LULZBOT®
TAZ
WORKHORSE

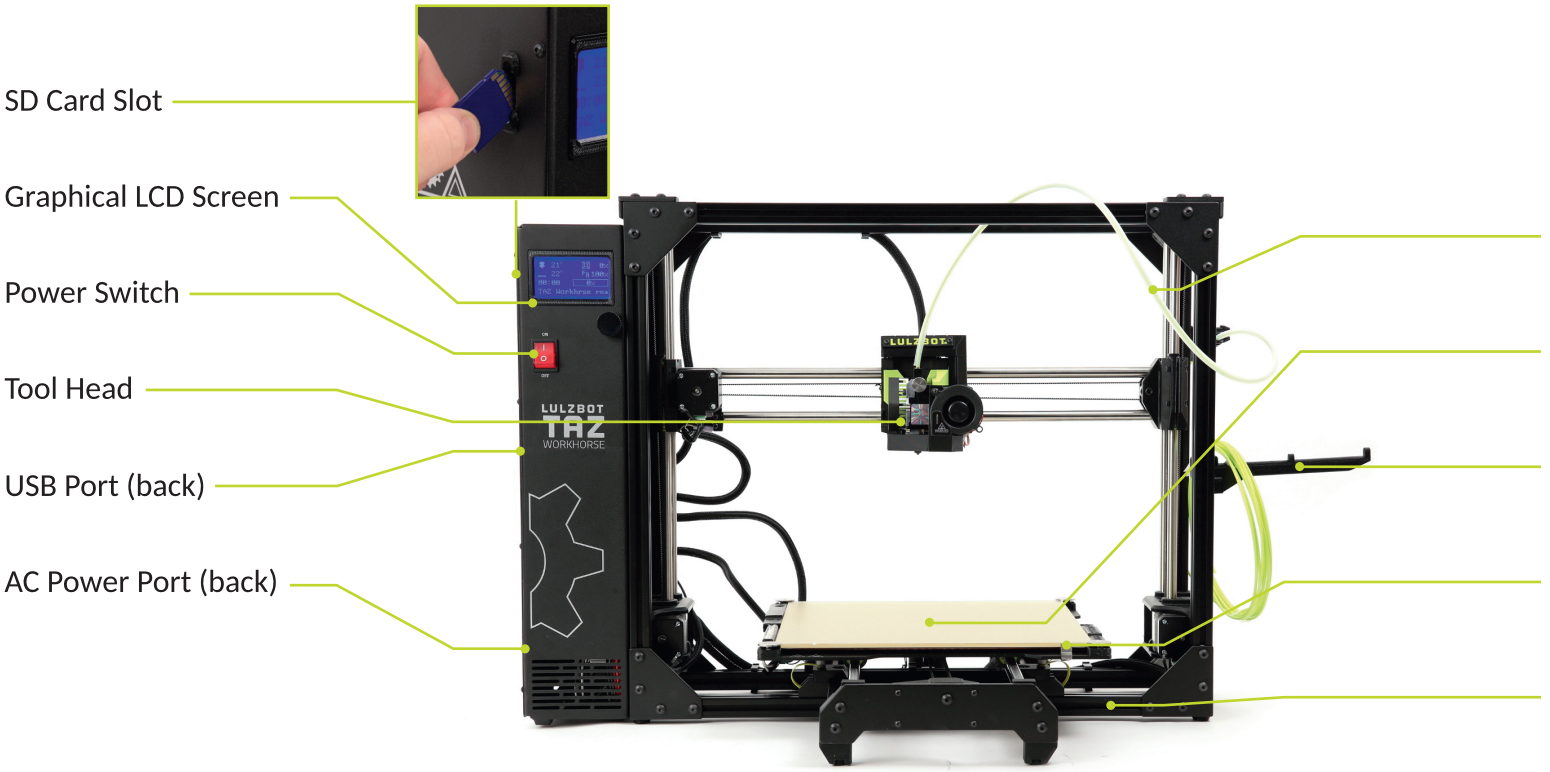
Welcome to the LulzBot Community

Thank you for choosing the LulzBot® TAZ Workhorse Edition 3D Printer. This Quick Start Guide will familiarize you with the proper use and operation of your TAZ Workhorse. By the time you finish, you will have completed your own calibration test on your new printer.

Complete documentation is available online at ***LulzBot.com/downloads.*** *If you have questions while setting up your LulzBot TAZ Workhorse, please contact our technical suppot team by emailing* ***Support@LulzBot.com*** *or calling* ***+1 (970) 377-1111****. Learn more at* ***LulzBot.com/Support****.*

Read the included User Safety Sheet completely before beginning the Quick Start Guide.

1 LulzBot TAZ Workhorse Key Components



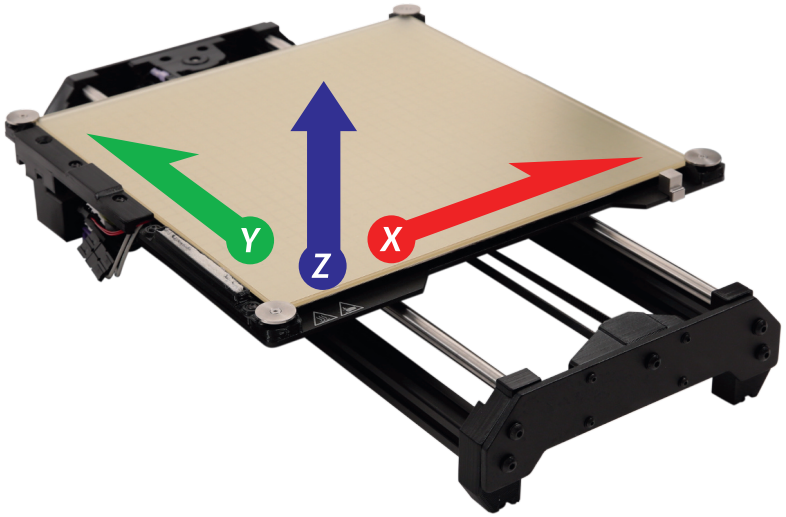
Filament Guide Tube

Modular Print Bed System

Filament Holder

Automatic Calibration Cube

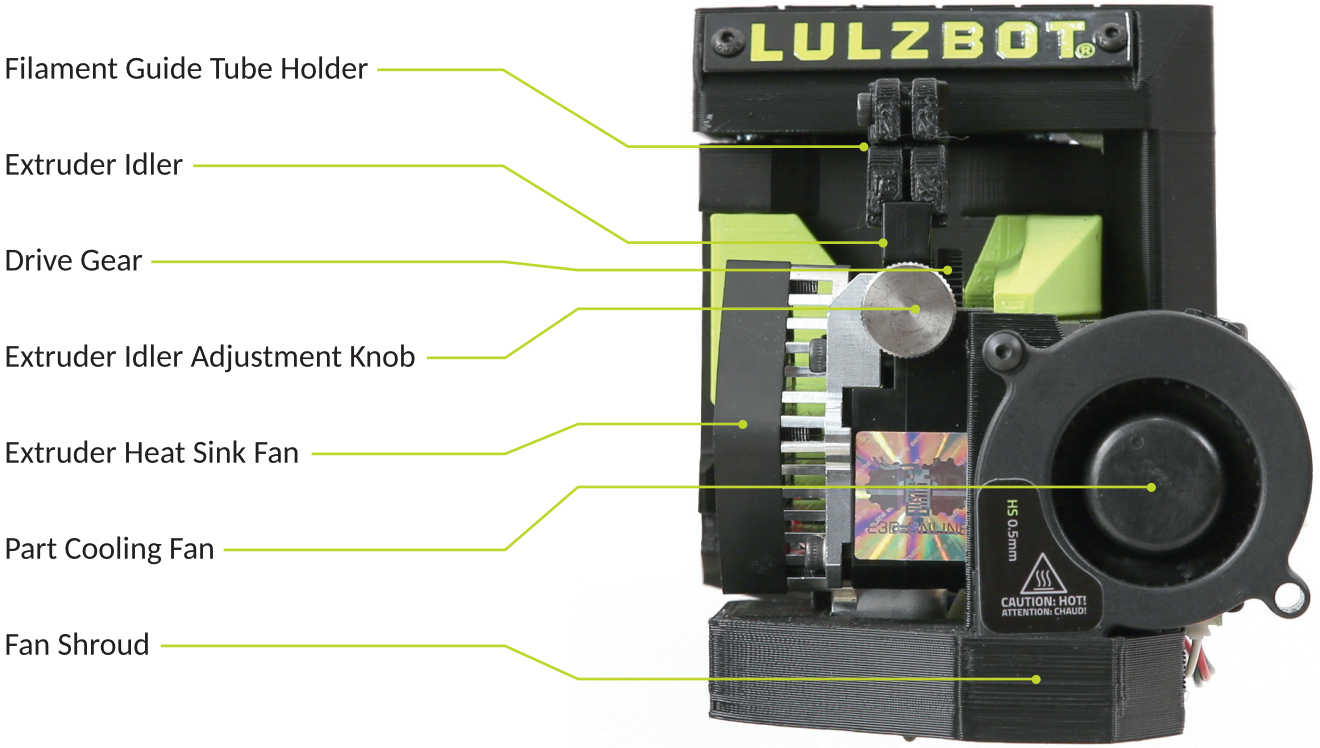
Aluminum Frame



Cartesian Coordinate System

The LulzBot TAZ Workhorse can move on three linear axes: X, Y, and Z.

Tool Head Key Components

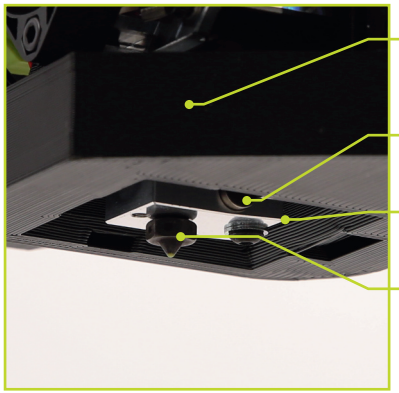




Filament Path

Extruder Idler

Extruder Idler Adjustment Knob



Fan Shroud

Extruder Heater Cartridge

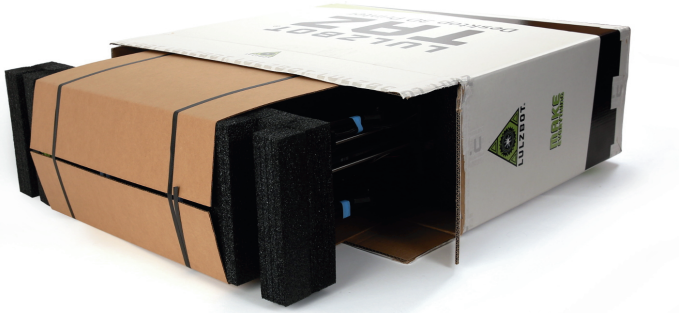
Extruder Heater Block

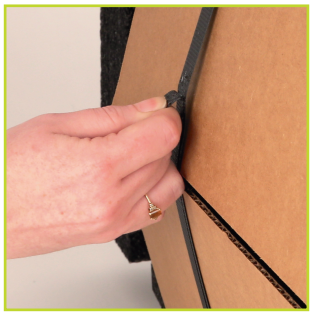
Extruder Nozzle

Your LulzBot TAZ Workhorse automatically calibrates using the washers at each corner of the modular print bed system, the automatic calibration cube, and by leveling the X-axis gantry before each print. These features ensure the highest quality single-material printing possible without the need for manual calibration.

2 Unpack your LulzBot TAZ Workhorse Edition Desktop 3D Printer

2.1 Place printer box on its side and carefully open the top of the box. Use the two black straps wrapped around the printer to remove it from the box. Once it has been removed, open the straps by pulling on the tabs.

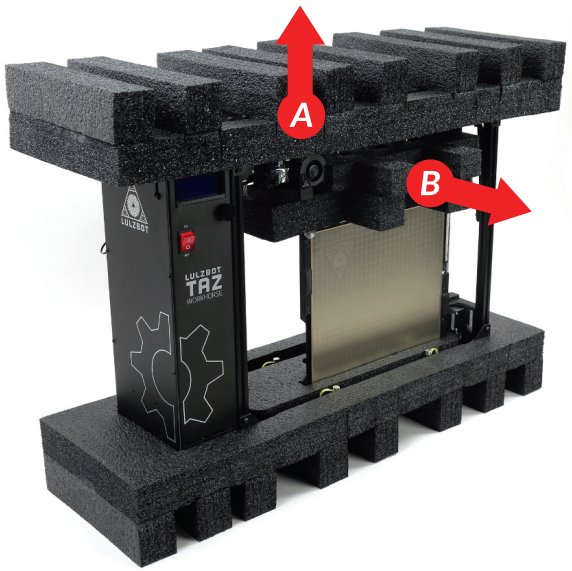




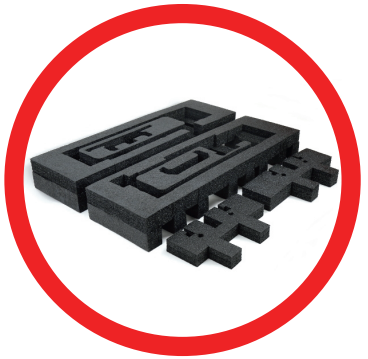
2.2 After removing the protective cardboard from the printer remove all additional contents.



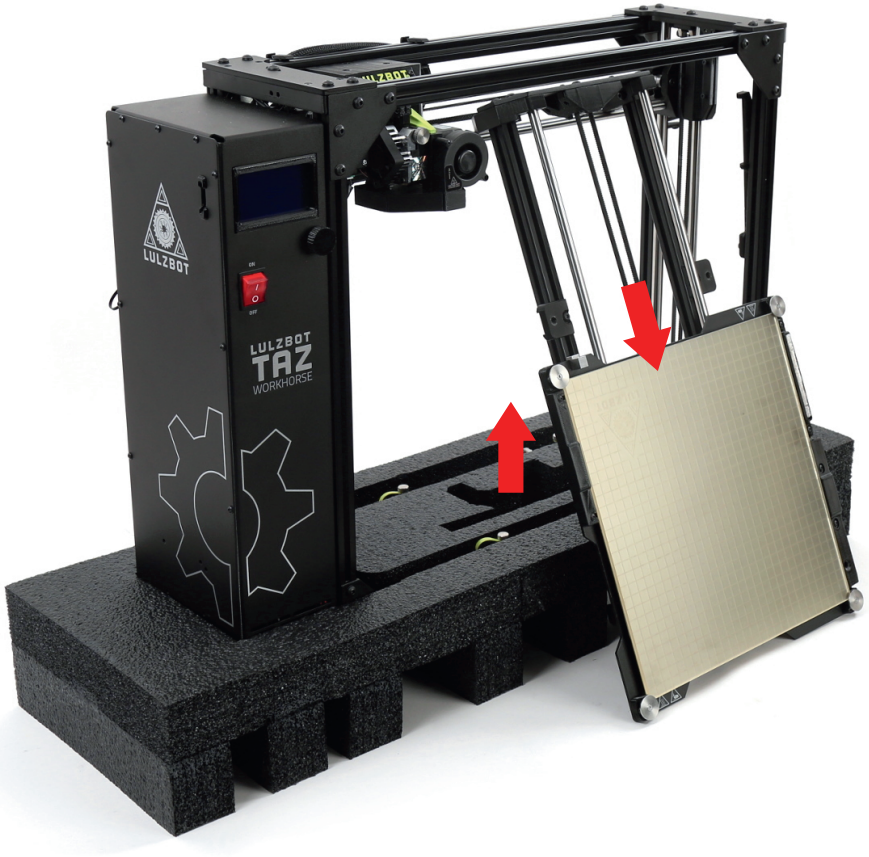
2.3 Stand the printer up and carefully remove the packaging foam from the top of the printer (A). Remove the central foam (B) by peeling it away starting at the side closest to the tool head. Confirm all contents in the included Packing List have been removed from the box.



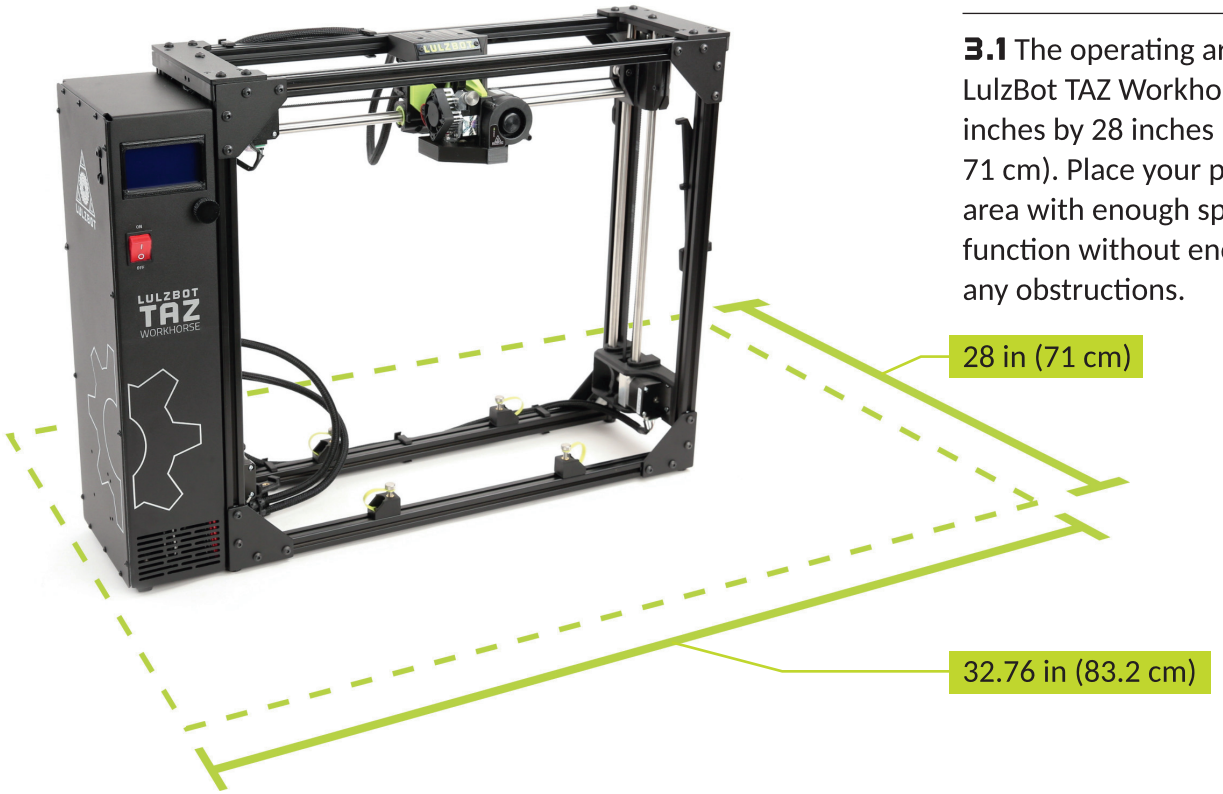
*Save all of the provided packaging materials and box. In the case that warranty service is needed, the 3D printer **must** be shipped in its original packaging.*



2.4 Slide the modular print bed up out of the lower foam as you tilt the Y-axis assembly away from the tool head. Lift the y-axis assembly out of the lower foam, then lower the bed and remove it from the printer frame. Once the modular print bed is clear, lift the printer from the final piece of packaging foam.



3 Assemble your LulzBot TAZ Workhorse Edition Desktop 3D Printer

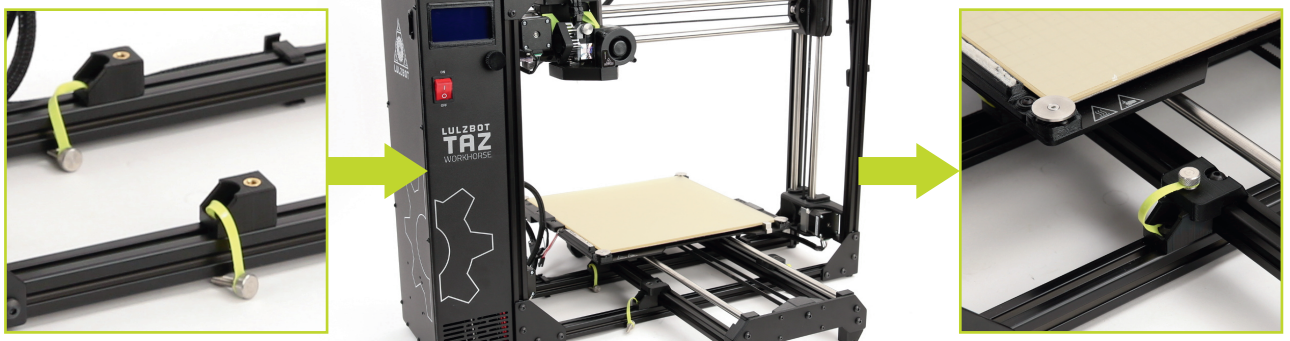


3.1 The operating area for your LulzBot TAZ Workhorse is 32.76 inches by 28 inches (83.2 cm by 71 cm). Place your printer in an area with enough space to function without encountering any obstructions.

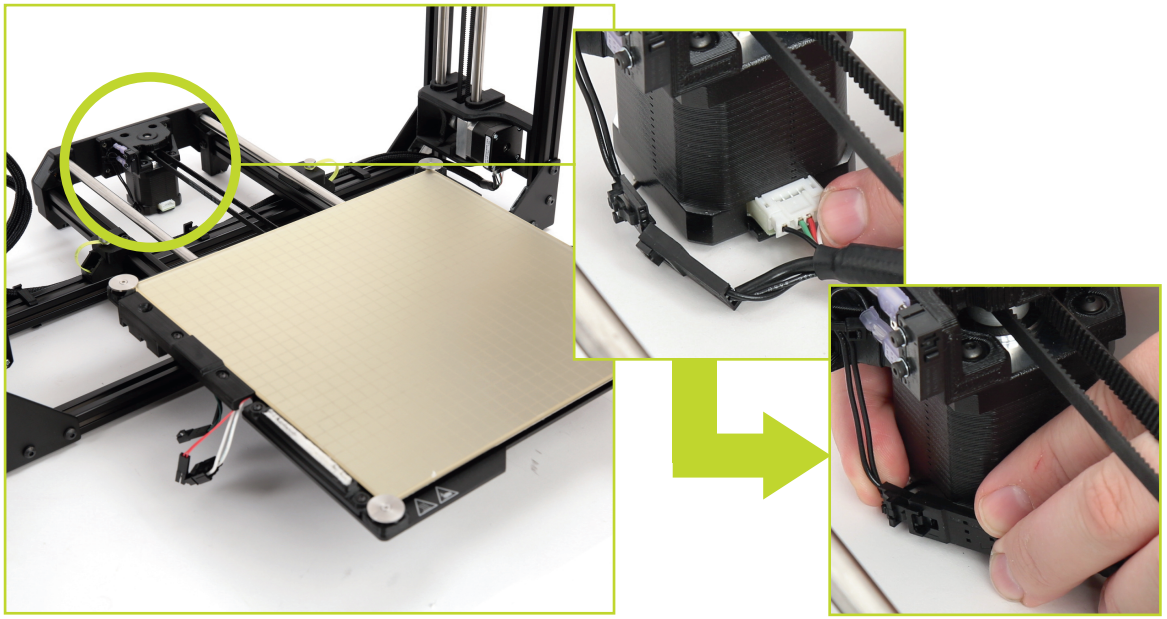
3.2 Unscrew all four thumbscrews from the mounting brackets on the printer frame.

3.3 Place the Y-axis assembly on the frame with the bed wiring on the left side of the modular print bed. Line up the four mounting brackets.

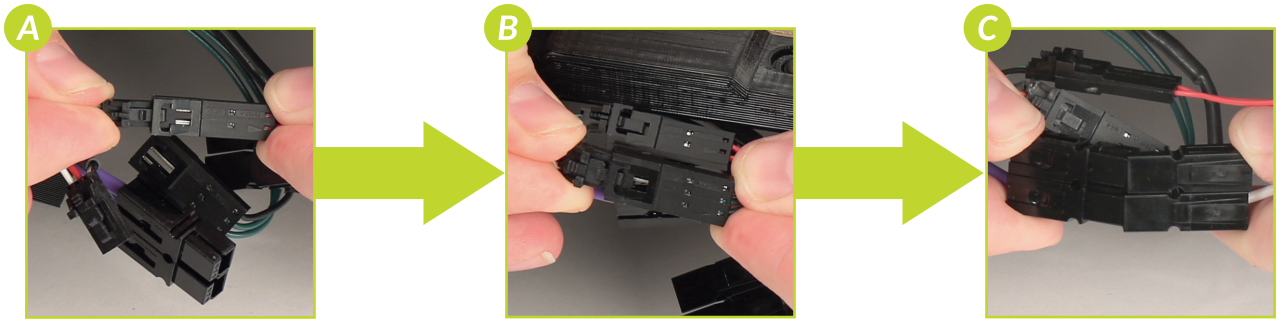
3.4 Slide the modular print bed away from you and screw in the front two thumbscrews until they are finger tight. Slide the modular print bed forward and screw in the back two thumbscrews until they are finger tight.



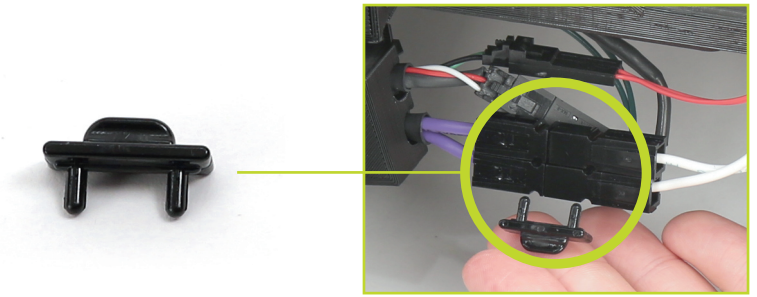
3.5 Connect the Y-axis stepper motor to the Y-motor harness mounted on the back of the printer frame, plugging in first the white connector, followed by the black connector into the stepper motor.



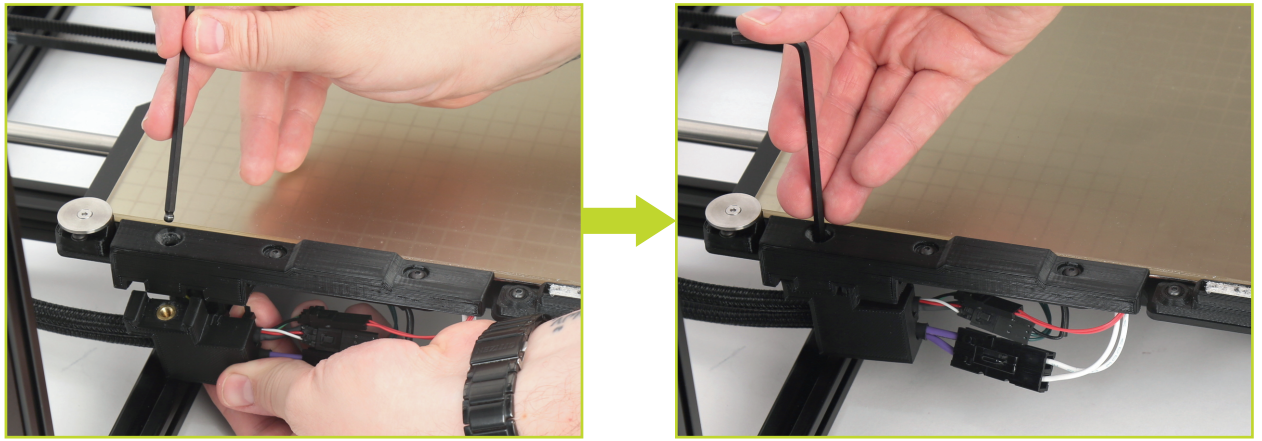
3.6 Connect the three sets of wire connectors from the bed harness coming from the back of the control box to the left side of the bed as shown below. Start with the small two pin connection (A), then the small three pin connection (B), then the large heater connection (C).



3.7 Once all connections are in place, locate the bed power harness retention clip in your tool bag. Press the two prongs of the clip into the two holes on the heater connection.



3.8 Align the end of the Y-axis cable chain under the modular print bed as shown. Once in place, secure the cable chain to the bed using the included 4 mm hex driver and the inset screw on the modular print bed. Turn the 4 mm hex driver counterclockwise until you feel the threads seat (to prevent stripping the threads), then while holding the cable chain level, turn the hex driver clockwise to screw on the cable chain.

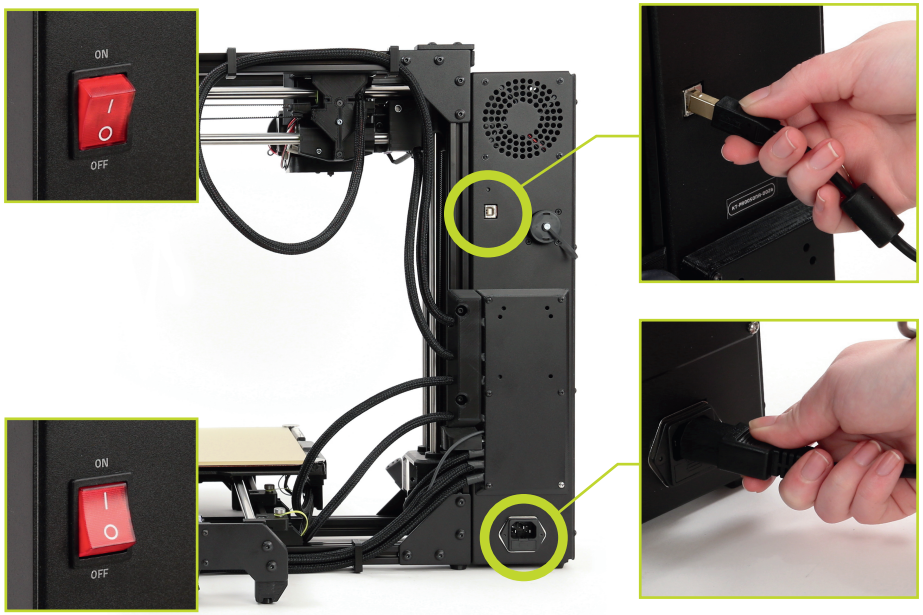


During the printer startup cycle, the X-axis will move to the top of the frame and make contact with the left and right limit switches in order to level the X-axis gantry. This process also completes before each print.

3.9 Verify that the power switch on the front of the printer is in the Off position.

3.10 Plug the USB cable into a computer and the back of the printer, and AC power connection on the back of the printer.

3.11 Flip the power switch to the On position to turn on the 3D printer.



4 Setting up Cura LulzBot Edition

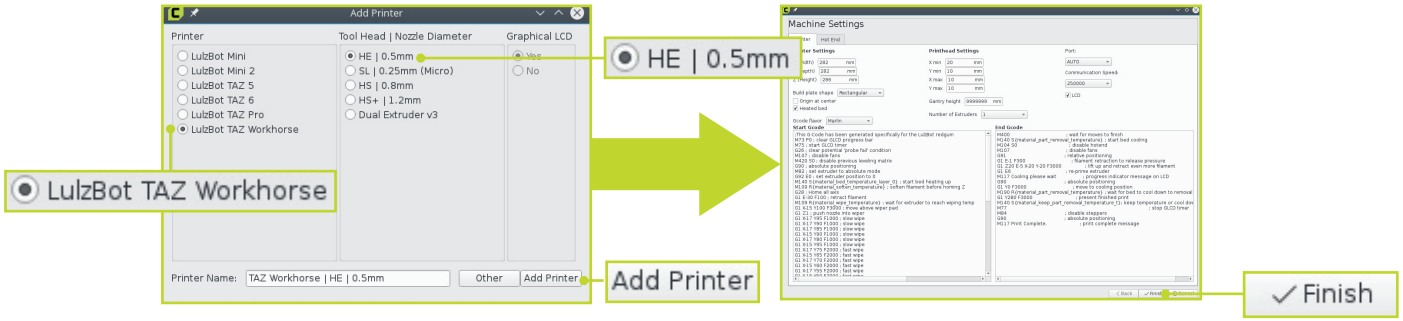
4.1 Cura LulzBot Edition, the recommended software to control your 3D printer, includes built-in support for over 30 materials. Find installation instructions, troubleshooting information, and more at **LulzBot.com/Cura**.

Already have Cura LulzBot Edition? Update now to get additional material support and new slicing profiles. Expert help and advice is available at **LulzBot.com/Support**.

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*There may be later versions of Cura LulzBot Edition available at **LulzBot.com/Cura**, with added features and functionality. We recommend checking for updates regularly.*

4.2 Launch Cura LulzBot Edition. The **Add Printer** menu will automatically appear. Select **LulzBot TAZ Workhorse** and **HE | 0.5mm**, then click **Add Printer**. Existing users should select the **Settings** dropdown menu, **Printer**, then **Add Printer**. On the next menu that appears, click **Finish** to complete the printer setup. Cura LulzBot Edition is now ready for use with your LulzBot TAZ Workhorse.



4.3 New firmware is consistently being developed to add new funcionality and ensure your LulzBot TAZ Workhorse is creating the best quality prints. Update the printer firmware now by clicking the **Settings** dropdown menu and selecting **Printer**, then **Manage Printers...**. With **LulzBot TAZ Workhorse** highlighted, click **Upgrade Firmware** and follow the prompts to install the latest firmware.

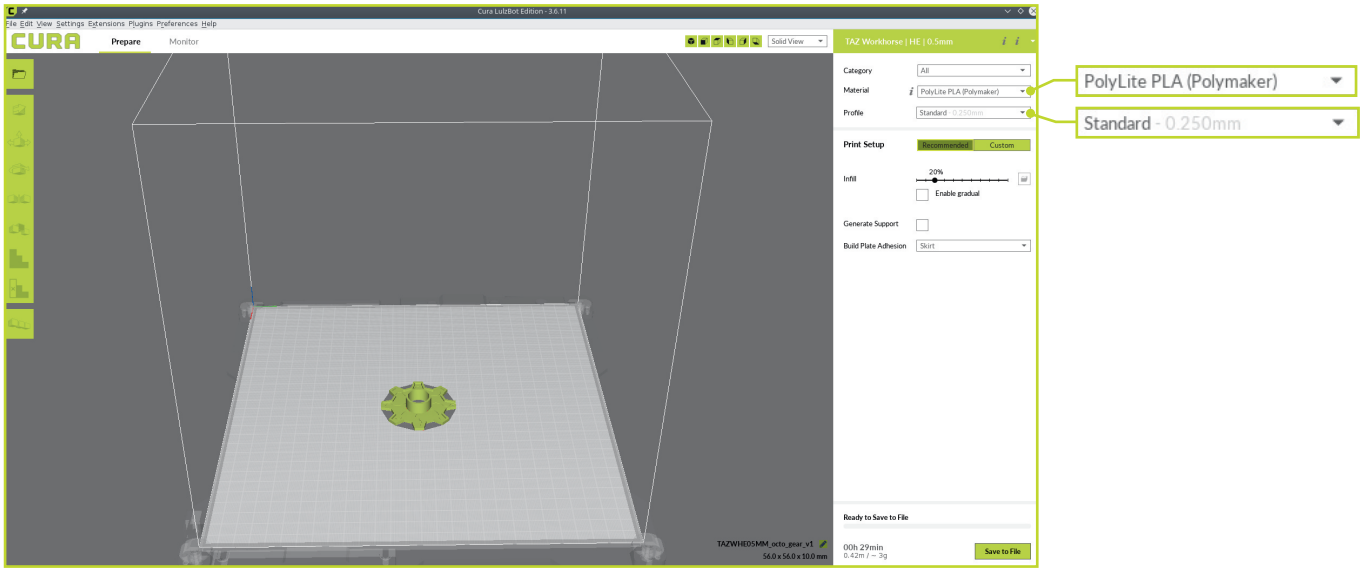
4.4 The first print model, octo_gear_v1.stl, will automatically load onto Cura LulzBot Edition's virtual print bed the first time you run Cura LulzBot Edition with your LulzBot TAZ Workhorse.

*If the First Print model is not present in the virtual print bed, you can download it from **download.LulzBot.com/3D_Models/TAZ_Workhorse_Samples/octo_gear_v1.stl** or from the included SD card, then load it into the virtual print bed using the **Open File** button in the main Cura interface.*

4.5 Locate the included sample coil of green PLA filament. We strongly recommend using the included PLA sample filament for your first print.

*Filament is the term for the materials your LulzBot TAZ Workhorse uses to 3D print objects. The included sample filament, PLA, is made from natural renewable resources. PLA and other types of filament can be purchased at **LulzBot.com/filament**.*

4.6 In the Prepare sidebar on the right side of the screen, confirm that **PolyLite PLA (PolyMaker)** is selected for Material and **Standard** is selected for the Profile to be used for printing.



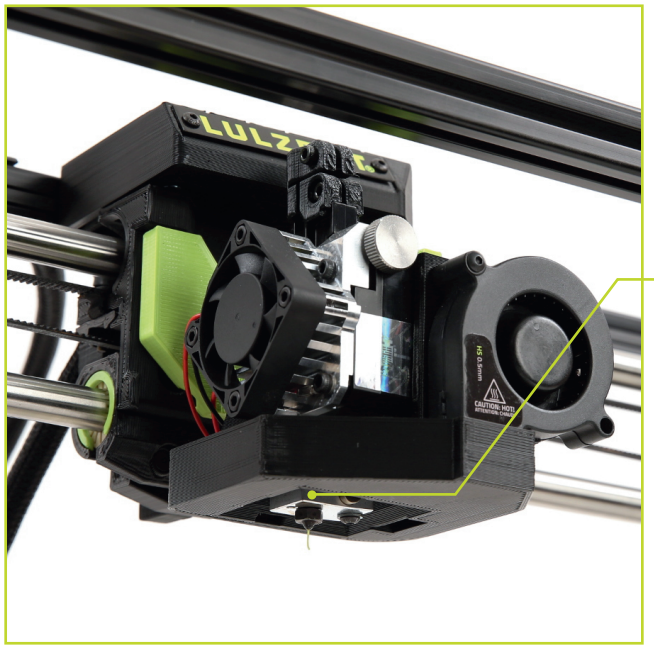
5 Preparing Your LulzBot TAZ Workhorse Edition to Print

Your LulzBot TAZ Workhorse was tested for quality assurance before being packaged. You will need to remove the remaining filament left in the tool head from this process before loading new filament for your next print. Follow the steps below to remove or change filament.

5.1 Press in on the LCD Control Knob to access the main menu on the LCD Screen. Turn the knob clockwise to scroll down to **Change Filament** and press in to select. Select **Preheat Custom** and rotate the LCD Control Knob clockwise to increase the target temperature 220°C, then press in on the LCD Control Knob to confirm the preheat temperature.

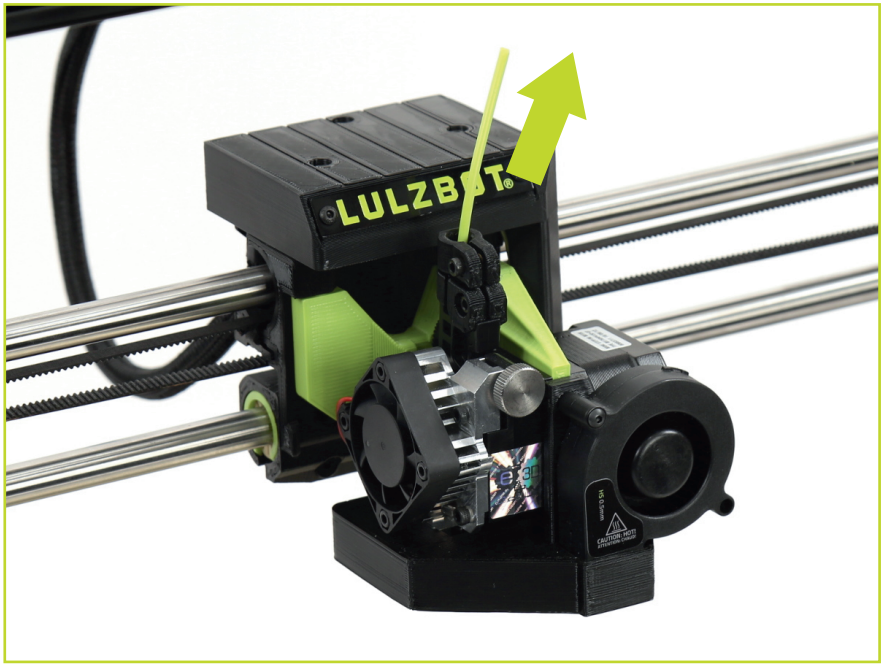


The hot end is now heating up to 220°C (428°F) and can burn your skin.



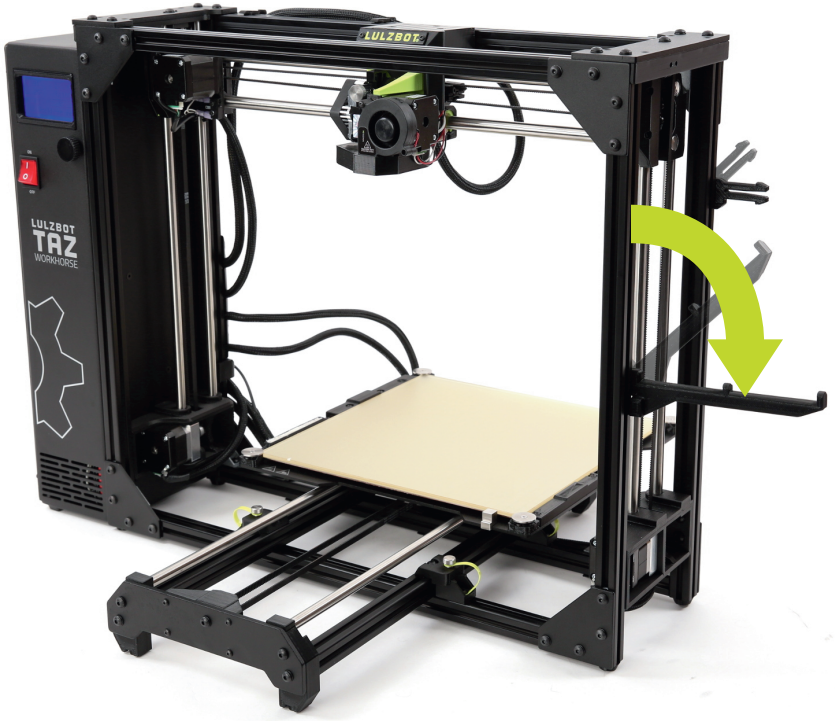
Very hot!
Do not touch!

5.2 Once the hot end reaches the target filament removal temperature, the filament will automatically begin to retract. Once the filament stops moving, pull it out of the idler.

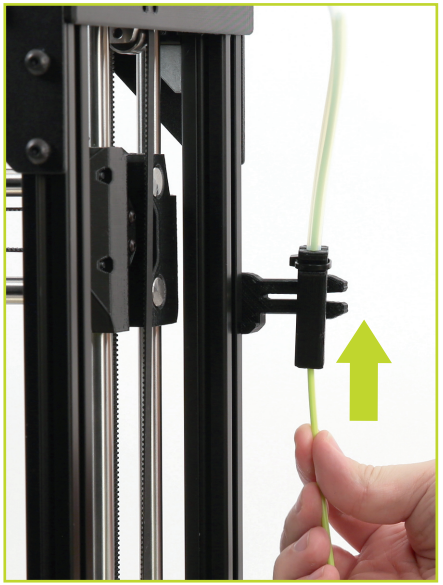


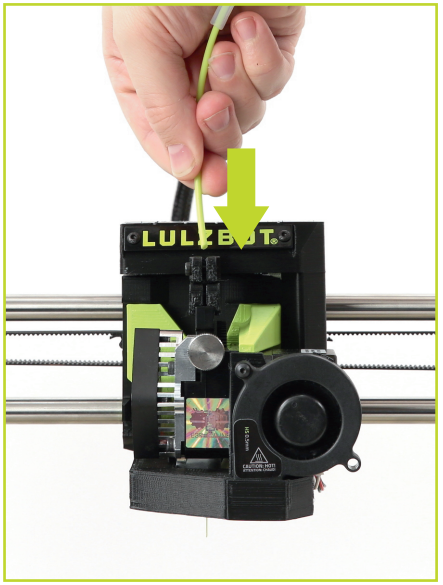
5.3 Rotate the filament holder and filament guide tube holder into place. Once in position, place the included PLA filament on the filament holder.

The filament holders may need to be adjusted to accomodate larger reels of filament. If this is the case, use the included 4 mm hex driver to loosen the screw at the base of the filament holder, move it to the appropriate position, and tighten.

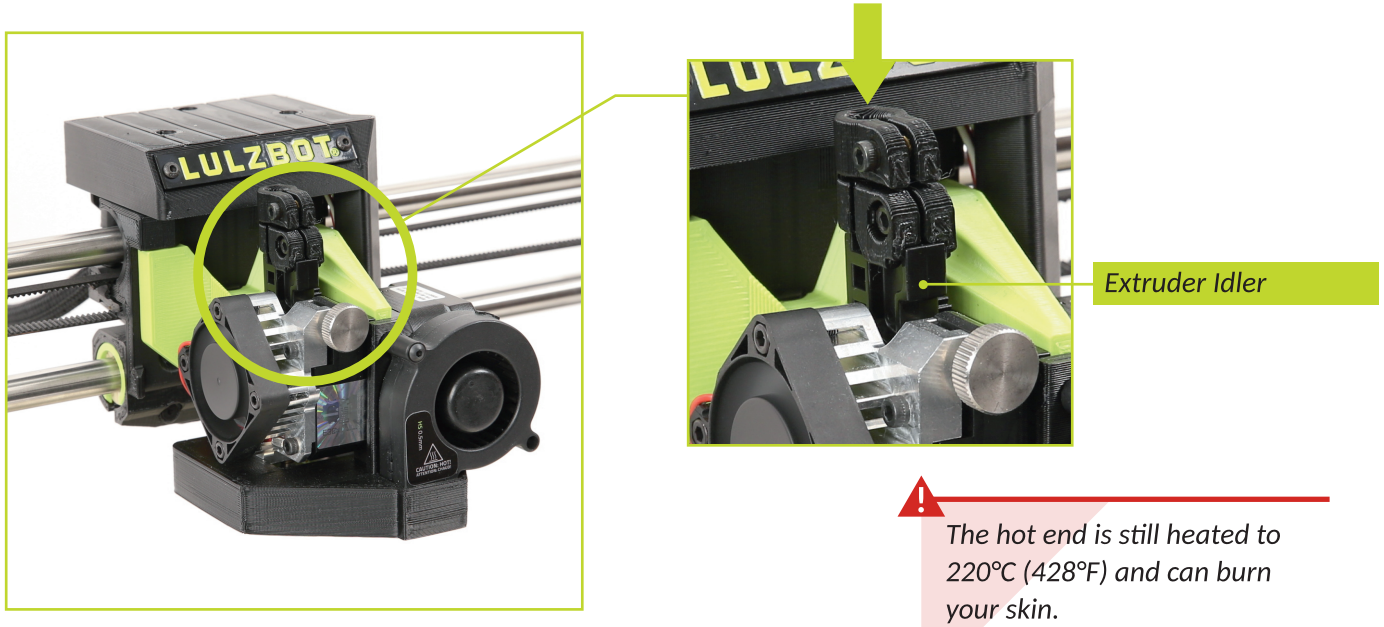


5.4 Feed the PLA filament up into and through the filament guide tube. Continue pushing filament through the guide tube until an easily grasped length is protruding from the other side.



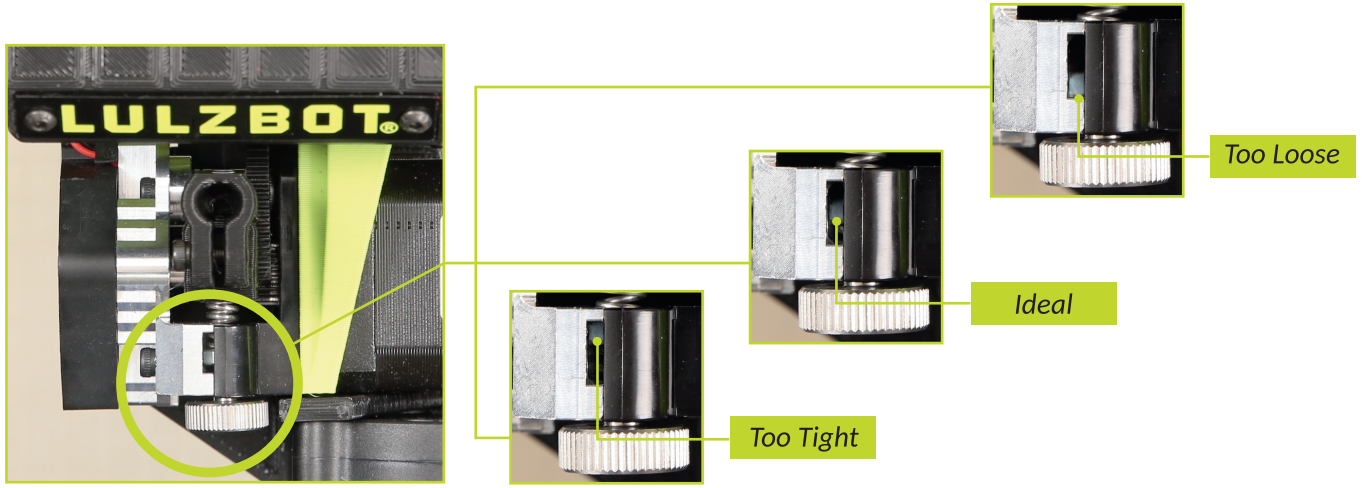


5.5 Locate the filament guide tube holder and idler on the tool head where the loaded filament was removed during step 5.2. Filament feeds down this path and into the hot end for printing.



The hot end is still heated to 220°C (428°F) and can burn your skin.

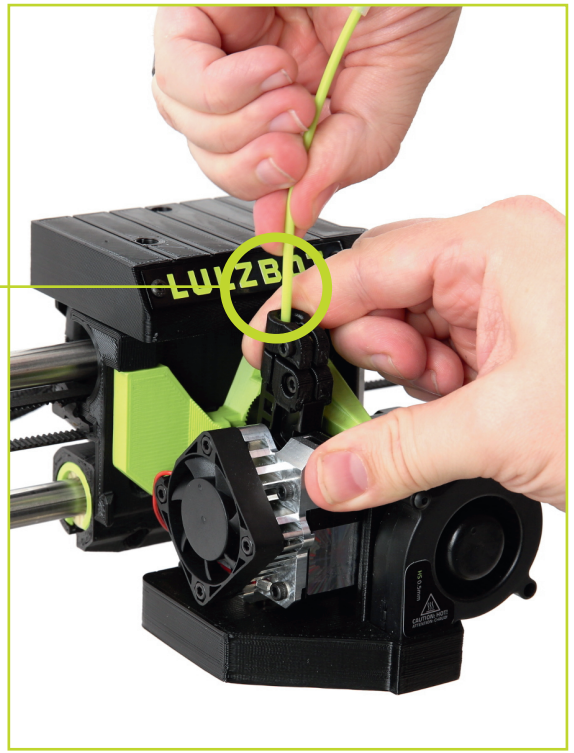
During printing, the extruder idler holds filament against the extruder hobb which pushes filament down into the hot end. Correct idler tension is important for keeping filament flowing properly during the printing process. The idler tension can be seen by looking at the tool head from above. Rotating the idler adjustment knob clockwise will move the internal nut closer to the idler knob, loosening the idler. Rotating counterclockwise will push the internal nut away from the idler knob, tightening the idler.



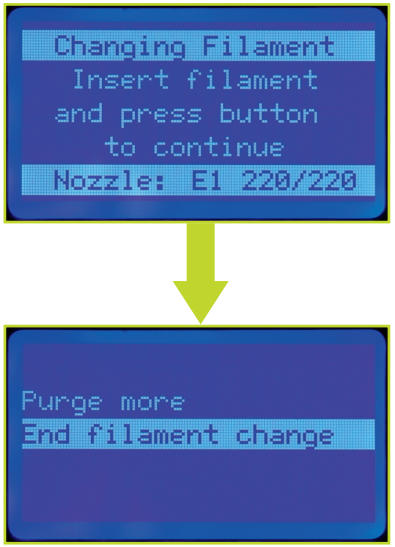
5.6 Straighten the filament slightly and while pinching the filament guide tube mount, feed the filament into the extruder. The idler may need to be loosened for filament to be inserted properly. Once the filament is in place, tighten the idler to the ideal tension shown in step 5.5.

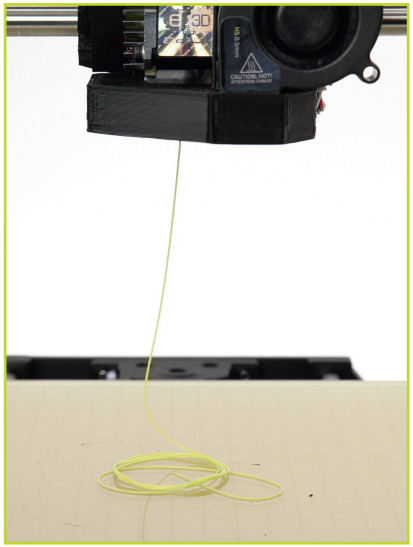
The filament must be inserted past the extruder hobb gear for filament to extrude properly. If there is resistance while pushing filament through the idler, trimming the filament at a 45° angle may help.





5.7 With the PLA in place, press the LCD control knob to begin the purging process. Let the filament advance until it extrudes smoothly as shown. If the filament stops advancing and filament is not extruding from the nozzle, select **Purge more**, otherwise select **End filament change**.





After removing filament, a small residual amount remains in the hot end that needs to be cleared out through the process detailed above. This purging process helps to remove any residual material left in the hot end.

6 Starting Your First Prints

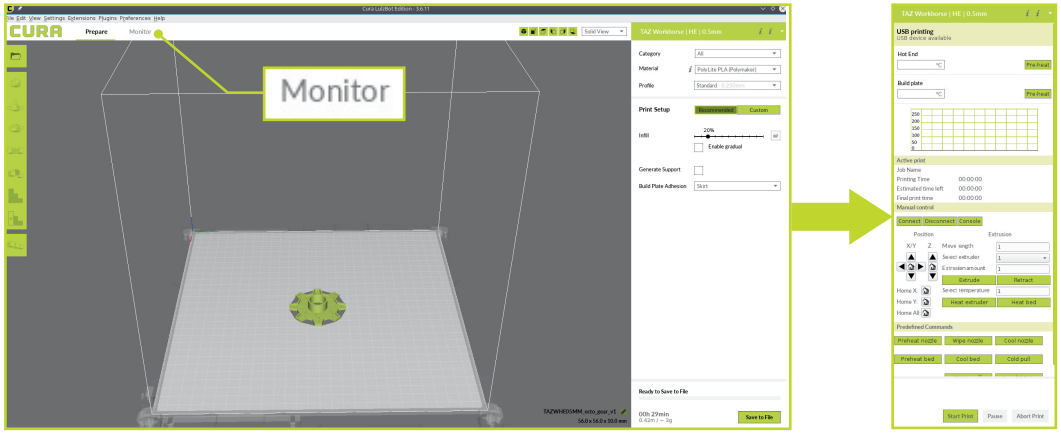
Before starting a print, check that your printer is ready. The hot end is still hot, use caution:

- *Confirm that all packaging has been removed from your LulzBot TAZ Workhorse.*
- *Verify that the 3D printer is in a well-ventilated area, on a flat and level surface, and with 30 centimeters (12 inches) clearance in all directions.*

If you need to make changes to your model, use the Prepare sidebar in Cura. Once changes are made, Cura will automatically begin implementing the changes (also known as reslicing).

The X-axis gantry may shift after your 3D printer is powered off. Each time you power on your printer the X-axis will be leveled during the automated homing process.

6.1 Your LulzBot TAZ Workhorse Edition 3D Printer is now ready to print! Click on the **Monitor** button at the top of the main Cura interface. This will change the sidebar on the right side of the screen to show printer information and controls.

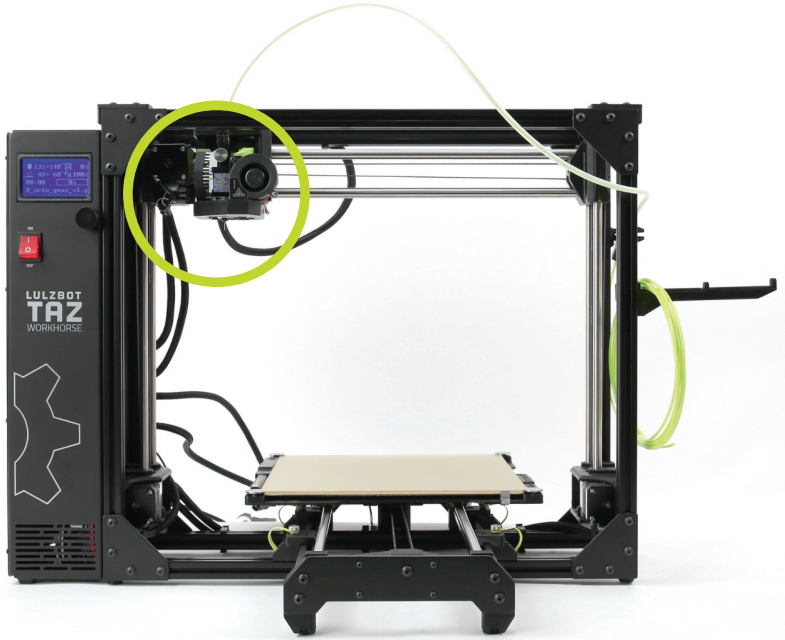


*Once models are sliced, they may also be saved to the included SD card by clicking **Save to File**. Once saved, models may be printed directly from the SD Card.*

6.2 Click the **Connect** button (A) under **Manual Control** to connect to the printer. Once connected the top status bar will change from **USB device available** to **Connected via USB** (B) and the current hot end and build plate temperatures will be displayed. Click **Start Print** (C) below the **Monitor** sidebar to start your first 3D print, then watch your LulzBot TAZ Workhorse automatically prepare itself for 3D printing.

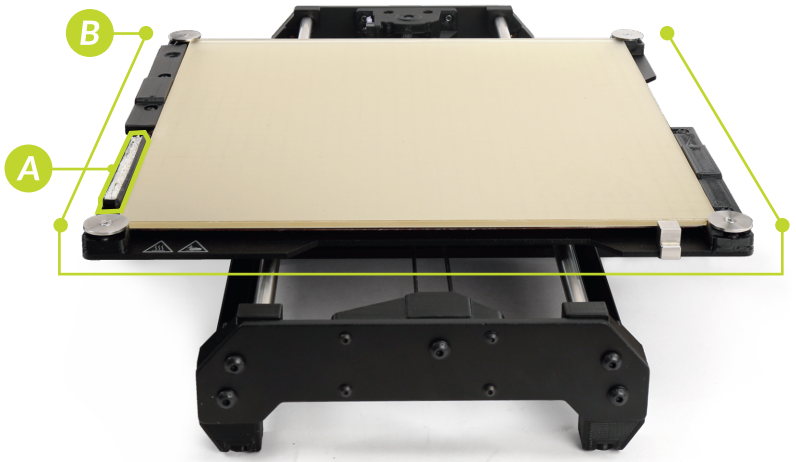


6.3 Your 3D printer will first move the tool head to the top left corner of the build area and allow the hot end to reach probing temperature. Depending on ambient temperature this can take one to three minutes.



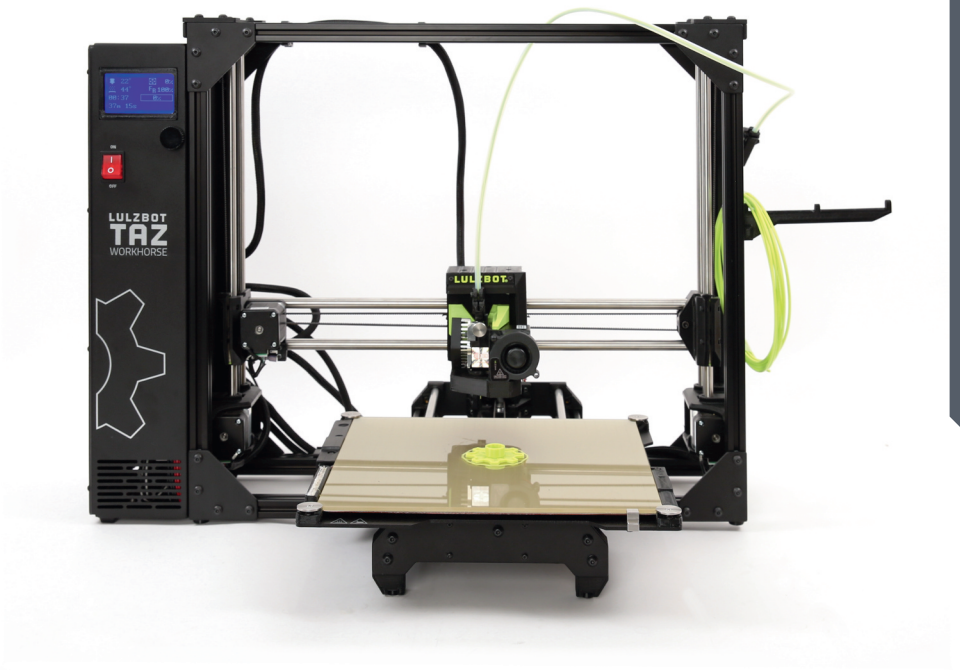
6.4 Once the hot end reaches its wiping temperature, the tool head will move to the wiper pad (A), cleaning the nozzle of residual filament. After the nozzle has been cleaned, your LulzBot TAZ Workhorse will heat to probing temperature and conduct an automated self-leveling sequence by touching each bed corner (B). When the leveling process is complete, the printing process will commence.

If probing fails to detect one of the bed corners, the printer will attept self-cleaning again, then repeat probing. If this fails three times, or if the bed corner is visibly pushed down during probing, the printer requires manual nozzle cleaning. Refer to the Maintenance section at the end of this guide for details on nozzle cleaning.

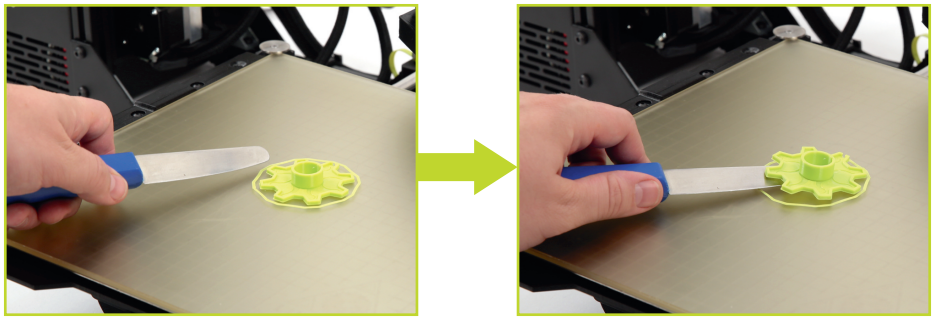


6.5 After your LulzBot TAZ Workhorse is finished 3D printing, the tool head and print bed will automatically move into the cooling position with the tool head in the top left of the build area and the print bed fully back.

Your print bed is now cooling. Do not attempt to remove your 3D printed object before the print bed moves forward. Attempting to do so could either burn your skin on the hot end or print bed, damage your printer, or damage your 3D printed object.



6.6 Once finished cooling to the proper removal temperature, the tool head will move to the top right and the print bed will move forward. Once the print bed has stopped moving, remove your first calibration print by gently sliding the included blue-handled knife under each side, then under the center of the print until it separates from the bed.



The blade of the blue-handled knife is sharp. Exercise caution when using it. The blade should be nearly parallel with the print bed and move parallel to the bed. Avoid prying prints up and away from the bed.

6.7 Now that your first print is complete, your LulzBot TAZ Workhorse is ready to do work, print after print. For more projects, ideas, and ready-to-print models visit **download.lulzbot.com/3D_Models/**.



7 Maintenance and Care

There is a small length of the PLA filament remaining in the hot end after your first sample print. You can remove the remaining filament by following the steps in Section 5. Use this process whenever changing filament to ensure a clean switch between different filaments, and to avoid extrusion issues due to print temperature differences.

When using a filament other than PLA for future prints, there may be a difference in the temperature required for purging the residual filament in the hot end and printing with the new filament. When changing filament, choose a temperature that splits the difference between the two required printing temperatures. The chart on the next page lists printing temperatures for some of the most popular filament available for your TAZ Workhorse.

Printing, Part Removal, and Bed Preparation

Filament	Purging Temperature (°C)	Part Removal Temperature (°C)	Print Bed Preparation (See maintenance section for more information)
ABS, HIPS	220	50	Isopropyl alcohol wipe
PLA	180	45	Isopropyl alcohol wipe
PETg	220	50	PVA glue stick
Bridge, PCTPE, Nylon 910	220	50	PVA glue stick
Ninjaflex, PolyFlex	200	Fully Cooled	Plain Glass or PVA glue stick
PA-CF	220	50	Isopropyl alcohol wipe
PolyCast	180	45	Isopropyl alcohol wipe

Your LulzBot TAZ Workhorse Edition Desktop 3D Printer is capable of printing a variety of materials including abrasive materials because of its high maximum print temperature and hardened steel nozzle. In addition, new materials are frequently added to our catalog, each thoroughly tested to develop the profiles included in Cura LulzBot Edition. Shop our full range of materials at **LulzBot.com/filament**.

Important Information About Your 3D Printer

Warranty and Support

Your machine comes with a limited one-year warranty and customer support period including Colorado, USA-based technical support available by email at **Support@LulzBot.com** and over the phone at **+1 (970) 377-1111**. For more information please visit us at **LulzBot.com/Support**.

Extended warranties of one, two, and three years may also be purchased to further protect your investment. Email **Sales@LulzBot.com** for more information.

Source Files

This product is certified Open Source Hardware and runs with Free Software because we support your right to see how it works, make modifications, and share your modifications with others. Find the source files online at **Download.LulzBot.com**, and see what's next by following our research and development online at **Devel.LulzBot.com**.

Filament Materials

Your LulzBot TAZ Workhorse utilizes an open format filament system. We strongly recommend purchasing your 3D printing filament from **LulzBot.com**, where every filament has been thoroughly tested to work on your printer and comes with optimized print settings for easier printing.

If you choose to purchase elsewhere, avoid inexpensive, low-quality filaments that can lead to failed prints and even damage your LulzBot TAZ Workhorse. Low quality filament can contain foreign objects, unlisted materials, blends, voids and density variations, and varying filament diameter. Purchasing consistent and reliable filament is key to protecting your investment in a LulzBot Desktop 3D Printer.

LCD Controller and SD Card Printing

Your LulzBot TAZ Workhorse can be operated without a USB tether to a computer by using the LCD Controller and included SD card. Once a .gcode file is saved to the included SD card, plug it into the slot located on the left side of the electrical box, select **Print from SD card**, and select the model you would like to print.

Maintaining Your LulzBot TAZ Worhorse 3D Printer

Make sure that the hot end and print bed are at room temperature before beginning any cleaning or maintenance unless otherwise noted.

Print Bed

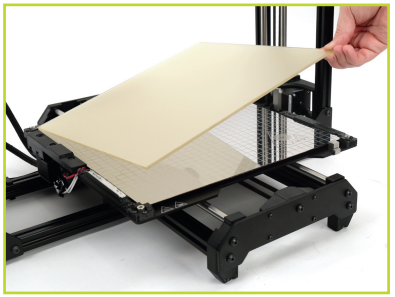
Adhesion to your LulzBot TAZ Workhorse's modular heated print bed is the foundation of a great 3D print. The bed can be used in three supported configurations: PEI, PEI with glue stick, or bare glass. The PEI print surface on your LulzBot TAZ Workhorse is the recommended default print surface for your 3D prints. Refer to the chart in at the beginning of Section 7 of this guide for bed preparation for specific materials.



Following these tips will help you get the most out of your print bed:

PEI: Oil on your skin and accumulated dust can negatively affect print adhesion to PEI. For optimal performance, lightly wipe the print bed and corner washers with a dry paper towel between prints. To deep clean the PEI print surface and corner washers, wipe with diluted Isopropyl Alcohol (1:10 IPA to water ratio) and a clean cloth.

Always wait for your PEI print surface to cool to removal temperature before attempting to remove 3D printed objects. Treated appropriately, PEI is highly durable, but note that even well-treated PEI will not last forever. It will need to be replaced periodically and is considered a consumable item. Replacement Glass/PEI Print Surfaces can be purchased at **LulzBot.com**.

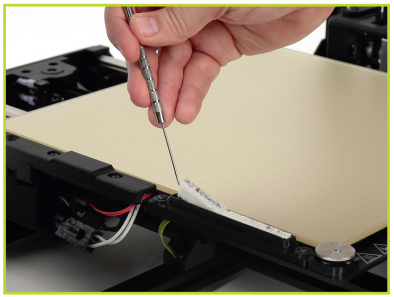


Bare Glass: The ability to print on bare glass is especially useful for TPU filaments such as Ninjaflex. To use the glass surface, unscrew each corner washer holding the print bed in place with the supplied 2 millimeter hex driver, then flip the print surface and place it back on the heater with the glass side up. Screw in each corner washer to hold the bed in place. Using care not to over-tighten, make sure that the washers are flat and parallel with the surface of the glass. If you do not wish to use the bare glass surface when printing TPU filaments, it is highly recommended to use a PVA gluestick on the PEI print surface.

PEI with Glue Stick: For some filaments, a polyvinyl alcohol (PVA) glue stick, such as an Elmer's® brand glue stick, is necessary for bed adhesion and/or release. Apply glue stick in light, even coats. Remove accumulated glue with a damp paper towel occasionally to maintain a flat, smooth base for your 3D prints.

Electronics Box Cleaning
Unplug the USB cable and power cord and remove filament from the filament holder before beginning any maintenance on the LulzBot TAZ Pro's control box. Unscrew the ten screws holding the control box panel in place and remove the panel to gain access to the control box. Using compressed air, clear the fans, power supply, and area around the control board of any dust or debris that may have collected inside.

Nozzle Wiping Pad
A clean nozzle tip is critical to your LulzBot TAZ Workhorse's performance, ensuring metal-to-metal contact in the leveling sequence. If you are experiencing leveling failures or have noticed prints starting too close to the bed, your nozzle wiping pad may require attention.



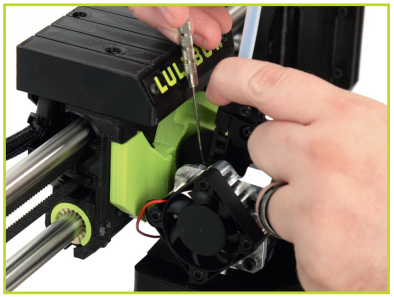
The wiping pad is reversible and replaceable. To remove a pad, pry up on it with the dental pick or tweezers from your LulzBot TAZ Workhorse tool kit. Then, either flip the pad over if the other side is unused, or replace the pad with one of the spares included in the tool kit. Additional pads can be purchased online at **LulzBot.com**.

Smooth Rod Cleaning
Wipe down the smooth rods on the X, Y, and Z axes using a clean, dry cloth. The bushings that allow movement along the smooth rods are self-lubricating. **Never apply lubricant to the smooth rods.**

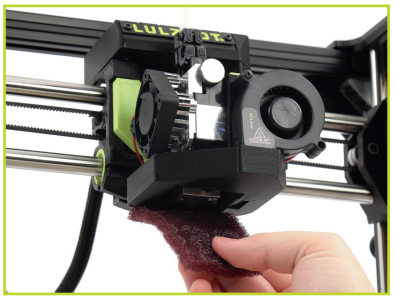
Tool Head Cleaning
A dental pick is included with your printer for cleaning theE3D Titan Extruder Hobb component of the tool head (the E3D Titan Extruder Hobb is the small grooved metal part of the tool head that feeds filament into the extruder). Use compressed air to clear any residual filament from the tool head.

Check all fans on the tool head to ensure that they are functioning properly during printing. Note that the extrusion cooling fan on the front of the tool head may not turn on until later in the print depending on filament used. Blow out all fans with compressed air to clear any dust or debris.

Over time you may also experience an accumulation of filament on the nozzle and heater block. To clean off this accumulated filament, heat the hot end up to 205°C (401°F) and then carefully wipe affected areas using the maroon Scotch-Brite™ scrubbing pad from your TAZ Workhorse tool kit. Never clean the hot end with metal utensils.



Print Area Cleaning
With regular use, dust and debris can collect underneath the printer that may cause interference with Y axis motion. Periodically clean and dust the area under and surrounding the printer to prevent this. Make sure that the hot end and print bed are at room temperature before beginning any cleaning or maintenance unless otherwise noted.



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Happy?

Why keep a good thing a secret?
Share your LulzBot LOVE with the World!

Here's how:

Tell your coworkers, friends, and family.

Share your experience by writing a LulzBot TAZ Workhorse review on Amazon.

Tag your projects with LulzBot on Instagram, Facebook, and Twitter.

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Not Happy?

We're here to help! Our friendly technical support is available 7 days a week.

Contact us here:

+1-970-377-1111

Support@LulzBot.com

LulzBot.com/Support

Notes