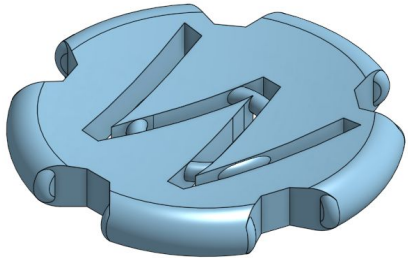


Westerdals

Introduction to 3D printing

jakob.a.nilsson@gmail.com



Ultimaker Cura 3D printing software

Download, install and start from here:

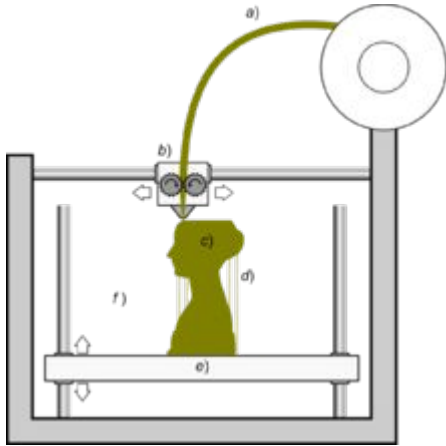
<https://ultimaker.com/en/products/ultimaker-cura-software>

Or just google: cura + download.

There is also a getting started manual on their site.

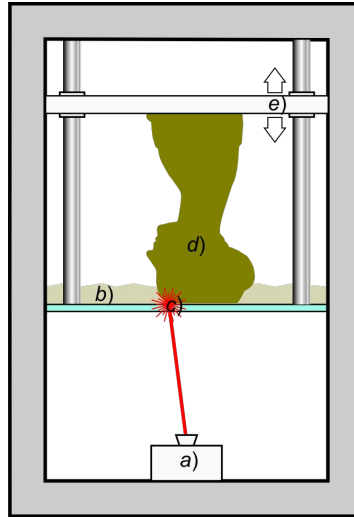


What is 3D printing?

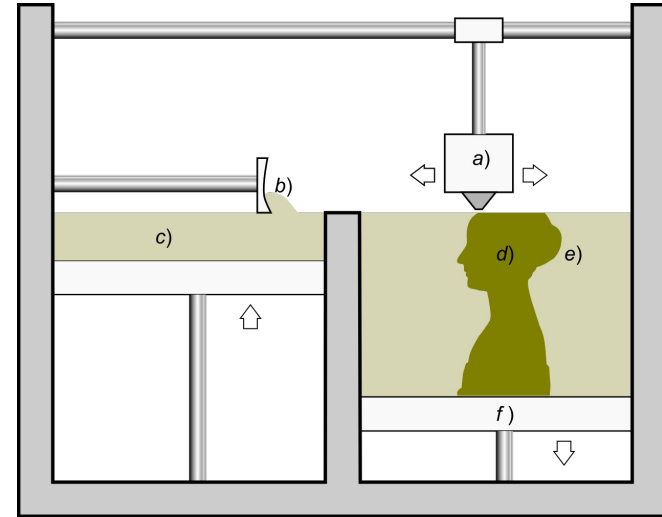


Fused filament fabrication

Aka FDM Fused deposition modeling TM



Stereolithography



Powder Bed

images from:

Scopigno R., Cignoni P., Pietroni N., Callieri M., Dellepiane M. (2017). "Digital Fabrication Techniques for Cultural Heritage: A Survey". *Computer Graphics Forum* 36 (1): 6–21. [DOI:10.1111/cgf.12781](https://doi.org/10.1111/cgf.12781).

What is FFF 3D printing?

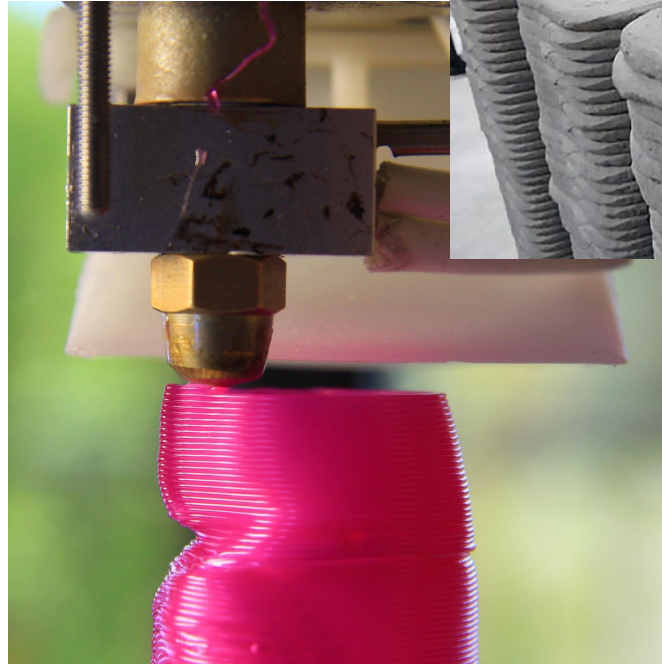
Fused filament fabrication

Additive manufacturing

Computer controlled

Layer by layer

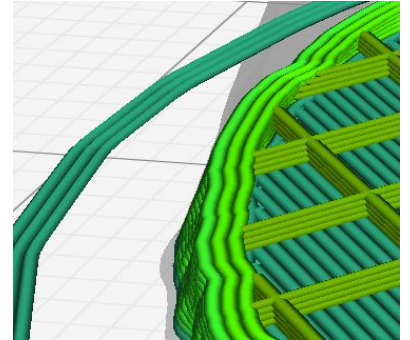
Uses slicing software



[tridimake](#)



[a apis cor](#)

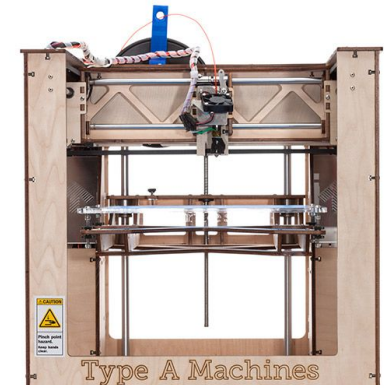


Printers at Westerdals

2 x Type A Machines 1 (2013 wood edition)

- Uses: 1.75 mm filament
- Build volume: 26 x 23 x 24 cm

2x



1 x Ultimaker 2+ Extended

- Uses: 2.85 mm filament
- Build volume: 22.3 x 22.3 x 30.5 cm
- Has: Heated bed

1x



All:

- Print surface: Glass + Glue stick
- Print material: PLA filament
- Speed: Fast enough
- Nozzle size: 0.4 mm
- Control: Smart Controllers with SD Card slots

Thermoplastic printing materials (filaments)

PLA - Polylactic acid

- Most common 3D printing filament!
- Natural PLA is a clear polyester
- Biodegradable, made from corn or sugar cane
- PLA can be mixed with fillers
 - Metal
 - Gypsum
 - Wood



[link](#)

Other printing plastics include:

- ABS
- PETG
- TPE
- NYLON



By [DanielNoree](#)



By [Fused3D](#)

How to print a 3D model file?

- Export the 3D Model (.obj or .stl file format)
- Load it into the Slicer software (Cura)
- Position the model (Rotate > lay flat)
- Choose your printer (Ultimaker 2 or Type A Machines 1 2013)
- Choose filament material (PLA)
- Choose optional settings (Recommended default)
- Save to SD card (.gcode)
- Insert the SD card in the 3D printer
- Start the job on the printer

Cura guide:

https://www.youtube.com/watch?v=RX2_e7RqUH0&t=49s (official ultimaker guide)


<https://www.youtube.com/watch?v=N1IAwzqpXsU> (Old version of cura but same principle)




Type A Machines S1 2013 in Cura

Follow link for [instructions](#)


Cura settings

Ultimaker 2+ 

Material

PLA 

Nozzle

0,4 mm 


[Check compatibility](#)

Print Setup


Recommended

Custom

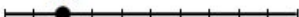
Layer Height


 0.06 0.1 0.15

Print Speed

Slower  Faster

Infill

20% 



☐ Enable gradual

Generate Support

☐

Build Plate Adhesion

☐

Cura settings

Layer height

Layer 0.1mm



Time: 3h 26m

Layer 0.2mm



Time: 1h 45m

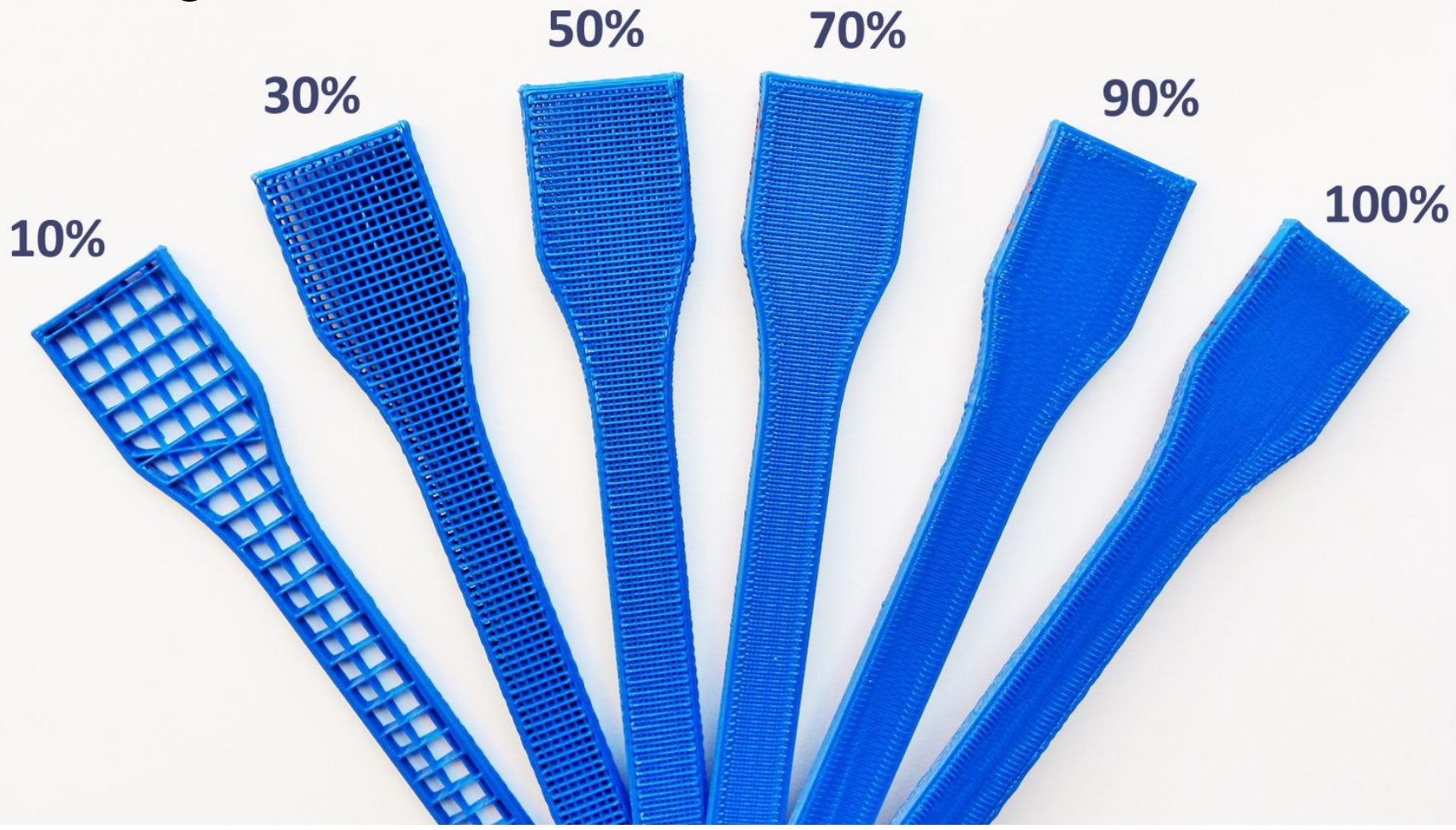
Layer 0.3mm



Time: 1h 11m

Cura settings

Infill



Overhang and support

