

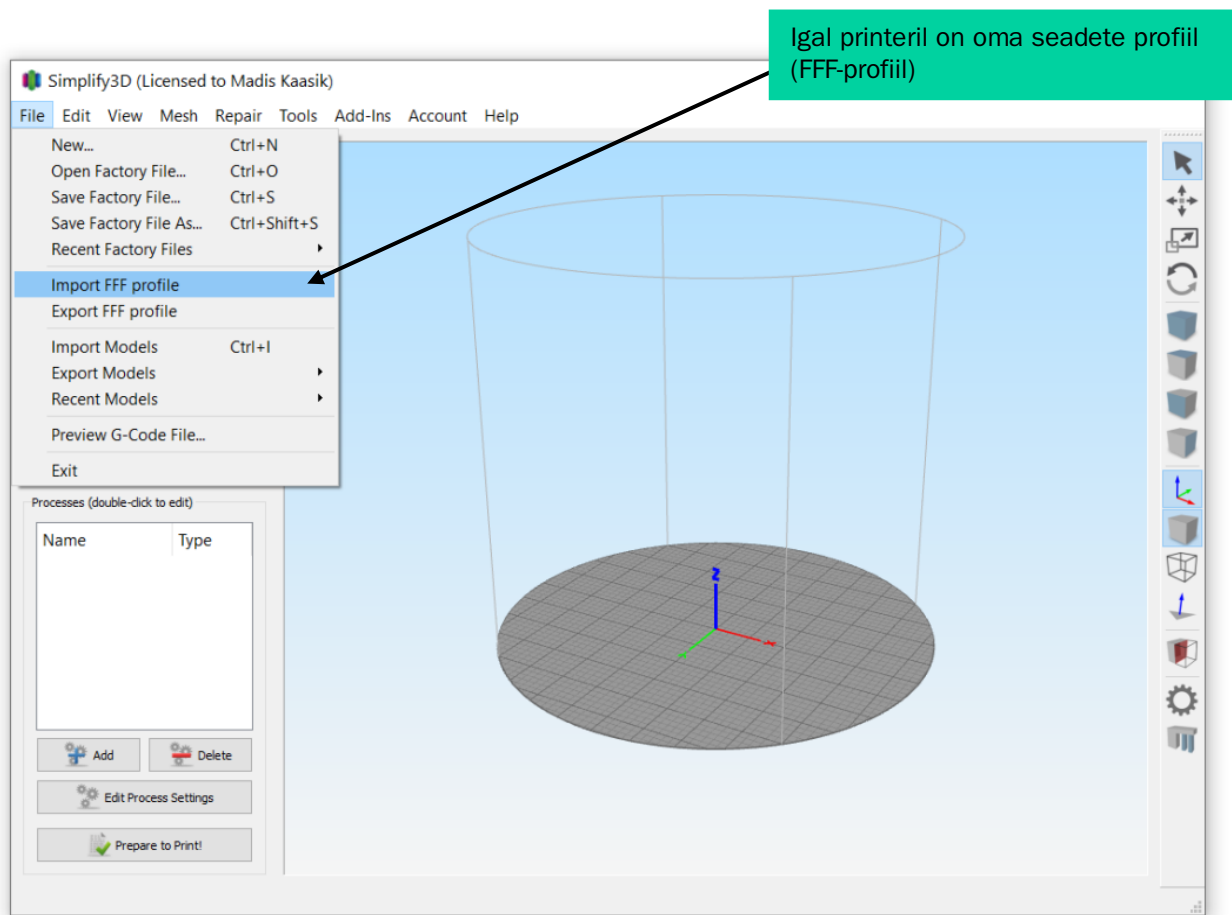
EKA

**Delta 900 3D-printeri kasutusjuhend
Simplify3D jaoks**

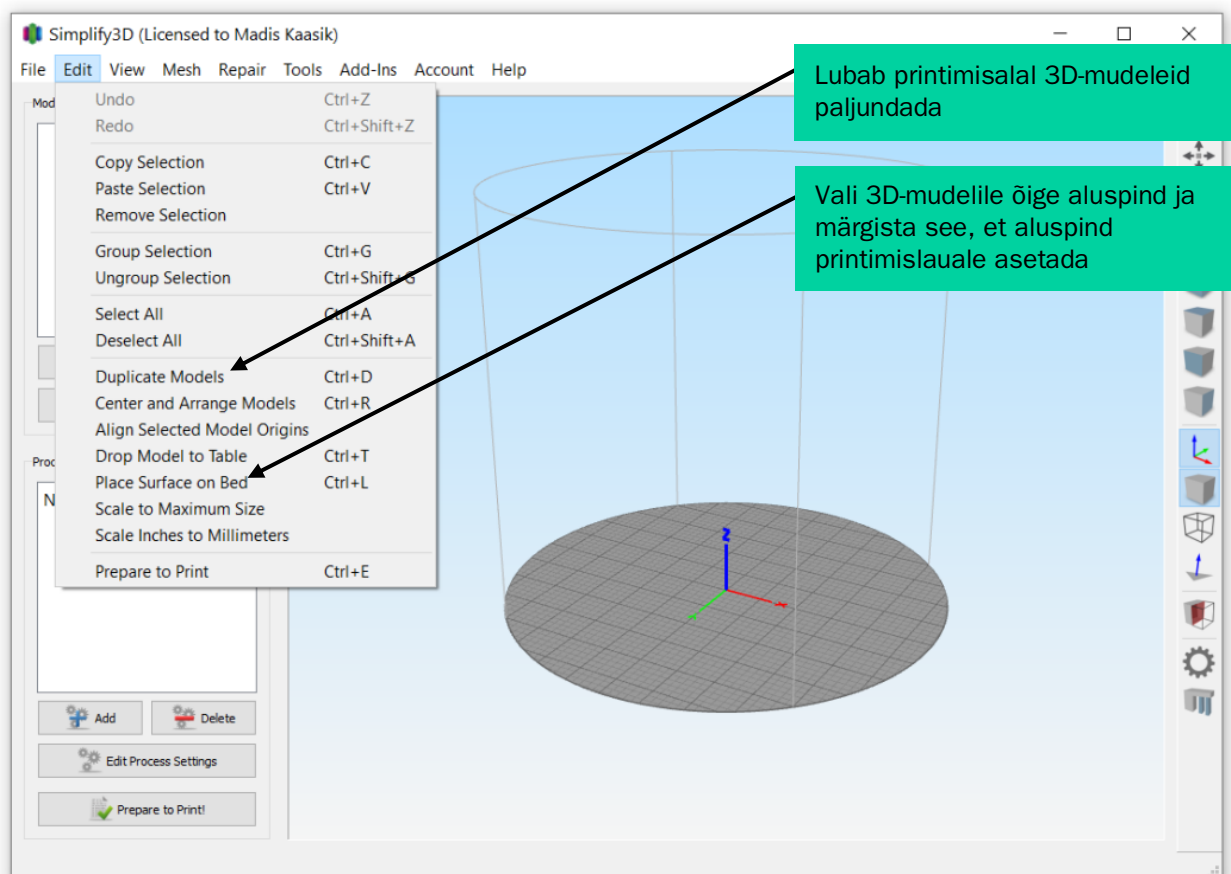
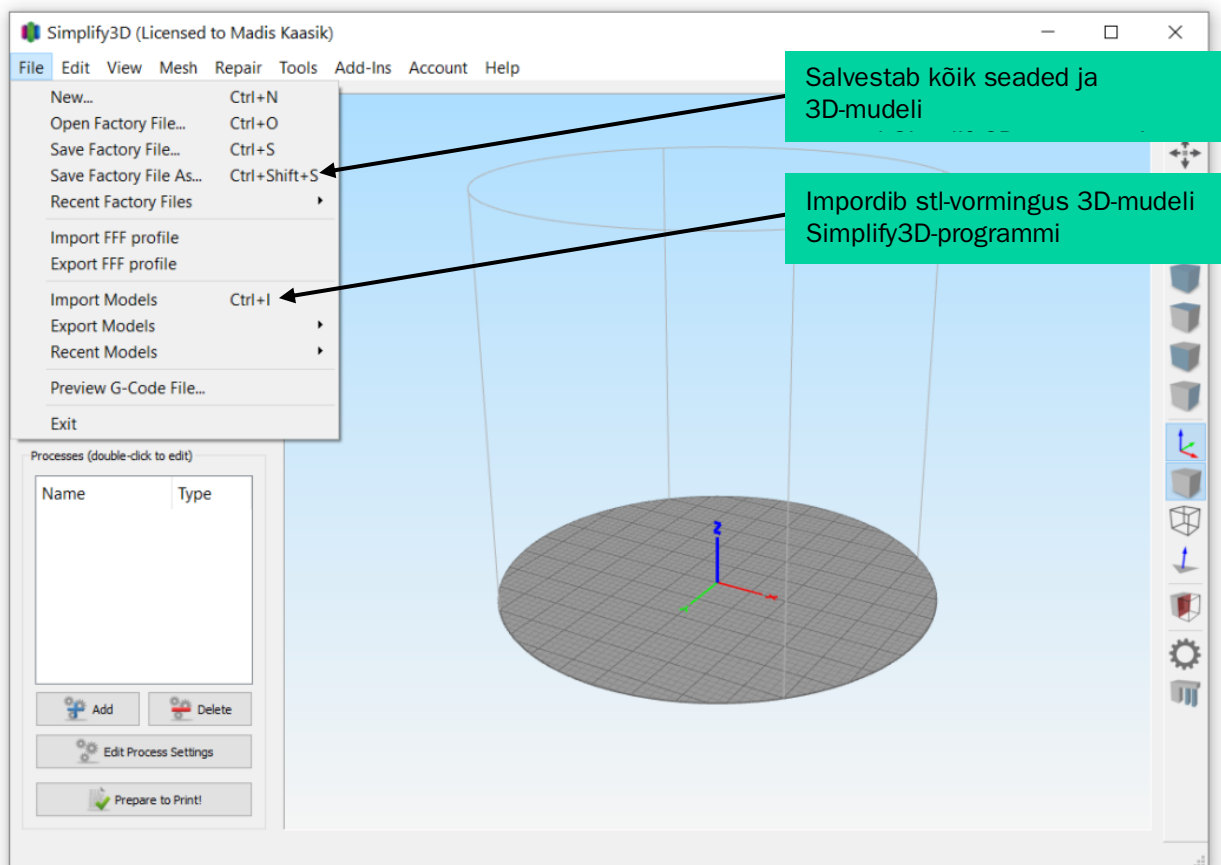
Dokumendis käsitletakse alljärgnevat:

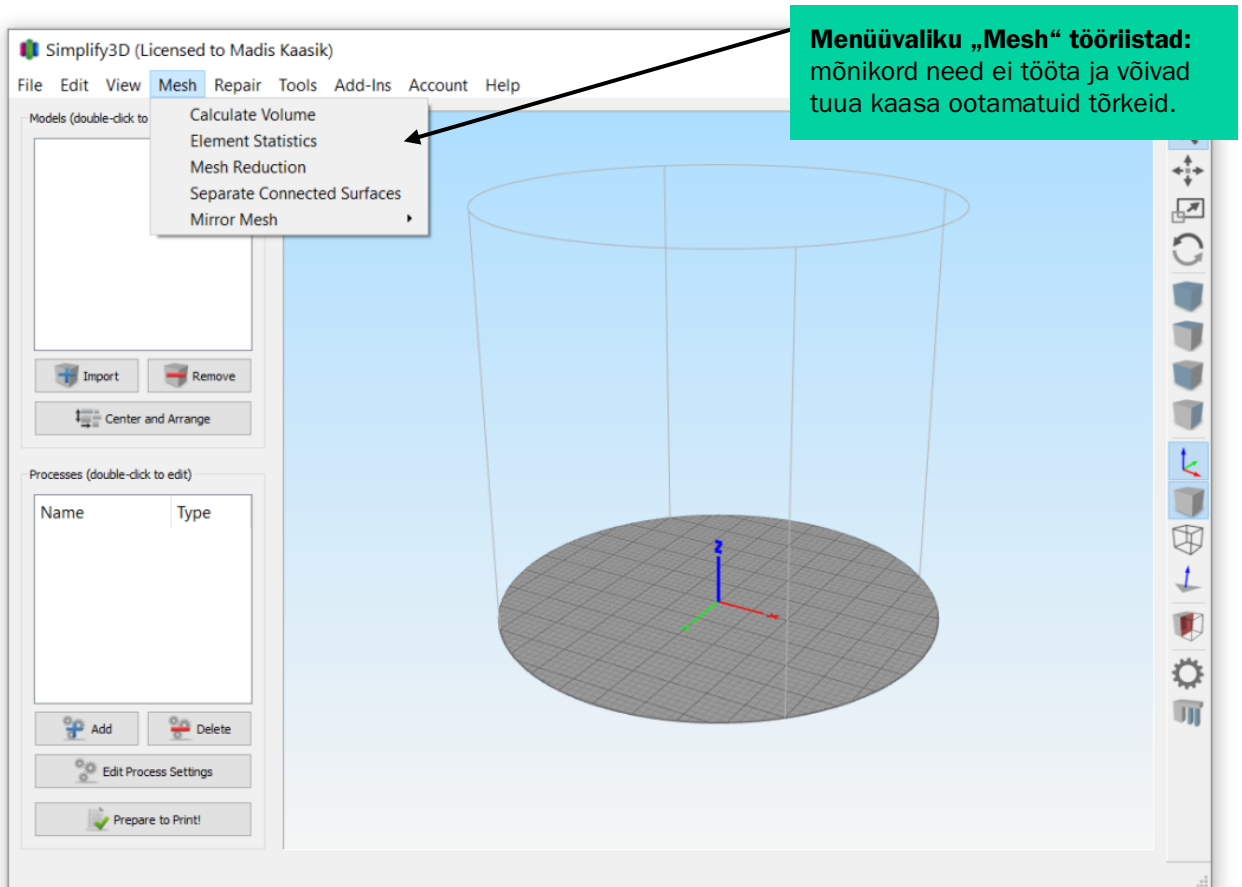
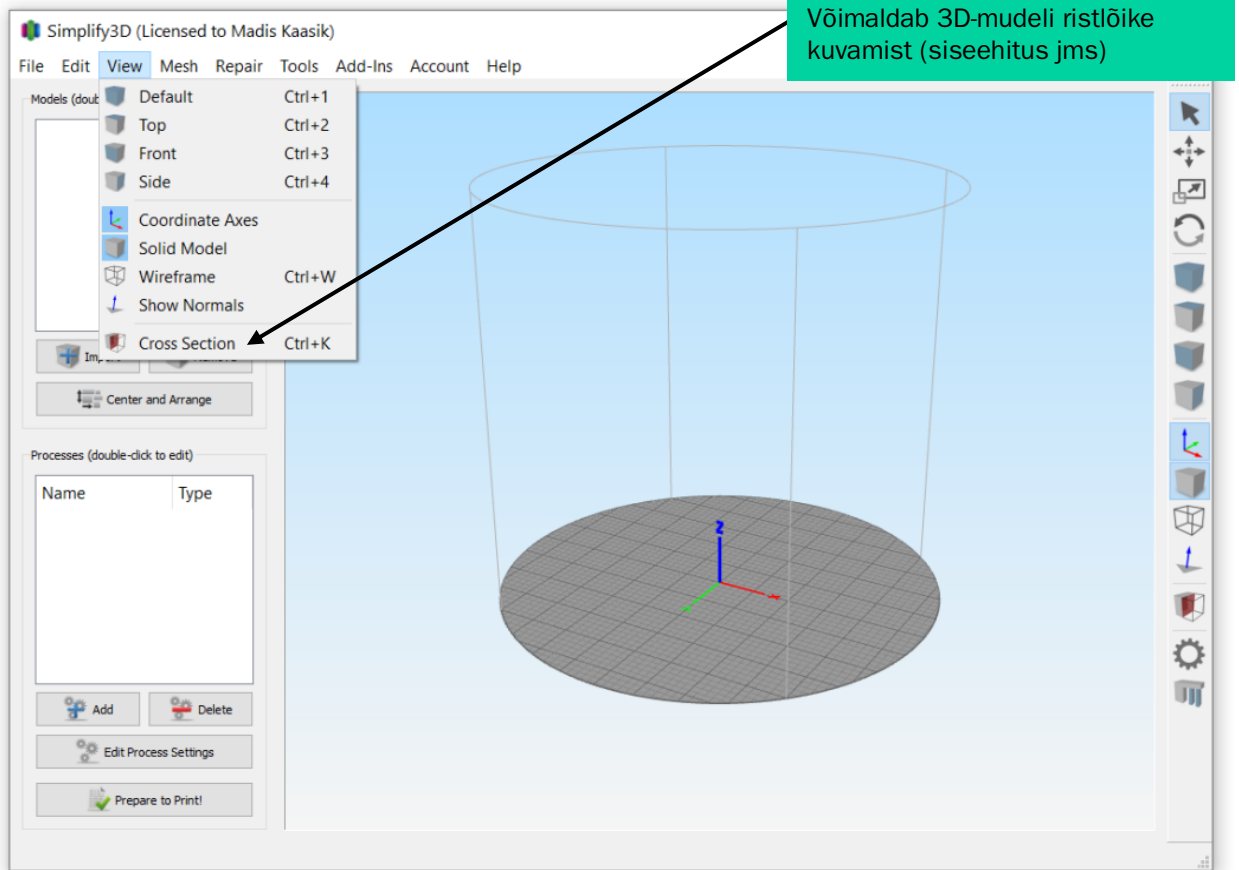
- 1.** Kuidas uut printerit esimest korda häälestada (lk 3)
- 2.** Simplify3D enim kasutatavad nupud ja sakid (lk 4–8)
- 3.** Punkthaaval printimisjuhiseid (lk 9–23);
kui prindid G-koodide importimisega, mine kohe lk-le 23)
- 4.** Seadme juhtpaneeli juhiseid (lk 24–26)

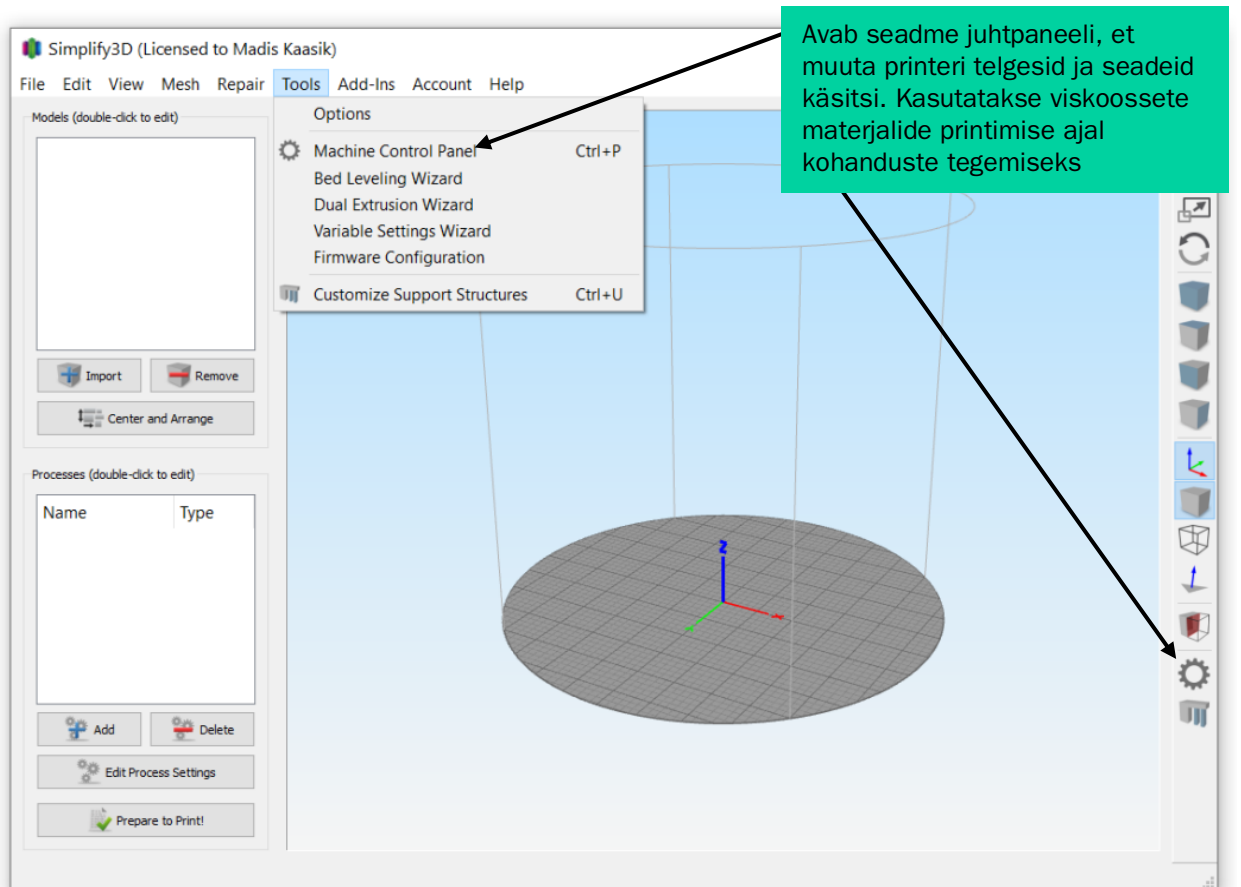
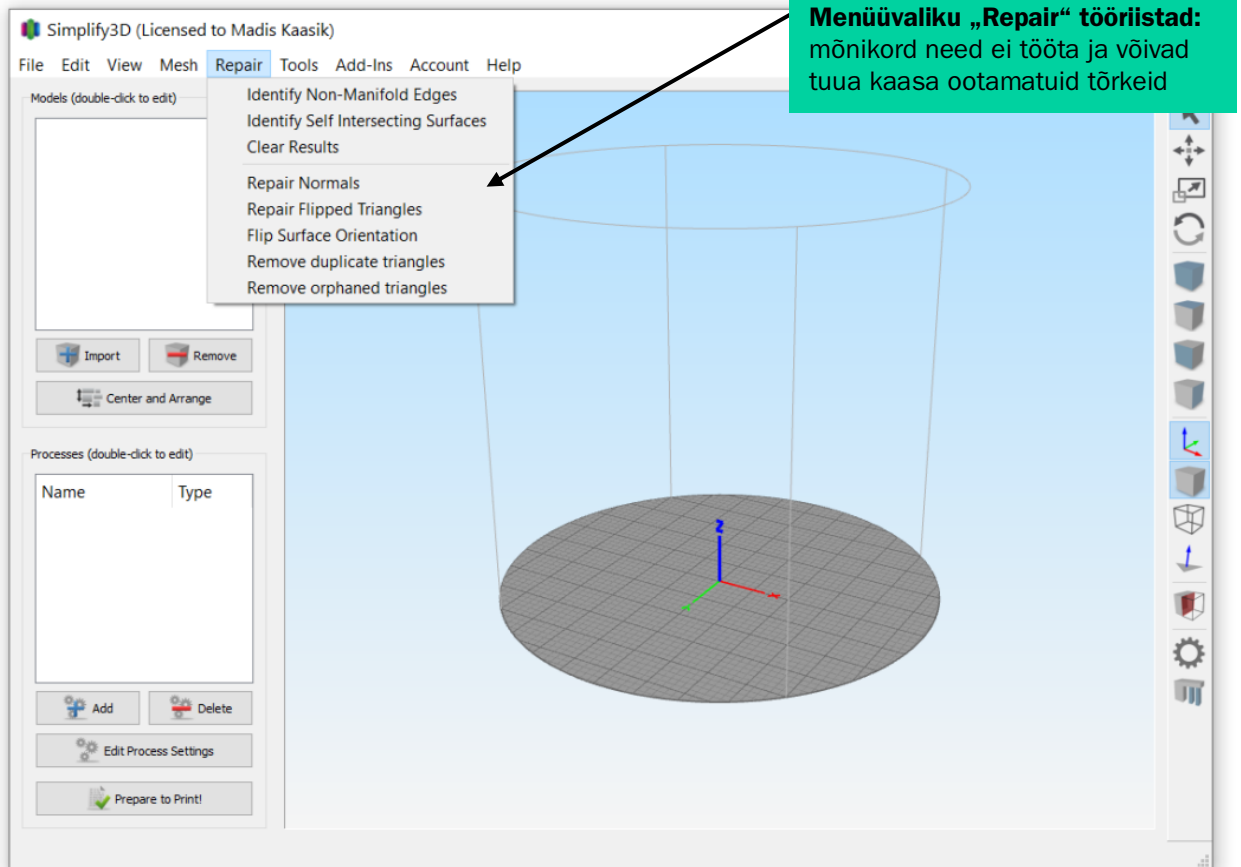
1. Kuidas uut printerit esimest korda häälestada

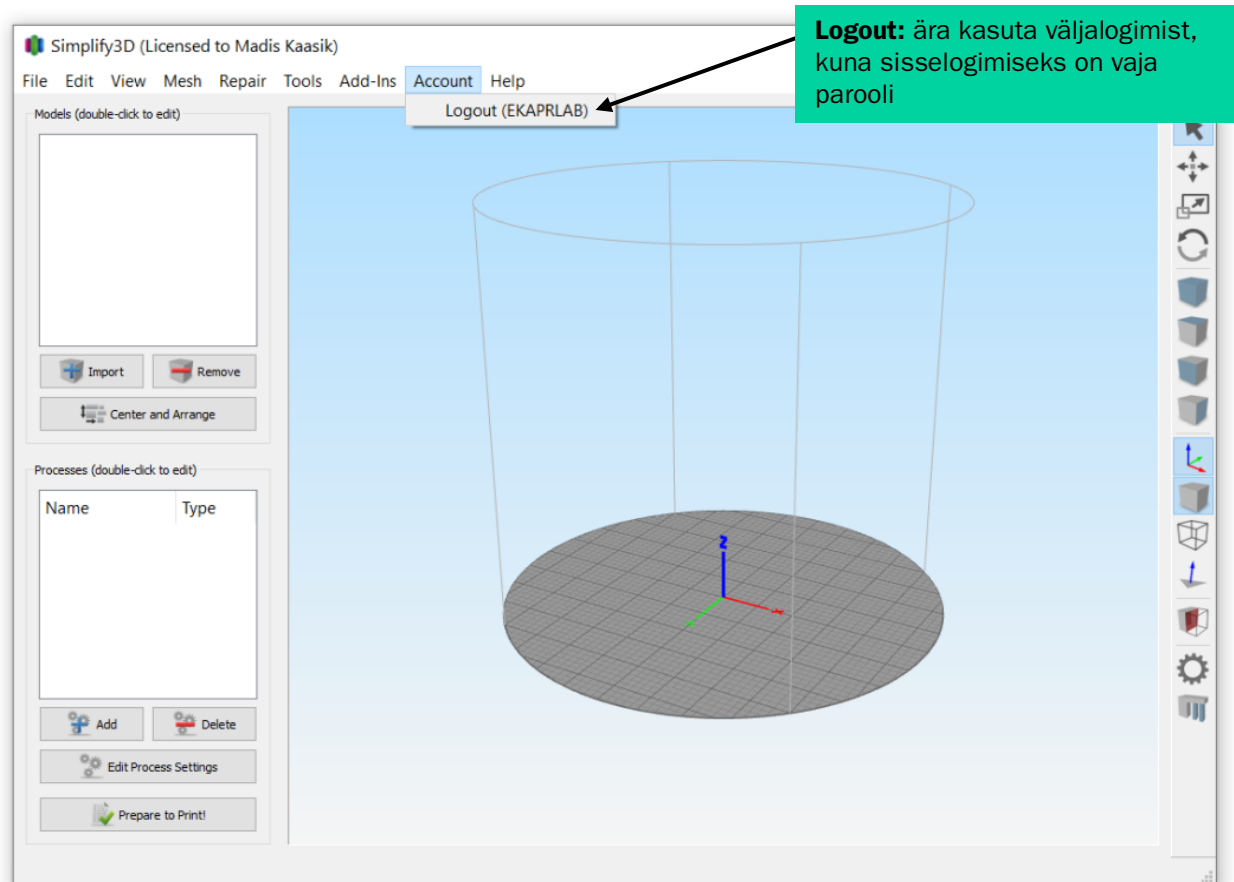
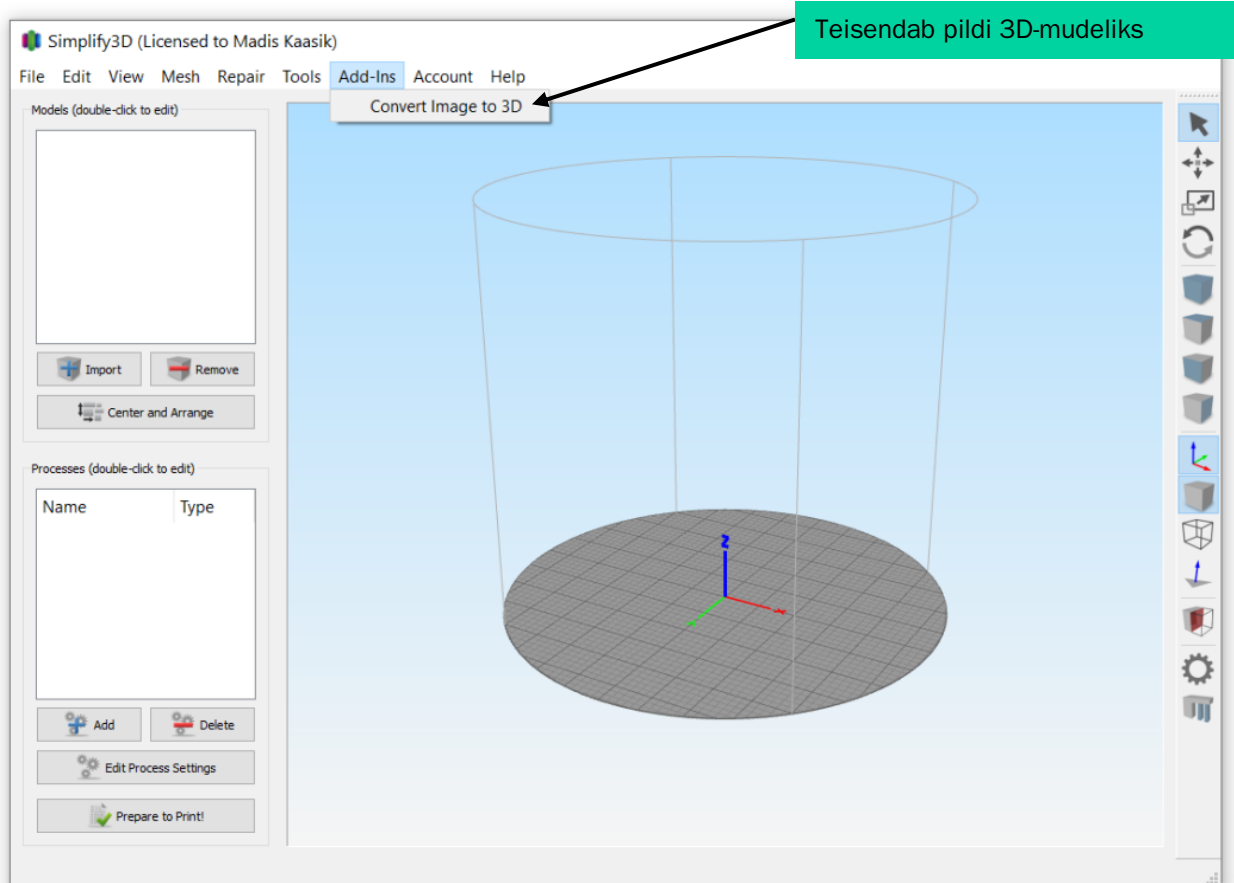


2. Simplify3D enim kasutatavad nupud ja sakid

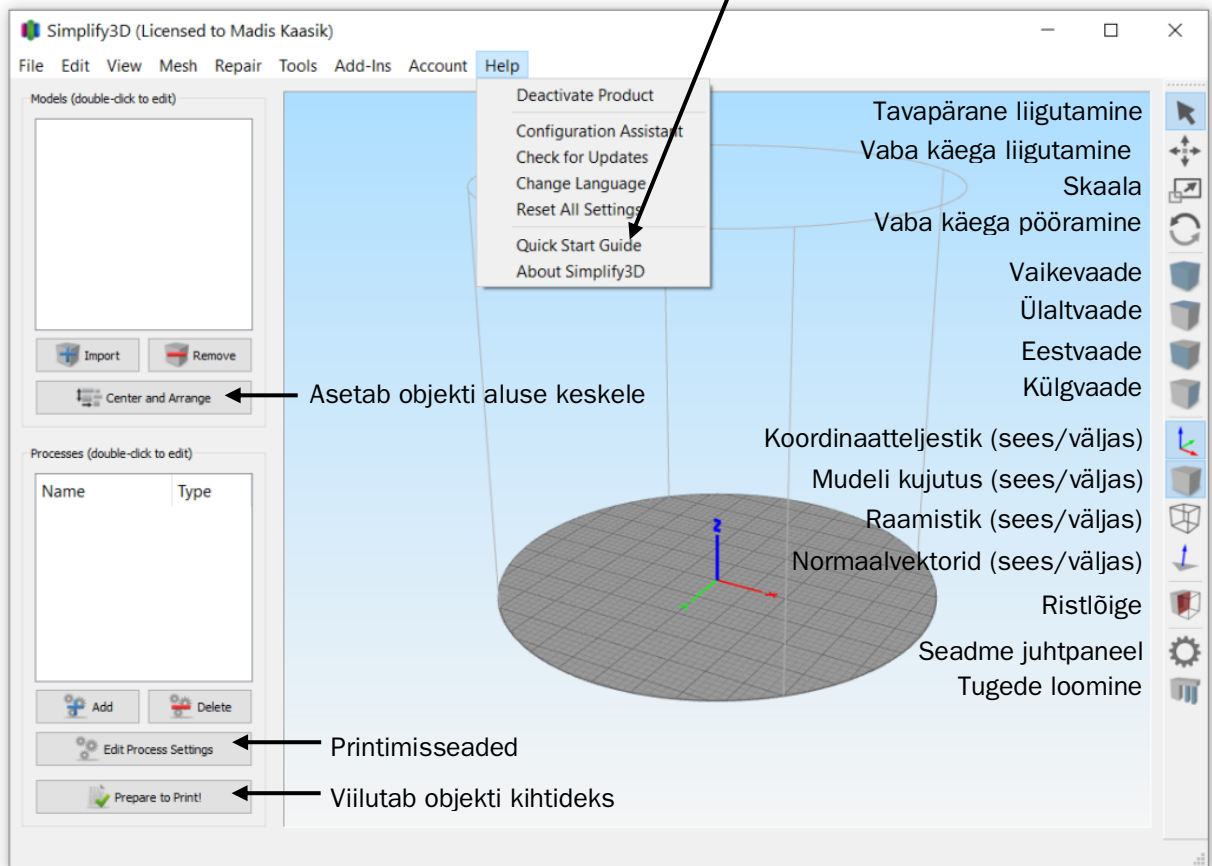








Kiirjuhend, kust leiab lisainfot



3. Punkthaaval printimisjuhised (kui prindid G-koodide importimisega, jäta vahele ja liigu kohe lk-le 24)

Punkt 01: impordi stl-vormingus fail

Punkt 02: tee mudeli peal topeltklõps, et avada seadete paneel (saad muuta orientatsiooni, skaalat ja asukohta)

Punkt 03: ava printimisseaded

The screenshot shows the Simplify3D software interface. The main window displays a 3D model of a yellow vase on a grey grid. The interface includes a menu bar (File, Edit, View, Mesh, Repair, Tools, Add-Ins, Account, Help), a Models panel on the left with an 'Import' button, and a Processes panel with an 'Edit Process Settings' button. On the right, a settings panel is open, showing options for 'Change Position', 'Change Scaling', and 'Change Rotation'. A red dashed box highlights this settings panel. Three callout boxes with arrows point to the 'Import' button, the settings panel, and the 'Edit Process Settings' button respectively.

Punkt 04: vali rippmenüüst õige printer

Algne (**original**) tähendab, et see printeriprofiil töötab printeriseadetega kõige paremini

Punkt 05: salvesta uus „algne“ printeriprofiil enda ja oma projekti nimega

The screenshot shows the FFF Settings application window. The 'Process Name' is 'Process 1'. The 'Select Profile' dropdown is set to 'EKA delta 700 - original - 05082020'. The 'Auto-Configure' dropdown is also set to 'EKA delta 700 - original - 05082020'. The 'Material' is 'PLA' and 'Print Quality' is 'Medium'. The 'General Settings' section shows 'Infill Percentage' at 100%. The 'Primary Extruder Toolhead' section is expanded, showing 'Extruder Toolhead Index' as 'Tool 0', 'Nozzle Diameter' as '6,00 mm', 'Extrusion Multiplier' as '0,90', and 'Extrusion Width' as 'Manual 0,40'. The 'Ooze Control' section has 'Retraction' checked with a distance of '1,00', 'Coast at End' unchecked with a distance of '0,20', and 'Wipe Nozzle' unchecked with a distance of '5,00'. Two 'Profile Name' dialog boxes are overlaid on the main window. The first dialog box has the text 'EKA delta 700 - original - 05082020' in the input field, with an orange callout box saying 'Kustuta see osa'. The second dialog box has the text 'EKA delta 700 - Anna Aken - Vaas' in the input field, with an orange callout box saying 'Lisa enda nimi ja projekti nimi'. Arrows point from the callout boxes to the corresponding parts of the dialog boxes. The main window has 'OK' and 'Cancel' buttons at the bottom right.

FFF Settings

Process Name: Process1

Select Profile: EKA delta 700 - Anna Aken - Vaas Update Profile Save as New Remove

Auto-Configure for Material: PLA + - Auto-Configure for Print Quality: Medium + -

General Settings

Infill Percentage: 10% Include Raft Generate Support

Extruder List (click item to edit settings)

- Primary Extruder

Add Extruder Remove Extruder

Primary Extruder Toolhead

Overview

Extruder Toolhead Index: Tool 0

Nozzle Diameter: 2,00 mm **Punkt 07: määra düüsi diameeter**

Extrusion Multiplier: 0,90

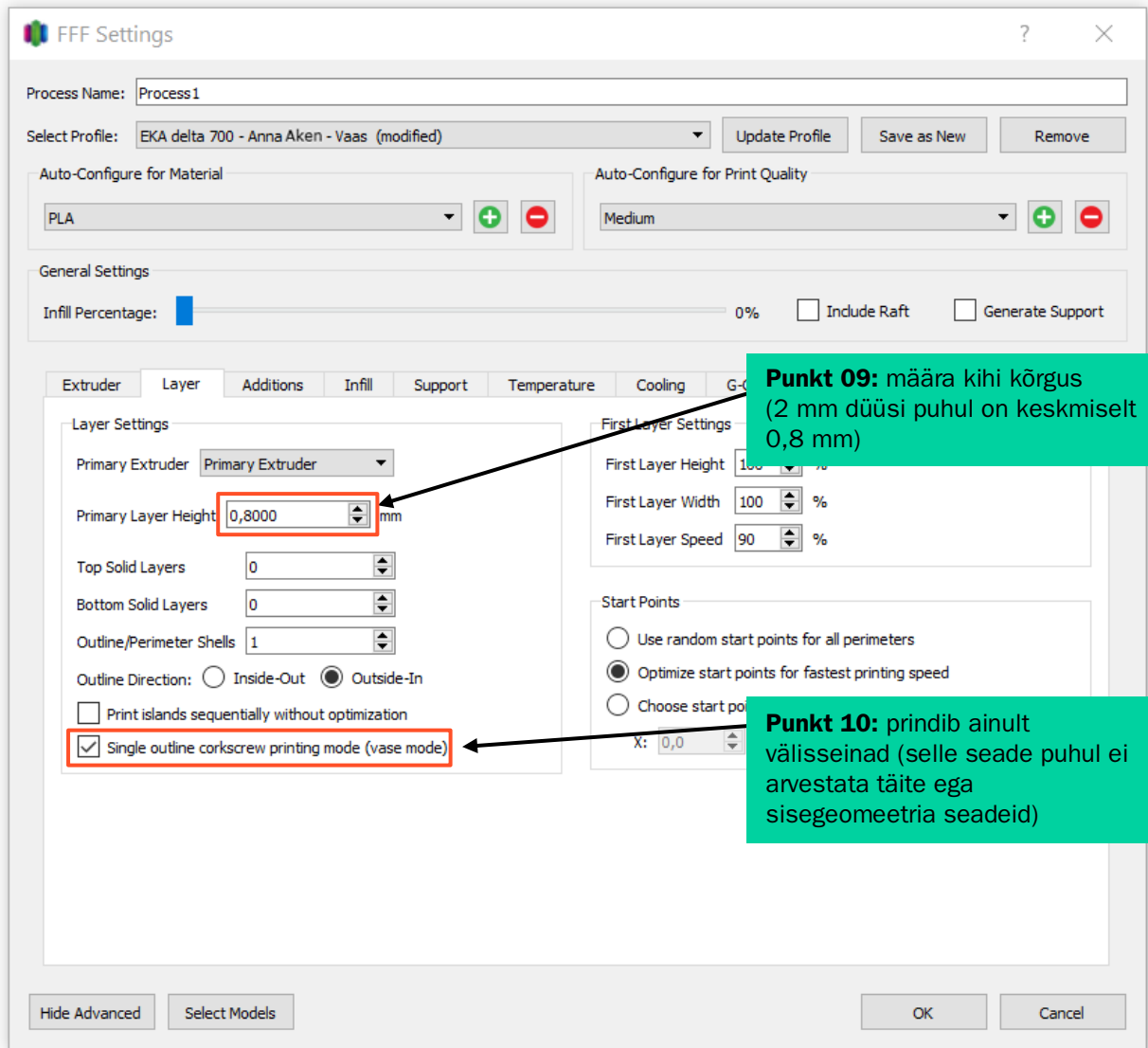
Extrusion Width: Auto Manual 2,40 mm **Punkt 08: automaatne laius ehk „Auto“ (käsitsi tuleb määrata puutuvate printimise joonte puhul)**

Ooze Control

- Retraction
 - Retraction Distance: 1,00
 - Extra Restart Distance: 0,00
 - Retraction Vertical Lift: 0,00 mm
 - Retraction Speed: 1800,0 mm/min
- Coast at End
 - Coasting Distance: 0,20 mm
- Wipe Nozzle
 - Wipe Distance: 5,00 mm

Hide Advanced Select Models OK Cancel

Punkt 06: vaata, et valitud oleks uus profiil, mille just salvestasid



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

Punkt 11: VALIKULINE: printer teeb enne objekti printimist selle ümber ühe ringi. Kasulik valik, et materjal korralikult voolama saada

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

Punkt 12: VALIKULINE:
täitmisfunktsiooni ei kasutata tavaliselt.
Seda võib kasutada objekti sisse
tugistruktuuride printimiseks

FFF Settings

Process Name: Process1

Select Profile: EKA delta 700 - Anna Aken - Vaas (modified) [Update Profile] [Save as New] [Remove]

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

Support Material Generation

- Generate Support Material
- Support Extruder: Primary Extruder
- Support Infill Percentage: 30 %
- Extra Inflation Distance: 0,00 mm
- Support Base Layers: 0
- Combine Support Every: 1 layers

Dense Support

- Dense Support Extruder: Primary Extruder
- Dense Support Layers: 0
- Dense Infill Percentage: 70 %

Automatic Placement

Only used if manual support is not defined

- Support Type: Normal
- Support Pillar Resolution: 4,00 mm
- Max Overhang Angle: 45 deg

Separation From Part

- Horizontal Offset From Part: 0,30 mm
- Upper Vertical Separation Layers: 1
- Lower Vertical Separation Layers: 1

Support Infill Angles

- 0 deg
- [Add Angle]
- [Remove Angle]

[Hide Advanced] [Select Models] [OK] [Cancel]

Punkt 13: VALIKULINE:
toefunktsiooni ei kasutata
tavaliselt

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

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

Punkt 14: VALIKULINE:
temperatuur tuleks seadistada
20 °C peale

Punkt 15: VALIKULINE: jahutust ei kasutata

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: 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

FFF Settings

Process Name:

Select Profile: Update Pr

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

Machine type:

	X-Axis	Y-Axis	Z-Axis
Build volume	<input type="text" value="200,0"/>	<input type="text" value="200,0"/>	<input type="text" value="260,0"/>
Origin offset	<input type="text" value="100,0"/>	<input type="text" value="100,0"/>	<input type="text" value="0,0"/>
Homing dir	<input type="text" value="Max"/>	<input type="text" value="Max"/>	<input type="text" value="Max"/>

Flip build table axis X Y Z

Toolhead offsets: X Y

Update Firmware Configuration

Firmware type:

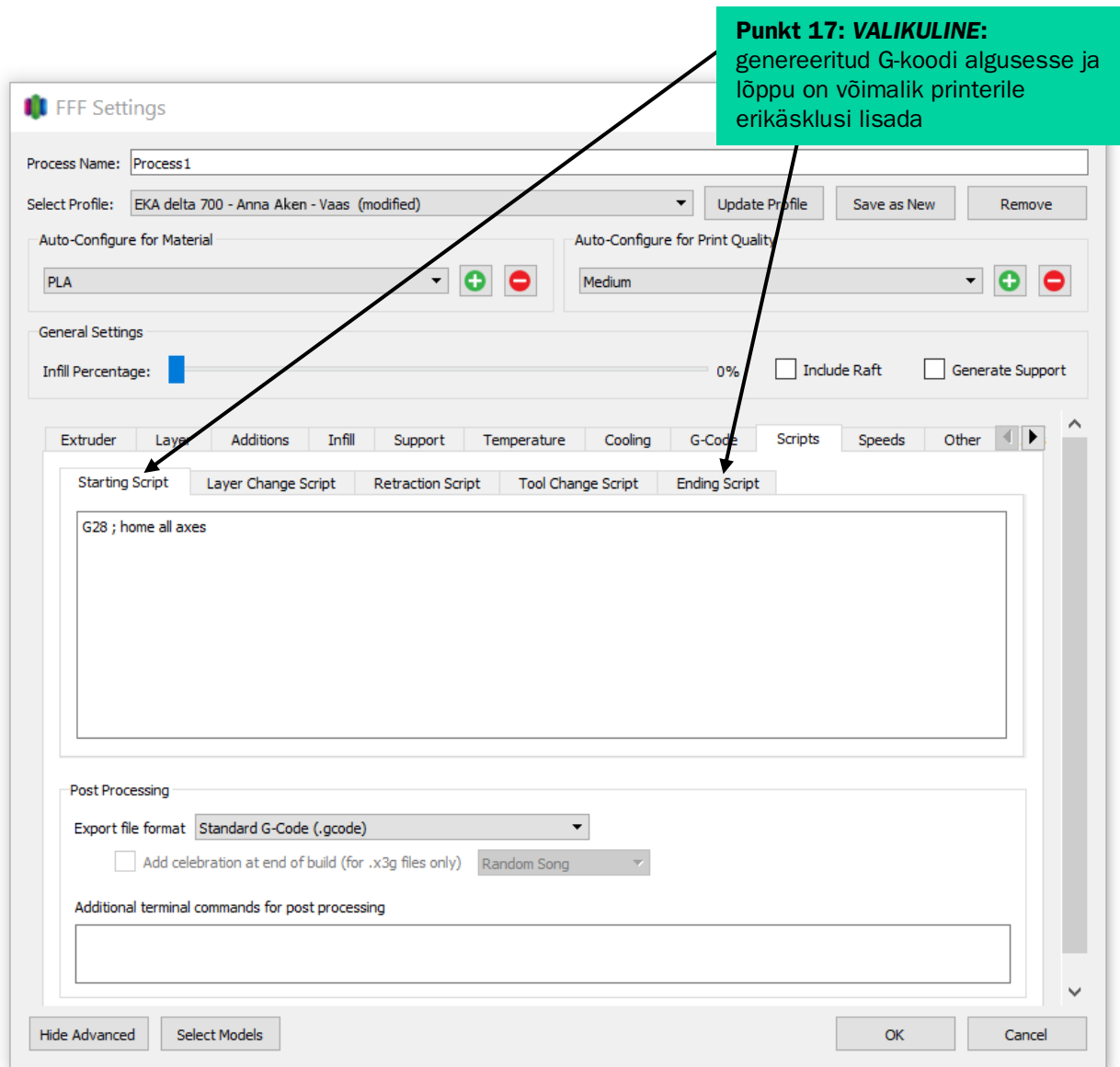
GPX profile:

Baud rate: bits/sec

Hide Advanced Select Models OK Cancel

Punkt 16: VALIKULINE: G-koodide seaded Delta 900 jaoks

Delta 900 printerile = 440mm



Punkt 18 VALIKULINE: kogu printimise ajal on soovitatav hoida ühtlast kiirust

The image shows the 'FFF Settings' dialog box. At the top, there is a 'Process Name' field with 'Process 1' and a 'Select Profile' dropdown menu set to 'EKA delta 700 - Anna Aken - Vaas (modified)'. Below this 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 tabbed interface at the bottom includes 'Extruder', 'Layer', 'Additions', 'Infill', 'Support', 'Temperature', 'Cooling', 'G-Code', 'Scripts', 'Speeds', and 'Other'. The 'Speeds' tab is selected and highlighted with a red border. It contains a 'Speeds' section with the following settings: 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), and Z Axis Movement Speed (3000,0 mm/min). To the right of the 'Speeds' section is a 'Speed Overrides' section with an unchecked checkbox 'Adjust printing speed for layers below' (set to 15,0 sec) and 'Allow speed reductions down to' (set to 20 %). At the bottom of the dialog are buttons for '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: Medium

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 50,0 sq mm

Extra inflation distance 0,00 mm

Bridging extrusion multiplier 100 %

Bridging speed multiplier 100 %

Use fixed bridging infill angle 0 deg

Apply bridging settings to perimeters

Dimensional Adjustments

Horizontal size compensation 0,00 mm

Filament Properties

Filament Toolhead Index Tool 0

Filament diameter 2,0000 mm

Filament price 1,00 price/kg

Filament density 1,70 grams/cm³

Tool Change Retraction

Tool change retraction distance 12,00 mm

Tool change extra restart distance -0,50 mm

Tool change retraction speed 600,0 mm/min

Hide Advanced Select Models OK Cancel

Punkt 19 VALIKULINE:

1. Bridging: ei kasutata tavaliselt
2. Filament Properties: ei kohaldu
3. Tool Change Retraction: ei kasutata
4. Dimensional Adjustments: ei kasutata tavaliselt

Punkt 20 VALIKULINE:

1. Layer modifications: kiire võimalus lõpetada/alustada printimist kindlal kõrgusel
2. Thin wall behavior: eksperimentaalne seade, ei ole katsetatud
3. Single extrusion: ei kasutata
4. Ooze control: ei kasutata
5. Movement behavior: ristumise vältimise lahtrisse tuleb teha linnuke
6. Slicing behavior: eksperimentaalne seade, ei ole katsetatud

Process Name: Process1
 Select Profile: EKA delta 700 - Anna Aken - Va
 Auto-Configure for Material
 PLA

General Settings
 Infill Percentage: 0% Include Raft Generate Support

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

Layer Modifications

- Start printing at height 0,00 mm
- Stop printing at height 0,00 mm

Thin Wall Behavior

- External Thin Wall Type: Perimeters only
- Internal Thin Wall Type: Perimeters only
- Allowed perimeter overlap: 10 %

Single Extrusions

- Minimum Extrusion Length: 4,00 mm
- Minimum Printing Width: 100 %
- Maximum Printing Width: 100 %
- Endpoint Extension Distance: 0,20 mm

Ooze Control Behavior

- Only retract when crossing open spaces
- Force retraction between layers
- Minimum travel for retraction 3,00 mm
- Perform retraction during wipe movement
- Only wipe extruder for outer-most perimeters

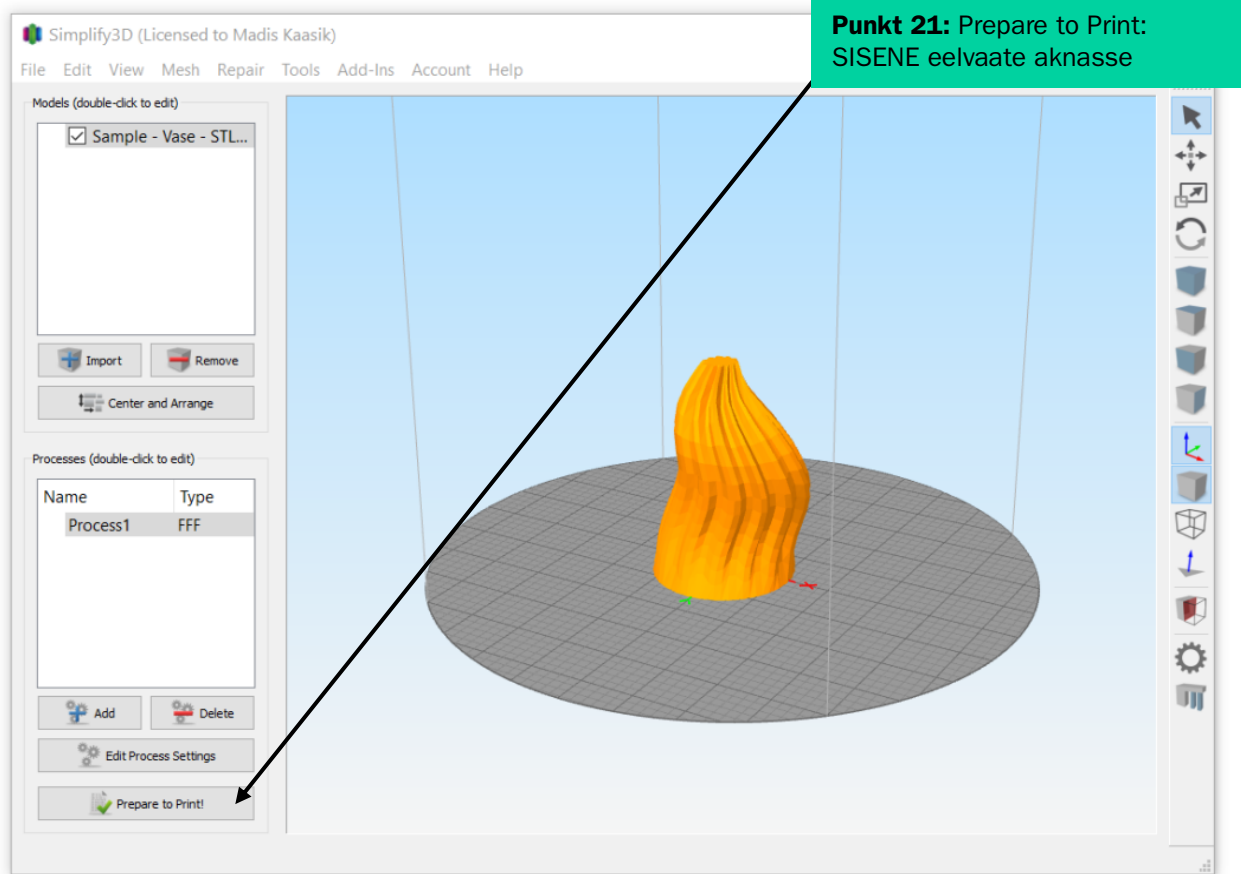
Movement Behavior

- Avoid crossing outline for travel movements
- Maximum allowed detour factor: 1,0

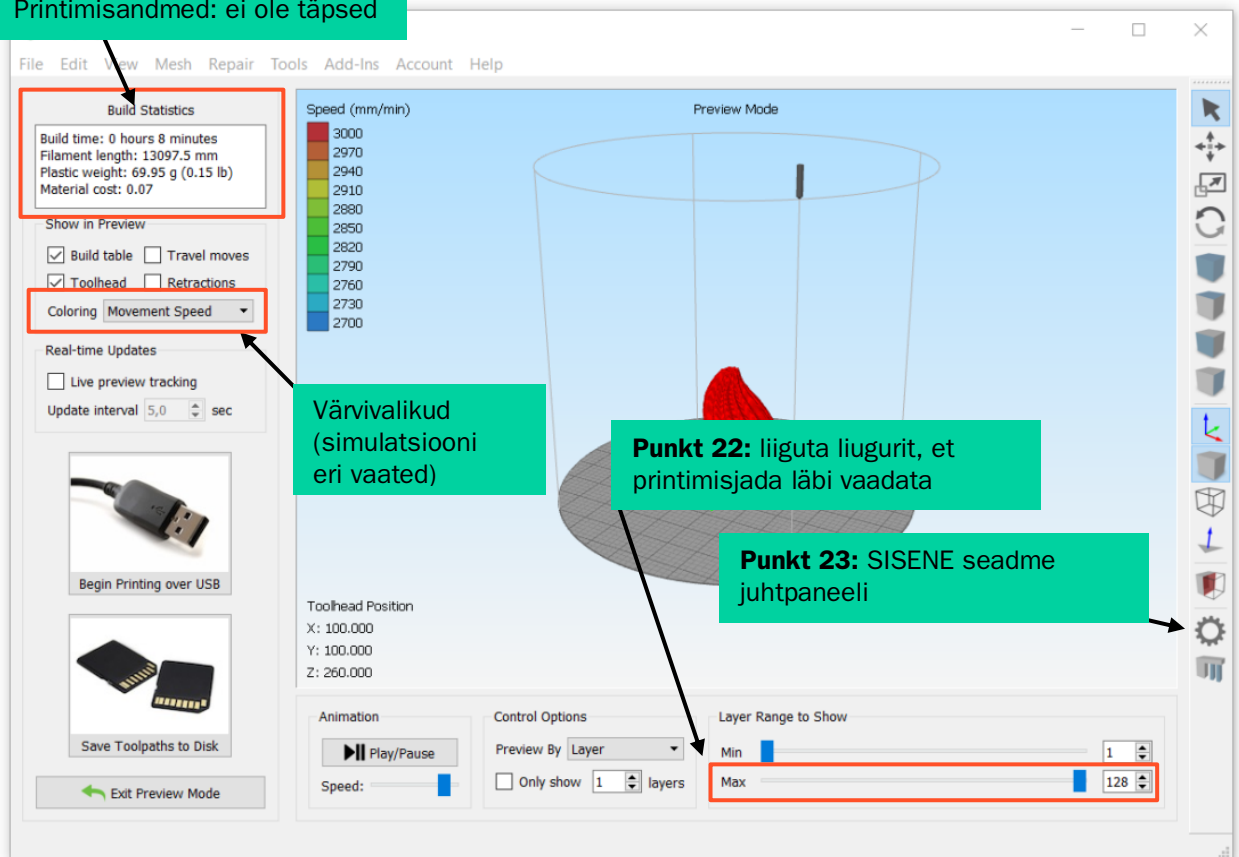
Slicing Behavior

- Non-manifold segments: Discard Heal
- Merge all outlines into a single solid model

Hide Advanced Select Models OK Cancel



Printimisandmed: ei ole täpsed



4. Seadme juhtpaneeli juhised

The screenshot shows the Machine Control Panel interface. Three callout boxes provide instructions:

- Punkt 01:** vali port (port ilmub, kui oledprinter USB-kaabliga ühendanud)
- Punkt 02:** Delta 900 baudikiirus on 250 000
- Punkt 03:** vajuta ühendamisnuppu „Connect“ (kui programm on ühendatud, muutub nupp roheliseks)

Sakk G-code:
G-kood kuvatakse mudeli viilutamise järel või võite G-koodi ise importida

Punkt 04:
PRINTIMISE
ALUSTAMINE

PRINTIMISE
PAUSILE PANEK

TURVALÜLITI

Kui printeril esineb tõrge, peab kindlasti vajutama seda nuppu

Machine Control Panel

Initialization

Disconnect Print Pause

Port: \\.\COM3 Refresh

Baud Rate: 250000 bits/sec Verbose

G-Code Library Communication Temperature Plot Jog Controls

SENT: M105
READ: ok T:39.3 /0.0 B:0.0 /0.0 T0:39.3 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.6 /0.0 B:0.0 /0.0 T0:39.6 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.8 /0.0 B:0.0 /0.0 T0:39.8 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.6 /0.0 B:0.0 /0.0 T0:39.6 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.0 /0.0 B:0.0 /0.0 T0:39.0 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.6 /0.0 B:0.0 /0.0 T0:39.6 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.1 /0.0 B:0.0 /0.0 T0:39.1 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.6 /0.0 B:0.0 /0.0 T0:39.6 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.7 /0.0 B:0.0 /0.0 T0:39.7 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.9 /0.0 B:0.0 /0.0 T0:39.9 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.4 /0.0 B:0.0 /0.0 T0:39.4 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.3 /0.0 B:0.0 /0.0 T0:39.3 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.5 /0.0 B:0.0 /0.0 T0:39.5 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.3 /0.0 B:0.0 /0.0 T0:39.3 /0.0 @:0 B@:0
SENT: M105
READ: ok T:39.4 /0.0 B:0.0 /0.0 T0:39.4 /0.0 @:0 B@:0

Position Readout

X 0.00 Zero X
Y 0.00 Zero Y
Z 0.00 Zero Z

Emergency Stop

Force Next

Accessory Control

Active Toolhead: Tool 0

Extruder 190 39 °C On Off
Heated Bed 60 0 °C On Off

Set Fan Speed

Custom Commands

Disable Motors Enable Motors
Print from SD Card Pause Current SD Print
Upload to SD Card SD Card Status
Macro 1 Macro 2 Macro 3

Override Settings

Movement: 100% 100
Extrusion: 100% 100

1% 200% 50% 150%

Sakk Communication :
Kuvab teavet ja võimaldab printerile käsklusi saata

Machine Control Panel

Initialization

Disconnect Print Pause

Port: \\.\COM3 Refresh

Baud Rate: 250000 bits/sec Verbose

G-Code Library Communication Temperature Plot Jog Controls

Bed Setpoint Extruder Setpoint

Temperature (C)

200
175
150
125
100
75
50
25
0

0 5 10 15 20 25 30

Samples

Monitor Temperatures Clear Plot Data

Position Readout

X 0.00 Zero X
Y 0.00 Zero Y
Z 0.00 Zero Z

Emergency Stop

Force Next

Accessory Control

Active Toolhead: Tool 0

Extruder 190 39 °C On Off
Heated Bed 60 0 °C On Off

Set Fan Speed

Custom Commands

Disable Motors Enable Motors
Print from SD Card Pause Current SD Print
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Macro 1 Macro 2 Macro 3

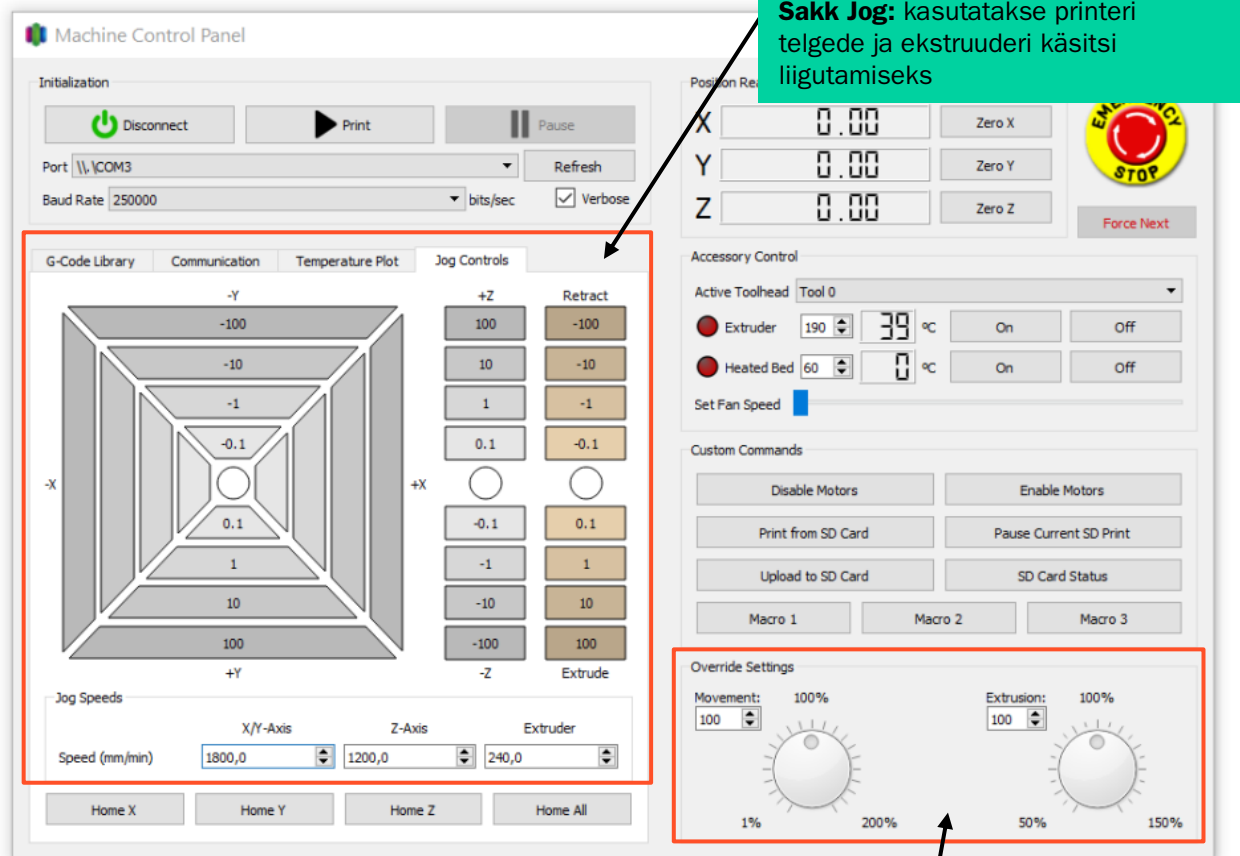
Override Settings

Movement: 100% 100
Extrusion: 100% 100

1% 200% 50% 150%

Sakk Temperature:
temperatuuri teave ei ole oluline

Custom Commands:
kasutatakse harva



Sakk Jog: kasutatakse printeri telgede ja ekstruuderi käsitsi liigutamiseks

Override Settings: ekstruuderi liikumise ja kiiruse muutmine enne printimist ja selle ajal

Valminud Hariduse Infotehnoloogia Sihtasutuse IT Akadeemia programmi toel.



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Koostanud **Madis Kaasik ja Lauri Kilusk, Eesti Kunstiakadeemia**, jaanuar 2021