



TRACTUS3D

A PROUD DUTCH COMPANY

HEART
SOUL
&
DUTCH
PERFECTION

Inside every 3D Printer

LARGE VOLUME SE series

Installation and user manual

Original manual v1.0

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Disclaimer

Please read this installation and user manual carefully before using this product. Misuse or failure to follow warnings and instructions may result in personal injuries, inferior results or damages to the 3D printer. Users and purchasers of this product must know and understand the contents of the manual for correct use and care of the Tractus3D Printer.

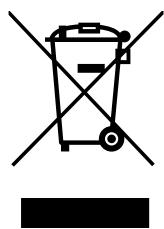
The conditions or methods necessary for assembling, care, storage, use or removal of the product is not within our control or knowledge. Therefor we do not take any responsibility and explicitly disclaim liability for injuries, loss, damages, or costs ensued from or connected with the assembly, care, storage, use or removal of the Tractus3D Printer.

The contents of this document is provided by Tractus3D and without warranties of any kind, either expressed or implied in relation to the propriety, reliability or accuracy or otherwise of these contents.

Intended use of our 3D printers

Tractus3D printers are engineered and manufactured for use within a commercial environment and for FFF materials. Tractus3D printers are ideal for functional prototypes, concept models and series production on a small scale. With the usage of Simplify3D, we have reached a very high level in the production of 3D models. However the user is responsible for qualifying and validating the utilization of the printed object, in particular if these are vital in highly restricted circumstances, like medical or automotive applications.

Our printers are compatible with 3rd party filaments but we do recommend the use of Easy2Print3D materials for the best results. The properties of these materials are fully matched with our printer settings.



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Preface

This is the installation and user manual for your Tractus3D printer.

This manual contains chapters about the installation and use of the 3D printer.

The manual contains important information and instructions on safety, installation and use. Please read all information and follow the instructions and guidelines in this manual carefully. This ensures that you will obtain great quality prints and that possible accidents and injuries are prevented. Make sure that everyone who uses the Tractus3D printer has access to this manual.

Every effort has been made to make this manual as accurate and complete as possible. The information is believed to be correct but does not aim to be all inclusive and shall be used only as a guide. Should you discover any errors or omissions, please bring this to our attention, so that we can make amendments.

This will enable us to improve our documentation and service to you.

1. Safety and compliance

Always work safe with your Tratus3D printer and follow all warnings and instructions to prevent any possible personal injuries or accidents.

1.1 Safety Notices



This manual includes warnings and safety notices.

Provides additional information that is helpful to do a task or to avoid problems.

Warns of a situation that may cause material damage or injuries if one does not follow the safety instructions.

General safety information

The Tractus3D printer has moving parts that will get hot and generate high temperatures. This may cause injuries. When in operation, never reach inside of the 3Dprinter. Control the 3Dprinter with the touchscreen, positioned on the front or with the power switch at the front, or via the webinterface. Let the Tractus3D printer cool down for at least 5 minutes before reaching inside. Do not leave or store items inside the 3D printer.

Without explicit instructions from Tractus3D, please do not adjust or change anything on the Tractus3D printer. Persons with reduced physical and/or mental capabilities that are unable to act accurately in case of emergency, or persons with lack of experience and knowledge should not use the Tractus3D Printer. Only when given instructions concerning the use of the appliance, or under supervision by a person responsible for their safety.

Children should always be under supervision when using the 3D printer.

1.2 Hazards

Electromagnetic compatibility (EMC)

This product has been tested and found to comply with the limits for a digital device Class A, according to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the 3D printer is operated in a commercial environment. This Tractus3D printer generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Electrical safety

Every printer has passed testing before shipment. This test guarantees the right level of insulation against electrical shock. A grounded mains socket must be used. Be sure that the buildings installation has dedicated means for over-current and short-circuiting.

The printer is powered by mains voltage, which is hazardous when touched. This has been marked with a high-voltage symbol. Always unplug the printer before doing maintenance. Never turn off the printer with a print head above 50 degrees Celsius!

Mechanical safety

The Tractus3D printer complies to the Machine Directive 2006/42/EU. The Tractus3D printer contains moving parts. No damage to the user will be expected from the drive belts, arms or slides. Always unplug the printer before doing maintenance.

Risk of burns

Do not touch the heated bed or printhead with your bare hands.

The print head can reach temperatures up to 500 °C and the heated bed can reach temperatures of more than 100 °C. This means there is a potential risk of burns!

Let the 3D printer cool down for 30 minutes before you perform any maintenance. Never turn off printer with a print head above 50 degrees Celsius!

Health and safety

Our printers are compatible with all brands of 3D print filament, but we do recommend the use of Easy2Print3D materials for the best results. The properties of these materials are fully matched with our printer settings. These materials can be printed safely if the recommended temperatures and settings are used. Printing in a well-ventilated area is always recommended. Please check the SDS of each specific material for more information.

Third-party materials may release VOCs* that are above regulated threshold levels when processed in Tractus3D printers (not covered by warranty). These substances may cause headaches, fatigue, dizziness, confusion, drowsiness, malaise, difficulty in concentration, and feelings of intoxication. We recommend the use of a fume extractor. Check the SDS of these materials for more information.

*Volatile Organic Compounds

2. Introduction

About the possibilities of your new Tractus3D printer

2.1 Main components

- Print head(s)
- Heated build plate
- Filament cabinet
- Tablet/Touchscreen
- Extruder
- Bowden tubes
- Polycarbonate panels
- Power socket with cord or adapter
- Ethernet port
- Power Switch

2.2 Specifications T3500SE

Machine properties

Printing technology	Fused filament fabrication (FFF) - Fused deposition modeling (FDM)
Build width	1000 mm diameter (39.4")
Build height	2200 mm (86.6")
Speed	up to 600 mm/s
XYZ resolution	20, 20, 50 micron
Layer resolution	0.4 mm nozzle: 300 - 50 micron 0.6 mm nozzle: 400 - 50 micron 0.8 mm nozzle: 600 - 50 micron 1.0 mm nozzle: 800 - 50 micron 1.2 mm nozzle: 1000 - 50 micron 1.4 mm nozzle: 1200 - 50 micron 1.8 mm nozzle: 1400 -50 micron
Operating sound	+/- 32 dBA
Power rating max.	2750 W
Connectivity	LAN + WIFI
Display	7" tablet and option for additional 15" color touchscreen (397 mm)
Language support	English, Dutch, French, German and many more
Monitoring	Nozzle camera and web interface

Physical dimensions

Dimensions	1350 mm x 1600 mm x 3550 mm
Net weight	375 kg
Shipping weight	850 kg
Shipping box dimensions	1800 mm x 1800 mm x 4200 mm

Build plate

Build plate material	Heated glass build plate
Build plate temperature	up to 110 °C
Build plate levelling	Automatic bed levelling with probe unit
Build plate heat up time	< 7 min (from 20 to 60 °C)

Print head

Feeder type	Direct drive dual gear
Nozzle diameter	0.4 mm, 0.6 mm, 0.8 mm, 1.0 mm, 1.2 mm, 1.4mm, 1.8mm
Nozzle temperature	up to 500 °C
Nozzle heat up time	< 90 sec
Max. extrusion volume	< 135 mm ³ /s

Ambient conditions

Operating ambient temperature	15 - 35 °C, 10 - 90% RH non-condensing
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Materials

Supported materials	PLA, PRO1, PET-G, ABS, ASA, Facilan C8, TPU/TPE, Nylon, PC, Fillers like woodfill
Filament diameter	1.75 mm

Software

Supplied software	Simplify3D with 1 license (usage on 2 computers)
Supported OS	MacOS, Windows and Linux
File types	STL, OBJ, 3MF, JPG, PNG
Printable formats	G, GCODE

2.3 Specifications T3000

Machine properties

Printing technology	Fused filament fabrication (FFF) - Fused deposition modeling (FDM)
Build width	1000 mm diameter (39.4")
Build height	1550 mm (61")
Speed	up to 600 mm/s
XYZ resolution	20, 20, 50 micron
Layer resolution	0.4 mm nozzle: 300 - 50 micron 0.6 mm nozzle: 400 - 50 micron 0.8 mm nozzle: 600 - 50 micron 1.0 mm nozzle: 800 - 50 micron 1.2 mm nozzle: 1000 - 50 micron 1.4 mm nozzle: 1200 - 50 micron 1.8 mm nozzle: 1400 - 50 micron
Operating sound	+/- 32 dBA
Power rating max.	2750 W
Connectivity	LAN + WIFI
Display	7" tablet and option for additional 15" color touchscreen (397 mm)
Language support	English, Dutch, French, German and many more
Monitoring	Nozzle camera and web interface

Physical dimensions

Dimensions	1350 mm x 1600 mm x 3050 mm
Net weight	275 kg
Shipping weight	750 kg
Shipping box dimensions	1800 mm x 1800 mm x 3600 mm

Build plate

Build plate material	Heated glass build plate
Build plate temperature	up to 110 °C
Build plate levelling	Automatic bed levelling with probe unit
Build plate heat up time	< 7 min (from 20 to 60 °C)

Print head

Feeder type	Direct drive dual gear
Nozzle diameter	0.4 mm, 0.6 mm, 0.8 mm, 1.0 mm, 1.2 mm, 1.4mm, 1.8mm
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Supported OS	MacOS, Windows and Linux
File types	STL, OBJ, 3MF, JPG, PNG
Printable formats	G, GCODE

3. Unboxing

The printer must be stored in a dry place, awaiting installation.



Unpacking should always be done by a qualified engineer of Tractus3D. Unpacking the printer on your own initiative can void the warranty.

4. Setup for first use

You need to set up the printer for first use after installing. This chapter will explain how to set up network settings, load materials, update the firmware, install Simplify3D and prepare the build plate.

Turn on the printer with the power switch at the back, to perform the setup steps.

4.1 Set up network

After finishing the calibration wizard that will run on first use, you need to configure the printer to be used in your network. We prefer to have a static IP address for the printer, or a DHCP reservation made by the network administrator.

Preparation need for using a static IP:

- A free IP address
- Subnet mask
- Gateway IP address

After using the calibration wizard, the printer will show a notification on the LCD, informing you about the IP address that is currently assigned. The printer is in DHCP mode by default and will receive an address from your network router. You can access the web interface if you copy the assigned IP to the address bar of your web browser.

Changing IP address

If you want to use a different IP instead of the address assigned by your router, please inform the Tractus3D engineer during installation of the printer. If there is no engineer present, please contact the support department so they can assist.

4.2 Update the firmware

All printers will be shipped with the latest firmware onboard. In some rare situations it's possible that while, or after shipping your 3D printer a new firmware is released. We will notify all users if the update is mandatory and adds functionality. Please do not update the machine without instructions by Tractus3D.

4.3 Calibrating the print bed

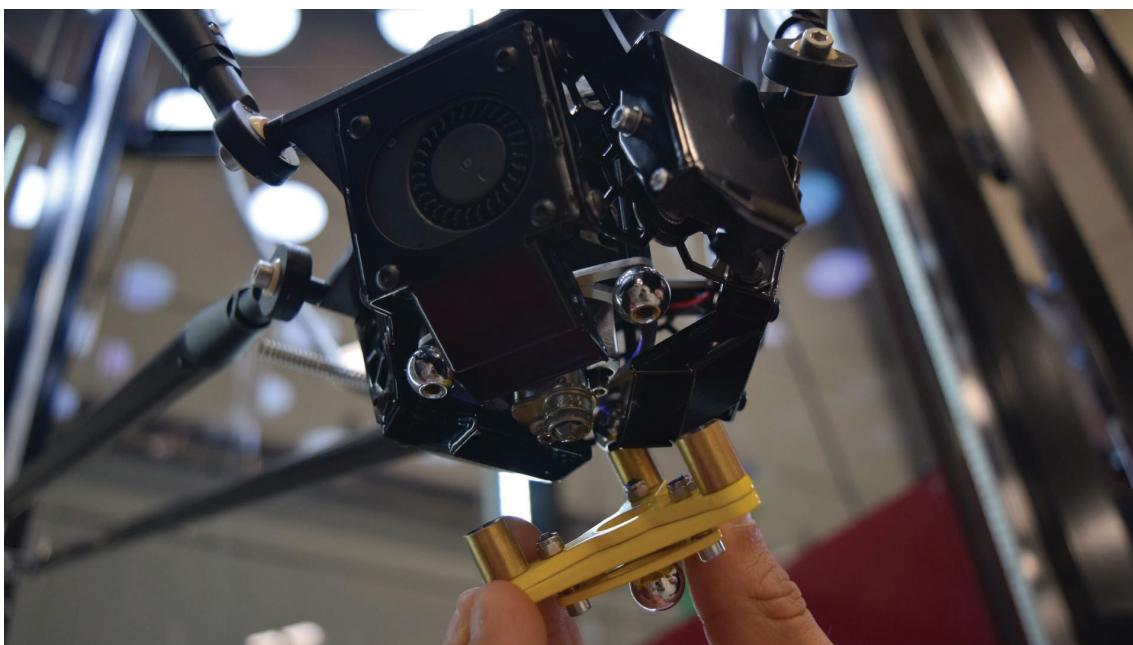
When you install the 3D printer for the first time or you have moved your printer to another location please always recalibrate the print bed.

Make sure the print bed is empty and cleaned. The nozzle is clean without any residue of filament.

Heat up the bed to 60 degrees on the webinterface, tablet or touchscreen.

Tools + Extra		Control Heaters		
Tool	Heater	Current	Active	Standby
Tool 0 TO - Load Filament	Heater 1 off	29.7 °C	0	0
Bed	Heater 0 active	31.3 °C	60	0
Chamber	Cabinet off	39.0 °C	0	0

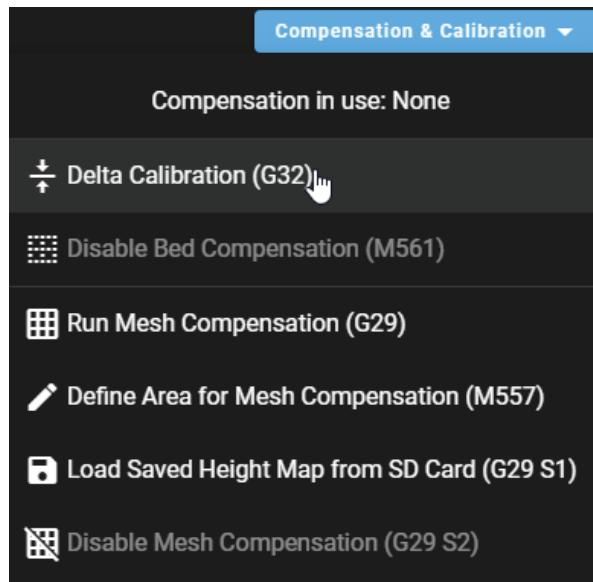
Click on **the active temperature drop down menu** and type the desired temperature, or use a pre-configured temperature. Then Press the heater names to toggle between On, Off or Standby.



Install the calibration unit by attaching it to the 3 steel balls below the print head



Connect the cable of the calibration unit to the mainboard of the machine



Use the **Delta Calibration** button. Please make sure the 3D printer has reached the bed temperature and the bed is clean! The printhead will move down and perform some calibration probes on the bed. This will take around 1 minute to complete. When the calibration is done the printhead will go up and calibration is done.

If you want to view the results you can click on the console button and look for the results.

4.4 Installing slicing software

By default we supply Simplify3D with our 3D printers as slicing software. As we do recommend this software it's not the only one that you can use for the 3D printer. The main reason for us to use Simplify3D is the ability to handle large files, and easy support customization. Tractus3D is a reseller of Simplify3D and does give basic support for the package and their printers but most of the support will be found online at the Simplify3D website.

<https://www.simplify3d.com/support/>

To get the Simplify3D license with your 3D printer please fill in the Request Simplify3D license on our website. Please use a general e-mail address for your request as this will be used company wide.

<https://tractus3d.com/get simplify3d>

Fill in this form and you will receive an e-mail with profiles and a Simplify3D registration link via email.



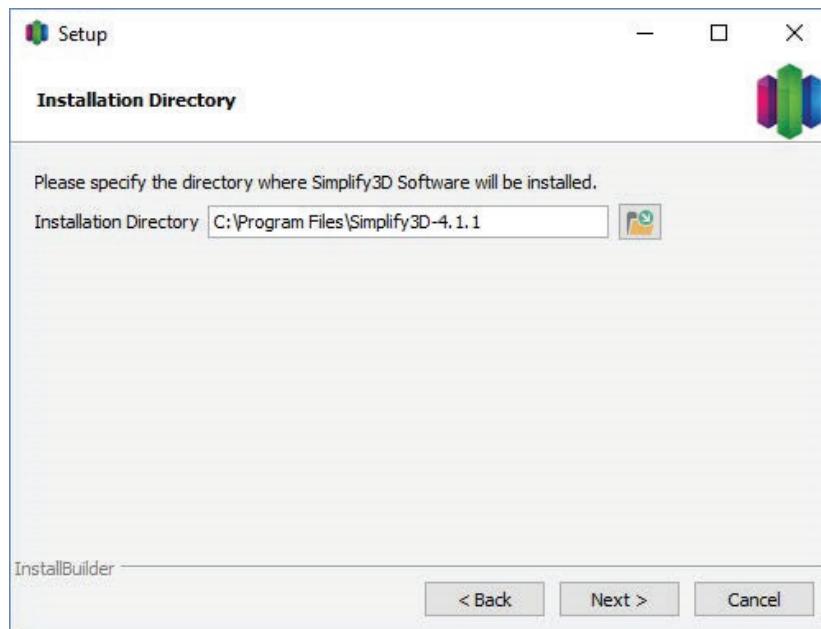
From this point on you are personally responsible for the license via the customer login portal

The screenshot shows a web browser window for the Simplify3D account download page. The URL is https://cloud.simplify3d.com/software/download. The page has a green header bar with the Simplify3D logo and navigation links for HOME, SOFTWARE, BUY NOW, SUPPORT, BLOG, COMMUNITY, and ACCOUNT. The 'ACCOUNT' tab is selected. On the left, there's a sidebar with a user profile picture for 'tractus3d' and links for Dashboard, Account Settings, Download Software (which is highlighted in green), Software Installations, and Logout. The main content area is titled 'Download Options'. It says: 'This page allows you to download the installer for the Simplify3D desktop software. After installing the software, you will be asked for your username and password so that the software can be linked to your Simplify3D account.' Below this is a dropdown for 'Operating System' set to 'Windows 64-bit' and a large green 'Download Software Installer' button. There's also a link to 'View latest release notes'. At the bottom, there's a section for 'Windows Installation Instructions' with bullet points: 'Unzip the .zip file and double-click the .exe file to install.' and 'Note: You may need to right-click and choose "Run as administrator" depending on your security settings.' At the very bottom of the page, there's a copyright notice 'Copyright © 2019 Simplify3D, All rights reserved.' and links for TERMS AND CONDITIONS, PRIVACY POLICY, and CONTACT US.

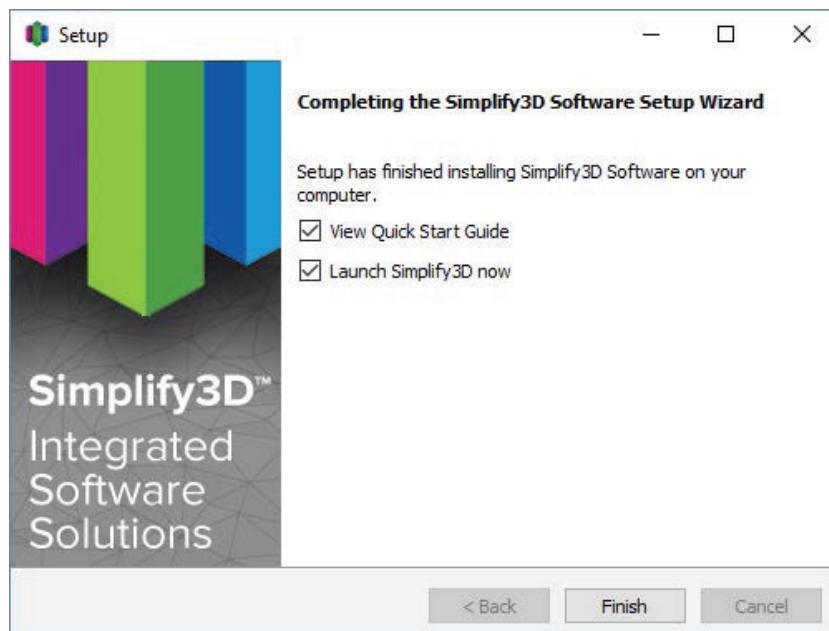
When you log in on the Simplify3D website click on **Download Software** and choose your operating system

Please refer to the Windows Installation Instructions on the website how to open the installer.
Select your installation language and click OK.

Select Next > read the Simplify3D software End User License Agreement and **Accept** the agreement to continue.
Choose **I accept the agreement** and click **Next >**



In the next window enter the installation directory. Click **Next >**



After the installation finishes you can launch the software and login

When you open Simplify3D for the first time, please login with the credentials you have made.

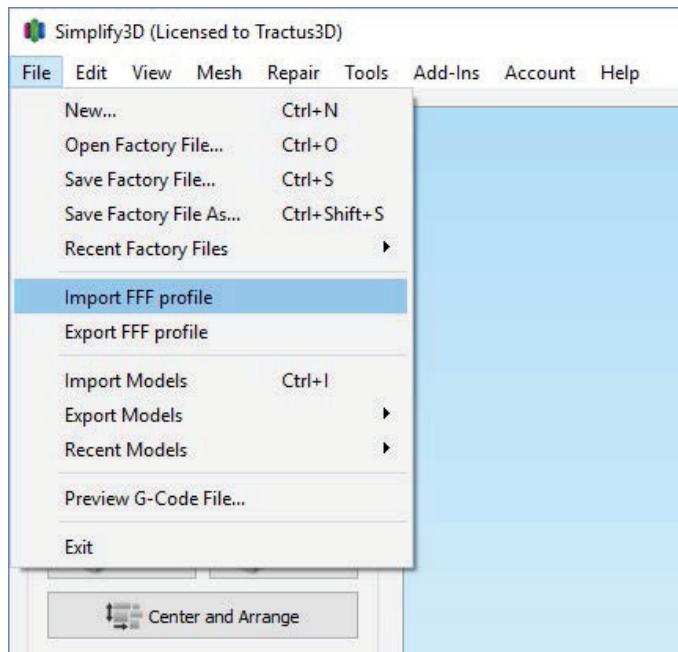
We will not use the installation wizard provided by Simplify3D, so on the printer installation screen click **Cancel**.

Simplify3D will now open in default settings so we can load our own updated profiles.

Importing Tractus3D settings in Simplify3D

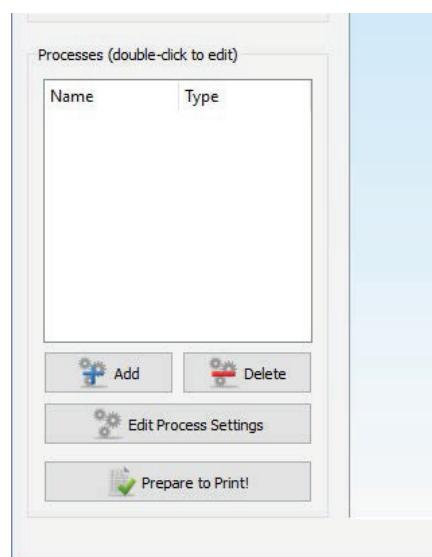
Now it's time to setup your printer in Simplify3D with the latest settings delivered by Tractus3D.

You should have received a email from Tractus3D with a .FFF file. (profile file for Simplify3D).

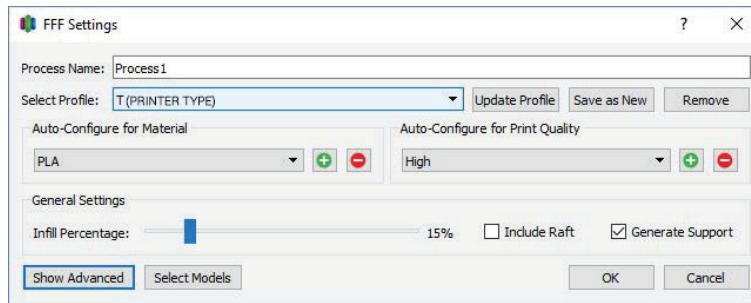


In Simplify3D go to **File > Import FFF profile**

Select the .FFF file you have received from Tractus3D and click **Open**



Now navigate to **Processes** and click the **Add** button



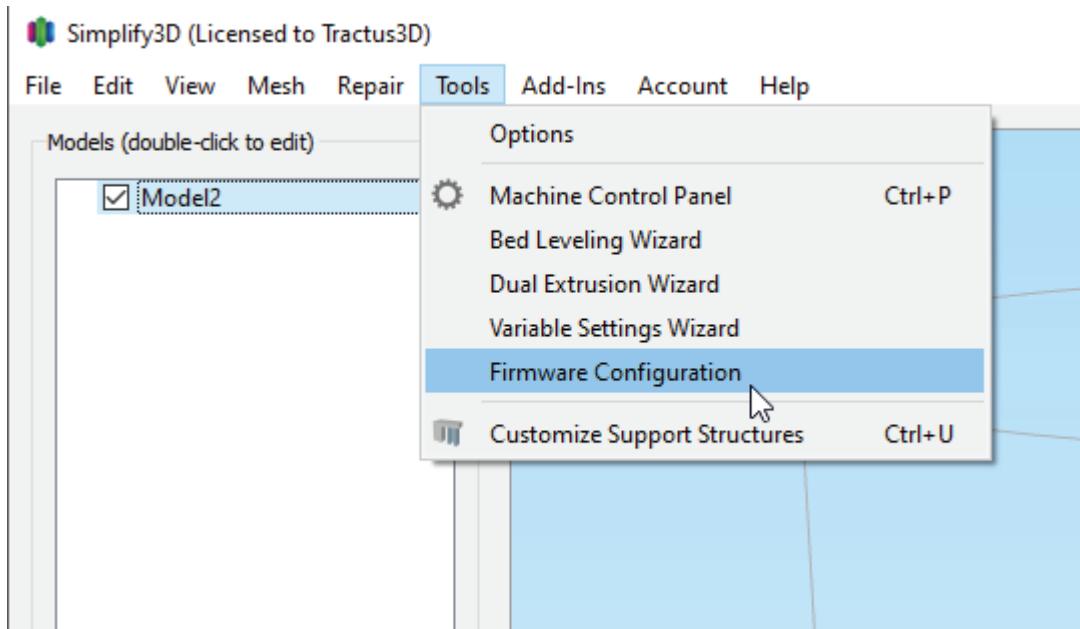
Select the imported settings under **Select Profile**

Give the process profile a recognizable name in the field **Process Name**

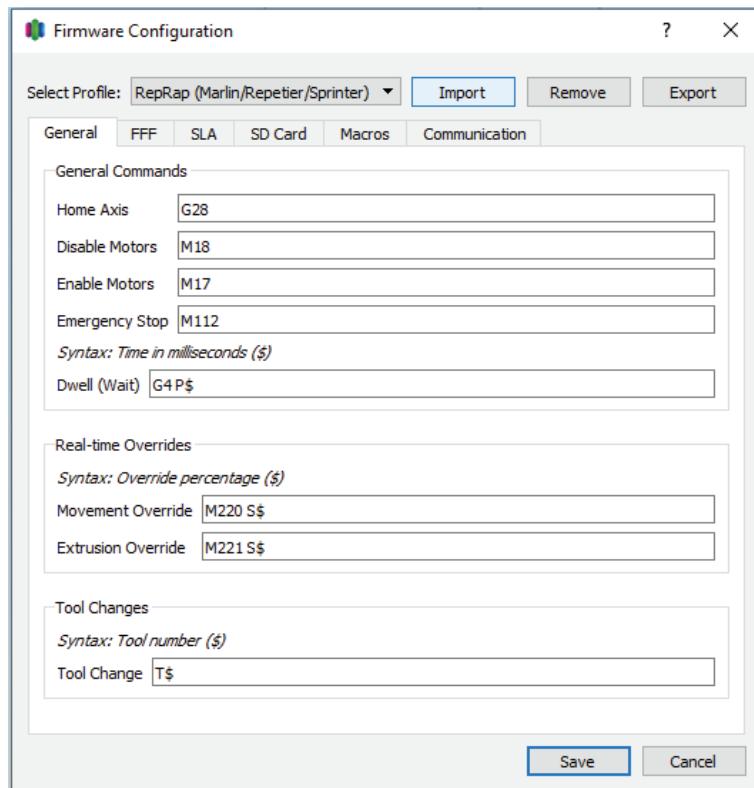
To see more settings of the process, click on **Show Advanced**. Click on **OK** to close this window, your process profile is set up now. However we also need to load a custom firmware file.

Updating firmware settings in Simplify3D

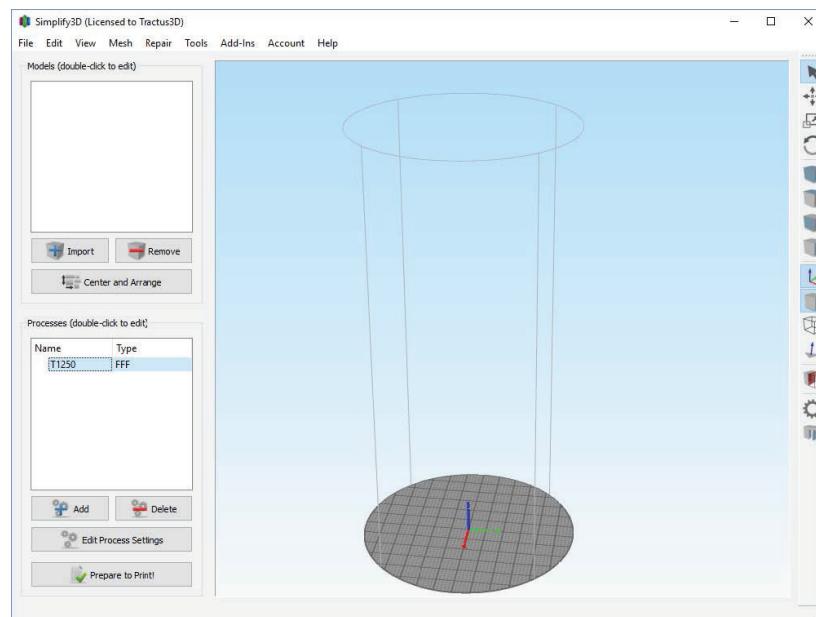
Besides configuring the profiles, the firmware file also has to be imported. The file is send out together with the printer profile. Follow the steps below to update the firmware settings in Simplify3D



In Simplify3D go to **Tools > Firmware configuration**



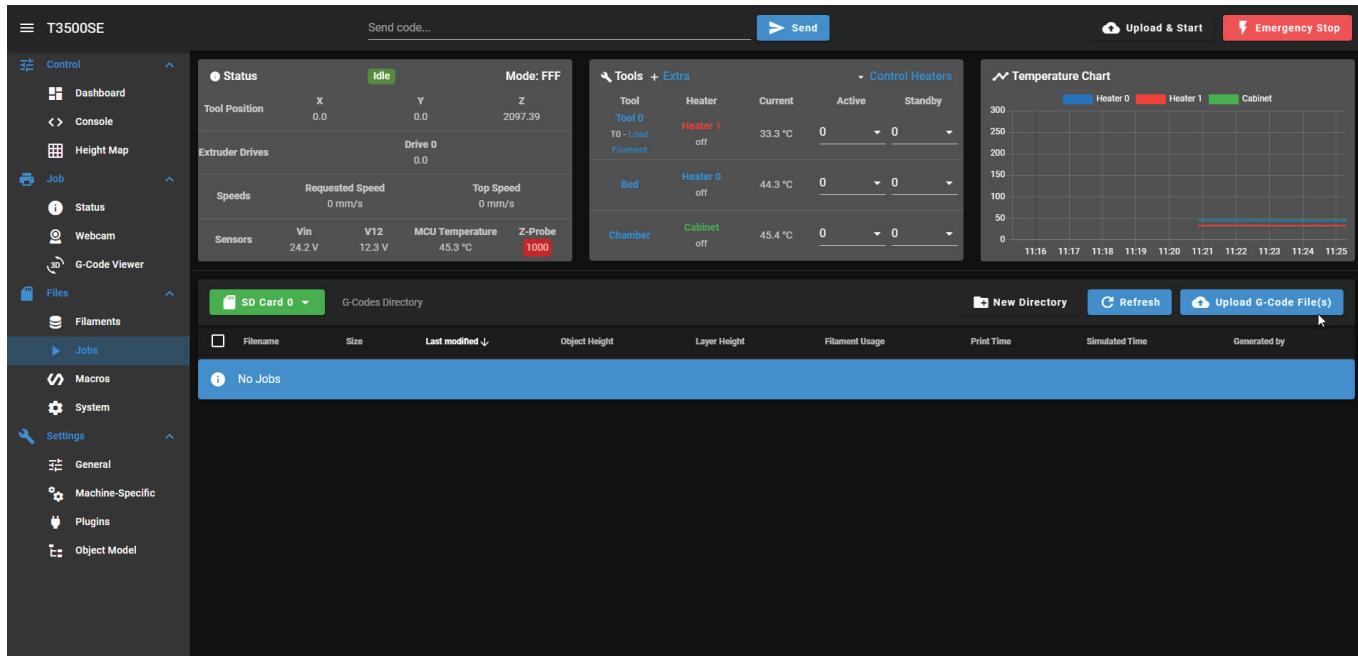
Select **Import** and navigate to the **.FRM file (from email)**



Click on **Import** to import a **STL** or **OBJ** file which you want to print

4.5 Uploading files to 3D printer

When you have created a file with your slicer software and have stored the G-Code file on your computer, it's only a matter of uploading this to the 3D printer to get started.



Go to **Jobs** and click the **Upload G-Code File(s)** button

5. Operation

After installation, it's time to start printing with your new 3D printer. This chapter provides information about the web interface, LCD touchscreen, cleaning the bed, starting a print, removing the print and support material.

5.1 Web interface

With our web interface you can control the 3D printer remotely. In this chapter we will explain the main web interface buttons and actions.

Machine Control

The web interface contains a lot of technical information which updates you about your printer and status.

Status		Idle		Mode: FFF	
Tool Position	X 0.0	Y 0.0	Z 2097.39		
Extruder Drives		Drive 0 0.0			
Speeds	Requested Speed 0 mm/s		Top Speed 0 mm/s		
Sensors	Vin 24.1 V	V12 12.3 V	MCU Temperature 45.1 °C	Z-Probe 1000	

Is this part of the interface you can review basic information about the position of the printhead, speeds, input voltage and mainboard temperature.

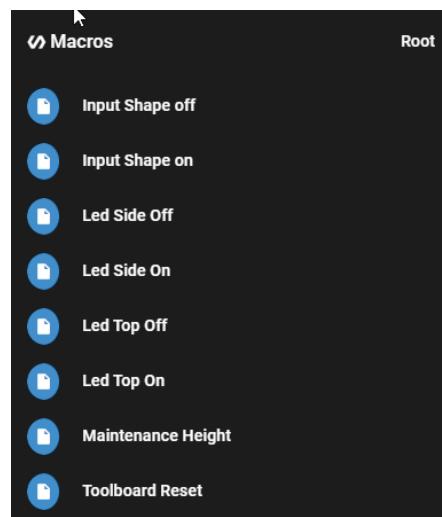
Tools + Extra					Control Heaters	
Tool	Heater	Current	Active	Standby		
Tool 0 T0 - Load Filament	Heater 1 off	32.5 °C	0	0		
Bed	Heater 0 off	40.5 °C	0	0		
Chamber	Cabinet off	45.1 °C	0	0		

Here you can see the actual temperature of your bed, chamber and nozzle (Tool 0). You can also set a new active temperature. When you set a Tool temperature the tool is not switched on default, you will have to click the **Heater 1** to toggle the heaters status from off to on or standby..

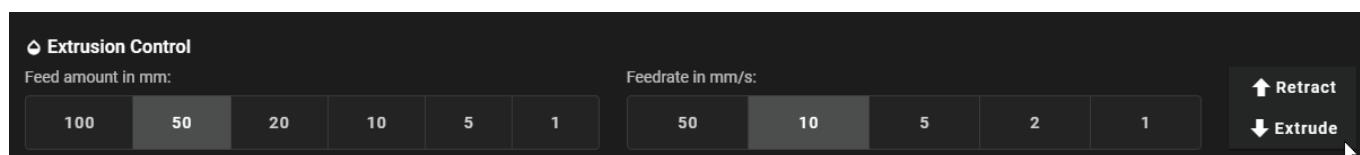


Control your printhead when the printer is idle with these buttons. **Home All** will bring the printer to its starting position. **Compensation & Calibration** is used for calibration of the machine (see chapter 4.3)

 Please make sure you don't use these buttons while the printer is printing an object!



Here you can find pre-defined shortcuts or make your own shortcuts (macro's). A macro is a sequence of g-code commands which you are using more often. **Maintenance Height** will move the print head to a position where you can easily remove or load it.



When you want to extrude manually use these buttons. The buttons **Retract** and **Extrude** will only be available when the nozzle (Tool 0) is at temperature (at least 170 degrees Celsius) For quick purging use a feed rate of 10mm/sec, however you can retract at maximum speed.

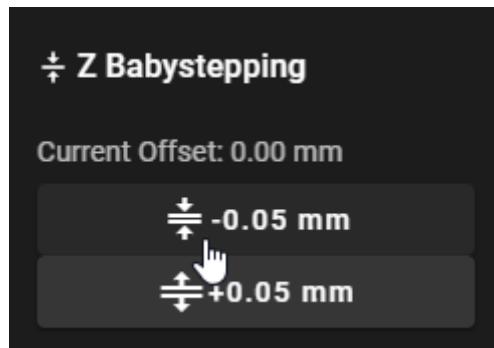
Print Status

The screenshot shows the 'Status' tab of the T3500SE printer's control software. The main area displays the current status of the printer, including tool position (X: 0.0, Y: 0.0, Z: 2097.39), extruder drives (Drive 0: 0.0), speeds (Requested Speed: 0 mm/s, Top Speed: 0 mm/s), and sensors (V12: 24.2 V, V12: 12.3 V, MCU Temperature: 34.3 °C, Z-Probe: 1000). The 'Tools + Extra' section shows heater controls for Tool 0, Bed, and Chamber. A 'Temperature Chart' shows the temperature of Heater 0, Heater 1, and Cabinet over time. The 'Job Control' section has a 'Pause Print' button. The 'Layer Chart' shows the current print layer at 0.00 mm. The 'Job Information' section shows height, layer height, filament usage, and file progress. The 'Extrusion Factors' section includes speed factor, fans, and extruder settings.

This part of the interface will be only working when a print is running.

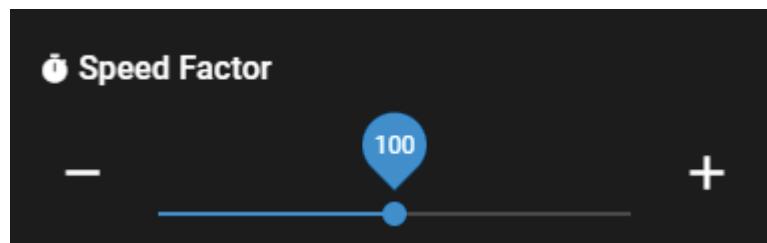


When the print is running and you want to pause the print job click on **Pause Print**. When you want to cancel the print first Pause the job and press **Cancel Print** to stop the job. Press **Resume Print** if you want to continue the print.



When printing the first layer your print head/nozzle could be set too high or too low. With **Baby Stepping** you can correct this for a better result, because your first layer is very important. To correct a slight offset you can use the baby stepping to get the print head closer to the bed (**-0.05mm**) or get the print head further away from the bed (**+0.05mm**).

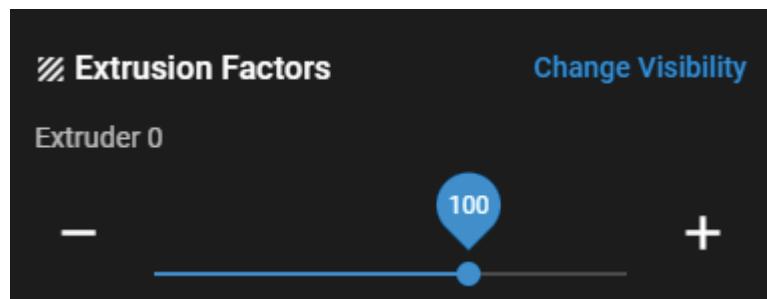
In the fields shown below you can override the settings of your print file.



Control the printing speed



Control your Tool Fan (Material Fan) to spinslower or faster
(compared to settings in the slicing software)



Control the extrusion multiplier of the printer
(the amount of plastic being pushed)

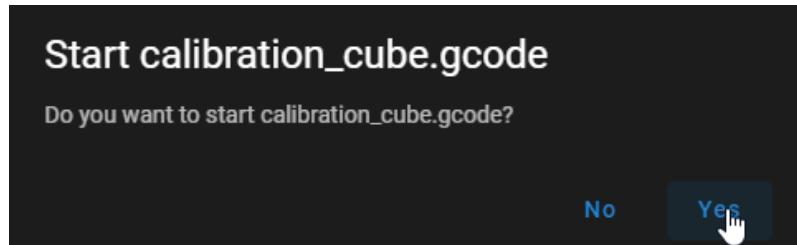
G-Code Files

SD Card 0		G-Codes Directory		New Directory		Refresh		Upload G-Code File(s)	
	Filename	Size	Last modified ↓	Object Height	Layer Height	Filament Usage	Print Time	Simulated Time	Generated by
<input type="checkbox"/>	Assembly		22-6-2022 13:21:16						
<input type="checkbox"/>	calibration_cube.gcode	1.0 KiB	22-6-2022 12:04:02	n/a	n/a	n/a	n/a	n/a	n/a

Here you can upload your files or start a print. It's also possible to create folders to get your files organised.

Start a print

Click on a filename in the G-Code Files list to start printing this file.



If you press **Yes**, the 3D printer will start this file. Usually (depending of the start up settings part of your slicing software) the 3D printer will start heating up the bed first.

Extra file options

Use a right mouse click on the file to give you more options. With these buttons you can **rename**, **delete** or **download** the file to the computer. We don't advise to use the Edit function if you have an editor like notepad++ on your computer, as this function is slow method compared to the external editor.

SD Card 0		G-Codes Directory		New Directory		Refresh		Upload G-Code File(s)	
	Filename	Size	Last modified ↓	Object Height	Layer Height	Filament Usage	Print Time	Simulated Time	Generated by
<input type="checkbox"/>	Assembly		22-6-2022 13:21:16						
<input checked="" type="checkbox"/>	Axiscompensations TAC001.gcode	510.8 KB	22-6-2022 13:27:18	6.00 mm	0.20 mm	10078.5 mm	49m 0s	n/a	Simplify3D(R) Version 4.1.2

The **Simulate File** option will start a print (simulated) directly without visible motion on the 3D printer.

With this option you can calculate a really accurate time of printing and usage of the material. When the simulation is finished be prompted with a message on the web interface.

6. Materials

The Tractus3D 3D printers all provide open material support. This means you can use any material with 1.75mm diameter on the machine with as long as the melting point is below 300c. However Tractus3D does not guarantee a successful print with "untested materials"

6.1 Material compatibility

We know there are a lot of brands and material types available on the market. We do love experimenting with new materials, but only if you know the risks and if you're not worried about a failed print in order to learn.

If you have troubles with the machine, we will always advise to go back to Tractus3D supported PLA with a clean (prefer new) nozzle.

Tractus3D supports the following materials:

- PLA
- PETG
- ASA
- ABS
- Facilan C8
- PR01

Known "experimental" materials can be used (not supported):

- TPU (all shore values)
- PC (PolyCarbonate)
- POM
- PA (Nylon)
- PP
- CF-PET
- Carbon, Wood, Brass, Bronze, Copper Fillers
- HIPS

If you are using Glow in the Dark or Filler materials (like Carbon, Wood, Brass, etc.) please make sure to use a special nozzle (hardened, ruby or stainless steel) which you can order at Tractus3D. You will have to investigate which bed temperature works the best for the chosen material. We can't supply a complete list of all materials available. In this manual you will find a list with our supported materials and print recommendations as a starting guide. You're advised to fine tune those settings to your needs.

6.2 Print recommendations

Each material requires different settings for optimal results. If you use Simplify3D with our profile, the settings provide a nice start for fine tuning. For all materials that are supported, you have to use a clean glass plate with adhesion products like 3DLac or glue sticks. The overview below shows the recommended settings per supported material.

PLA

- Bed temperature at 55 degrees Celsius
- Nozzle temperature 200 degrees Celsius
- Print speed 60mm/s
- Full cooling with material fan after first layers are printed

PETG

- Bed temperature at 70 degrees Celsius
- Nozzle temperature 230 degrees Celsius
- Print speed 80mm/s
- Full cooling with material fan after first layers are printed

ASA

- Bed temperature at 80 degrees Celsius
- Nozzle temperature 250 degrees Celsius
- Print speed 80mm/s
- 0% cooling if possible, max 50% cooling with material fan after first layers are printed

ABS

- Bed temperature at 80 degrees Celsius
- Nozzle temperature 250 degrees Celsius
- Print speed 80mm/s
- 0% cooling if possible, max 50% cooling with material fan after first layers are printed

Facilan C8

- Bed temperature at 40 degrees Celsius
- Nozzle temperature 200 degrees Celsius
- Print speed 60mm/s
- Full cooling with material fan after first layers are printed

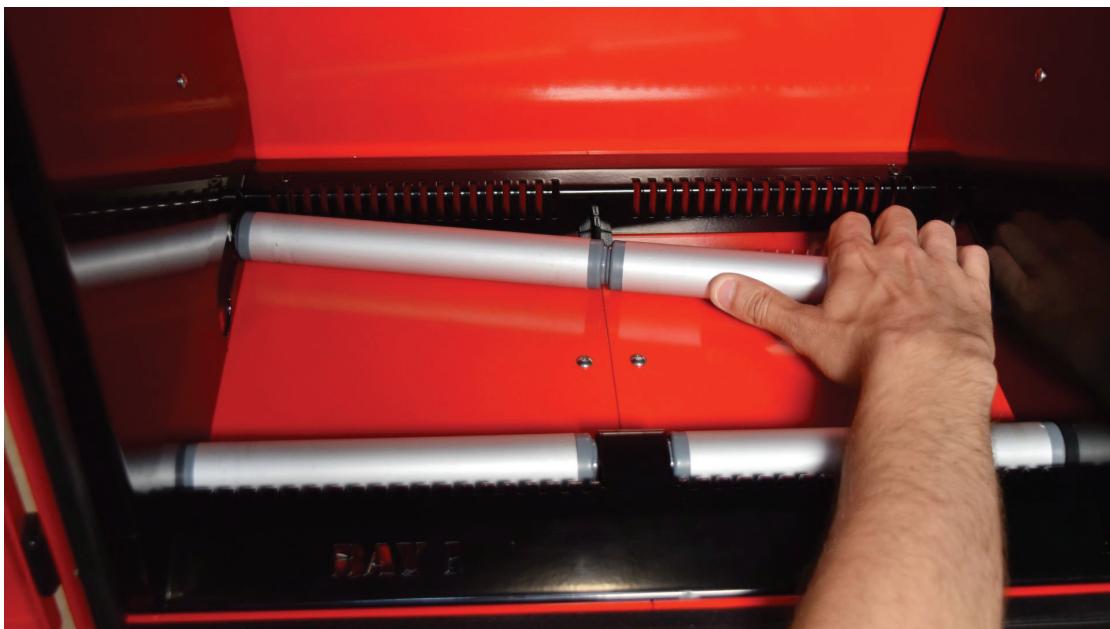
PRO1

- Bed temperature at 60 degrees Celsius
- Nozzle temperature 225 degrees Celsius
- Print speed 120mm/s
- Full cooling with material fan after first layers are printed

7. Operating the 3D printer

7.1 Load material

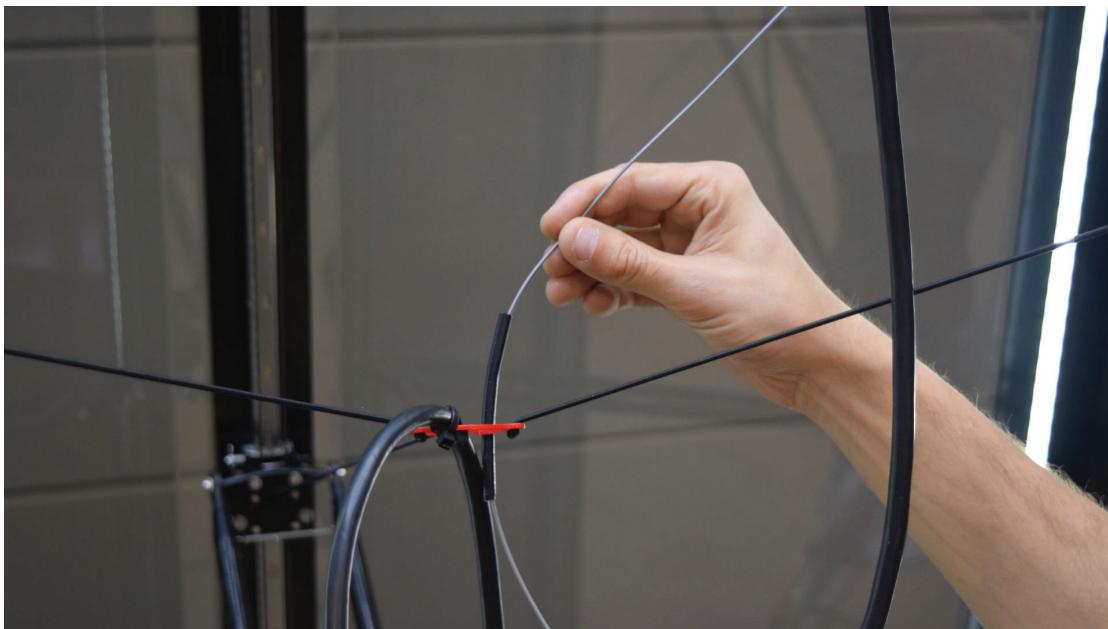
You need to load the material into the 3Dprinter, before you can start printing. It is recommended to use the spool of PLA that comes with your 3Dprinter. Take the filament out of the box and airtight packaging, but please do not let go of the filament wire, it can get tangled.



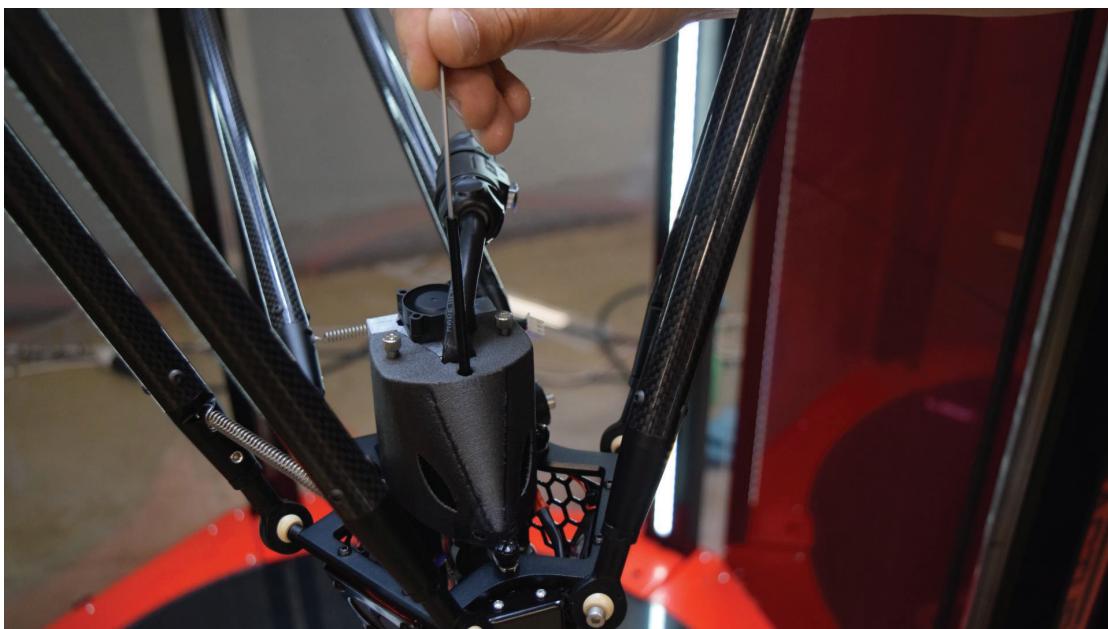
Open the filament cabinet and make sure the roller is in the correct position for your spool



Insert the filament in the tube (side where the spool is) and feed it upwards



Pull the filament wire through the tube in the middle of the machine



Insert the filament into the tube on top of the print head

Select the appropriate macro for your material from the folder **Filament (un)load** in the macro's section. The print head will start heating, once it reaches temperature it will purge the filament. You can also set the temperature manually, and load the filament with the extrusion controls.

**⚠ You can only load the filament if the nozzle is on temperature above 170 degrees
This to prevent any cold extrusion damage**

7.2 Unload material

Unloading material is very easy. In the macro's section please open the folder **Filament (un)load** then click the macro **Unload Filament**. The print head will start heating, once it reaches temperature it will unload the filament. You can then pull the wire out of the print head.

7.3 Removing the filament with a blob

It is possible for the filament to get stuck in the print head during printing, this creates a blob on the end of the filament wire making it very difficult or impossible to unload the filament using the normal method. For this problem we have made a custom macro that temporarily disables the hot-end fan.

Please select the macro **Hotend Fan Off** This will heat up the entire print head so all the material inside will become soft. You should then be able to run the unload macro without any issues.

7.4 Preparing the print bed

We recommend you clean the plate with a spatula if printing remains are present. After that, clean the plate with some water and a towel. In case of some remaining grease, use some Isopropanol. Make sure the bed is completely cleaned and don't touch the plate after cleaning.



We recommend using a glue spray like 3DLac. For filaments that are more difficult to print you can look into a dedicated product for the type of filament you are using. Make sure you not to use too much of the adhesion product as this will make the adhesion to the bed worse. However if you are printing PETG, ASA or ABS please use a lot of spray glue. This acts as a interference layer between the part and the glass plate. This reduces the chances of the glass plate breaking under stress.

7.5 Removing a print from the bed

Once your 3D print is finished it must be removed from the build plate.

**⚠ Always let the print bed cool down to room temperature before removing the print.
Otherwise you may damage the bed!**

There are several methods to remove the printed object from the bed on room temperature.

- After cooldown is completed, just remove the loosened prints from the bed
- Use a spatula under the edge of a print, always keep the spatula as flat as possible (parallel with the bed) to avoid scratches or damage to the bed. Apply a little amount of force to remove the print of the bed.
- In some cases you can also use a spray bottle (water only) to spray some water around the edges of the print. This works exceptionally well if the water can get under the print.



⚠ When you print a product with a brim, be aware of the danger of cutting yourself while removing the print from the build plate. A brim can be very sharp!

7.6 Remove support material or brim

Prints which are using (breakaway) support will require post-processing to remove the support structures. You can manually break the support structures from the model you printed. Sometimes it will require a tool like pliers or tweezers to break away the support material.



It is advised to wear protective gloves when the support structure contains sharp corners or half broken parts.

After removing most of the support structure, the remaining part(s) of the support structure can be pulled from the model with cutting pliers. Carefully get underneath them and then bend it upwards.

Sometimes a final layer of the support material remains after pulling the support from the model. Try pulling this off with pliers or with tweezers for smaller parts.

8. Maintenance

8.1 Maintenance schedule

To keep your 3D printer in optimal condition we recommend the following maintenance schedule assuming you print 1.500 hours a year.

Every print again

- Check if the print head fan is running after heating up
- Clean the print head and nozzle

Every month

- Clean the 3D printer
- Check all arms
- Check the sliding rails

Every 3 months

- Check tension and wear of belts
- Clean the feeder/extruder motor
- Clean the Bowden tube

Every 12 months

- Replace the main Bowden tube
- Replace the feeder/extruder gear
- Grease the sliding rails

If the usage frequency is higher, we recommend performing more frequent maintenance on your printer to ensure optimal printing results.

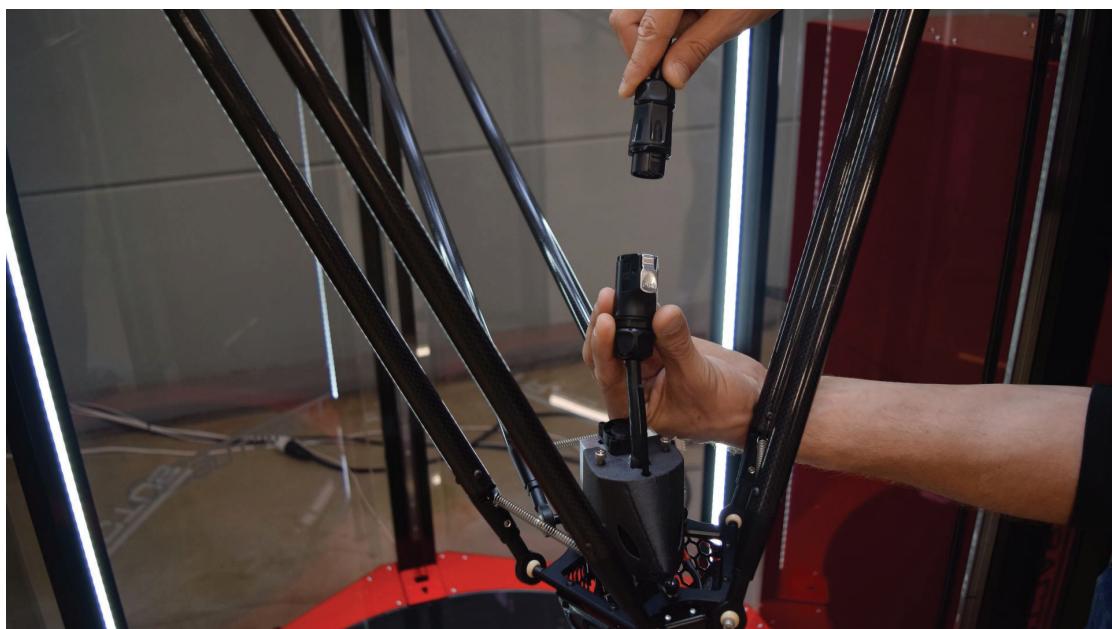
8.2 Change the print head

The print head can be changed rapidly on a SE series Large Volume 3D printer.

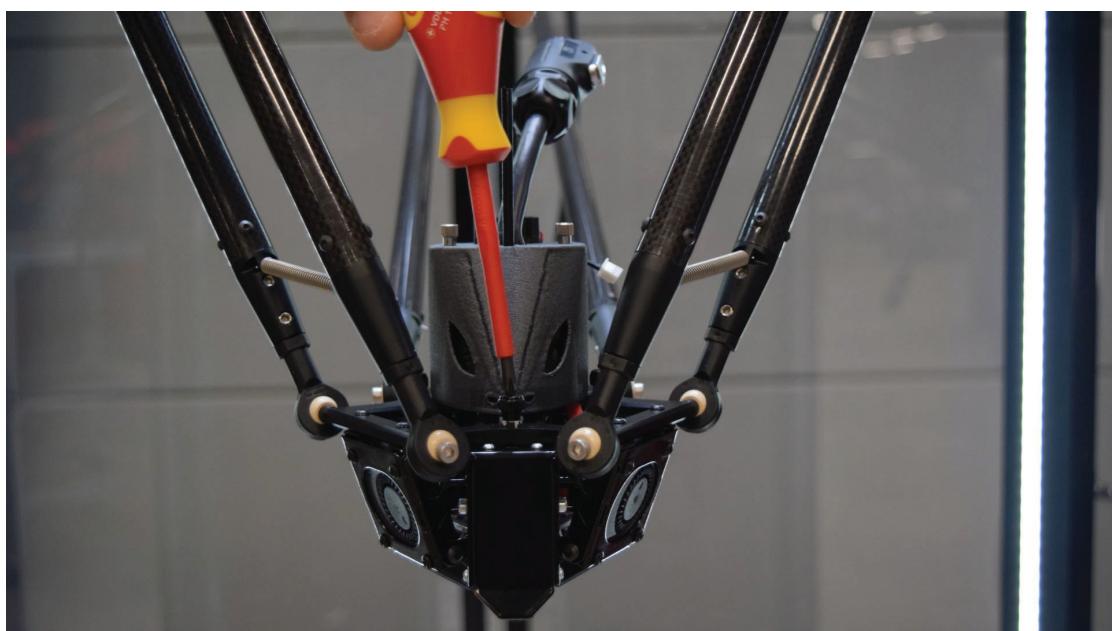
Unload the filament

Make sure you unload the filament if possible. (See chapter of unloading filament for help) If you are unable to unload the filament you can refer to manual chapter **7.3**

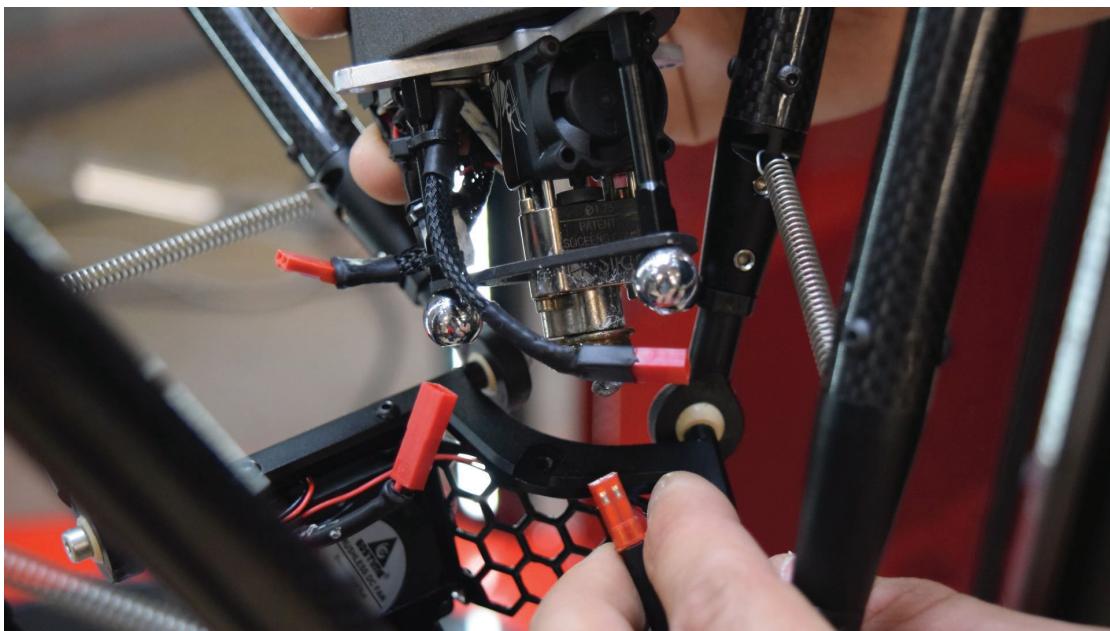
Disconnect the maincable



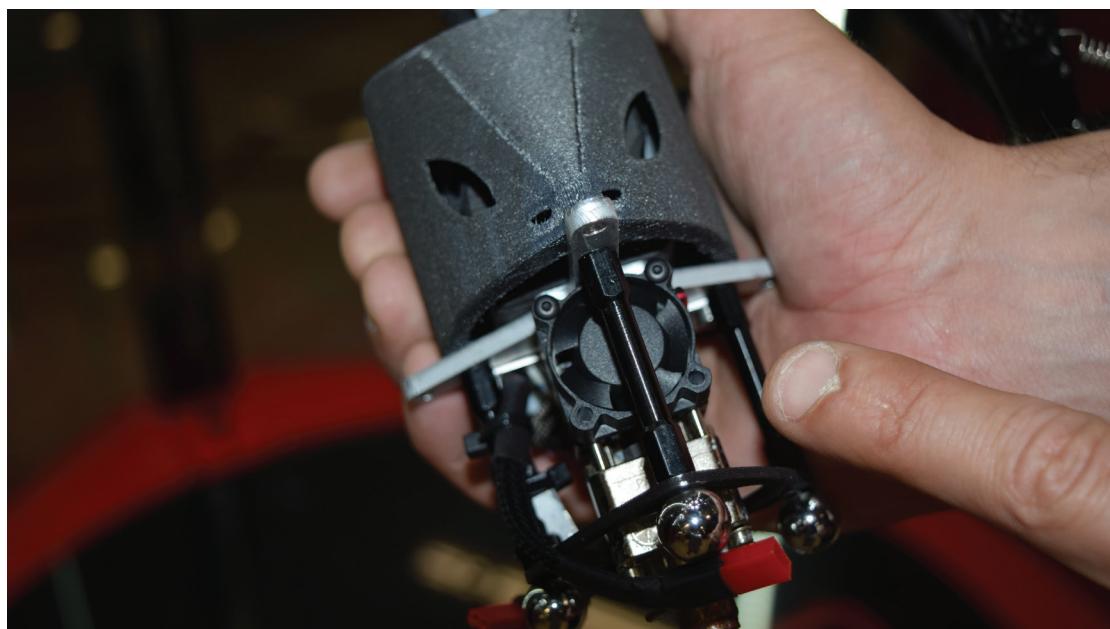
Unscrew the print head (3 screws)



Disconnect the red fan and camera cable



Remove the print head



8.3 Change the bed plate

When you change the glass bed plate please make sure you calibrate the machine after installing the new plate.



Unscrew the motor cover screws



Pinch the belt and move through cut-out

You can now remove the glass plate from the printer. The black plate with logo (heatspreaders) should remain in place. When placing a new plate, do not overtighten the screws. Turn them until you feel some resistance, then make one full turn to properly tighten.

8.4 Material usage and storage

When you have multiple opened spools of filament, you must store them properly. It may affect its quality and usability, if the filament is not correctly stored.

To preserve the optimal conditions for your filament it is important that you store them:

- Cool (below 30 degrees Celsius) and dry (Humidity below 50%)
- Out of direct sunlight
- In a resealable bag or box

If the filament is exposed to a higher humidity the quality of the filament can be affected.

You can store the material in a resealable bag or box, including some silica gel.

8.5 Clean the 3D printer

For the best print results, it is important to keep the 3D printer clean while using it. It is advised to not use the printer in a room where it can easily be covered with dust. Also remove small pieces of material that might be left inside the printer.

Clean the bed plate

To clean the bed plate please see **Chapter 7.4 Preparing your print bed**

Clean the casing

The transparent part of the casing is made of polycarbonate. The leading cause of unnecessary damage to polycarbonate is the use of improper cleaners or improper cleaning techniques. This is completely avoidable with just a little bit of knowledge.

The first thing you need to know is to never use any kind of cleaners containing ammonia. This is a guaranteed way to cause damage to your polycarbonate and tarnish the look of it. Popular household cleaners such as Windex or 409 will cause damage to polycarbonate sheets and should never be used as a substitute for a proper cleaner. It is also imperative that you never use a dry cloth, or your hand to wipe a piece of polycarbonate. Using a dry cloth to clean your polycarbonate will rub the dirt and dust into your polycarbonate sheet, scratching or causing damage to it. This is the same reason why car washes use damp towels instead of dry ones for drying cars, to avoid unnecessary scratches.

For proper cleaning and care of your polycarbonate sheets, we recommend a soft cloth. The first step to cleaning your polycarbonate is to remove all the dust and dirt from it. In order to do this, you can either blow the debris off the polycarbonate or use water and a soft cloth to float the debris off. After you have removed the dust from your polycarbonate you should clean it with a mild solution of warm water and dish detergent.

Make sure you clean the inside and outside of the casing including transparent parts regularly.

8.6 Clean the print head and nozzle

During printing some materials can get stuck to the outside of the nozzle and will degrade. This won't damage your printer, but it can generate fumes and can drip off on your print. It is recommended to keep the nozzle clean in order to achieve the best print results.

Before starting a new print, always check the nozzles. At least once a month, remove the plastic from the outside of the nozzles by taking the following steps:

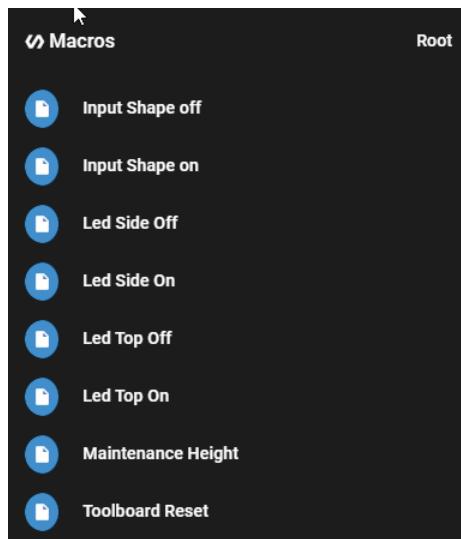
 During this procedure do not touch the nozzles and be careful while cleaning them as they will become hot.

1. Heat up the print head to 175 degrees Celsius
2. Lower the print head by moving the printer to the maintenance location
Press Macro > Maintenance
3. Wait for the print head to reach this temperature
4. Take a heat resistant towel/cloth and wipe the nozzle block quickly on all 4 sides (don't do this too slowly as your towel/cloth maybe get too hot)
5. Cool down the print head again
6. If there is still a lot of debris on the print head, please contact our support desk

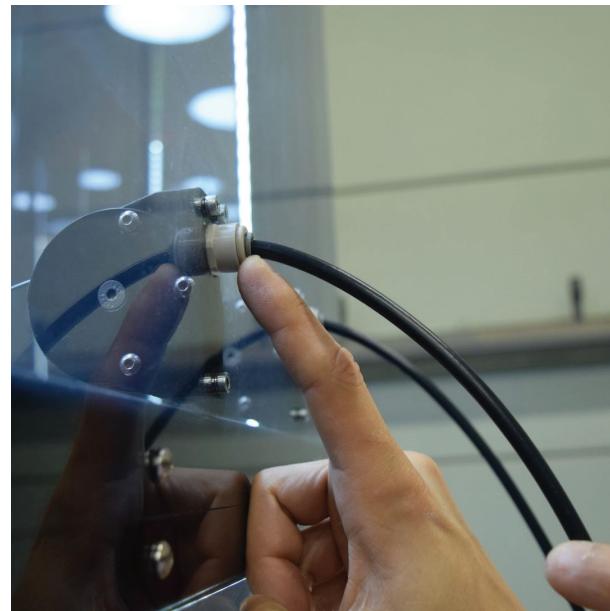
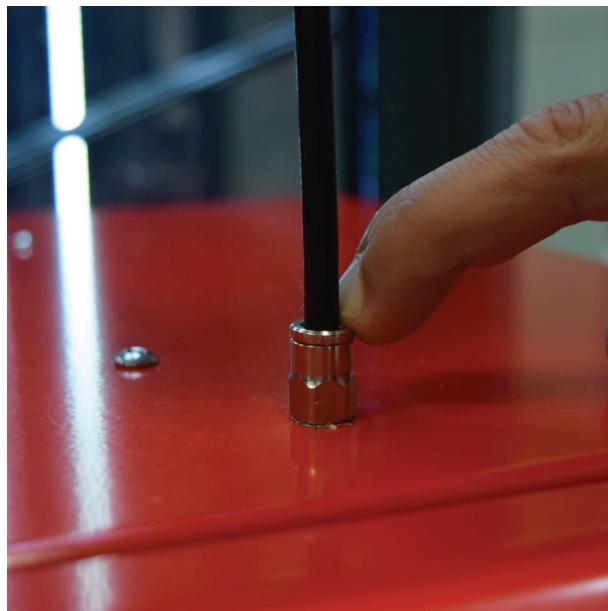
8.7 Clean the Bowden tube

Particles in the Bowden tubes can impede smooth movement of the filament. Clean the Bowden tubes at least once a month, or after experiencing an issue with filament grinding. To clean the Bowden tubes, they must first be removed from the printer.

Unload the filament first (see chapter 7.2 Unload Filament for help)



Press Macro > Maintenance height



Remove the tubes by pressing down on the collet clips of the coupler
(please note upper side of tubes)

Cut off a small piece of sponge or ball up a piece of tissue. Insert this into the feeder end of the Bowden tube and push it all the way through the tube with a length of the filament.

Place the tube back in the printer, please note the correct sides of the tube on the correct spots in the printer/print head. (slightly chamfered outside is the print head side of the tube)

8.8 Greasing the sliding rails

Every year the linear rails on your 3D printer can use some new grease. Please contact Tractus3D to order a maintenance kit for this purpose. The kit will contain several items like bowden tubes, belts and a grease gun.

In order to grease the rails the grease gun has to be positioned over the nipples on the slide carriages. Proper instructions will be included in the kit.

8.9 Check tension and wear of belts

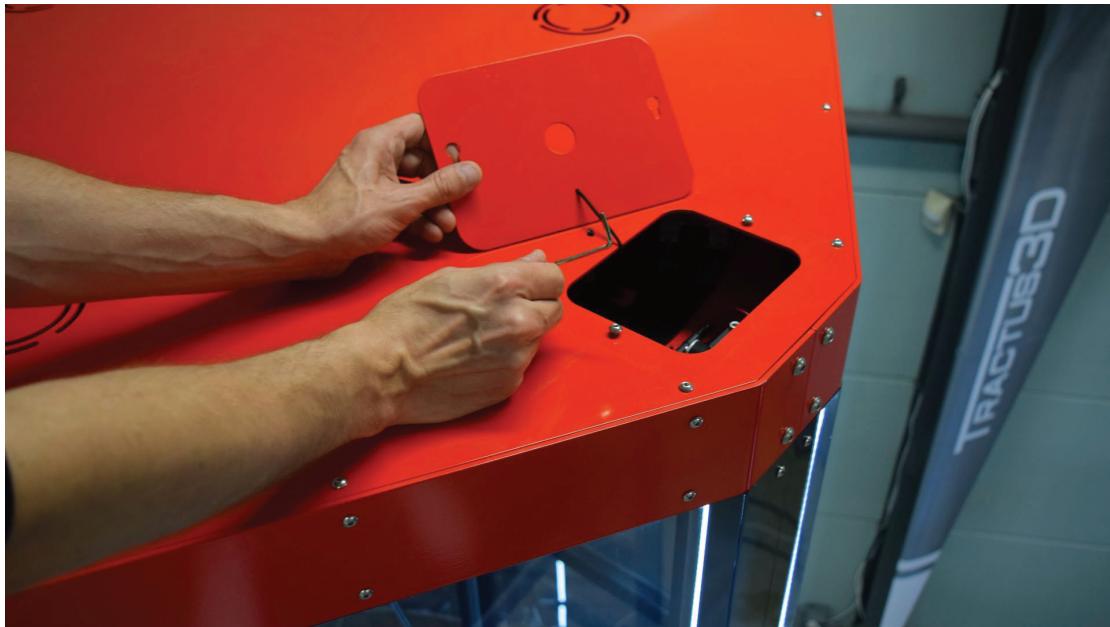
Maintaining correct tension on the belts is important to ensure good print quality. The belts transfer the movements of the motors to the slides. If the belts are too loose, print head movement may not be accurate, which can cause print inaccuracies. Over time, the belts may get stretched. It is recommended to check the tension of the belts at least once every three months. Pluck the three belts to check their tension. They should resonate, like a guitar string. Furthermore, the tension of the three belts should be equal. To restore the tension, perform the following steps:

1. Home the printer (make sure the slides are all the way up)
2. Move the printhead down so the slide carriages are about half way down the printer, use this command:

G1 Z1000 F6000

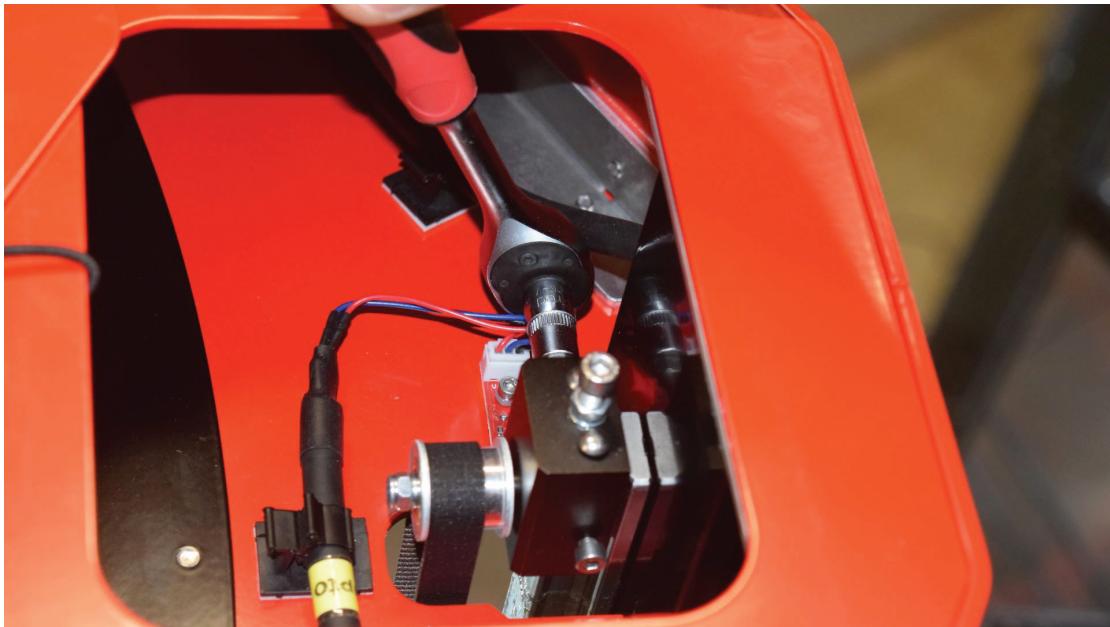


3.



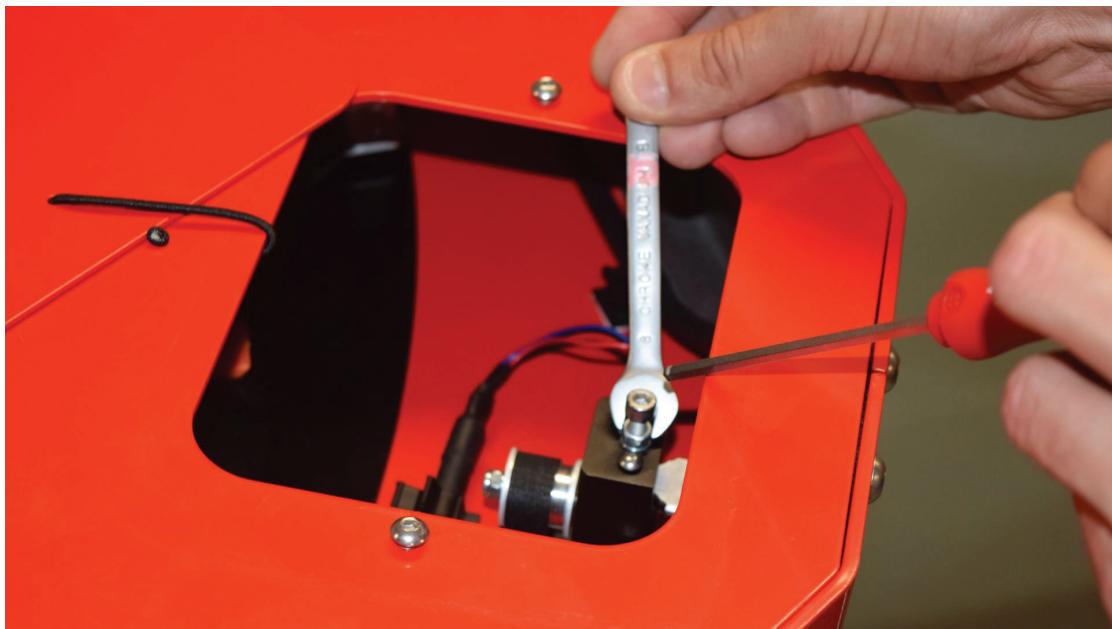
Remove the top covers of the printer

4.



Loosen the set screws on the belt tensioner

5.

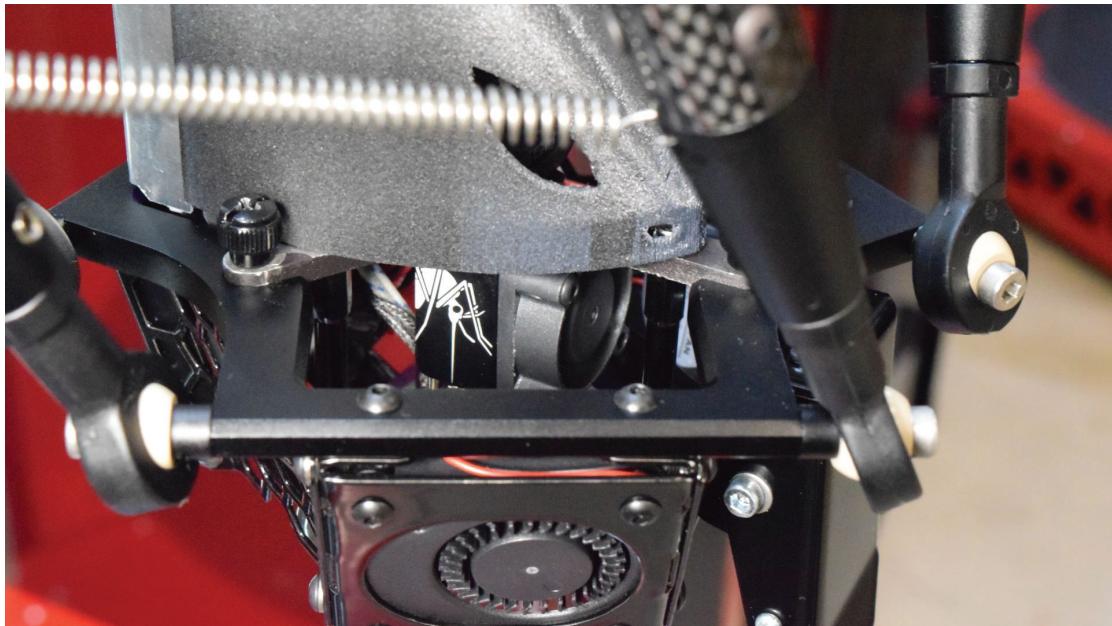


Tighten or loosen the main screws to adjust tension

6. Repeat this for all three belts
7. Make sure all belts are set at the same tension

8.10 Check if print head fan is running after heating up

The small fan on the print head cools the print head during a print. This helps to prevent the heat from the nozzle traveling too far upwards. The fan takes in air from the front of the print head and directs it towards the metal cooling ribs of the print head. Sometimes the airflow causes thin strands of filament to be sucked into the fan during a print. If strands accumulate in the fan, they can decrease the effective cooling and eventually obstruct the fan and prevent it from spinning.



If you heat up the print head above 50 degrees Celsius the fan should start spinning. If it's not spinning, please don't heat up the print head anymore and let it cool down. See if there are any obstructions in the fan. If there are any, remove them with some tweezers.

If the fan is still not spinning and there is no obstruction found, the fan should be replaced. Contact our support desk for more information.

9. Troubleshooting

A few printer-specific issues may occur when using your 3D printer. You can troubleshoot those yourself using the following information.

9.1 Removing the filament with a blob

It is possible for the filament to get stuck in the print head during printing, this creates a blob on the end of the filament wire making it very difficult or impossible to unload the filament using the normal method. For this problem we have made a custom macro that temporarily disables the hot-end fan.

Please select the macro **Hotend Fan Off** This will heat up the entire print head so all the material inside will become soft. You should then be able to run the unload macro without any issues.

9.2 Print quality issues

Poor bed plate adhesion

If the adhesion of a print to the build plate is troublesome , the following actions can be taken:

- Ensure that the correct material settings and adhesion method were used
- Recalibrate the machine
- Make sure the bed is cleaned correctly
- Use adhesion products, like sprays or glue stick, if necessary for the filament.

Under-extrusion

Under-extrusion occurs when the printer is not able to feed enough filament. You can recognize under extruding when you see very thin layers , missing layers, or layers that have random holes and dots in them.

There are several reasons that may cause under-extrusion:

- Low quality filament (inconsistency of the diameter) or using wrong settings
- Incorrect set up of the feeder tension
- Friction in the Bowden tube
- Small filament particles in the feeder or Bowden tube
- A partial obstruction in the print core

If under-extrusion is affecting your 3D printer and mentioned causes do not apply, please contact the support desk.

Warping

When filament shrinkage occurs while printing, the corners of the print will lift and the print can detach from the bed plate. This is called warping. When printing plastics, the plastic first expands a little, but it shrinks during cool down. If the filament shrinks too much, it causes the print to bend upwards from the build plate.

When warping occurs, please make sure you have done the following:

- Ensure that the correct material settings and adhesion method were used
- Recalibrate the machine
- In case of a glass build plate, apply a layer of glue or spray
- Modify the shape of your model
- Use a brim
- Choose another material that is less sensitive to warping

For detailed support, please contact us: <https://tractus3d.com/knowledge/>

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