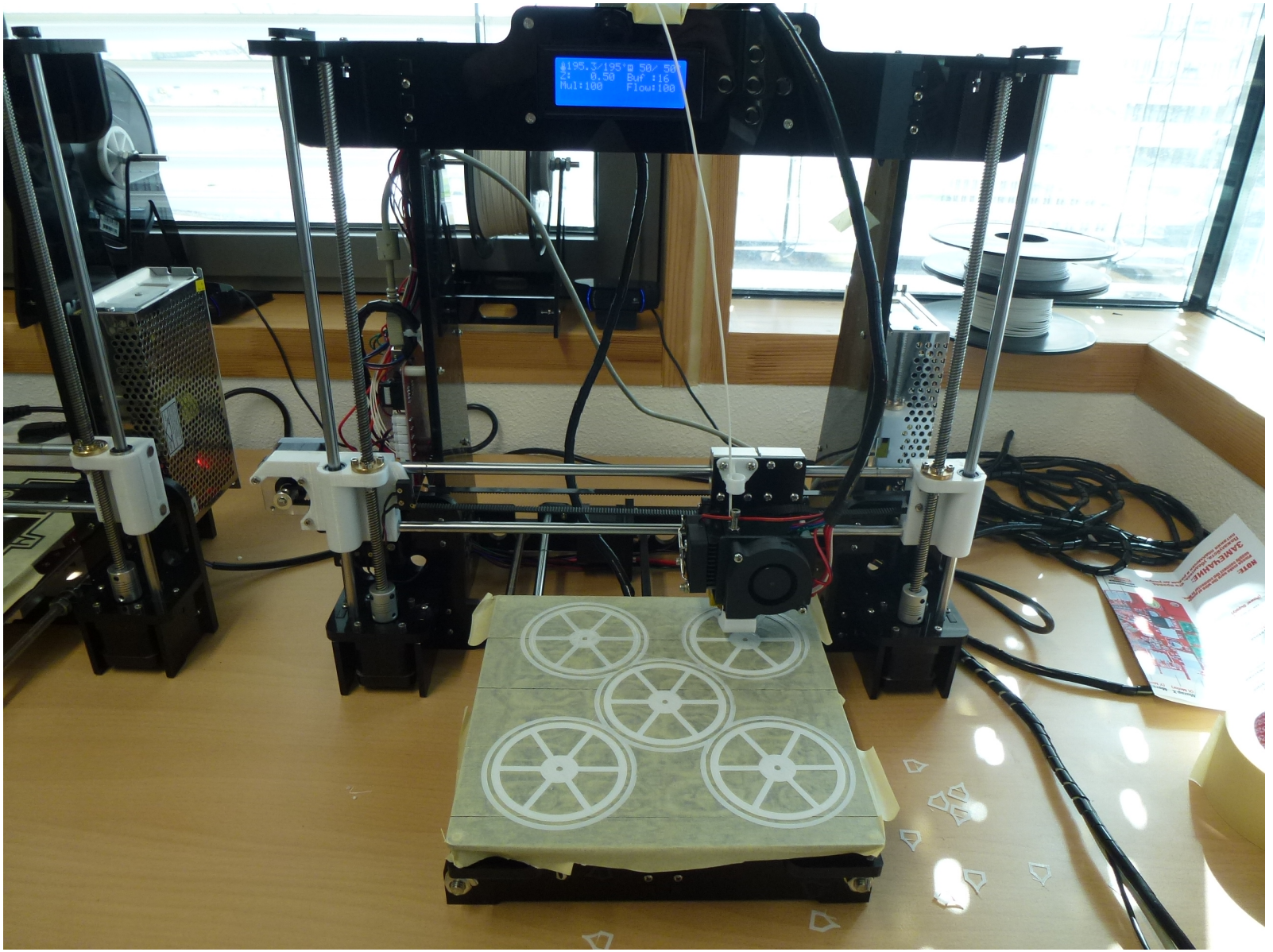
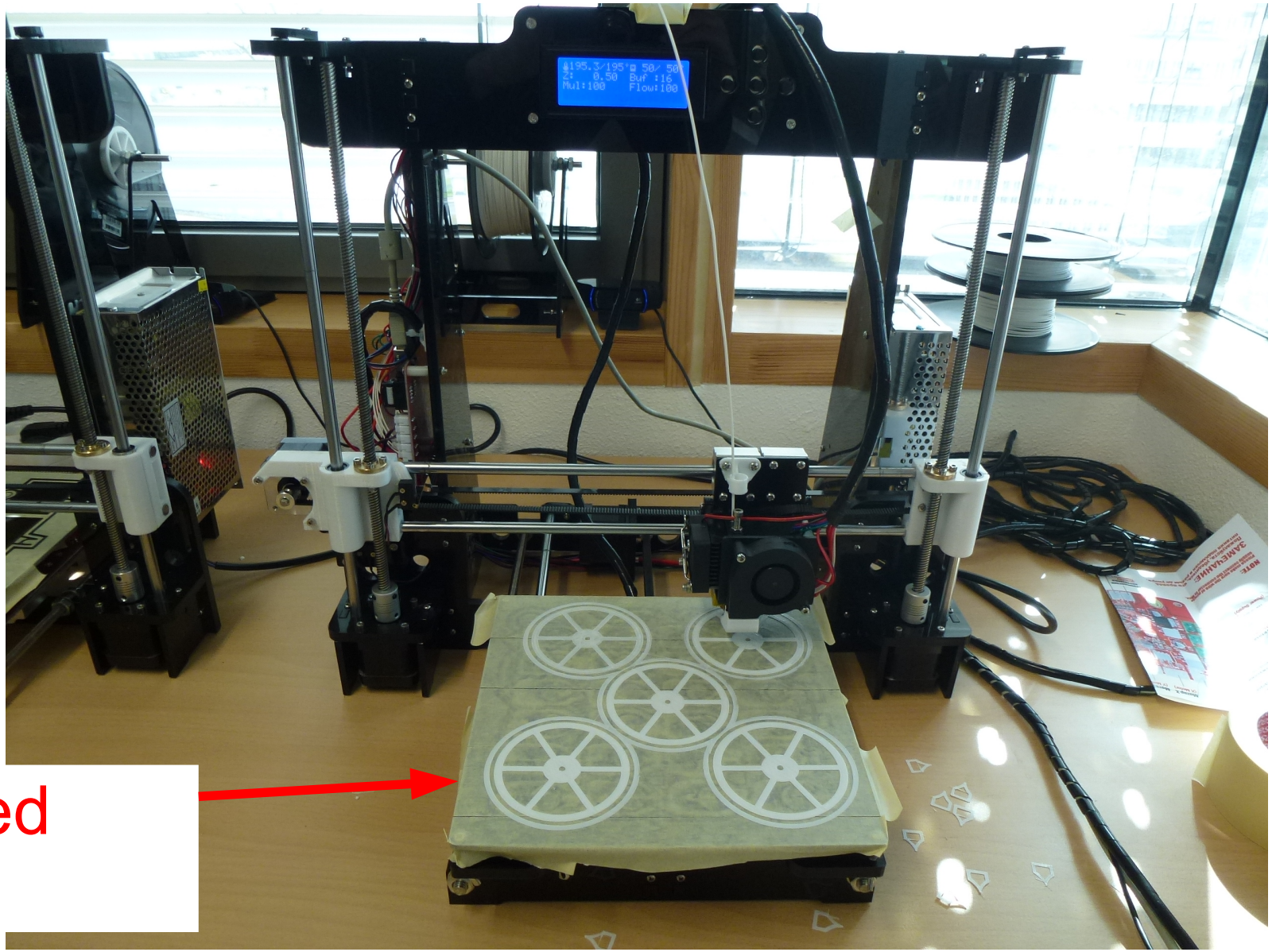
3D printing

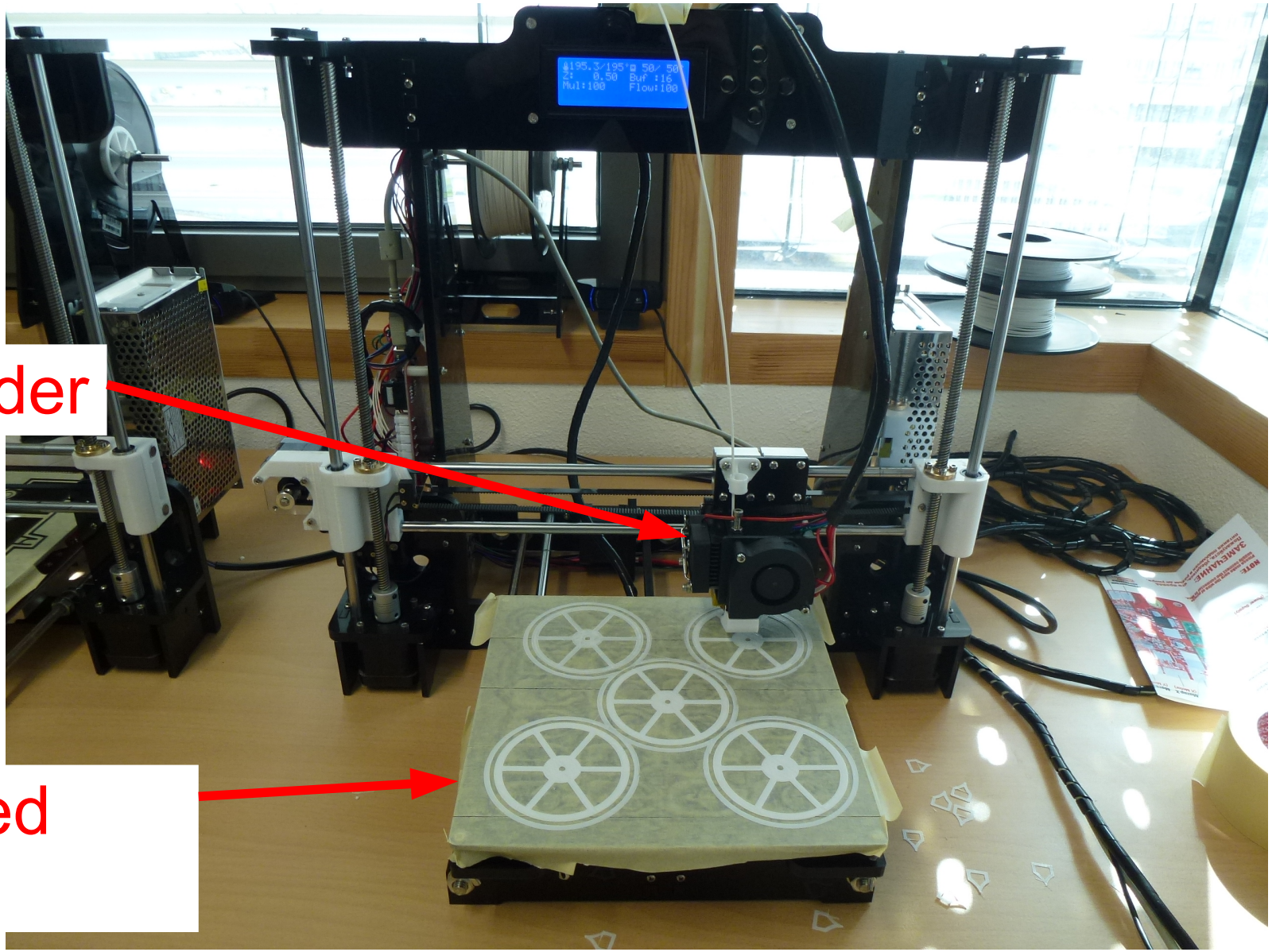
3D printers



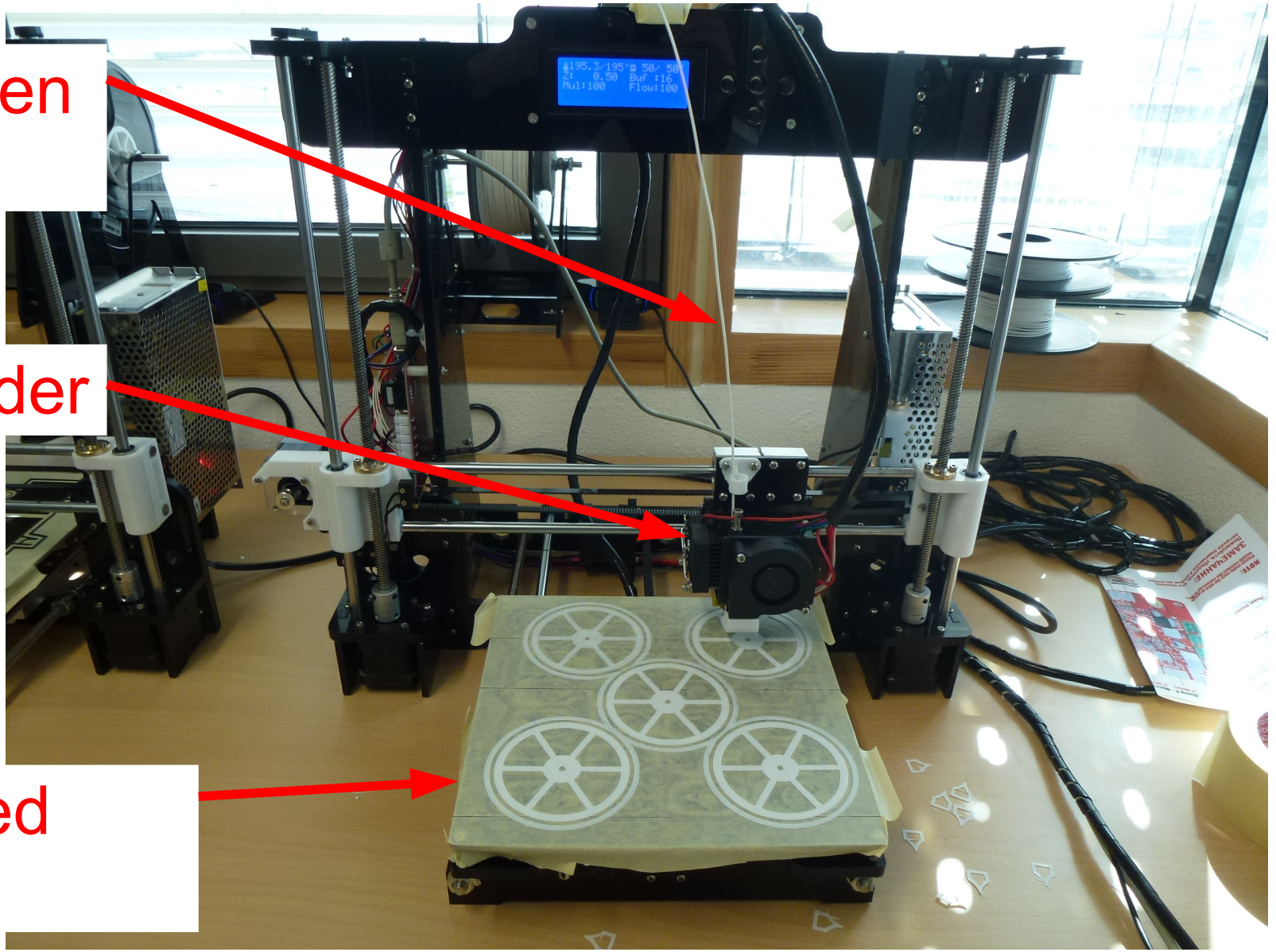
3D printers



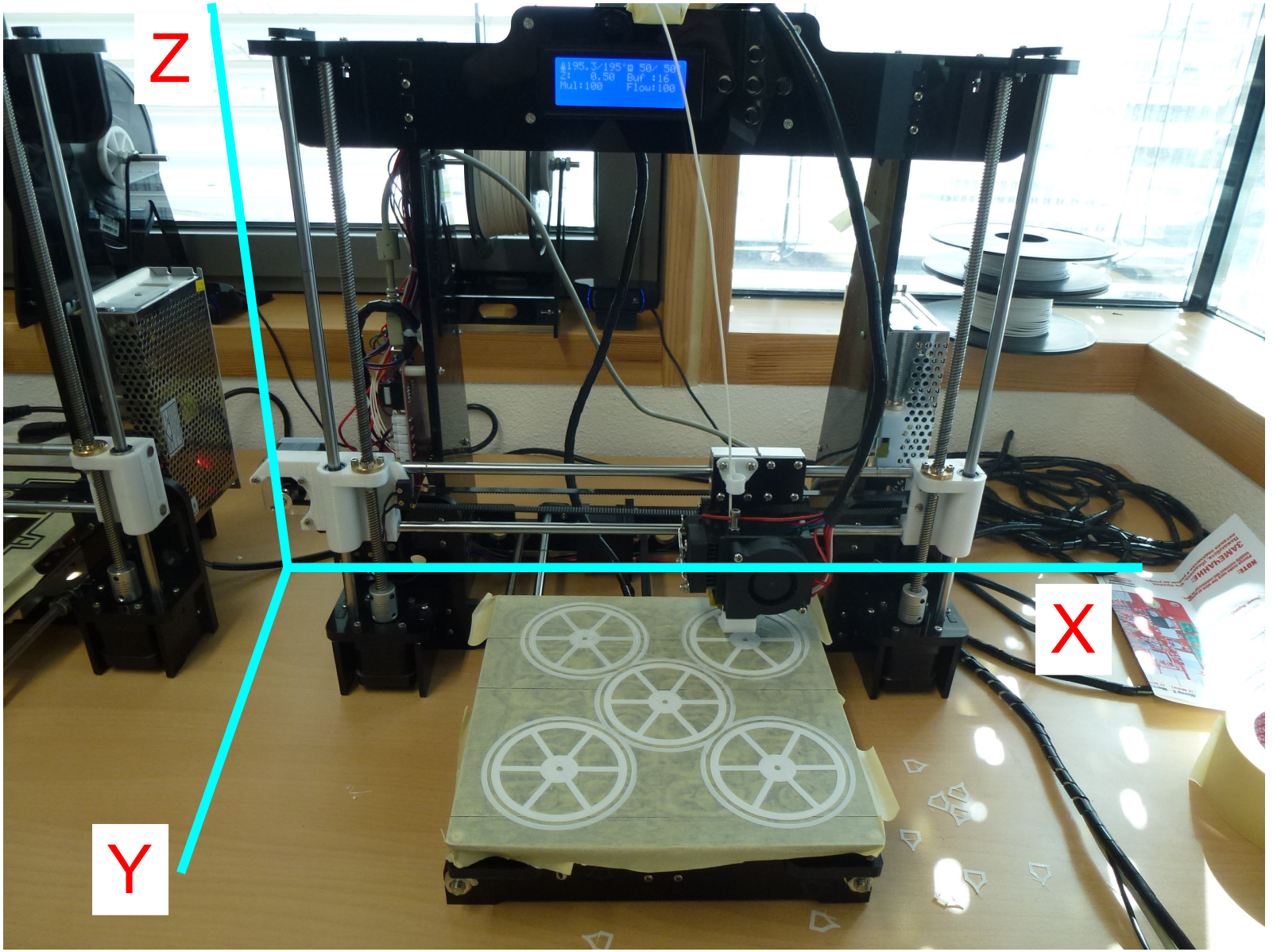
3D printers



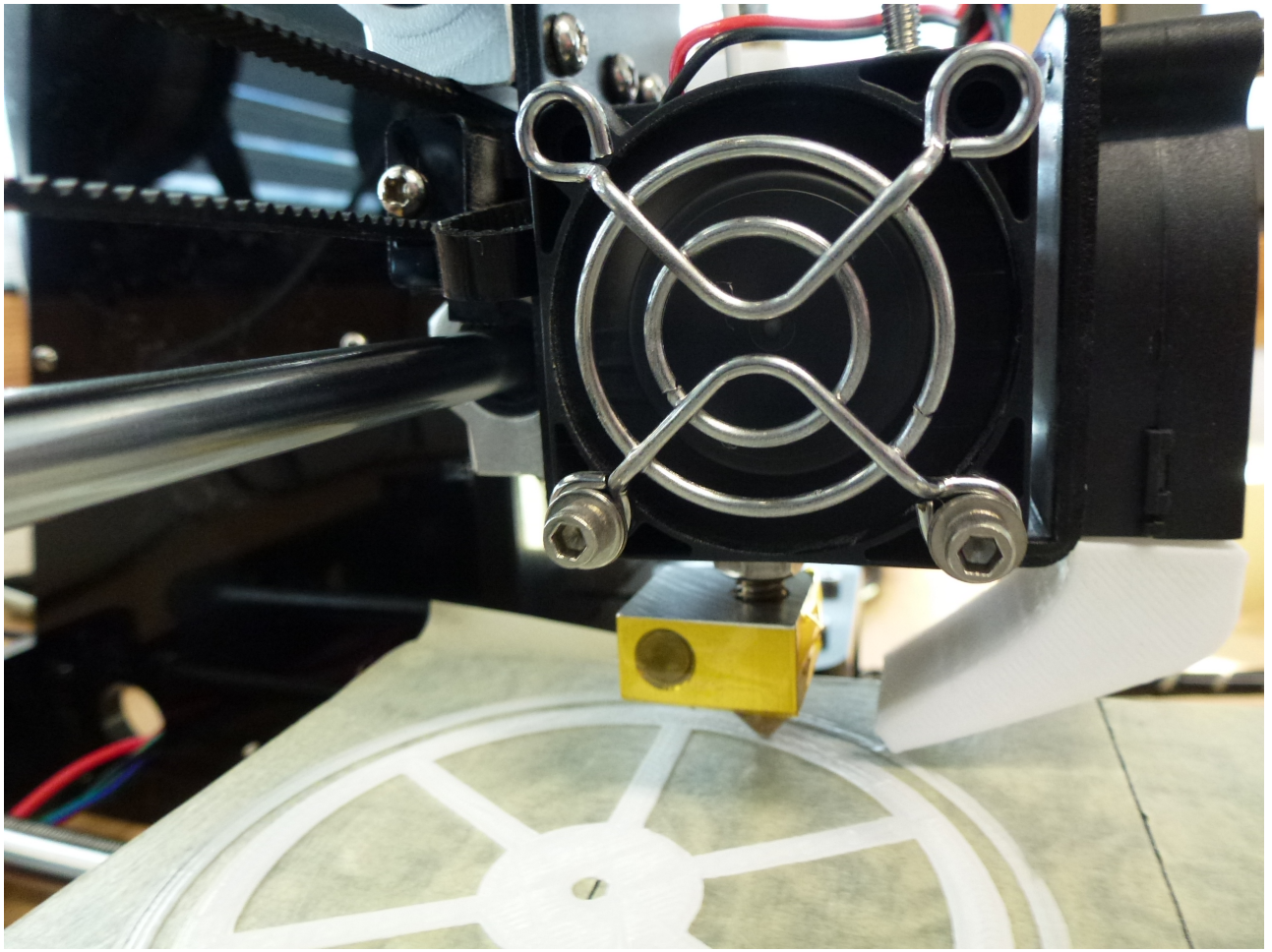
3D printers



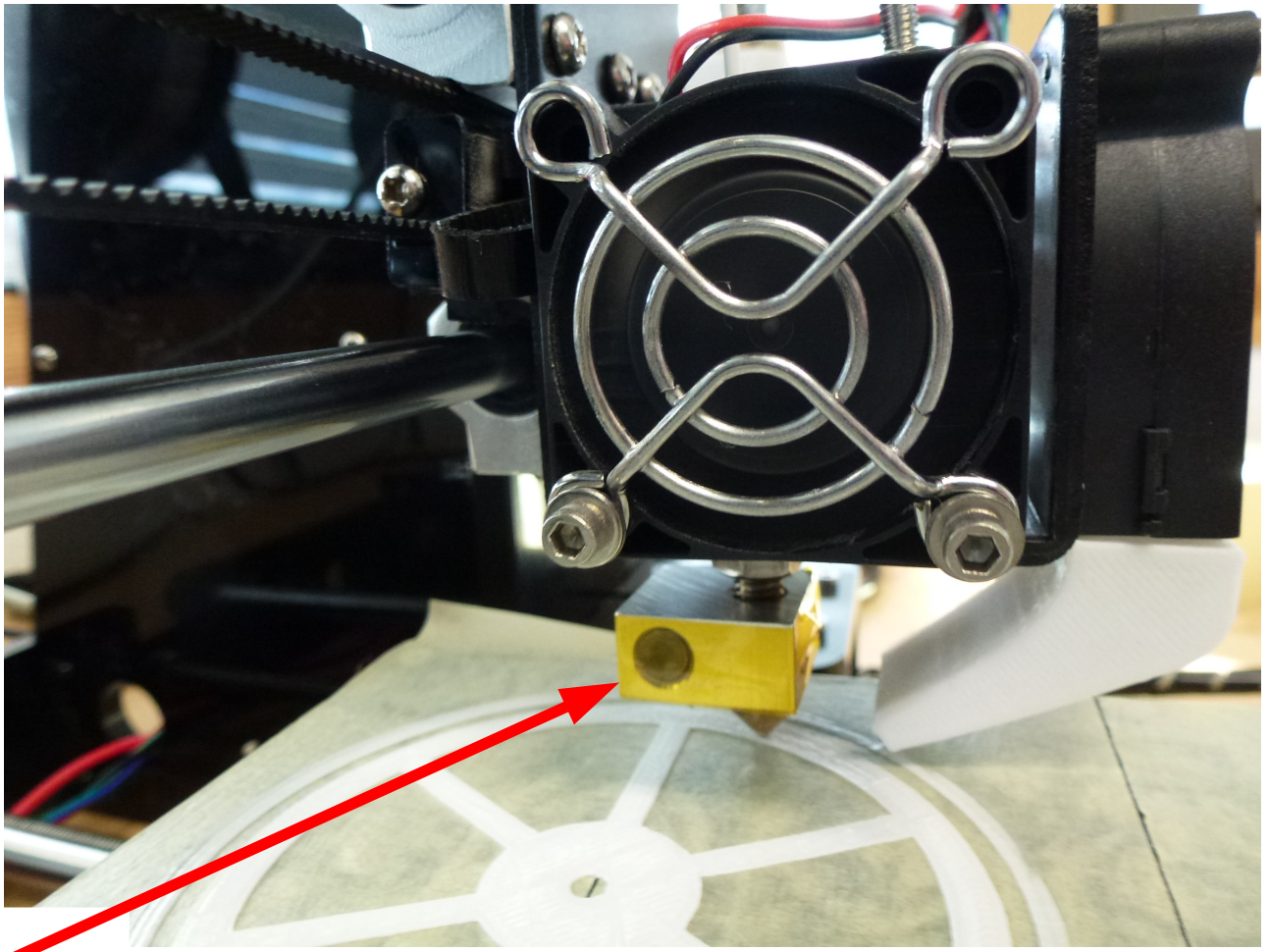
3D printers - axes



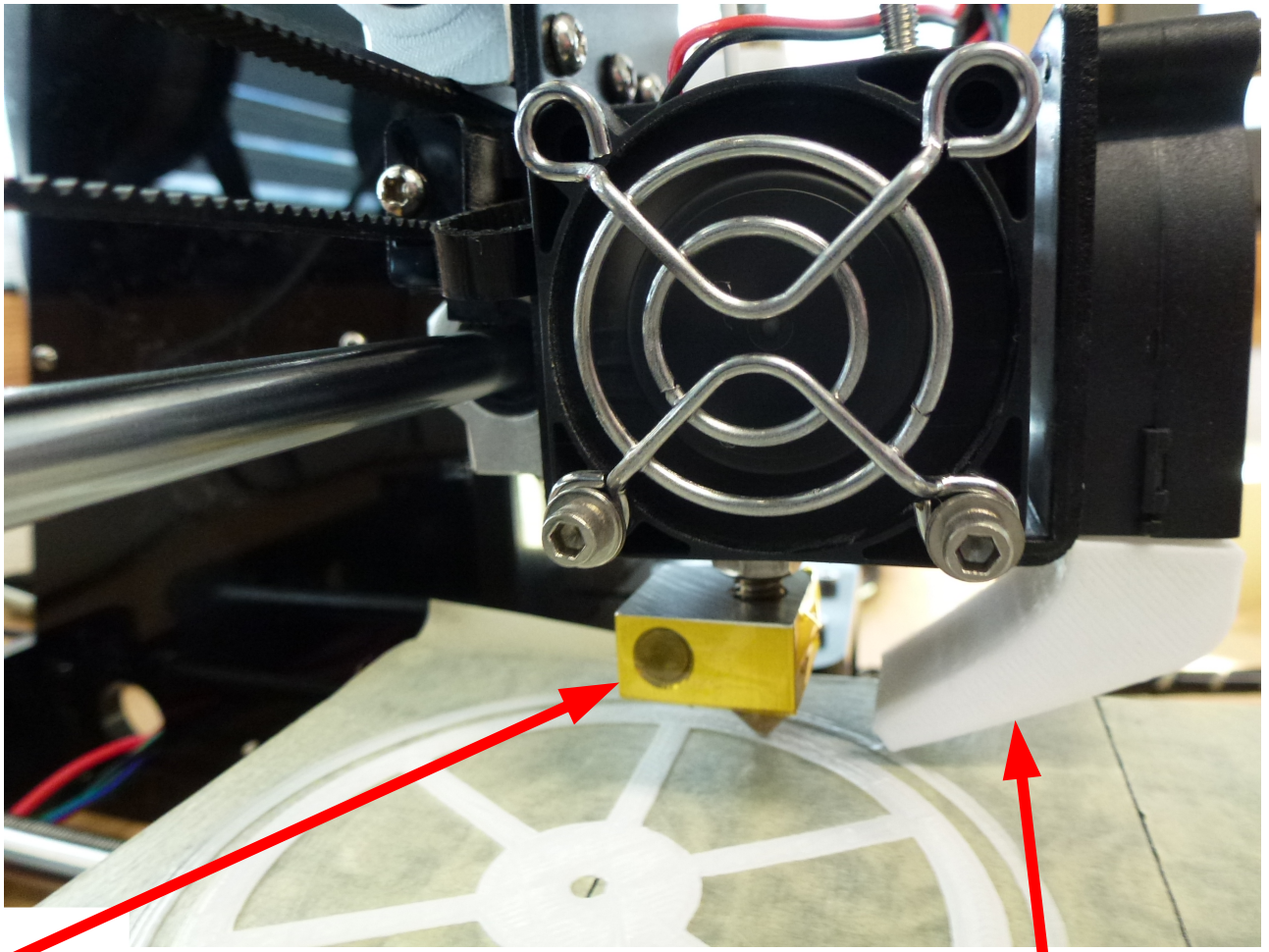
3D printers - extruder



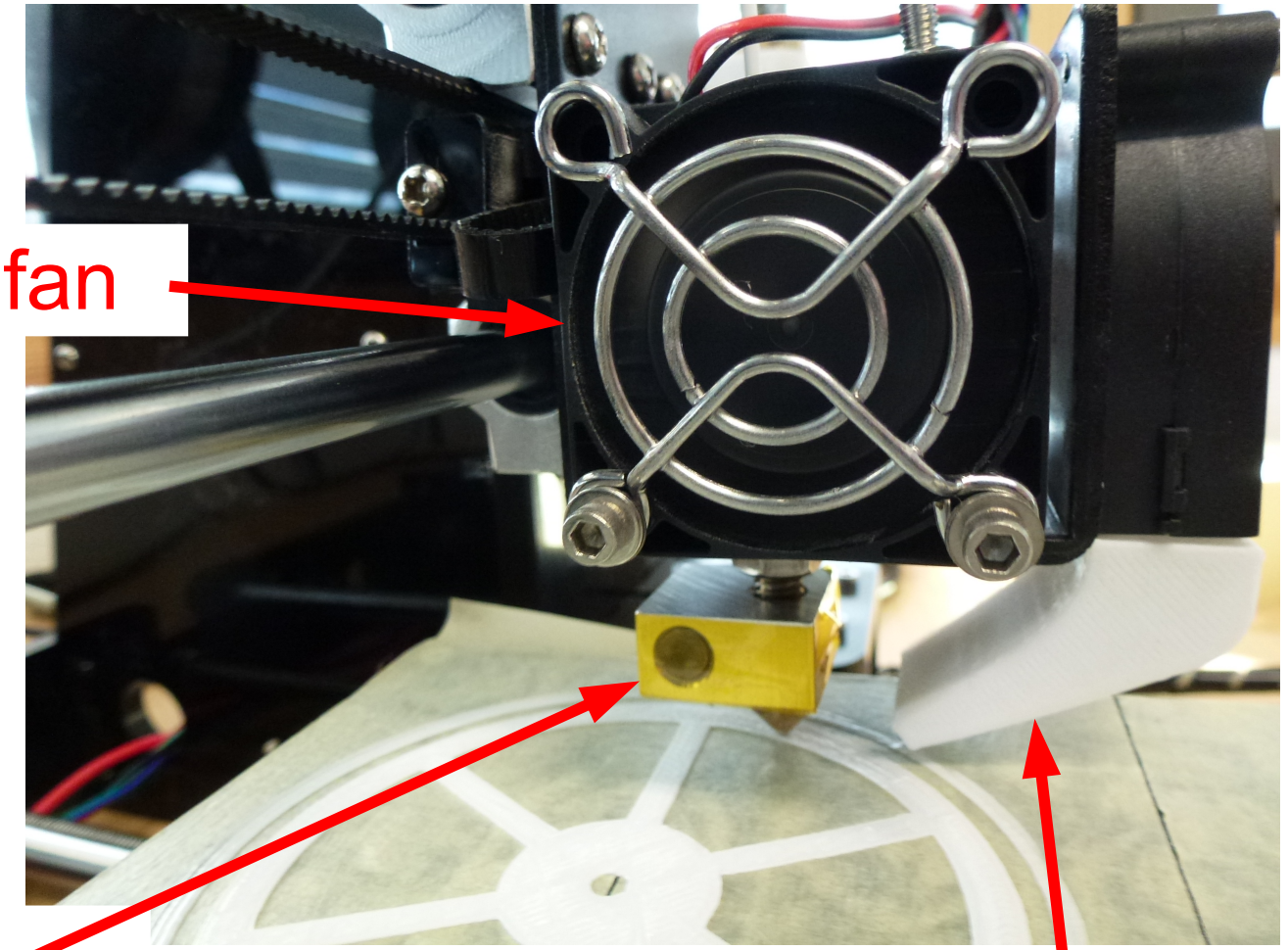
3D printers - extruder



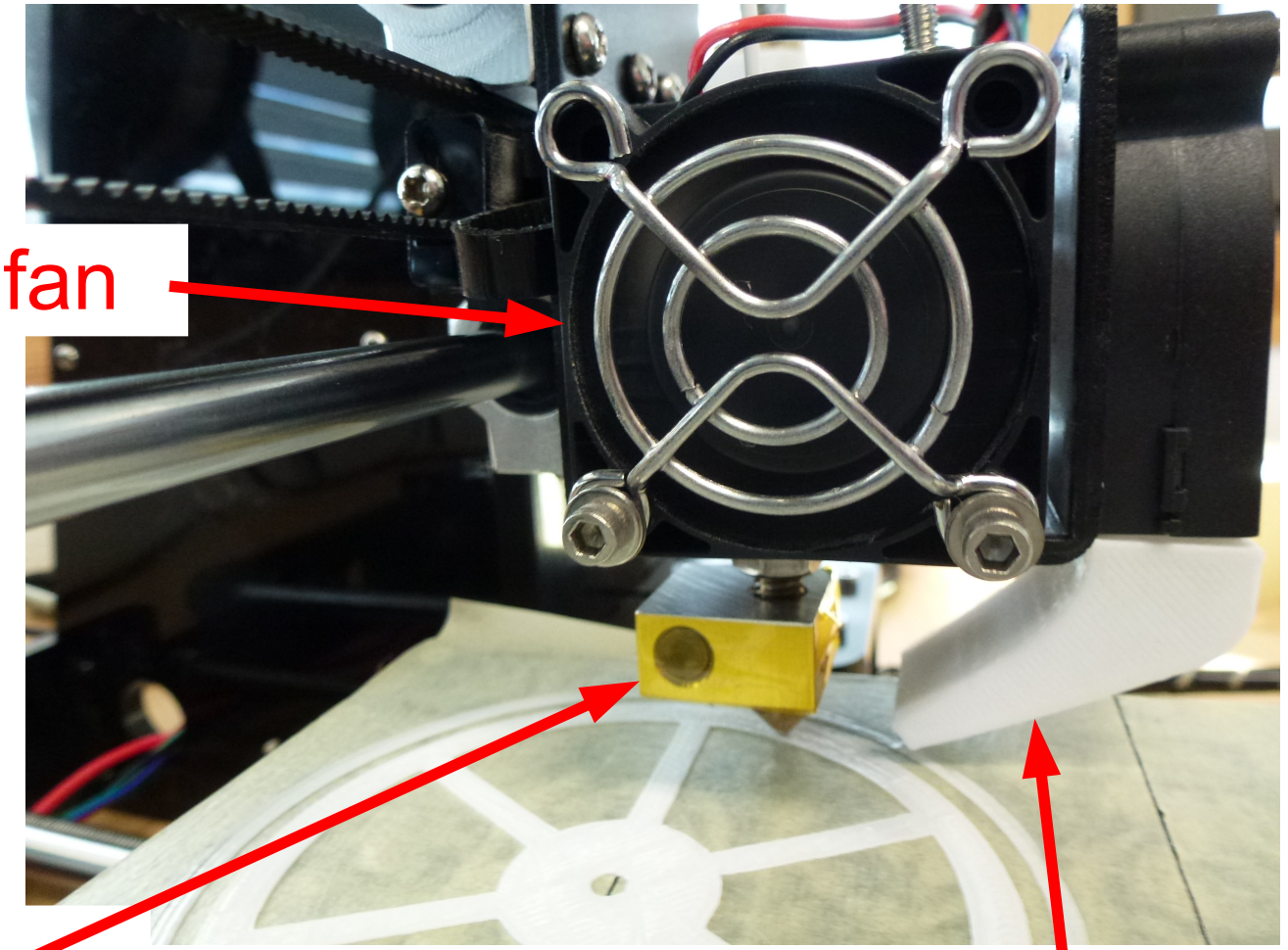
3D printers - extruder



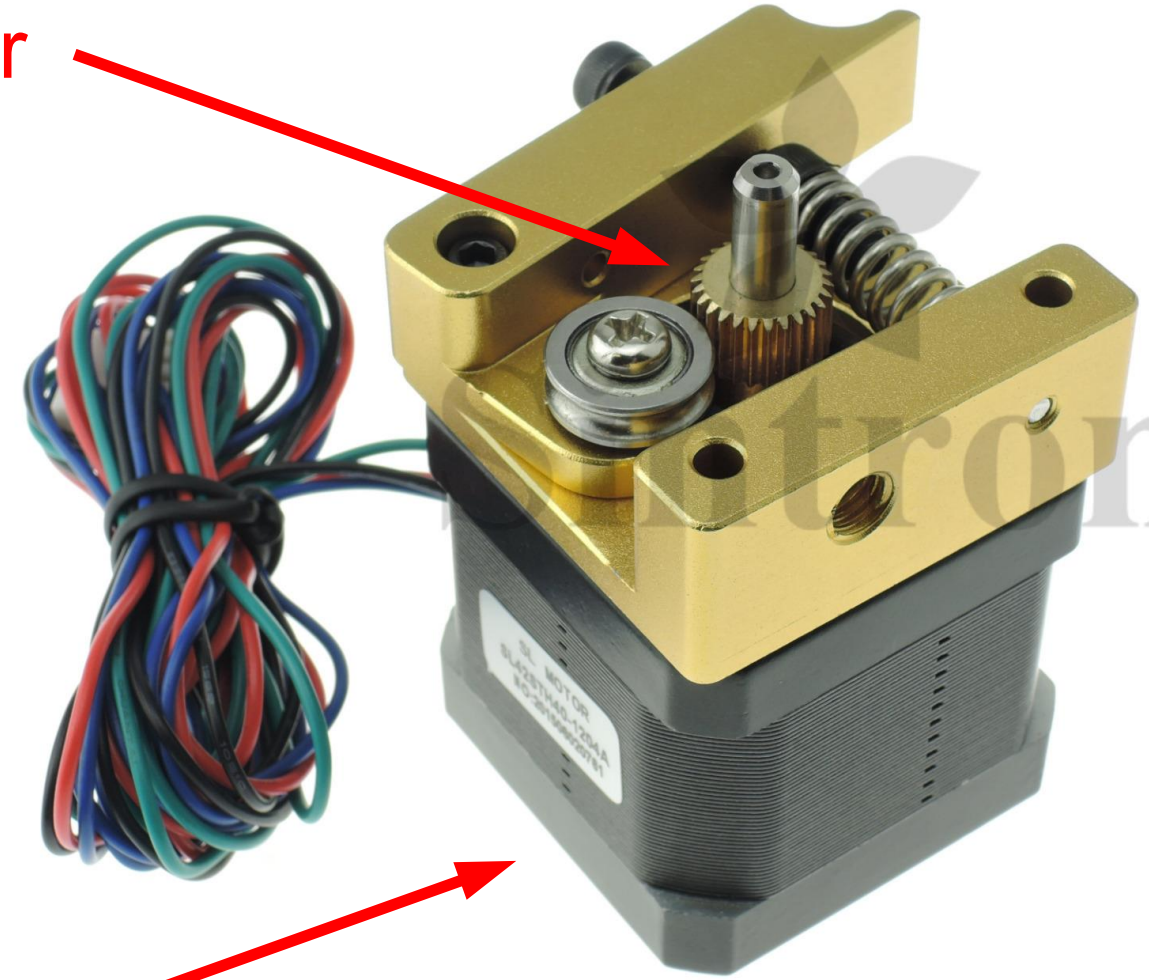
3D printers - extruder



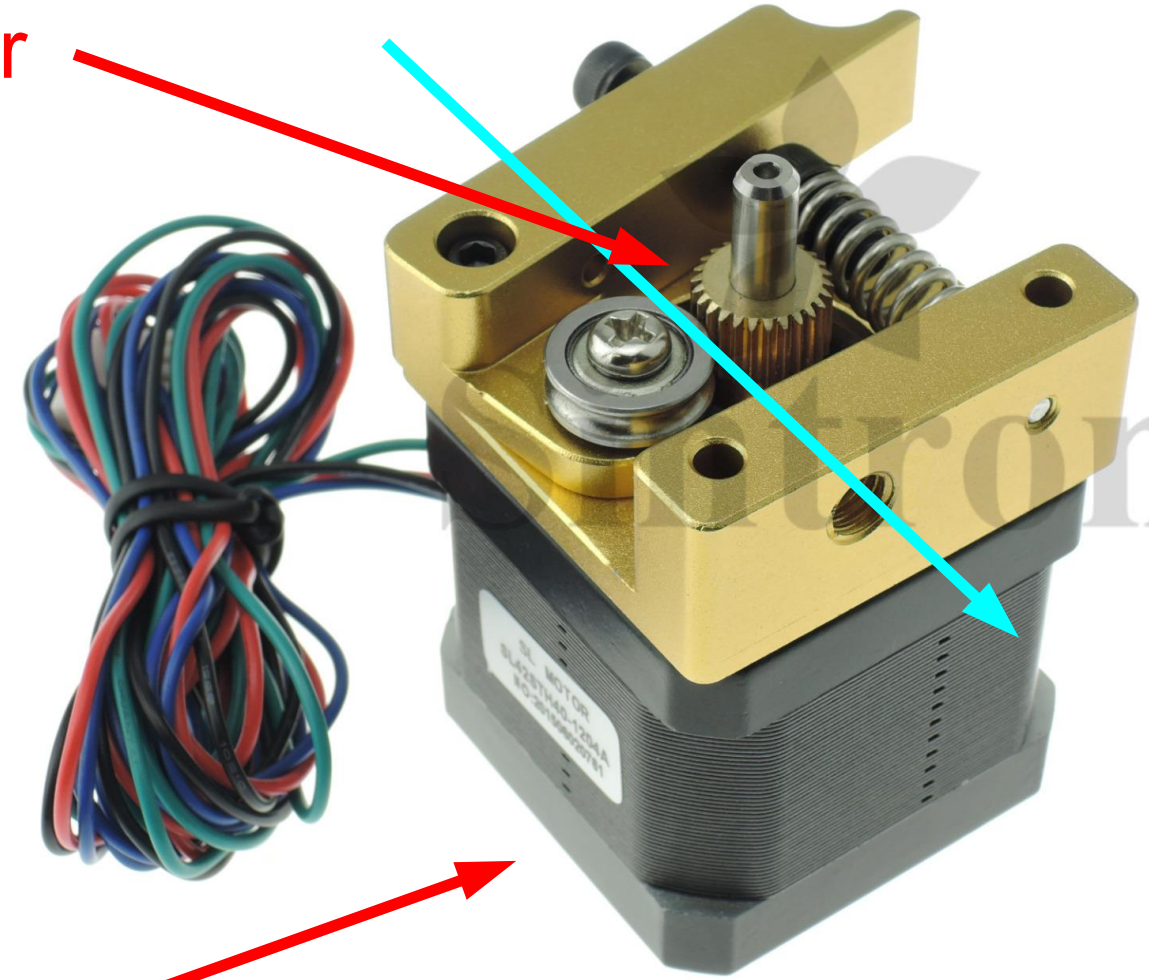
3D printers - extruder



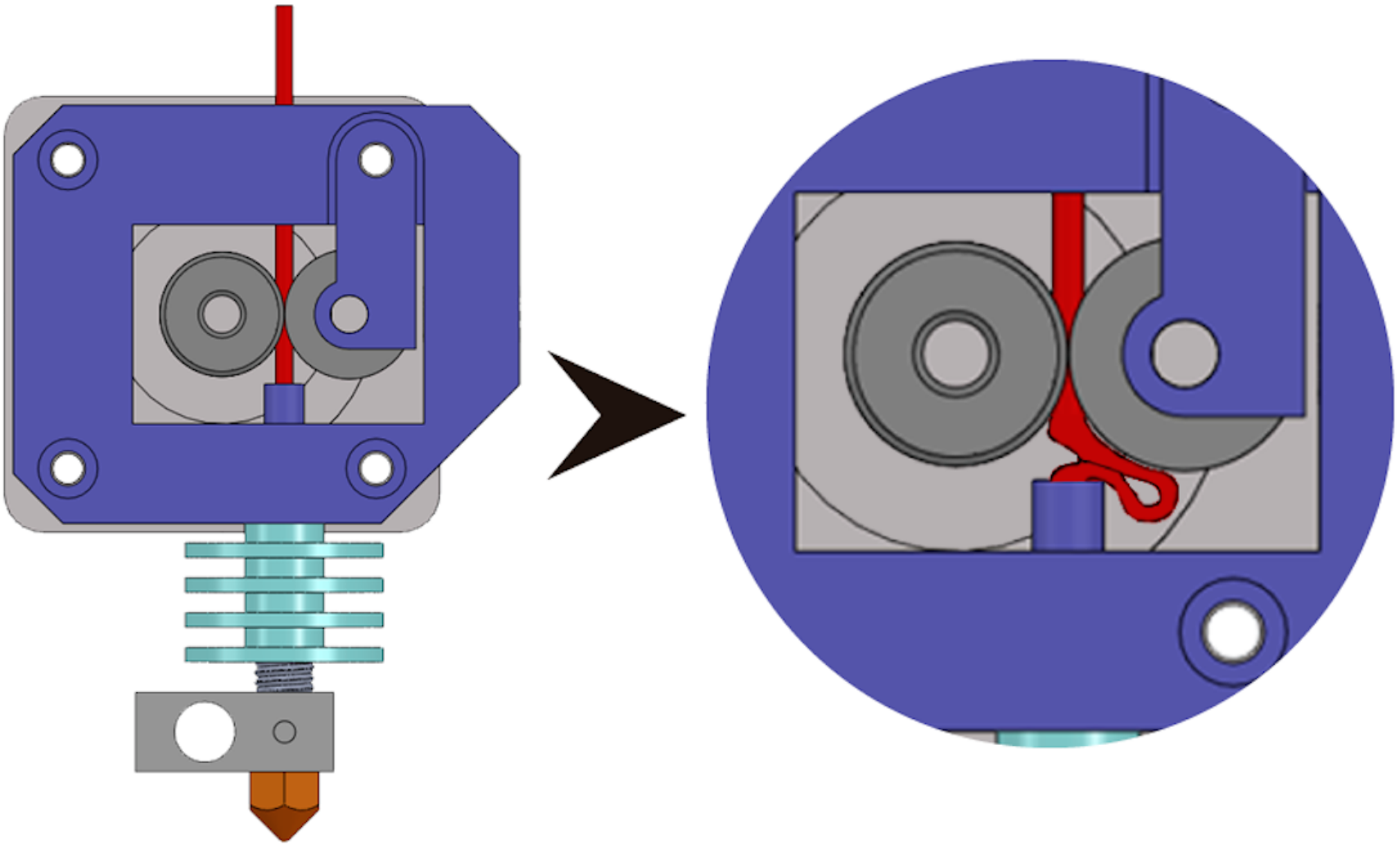
3D printers - extruder



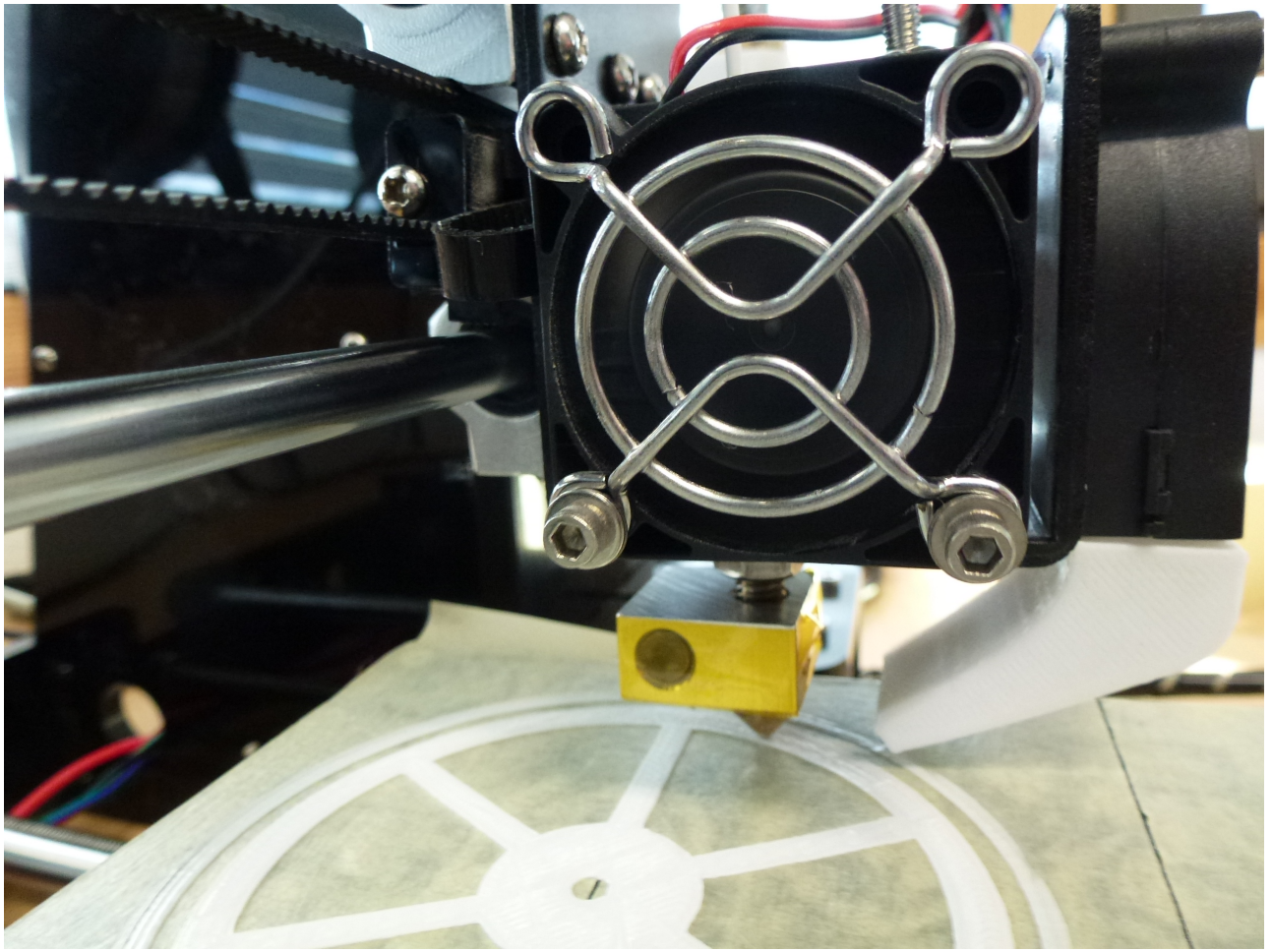
3D printers - extruder



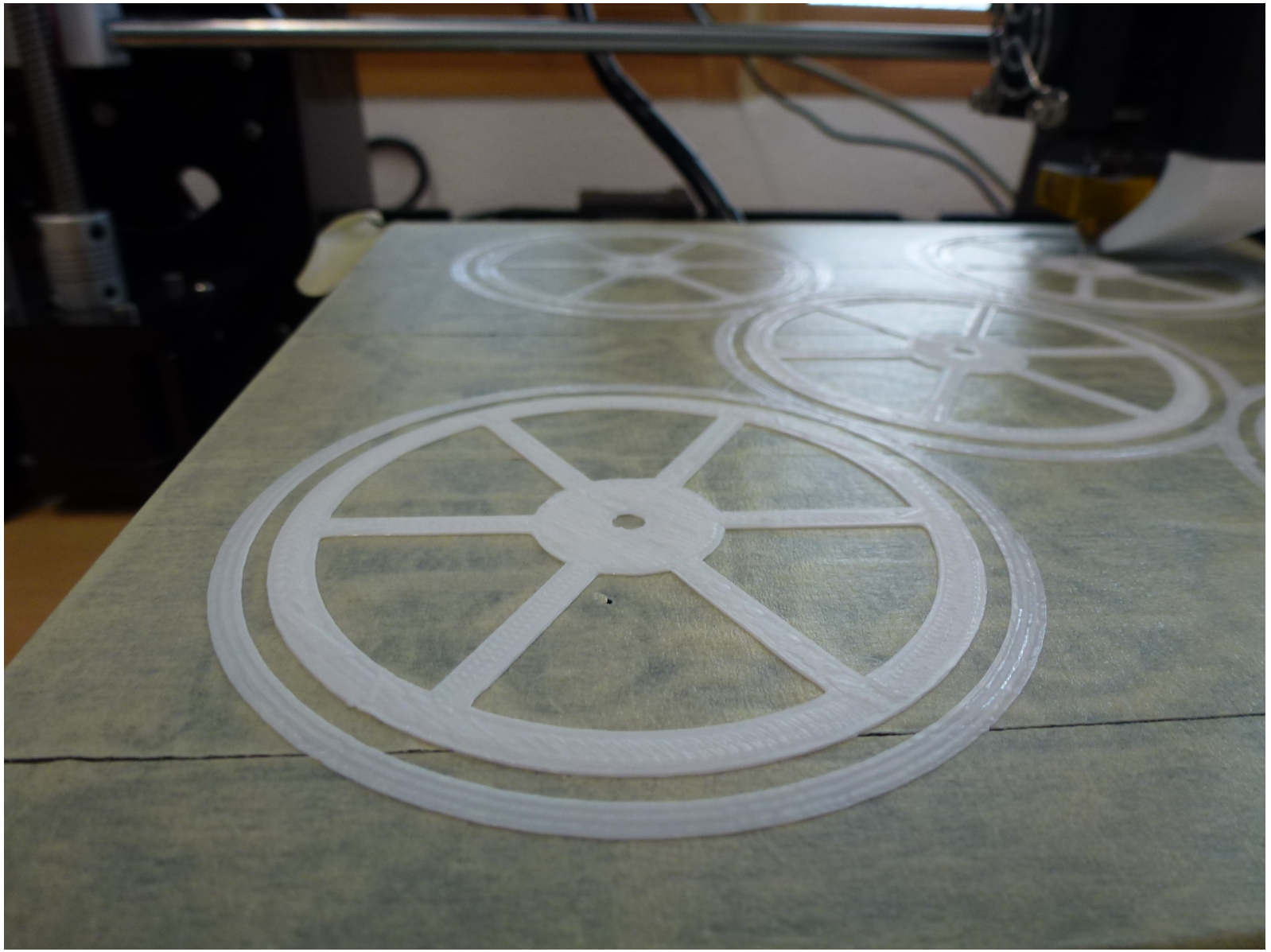
3D printers - extruder



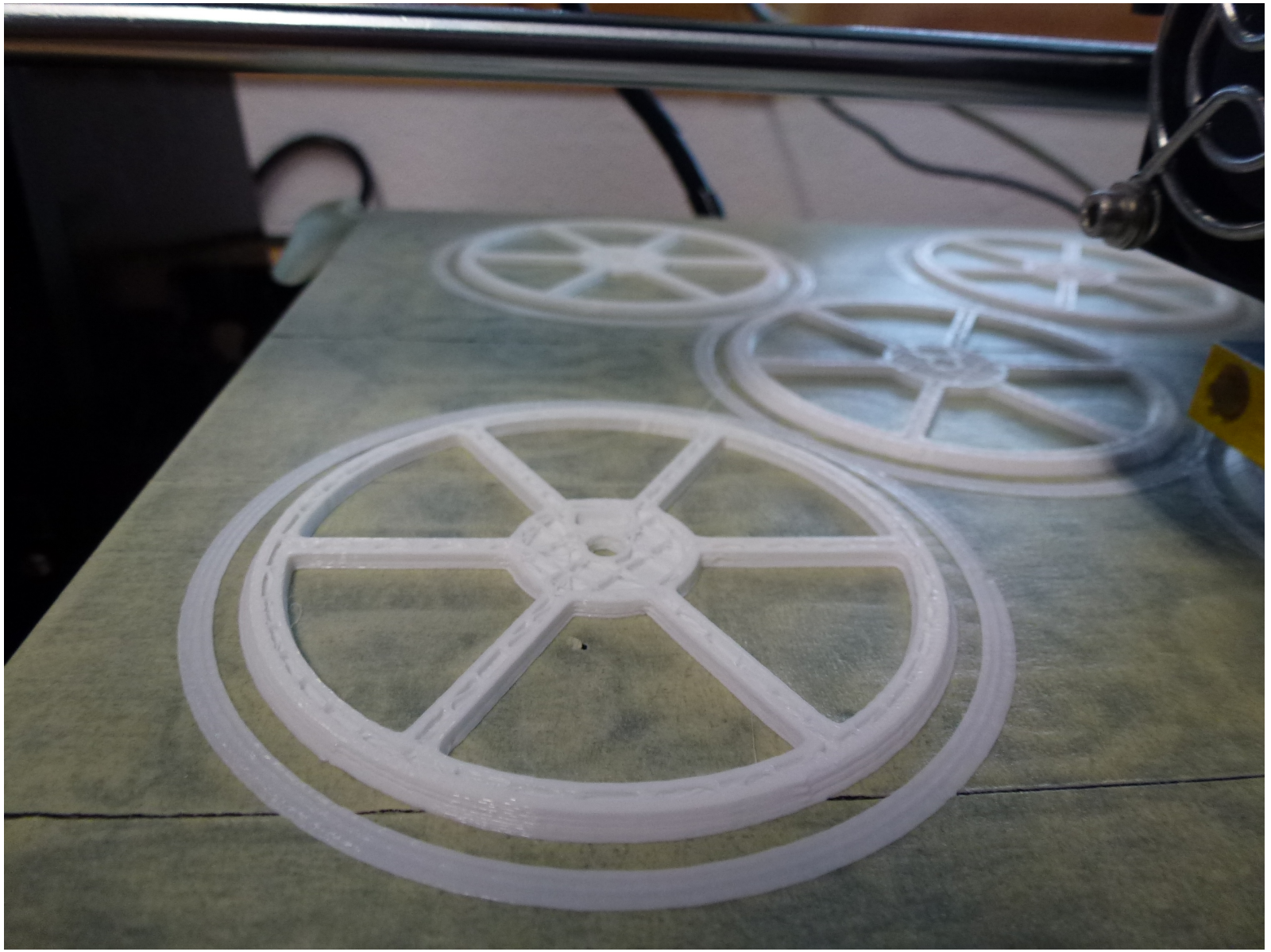
3D printers - printing



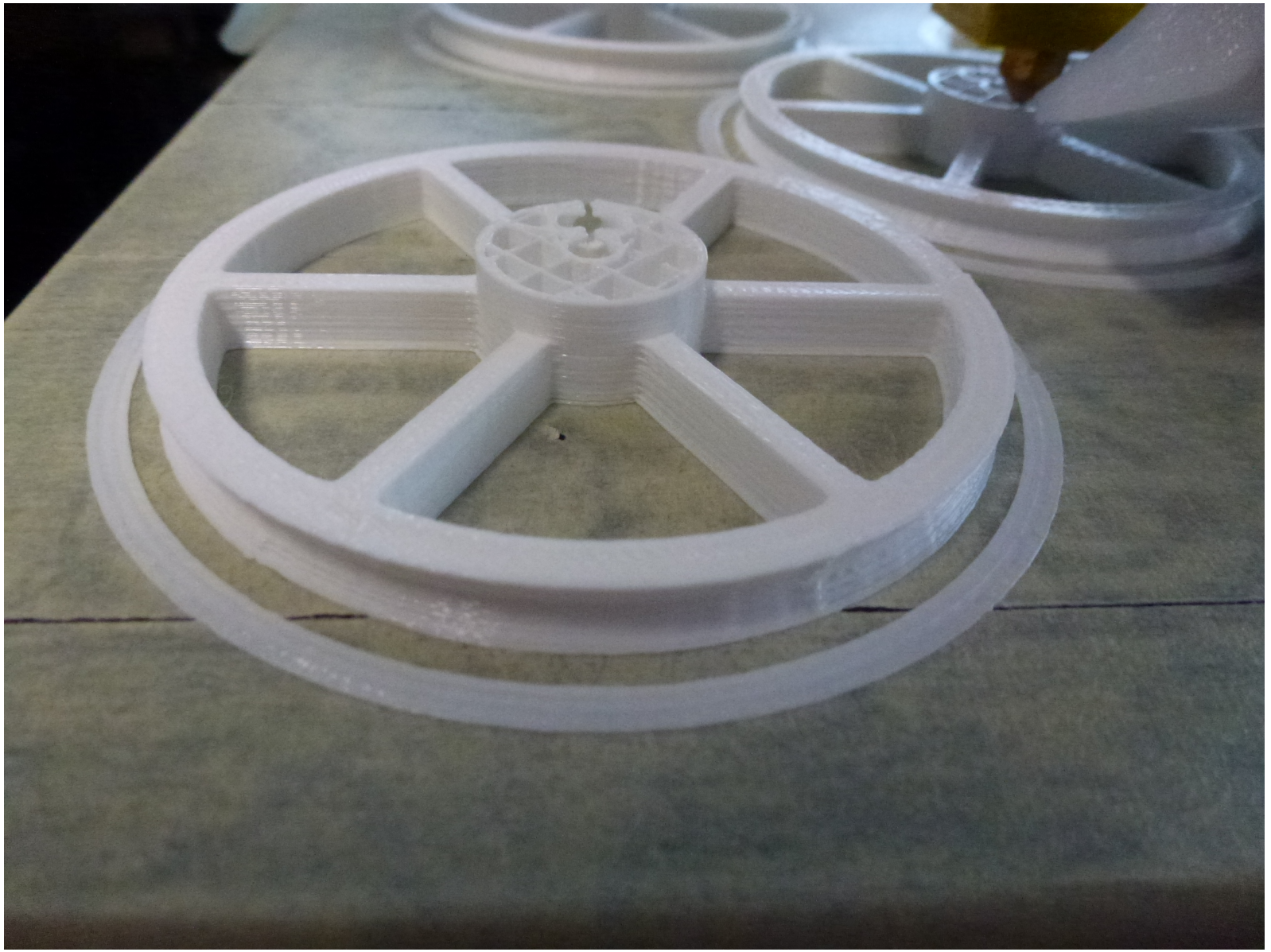
3D printers - printing



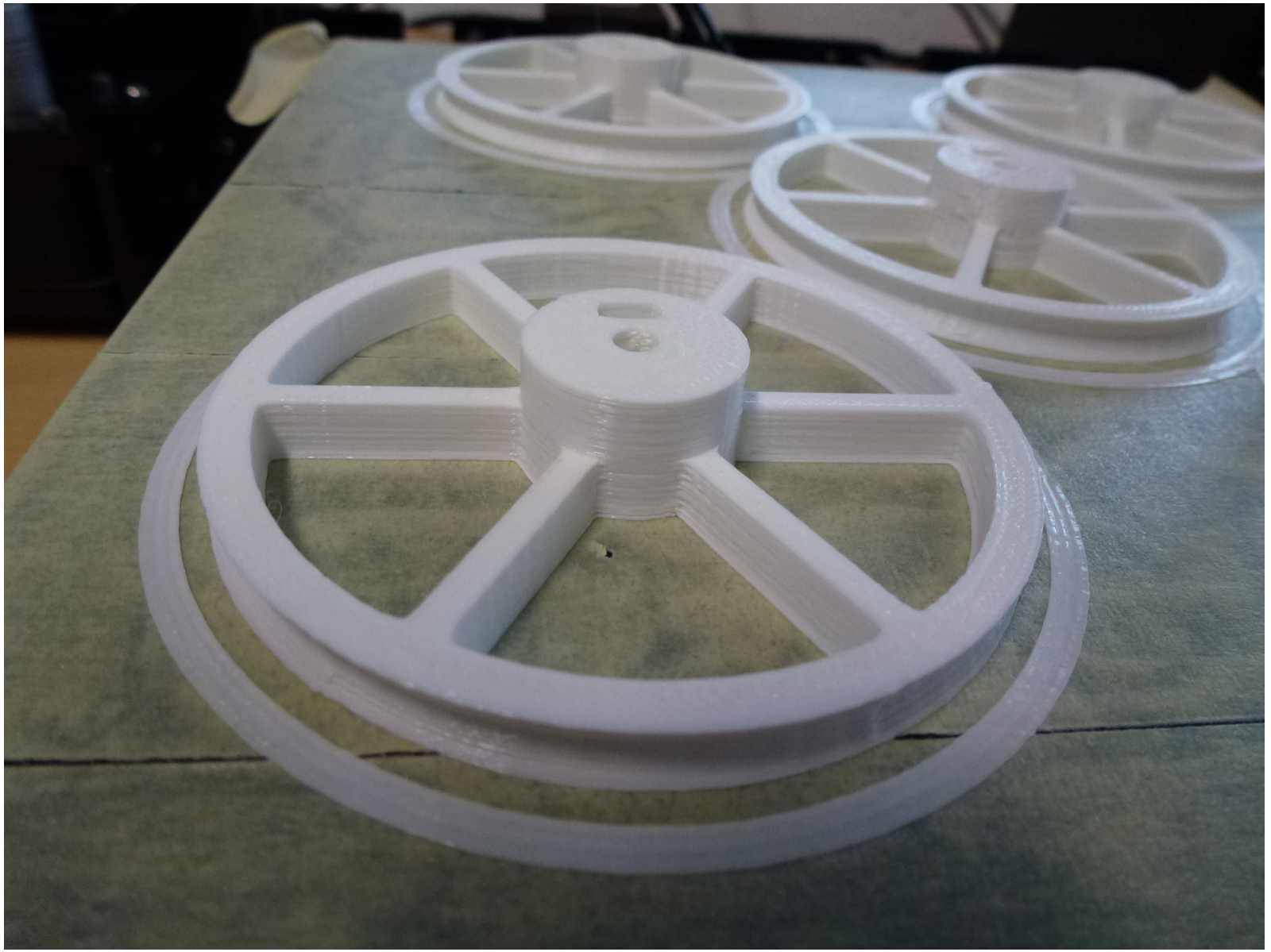
3D printers - printing



3D printers - printing

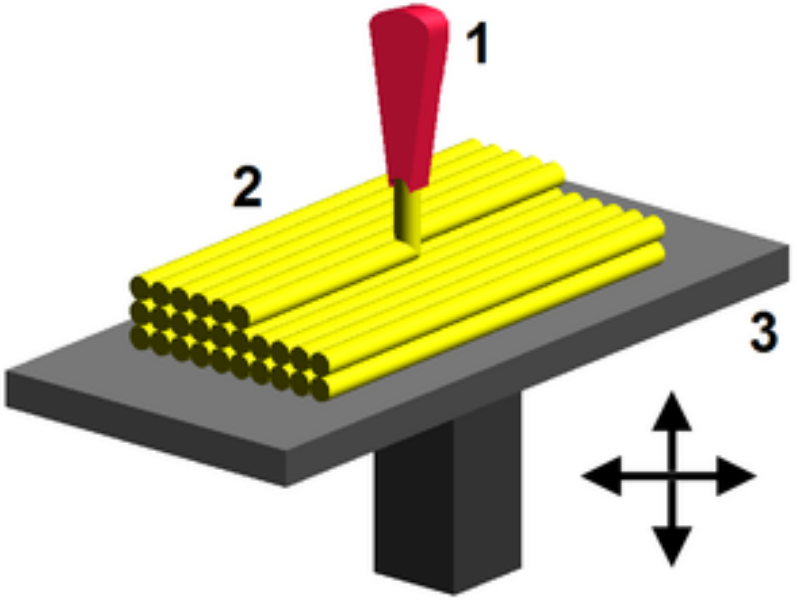


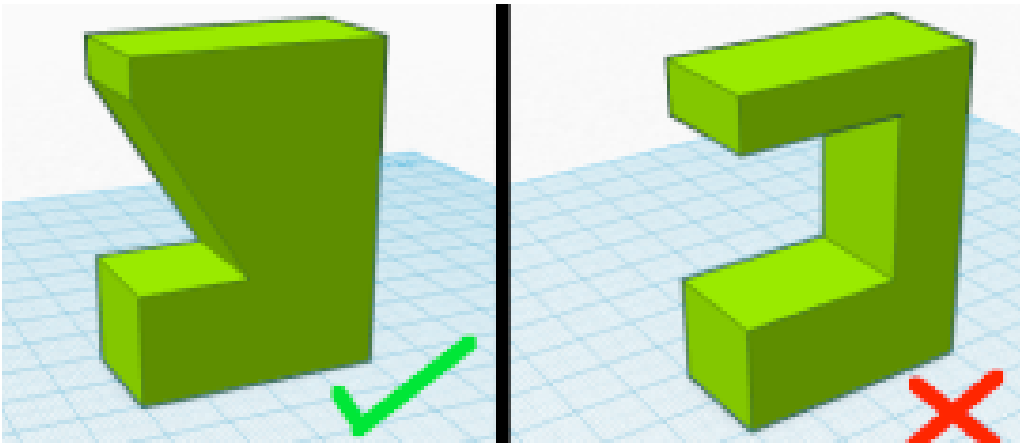
3D printers - printing



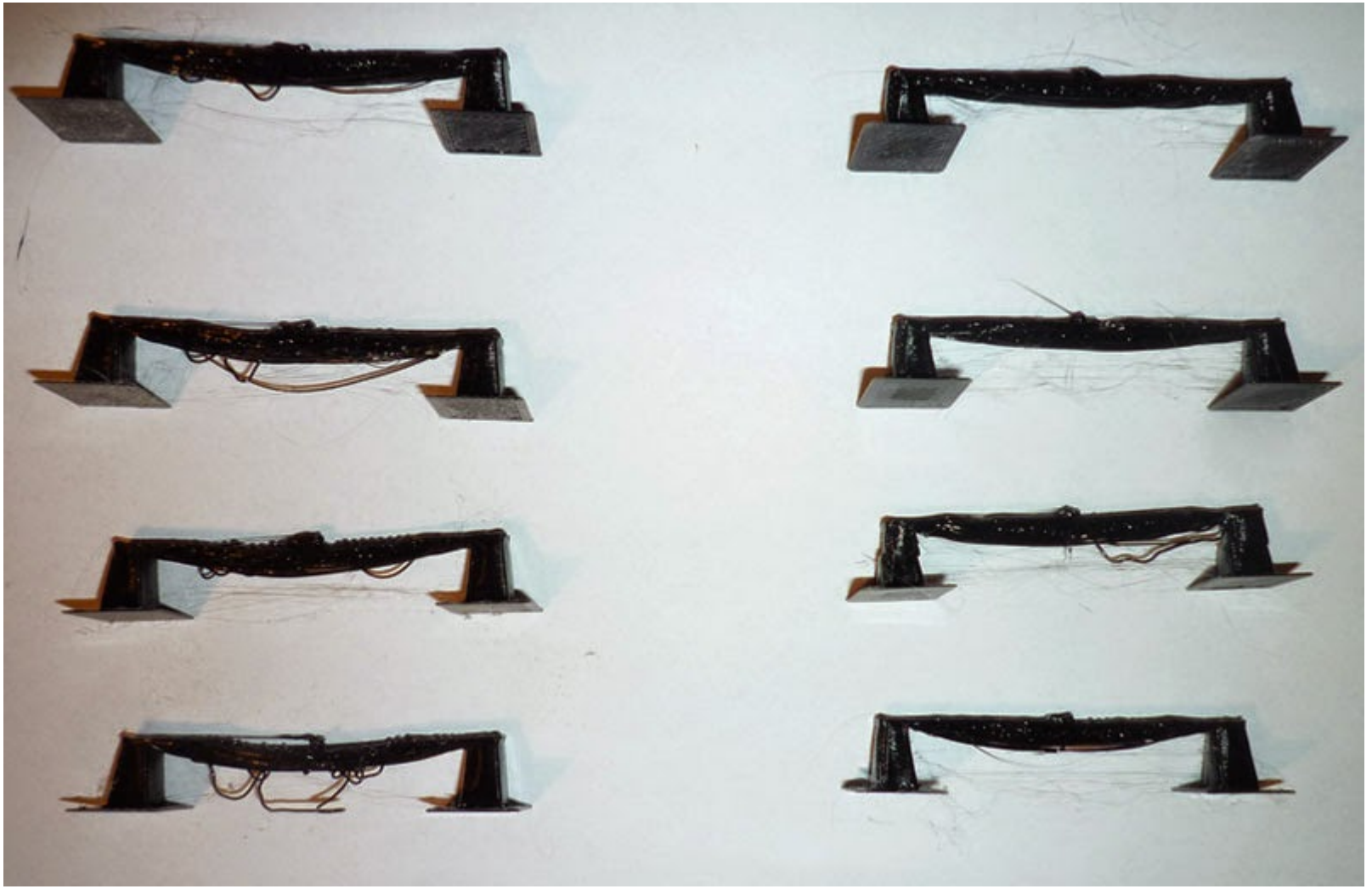
Limitations

- Structures are printed layer by layer
  - They need a surface
  - Can't print in air (without support on the other side)

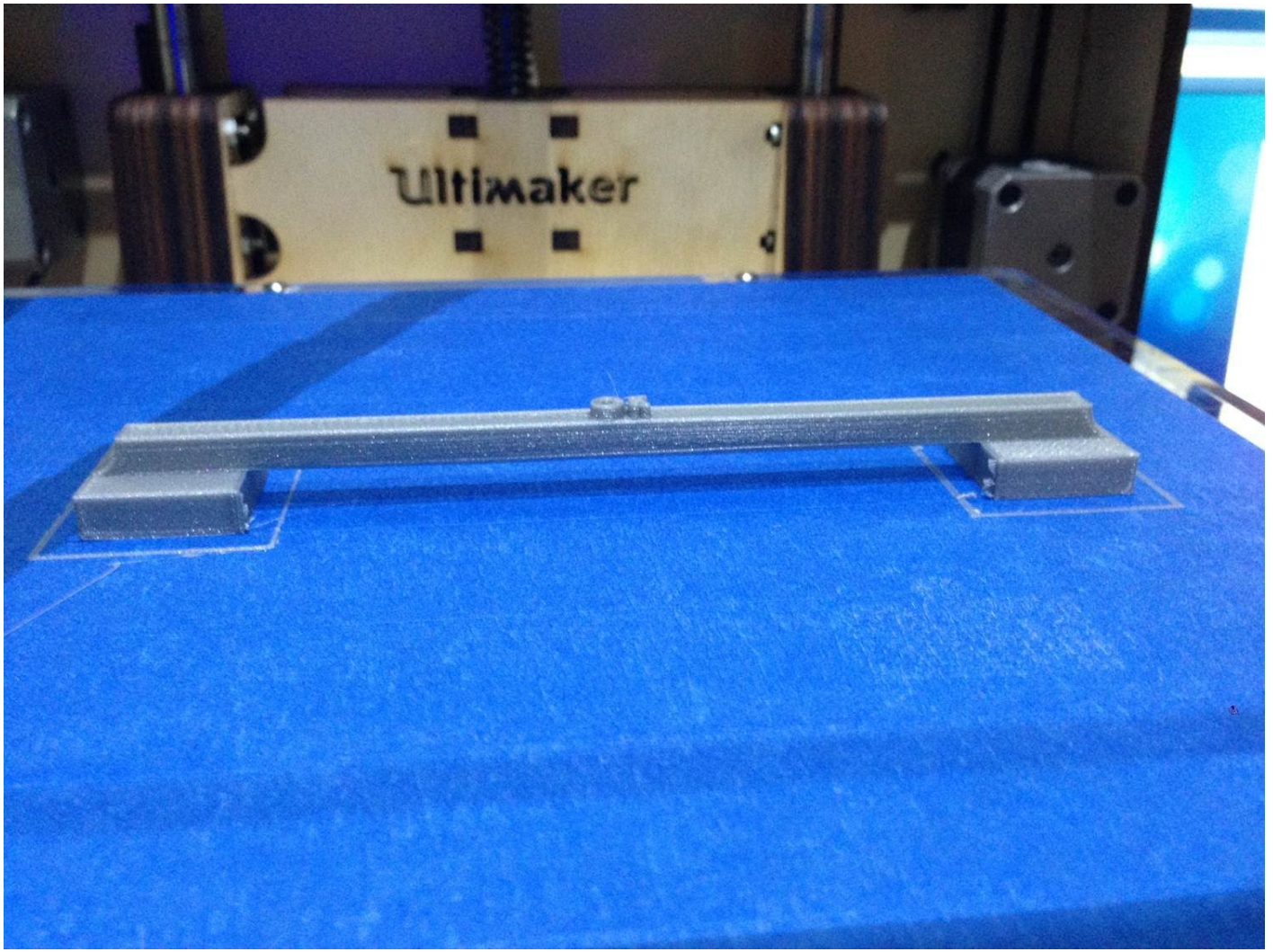




Limitations

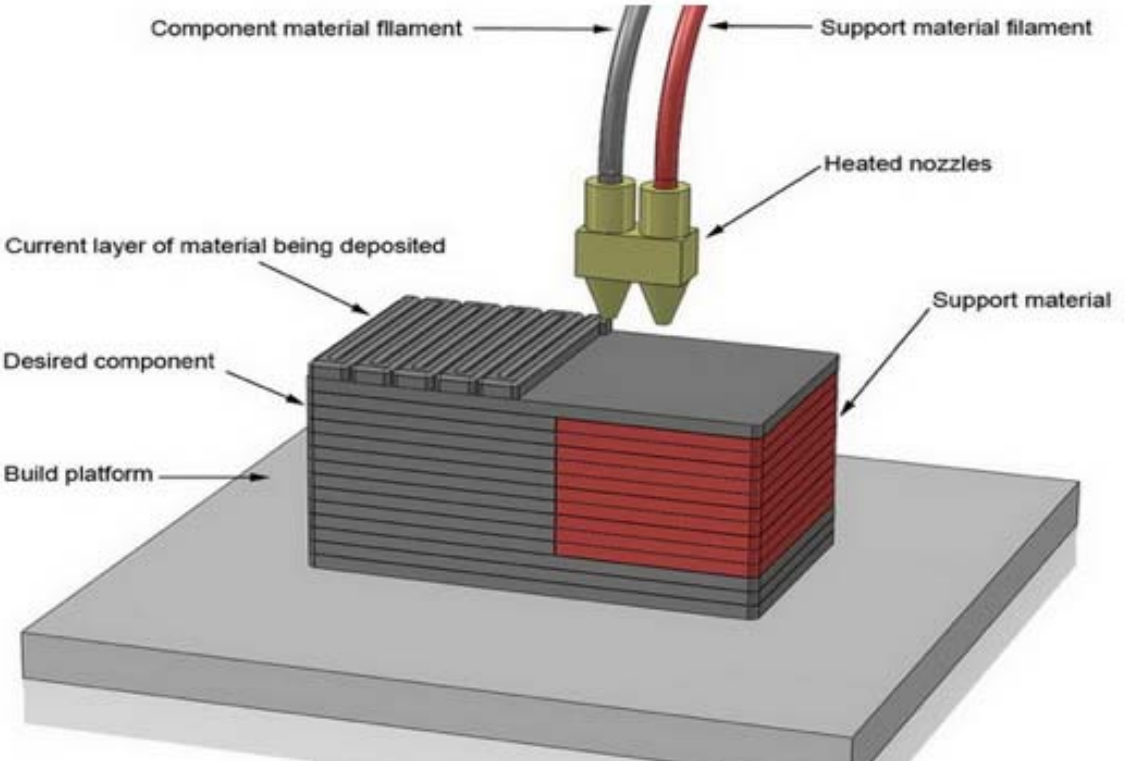


Limitations

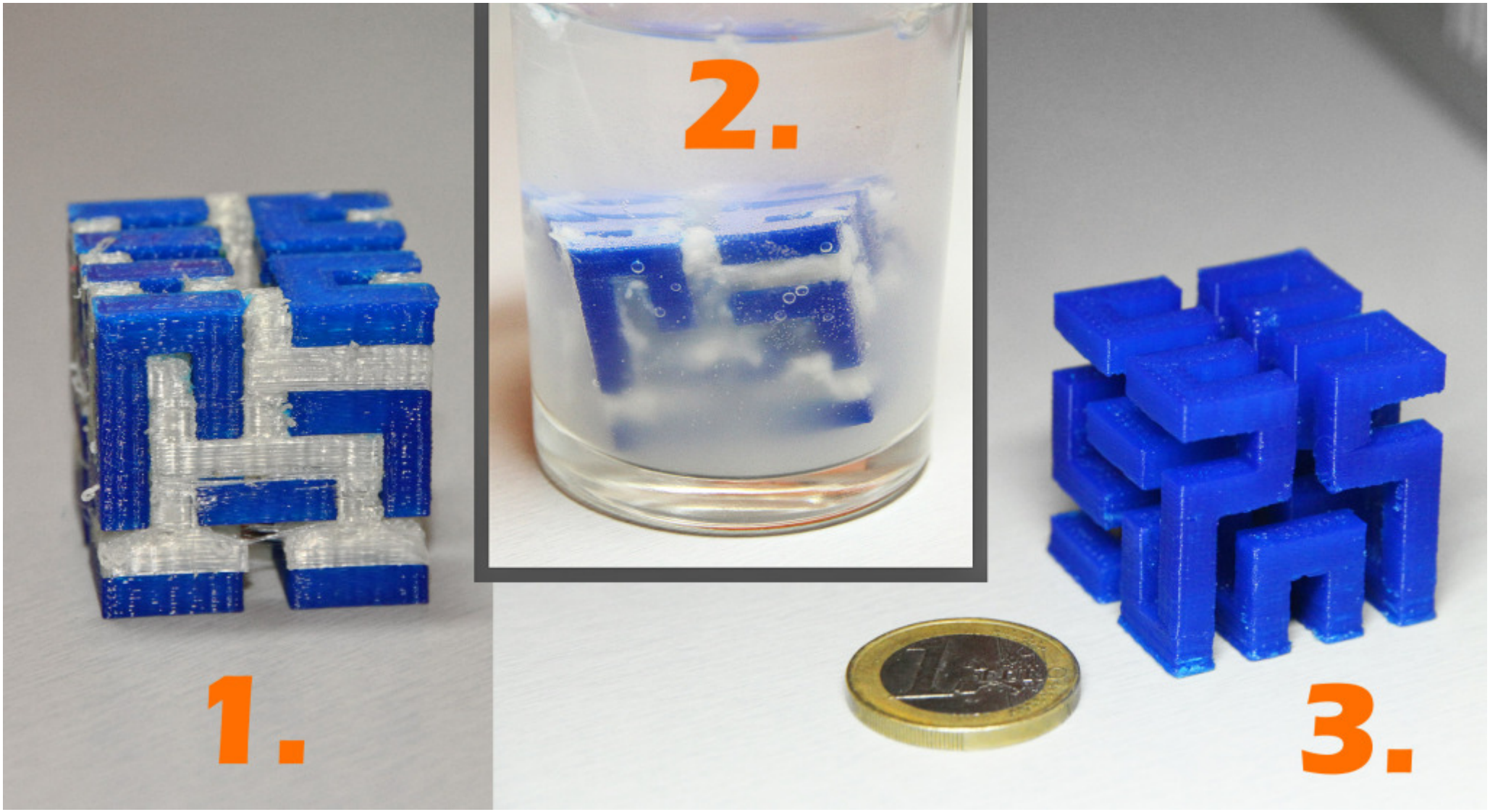


Support material

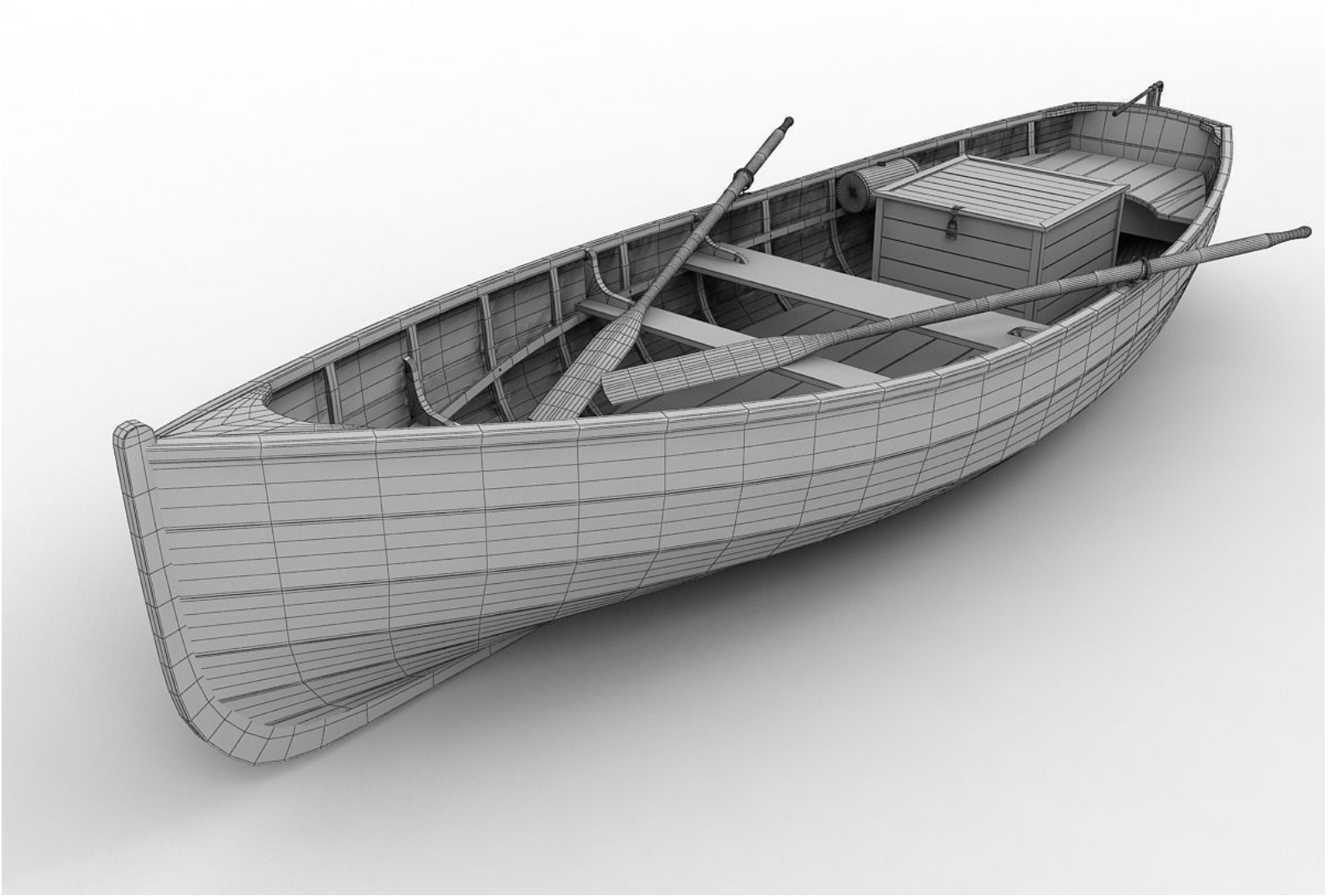
Support material



Support material



Designing your components



Designing your components

- Graphical CAD tools:
  - Unigraphics ($8000 - $15000)
  - Solidworks ($3995)
  - FreeCAD (Free)
- Scripted CAD
  - OpenSCAD (Free)

Designing your components

- Graphical CAD tools:
  - Unigraphics ($8000 - $15000)
  - Solidworks ($3995)
  - FreeCAD (Free)
- Scripted CAD
  - **OpenSCAD (Free)**

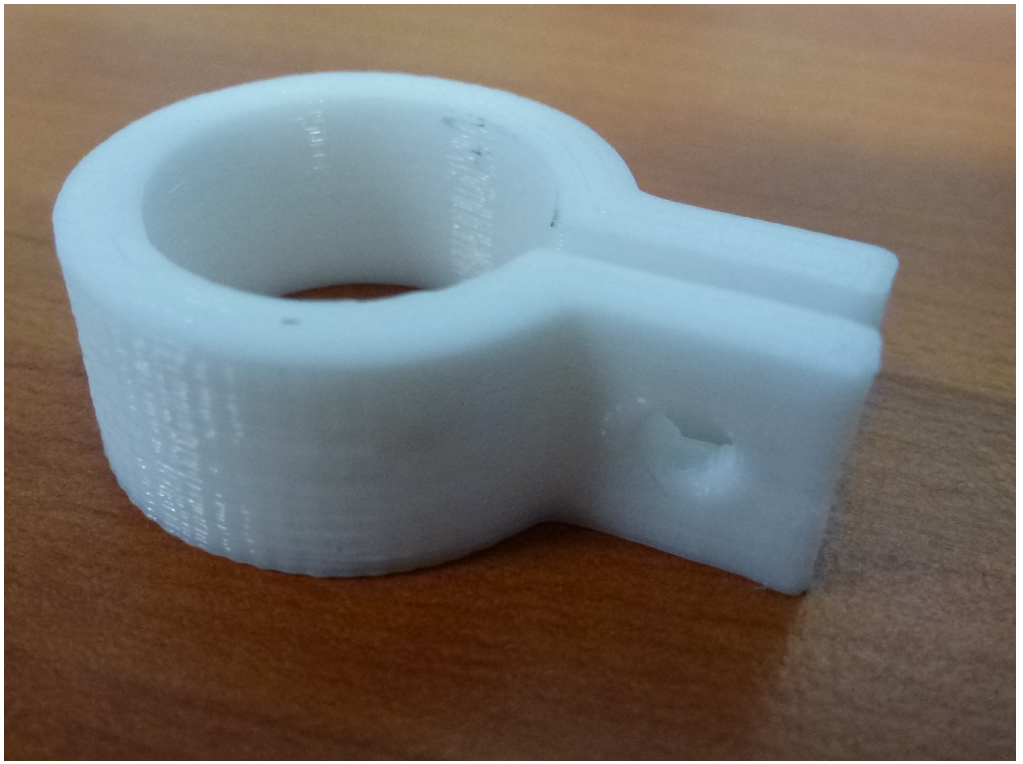
OpenSCAD

- Get OpenSCAD
  - http://www.openscad.org/downloads.html
    - MAC
    - Windows
    - Linux
- Very useful:
  - http://www.openscad.org/cheatsheet/

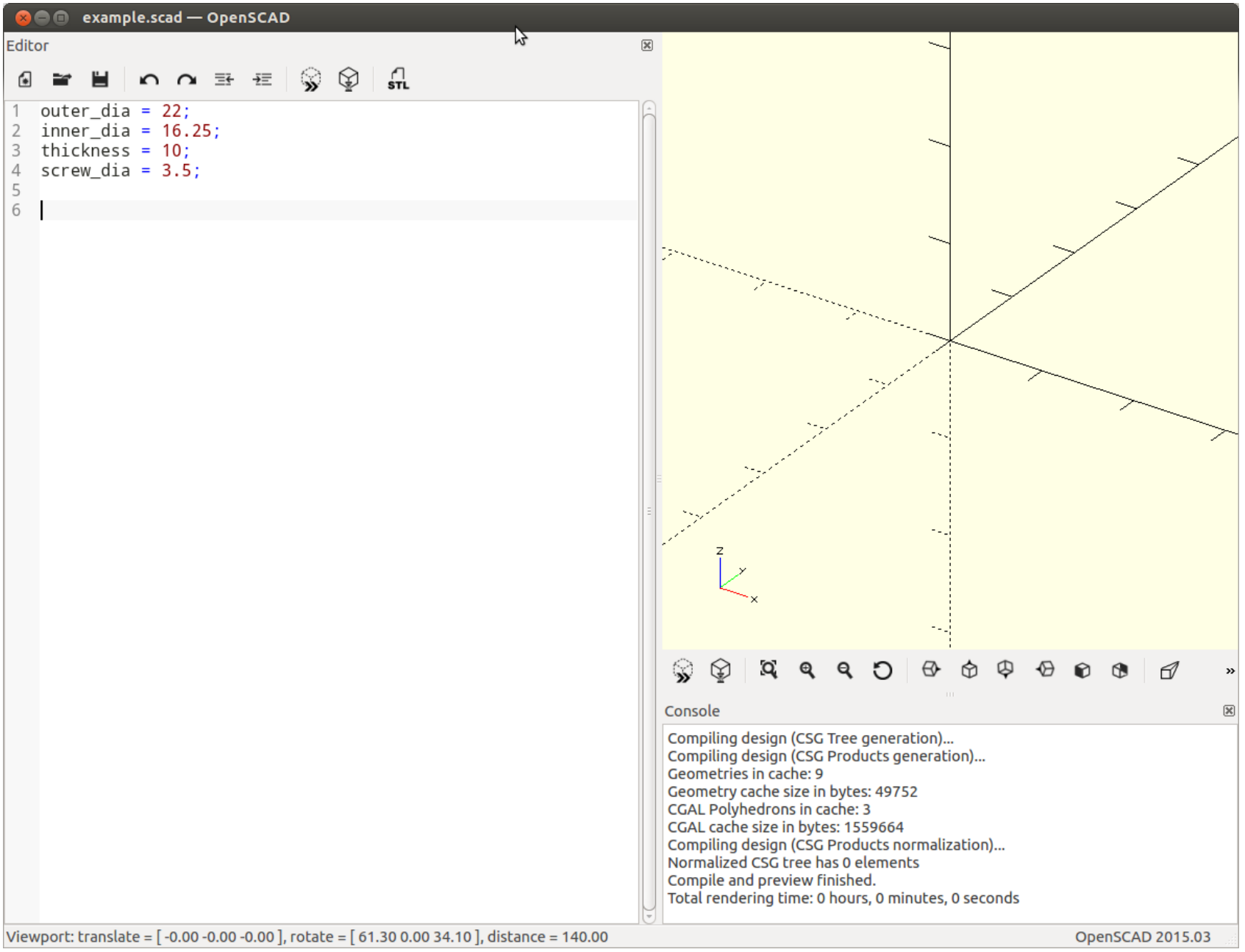
OpenSCAD

- OpenSCAD works by combining and subtracting primitive objects.
  - constructive solid geometry
- Supports variables and math operations so your designs can be completely parameterized.

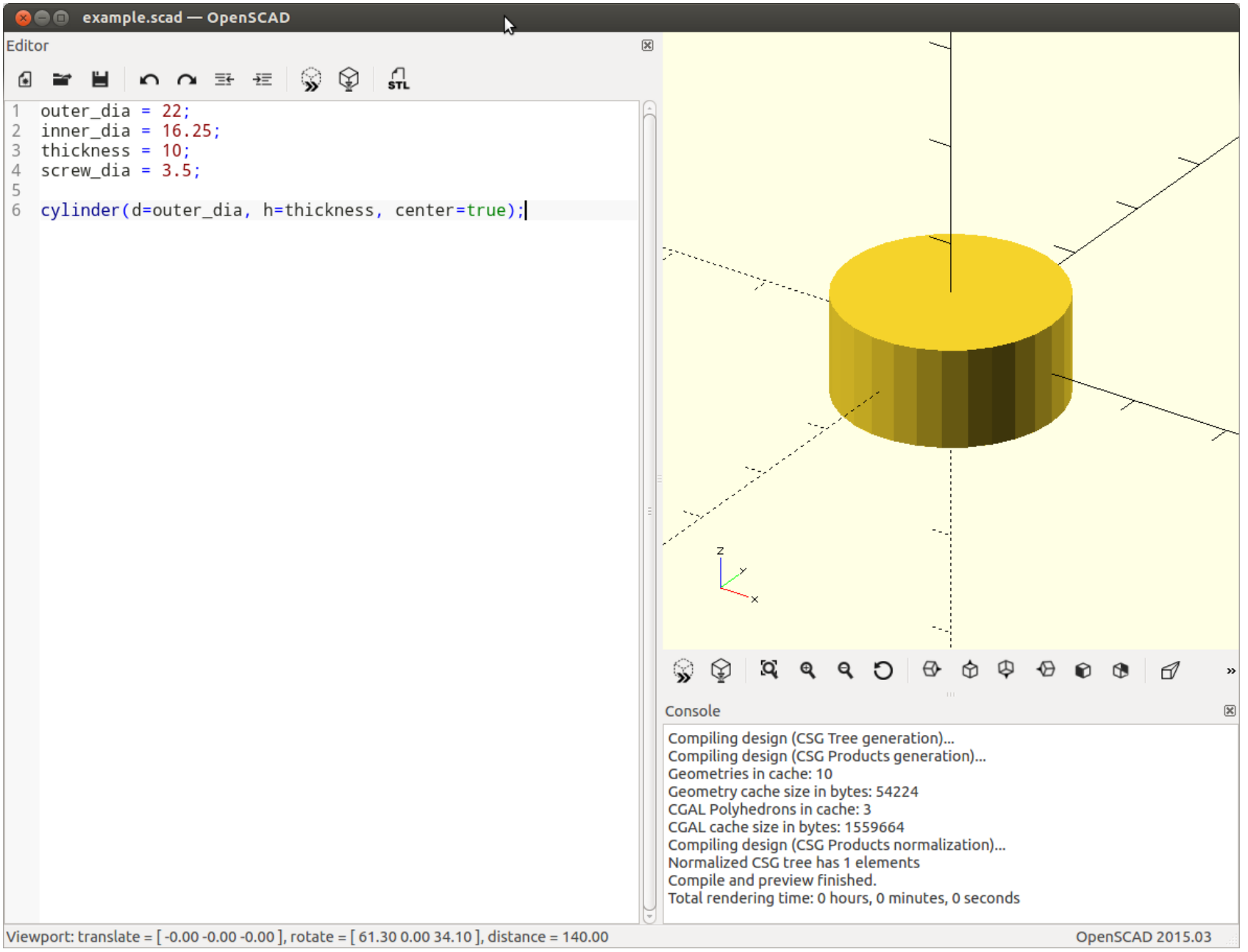
Example: MPPT clamp



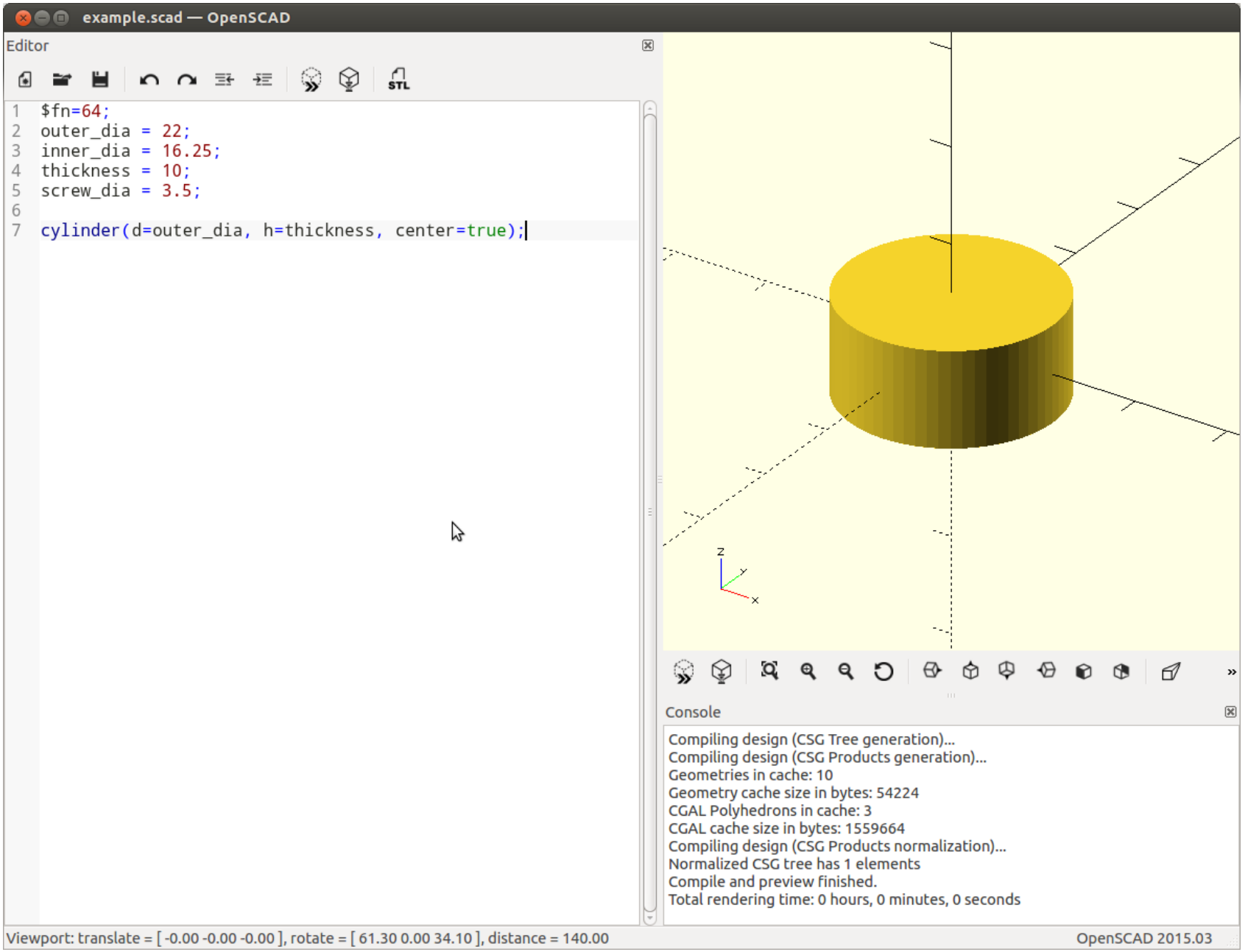
Example: MPPT clamp



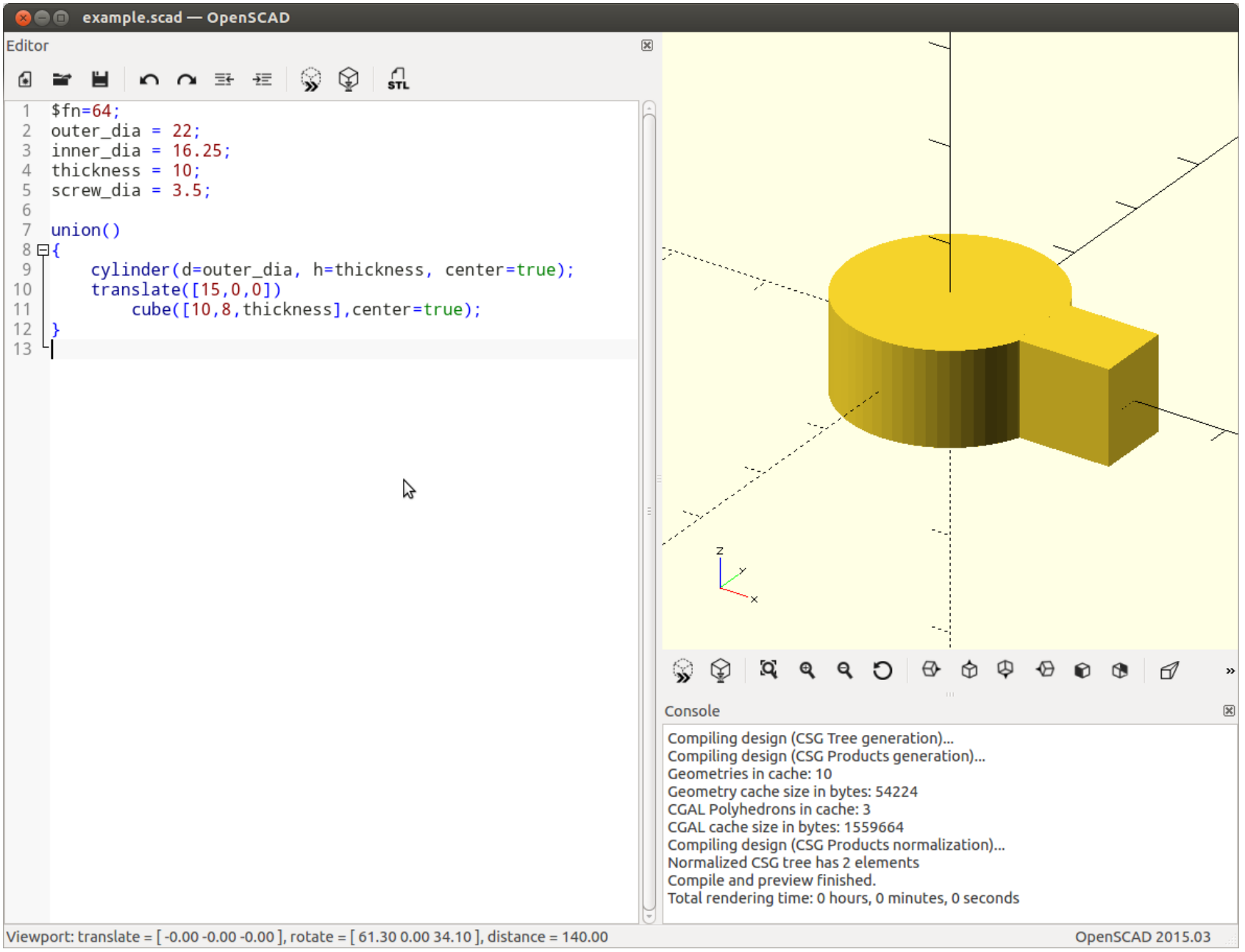
Example: MPPT clamp



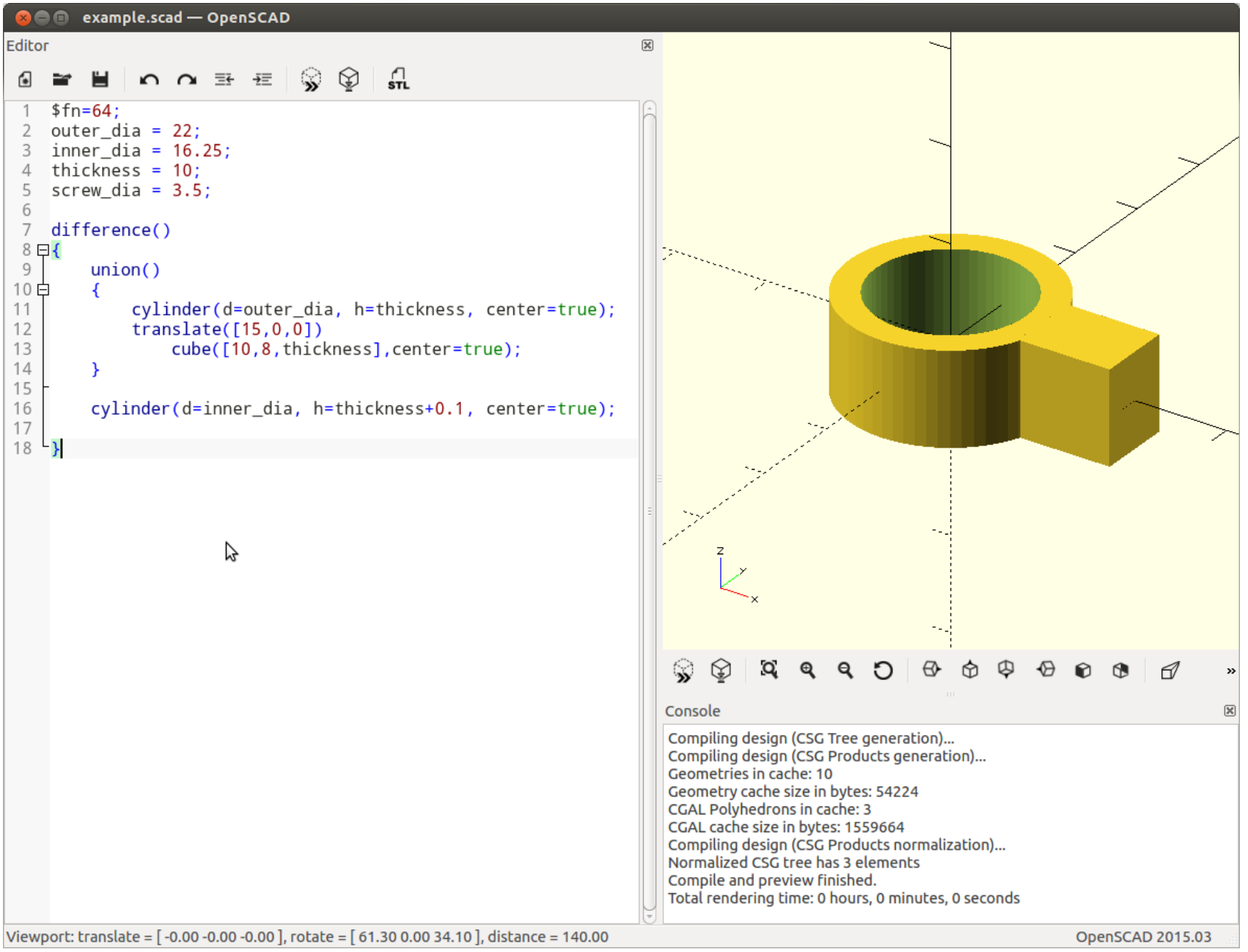
Example: MPPT clamp



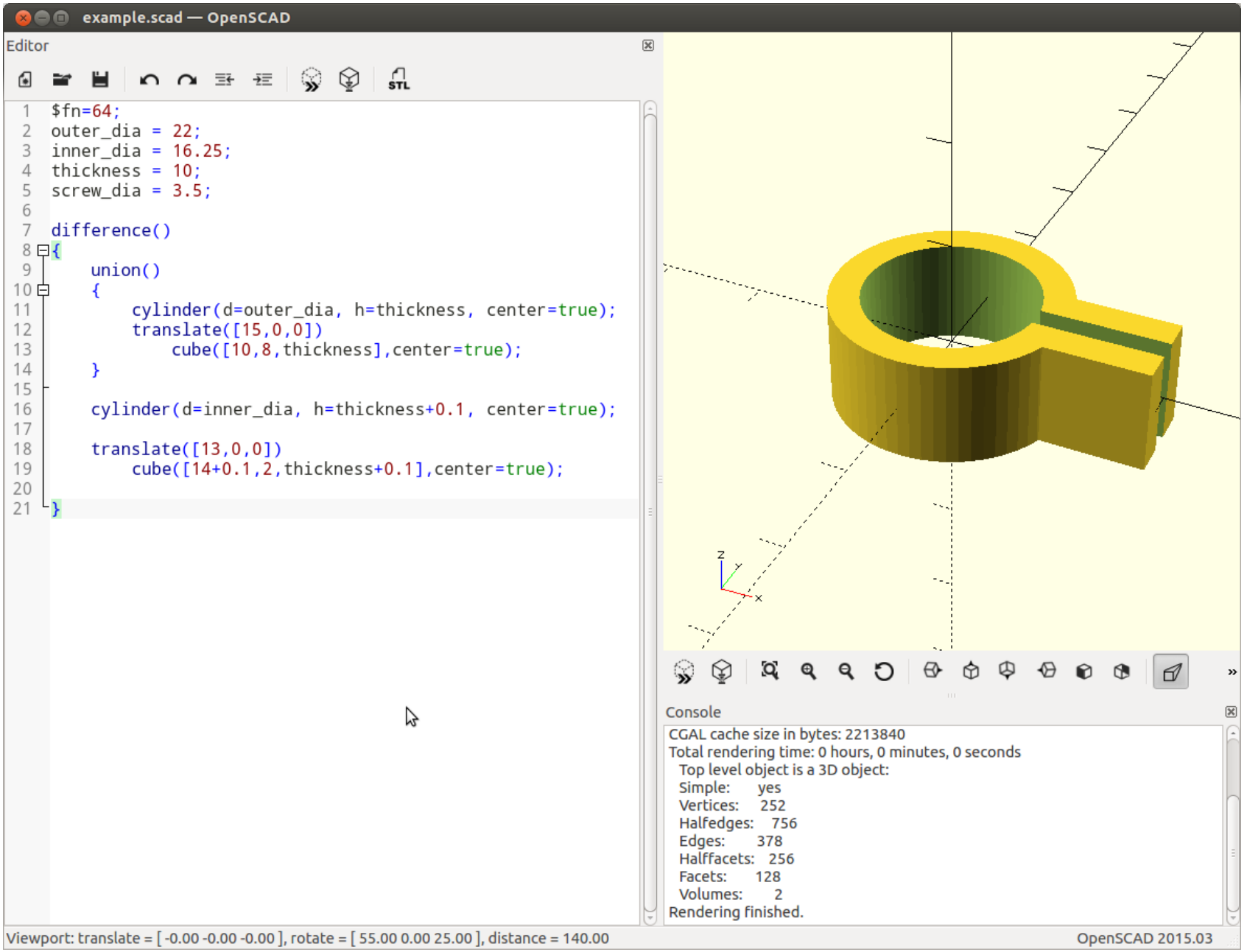
Example: MPPT clamp



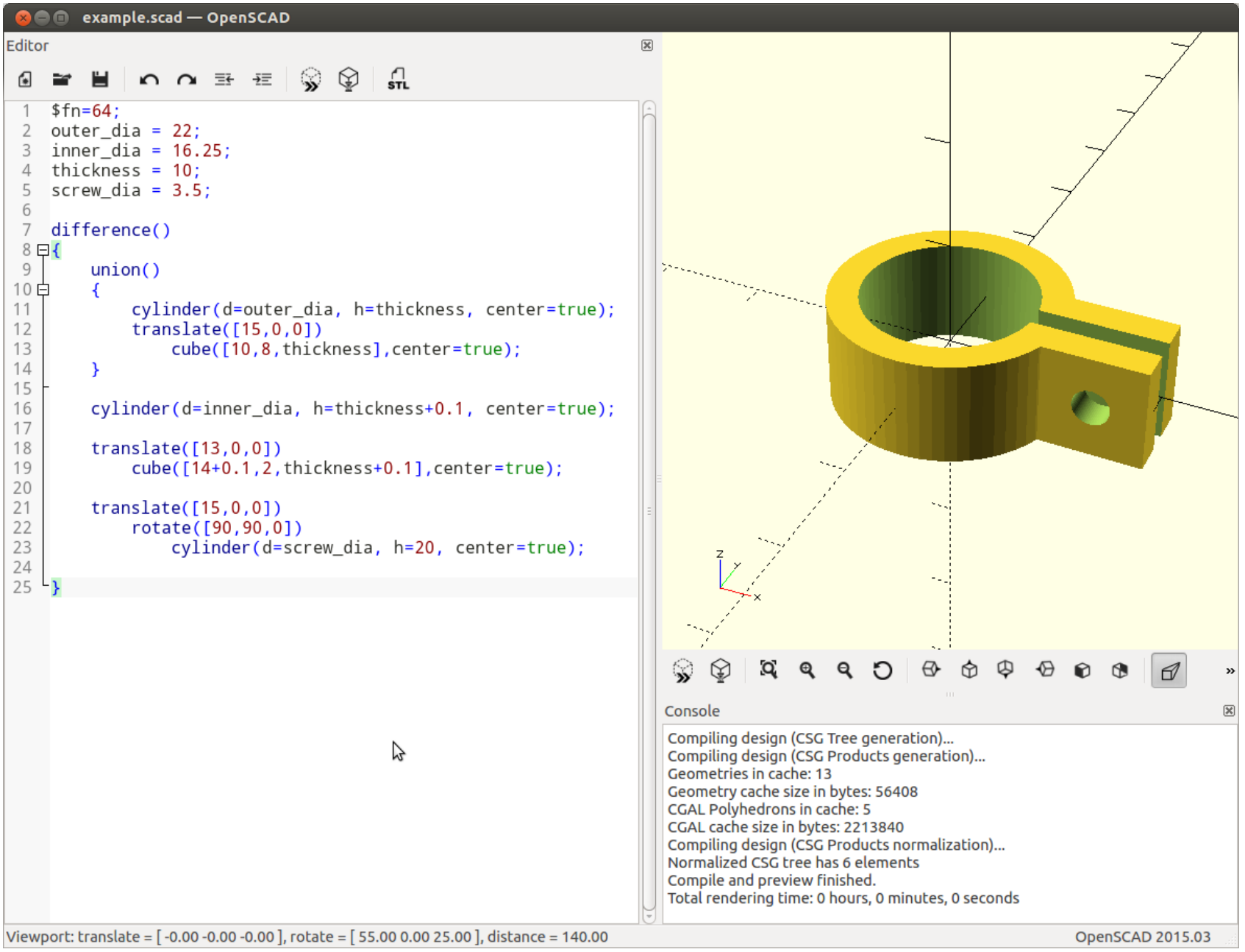
Example: MPPT clamp



Example: MPPT clamp



Example: MPPT clamp



Example: MPPT clamp

- Exporting your file for printing:
  - Press F6 for full render
  - Export the STL file.
- Send your STL files to the printer assistants, they will check your design and print it.

- Printer assistants: we have to plan a meeting