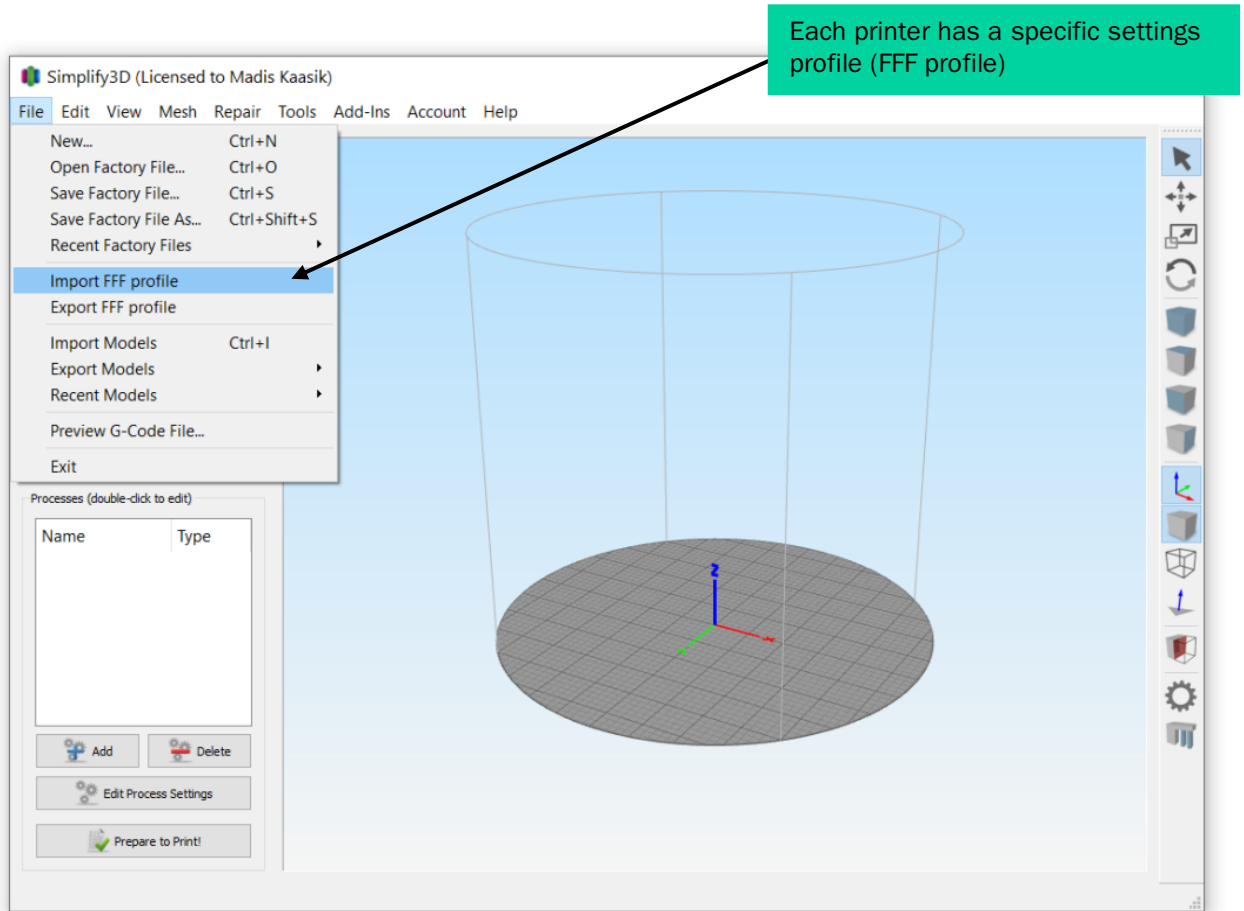


**Cartesian flat 3D printer  
user guide for Simplify3D**

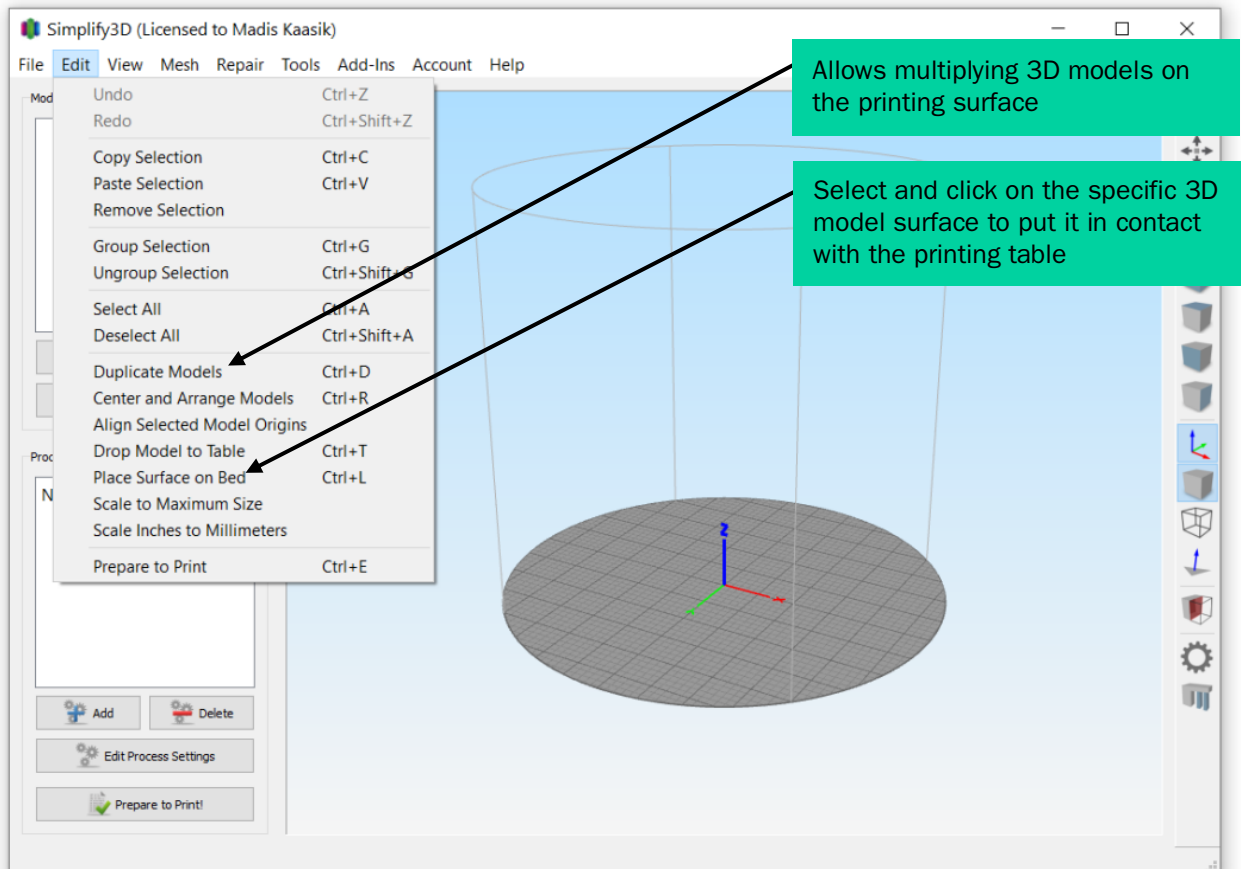
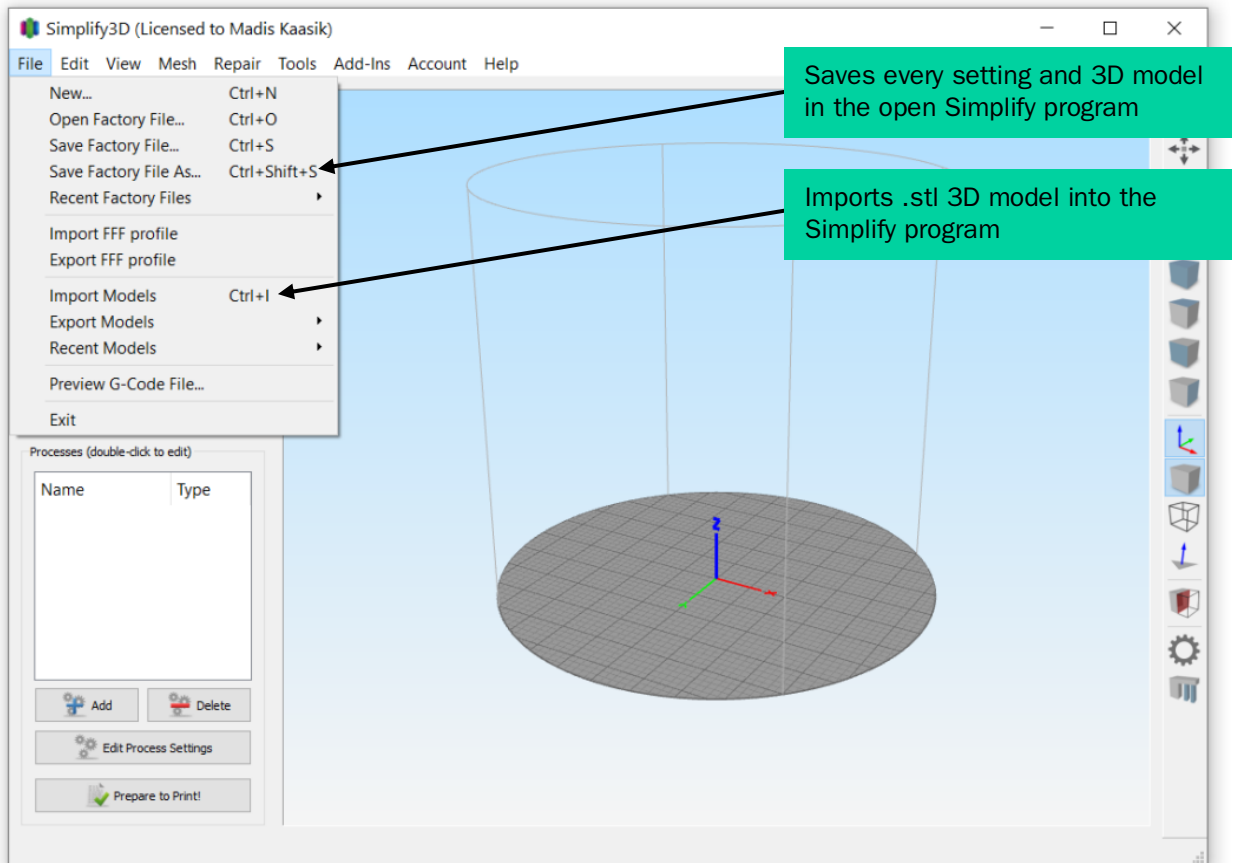
## **In this document:**

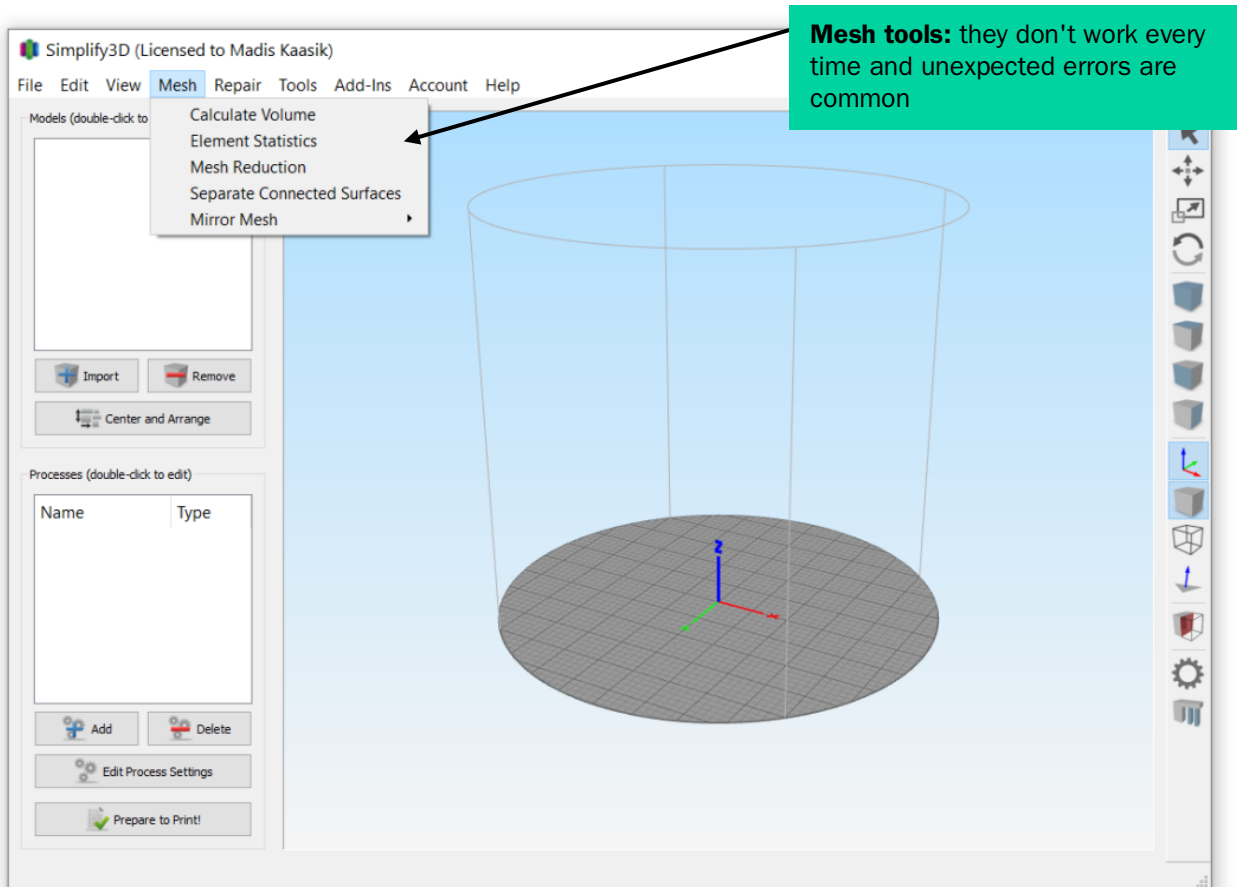
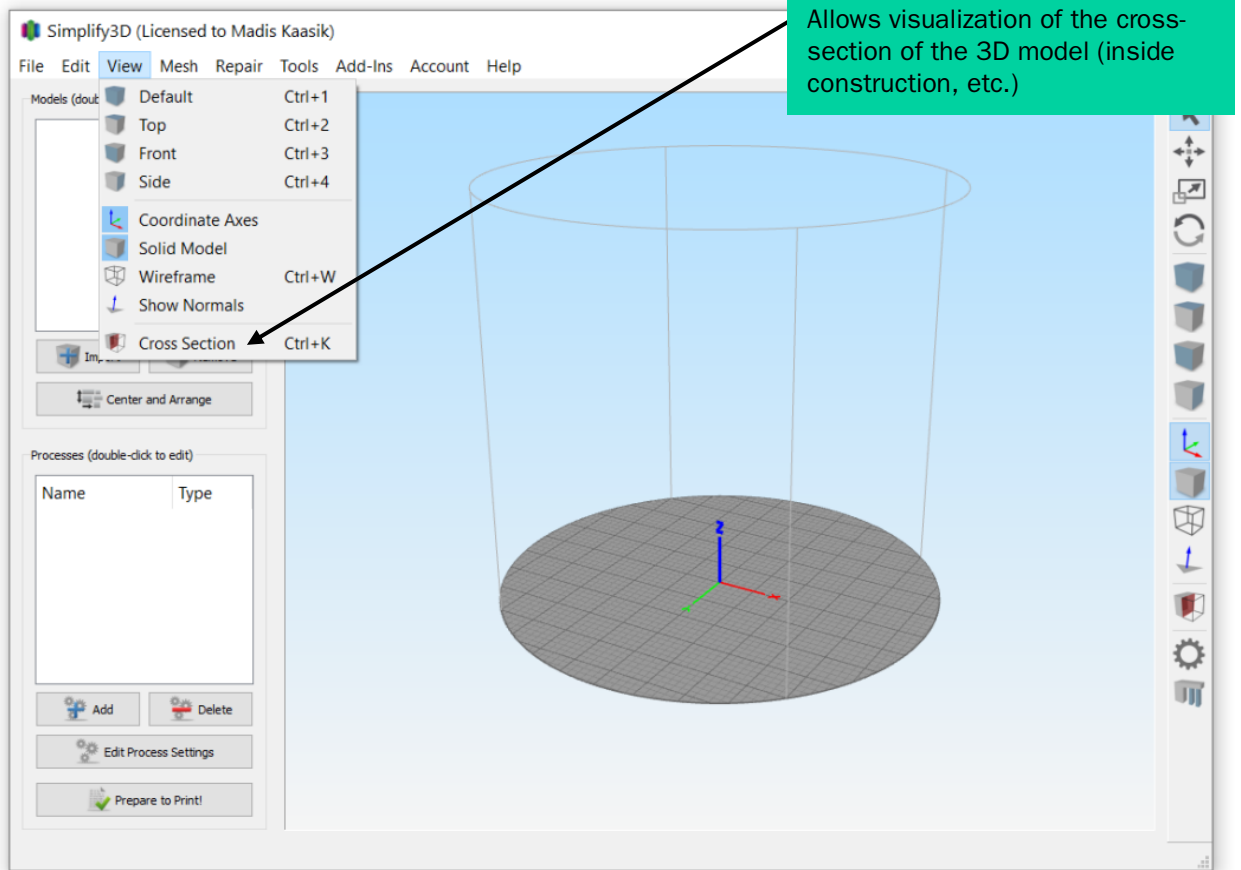
- 1.** How to set up a new printer for the first time (page 3)
- 2.** Simplify3D most used buttons and tabs (pages 4–8)
- 3.** Step-by-step printing guide (pages 9–23);  
skip to page 23 if you are printing by importing the G-code)
- 4.** Machine control panel guide (pages 24–26)

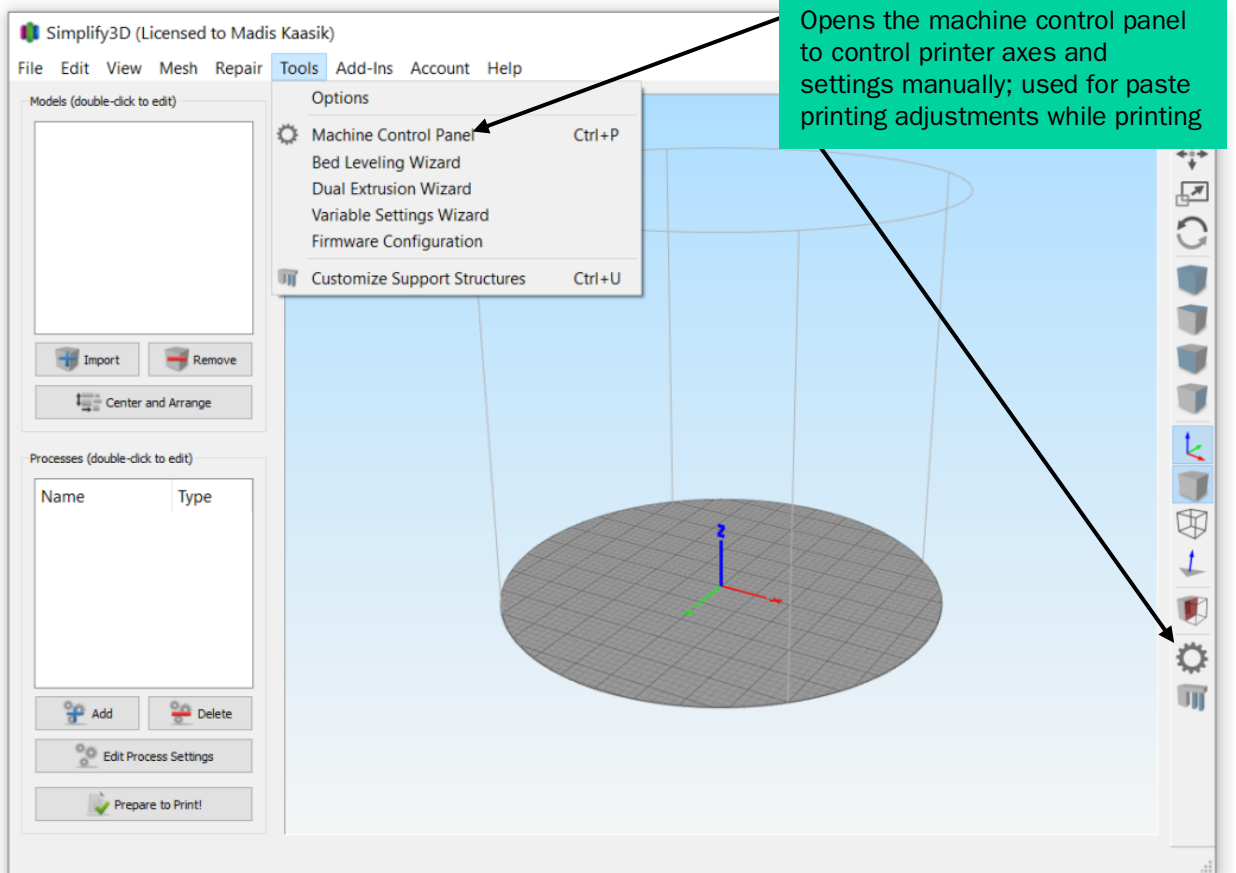
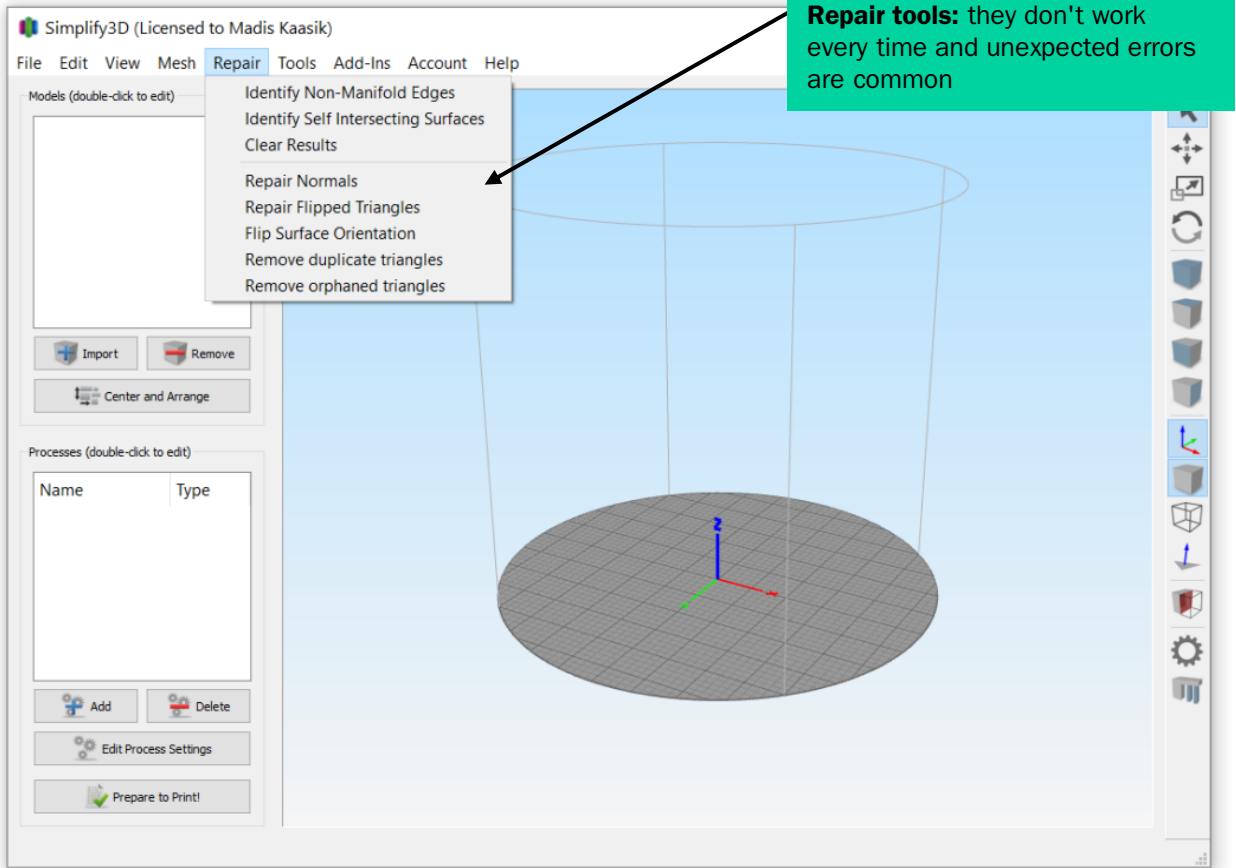
# 1. How to set up a new printer for the first time

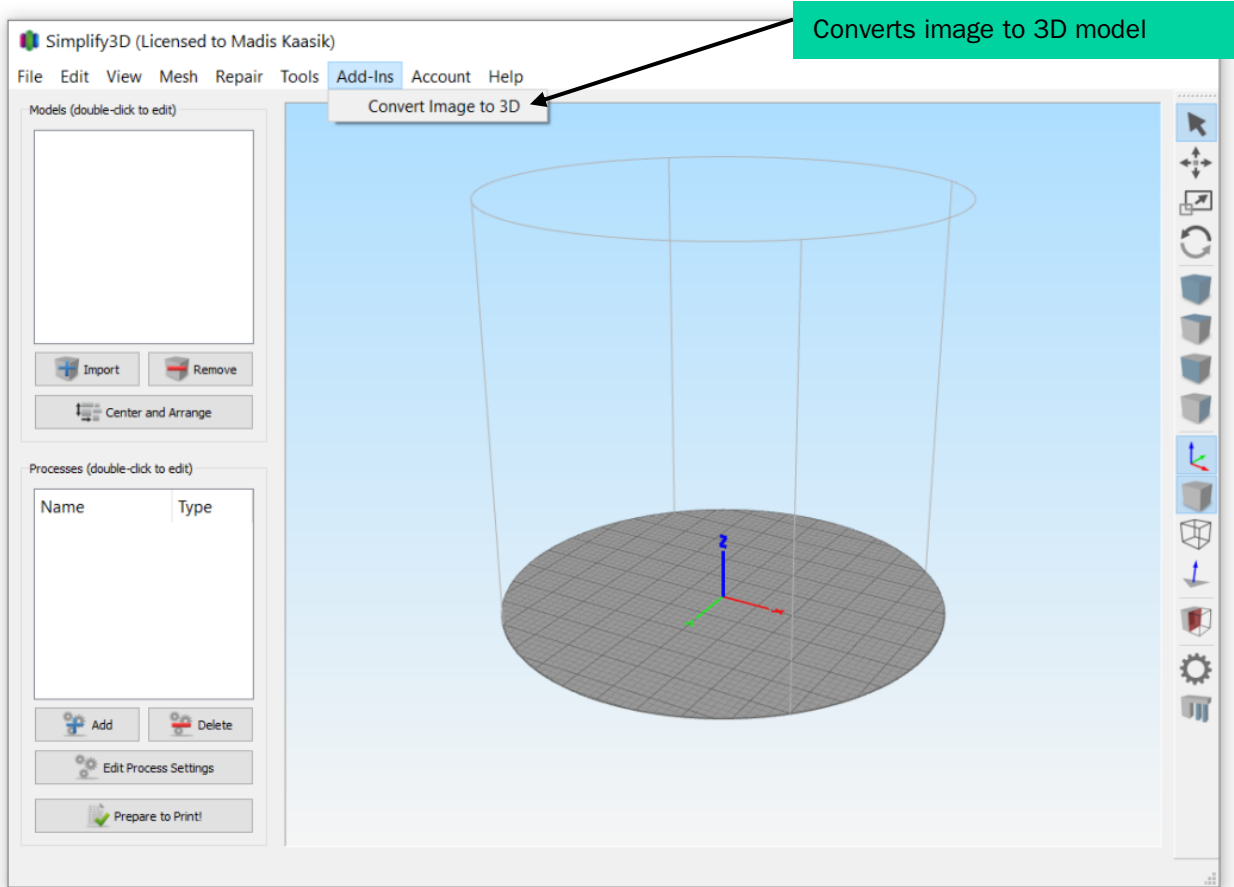


## 2. Simplify3D most used buttons and tabs

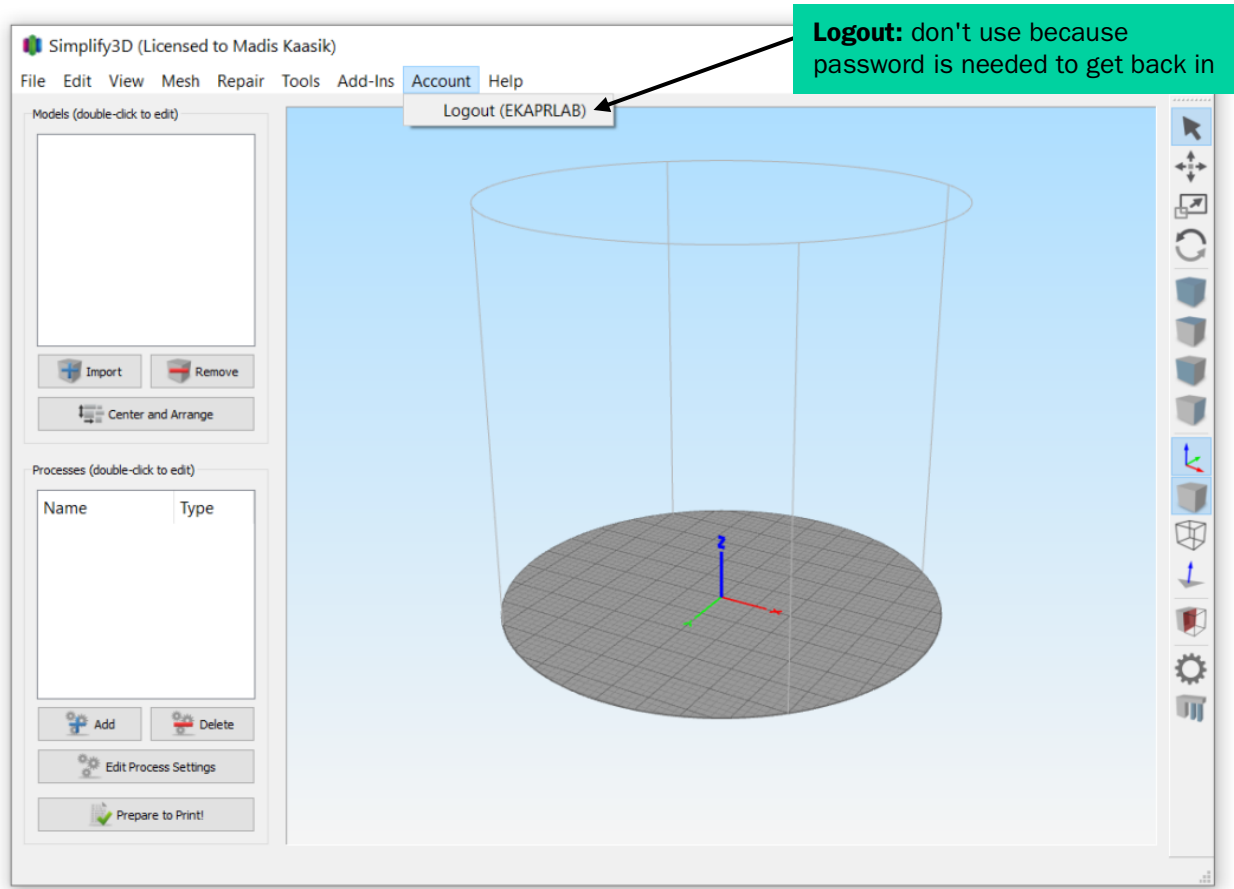






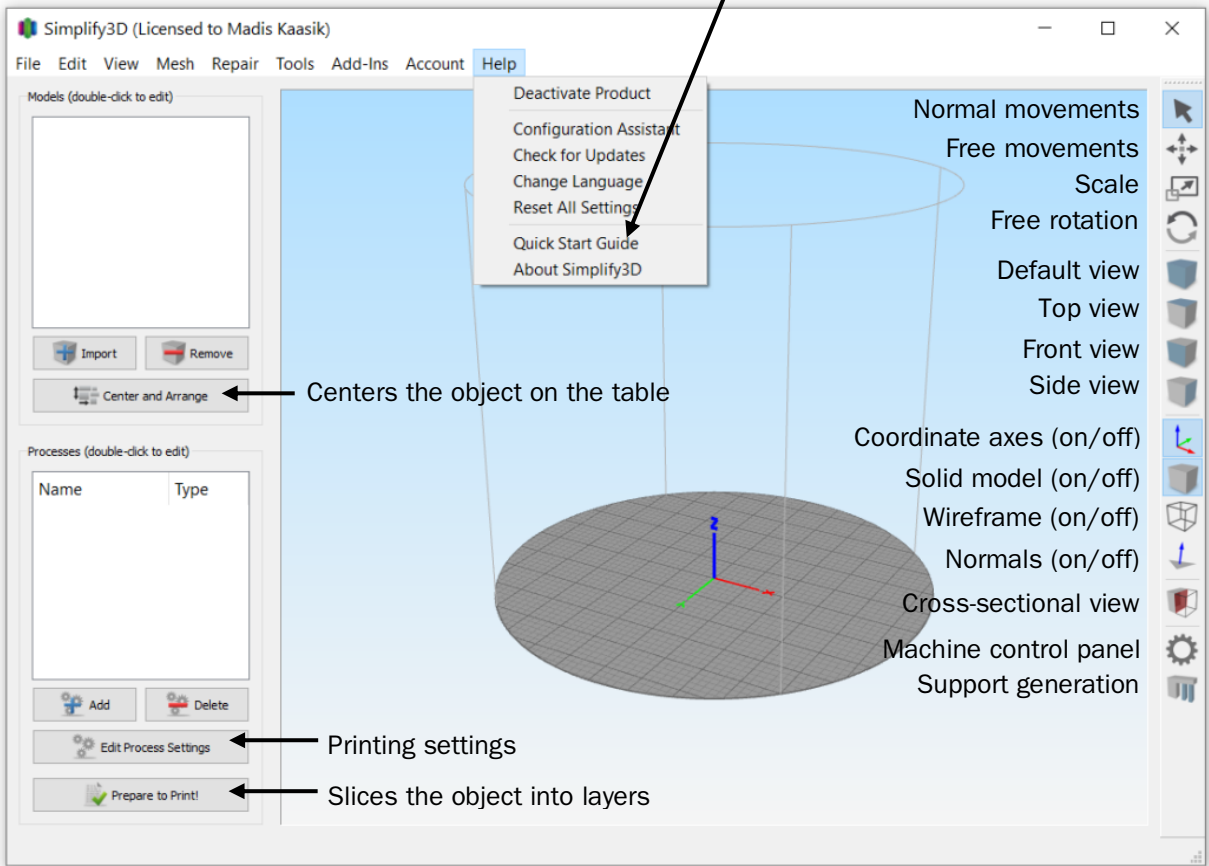


Converts image to 3D model



Logout: don't use because password is needed to get back in

**Quick start guide** for more info

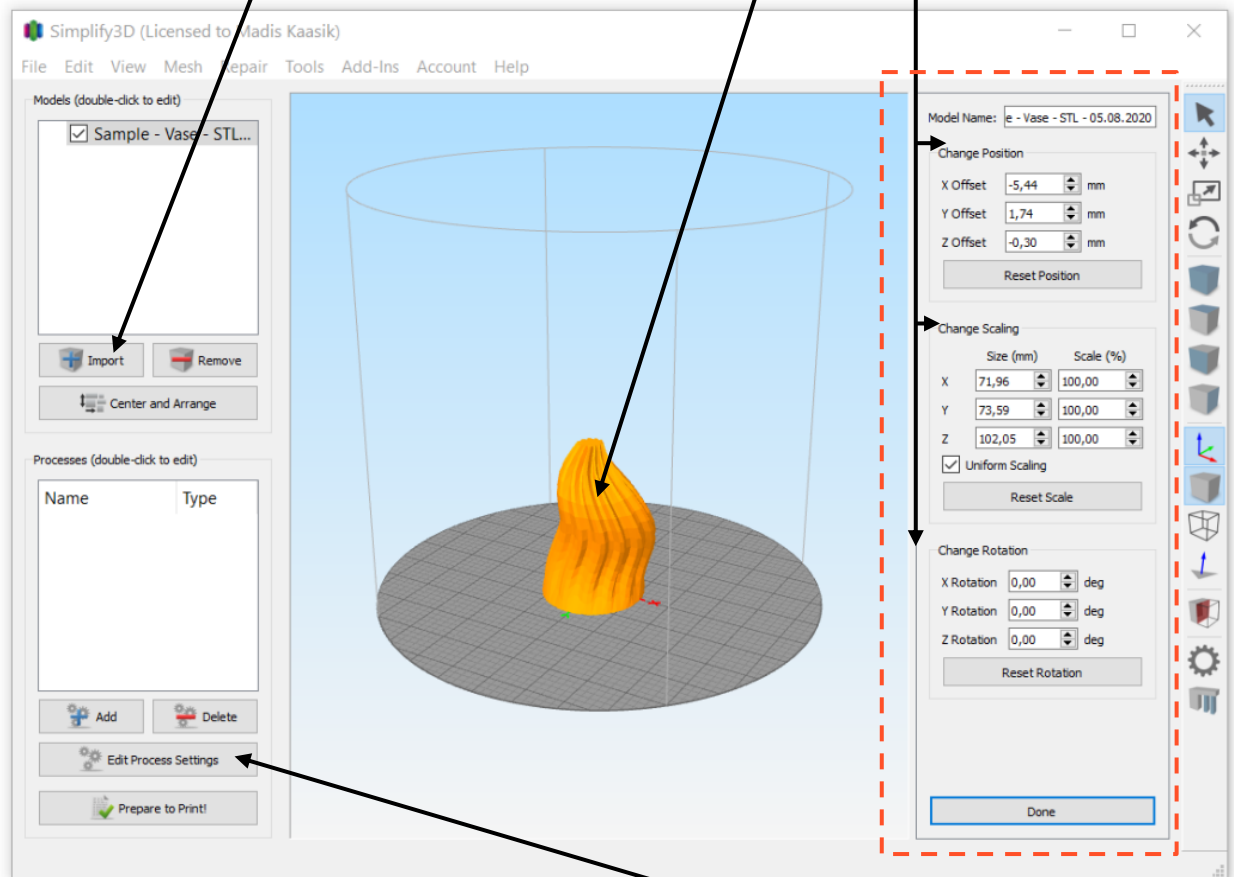




### 3. Step-by-step printing guide (skip to page 24 if you are printing by importing the G-code).

**Step 01:** Import the .stl file

**Step 02:** Double click on the model to open the settings panel  
(change: **rotation, scale, position**)



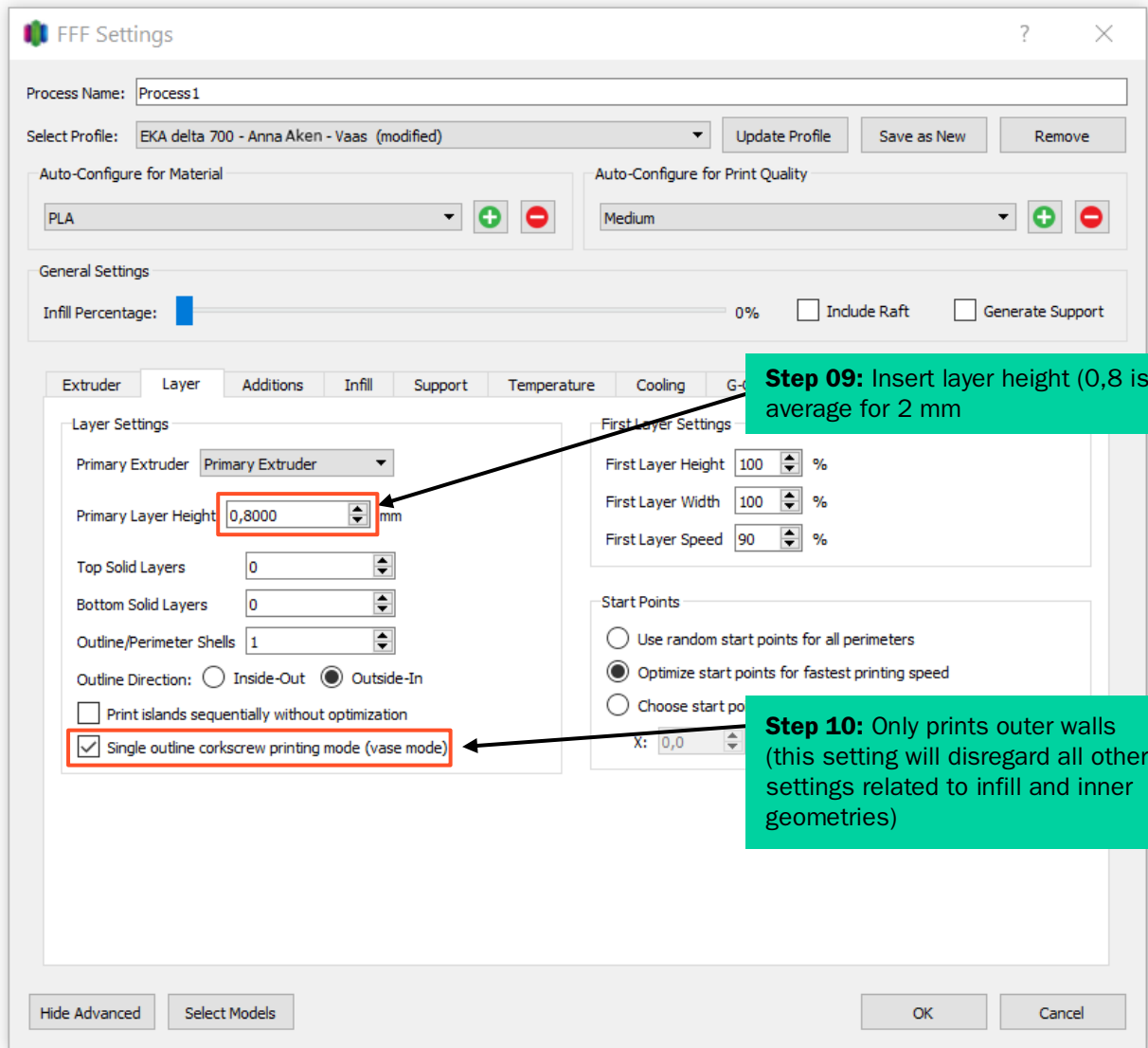
**Step 03:** Open printing settings

**Step 04:** Select the printer from the drop down menu  
**'Original'** means that the printer profile is working well with the best settings for the printer

**Step 05:** Save over the 'Original' printer profile with your name and project name

The screenshot shows the 'FFF Settings' window with the 'Select Profile' dropdown menu open, highlighting 'EKA delta 700 - original - 05082020'. Below this, a 'Profile Name' dialog box is shown with the text 'EKA delta 700 - original - 05082020' in the input field, and a red box around the word 'original'. A red callout box points to this part with the text 'Delete this part'. A second 'Profile Name' dialog box is shown below it, with the text 'EKA delta 700 - Anna Aken - Vaas' in the input field, and a red box around 'Anna Aken - Vaas'. A red callout box points to this part with the text 'Add your name and project'. The background window shows various settings for the 'Primary Extruder Toolhead', including 'Nozzle Diameter' (6,00 mm), 'Extrusion Multiplier' (0,90), and 'Extrusion Width' (Manual, 0,40).

The image shows the 'FFF Settings' dialog box. At the top, 'Process Name' is 'Process1'. The 'Select Profile' dropdown is set to 'EKA delta 700 - Anna Aken - Vaas'. Below this are 'Auto-Configure for Material' (set to 'PLA') and 'Auto-Configure for Print Quality' (set to 'Medium'). The 'General Settings' section shows 'Infill Percentage' at 10%, with 'Include Raft' and 'Generate Support' checkboxes. The 'Extruder' tab is active, showing an 'Extruder List' with 'Primary Extruder' selected. The 'Primary Extruder Toolhead' settings are shown in the 'Overview' section: 'Extruder Toolhead Index' is 'Tool 0', 'Nozzle Diameter' is '2,00 mm' (highlighted with a red box), 'Extrusion Multiplier' is '0,90', and 'Extrusion Width' is 'Auto'. The 'Ooze Control' section has several options: 'Retraction' (checked) with 'Retraction Distance' 1,00, 'Extra Restart Distance' 0,00 mm, 'Retraction Vertical Lift' 0,00 mm, and 'Retraction Speed' 1800,0 mm/min; 'Coast at End' (unchecked) with 'Coasting Distance' 0,20 mm; and 'Wipe Nozzle' (unchecked) with 'Wipe Distance' 5,00 mm. Annotations include: 'Step 06: Make sure that the profile you previously made has been selected' pointing to the 'Select Profile' dropdown; 'Step 07: Insert nozzle diameter' pointing to the 'Nozzle Diameter' field; and 'Step 08: Width auto (manual is the option for lines thattouch)' pointing to the 'Extrusion Width' radio buttons. Buttons at the bottom include 'Hide Advanced', 'Select Models', 'OK', and 'Cancel'.



FFF Settings

Process Name: Process1

Select Profile: EKA delta 700 - Anna Aken - Vaas (modified)

Auto-Configure for Material: PLA

Auto-Configure for Print Quality: Medium

General Settings

Infill Percentage: 0%  Include Raft  Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Speeds Other

Use Skirt/Brim

Skirt Extruder: Primary Extruder

Skirt Layers: 1

Skirt Offset from Part: 4,00 mm

Skirt Outlines: 2

Use Prime Pillar

Prime Pillar Extruder: All Extruders

Pillar Width: 12,00 mm

Pillar Location: North-West

Speed Multiplier: 100 %

Use Raft

Raft Extruder: Primary Extruder

Raft Top Layers: 3

Raft Base Layers: 2

Raft Offset from Part: 3,00 mm

Separation Distance: 0,14 mm

Raft Top Infill: 100 %

Above Raft Speed: 30 %

Use Ooze Shield

Ooze Shield Extruder: All Extruders

Offset from Part: 2,00 mm

Ooze Shield Outlines: 1

Sidewall Shape: Waterfall

Sidewall Angle Change: 30 deg

Speed Multiplier: 100 %

Hide Advanced Select Models OK Cancel

**Step 11 OPTIONAL:** Allows printing line around the model on the printing bed before starting to print the object. Good option to get the paste flow going

FFF Settings

Process Name:

Select Profile:

Auto-Configure for Material:

Auto-Configure for Print Quality:

General Settings

Infill Percentage:  0%  Include Raft  Generate Support

Extruder | Layer | Additions | **Infill** | Support | Temperature | Cooling | G-Code | Scripts | Speeds | Other

**General**

Infill Extruder:

Internal Fill Pattern:

External Fill Pattern:

Interior Fill Percentage:  %

Outline Overlap:  %

Infill Extrusion Width:  %

Minimum Infill Length:  mm

Combine Infill Every:  layers

Include solid diaphragm every  layers

**Internal Infill Angle Offsets**

deg

Print every infill angle on each layer

**External Infill Angle Offsets**

deg

Hide Advanced | Select Models | OK | Cancel

**Step 12 OPTIONAL:** Infill is usually not used. It can be used for printing supported structures inside the object

FFF Settings

Process Name:

Select Profile:

Auto-Configure for Material:

Auto-Configure for Print Quality:

General Settings

Infill Percentage:  0%  Include Raft  Generate Support

Extruder | Layer | Additions | Infill | **Support** | Temperature | Cooling | G-Code | Scripts | Speeds | Other

**Support Material Generation**

Generate Support Material

Support Extruder:

Support Infill Percentage:  %

Extra Inflation Distance:  mm

Support Base Layers:

Combine Support Every:  layers

**Dense Support**

Dense Support Extruder:

Dense Support Layers:

Dense Infill Percentage:  %

**Automatic Placement**

*Only used if manual support is not defined*

Support Type:

Support Pillar Resolution:  mm

Max Overhang Angle:  deg

**Separation From Part**

Horizontal Offset From Part:  mm

Upper Vertical Separation Layers:

Lower Vertical Separation Layers:

**Support Infill Angles**

deg

**Step 13 OPTIONAL:** Support is usually not used

FFF Settings

Process Name:

Select Profile:

Auto-Configure for Material:

Auto-Configure for Print Quality:

General Settings

Infill Percentage:  0%  Include Raft  Generate Support

Extruder Layer Additions Infill Support **Temperature** Cooling G-Code Scripts Speeds Other

Temperature Controller List (click item to edit settings)

Primary Extruder

### Primary Extruder Temperature

Overview

Temperature Identifier:

Temperature Controller Type:  Extruder  Heated build platform

Wait for temperature controller to stabilize before beginning build

Per-Layer Temperature Setpoints

Layer	Temperature
1	20

Layer Number:

Temperature:  °C

**Step 14 OPTIONAL: Temperature setting should be 20 °C**



**FFF Settings**

Process Name:

Select Profile:  Update Profile Save as New Remove

Auto-Configure for Material:  + -

Auto-Configure for Print Quality:  + -

General Settings: Infill Percentage:  0%  Include Raft  Generate Support

Extruder Layer Additions Infill Support Temperature **Cooling** G-Code Scripts Speeds Other

**Per-Layer Fan Controls**

Layer	Fan Speed
1	0
2	0

Add Setpoint Remove Setpoint

Layer Number:  Fan Speed:  %

**Fan Options**

Blip fan to full power when increasing from idle

**Fan Overrides**

Increase fan speed for layers below  sec

Maximum cooling fan speed:  %

Bridging fan speed override:  %

Hide Advanced Select Models OK Cancel

**Step 15 OPTIONAL: Cooling is not used**

**Step 16 OPTIONAL: G-code settings for Flat**

FFF Settings

Process Name:

Select Profile:

Auto-Configure for Material:

Auto-Configure for Print Quality:

General Settings

Infill Percentage: %  Include Raft  Generate Support

Extruder | Layer | Additions | Infill | Support | Temperature | Cooling | **G-Code** | Scripts | Speeds | Other

**G-Code Options**

- SD firmware (include E-dimension)
- Relative extrusion distances
- Allow zeroing of extrusion distances (i.e. G92 E0)
- Use independent extruder axes
- Include M101/M102/M103 commands
- Firmware supports "sticky" parameters
- Apply toolhead offsets to G-Code coordinates

**Global G-Code Offsets**

	X-Axis	Y-Axis	Z-Axis
Offset	<input type="text" value="0,00"/>	<input type="text" value="0,00"/>	<input type="text" value="0,00"/>

**Update Machine Definition**

Update Machine Definition

Machine type:

	X-Axis	Y-Axis	Z-Axis
Build volume	<input type="text" value="650,0"/>	<input type="text" value="750,0"/>	<input type="text" value="330,0"/>
Origin offset	<input type="text" value="0,0"/>	<input type="text" value="0,0"/>	<input type="text" value="0,0"/>
Homing dir	<input type="text" value="Min"/>	<input type="text" value="Min"/>	<input type="text" value="Min"/>

Flip build table axis  X  Y  Z

Toolhead offsets:  X  Y

**Update Firmware Configuration**

Update Firmware Configuration

Firmware type:

GPX profile:

Baud rate:  bits/sec

**Step 17 OPTIONAL:** Possibility to add commands into the START and END of the generated G-code for a specific printer

The image shows a screenshot of the 'FFF Settings' dialog box. At the top, there are fields for 'Process Name' (Process 1) and 'Select Profile' (EKA delta 700 - Anna Aken - Vaas (modified)). Below these are sections for 'Auto-Configure for Material' (set to PLA) and 'Auto-Configure for Print Quality' (set to Medium). The 'General Settings' section includes an 'Infill Percentage' slider at 0% and checkboxes for 'Include Raft' and 'Generate Support'. A horizontal tab bar at the bottom of the main settings area includes 'Extruder', 'Layer', 'Additions', 'Infill', 'Support', 'Temperature', 'Cooling', 'G-Code', 'Scripts', 'Speeds', and 'Other'. The 'G-Code' tab is selected, and within it, the 'Starting Script' sub-tab is active. A text area under 'Starting Script' contains the text 'G28 ; home all axes'. Below this is a 'Post Processing' section with a dropdown for 'Export file format' (Standard G-Code (.gcode)), a checkbox for 'Add celebration at end of build (for .x3g files only)', and a dropdown for 'Random Song'. At the bottom of the dialog are buttons for 'Hide Advanced', 'Select Models', 'OK', and 'Cancel'. A green callout box with a black border points to the 'Starting Script' and 'Ending Script' tabs, containing the text 'Step 17 OPTIONAL: Possibility to add commands into the START and END of the generated G-code for a specific printer'.

**Step 18 OPTIONAL:** It's recommended to keep the speeds constant for the entire print

The screenshot shows the 'FFF Settings' dialog box. The 'Process Name' is 'Process 1'. The 'Select Profile' is 'EKA delta 700 - Anna Aken - Vaas (modified)'. The 'Auto-Configure for Material' is set to 'PLA' and 'Auto-Configure for Print Quality' is set to 'Medium'. The 'General Settings' section shows 'Infill Percentage' at 0%, with 'Include Raft' and 'Generate Support' checkboxes. The 'Speeds' tab is selected and highlighted with a red box. The 'Speeds' section contains the following settings:

Setting	Value	Unit
Default Printing Speed	3000,0	mm/min
Outline Underspeed	100	%
Solid Infill Underspeed	100	%
Support Structure Underspeed	100	%
X/Y Axis Movement Speed	3000,0	mm/min
Z Axis Movement Speed	3000,0	mm/min

The 'Speed Overrides' section is also visible, with the following settings:

- Adjust printing speed for layers below 15,0 sec
- Allow speed reductions down to 20 %

Buttons at the bottom include 'Hide Advanced', 'Select Models', 'OK', and 'Cancel'.

FFF Settings

Process Name:

Select Profile:

Auto-Configure for Material:

Auto-Configure for:

General Settings

Infill Percentage:  0%  Include Raft  Generate Support

Extruder Layer Additions Infill Support Temperature Cooling G-Code Scripts Speeds **Other**

**Bridging**

Unsupported area threshold  sq mm

Extra inflation distance  mm

Bridging extrusion multiplier  %

Bridging speed multiplier  %

Use fixed bridging infill angle  deg

Apply bridging settings to perimeters

**Dimensional Adjustments**

Horizontal size compensation  mm

**Filament Properties**

Filament Toolhead Index

Filament diameter  mm

Filament price  price/kg

Filament density  grams/cm<sup>3</sup>

**Tool Change Retraction**

Tool change retraction distance  mm

Tool change extra restart distance  mm

Tool change retraction speed  mm/min

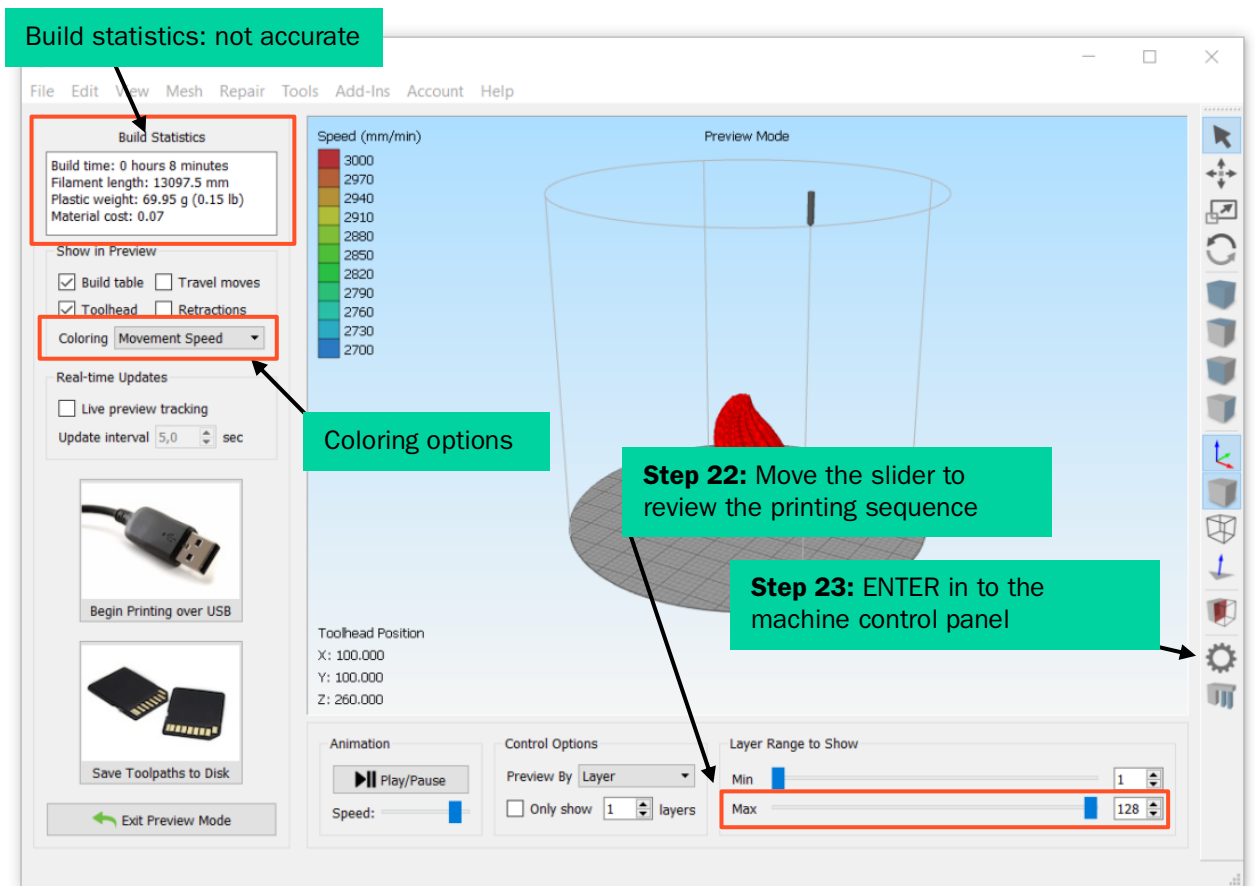
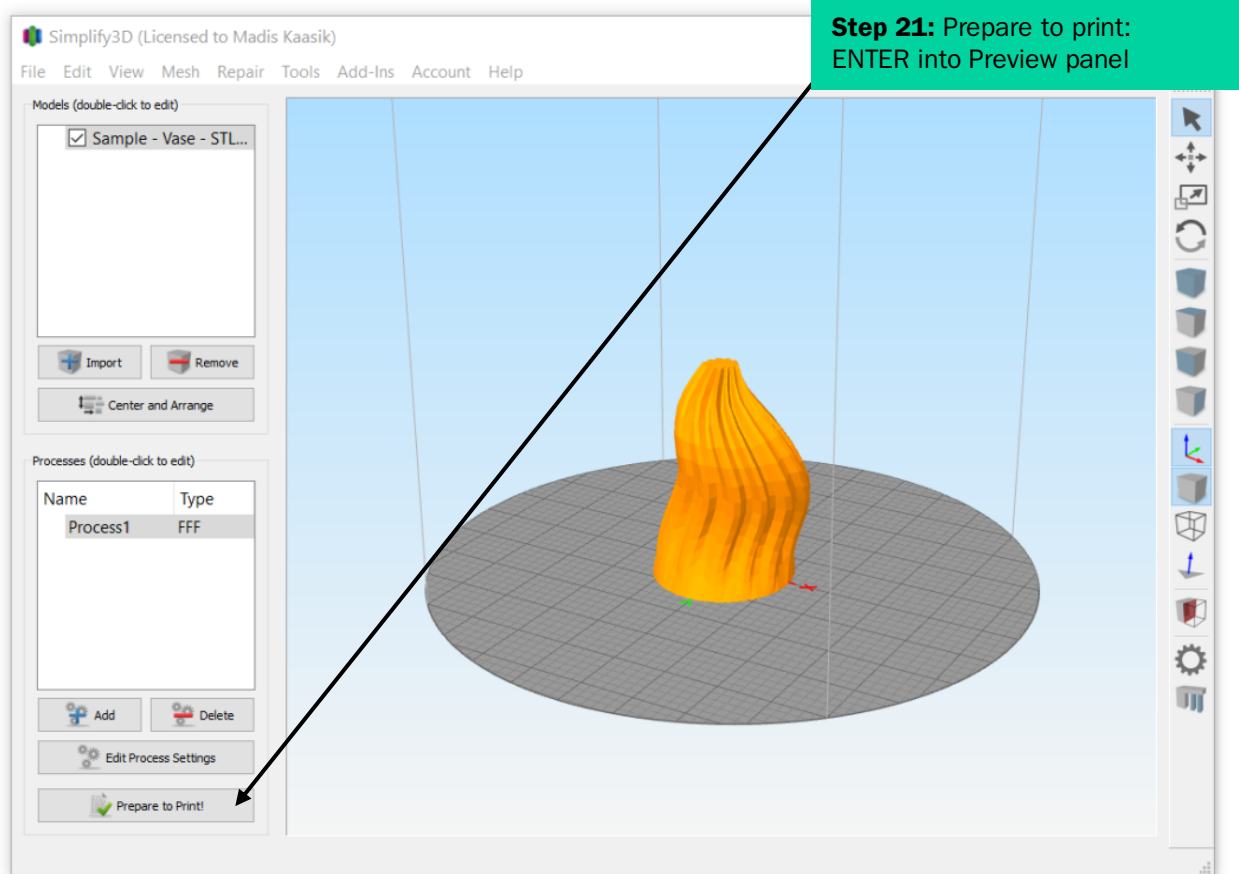
**Step 19 OPTIONAL**

1. Bridging is usually not used
2. Filament properties do not apply
3. Tool change retraction is not used
4. Dimensional adjustments are usually not used

**Step 20 OPTIONAL**

1. Layer modifications: fast option to start/end prints from specific heights
2. Thin wall behavior: experimental setting, not tested
3. Single extrusion: not used
4. Ooze control: not used
5. Movement behavior: avoid crossing
6. Slicing behavior: experimental setting, not tested

The screenshot shows the 'FFF Settings' dialog box with the 'Advanced' tab selected. The 'Layer Modifications' section has 'Start printing at height' and 'Stop printing at height' both set to 0,00 mm. 'Thin Wall Behavior' has 'External Thin Wall Type' and 'Internal Thin Wall Type' set to 'Perimeters only' and 'Allowed perimeter overlap' set to 10%. 'Single Extrusions' has 'Minimum Extrusion Length' at 4,00 mm, 'Minimum Printing Width' at 100%, 'Maximum Printing Width' at 100%, and 'Endpoint Extension Distance' at 0,20 mm. 'Ooze Control Behavior' has all options unchecked. 'Movement Behavior' has 'Avoid crossing outline for travel movements' checked and 'Maximum allowed detour factor' at 1,0. 'Slicing Behavior' has 'Non-manifold segments' set to 'Heal' and 'Merge all outlines into a single solid model' checked. The 'Advanced' tab is highlighted in red in the original image, with an arrow pointing to it from the callout box.



## 4. Machine control panel guide

The screenshot shows the Machine Control Panel interface. The top section is titled 'Initialization' and contains a 'Connect' button (a red power icon), 'Print' and 'Pause' buttons, a 'Port' dropdown menu, a 'Refresh' button, a 'Baud Rate' dropdown menu set to '250000 bits/sec', and a 'Verbose' checkbox. The right side shows 'Position Readout' for X, Y, and Z axes. The bottom section is titled 'G-Code Library' and contains a table with columns for 'Filename', 'Run Time', and 'Material Usage'. Below the table are 'Add to Library', 'Remove from Library', and 'Run Selected G-Code' buttons. The right side of the bottom section contains 'Accessory Control' (Extruder at 190°C, Heated Bed at 60°C, Set Fan Speed), 'Custom Commands' (Disable/Enable Motors, Print from SD Card, Upload to SD Card, Macro 1-3), and 'Override Settings' (Movement and Extrusion dials).

**Step 01:** Select port (port will appear when you connect the printer USB)

**Step 02:** Baud rate for Flat is 115200

**Step 03:** Press connect (button goes green when connected)

**G-Code tab:**  
G-code appears after slicing the model or you can *import G-code*



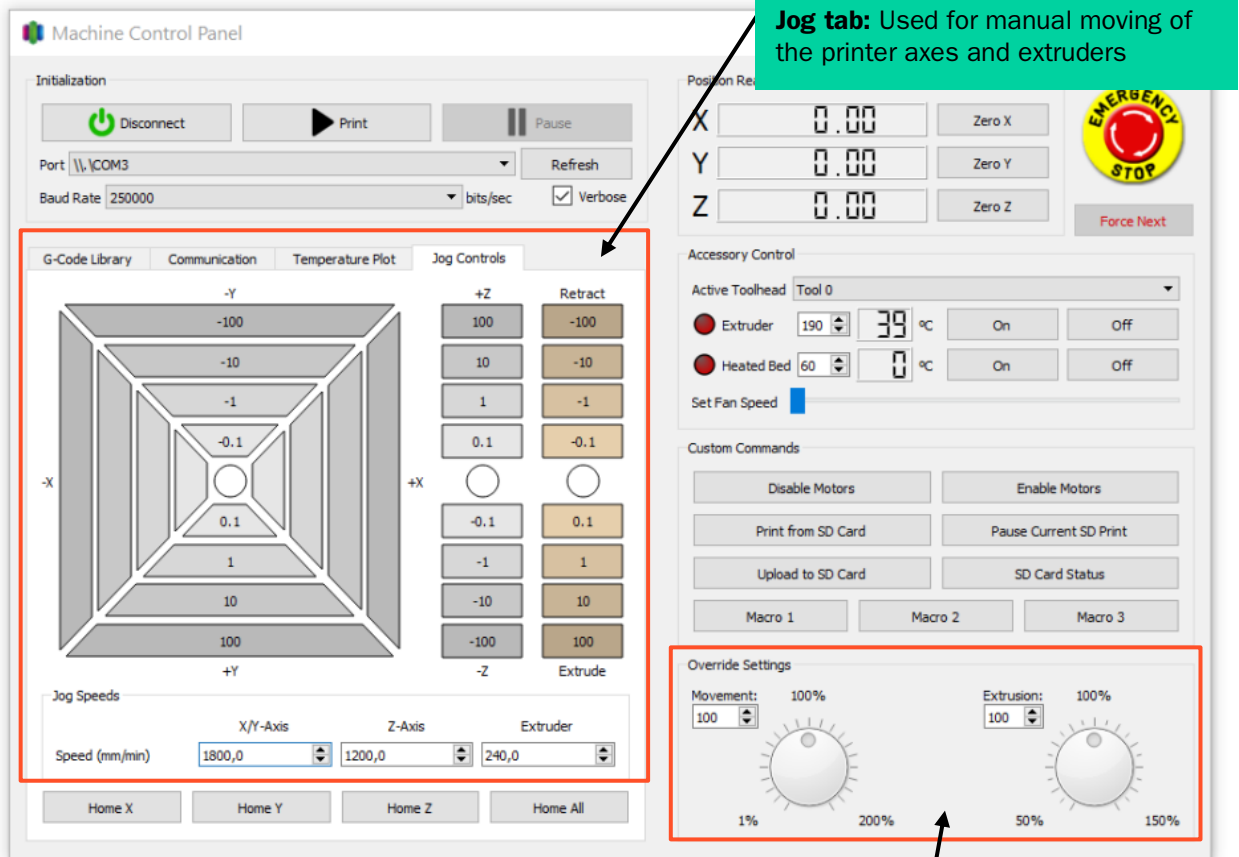
**Step 04: START**

**PAUSE PRINT**

**EMERGENCY STOP**  
It's **very important** to press this if the printer has an error

The screenshot shows the Machine Control Panel interface. The 'Communication' tab is selected, displaying a log of G-code commands and responses. A green callout box points to the 'Print' button in the 'Initialization' section, labeled 'Step 04: START'. Another green callout box points to the 'Pause' button, labeled 'PAUSE PRINT'. A red callout box points to the 'EMERGENCY STOP' button, with the text 'It's very important to press this if the printer has an error'. A green callout box points to the communication log, stating 'Communication tab: Shows info and allows you to send commands to the printer'. The interface includes sections for Position Readout (X, Y, Z coordinates), Accessory Control (Extruder and Heated Bed status), Custom Commands, and Override Settings.

The screenshot shows the Machine Control Panel interface with the 'Temperature Plot' tab selected. A green callout box points to the 'Print' button, labeled 'Step 04: START'. Another green callout box points to the 'Pause' button, labeled 'PAUSE PRINT'. A red callout box points to the 'EMERGENCY STOP' button, with the text 'It's very important to press this if the printer has an error'. A green callout box points to the temperature plot, stating 'Temperature tab: Temperature info is not relevant'. A red callout box points to the 'Custom Commands' section, stating 'Custom commands: rarely used'. The temperature plot shows a line graph of temperature (C) over 30 samples, with 'Bed Setpoint' and 'Extruder Setpoint' labels. The interface also shows Position Readout, Accessory Control, and Override Settings.



**Jog tab:** Used for manual moving of the printer axes and extruders

**Override settings:** For adjusting the movement and extruder speeds before the print or while printing

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Compiled by **Madis Kaasik and Lauri Kilusk**, **Estonian Academy of Arts**, January 2021