Fusion3

EDGE 3D Printer

QUICKSTART GUIDE
Revision 3/21/2024

**PLEASE READ THIS DOCUMENT
BEFORE OPERATING YOUR NEW 3D PRINTER**

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INTRODUCTION

Thank You

Thank you for purchasing the Fusion3 EDGE 3D printer! We have worked hard to deliver the very best 3D printer available on the market today, and the best user experience possible. We think you'll be surprised and delighted by what your new 3D printer can do.

Current Fusion3 Owner?

If you're coming from a previous Fusion3 product, **please** approach EDGE with an open mind! This is a very different machine than what you're used to, and it needs to be treated and used differently than our other products. Also, there are subtle differences between EDGE and other Fusion3 3D printers as it relates to consumables and warranty coverage.

Role Of The Quickstart Guide

This quick-start guide is designed to assist you with unpacking, setting up and walking you through your first print with EDGE.

The Quickstart Guide is not a Comprehensive Manual

In the past, we at Fusion3 have published a Quickstart Guide, a User Manual, and Technical Bulletins for individual repairs or maintenance items. **With the introduction of EDGE we are taking a new approach.** While we are still producing this Quickstart guide to assist customers at the time of unpacking, all of our documentation will be provided in individual modules around specific topics (not as an accumulated User Manual) on our website *Support > Manuals & Downloads > EDGE*. This user documentation is a living, constantly expanding corpus of knowledge so please always check our website for the most up-to-date information.

Your 3D Printer Is A Complex Piece of Equipment: There is a Learning Curve Involved

We at Fusion3 are always looking for ways to make 3D printing easier. However, you must still think of your 3D printer as a powerful machine tool, not a push-button appliance (like a microwave or coffee-maker). Please be prepared to invest the time to learn how it works and how to get the most out of it.

Fusion3 Is Here To Help You Get Through This Learning Curve

We provide a number of resources to help you learn how to use our 3D printers and also get the greatest amount of performance from our systems.

1. **Free Training Videos**
   Please ensure that all operators watch our new user training videos. Not only is this a condition to activate your 3D printer warranty, we have found that it drives much higher initial customer satisfaction and 80% fewer customer service issues during the first months of customer ownership. The videos can be found here: https://www.fusion3design.com/new-user-training/

2. **Selecting Materials**
   Fusion3 has compiled our Certified Materials List, found on the Fusion3 website (*Materials > Certified Materials List*). If you are not sure how to select the right material for your task, please feel free to reach out either to your sales representative or the Technical Support team (*Support > Contact Support*) and we would be happy to suggest a type of material and a few different providers for you to contact.

3. **Technical Support**
   Fusion3's Technical Support team is here to help you tackle any issues related to the operation of your Fusion3 3D printer and software. The Technical Support team is available every Monday through Friday, except public holidays, via email (support@fusion3design.com) or video call.

   Please note: While customers find it reassuring to place a phone call to our Technical Support representatives, for most issues, you may find faster resolution by starting your case via email. Our Support Team will be able to more quickly help identify the issue and suggest solutions if you start your support case using our 'Contact Support' form at https://www.fusion3design.com/contact-support/. Please include comprehensive detail, including pictures of your part and/or any affected components of the 3D printer, computer files, including your STL file, your slicer project file, and GCODE.

UNPACKING YOUR EDGE 3D PRINTER

How to correctly unpack your EDGE 3D printer from its shipping packaging

IMPORTANT: Please carefully inspect the printer and packaging for damage and issues. Note any packaging damage on the Bill of Lading (BOL) WHEN YOU RECEIVE THE SHIPMENT FROM THE SHIPPER. If damage is not noted on the BOL then we cannot file a claim to cover any shipping damage.

IMPORTANT: Please retain all packing materials. Your 3D printer is a sensitive piece of electrical equipment and should always use this packaging when being transported or shipped.

1. Inspect the box for damage. Check for punctures or impacts from the side, check for crushing from the top, and check the shockwatch to see if it's triggered.

If the shockwatch is triggered: Your shipment has experienced a shock > 25G. Your printer may be fine, but the odds of shipping damage are higher.

2. Cut the tie-down straps that hold the box onto the pallet. There may be just 2 straps, that's ok.

3. Unfold the top of the box.

4. Above the printer you will find a cardboard tray. This contains your toolkit, your filament, and your print surfaces. Lift the tray straight out of the box.

DO NOT LIFT BY THESE

5. Remove the 4 foam corner block sets.

6. Lift the cardboard box straight up and off of the printer and pallet.

7. The printer is bolted down to the pallet using 2 metal clips. Remove the bolts using a 10mm driver.

8. Remove the clips from the ribs underneath the printer.

9. Use 2 people to carefully pick the printer up off its pallet and move it to a suitable location.

USE LIFT POINTS EACH SIDE
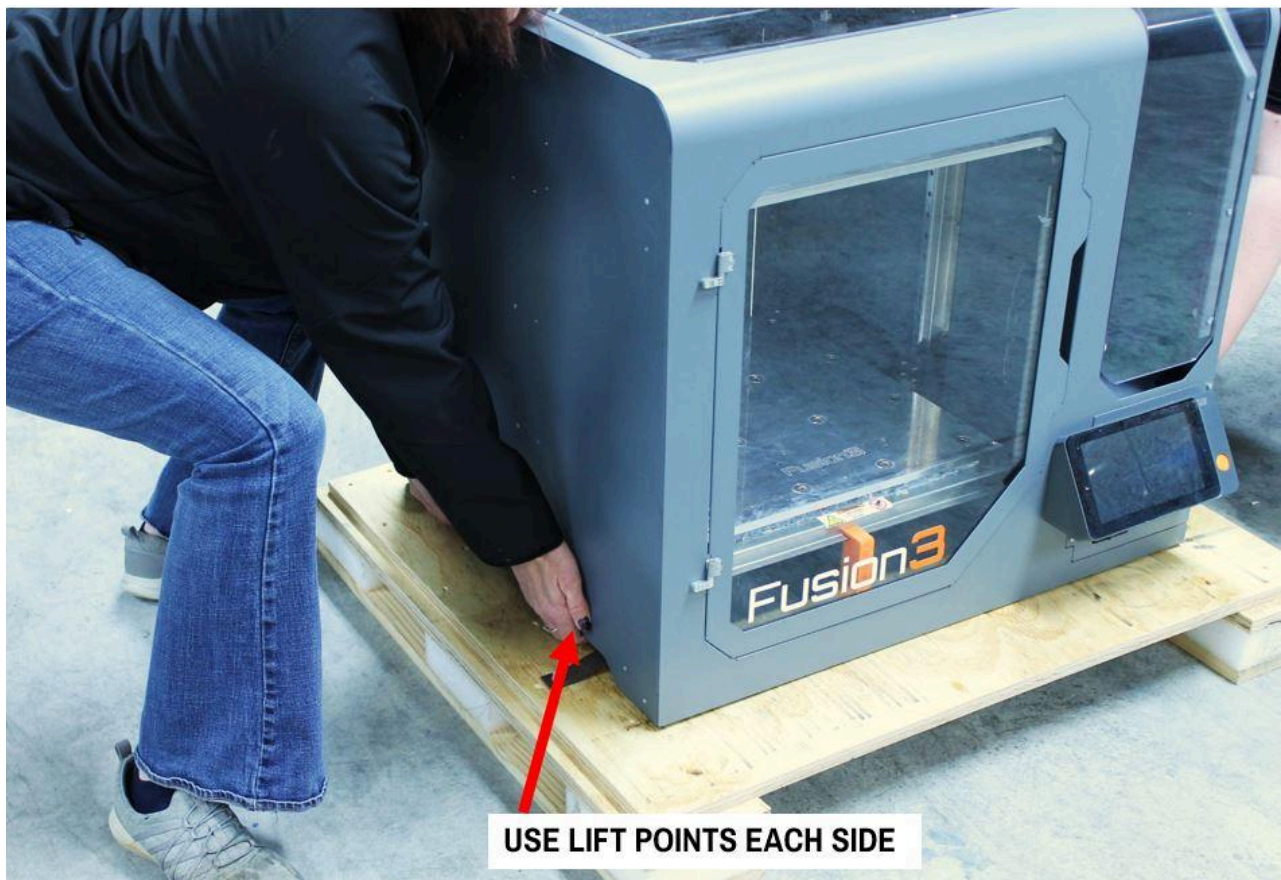
SETTING UP YOUR EDGE 3D PRINTER & FIRST PRINT

How to set up your new EDGE 3D printer.

WHERE SHOULD I LOCATE MY EDGE 3D PRINTER?

Please select a surface that meets the following criteria:

- Capable of supporting 120 lb (55 kg)
- At least 31" x 30" in size
- Sturdy enough to resist vibration & shaking during the printer's operation
- Reasonably flat and level
- At least 2" of clearance on the rear side and left side of the printer, for exhaust fans
- Close proximity to a 120/110V power outlet capable of delivering 6 amps continuous power

In addition you may want to consider these optional criteria:

- Reasonably out of the path of foot traffic so that people do not accidentally bump or knock the printer
- A location where the noise of the printer (approximately equivalent to a printer or copy machine running) will not bother anyone
- Close to a wired ethernet port if you intend to install the printer on your wired network

If you have purchased one of our optional rolling carts, simply place the printer on top of the cart with the front and side edges of the printer aligned with the cart.

LIFTING & MOVING

EDGE requires 2 people to lift and move it at all times. The unit weighs approximately 100 lb.

NOTE: This is a delicate piece of precision equipment; do not subject it to bumps, drops, or other shocks!

Use the cutouts on the right and left sides, just below the "2 person lift" warning labels, to pick up the printer.
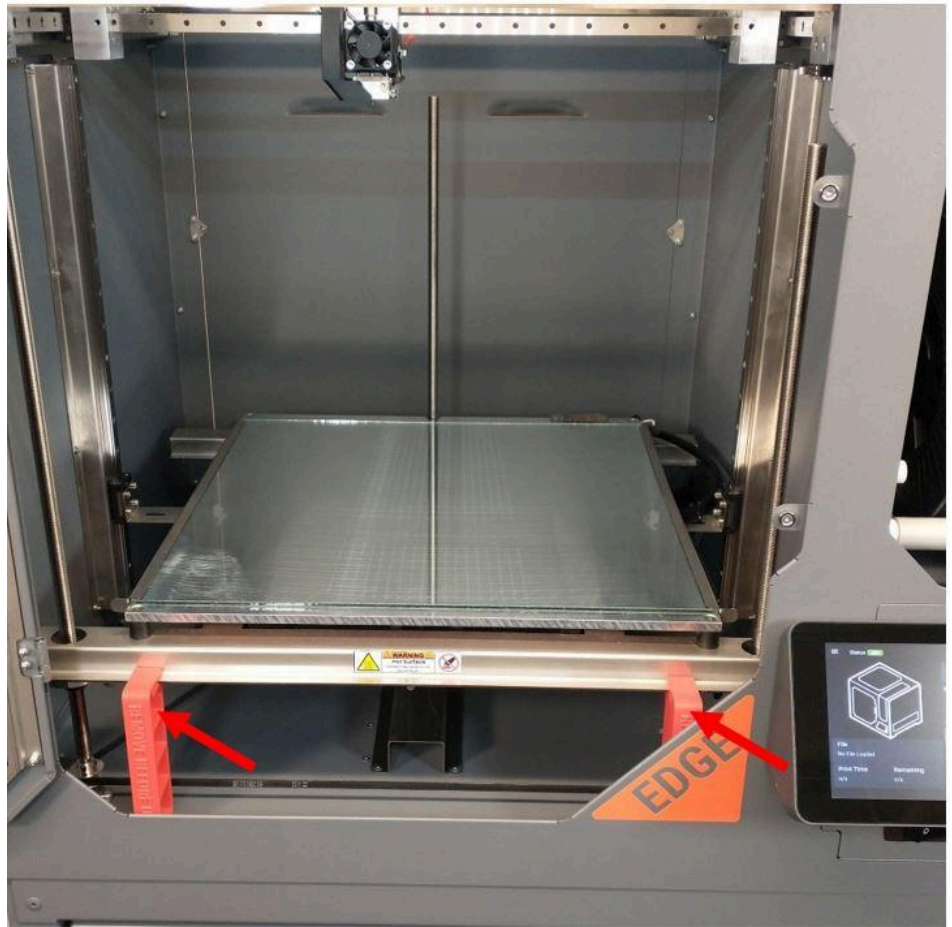

USE LIFT POINTS EACH SIDE

REMOVE PROTECTIVE FILMS

Remove the protective films from the following areas:
- Top window, both inside & outside
- Outside of front door
- Outside of filament bay door
- LCD screen

REMOVE SHIPPING FIXTURES

1. Open the main door. You will find 2 bright orange shipping fixtures supporting the Z axis.

2. Use the 2.5mm hex drive included in your operator's toolkit to unbolt the fixtures from the base of the printer.

REMOVE SCREW

3. Slide the fixtures off of the front edge of the Z axis. You may need to lift the Z axis slightly by moving the belt as shown in the picture.

PLEASE RETAIN THE FIXTURES WITH YOUR PACKING MATERIALS: You will need to reinstall them if you need to transport or ship your EDGE 3D printer in the future

INSTALL FILAMENT SPOOL ROLLERS

Remove the filament spool rollers from your toolkit and install them into the holders in the bottom of the filament bay as shown.

CONNECT POWER & ETHERNET

IMPORTANT NOTE FOR INTERNATIONAL CUSTOMERS
1. **FUSION3 IS UNABLE TO SUPPLY A POWER CORD FOR LOCATIONS OUTSIDE OF THE USA & CANADA DUE TO THE VARIETY AND TYPES OF PLUGS IN YOUR LOCATION. PLEASE SOURCE A 3-PRONGED DESKTOP COMPUTER PLUG (18 AWG)**

2. **YOU WILL NEED TO CHECK THE INTERNAL POWER SUPPLY'S VOLTAGE SELECT SWITCH BEFORE POWERING ON YOUR EDGE. PLEASE CONTACT FUSION3 SUPPORT FOR ASSISTANCE.**

DO NOT POWER ON YOUR 3D PRINTER ON WITHOUT PERFORMING THESE STEPS!

To connect the power cord:

1. Make sure the power switch on the front of the machine (under the LCD) is set to "O" or "off".

POWER SWITCH OFF

2. Open your operator's toolkit and locate the power cord.

3. Insert the power cord into the power outlet on the back of your printer.

4. Insert the other end into a wall outlet capable of delivering 6 amps continuous power.

5. (Optional) Insert an ethernet cable to connect your printer to your wired network. If you wish to use the onboard WiFi, configuring your network is covered later.
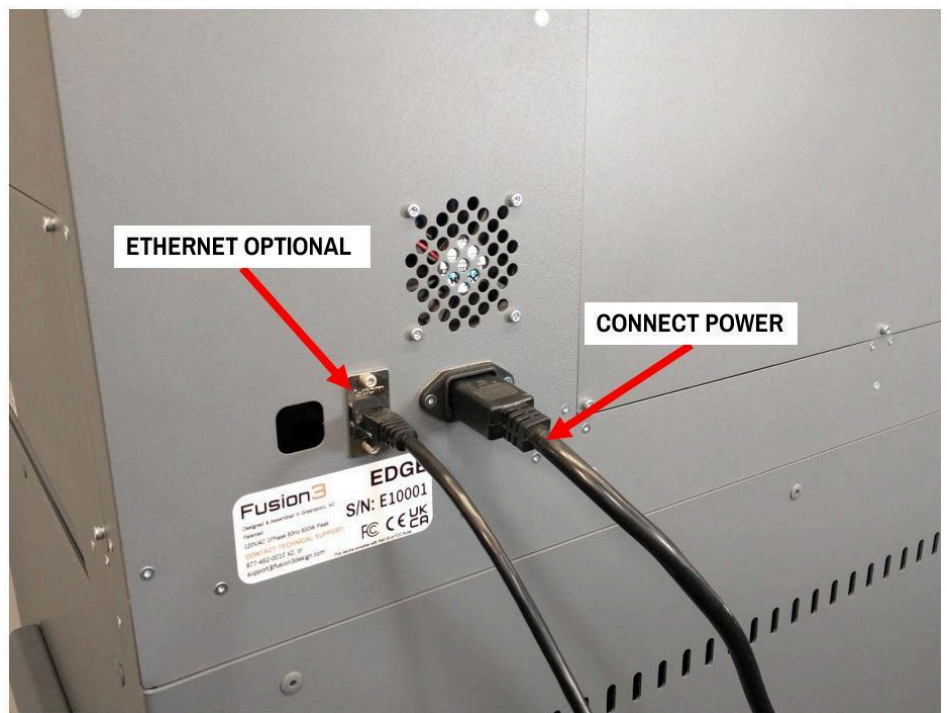
FIRST POWER UP

1. Press the power switch to the "on" or "I" position. Your printer may take 1-2 minutes to boot fully.

2. A "first run" wizard will walk you through checking all the printer's functions and making sure everything is working correctly. This should take less than 10 minutes, but it's very important you do not skip it!

IMPORTANT: If you encounter a problem during this first run script, contact Fusion3 Customer Support. PLEASE DO NOT attempt to bypass or fix an issue yourself; what has likely happened is related to shipping damage and we want to make sure we completely and thoroughly fix the problem for you.

3. Once the script completes, you will see the main status screen on the LCD.
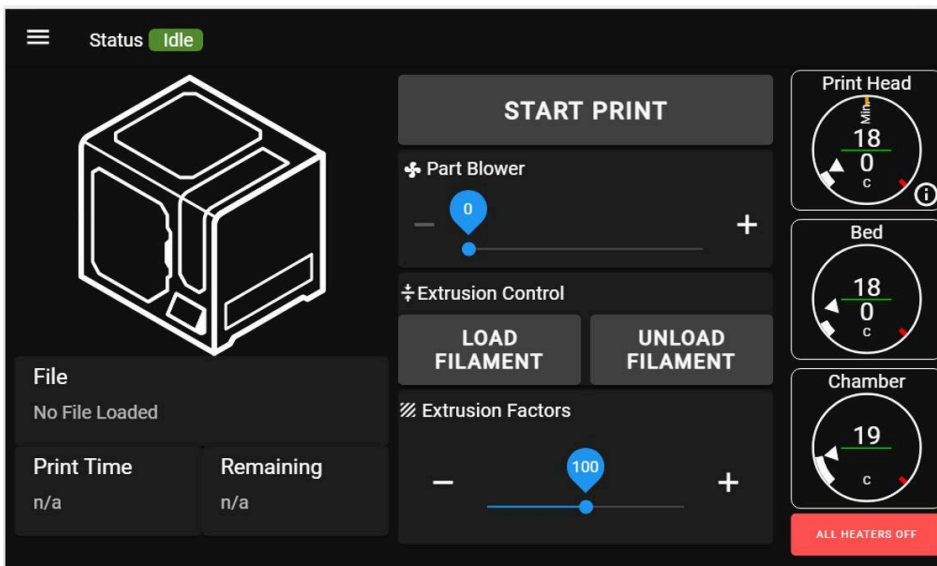

LOAD FILAMENT & PREPARE THE PRINT BED

Please refer to the *Loading Filament* section for instructions on loading filament.

Please refer to the *Cleaning & Preparing the Bed* section for instructions on preparing the bed for printing.

Make sure the main door is closed. By default, you cannot start a print with the main door open, for safety.
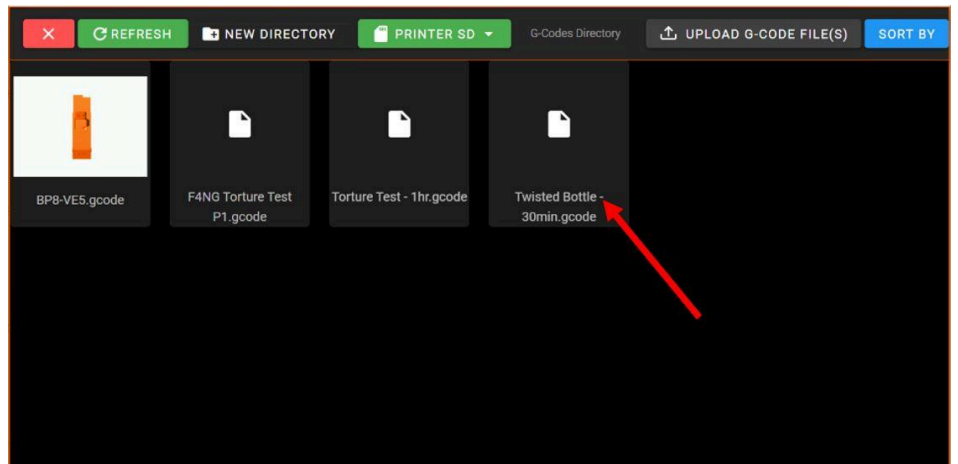
FIRST PRINT

On the main screen on the LCD, select the "Start Print" button. You will see a dialog box with all of the gcode files available to print on it.
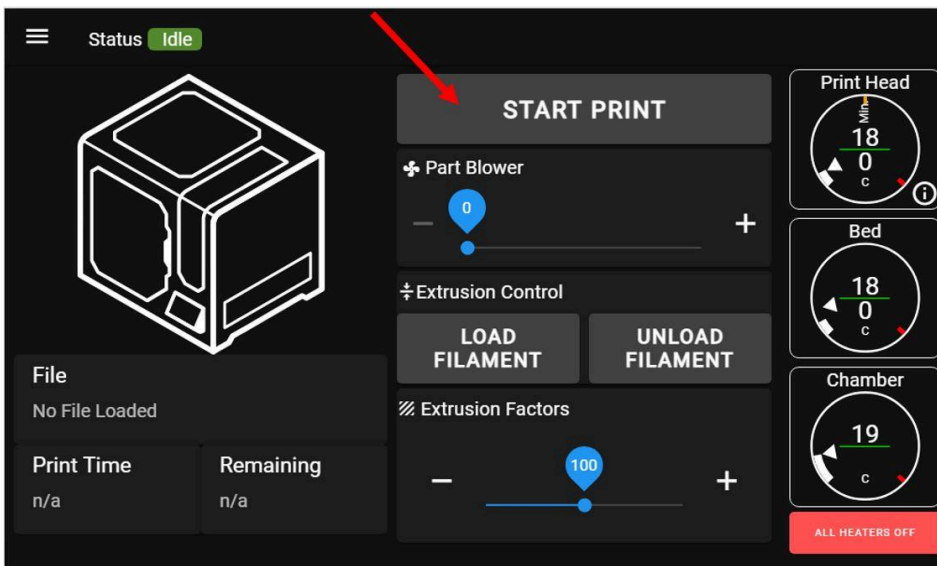
Select one of the pre-sliced files from the list. These are all sliced for the roll of filament we sent with your printer (ABS).


Confirm that you want to start the print.

NOTE: The exact files you see on your printer will vary from the ones in the picture. Select any file you want.
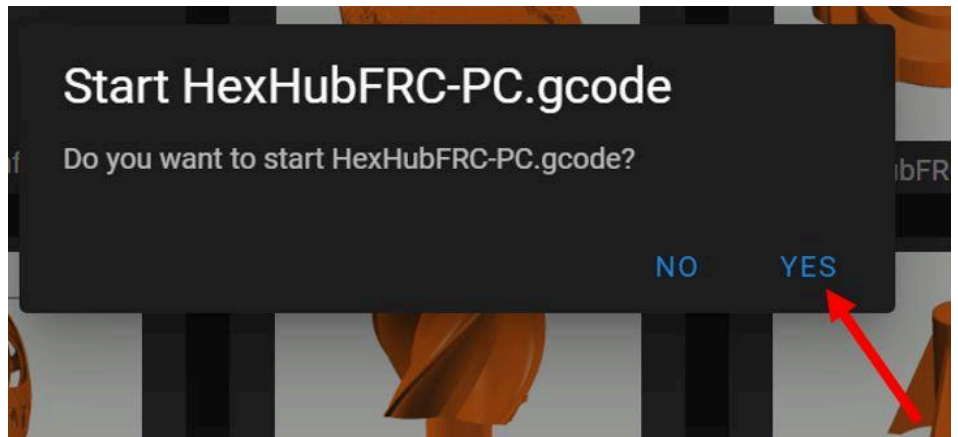
Your printer will begin the print, but it may seem like nothing is happening at first. Here's the beginning of print sequence:

1. The bed heats to its target temperature. Nothing else will happen until the bed is up to temperature. You will see the bed temperature gauge pulse orange to indicate it's heating, and the UI will transition to its print progress screen. For ABS, heating the bed for the first time may take up to 20 minutes.
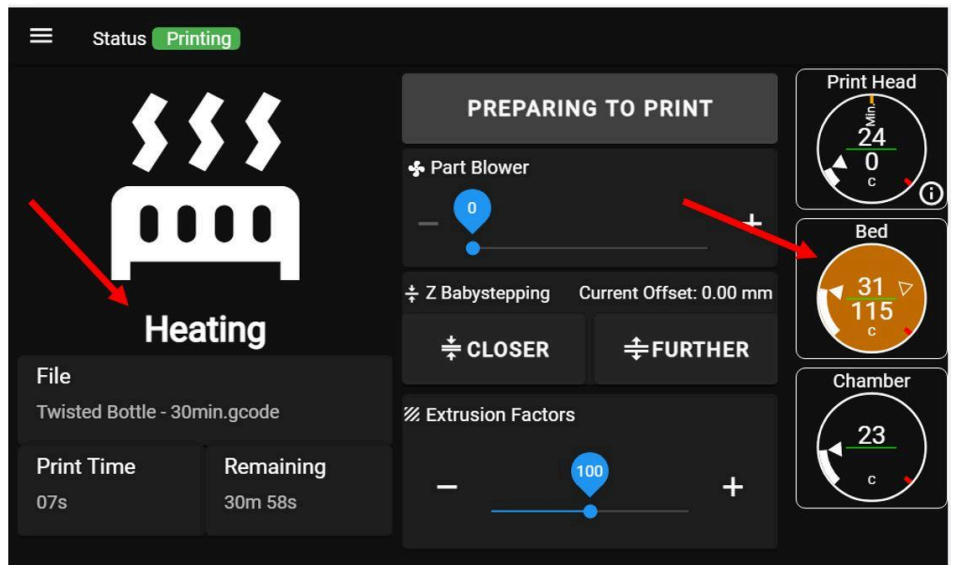
2. Once the bed is up to temperature, the printer will home its Z, Y, and X axes, in that order.

3. The printer will perform a self-calibration and bed leveling routine to ensure the bed is level and the first layer height is correct. The print head will come up to temperature during this sequence. Watch the screen for status updates and information on what the printer is doing.

4. Once the bed probing is complete, the print head will move to the front left corner, extrude some filament in free air to prime the extruder, then the print will begin.

5. At the end of the print, the print head will move to the back-left corner and the bed will drop to the bottom to make part removal easier.

6. For more information on part removal, see the *Cleaning & Preparing the Bed* section.

NOTE: If you open the main door during a print, the printer will automatically pause the print for safety. To resume a print, close the main door and select "Resume" on the control panel.

EDGE - LOADING FILAMENT

How to load filament into your EDGE 3D printer

1. Depending on the size of the spool, adjust the rear spool roller to fit the size of spool you are loading.
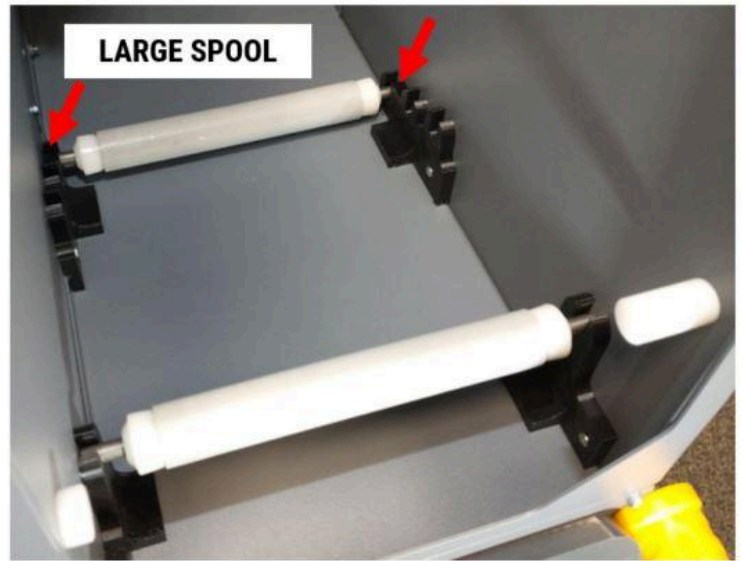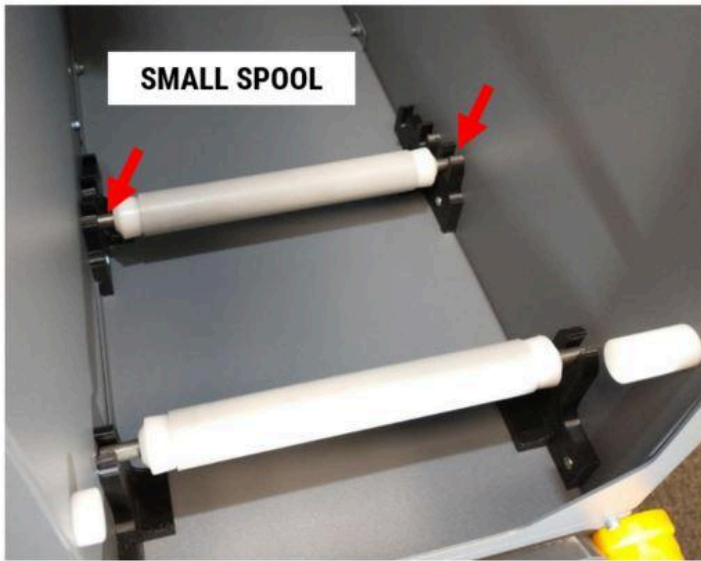

2. Place the filament spool onto the rollers with the free end of filament paying off the front and pointing up.

IMPORTANT: NEVER allow the free end of the filament to get loose and out of control. When this happens it can wrap under itself on the spool and cause a tangle later. This is rarely obvious immediately after it happens, and inevitably shows up in the middle of a 20+ hour print job and causes a feed issue.
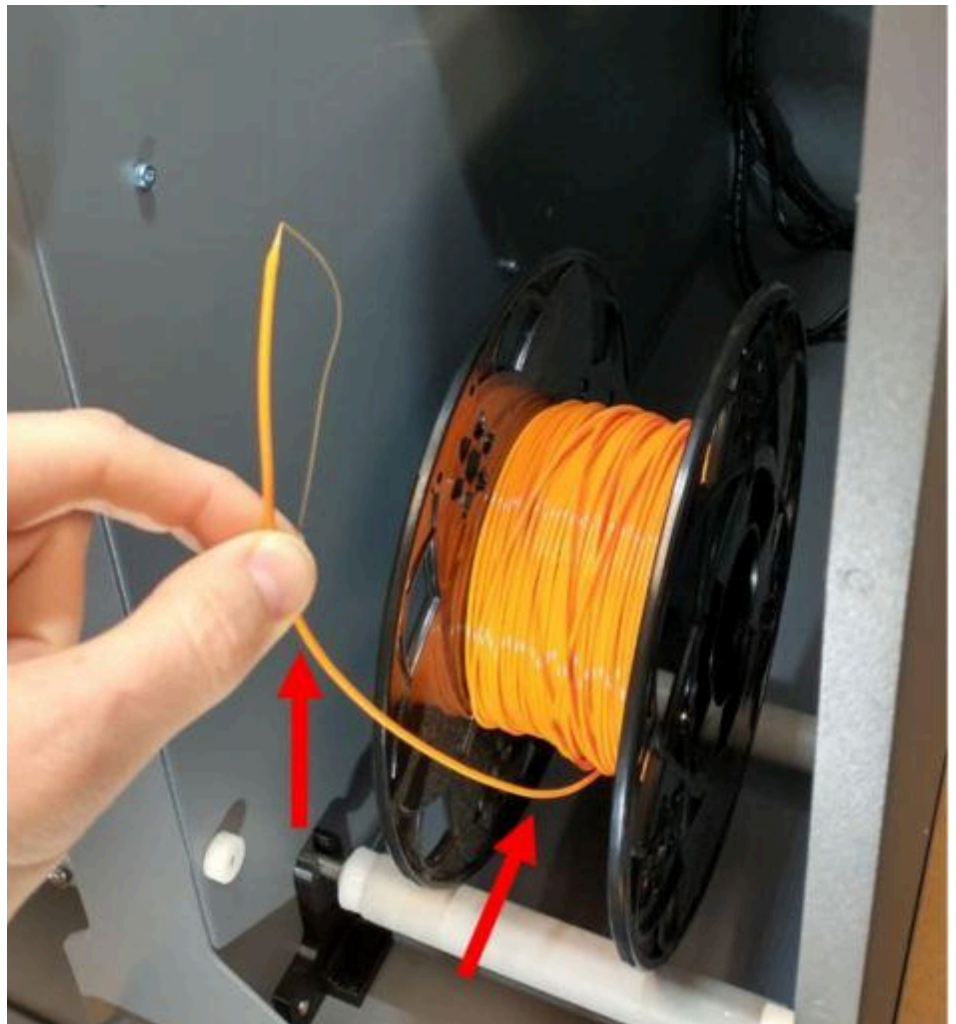
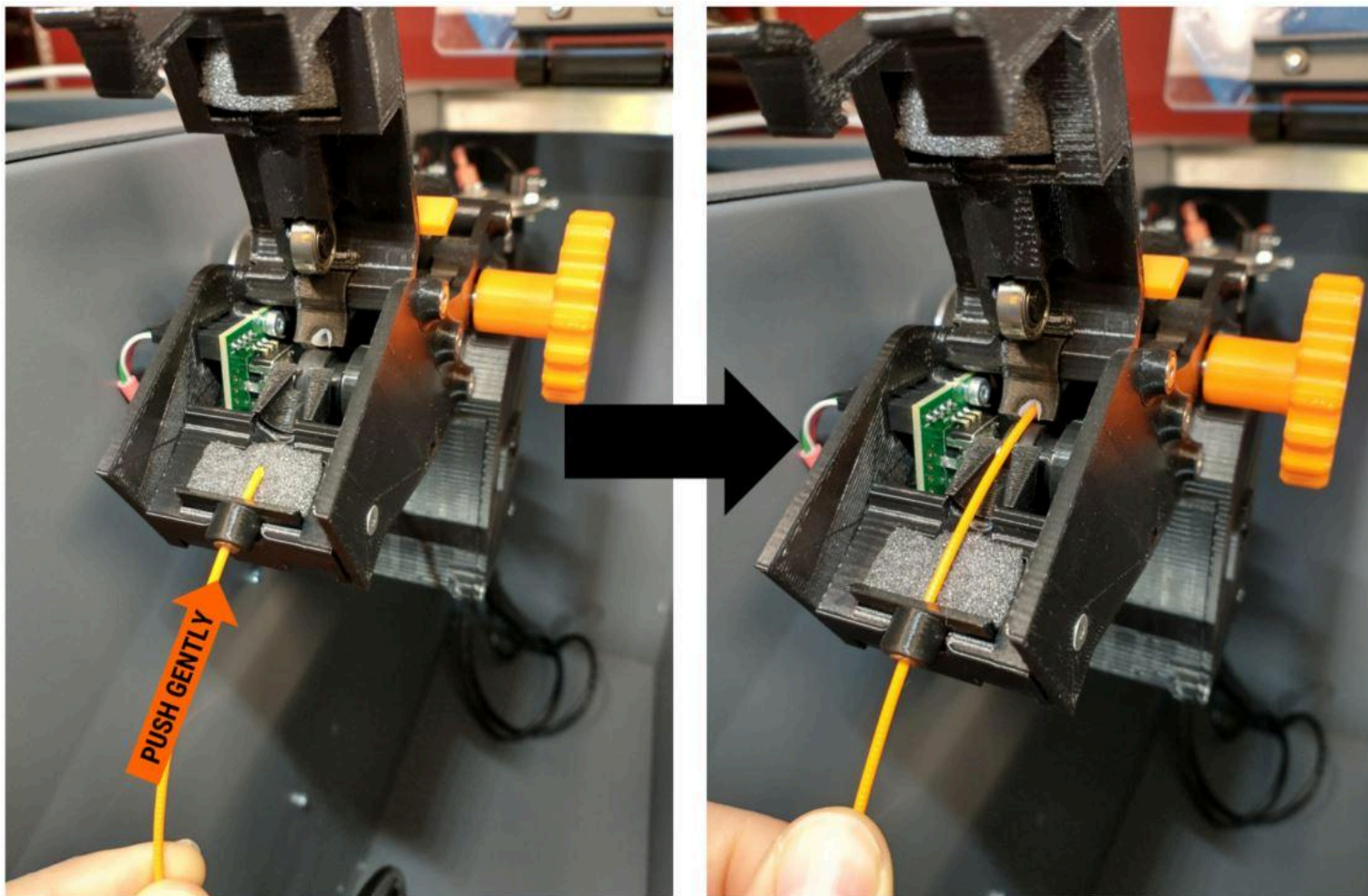3. Open the filament monitoring door on the extruder.
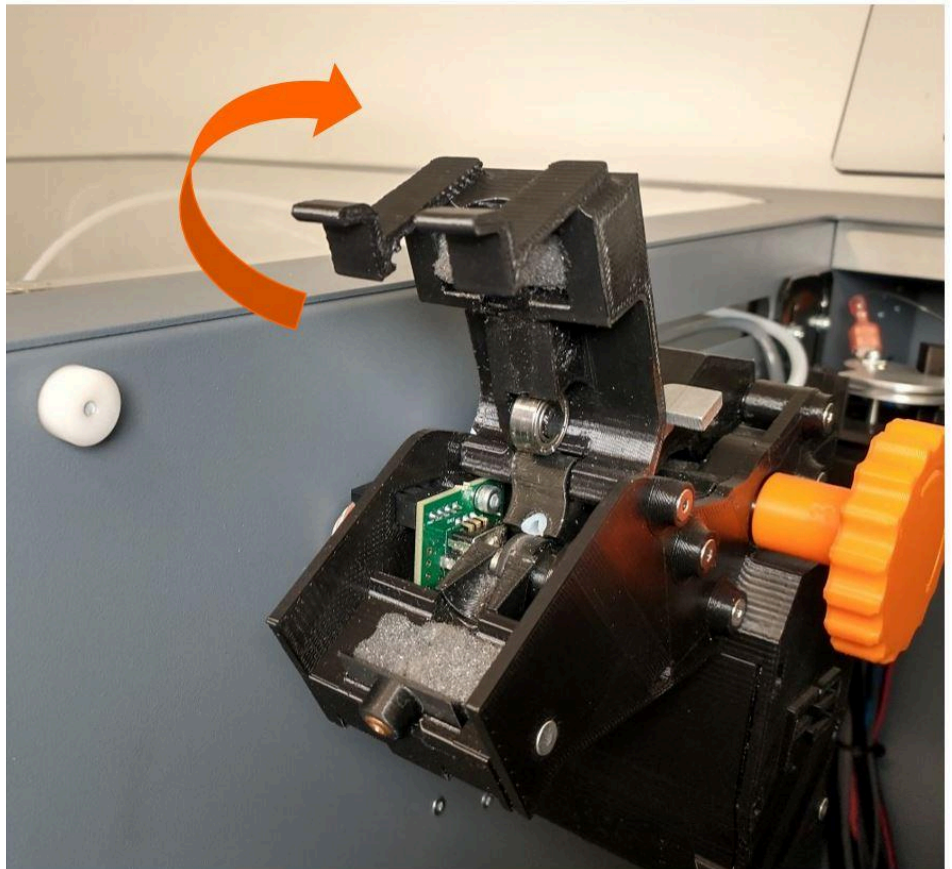
4. Loosen the free end of filament from the spool. Trim the end at a diagonal as shown.
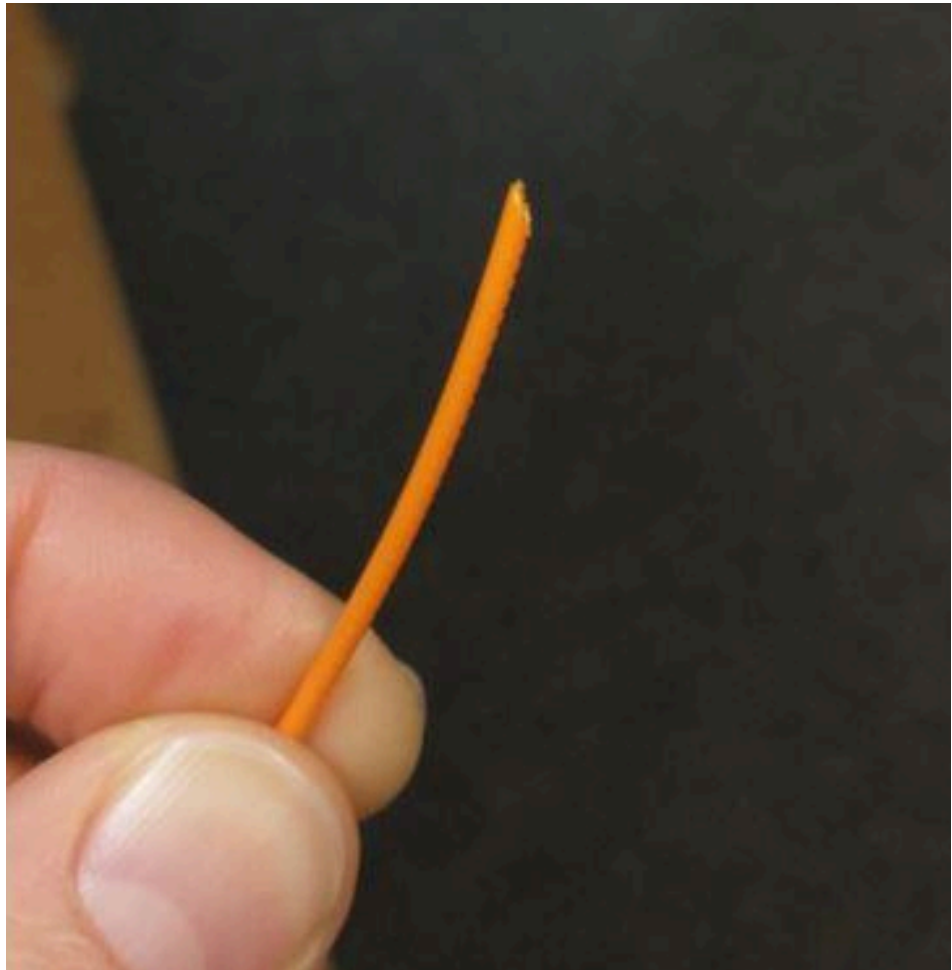
5. Feed the end into the extruder, through the inlet guide, over the wiper, over the monitoring wheel, and into the liner. Gently push until you feel it bottom out.


6. Grasp the manual advance knob on the side of the extruder, and rotate it slowly away from you as you continue to push on the filament. You should feel the feed gear engage the filament. When this happens, the idler bar will shift up slightly.
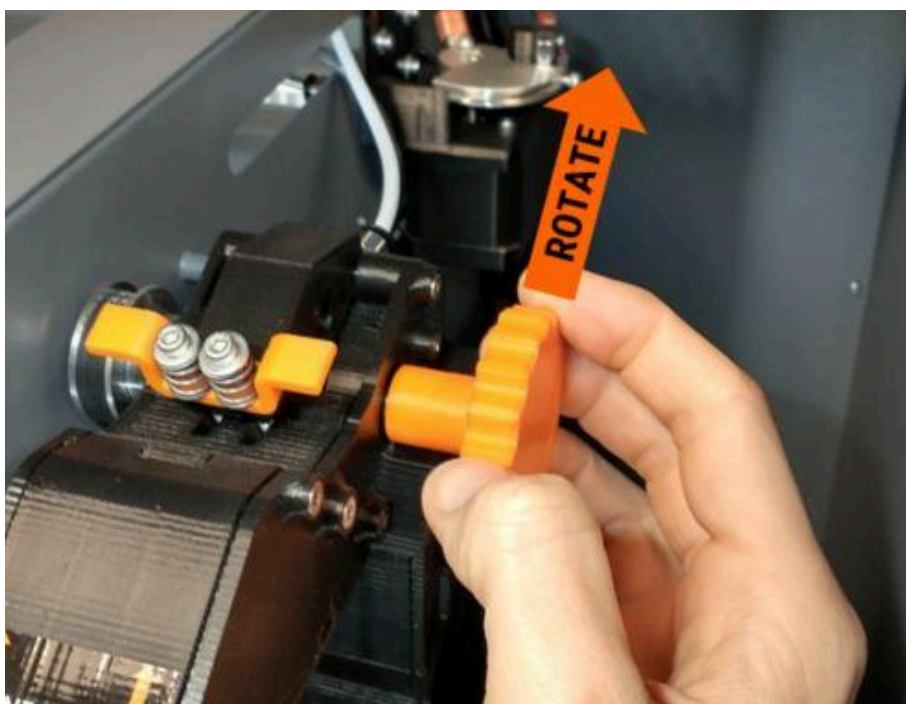
7. Continue to turn the manual advance wheel until you see the filament protrude into the bowden tube at the exit of the extruder. You need to see 1.5-3 inches protruding into the tube.
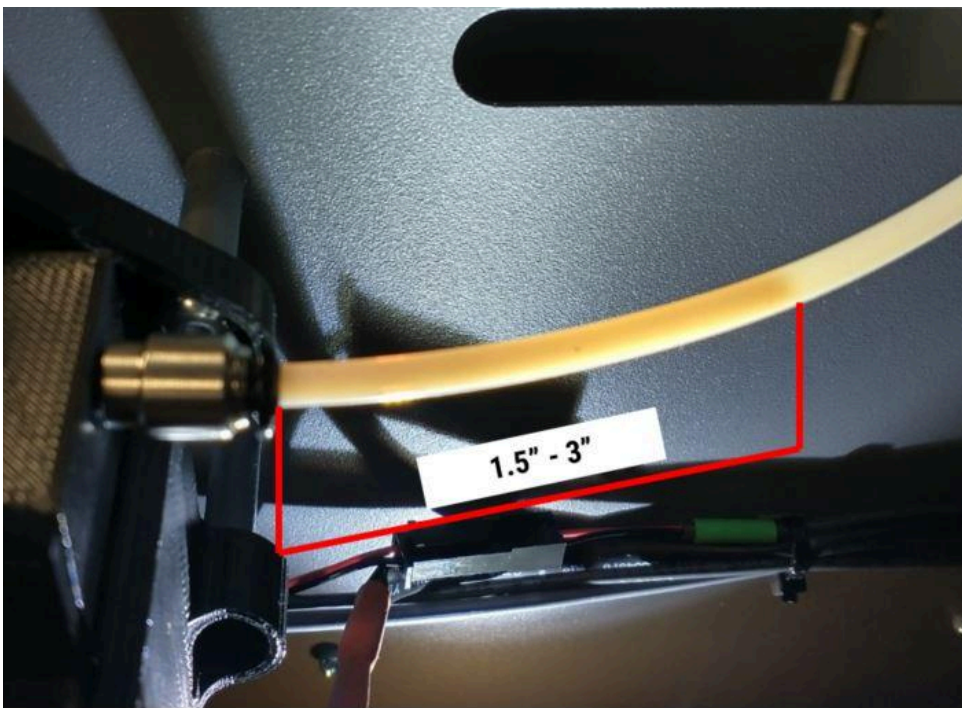

8. On the control panel, select the "Load Filament" button on the main screen. The printer will begin its load filament sequence by heating the head and moving the bed down away from the print head. It can take 1-2 minutes to heat the print head and it will look like nothing is happening; please be patient.
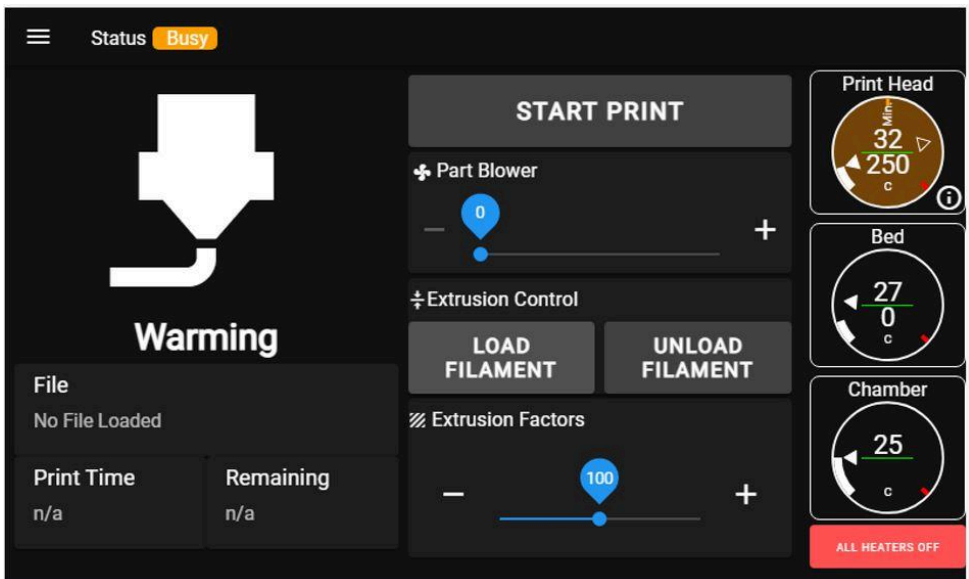
9. Once the head is up to temperature, the extruder will begin to feed filament through the tube and up to the print head. Once the filament reaches the print head, it will extrude out several feet to clear out any old material that might be loaded into it.

10. After the load is complete, the extruder will reverse slightly and the print head will shut off. **CAUTION**: The head will remain hot for several minutes.

11. Remove the string of filament from below the print head.
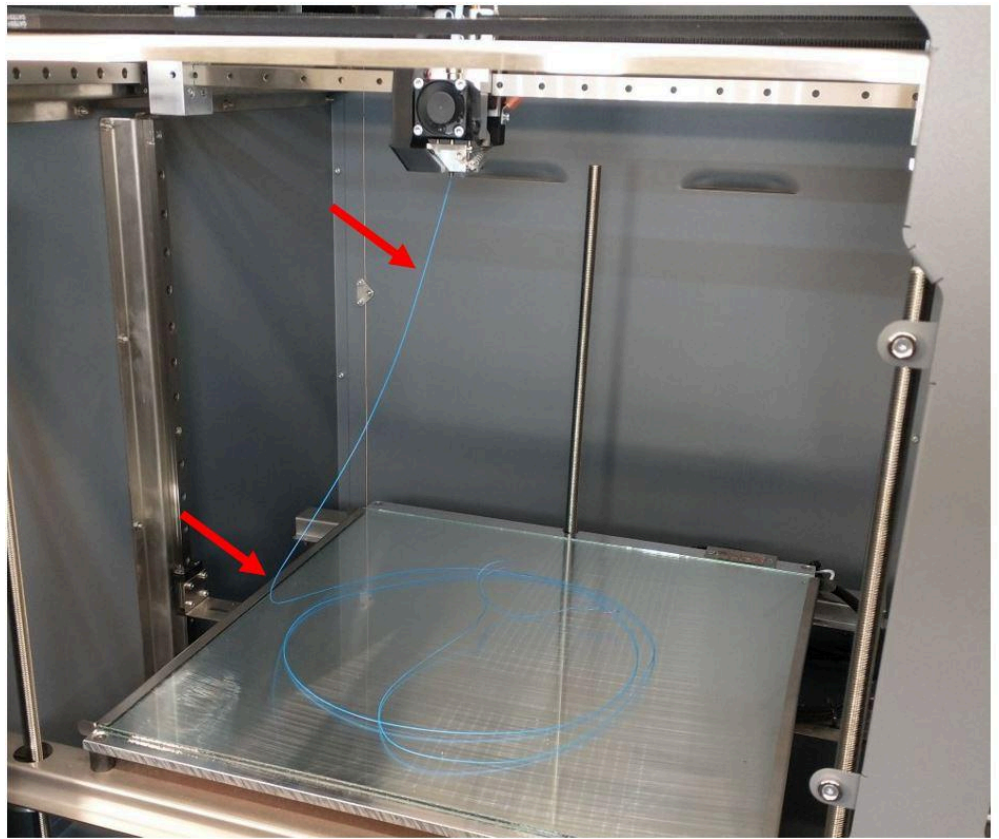
IF YOU ENCOUNTER ISSUES LOADING FILAMENT

In most circumstances you do not need to open the idler bar to load filament. If you encounter stiff resistance and the filament stops feeding into the extruder, then you should open the idler bar and make sure the filament is passing over the feed gear correctly.

SPECIAL CASES: FLEXIBLE FILAMENTS

Flexible filaments (TPU, TPE) are more prone to issues during the load filament sequence, since they are so flexible.

In some cases you may need to feed these up to the print head manually instead of using the automatic sequence. Simply manually heat the print head and use the manual advance wheel to advance the filament up through the bowden tube.

If you're changing from a high temperature material (such as PC, PC-PBT) to a flexible, this is a situation where your odds of encountering a misfeed are higher. One workaround is to load PLA, then unload it, then load your flexible.
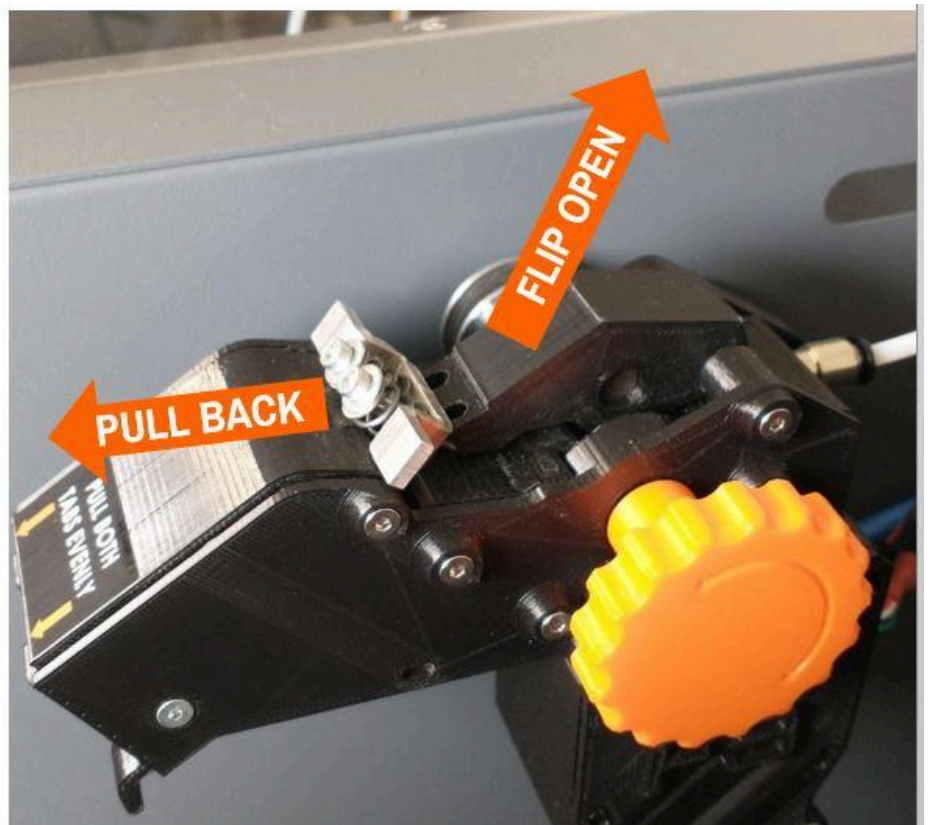
USING THE EXTRUDER

How to use EDGE's extruder

TO OPEN THE FEED SECTION

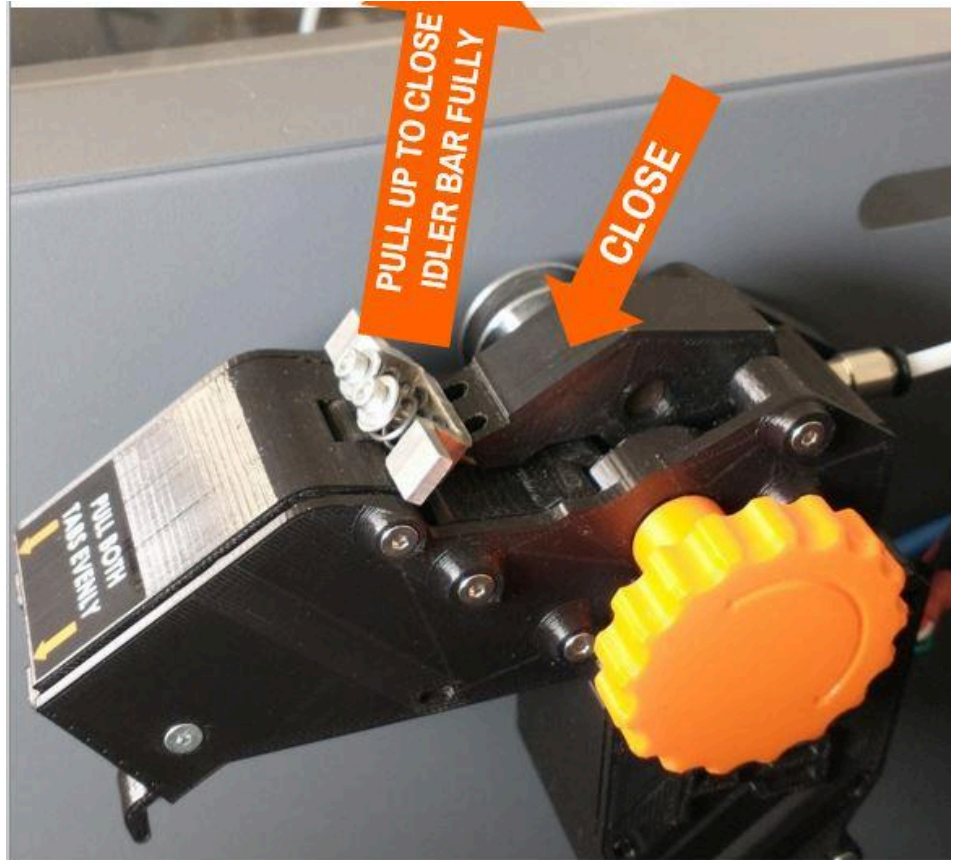1. Pull up on the spring grabber to relieve the spring tension.

2. Pull the spring grabber towards yourself to slide the springs off of the idler bar.

3. Now open the idler bar to expose the feed gear.

TO CLOSE THE FEED SECTION

1. Close the idler bar.

2. Lift up on the spring grabber and pivot the grabber + springs over the end of the idler bar.

3. If it won't slide easily, pull up more on the spring grabber.
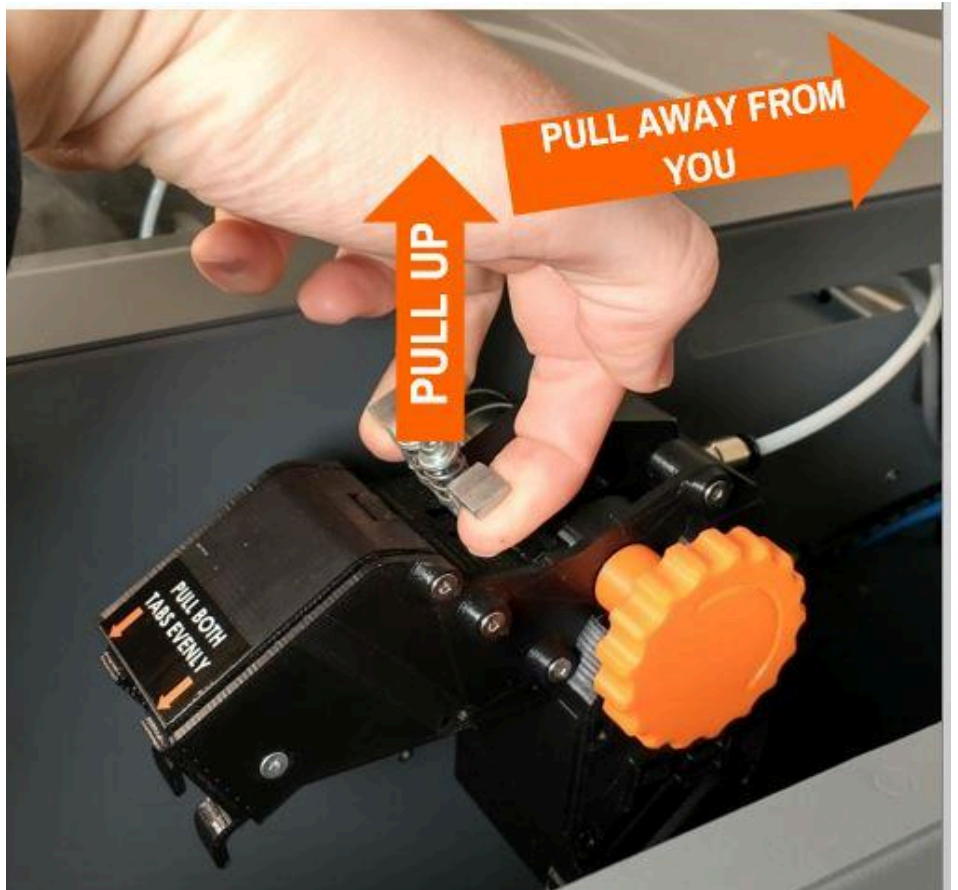
4. Make sure the spring grabber is fully seated against the step in the idler bar.

SPRING GRABBER SEATED ON CHIN
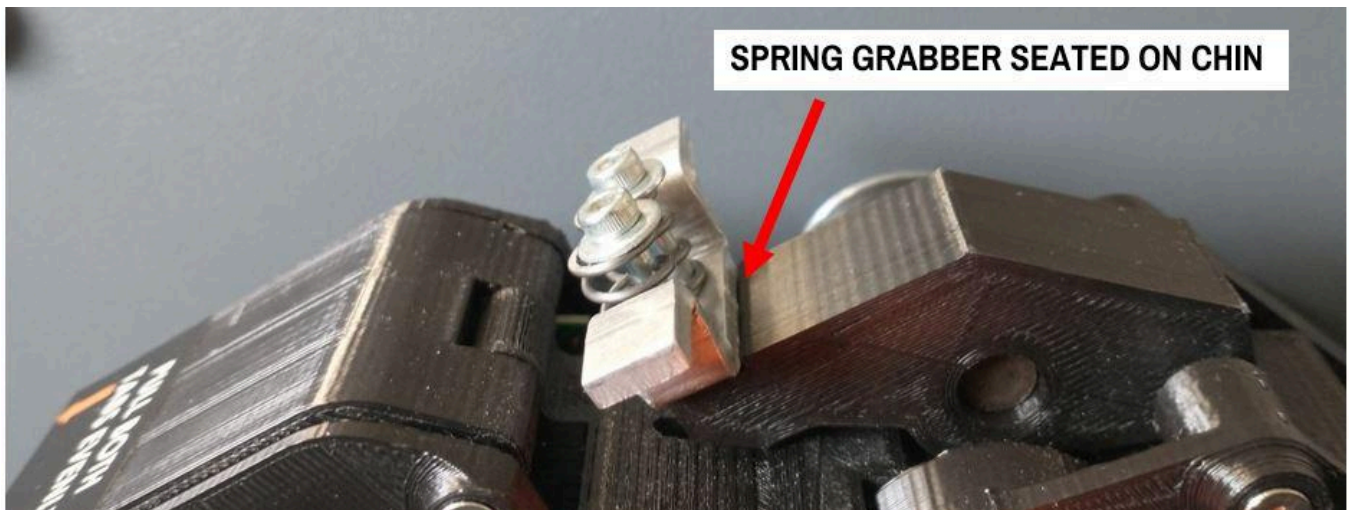
TO OPEN THE FILAMENT MONITORING DOOR

1. Use 1 or 2 fingers to pull the release tabs slightly toward yourself.

2. Apply upward pressure to the door. It will swing up as soon as you fully disengage the latches.

LIFT DOOR

PULL BOTH TABS EVENLY

PULL TABS
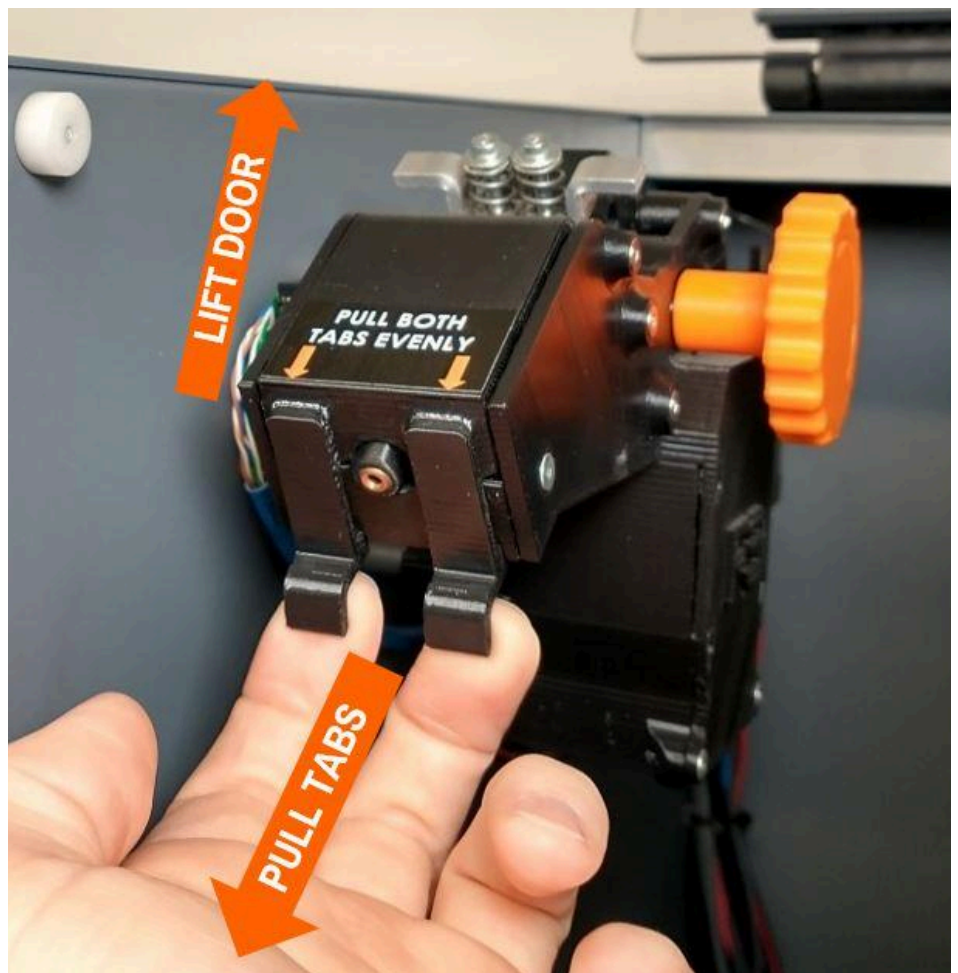
TO CLOSE THE FILAMENT MONITORING DOOR

1. Rotate the door down.

2. Apply gentle downward pressure until you feel the latches click into place. The door should be flush with the top surface of the rest of the extruder when fully closed.

PUSH CLOSED

DOOR FLUSH WITH BODY

LATCHES WILL "CLICK"
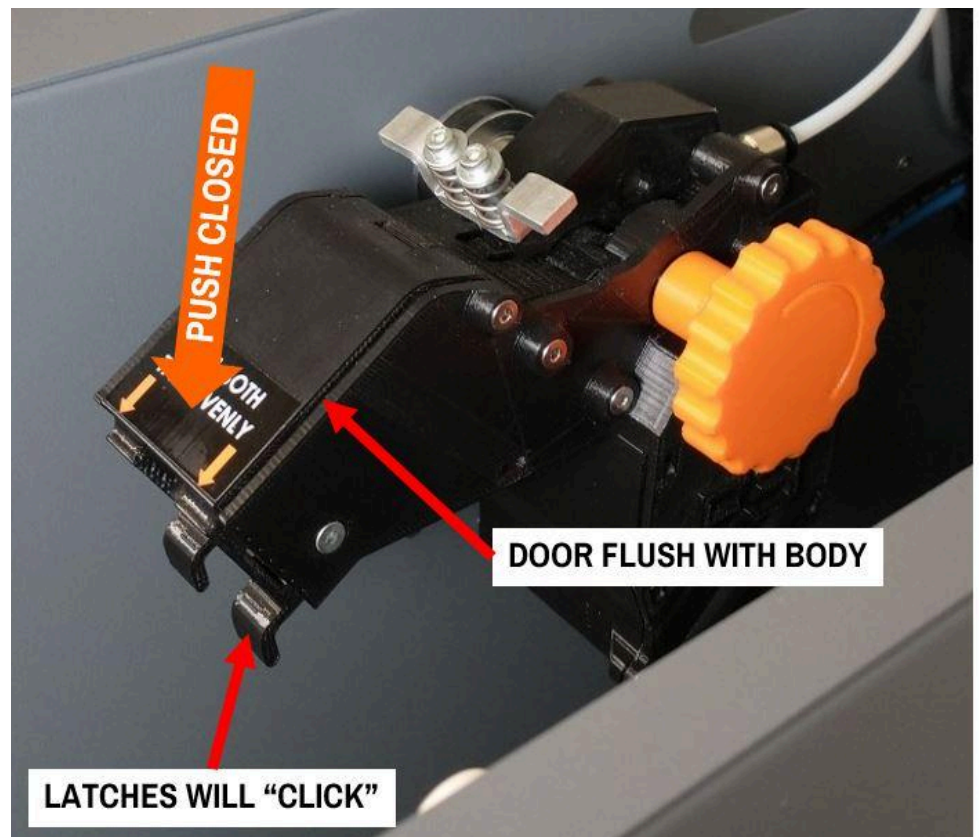
How to clean & prepare the print bed on your EDGE 3D printer

BEFORE EACH PRINT

Your print surface must be prepared before each print. Different print surfaces require different procedures. Here is information on the standard glass print surface, and general pointers for the interchangeable surfaces.

GLASS PRINT SURFACE (standard)

General Notes:

- The print bed should be cleaned after every print.
- Do not reuse a bed coating for more than 1 print. Doing this can lead to adhesion issues and print failures.
- All Fusion3-recommended bed coatings are water-soluble to make cleanup easy and safe.

To Clean The Glass Print Surface:

1. Remove the print skirt from around where the object was printed.
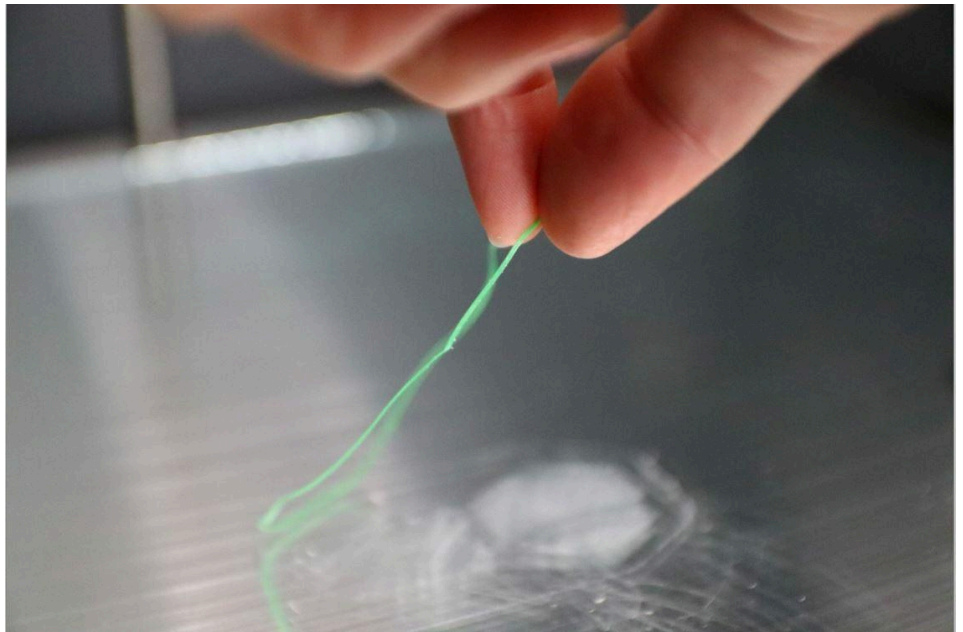
2. Remove the priming wipe from the front of the bed and any other remaining plastic left on the bed.

3. Spray the surface of the bed with enough water to wet through and soften the bed coating.

4. Using your parts scraper, scrape the coating off the bed (using your parts scraper reduces the paper towels needed).

5. Collect the water and scraped-off coating in a paper towel and wipe it off the bed. Repeat as needed to get all the coating and water off.

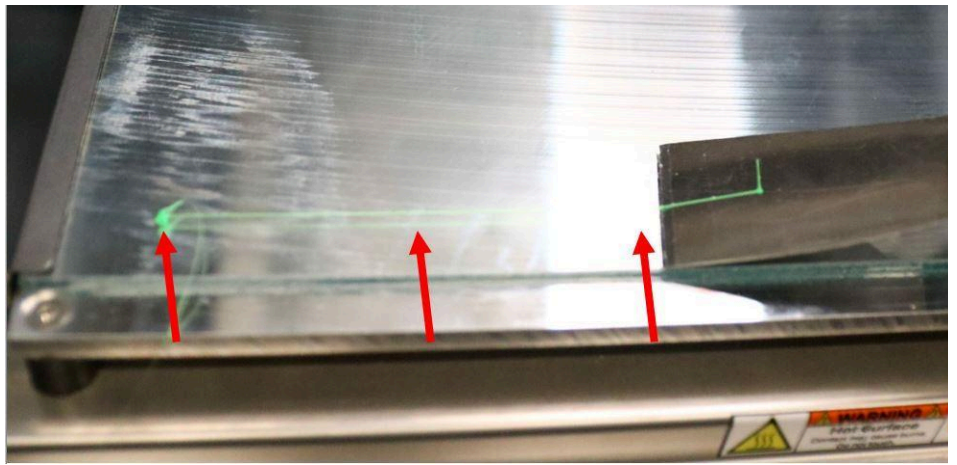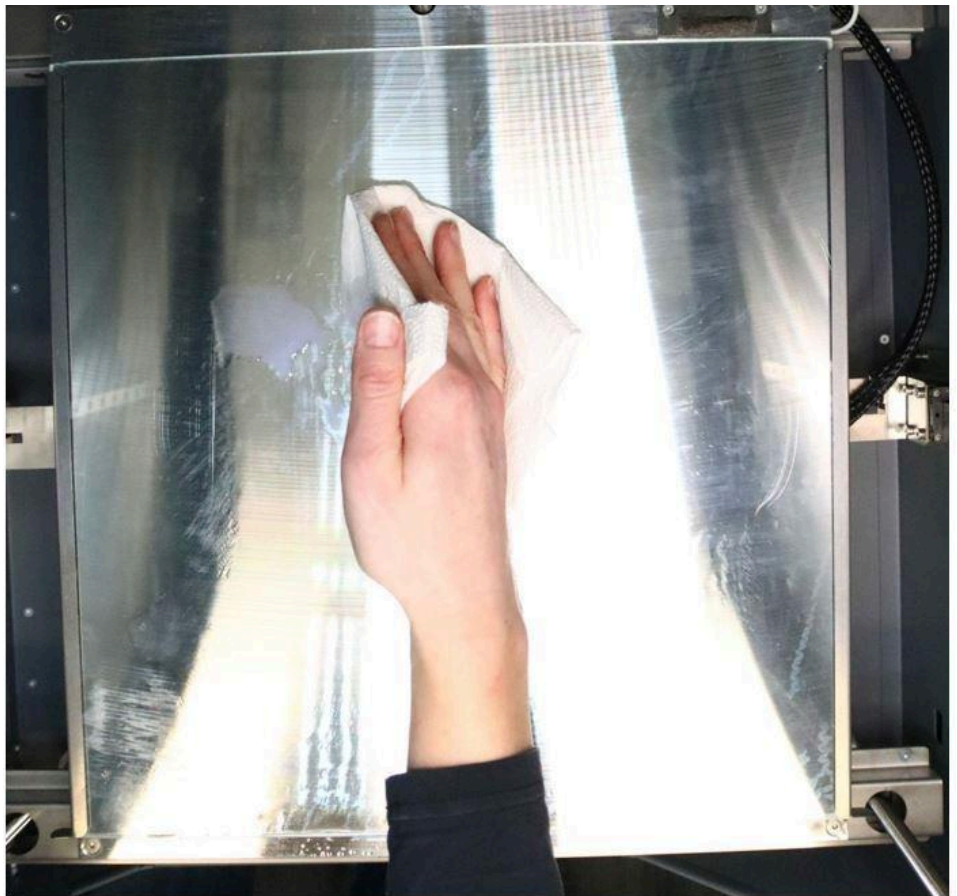6. If desired, you can remove the glass from the printer and clean it separately, but the basic steps are the same.

NOTE: If water gets between the glass and the tool plate, it's a good idea to remove the glass and wipe it up. Over time, water can deposit scale which is unsightly and can prevent good heat transfer between the tool plate and the glass.

Preparing The Surface For Printing:

NOTE: The exact preparation you need will depend on what material you're printing. We're going to cover the basics below, but if you have material-specific documentation that says something different, follow those instructions.

General Notes:
- Surface must be clean
- Surface must be dry; wait for all water residue to evaporate off of the glass after cleaning
- Surface must be less than 45 C. Applying the bed coating with the surface hotter than this will lead to poor first layer adhesion

Most materials will use 1 to 3 layers of purple gluestick applied to the glass.

1. Hold the gluestick at 90 degrees to the bed; it should stick straight up.

2. Apply only very light downward pressure during application; let the gluestick do the work.

3. Cover the area your print is going to need with back-and-forth passes with the gluestick, like a 3D printer printing infill. You should have no gaps in your gluestick coverage.
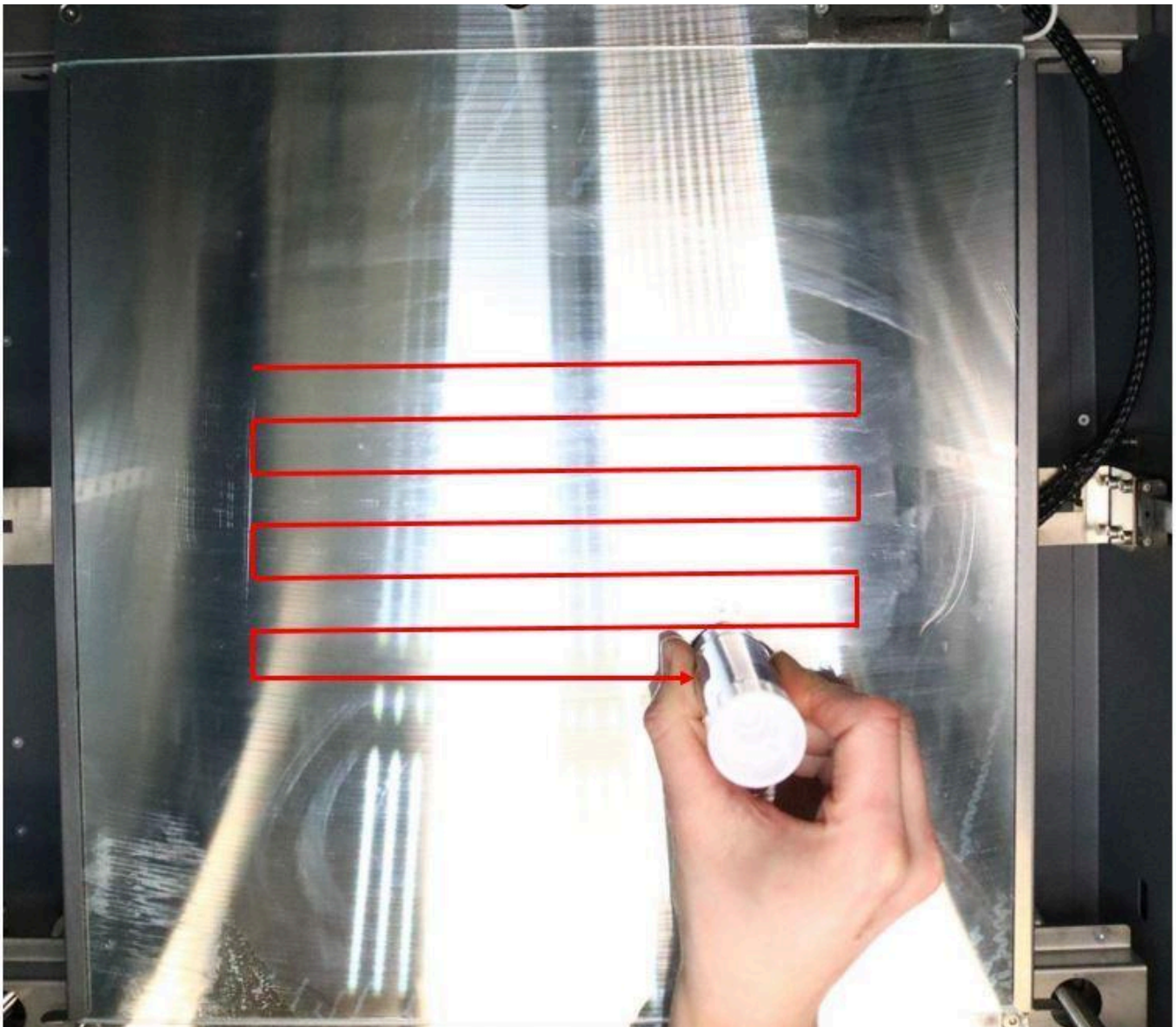
4. For materials that require more than 1 layer of gluestick, apply the subsequent layers at 90 degrees to the previous layer.

What Bed Coating to Use?
- For most materials, Fusion3 recommends purple gluestick like the one including with your toolkit.
- Please refer to the Fusion3 Certified Materials list where we provide a recommended number of layers of glue stick to apply for each material
- For a given material, if you don't have information about bed coatings, assuming 2 layers of purple gluestick.
- For polycarbonate and PC-blends, we recommend Magigoo-PC (NOTE this is NOT normal Magigoo).
- For nylons, gluestick works well, but Magigoo-PA is also fine to use.

General Adhesion Rules:
- **If you need more adhesion,** decrease gluestick layers; minimum of 1; OR try magigoo; increase bed temperature by 5 C
- **If you need less adhesion:** add a gluestick layer; decrease bed temperature by 5 C

REMOVABLE FLEXIBLE BED SURFACES (optional accessory)

If you purchased the magnetic tool plate option, you have the option to use a wide variety of print surfaces that can be laminated to thin steel sheets, which are magnetically attached to the tool plate.

Note: Fusion3 considers these surfaces to be an 'expert' option and our ability to provide technical support is extremely limited. Customers should be self sufficient or contact the manufacturer of the specific print surface product for technical or warranty assistance.

- Some of these surfaces are sold by Fusion3; many more are available on the open market.
- In general, these surfaces should not need a coating applied to them.
- In general, to clean them these surfaces should be wiped down with water or rubbing alcohol.
- Refer to the surface's specific documentation or contact the manufacturer for more information or warranty assistance.

CARE OF THE TOOL PLATE

With both the standard and magnetic tool plates, periodically wipe down the surfaces with water or rubbing alcohol.

When you install a surface(glass or flexible), make sure both mating faces have no debris on them that could a) damage the tool plate, b) cause poor heat transfer between the plate and the surface, c) cause a non-flat print surface.

CAUTIONS, WARNINGS, & OPERATING NOTES

How to avoid injury or damage to your EDGE printer during operation or servicing.

UNATTENDED OPERATION

NOTE: PLEASE NEVER RUN YOUR FUSION3 3D PRINTER UNATTENDED

While EDGE is highly reliable and includes many safety features, as with any 3D printer or machine tool, there is still a requirement to properly monitor your equipment in the event of an unforeseen combination of circumstances that could cause hazard to property or life. *Damage due to unattended operation may not be covered under your warranty!*

Please always ensure someone is available to monitor your printer (in person or remotely via webcam) and can intervene if a print job fails for some reason. This means if you are monitoring the printer remotely, you need to have systems in place to a) allow you to pause or stop a print job in progress via the interface, or b) cut power to the machine as a way of halting a print.

HOT COMPONENTS PRESENT DURING OPERATION

During normal operation, EDGE contains several components that get hot enough to cause severe burns if you come in contact with them. These components are:

- The print head
- The print bed
- The X, Y, & Z motors

We recommend you keep all EDGE doors and windows closed during operation to increase safety (and improve print performance).

EDGE will automatically pause the print if you open the main door during a print. HOWEVER, this will not eliminate the risk of contacting hot components if you reach inside the machine. USE CAUTION.

ELECTRICAL SHOCK HAZARD

Your EDGE contains some components that operate at 110V AC. These components are all located in the enclosed electronics bay. If the service door is removed while the equipment is powered on, a shock hazard will be present. We strongly recommend you leave the service door in place if the equipment is plugged in and/or operating. If you need to service the components in the electronics bay, please unplug the power cord and wait 10 minutes before performing any work.

UNAUTHORIZED MODIFICATIONS

Performing modifications or changes to your EDGE 3D printer beyond what is covered in Fusion3's documentation, or recommended by Fusion3 Customer Support may result in all or part of your warranty becoming void. Additionally, these actions may make it difficult or impossible for Fusion3 to provide technical support for your printer.

IF YOU ENCOUNTER AN ISSUE

First, don't panic! EDGE has many features built in to detect or help us debug issues.

IF YOU ENCOUNTER AN ISSUE DURING A PRINT

FIRST, pause the print. This stops whatever bad thing is currently happening and limits potential damage.

SECOND, determine if you need to cancel the print. Some fixes can be done with a print in progress, but some can't. And sometimes you need additional information or need to run tests that cannot be done with a print paused.

THIRD, check the console for error messages for information about what happened. This information is the starting point for determining what went wrong, and how to fix it. And if you need to contact Support, they're going to ask for this information.

IF YOU ENCOUNTER AN ISSUE PRE-PRINT

The most common issue you'll see is you started a print and it never actually started. Somewhere in the start-of-print sequence, EDGE saw something it did not like, and halted the print job before damage could occur.

FIRST, DO NOT try to restart the print right away.

SECOND, check the LCD for any pop-up messages that might tell you what happened. If you don't see any, check the console for additional error messages. Typically, these are descriptive enough that you'll be able to figure out what the problem is, and fix it.

For example, EDGE might tell you the bed was too out of level and needs to be re-leveled. The fix is to run the manual bed leveling wizard.

NEXT STEPS - LEARN MORE ABOUT YOUR NEW 3D PRINTER

Now that you've run your first print, here's a series of resources to help you set up the slicing software, and learn more about your new EDGE 3D printer.

VARIETY OF DOCUMENTS & RESOURCES AT THE FUSION3 WEBSITE

The Fusion3 website has a robust amount of Technical Support resources for your new EDGE 3D printer. An important area is the **EDGE Manuals & Downloads** page (*Support > Manuals & Downloads > EDGE 3D Printer*) which contains a number of different documents that detail the setup, use and maintenance of your EDGE 3D printer.

F3SLIC3R 3D PRINTING SOFTWARE

F3slic3r is Fusion3's open-source based free slicer. It's powerful, flexible, easy to use, and produces excellent prints. More information on the basics of using F3Slic3r can be found on the new user training page, in video 4.

INFORMATION ABOUT CONSUMABLES

Much like tires and windshield wipers on a car, EDGE has some components that are considered consumables and must be replaced on a regular basis. Learn more about them in the "*Information about Consumables*" support document.