

Using of 3D printer (Prusa MK4S)

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Tags: AE Additive manufacturing 3D print photoreactor

Category: Protocol

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Goal

3D printing of a finished model using [Equipment - 3D printer - PRUSA MK4S - CEEC I Lab 208](#)

Prerequisites and preparation

- [Equipment - 3D printer - PRUSA MK4S - CEEC I Lab 208](#)
- .stl file with model
- Sufficient filament (typically black PLA)
- Prusa slicer software (https://www.prusa3d.com/page/prusaslicer_424/)

General notes

- This protocol describes the day-to-day use of the 3D printer, not everything
- The use of the 3D printer and software is quite intuitive, so if it feels weird to do it in a specific way it is probably wrong
- For questions consult the user manual (it is genuine very good) or ask a responsible person
- For regular maintenance consult the user manual, following parts have to be maintained regularly
 - Every few 100 h printing hours: regreasing bearing
 - Fan and extruder: when error occurs
 - Electronics: every 800 printing hours
 - Nozzle: when filament is not extruded as expected

Typical printing settings

- Have to be set once in the software: [Protocol - Standart settings for 3D printer \(Prusa MK4S\)](#)
 - Druckeinstellung: choose 0.20mm SPEED @MK4S HF0.4
 - Filament: generic PLA
 - Printer: Original Prusa MK4S HF0.4 nozzle
 - In settings: Keep all as standart settings, besides:
 - In "Stützmaterial": "Generiere Stützmaterial": add ☐
 - In "Stützmaterial": "Stil": choose "organisch"
 - In "Stützmaterial": "Stützen nur auf dem Druckbett" add ☐
- Save these settings

Steps

Step number	Step description
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1. Obtaining printable file	<p>Drag-and-drop .stl file into Prusa slicer software</p> <p>If needed adjust the position and orientation of the sturcture using the functions on the left</p> <p>Check priting settings: typical settings (can be adjusted as needed):</p> <p>Click on "Jetzt slicen" or english equivalent on the bottom right</p> <p>Save G-code using "Export G-code" on the bottom right to save it on a USB stick</p>						
2. Setting up the printer	<p>Start printer (on/off switch on the back side)</p> <p>Check that correct and a sufficient amounts of filament is inserted in the 3D printer</p> <p>If not change filament:</p> <table border="1"> <tr> <td>1.</td><td>Click on filament (either using the touchscreen or the knob next to the display)</td></tr> <tr> <td>2.</td><td>Choose change filament and follow the instructions</td></tr> <tr> <td>3.</td><td>Before loading the new filament you are asked which type of filament you will load. Choose the correct one</td></tr> </table> <p>Clean the surface with a kimtech wipe, is you feel significant residues of filament you can use isopropanol on a kimtech wipe or a plastic spatual for cleaning (details see step)</p>	1.	Click on filament (either using the touchscreen or the knob next to the display)	2.	Choose change filament and follow the instructions	3.	Before loading the new filament you are asked which type of filament you will load. Choose the correct one
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2.	Choose change filament and follow the instructions						
3.	Before loading the new filament you are asked which type of filament you will load. Choose the correct one						
3. Starting the print	<p>Insert the USB stick</p> <p>The most recent saved G-code file will open. Press start if you want to print this file. Than the printing will start.</p> <p>Otherwise press back and than choose print and navigate through the folder sturcture to your desired file. Press on it and press start. Than the printing will start.</p>						
4.1. Removing the print for larger prints	<p>Wait till the priting plate is below 35 °C</p> <p>Remove the print by taking the priting plate off from the printer (caution it is hold by quite strong magents, grab it at the edges facing you and lift it up</p> <p>Bend the plate (you can bend it with little force, but do not force it to bend more like maybe 10 - 20 °) in each direction</p> <p>Removing the print now is typically very easy by just lifiting it up from the plate</p> <p>This should work, if not try also 4.2</p>						
4.1. Removing the print for smaller prints	<p>Wait till the priting plate is below 35 °C</p> <p>Remove the print using a hard plastic spatula (slide the spatula over the plate against the print)</p> <p>This should work, if not try also 4.1</p>						
5. Removing support from print	<p>The support is weaker than the print, so you typically can remove it just by breaking the support of from the stucture</p> <p>For delicate / thin / complex structures be a bit careful</p>						
6. Cleaning the printer	<p>After removing the print remove evatually remaining larger parts of support as described in 4.1</p> <p>Clean the surface by moving the hard plastic spatula over the bed to remove small parts of filament</p> <p>Wipe the plate with isopropanol on a kimtech wipe</p> <p>If you still fell small bumps on the surface repeat step 6, till non or very little bumps are left</p> <p>Do never use metal / your fingernails for removing filament from the plate</p> <p>Do only use isopropanol for cleaning. Never use acetone or other organic solvents</p>						

7. Shut off the printer	Remove the USB stick Turn off the printer (on/off switch on the back side)
8. Writing of eLab entry	<p>Use template for 3D printing</p> <p>In table "CAD and Image of 3D print": Add screen shot of CAD file and a picture of the 3D printed part</p> <p>in table "Literature/reference experiments": add like Information - eLabFTW Guide - Water Splitting Group</p> <p>in table "Filament": add name of used Polymer and name of used filament (e.g. PLA; PrimaValue PLA+ black, 1.75 mm diameter)</p> <p>in table "3D printing parameters": link used printer; add choosen values (typical values are: Printing temperature: 215 °C, Bed temperature: 60 °C, Layer height: 0.2 mm, Infill [%]: 15, Infil type: Gitternetz, support sturcture typ: organisch</p> <p>in table "printing procedure: Use unique part identifier, use versioning: e.g. aperture_UHP_beam_combiner_V1.2, date, time: fill in; CAD and STL file: upload respective file; description: description of the use of the part; reference part: if applicable link previous version; modifications: if applicable add description of changes made between old and new version, print result: short describe outcome of the print (e.g. worked as desires; ... has to be changed etc.)</p> <p>Results and Future recommendations as in Information - eLabFTW Guide - Water Splitting Group</p>

Linked resources

Equipment - [3D printer - PRUSA MK4S - CEEC I Lab 208](#)

Information - [eLabFTW Guide - Water Splitting Group](#)

Protocol - [Standart settings for 3D printer \(Prusa MK4S\)](#)

Attached file

prusa3d_manual_mk4s_mk39s_101_en.pdf

sha256: a3cb4a3c1b2603766d1dcc2e1f610dfa340a7115663e4ce6791b5b26ff81c6da





Unique eLabID: 20251014-38ba25fe9dcf697a466c0274cc2a025cb478c543

Link: <https://elab.water-splitting.org/database.php?mode=view&id=287>