

3D Printing (3DP) provides a wide range of possibilities for the realization of freeform 3D structures. Recent developments allow for a wide range of materials to be processed, from pure polymer materials to highly filled composites for creating metal parts. In the FDM process, the material of choice is provided as a filament and molten in a hot end before deposition on the building platform layer by layer.

Contact

See KNMF website or contact the KNMF User Office.

Equipment

FDM-Printers

- Stratasys uPrint SE Plus
- Leapfrog Xeed
- Leapfrog Bolt
- zMorph 2.0 SX
- Makerbot Replicator 2x

3D Scanning

- Einscan Pro (Accuracy up to 0.05 mm)

Filament fabrication

- Filafab Extruder & Winding

Coming soon: 3D Inkjet Printing with dual printheads (multimaterial inkjet)

Features

- Resolution: 50 μm (z-axis), 200 μm (x/y-axis)
- Accessible printing area:
300 mm x 320 mm x 205 mm
- Dual printheads (two build materials or one build/one support material)
- Printhead temperature up to 250 °C
- Graded structures possible (see Samples)

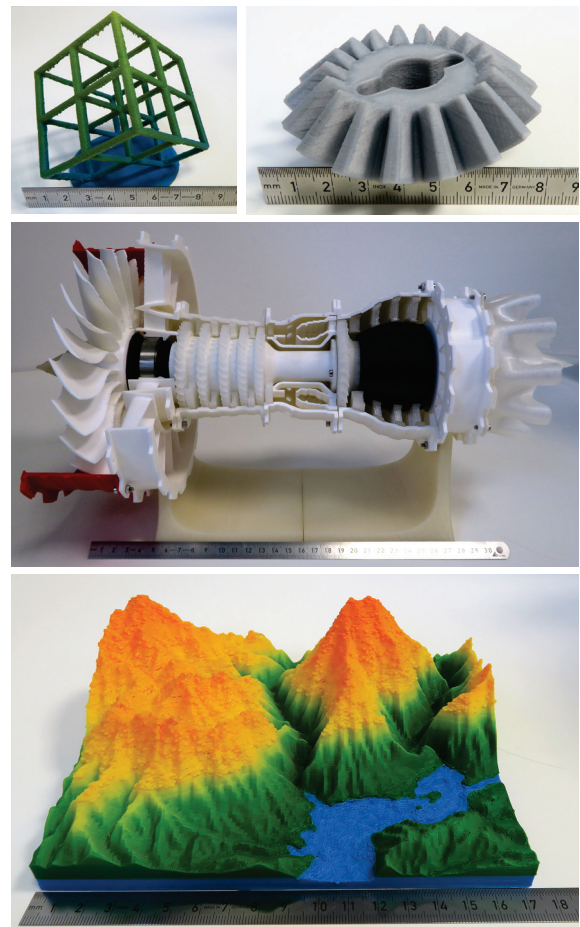
Limitations/constraints

- Depending on object size & geometry:
long build time
- No transparent objects possible
- Currently no materials with melting temperature
>250 °C possible

Materials

- ABS, PLA, PVA, Nylon
- Filled materials (optical effects, magnetic,
electrically conductive)
- Custom materials

Samples



3D Printing



Data

- STL format
- Various CAD files can be exported to STL format
- Wall thicknesses should be multiples of x/y resolution for better accuracy
- Use correct units during designing the structures
- Avoid duplexes (use snaps)
- Overhangs with degrees $>30^\circ$ need support
- Models must be solid bodies, not surfaces. No open faces, models must be watertight
- In case of periodic structures a single unit cell is sufficient