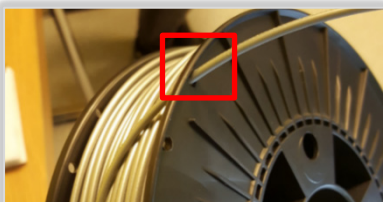
- **PLA** – This is used for most jobs. As it is fast and made from starch, this biodegradable filament is ideal for 3D models and prototypes.
- **CPE** – Used for complex technical prints, this is fairly stiff, strong and impact resistant, and is good at bridging large gaps.
- **ABS** – A tough filament for mechanical uses. It is impact resistant and very hard, while retaining good flexibility.

Unloading a filament reel

1. Turn the jog wheel on the front of the printer to select **MATERIAL** (shown on LCD display), then press the jog wheel to apply.
2. Turn the jog wheel to select **CHANGE**, then press it again. The print nozzle will heat up and automatically unwind the existing filament.
3. Manually extract the remaining filament from the feed tube at the back of the printer.
4. Remove the filament reel by pinching the ends of the spool holder together, and sliding the reel off.



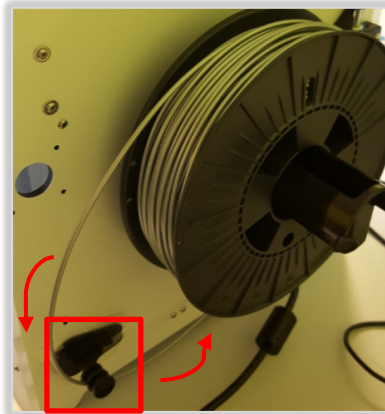
5. Wind the remaining filament onto the reel. Tuck the end through one of the reel holes so it doesn't unwind and become damaged.



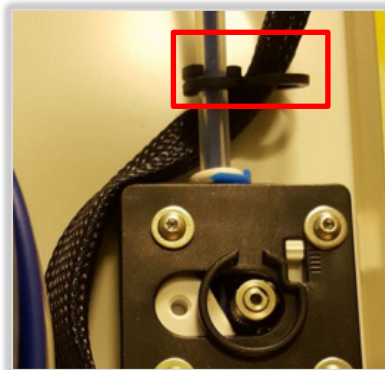
6. When prompted to **Remove material** (shown on LCD display), use the jog wheel to select **READY**.

Loading a filament reel

1. Pinch the ends of the spool holder together and slide the new reel on, making sure the filament comes off the reel in a **anti-clockwise motion** as you look at the **back** of the printer.
2. Feed the filament around the small **guide** on the back of the printer (bottom left).



3. Feed the filament into the material feeder (back, centre right).
4. When the filament is past the **first clip**, use the jog wheel to select **READY** to **Insert new material from the backside of your machine, above the arrow**.



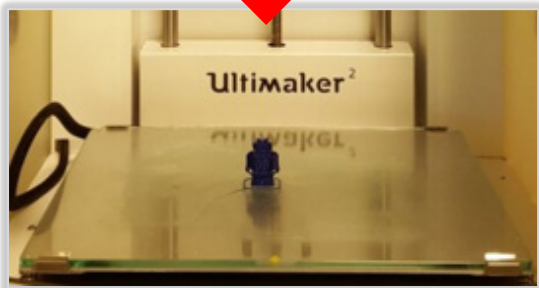
5. The LCD will display **Forwarding material** and will automatically pull the filament through the feed tube to the nozzle.
6. Select **READY** when the printer nozzle ejects some filament, showing it is ready to print.
7. Use the jog wheel to select the filament **material type** you have loaded.
8. Clear any stray filament from the glass plate.

Preparing to print

1. Using a glue stick, place some glue on the glass plate roughly in the area your job will print. This will help it adhere to the plate.

Tip: If there is a build up of glue on the glass plate from previous print jobs, you can scrape this off carefully using a razor blade. Try to collect the scrapings and dispose of them rather than wiping them onto the floor of the printer.

Note: Remember, if you positioned your model in the middle of the checkered area in Cura, it will print in the middle of the glass plate in the Ultimaker 2.



2. Insert your **SD card** in the slot on the front of the printer.
3. Select **PRINT** using the jog wheel, then use the jog wheel to find and select your file.

The display will tell you how much filament the print job needs, and how long it will take. Select **ABORT** if you picked the wrong file.

4. Confirm your print job using the jog wheel.

The printing process

Once printing has started, do not reach inside the printer.

1. Watch the LCD display for information on the print progress.
2. The printer will heat up.

3. The glass plate will **raise up** and a small amount of filament will be ejected from the nozzle to clear it.
4. The printer will then start your job and tell you the **time remaining** on the display.
5. When finished, the glass plate will lower.
6. Wait until the display reads **Print Finished** as the printer will be **very hot**. You can then remove the print.
7. If the object is stuck, carefully use a spatula to slowly loosen it from each side.



Troubleshooting

How do I abort a print job?

If something goes wrong with your print job, you can use the jog wheel on the front of the Ultimaker 2 to select **Abort**.

I can't feed the filament through to the print nozzle, what do I do?

Use the jog wheel to reverse the material out of the Ultimaker 2. Check that the end of the filament is trimmed neatly. If not, cut it with scissors. Then try feeding the filament again.

Where can I find other tips for using the Ultimaker 2?

<https://ultimaker.com/en/manuals/16554-user-manual>

<https://ultimaker.com/en/tips-tricks>

<http://support.3dverkstan.se/article/30-getting-better-prints>

Further information and help

Questions? Log a call with the IT Service Desk:

- <https://myit.abdn.ac.uk>
- servicedesk@abdn.ac.uk