

Manual Premium Builder

Version 1.2

“We all become builders”



Builder Premium Specifications



Printing

Print technology	FDM / FFF Fused Deposition Method
Buildvolume (LxWxH):	Small: 205x215x200 mm (8.07x8.46x7.87 inch) Medium: 205x215x400 mm (8.07x8.46x15.74 inch) Large: 205x215x600 mm (8.07x8.46x23.62 inch)
Resolution:	Low quality: 0.3 - 0.2mm Normal quality: 0.2 - 0.1 mm High quality: 0.1 - 0.05 mm
Printspeed:	Dual: 10 - 80 mm/s
Travelspeed:	Dual: 10 - 120 mm/s
Position accuracy	X: 10 micron Y: 12.5 micron Z: 2.5 micron
Nozzle diameter:	0.4 mm
Filament	1.75 mm PLA/ Flex / Wood-Bronzfill
Operating temp. nozzle	Dual: 180 - 250° C

Electronics

AC input:	2x 100 - 240V 3A 50/60Hz (6A 50/60Hz)
Power:	2x 120 W (240W)
Connections:	USB, Wifi, Display Standalone

Printer

Weight:	Small: 18 KG Medium: 22 KG Large: 24 KG
Dimensions printer (LxWxH):	Small: 380x370x495 mm (14.96x14.57x19.49 inch) Medium: 380x370x710 mm (14.96x14.57x27.95 inch) Large: 380x370x890 mm (14.96x14.57x35.04 inch)
Color frame:	Red /White
Print platform:	Heated bed glass plate
Certificate:	CE certificate

Temperature

Operating - temp. printer:	15 - 32° C
Storage - temp. printer:	0 - 35° C

Software

Software	Repetier, Cura, Simplify3D
Operating systems	Windows, MAC
File types	STL / OBJ / AMF / DAE

⚠ CAUTION

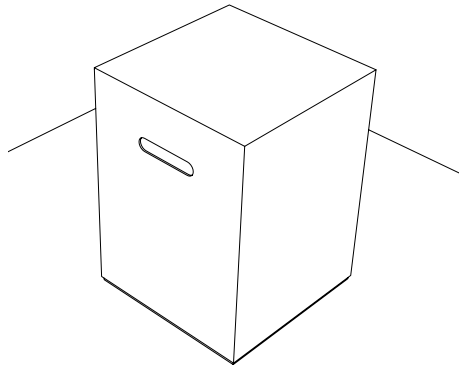
The Builder warranty is only valid when Builder approved material is used.

Builder Premium Content

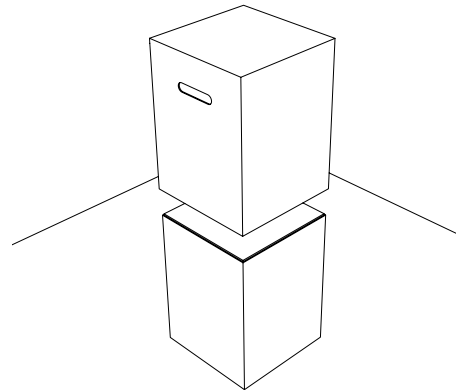


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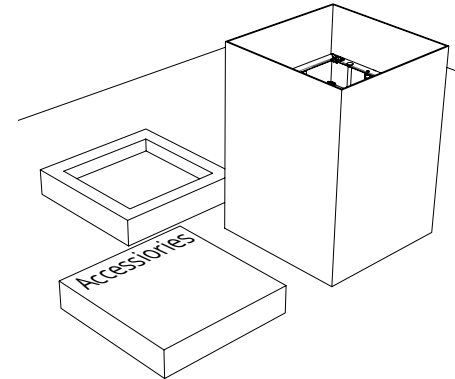
Builder Premium Unboxing



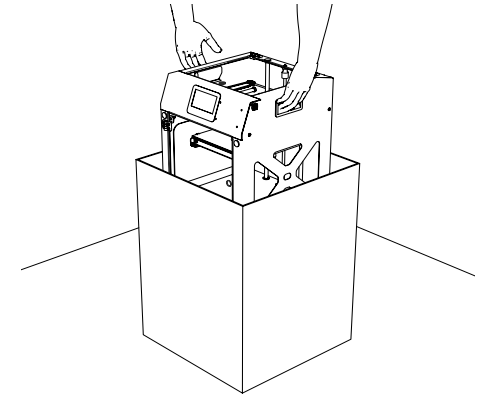
Place the box on a flat surface



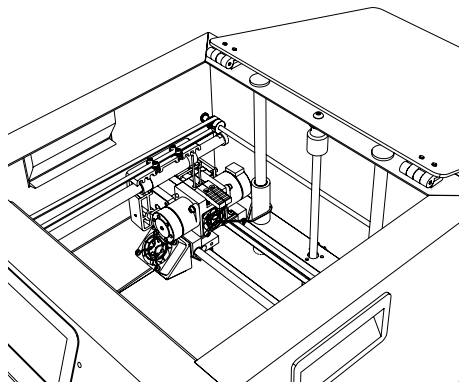
Lift the top box



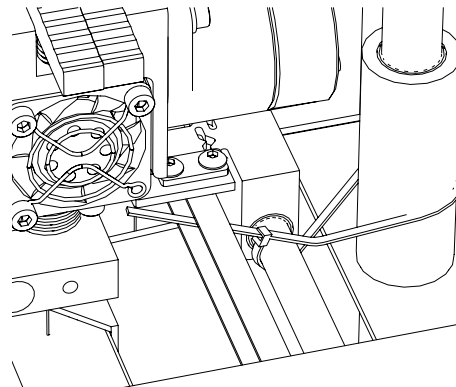
Take out the accessories box and the foam



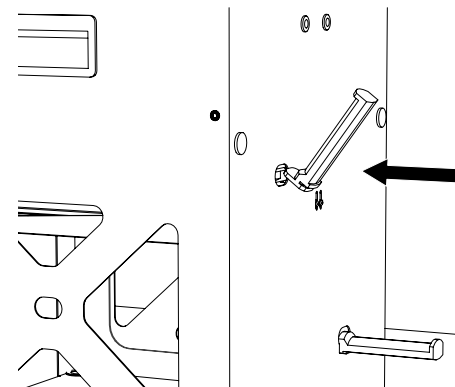
Lift the printer out of the box



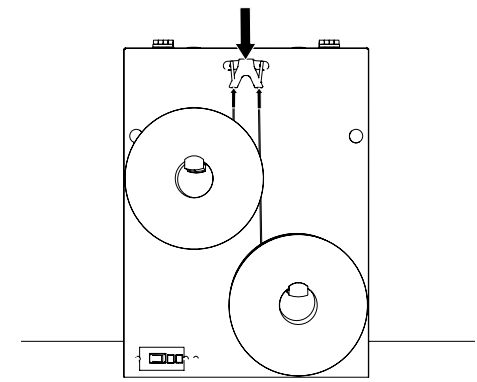
Place the printer on a flat stable surface and open the top



Remove the ty-rap which is holding the axis together



Attach the spool holder to the frame



Place the filament clip and slide the filament through the clip

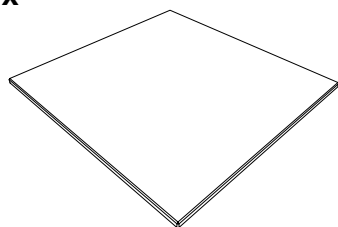
Builder Premium Accessoires



Accessoires

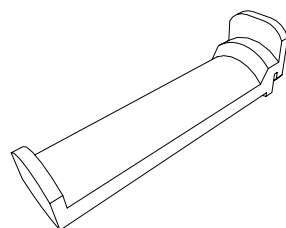
The following parts are included with your Builder 3D printer. Please check if the items below are inside the box.

1 x



Build Plate

2 x



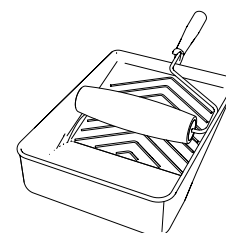
Filament holder

2 x



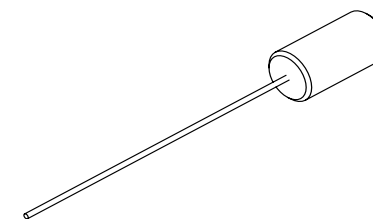
Filament guide tube

1 x



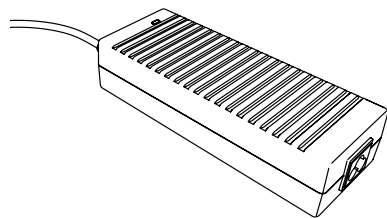
Paint tray and roller

2 x



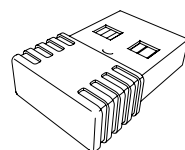
Pressure plug

2 x



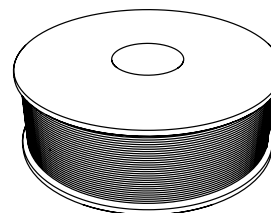
Power supply

1 x



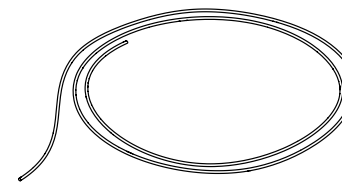
Wifi USB adapter

2 x



Filament

1 x



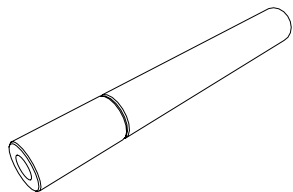
Steel wire cleaning nozzle

1 x



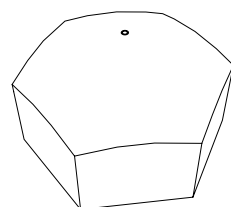
Wood glue

2 x



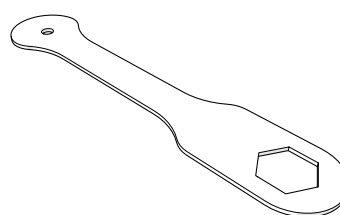
Teflon tube (Spare parts)

1 x



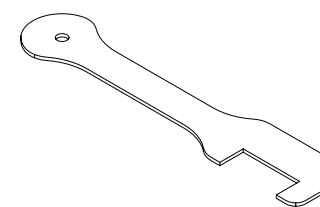
Nozzle 0.4 mm

1 x



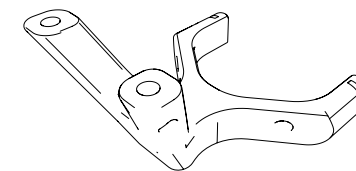
Tool nozzle

1 x



Tool heaterblock

1 x



Filament clip

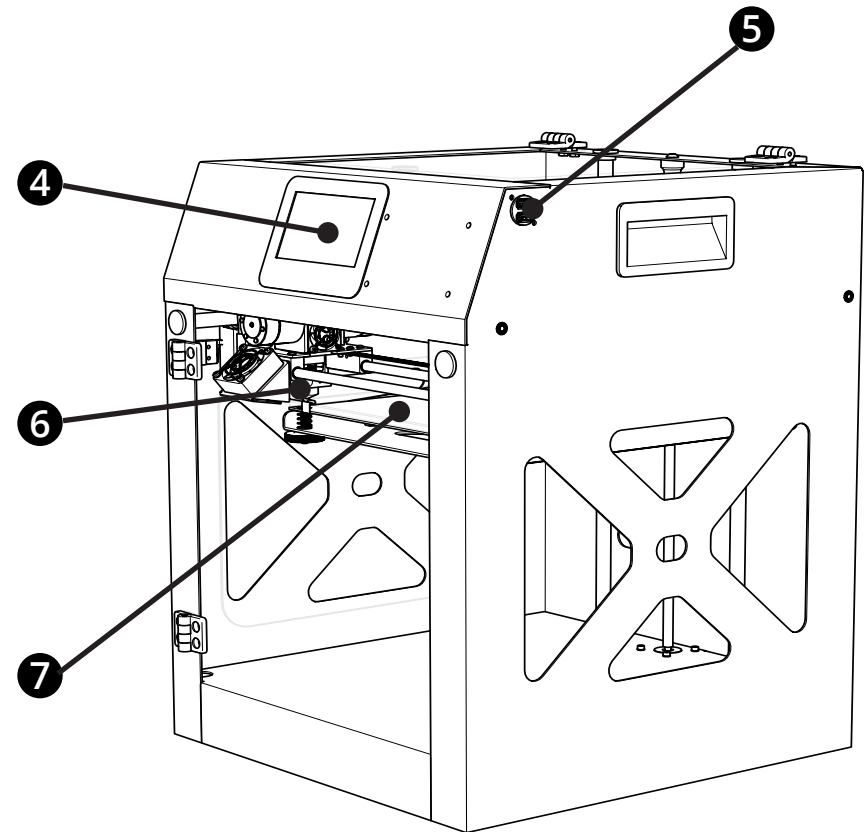
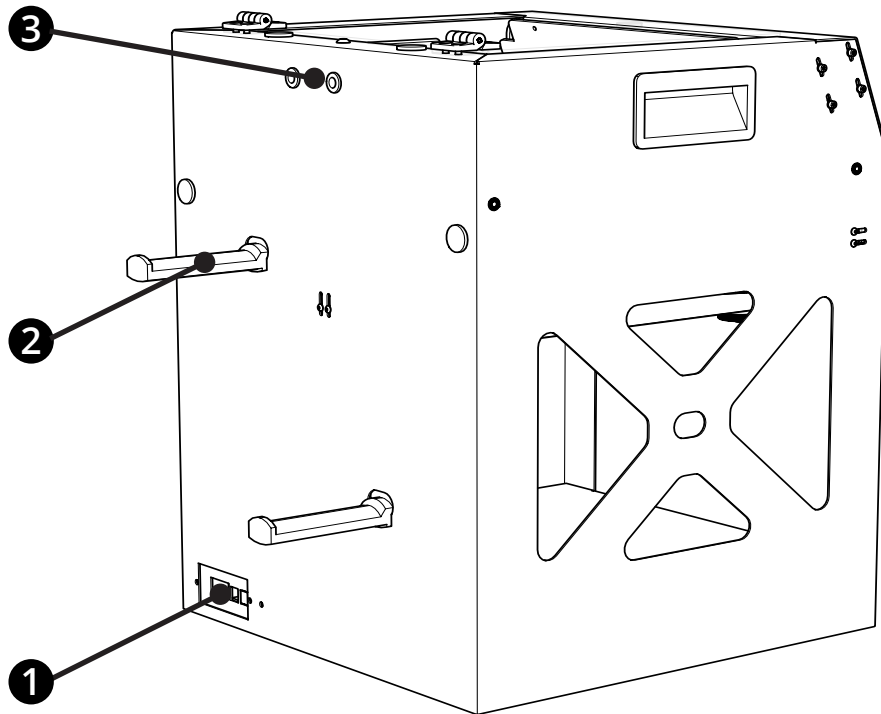
Builder Premium Overview



Parts:

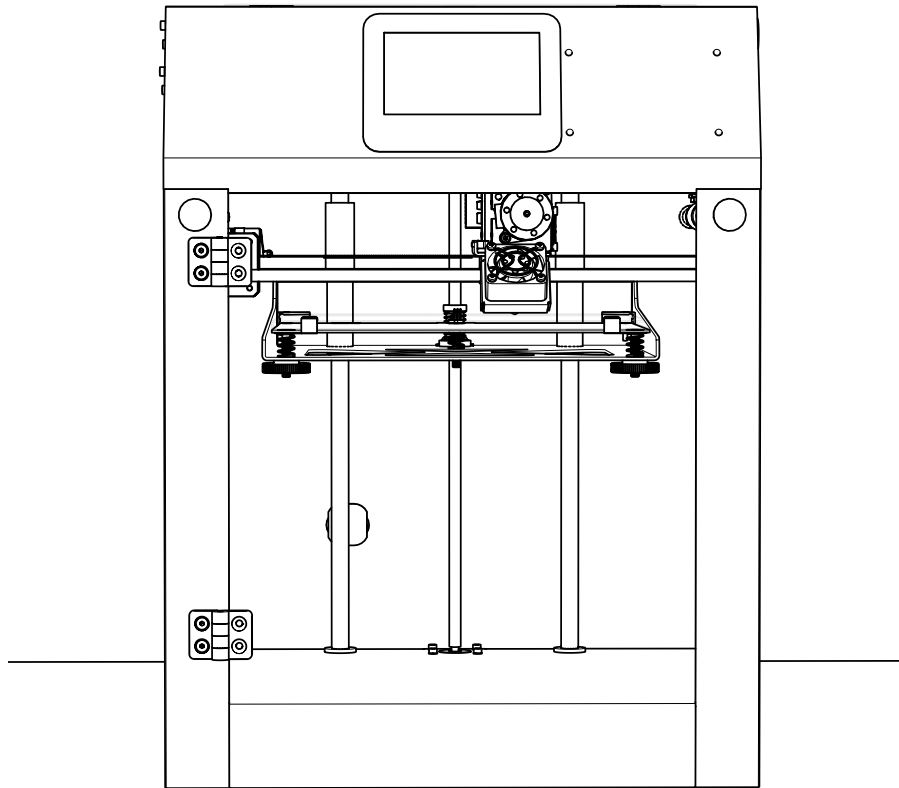
1. Power socket
2. Spool holder
3. Filament Guide

4. LCD Screen
5. USB Socket
6. Nozzle
7. Heated bed

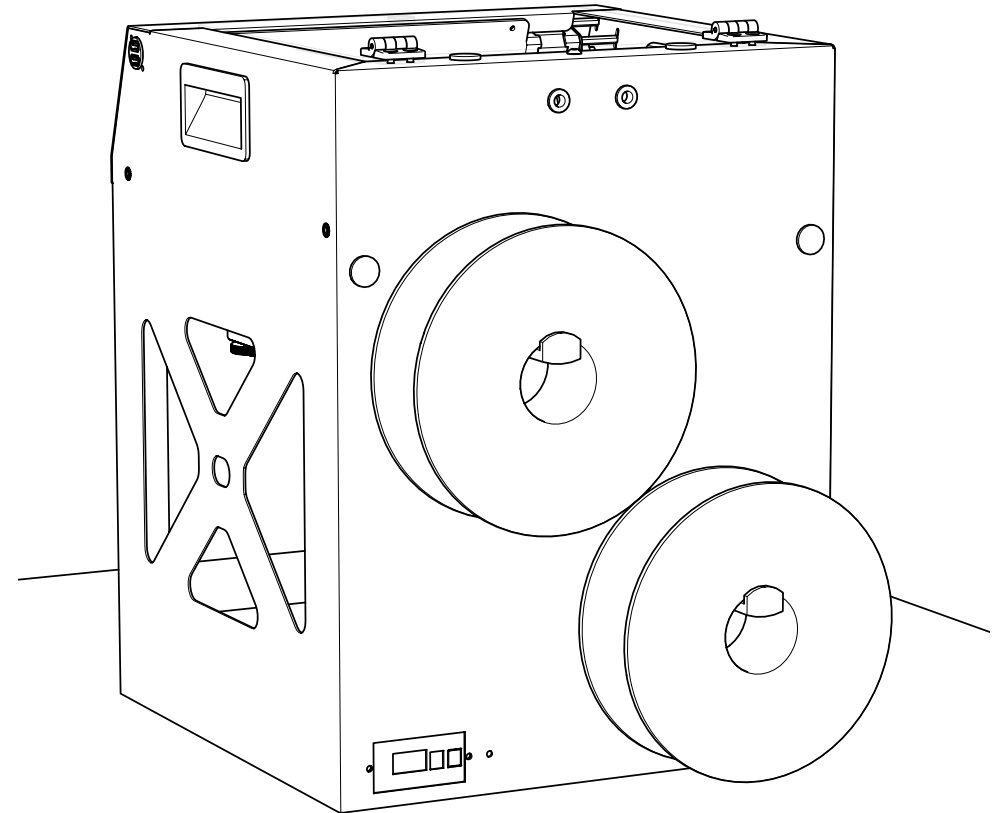


Start printing

Builder Premium Installing

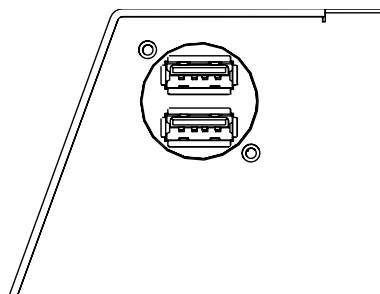
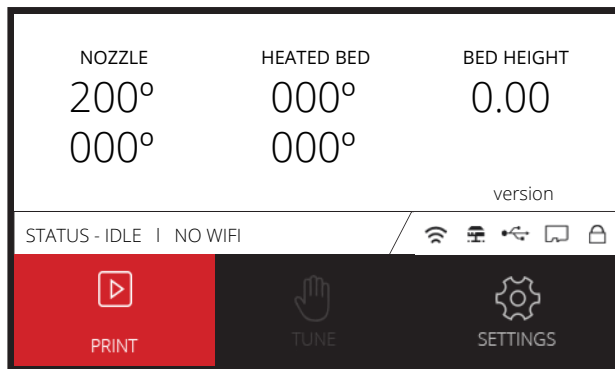
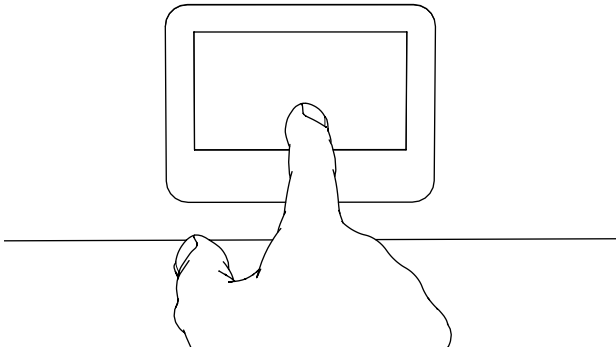


Place the Builder on a stable surface.



Make sure the power switch is in the Off position. Plug the power supply into the power input of the Builder. Now plug the power cord into a grounded outlet.

Builder Premium Control



Control

Switch on the Builder Premium and wait until the main screen appears. Control the Builder by pressing the buttons on the LCD touchscreen.

Main Screen

The main screen provides information about the printer and object. Press the wifi button and a connection with a network can be made. In the main screen an IP address will be shown. Type this address in your smartphone which is connected with the same network. Now the print can be watched from your phone.

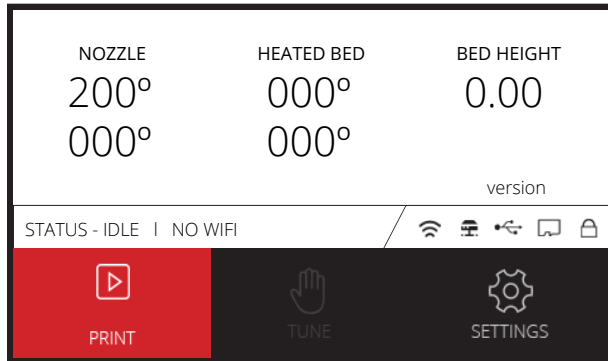
USB stick

Plug in the USB stick on the side of the printer. Select print to select the gcodes from the USB stick.

Wifi adapter

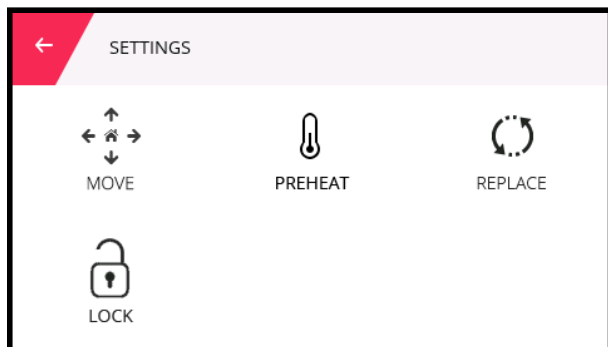
Plug in the Wifi adapter to make a connection with your network

Builder Premium Interface



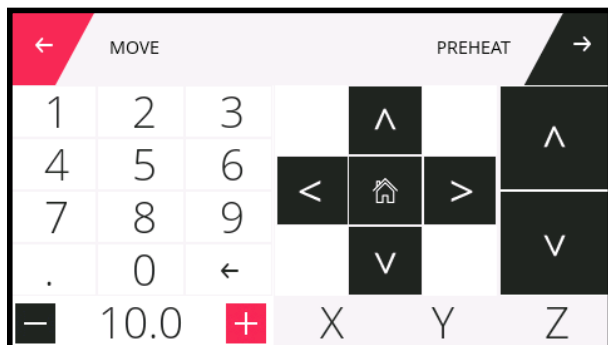
Main screen

The Main screen shows the most important information. From this information screen a few settings can be changed while printing. The most commonly used functions are explained in this chapter.



Settings screen

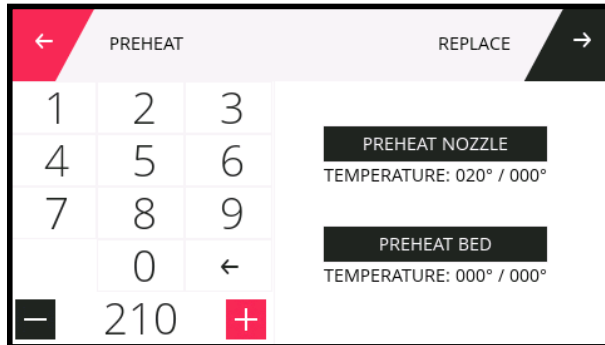
The settings screen shows the main functions for preparing the printer. In this menu the printerhead can be moved, you can preheat the printer or the filament can be loaded or unloaded. When a print is started locking the printer screen is possible to secure the print. Choose the lock menu and enter a password. This password can be changed anytime. Reset the password by switching off and on the printer.



Move screen

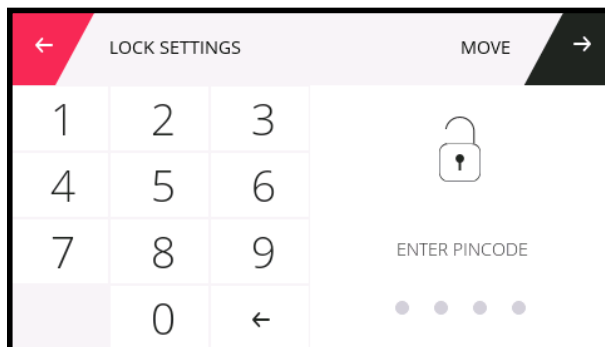
Move the printhead in the move screen. Enter a value and move the printhead by choosing the direction.

Builder Premium Interface



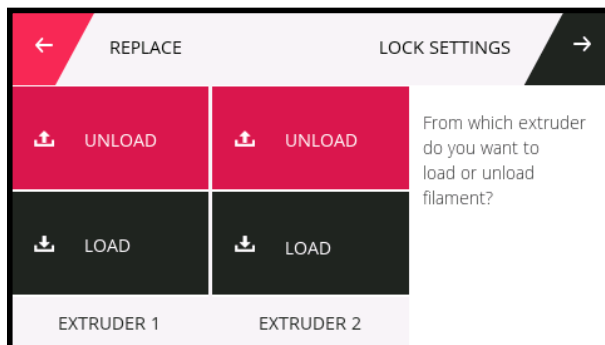
Preheat screen

Enter the required temperature and select preheat nozzle or bed to heat up.



Lock screen

The lock screen gives the opportunity to lock the screen while printing so nobody is able to stop or tune the print except you.

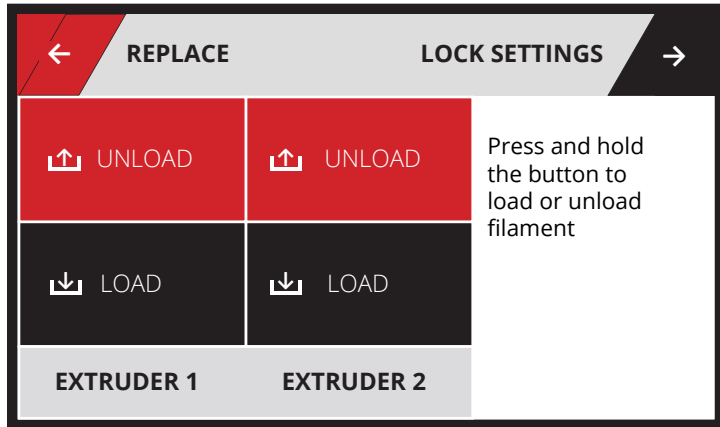


Replace screen

When inserting filament choose the extruder and press load until the filament is placed.

Builder Premium

Installing filament



Installing filaments

Insert filament material by following the steps below

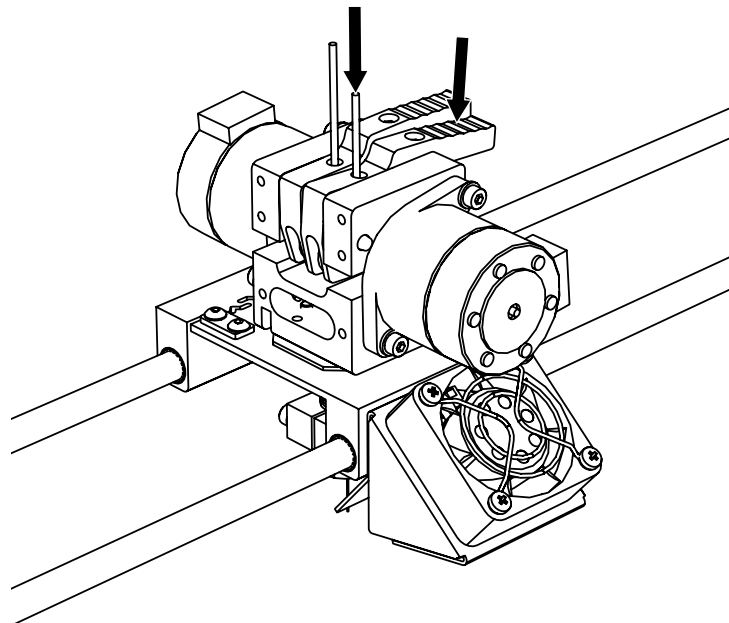
1. Select replace in the settings menu.
2. Press load and the printer will start to heat up the nozzle.
3. When the temperature is reached the text next to the buttons starts to blink.
4. Push down the lever and insert the filament until you feel some resistance. Now insert the second filament by doing the same.
5. Press the load button until some filament comes out of the nozzle. Do this with both extruders.

Start Printing

1. Select print in the main menu.
2. Select the storage from where you want to print.
3. Select the file which you want to print.

⚠ WARNING

Make sure when printing with the Dual-Feed Builder both extruder holes are filled with a filament



Builder Premium Wireless connection



Status: Operational
Nozzle Temperature: 022 / 000
Bed Temperature: 022 / 000

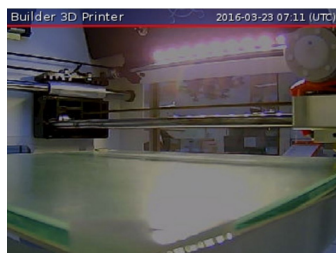
Files:

Twisted vase.gcode		
Bedleveling.gcode		
Bracelet Colormix.gcode		
Color mix builder beker.gcode		

Select file to upload (... MB free):



Live webstream:



Wireless connection

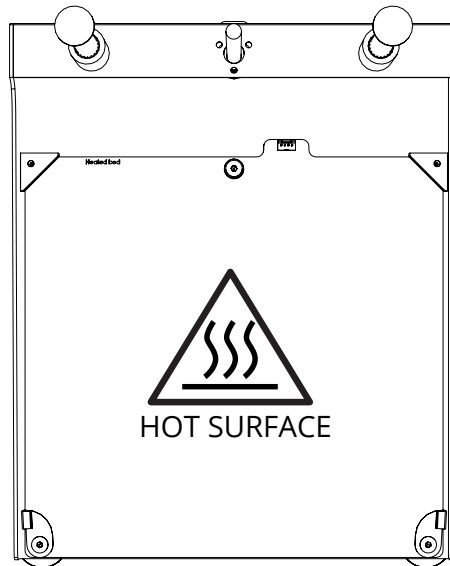
With the Premium line 3D printer from Builder it's possible to control the printer using a wireless connection. To connect a device with the printer select a wifi network by pressing the wifi icon. All the wifi spots in the neighbourhood will show up now. Select a wifi network and enter the password. Go back to the main screen. Enter the IP adress in the adress bar of a device and a new page will open. On this page print jobs can be loaded, started or stopped. In addition, the print jobs can be watched with the live webstream camera.

To load an Gcode on the printer, browse the file and select. Use the "upload file" button to upload the file on the printer. When using Chrome a status bar is showed at the left bottom of the screen. When the upload is complete the list will be refreshed and the uploaded file can be printed with a click on the "print" icon. Cancel the print by clicking the "remove doc" icon.

NOTE

Both devices need to be connected to the same network

Builder Premium Bed leveling



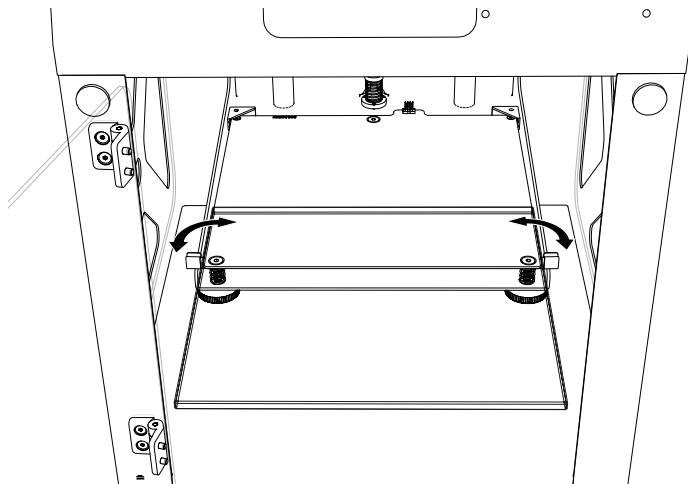
Bed leveling

The Premium Builders are equipped with a heated bed. The heated bed ensures a good adhesion between object and glass plate. Besides the heated bed significantly reduces warping of the object.

Leveling the print bed is extremely important for a good quality print. After transportation you might want to level your glass plate to ensure your object will stick well to the glass plate. Use the following these steps to check this.

⚠ CAUTION

There is a potential risk of burns, as the heated bed can reach a temperature of 60 degrees Celsius.

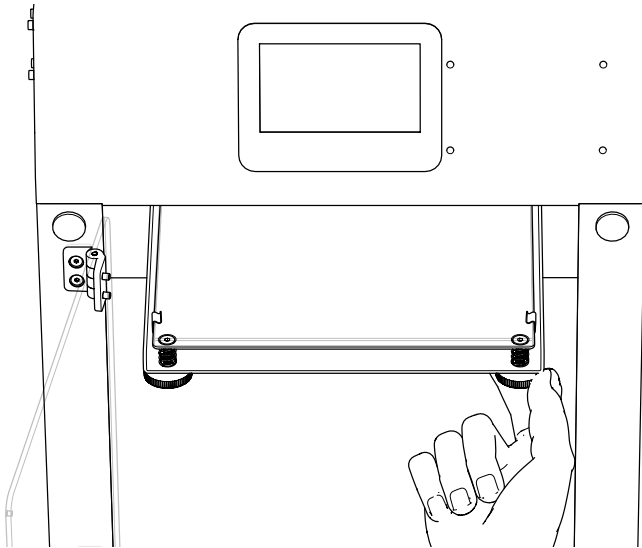


Prepare

Install the glass plate by opening the two bed clamps. Now gently slide the glass plate inside the clamps at the back of the build plate. Hold the glass plate in place with the two clamps at the front of the buildplate.

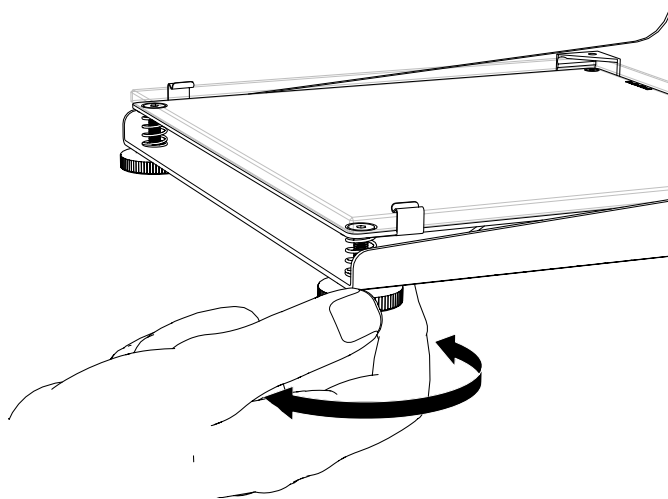
For a good adhesion to the glass plate it's necessary to apply an adhesion layer. Builder provides woodworkers glue with the Builder Premium line. Dilute the wood glue half with water and apply this with the paint roller. Using a glue stick is also an option.

Builder Premium Bed leveling



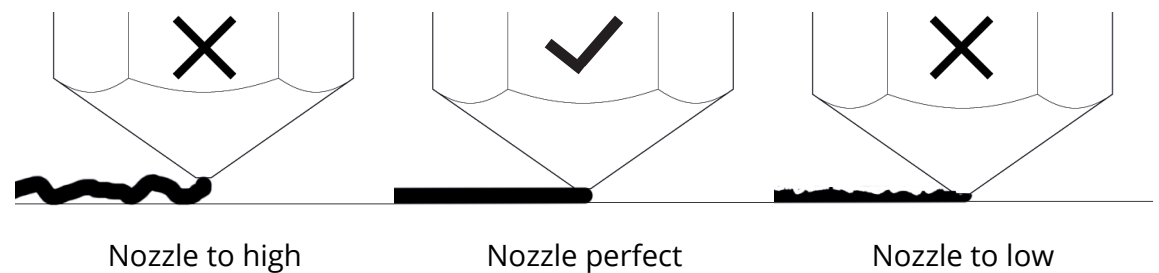
Set height

1. Clean the nozzle for a right adjustment.
2. Move the extruder head to his home position so the printer recognizes his zero position.
3. When the printhead is in his home position, measure the space between the nozzle and the bed with a piece of paper. Adjust the screws until you feel slight friction when moving the piece of paper.
4. Now move your printhead above the second adjusting point (screw) and repeat the steps with the piece of paper.



Fine tune height

Fine tune the nozzle height when printing the “bed leveling” gcode. The first layer has to stick to the platform as shown in the image below. During printing it is possible to optimize the height.



Builder Premium Filament



Filament

Builder 3D printers offers you many different types of filament. Every filament that is for sale is tested on our printers. The following types are available in our web shop

- Woodfill, wooden look
- Bronzefill, a bronze appearance after polishing
- PVA, material which dissolves when it makes contact with water
- PLA



Printing other materials

After printing with other materials it's wise to extrude some PLA to prevent jamming. Push down the filament until it comes out.

Software

Builder Premium Printer software



Cura (Windows, MAC, Linux)

Cura is an open source program which prepares your object into a file (gcode) that can be read by the Builder 3D printer.

- Go to our website and click “support” --> “installation” (Step 2).
- Download the Cura software
- After installing Cura, select Custom machine and enter the sizes of your Builder.
- Download the INI-files for your Builder 3D printer.
- Load the INI-files in Cura by using the option “open profile”.
- Enter the number of extruders in the “Machine settings” menu.
- Reopen this menu and set the extruders offset (X-Y) values to zero.
- For more information about Cura, [check the manual](#).



Repetier

Repetier Host prepares your object into a file (gcode) that can be read by the Builder 3D printer.

- Download Repetier Host from our website.
- Repetier Host is adjusted to the settings of the Builder 3D printer.
- For more information about Repetier Host, check chapter “Repetier Host”.

Cura Configuration wizard



Guide to 3D printing with Cura

Cura is an open source program which prepares your object (STL file) into a Gcode file that can be read by the Builder 3D printers. This manual describes how to set up Cura for your Builder 3D printer.

Configuration Wizard

When you open up Cura for the first time, you will be asked to select the 3D printer that you have. To set up your machine follow the instructions below.

Select your machine

What kind of machine do you have:

- Ultimaker 2
- Ultimaker 2extended
- Ultimaker 2go
- Ultimaker Original
- Ultimaker Original+
- Printbot
- Lulzbot TAZ
- Lulzbot Mini
- Other (Ex: RepRap, MakerBot, Witbox)

The collection of anonymous usage information helps with the continued improvement of Cura. This does NOT submit your models online nor gathers any privacy related information. Submit anonymous usage information:
For full details see: <http://wiki.ultimaker.com/Cura:stats>

Select the option "Other" and choose if you want to submit anonymous usage information

< Back Next > Cancel

Other machine information

The following pre-defined machine profiles are available
Note that these profiles are not guaranteed to give good results, or work at all. Extra tweaks might be required.
If you find issues with the predefined profiles, or want an extra profile, please report it at the github issue tracker.

- BFB
- DeltaBot
- Hephestos
- Hephestos_XL
- MakerBotReplicator
- Mendel
- Ord
- Prusa Mendel i3
- Rigid3D
- RigidBot
- RigidBotBig
- Witbox
- Zone3d Printer
- julia
- kathal
- punchtec Connect XL
- Custom...

Select the option "Custom..."

< Back Next > Cancel

Custom RepRap information

RepRap machines can be vastly different, so here you can set your own settings. Be sure to review the default profile before running it on your machine.
If you like a default profile for your machine added, then make an issue on github.

You will have to manually install Marlin or Sprinter firmware.

Machine name:

Machine width X (mm):

Machine depth Y (mm):

Machine height Z (mm):

Nozzle size (mm):

Heated bed:

Bed center is 0,0,0 (RoStock):

Enter the correct width, depth and height for your Builder 3D printer and select "heated bed".

< Back Finish Cancel

Cura

Cura settings



Machine settings	
E-Steps per 1mm filament	0
Maximum width (mm)	
Maximum depth (mm)	
Maximum height (mm)	
Extruder count	2
Heated bed	<input type="checkbox"/>
Machine center 0,0	<input type="checkbox"/>
Build area shape	Square
GCode Flavor	RepRap (Marlin/Sprinter)
Extruder 2	
Offset X	0.0
Offset Y	0.0

Builder Profile

After running the wizard the machine settings menu appears. Check if all the printer settings for your printer are correct. When you're using a Builder Dual Feed system, set the "Extruder count" to "2". Now reopen the menu in order to get the "Extruder 2" offset values. Set both offset values to zero.

Now open the Builder profile (INI-file) in Cura.

"File" > "Open profile..." > "Browse for the INI file on your computer" (Check downloads)

Basic		Advanced		Plugins		Start/End-GCode	
Quality				Support			
Layer height (mm)	0.2	Support type	None				
Shell thickness (mm)	0.8	Platform adhesion type	None				
Enable retraction	<input checked="" type="checkbox"/>	Support dual extrusion	Both				
Fill				Dual extrusion			
Bottom/Top thickness (mm)	0.6	Wipe&prime tower	<input type="checkbox"/>				
Fill Density (%)	20	Ooze shield	<input type="checkbox"/>				
Speed and Temperature				Filament			
Print speed (mm/s)	45	Diameter (mm)	1.75				
Printing temperature (C)	220	Diameter2 (mm)	0				
2nd nozzle temperature (C)	0	Flow (%)	100.0				

When the profile (INI-file) is loaded check if the settings are correct. Print speed depends on your type printer.

Note

Move the mouse over an option for a description.

Cura Interface



Interface

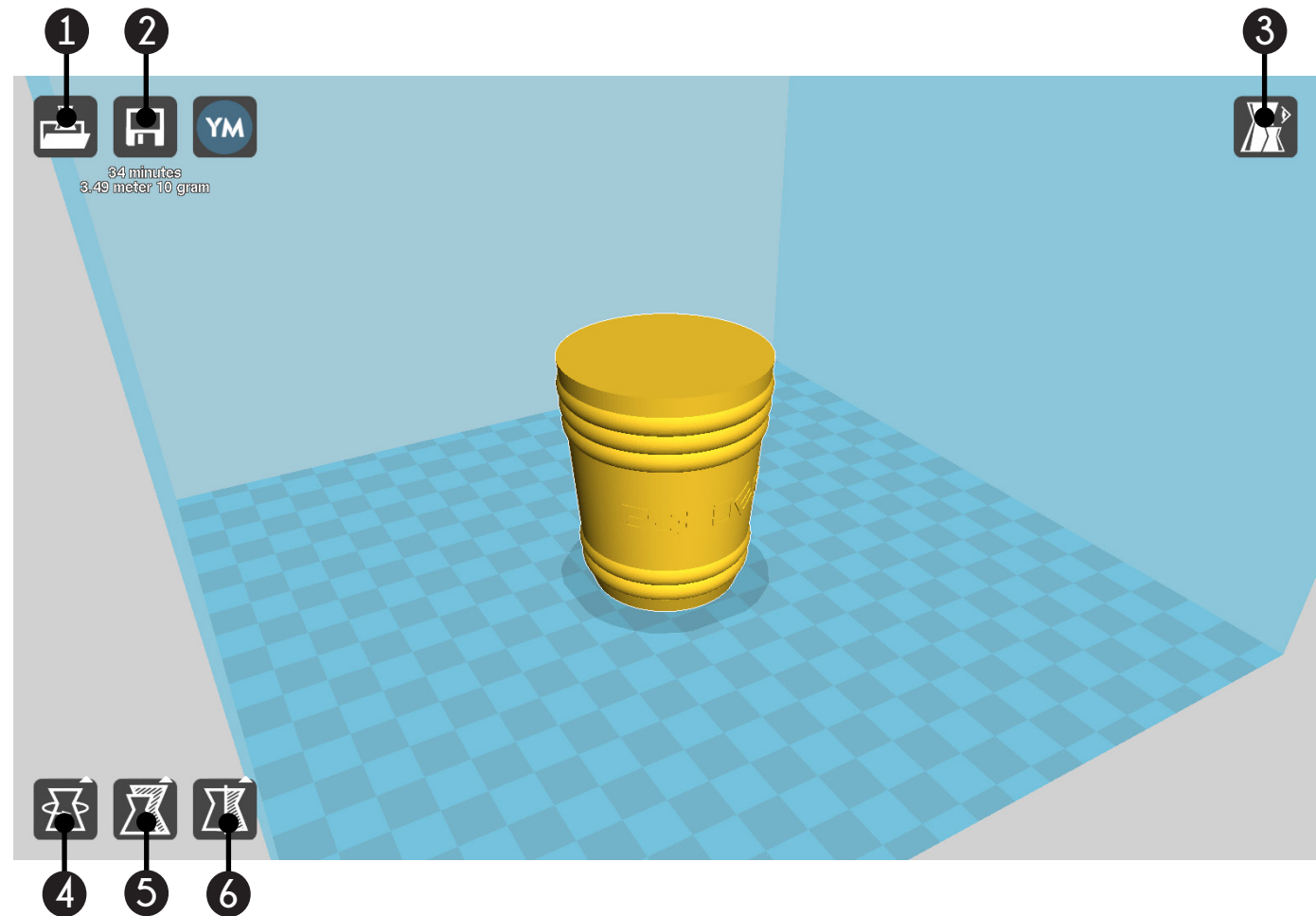
The image below shows the main screen of Cura with the most important functions. Here you can load and adjust 3D models and select the preferred print profile. Cura will convert the 3D model to a 3D print file (Gcode).

Tools Cura

1. **Load:** Load a 3D model (STL-file)
2. **Save Toolpath:** Save 3D model as a GCODE file on computer or SD card.
3. **View mode:** This option allows you to view a 3D model in different modes. This can be useful to see how an object looks like after slicing.
4. **Rotate:** Rotate the 3D model in a way how it's easy to print.
5. **Scale:** Scale the 3D model.
6. **Mirror:** Mirror the 3D model.

Note

By right clicking on your model you can center, delete and multiply your object.



Cura

Basic settings



Print profiles

In this chapter you can find basic settings for some main materials.

Beginner: When you first start with 3D printing we recommend to start printing with PLA material. Below you can find some basic settings for printing with PLA material.

Fast PLA print

Layer height: 0.3 mm
Shell thickness: 0.8 mm
Fill density: 20%
Print speed: 60 mm/s

Normal PLA Print

Layer height: 0.2 mm
Shell thickness: 0.8 mm
Fill density: 20%
Print speed: 45 mm/s

High Quality PLA Print

Layer height: 0.1 mm
Shell thickness: 0.8 mm
Fill density: 20%
Print speed: 30 mm/s

Intermediate: After you understand the basics of 3D printing you can start with printing PLA in combination with PVA as a support material. Below you can find the basic settings for printing with PVA material.

Normal PVA print

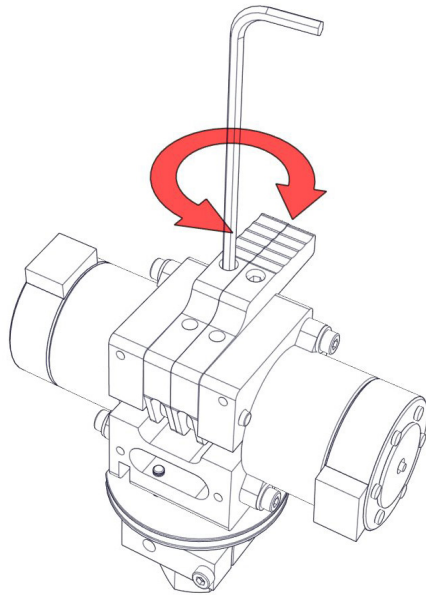
Layer height: 0.2 mm
Shell thickness: 0.8 mm
Fill density: 20%
Print speed: 35 mm/s
Support type: Everywhere
Platform adhesion: Brim
Support Dual extrusion: Second extruder
Wipe&Prime tower: On

Open this menu by clicking the "..." behind "support type"

A screenshot of the Cura software's "Support" dialog box. The dialog has a title bar "Support" and contains several settings: "Structure type" is a dropdown menu set to "Grid"; "Overhang angle for support (deg)" is a text input field with "55"; "Fill amount (%)" is a text input field with "25"; "Distance X/Y (mm)" is a text input field with "0.5"; and "Distance Z (mm)" is a text input field with "0". At the bottom left of the dialog is an "Ok" button.

Cura

Basic settings



Expert: When you understand all about 3D printing you can start print flexible filament. Below you can find the basic settings for a normal flexible print.

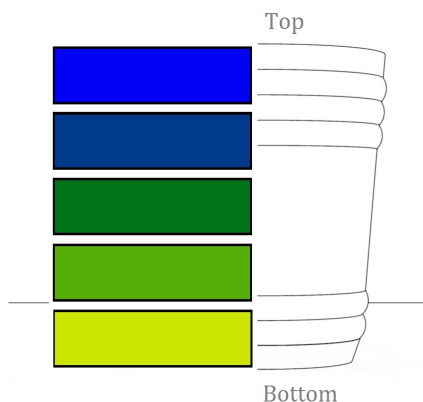
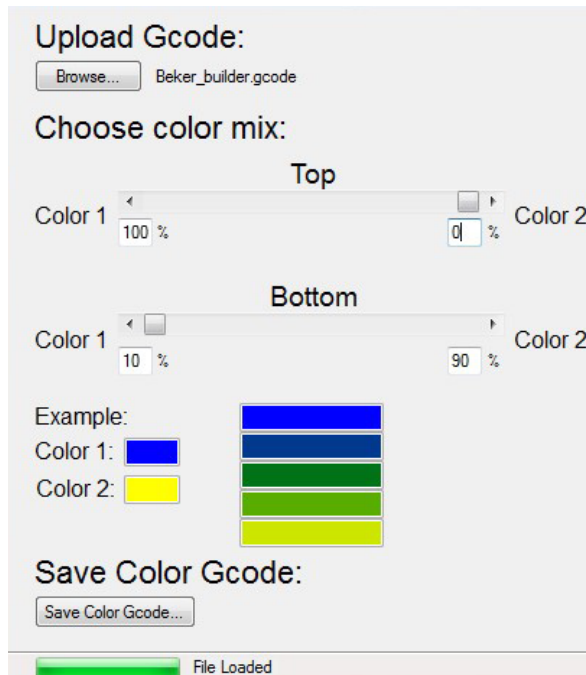
Normal Flexible print

Layer height: 0.2 mm
Shell thickness: 0.8 mm
Fill density: 20%
Print speed: 20 mm/s

Adjust tension lever

When printing at high speed the printer has to extrude more material. To avoid under extrusion increase the pressure on the filament by tightening the screw in the lever.

Builder Premium Colormixing



Colormixing

Besides printing two colors or support material with the Dual-Feed extruder system, it's possible to mix two colors. When using the colormixing tool, a color gradient can be made. Also manually a color gradient can be made during printing.

Colormixing Tool:

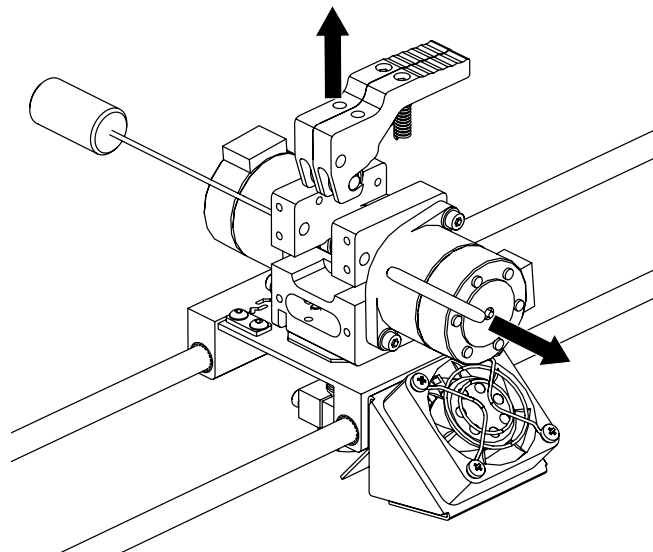
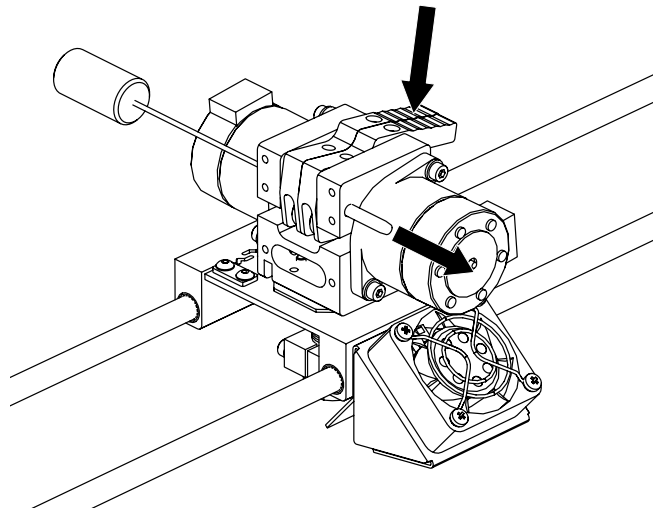
- Activate the colormix application with the received activation code (starts with BP)
- Upload the Gcode file you want to colorize. Click browse to upload.
- Choose the gradient by sliding the bars. The colors are an example of how the product should look like.
- Color in the middle is a mix of the top color and bottom color. In the example blue and yellow makes green.
- Save the colored Gcode when you are satisfied with the settings.

Color mixing manually

For a manual colormixing object, navigate through the display menu. During printing, the ratio percentage of each (front/rear) extruder can be set. Select an extruder and set the amount of ratio you want.

Maintenance & support

Builder Premium Dual-Feed extruder



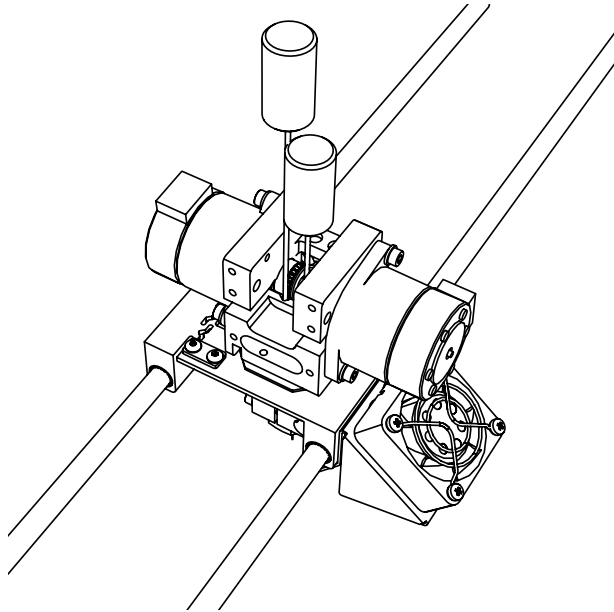
Maintain printhead

Maintaining your Builder 3D printer is important to achieve the best result. After a lot of printing, the filament material feeding wheel can contain small plastic parts. For cleaning this follow the next steps.

- Press down both levers of the Dual-Feed system
- Use the pressure plug to remove the shaft that is holding both levers in place.
- Take both levers out of the extruderhead
- Check the feeding wheel for stuck printing material. Remove this by using a simple brush or compressed air.
- When cleaning the feeding wheel is hard, you can choose to remove the feeding wheel from the extruder motor. Remove only when needed!
- When assembling the feeding wheel be sure that the groove is above the hotend entrance
- After cleaning, assemble both levers in place by pushing the shaft through

For changing the nozzle and tubes go to our youtube page

Builder Premium Dual-Feed extruder



Pressure plugs

In case the filament material gets jammed, you can choose to use the pressure plugs. Only use the pressure plugs when there is no other option.

- Heat up the printhead of your Builder Dual-Feed extruder till 230 degrees Celsius.
- Press down both levers of the Dual-Feed system.
- Use the pressure plug to remove the shaft that is holding both levers in place.
- Take both levers out of the extruderhead.
- Place the pressure plugs in both channels as shown at the picture.
- Add some pressure to the both of the pressure plugs until the jammed material comes out of the nozzle.
- After cleaning, assemble both levers by pushing the shaft through .

Printing other materials

After printing with other materials Builder advises to extrude some PLA to prevent jamming. Push down the filament until it comes out.

Caution

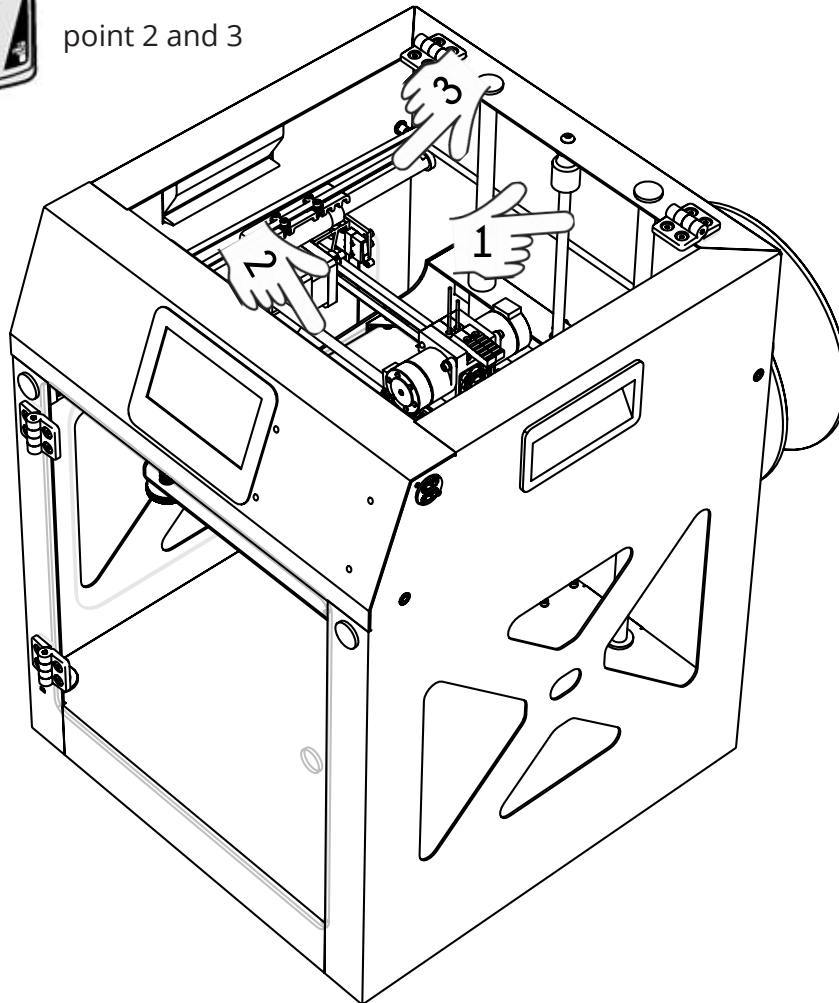
When using the pressure plug do not slide it along the feeding wheels. This can damage the printer feeding wheel.

Builder Premium Maintenance



Use grease to lubricate point 1

Use oil to lubricate point 2 and 3



Maintenance

To achieve the best results and lifetime, maintenance of your Builder 3D printer is very important.

Lubricate

Lubrication of the rotating and sliding parts is important for a nice print surface. Lubricate the axis (X-Y) 2 and 3 with oil when the printed objects shows some signs of vibrations. Lubricate the Z axis when those feel dry.

Feeder wheels

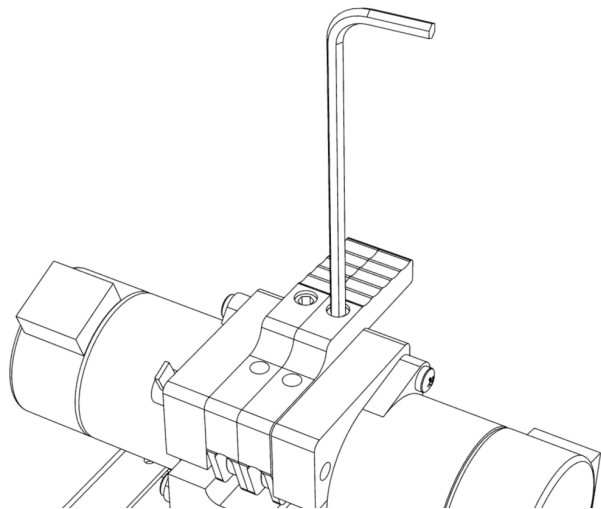
After a lot of printing, the feeding wheel can contain small plastic parts. For cleaning, use a simple brush or compressed air.

Nozzle

During printing, print material can stick to the nozzle. This stuck material can pollute the object while printing. Clean the nozzle before printing.

⚠ WARNING

When the nozzle is hot, clean the nozzle using a thick towel. Do not use any sharp objects to clean the nozzle, this can damage the nozzle.



The first layer does not stick to the print bed

This problem is well known in the 3D printing world. The color substances added to the filament may influence the melting point of the filament. To optimize the adhesion of first layer make sure that:

- The space between the nozzle and print bed is correct. This should be 0.2 – 0.3 mm.
- Clean the print bed, replace the adhesion layer by using Wood glue or Pritt
- Increase the “first layer thickness” for a better adhesion.
- Place a “skirt” around the object. The skirt is a line drawn around the object at the first layer. This helps with printing a good first layer.
- Extrude material before printing.
- Use the option “brim” to create some extra grip around the object.

Under extrusion

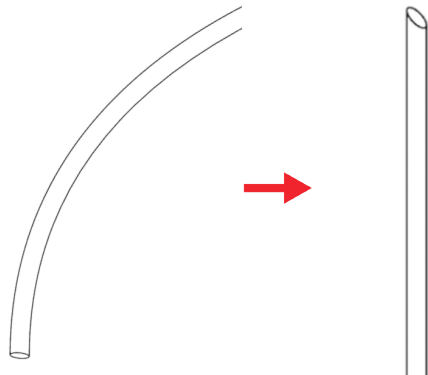
- Make sure the extruder wheels are clean. After a lot of printing these wheels can be full of dust and/or filament. Clean them with a brush or compressed air.
- There is not enough pressure on the filament. Increase the pressure by tightening the lever screws
- The extrusion speed is too high. Decrease the print speed.
- The nozzle got jammed. Clean the nozzle with the tools provided by Builder 3D Printers.
- Increase the temperature (250C) for a short time (max 5 min). The Builder will melt the old material and extrude this through the nozzle.
- The filament specs are different from the filament delivered by Builder 3D Printers. Every filament has its own specs. Contact the filament supplier for more info.

- The thermal protection is activated as the extruder head got to hot. Cool down the extruder

No connection with the Builder:

The Builder 3D Printers are stand-alone printers. If the Builder is connected to the pc or laptop but the software is unable to identify the printer this might be the problem:

- Is the driver installed correctly? Use administrator rights.
- Check to which COM port the Builder is connected. Use “device management”.



Difficulty with inserting the filament

- Bend the filament straight and cut the filament at an angle (see example). This makes it easier to insert the filament in the extruder head.
- Broken filament in the extruder head. Preheat to 210 and remove the broken filament. If the filament is too short, use the pressure plug.
- Lever screws are too tight. Turn them a bit looser.

The 3D printed object doesn't look good.

- Not enough cooling. Increase the “minimum layer height” time
- Check the tension on the timing belts. Increase the tension if needed. Check our official YouTube channel: <https://www.youtube.com/user/builder3dprinters>
- The filament specs are different from the filament delivered by Builder 3D Printers. Every filament has its own specs. Contact the filament supplier for more info.

Builder Premium

Safety instructions



⚠ WARNING

If you do not follow these next instructions, it will lead to fire, electric shocks or other injuries or damage to the Builder or other properties. Read all safety information below before you start using the Builder.

- Do NOT use water or fluid liquids, the bottom contains electric components.
- Minimum age for use of the Builder is age 14.
- Use the Builder in a bright area and preferably in 20 degrees Celsius.
- Do NOT enter the printing area with your hands when the printer is in use.
- Make sure the Builder is placed in a ventilated room.
- When cleaning the nozzle, use a piece of cloth, but beware(!!) the nozzle is still hot after printing.
- After a 30 hour print, clean the round conduction with a piece of cloth and provide the printer with new grease/oil if necessary.
- Turn the Builder off with the main switch on the back of the Builder when the printer needs maintenance.
- The Builder has been extensively tested, but if a failure occurs please contact helpdesk@builder3dprinters.com.
- Do NOT open the bottom side or the coverplate behind the display, but leave this to our certified workers.
- If you decide to leave the Builder unattended to print, make sure to remove flammable objects near the printer.



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