User's Manual
Wuxn WXR 3D Printer

Wuxn LLC
www.wuxn3d.com
Version 1.0.0

Proudly Designed &
Made in USA

Thank you for purchasing the Wuxn WXR 3D printer. Please take your time to familiarize yourself with this Wuxn WXR *User's Manual* before using the printer.

The *User's Manual* provides deeper insight into the unboxing, componentry, calibration, software, maintenance, and printing with the Wuxn WXR.

The Wuxn WXR offers a powerful and user-friendly ecosystem, consisting of:

1. Wuxn WXR Printer
2. WuxnSlicer Software
3. Wuxn Classic Filament

Together, these components deliver exceptional print quality, improved part strength, and fast speeds.

Please download the latest versions of the Wuxn WXR documentation at www.wuxn3d.com.

WXR 3D PRINTER (NEW)   PLA FILAMENT   PETG FILAMENT   FIRMWARE & SOFTWARE   ABOUT US

Table of Contents

For any questions or concerns you might have while using your Wuxn WXR printer, please contact support@wuxn3d.com.

Safety Instructions

1. Exercise caution while interacting with the Wuxn WXR. Always be aware of the machine state. The hotend and hotbed move with considerable force. Keep hands and loose clothing away from moving parts. It uses electricity to heat and create motion.
2. Always place the printer on a stable surface that is well ventilated.
3. The machine is a household object that utilizes 230 VAC/50 Hz or 120 VAC/60Hz. Never connect the printer to an outlet that does not supply the correct power.
4. The device is for indoor use only. Do not place the machine in the rain, snow, highly-contaminated areas, or areas containing flammable, or explosive vapors.
5. Never disassemble the power supply; The power supply is not serviceable by the user.
6. Do not touch the nozzle or hotbed while in use. The printer can reach temperatures of 300° Celsius. Temperatures of above 40° Celsius can cause harm to humans or animals.
7. Do not reach into the operating printer or injury may occur.
8. Do not allow unsupervised children access to the machine.
9. Do not leave the printer powered on while unattended.
10. Never operate the machine without reading the entire contents of the Wuxn WXR *User's Manual* and *Quick Start Guide*.

For any questions or concerns you might have while using your Wuxn WXR printer, please contact support@wuxn3d.com.

Disclaimer:

Failure to read the Wuxn WXR *User's Manual* may lead to personal injury, inferior results, or damage to the 3D Printer. Always ensure that anyone who operates the 3D printer knows and understands the contents of this manual. The information in this manual is provided without any warranty, expressed or implied, regarding its correctness.

Boxed Components

Important: Save the packaging for the future. It is designed specifically to protect the printer while shipping and storing.

★ Wuxn WXR Machine
★ Wuxn Print Surface
★ Wuxn Classic PLA - 1kg
★ Accessories Box
★ Quick Start Guide
★ Quality Assurance Test
★ Package Checklist

Unboxing

1. Carefully remove external plastic from box, cut Wuxn tape along top box seam, spread box flaps to expose the top protective packaging.
2. Lift out top protective packaging, dividers, and accessories kit.
3. Lift the Wuxn WXR out of the box and place on a flat and stable surface.
4. Cut orange wire ties holding the extruder.
5. Cut orange wire ties holding the hotbed.
6. Using the provided 2.5mm allen key, remove and save the two orange Z-axis stoppers from the sides of the vertical columns.

Accessories

Wuxn Classic PLA - 1kg
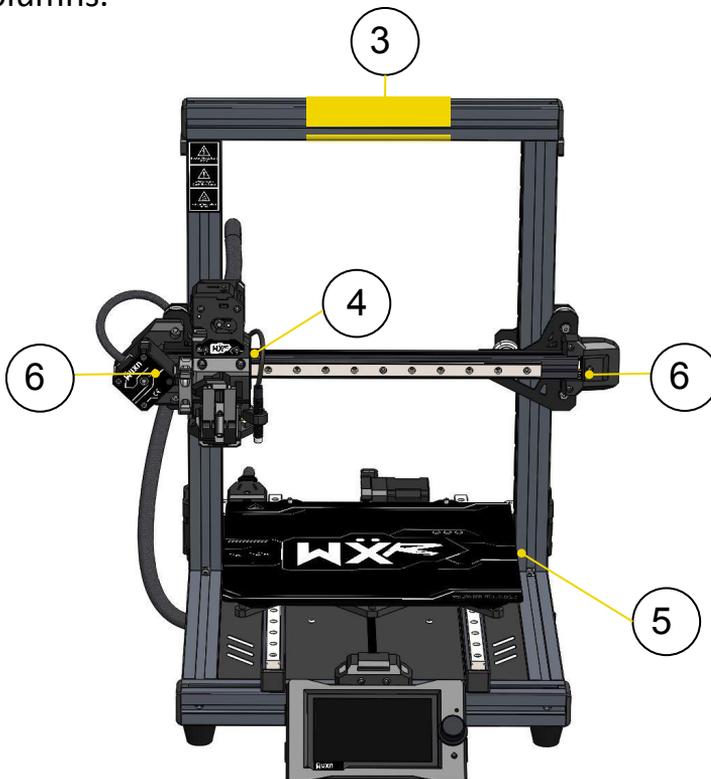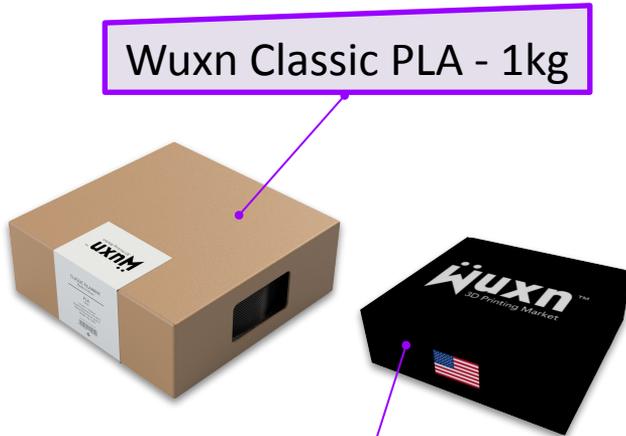
Accessories Box

★ Full Size SD Card
★ Spool Bearing
★ Factory Print
★ 2.5mm Hex Key
★ Spool Subassembly
★ USB Cord
★ Power Cord
★ Flush Cutters

Important: Save the packaging for the future. It is designed specifically to protect the printer while shipping and storing.

Identification

Every Wuxn WXR printer undergoes a quality assurance test and receives a unique product label.

Verify your unique serial number located on the back left of the machine.

Wuxn will reference this information when processing customer service requests.

Assemble Spool Holder

1. Slide spool rollers onto left spool bracket.
2. Slide right spool bracket into spool rollers.
3. Snap on Spool Holder to the top center of frame.

Key Components

Spool Holder

Z Wheel Stoppers

Z-Towers

Auto-Loading Filament

Z Wheels Adjustment

Extruder

X Belt Tensioner

X Gantry

AC Plug Slot

Power Switch

Y Gantry

Hotbed

Y Belt Tensioner

Printing SD Card

Color Touch Display
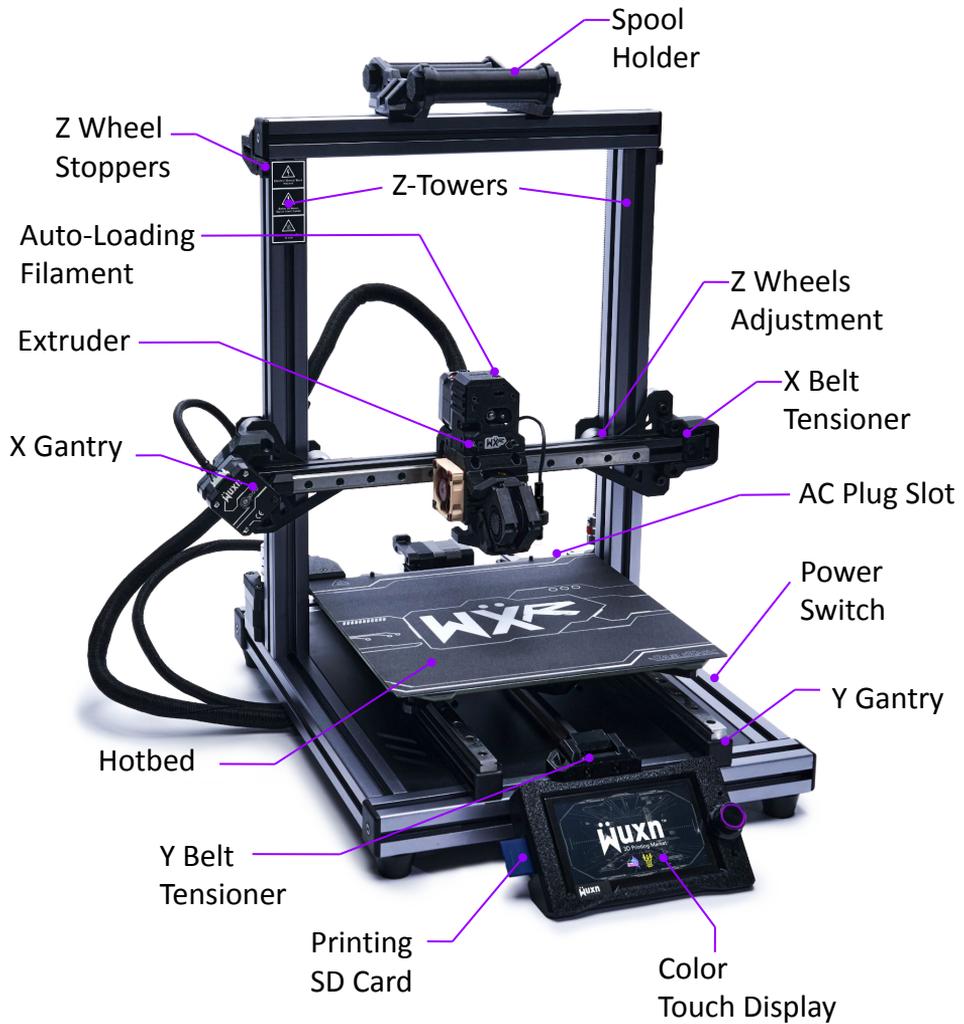
Key Components - Extruder

Wuxn Gears

Tensioner

Wuxn WXR
Nameplate

Noctua
Hotend
Fan

Slice Engineering
Copperhead
Hotend

Part Cooling
Fans

Z Height Probe

0.4mm Nozzle
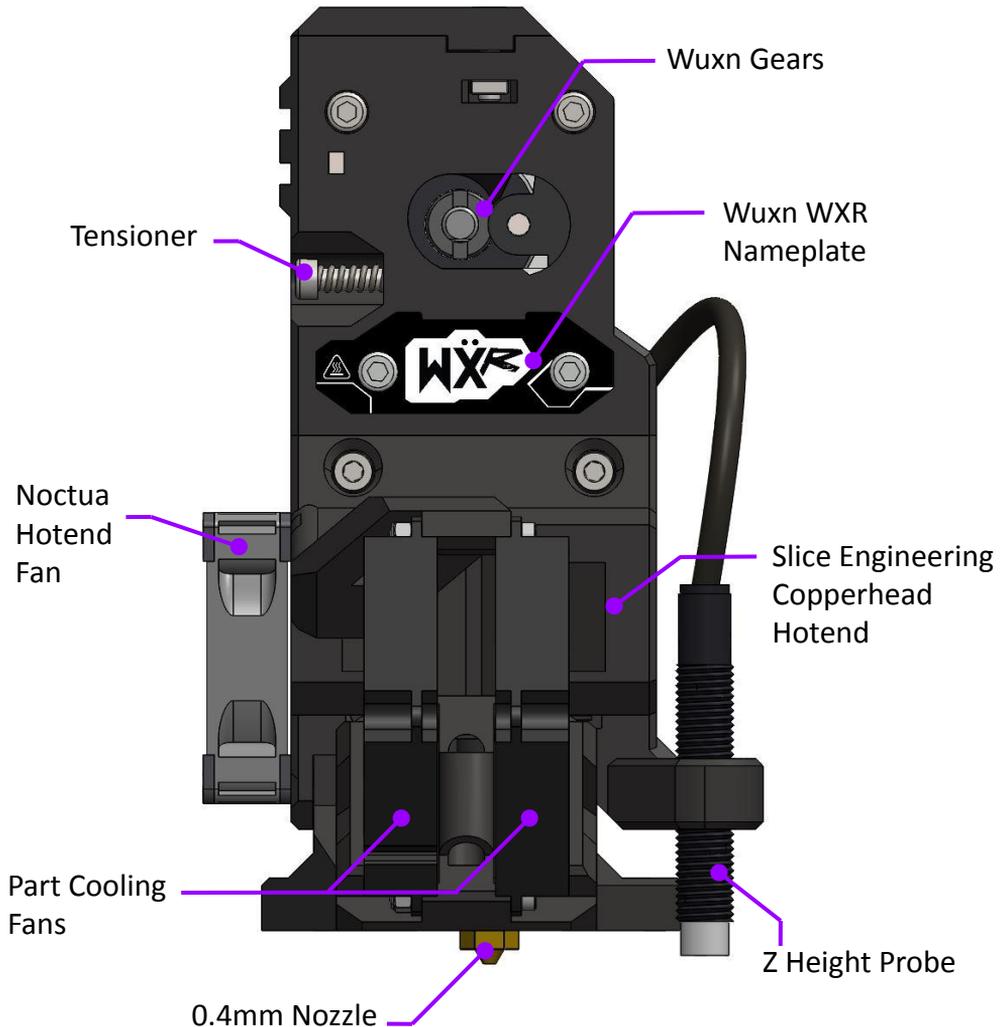
Disclaimer - Wuxn WXR only supports 1.75mm filament. Using another sized filament may damage the Extruder.

⚠ Hot surfaces while in use.
Contact may cause burns.

Key Components - Hotbed

Alignment Tabs

Wuxn BuildTak
Print Surface

Heating LED Indicator

Magnetic
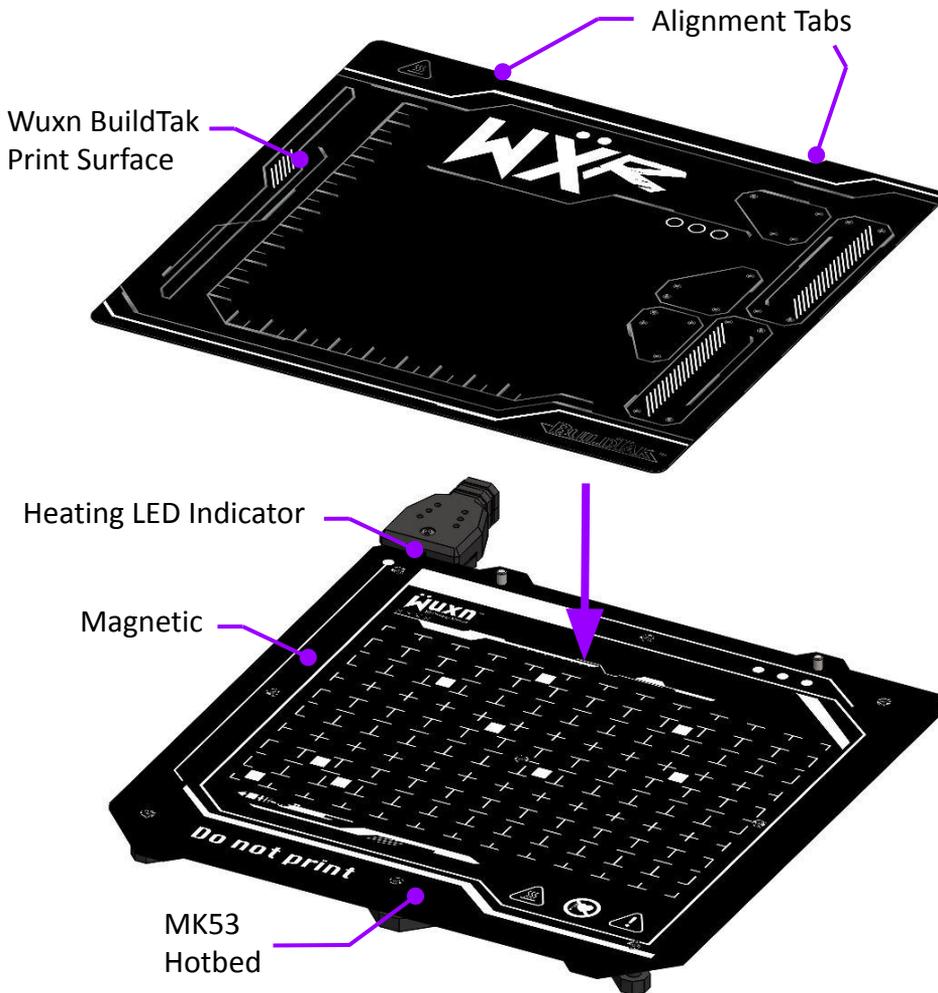
MK53
Hotbed

Disclaimer - Do NOT print on the MK53 hotbed. Attempting to print on the hotbed may damage the surface or nozzle.

Hot surfaces while in use.
Contact may cause burns.

Key Components - X Gantry

Z

Global Axes

Y   X

Belt Tension Meter
Position

X Belt

X
Motor

X

Rigid Linear
Guide Rail

X Belt Tensioner

Adjustment Bolts
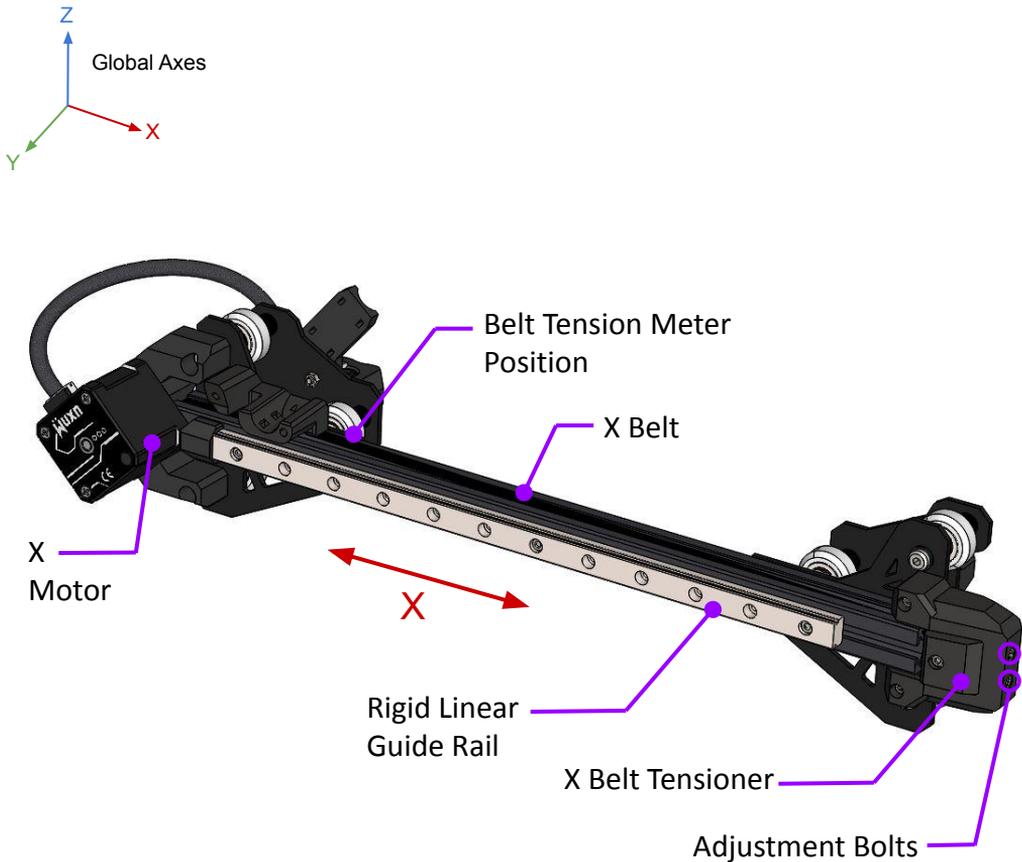
Important - The X belt must be tensioned properly and the linear guide rail must be lubricated regularly. Please see "Maintenance" to learn more.

Key Components - Y Gantry

Z
Global Axes
Y
X

Y Motor

Floating Linear Guide Rail

Y Belt

Y

Y Belt Tensioner and Adjustment Bolts

Belt Tension Meter Position

Rigid Linear Guide Rail
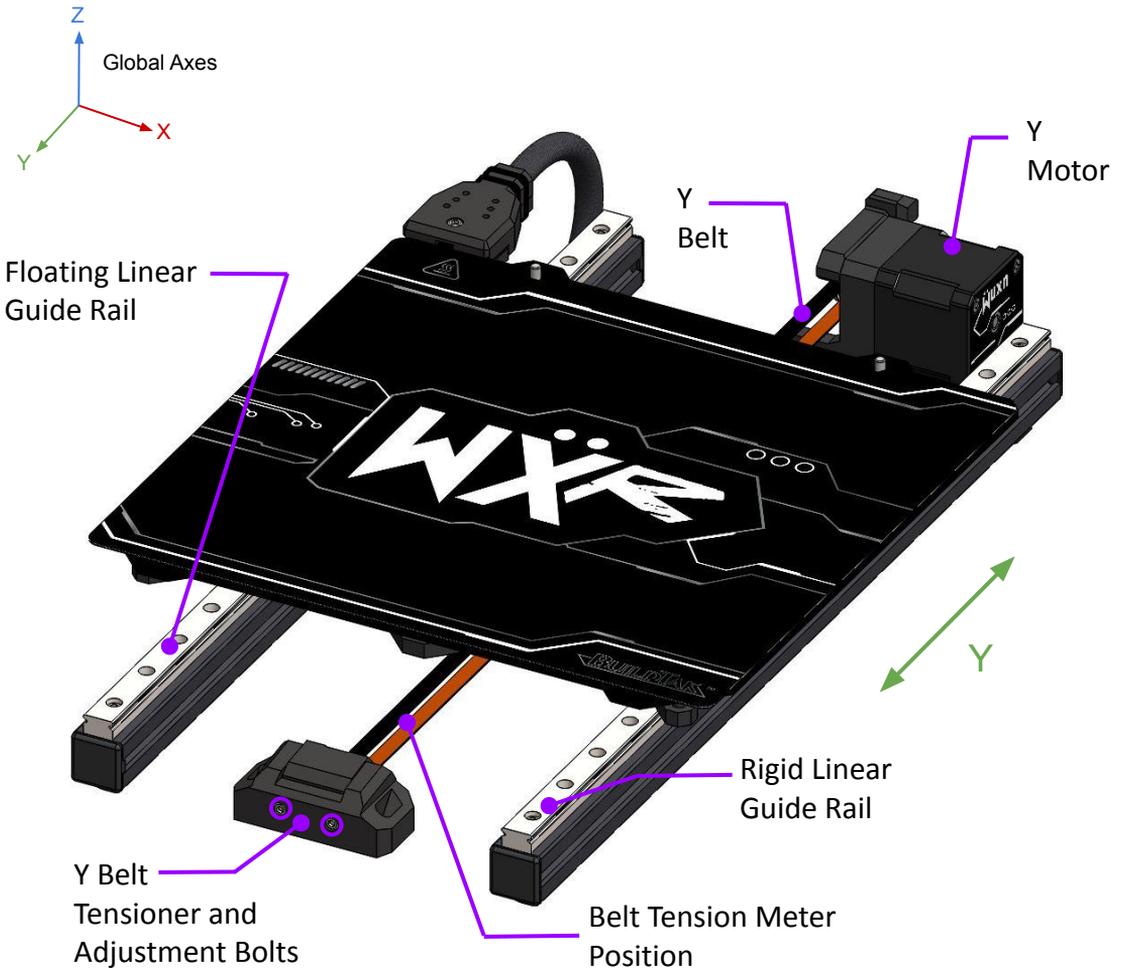
Important- The Y belt must be tensioned properly and the linear guide rails must be lubricated regularly. Please see "Maintenance" to learn more.

Key Components - Z Tower

Z

Global Axes

X

Z Wheel Stoppers

Z

Z Wheels Tensioning Nuts

Lead Screws

Z Couplers

Z Motors
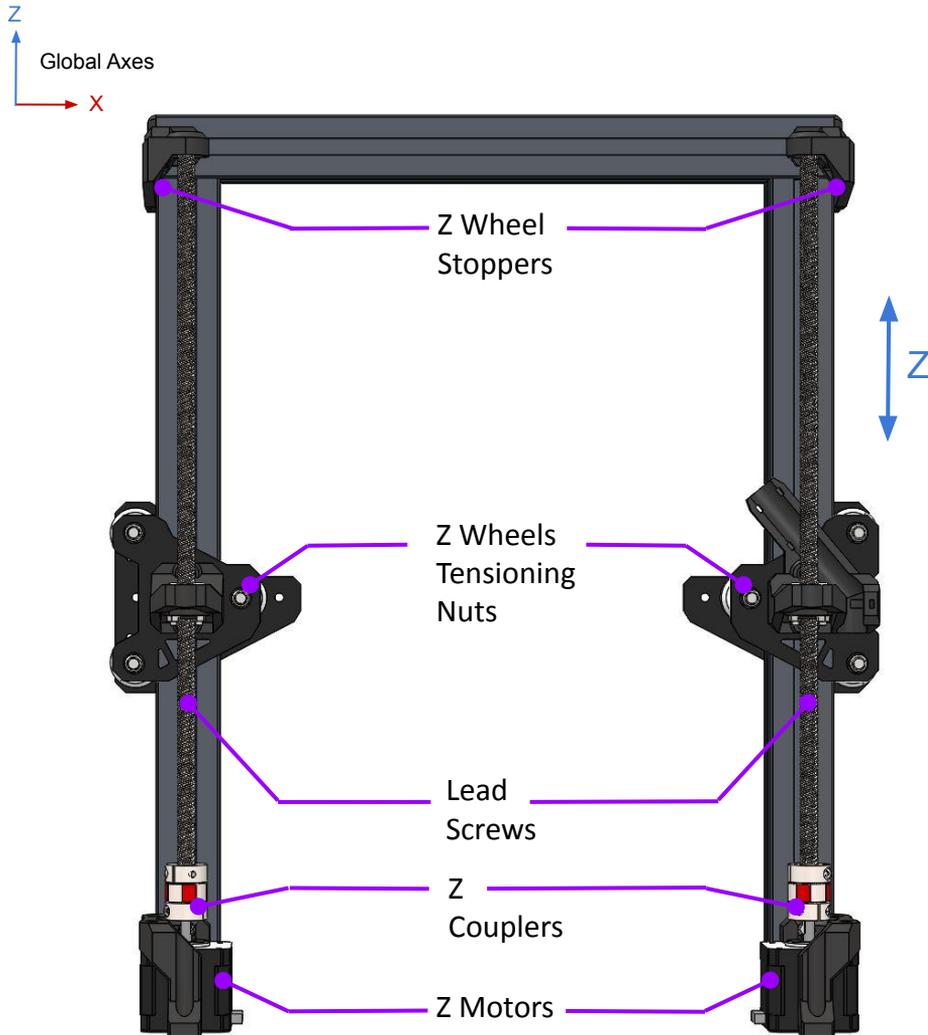
Important - The Z couplers can separate from shipment or abuse. Use the "Set Z" Wizard item to reseat the couplers. Do NOT lubricate lead screws or mating parts. The Z wheels must be tensioned properly. Please see "Maintenance" to learn more.

Final Inspection

Wuxn Classic Filament

Spool holder
mounted

Orange Z
stopper
and cable tie
removed

Orange Z
stopper
removed

Wuxn print
surface
attached

AC power
cable plugged
in

Orange cable tie
removed
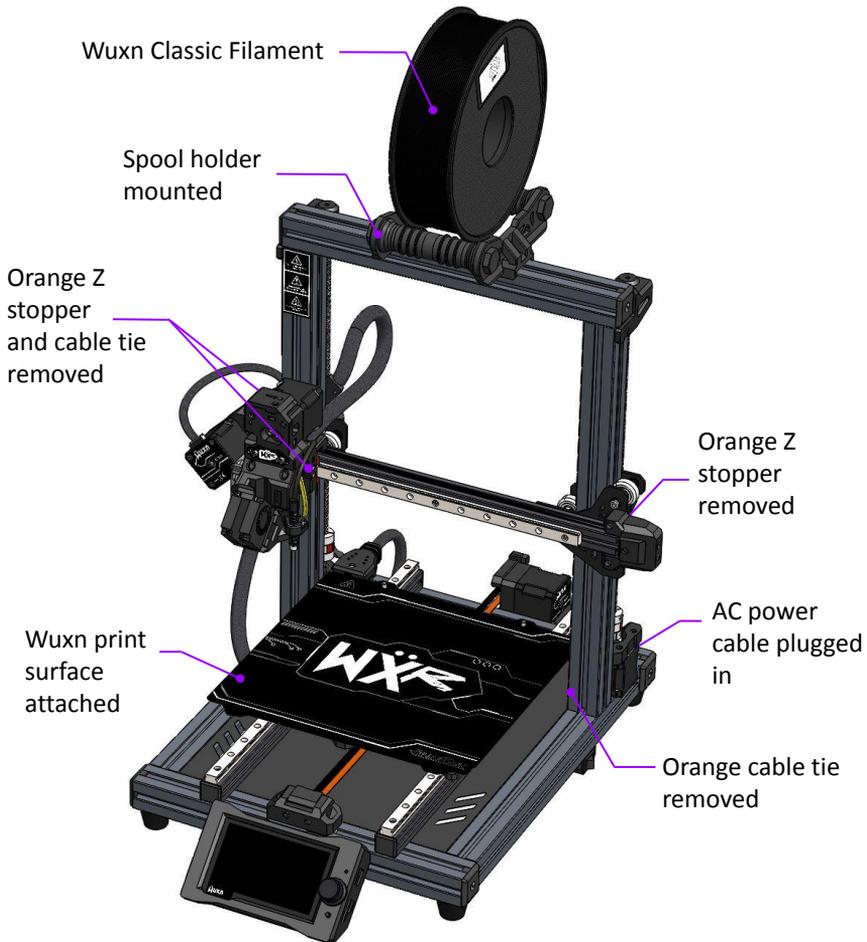
Important - Have the provided SD card at the ready, but do not insert into the printer yet. Always place the printer on a stable surface that is well ventilated. Do not leave the printer powered on while unattended.

Hot surfaces while in use. Contact may cause burns.

Auto-Loading Filament

1.75mm Filament

Wuxn Gears

1. Cut Wuxn Classic filament tip at a sharp angle (45°).
2. Insert the filament into the top of the Extruder subassembly.
3. The Wuxn gears will automatically start turning and pull the filament into the hotend.
4. Follow the Wuxn WXR TFT display prompts to finish loading the filament into Extruder subassembly.
5. Remove the excess filament from the nozzle with pliers.

⚠️ Hot surfaces while in use. Contact may cause burns.

Unloading Filament

To initiate the unloading of filament use the Wuxn WXR TFT display menu:
"Menu>Load/Unload>Unload", then follow the prompts.

Important Tip 1
To switch from a high-temperature material to a low-temperature one, set the temperature to the previous nozzle temperature. For instance, unloading PETG at 235 degrees Celsius and loading PLA at 235 degrees Celsius.

Important Tip 2
Immediately remove the filament from the extruder once it has been ejected.

Out-of-Box Wizard
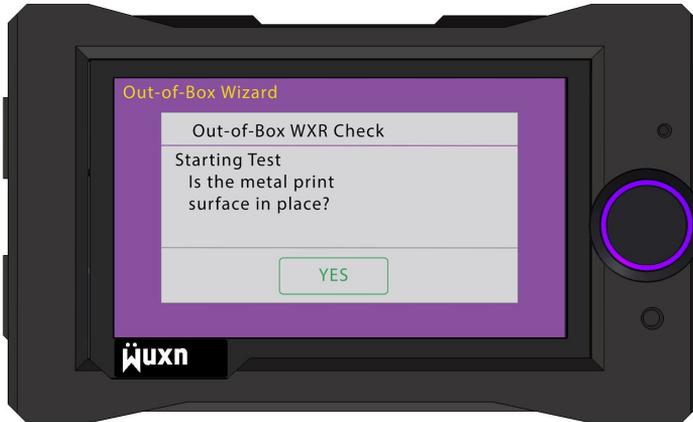
Important: Complete *Final Inspection* before first power on to avoid damaging the machine.

The Out-of-Box Wizard is used to calibrate the Wuxn WXR and will execute when the machine is powered on for the first time. Follow the prompts. Please do not insert the SD card until prompted to do so by the Out-of-Box Wizard.

Use the Out-of-Box Wizard and other Wizard Items to calibrate your printer after maintenance or modifications.

The Out-of-Box Wizard runs automatically once. If you wish to run it again in the future, use the Wuxn WXR TFT display menu: "**Menu>Wizards>Factory Reset**", then follow the prompts.

Wuxn Wizards

There are seven custom "software" tools available to tune, check, or adjust critical parameters. An overview of these is:

Diags - Functional test of fans, probe, and motors.

Set Z - Reset separated Z couplers.

Bed Level - Performs a 49-point leveling process.

1st Layer - Allows real time adjustment of nozzle offset.

PID - Calibrate heaters on the hotend and hotbed.

E Steps - Guided process to set flow rate (advanced users).

Reset - Restore the Wuxn WXR to all factory settings.

To initiate the Wuxn Wizards use the Wuxn WXR TFT display menu;
"Menu>Wizards", then follow the prompts.

Printer Control

The Wuxn WXR can be controlled through the TFT display or a USB cable. The TFT display is the most efficient, quickest, and easiest way to control your 3D printer. However, if you prefer, you can also use a USB cord in combination with free software like Pronterface or a camera system. Keep in mind that this method requires the printer to stay connected to additional hardware throughout the entire printing process, and is not recommended for regular use.

The Wuxn WXR's TFT menu is designed to be user-friendly while still offering all necessary control options. The menu is divided into three main sections:

1. Information Menu

2. Main Menu

3. Print Menu

To ensure you have the latest Wuxn Firmware, please check our download portal at https://wuxn3d.com/pages/software-firmware.

WUXN FIRMWARE
RELEASE 01

SUMMARY

The Wuxn Firmware powers the Wuxn WXR 3D printer and is designed to improve reliability and user-friendliness. The Wuxn Wizards assist users in operating the machine while also automatically performing calibration.

WUXN TFT DISPLAY FIRMWARE

WUXN 3D PRINTER FIRMWARE

Printer Control

Information Menu - This is the main screen that displays the most important information. From here, you can quickly adjust the nozzle temperature, bed temperature, fan speed, print speed, and flow rate. These are the five settings that may need to be adjusted for different filaments.
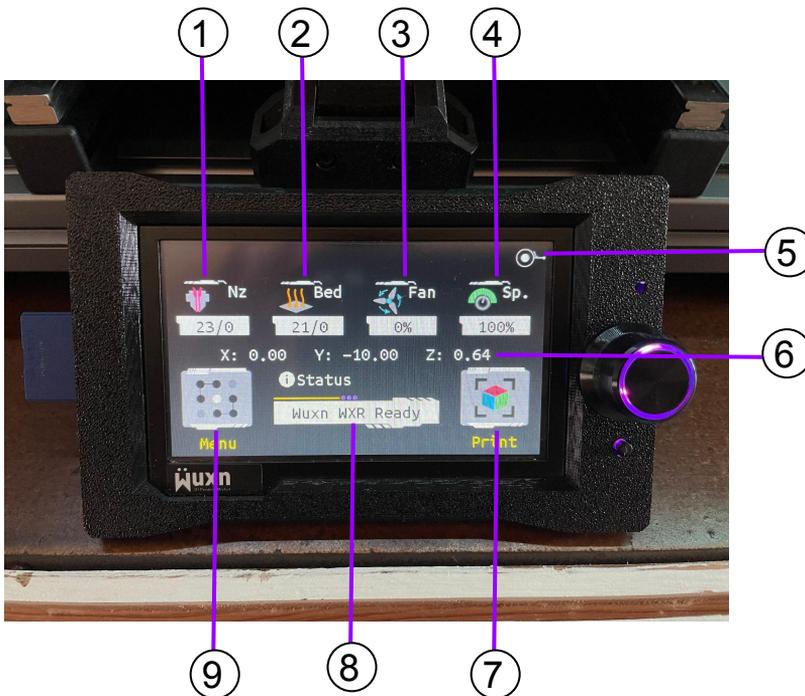
1. Nozzle Temperature (actual/desired temperature)
2. Hotbed Temperature (actual/desired temperature)
3. Fan Speed (control the part cooling fan speed)
4. Print Speed or Flow Rate (control the speed at which you print or the flow rate of the filament)
5. Quick Homing (Home the X, Y, and Z axes to the zeroth position)
6. Actual Position of X, Y, and Z axes
7. Print Menu
8. Status Menu (Error notifications will be posted here)
9. Main Menu

Printer Control

Main Menu - This screen contains selections for pre-configured filament temperatures, motion control, loading and unloading filament, Wuxn Wizards, and setting machine configurations.
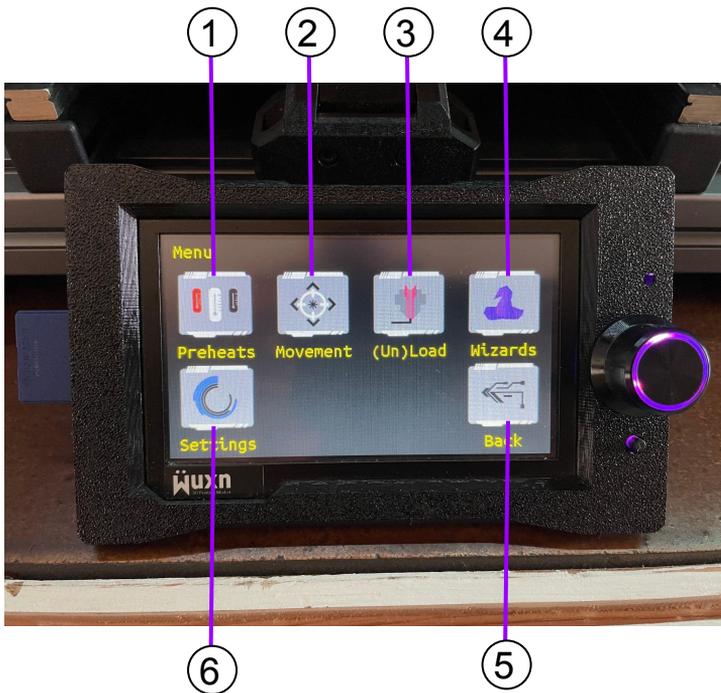
1. Preheats Menu (quickly select 6 different filament temperatures or specific custom values)
2. Movement Menu (Manually jog all axes or disable motors)
3. Load/Unload Menu (Manually load or unload filament)
4. Wuxn Wizards (Calibrate Wuxn WXR here)
5. Back (Return to Information Menu)
6. Settings Menu (Adjust TFT settings, Use G-Code terminal, or view firmware version)

Printer Control

Print Menu - This screen is used to start the printing process. The Wuxn WXR is capable of printing with a full size SD card or flash drive of 8, 16, or 32 gigabytes.
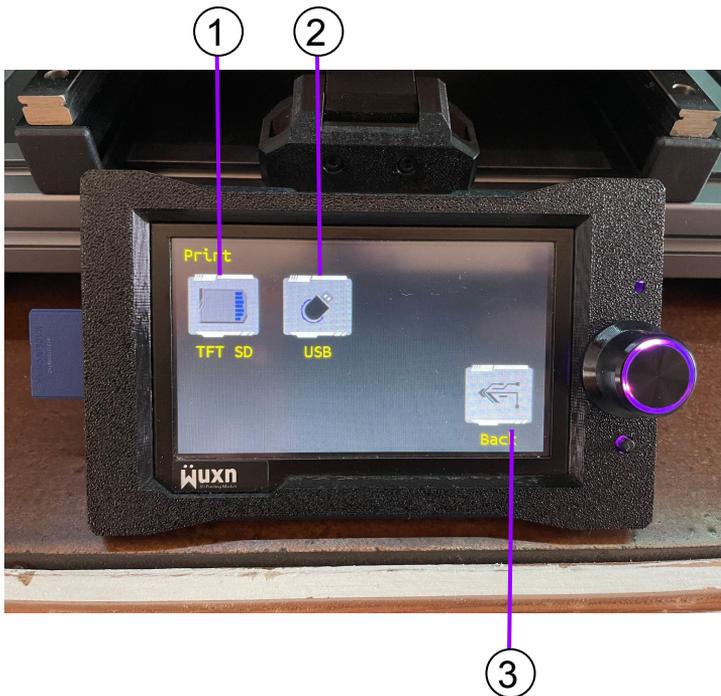
1. TFT SD Card Menu (All files stored on full size SD card will be displayed here)
2. USB Drive Menu (All files stored on USB drive will be displayed here)
3. Back (Return to Information Menu)

First Print

Spool Bearing Slot

Wuxn Calibration Cube
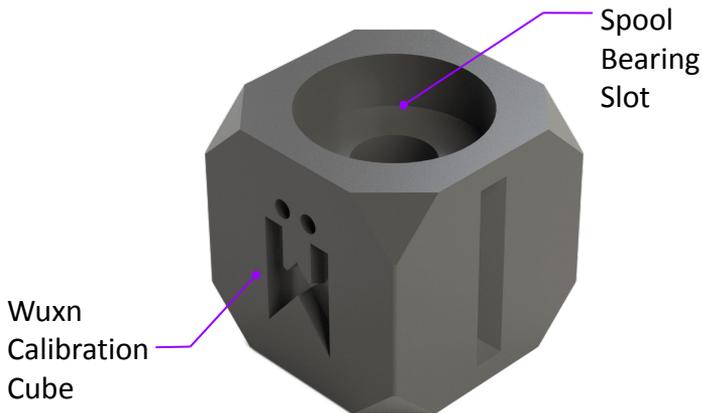
The Wuxn Calibration Cube is printed to confirm dimensional accuracy and print quality of your new Wuxn WXR machine.

The Wuxn WXR machine comes with an extra spool roller bearing. Place the bearing into the top of the cube. The bearing should fit snugly and not fall out, due to gravity, when turned upside down.

The length, width, and height of the cube should measure 30mm respectively. Using a pair of calipers, measure the three lengths to determine if the tolerances are +/-0.1mm.

Fun Fact: The faster you print objects the weaker they are. As the print speed increases the amount of time available for molecular diffusion to occur within the layers decreases. A shorter time of diffusion impacts the microstructure bonds, resulting in an imbalance of molecular forces. The "non-uniform" forces create weaker bond regions and increase the risk of mechanical load fracture/failure in the affected area(s).

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Retrieving Print

To prevent deformation, it is important to let the Wuxn Print Surface cool down to room temperature before attempting to remove the printed object. To loosen the bond between the plastic and the print surface, try flexing the metal plate a few times.

If the part is still attached to the surface, try flexing the plate inward and from both the X and Y directions to remove the object from the surface.
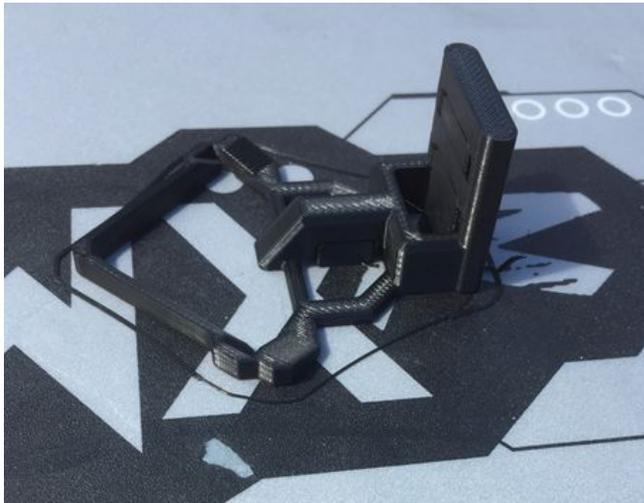
Important Tip
If the printed parts are difficult to remove from the print surface, try adjusting the distance between the nozzle and the print surface by raising the "Z Height" at the beginning of the printing process.

3D Printing Crash Course

Creating a 3D print requires three general processes:
- Finding a 3D model file
- Preparing the 3D model
- Printing the 3D object

Finding
There are a number of websites holding thousands of models that can be downloaded and printed on your Wuxn WXR. Here is a list of our favorite websites to visit when finding a new 3D model to print:

Name	URL	Free or Paid
Thingiverse	https://www.thingiverse.com/	Free
Cults3D	https://cults3d.com/	Both
Printables	https://www.printables.com/	Free
MyMiniFactory	https://www.myminifactory.com/	Both
3Demon	https://3d-mon.com/	Paid
Pintablebricks	https://printablebricks.com/	Free
Fab365	https://fab365.net/	Both
ToyMakr3D	https://www.toymakr3d.com/	Both
Thangs	https://thangs.com/	Free
GrabCAD	https://grabcad.com/library	Free
NASA	https://nasa3d.arc.nasa.gov/models/printable	Free

Alternatively, you can create an 3D object in a computer-aided design (CAD) software. Best design practices and philosophies are outside the scope of this document. Some of the best CAD software to start with includes Autodesk Fusion 360, TinkerCAD, FreeCAD, and SketchUp. For more professional users we recommend Solidworks or PTC CREO Parametric.

3D Printing Crash Course

Preparing
Once an object is recognized, it must be transformed into "G-code" that the printer can use as a guide to print it. This process is known as "slicing" and the object must be in a specific format for the slicing software to work properly. Some common file formats for this purpose include .stl, .obj, and .3mf.

To make the slicing process easier, WuxnSlicer has been developed. This software comes pre-configured with machine parameters, material settings, and print profiles, ready to use. To use WuxnSlicer, simply download the software, import your 3D model, orient it, choose your settings, and slice the model to generate the G-code.

Once the G-code file has been generated, it must be transferred to the Wuxn WXR printer via an SD card or flash drive to initiate the printing process. The G-code file contains a specific set of instructions for the Wuxn WXR to follow.

Printing
Before printing with the Wuxn WXR, it is important to properly prepare the printer. Ensure that the printer is in a well-ventilated area on a stable surface. Connect the Wuxn WXR to a standard 120 VAC outlet, then clean the print surface with 99% isopropyl alcohol. Turn on the printer and load the filament into the extruder. Once the filament is loaded, insert the storage card or drive into the appropriate slot, select "print" and the printing process will begin.

For more detailed information on 3D printing with the Wuxn WXR, please continue to read the ***Wuxn WXR User's Manual***.

WuxnSlicer
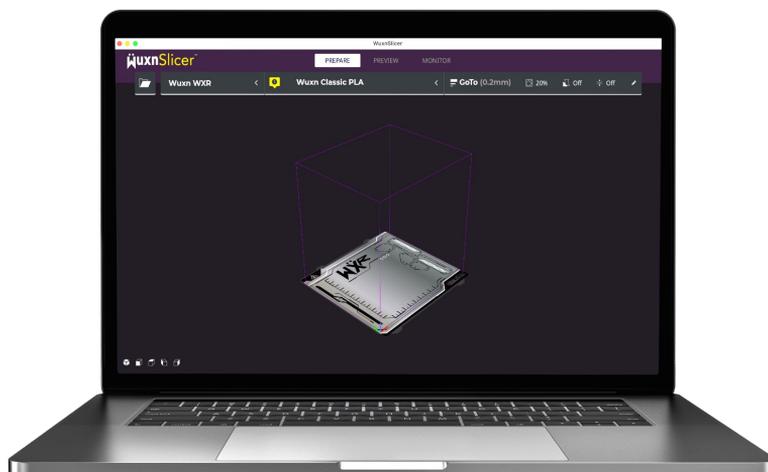
WuxnSlicer is the recommended software for converting 3D objects into specific instructions for Wuxn 3D printers. WuxnSlicer is a derivative of Ultimaker Cura.

WuxnSlicer + Wuxn Firmware + Wuxn Filament have been engineered to optimize print performance, quality, strength, and speed.

Please visit www.wuxn3d/pages/software-firmware to download the most recent version of WuxnSlicer for Mac or PC.

Installing WuxnSlicer

Installation is simple. Just start the installer and follow the on-screen instructions. When updating to a newer version of WuxnSlicer, it's possible that the WuxnSlicer Install Wizard may not launch due to leftover cache from the previous version on your computer. Please see our WuxnSlicer Reinstallation Guide for further assistance.
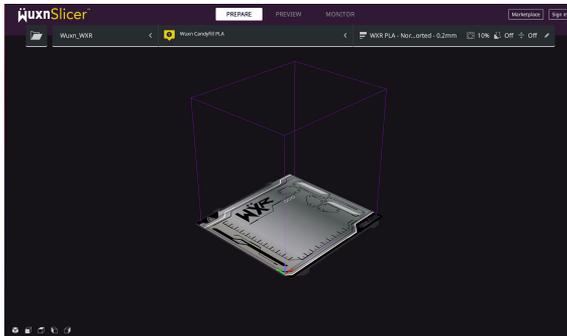
Wuxn Dark
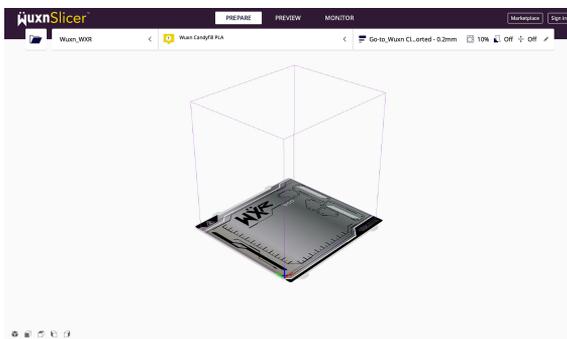
Wuxn Light*

*Navigate to Preferences -> Themes and select your preference after installation. WuxnSlicer will then require you to open and close the application to apply the settings.

Installing WuxnSlicer

Double click:WuxnSlicer-2.0.0.exe ☑ WuxnSlicer-2.0.0.exe

Select a file path and follow the prompts:
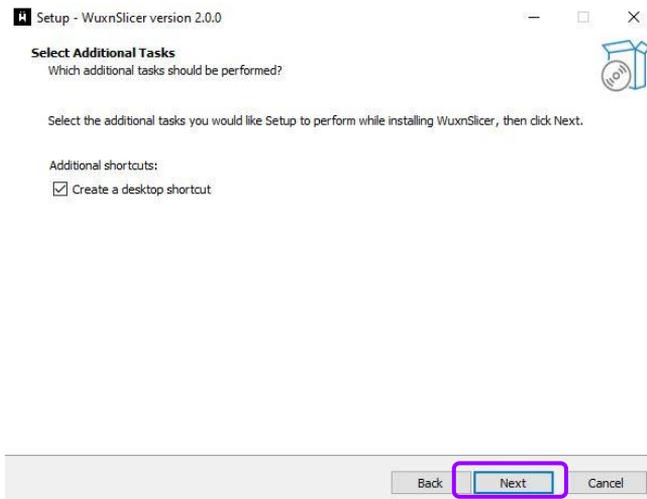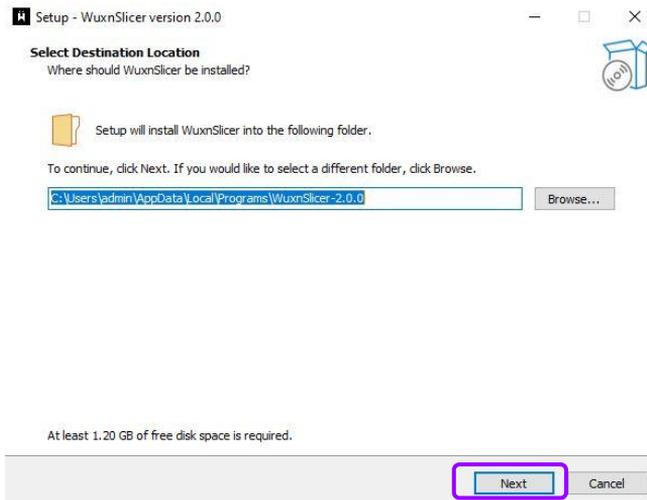
Note - this is an example of the Windows 10 installation process.

Installing WuxnSlicer

Follow the prompts:
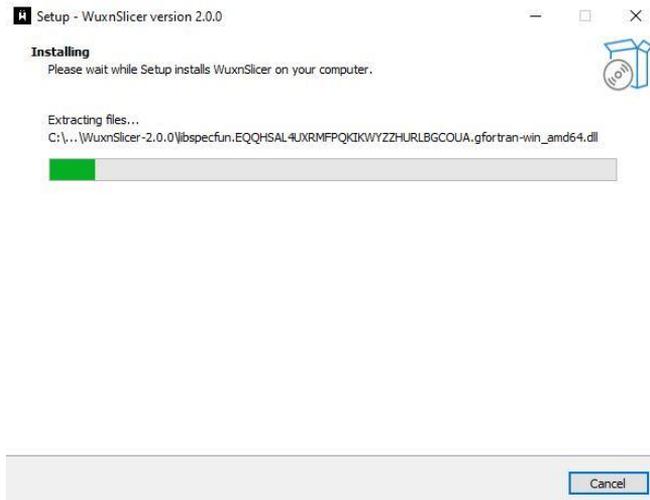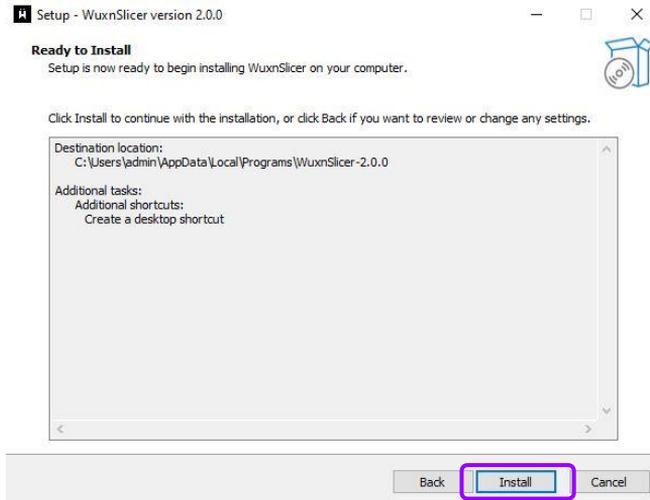
Note - this is an example of the Windows 10 installation process.

Launch WuxnSlicer
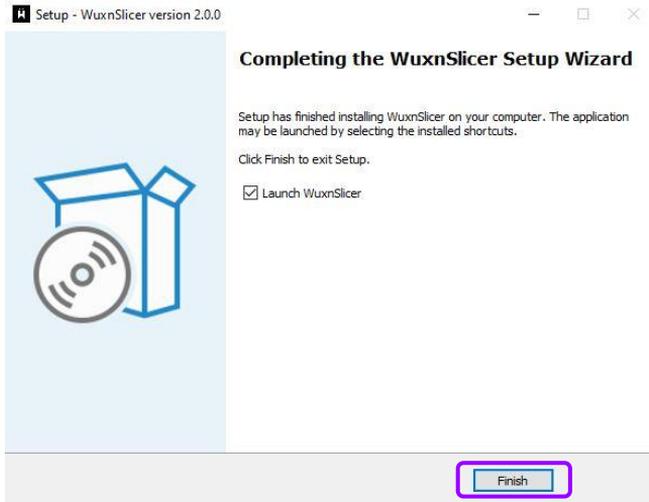
WuxnSlicer Icon is added to your desktop.

After selecting finish, WuxnSlicer will automatically launch.

WuxnSlicer Overview
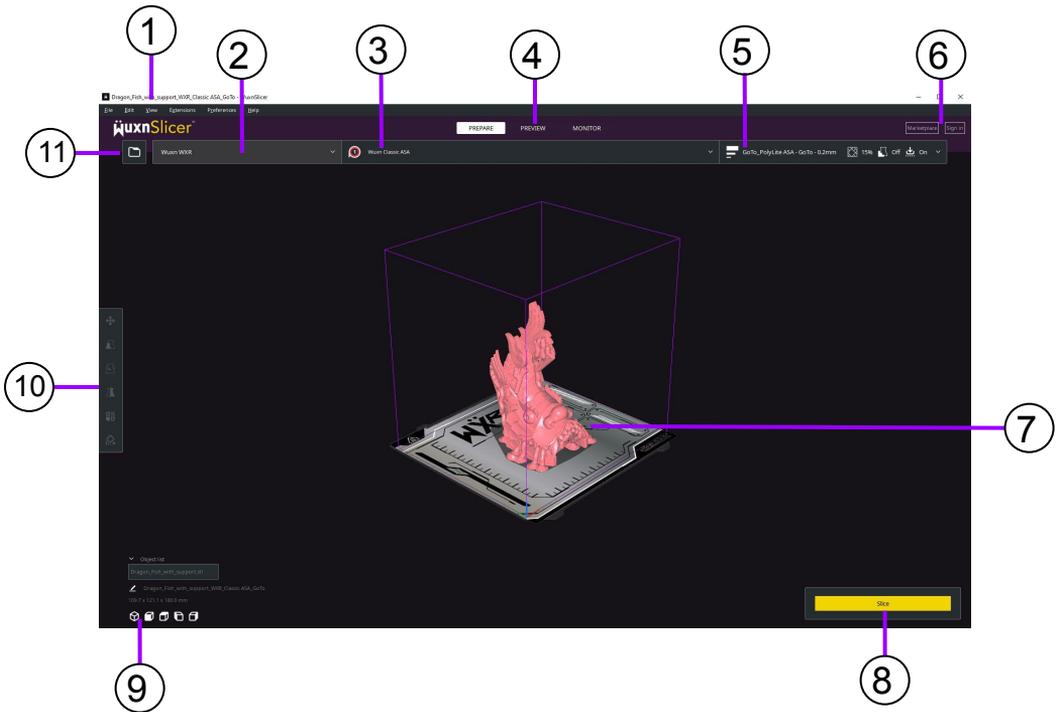
1. Action Bar (Contains settings, software version, and part file name)
2. Machine Settings (A list of Wuxn printers that have various settings such as size, firmware, and start and end G-code)
3. Material Settings (A list of filament settings already optimally pre-configured)
4. Window Actions (Prepare screen is shown and preview screen displays sliced G-Code layers)
5. Print Profiles (A list of print settings already optimally pre-configured)
6. Account Login and Downloads
7. Build Volume (3D model viewer)
8. Slice Button (Generate the G-Code)
9. Various Viewing Modes and Object list
10. Model Manipulation Tools (Position, scale, rotate, and other actions)
11. Open File (Import the 3D model into WuxnSlicer with this button)

WuxnSlicer Controls

This is a list of the basic mouse and keyboard controls when using WuxnSlicer:

1. Left Click - Select
2. Right Click - More Options
3. Scroll Wheel Forward - Zoom in
4. Scroll Wheel Backward - Zoom out
5. Hold Right Click and Move Mouse - Rotate
6. Left Click 3D model and then type T - Move the 3D model
7. Left Click 3D model and then type S - Scale the 3D model
8. Left Click 3D model and then type R - Rotate the 3D model
9. Left Click 3D model and then type M - Mirror the 3D model
10. Left Click 3D model and then type E - Block support material from the specified area of the 3D model

Left Click

Right Click

Scroll Wheel

Using WuxnSlicer

Step 1 - Select the file icon in the top left, navigate to your file, and then select "open" to import a 3D model into WuxnSlicer.

The primary file types that are supported by WuxnSlicer are: 3MF File (.3mf), AMF File (.amf), and STL file (.stl).
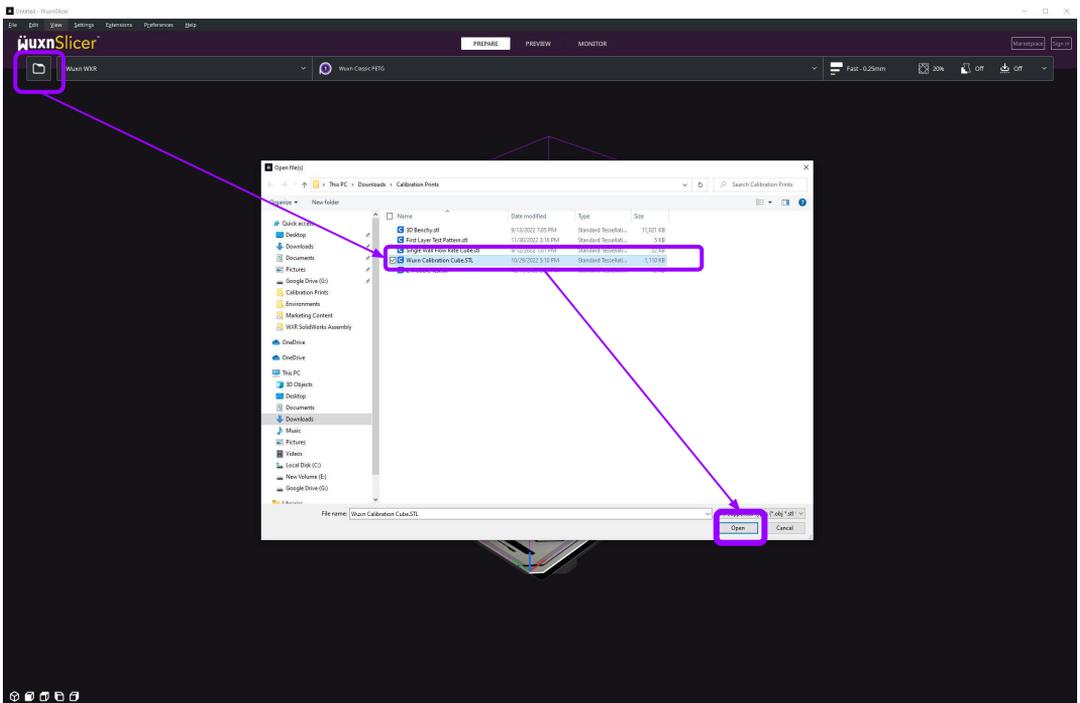
Note: Importing a .gcode file at this step will only allow for previewing and NOT slicing. To see a full list of the file types that are supported by WuxnSlicer please visit the website found here.

Using WuxnSlicer

Step 2 - Use the model manipulation tools to move, scale, rotate, mirror, add per model settings, or add support blockers if needed.

Example, Wuxn Calibration Cube.stl:

❏ Left click the 3D model, select "Rotate", select "face to align to build plate", and then select the bottom face of the cube. This will snap the object right side up.
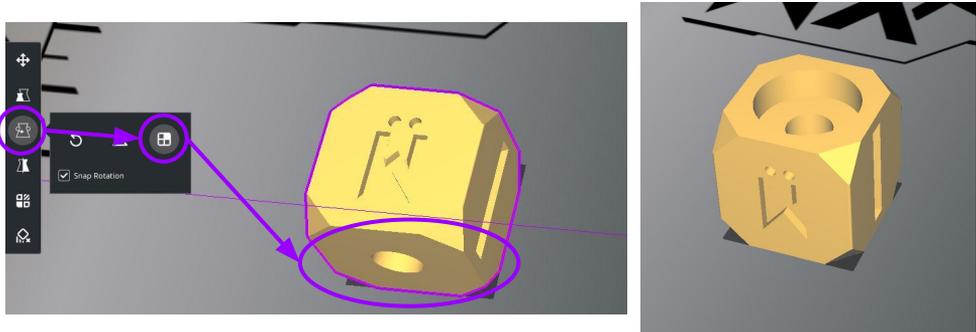
❏ Left click the the 3D model, select "Move", left click Y text box, type in 0, and select enter. This will center the cube in the build volume.
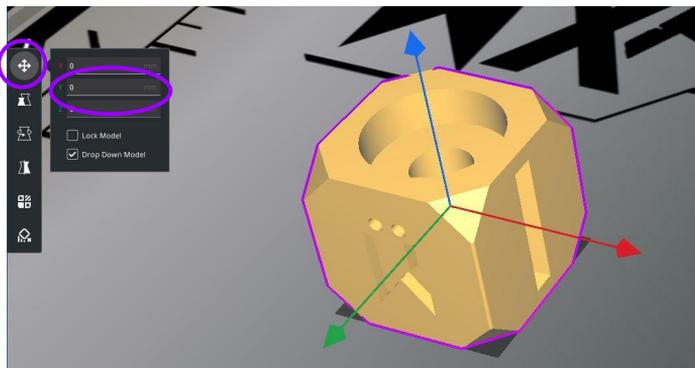
Note - You may also center the object in the build volume by left clicking the 3d model, right clicking, and then select "center selected".

Using WuxnSlicer

Step 3 - In the Materials Settings tab, select the material you want to use for printing.
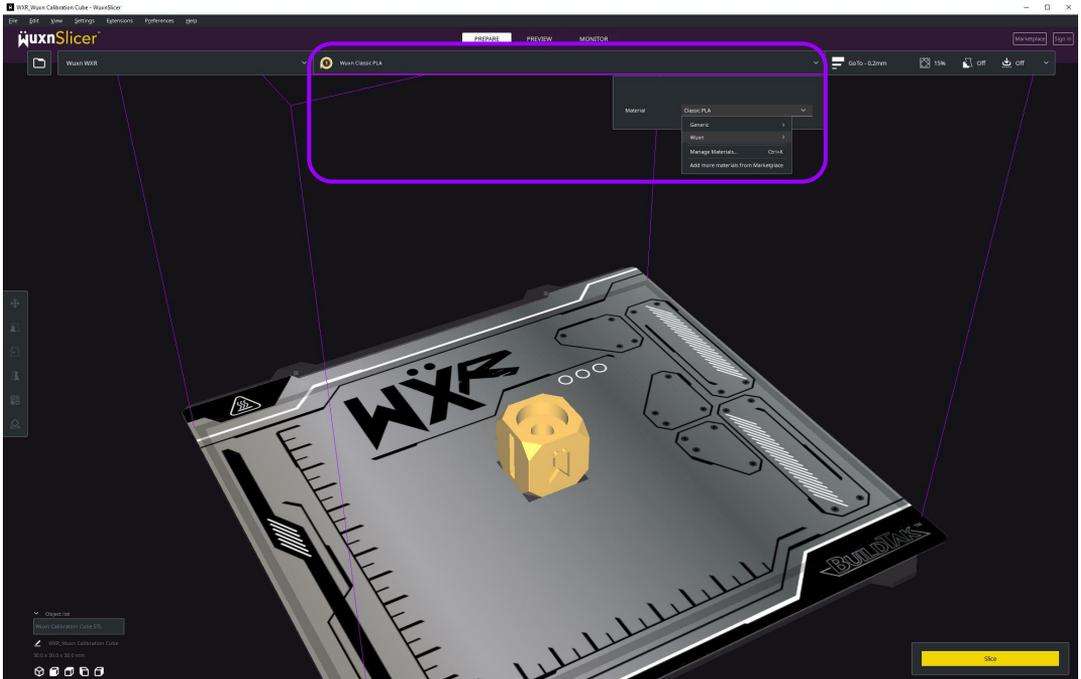
Note: When using filaments that are not from the Wuxn brand, it is recommended to select the Generic Material profile as it usually produces satisfactory results. However, if the filament is not extruding as expected or the part is not adhering properly, try adjusting the five settings found in the Information Menu on your TFT display (see page 23).

Important - It is always easiest to print with PLA filament, especially when printing larger objects.

Using WuxnSlicer

Step 4 - Three unique print profiles will be generated based on your material selection. Choose "Strong," "GoTo," or "Fast" from the list of profiles to match your desired needs.
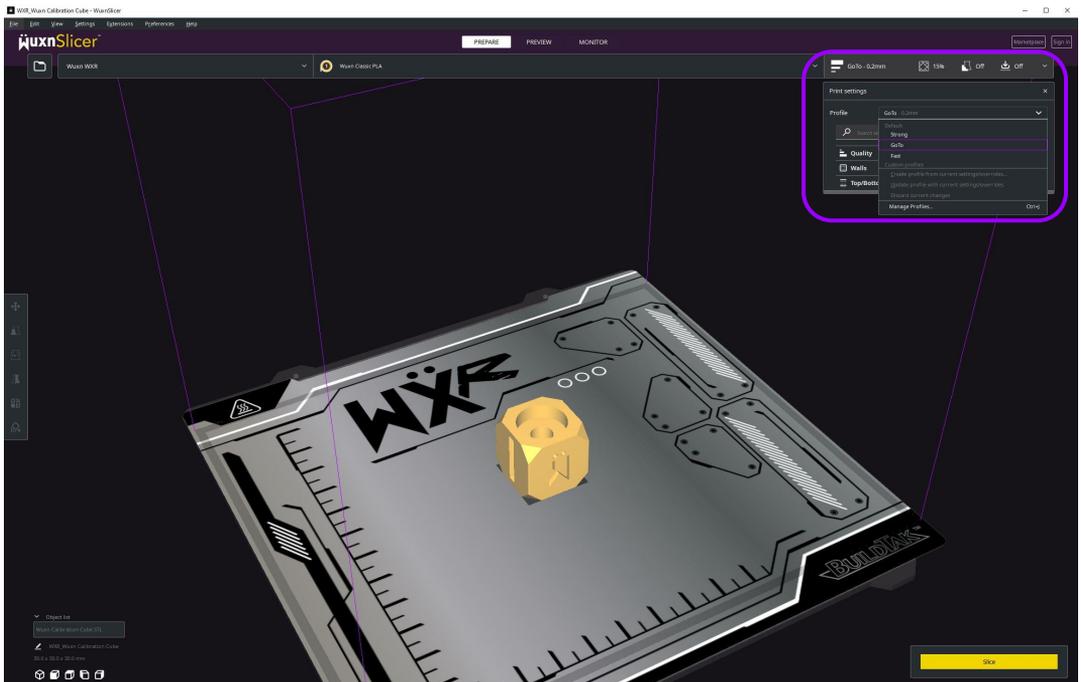
Strong: This profile produces a strong 3D part but takes the longest time to print.

GoTo: This is the standard profile commonly used by the Wuxn team. It offers a balance of moderate speed, high print quality, and reliability.

Fast: If time is a priority, use the fast profile. However, it yields the lowest quality of the three options.

Using WuxnSlicer

Step 5 - Select the "Slice" option to create a G-code file. This file will include a tool path for your Wuxn WXR 3D printer to follow.
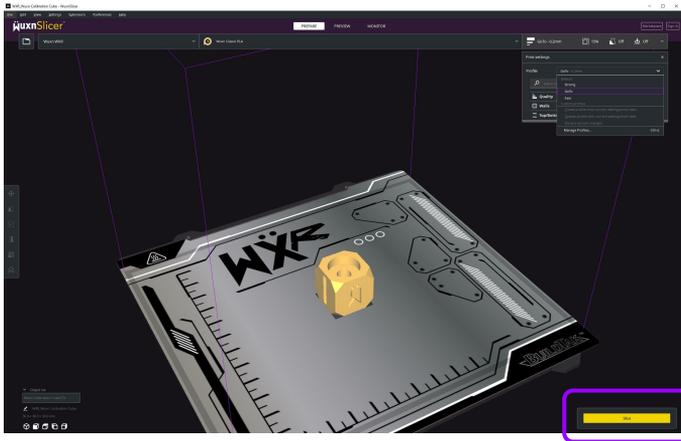
Use the 'Preview' window to view the G-Code and confirm that the slicing matches your expectations, particularly for the first layer. Utilize the sliders on the right and bottom of the screen to review each layer.
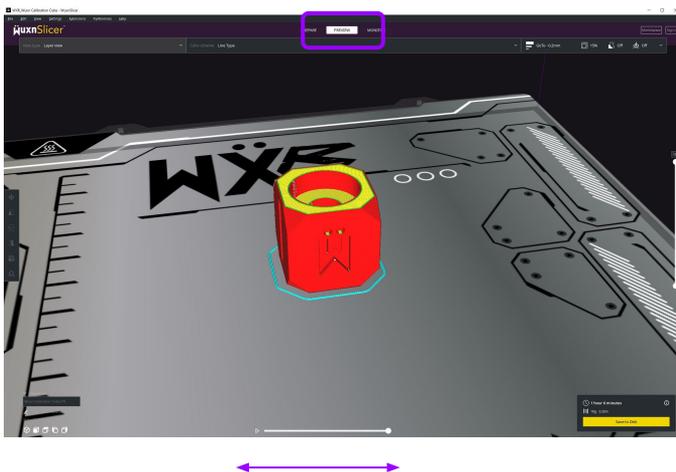
Using WuxnSlicer

Step 6 - Save the .gcode file to the SD card supplied with the Wuxn WXR. The Wuxn WXR is compatible with 8GB, 16GB, and 32GB SD cards or USB drives.
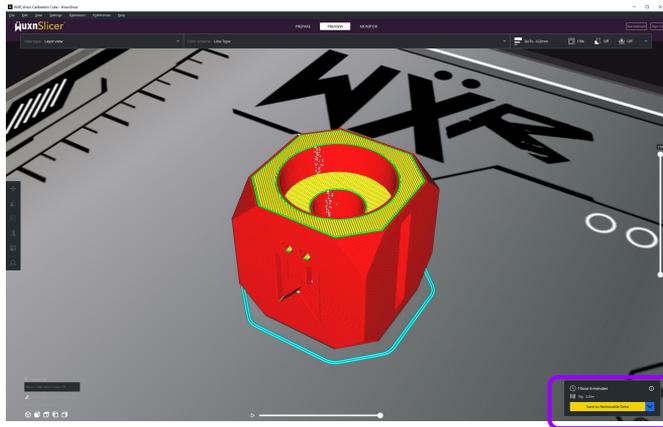
Transport SD card with the .gcode file to your Wuxn WXR and insert into the TFT display, and the printer will automatically display the file.
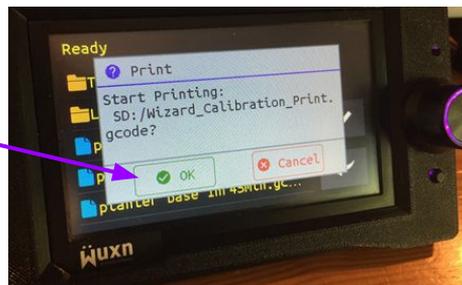
Tap OK to begin print

WuxnSlicer Tips

How do I print larger models?
To print larger models, break them down into smaller parts and connect them using fasteners, joints, or adhesives.

Utilize WuxnSlicer to divide the model by positioning it below the build surface.
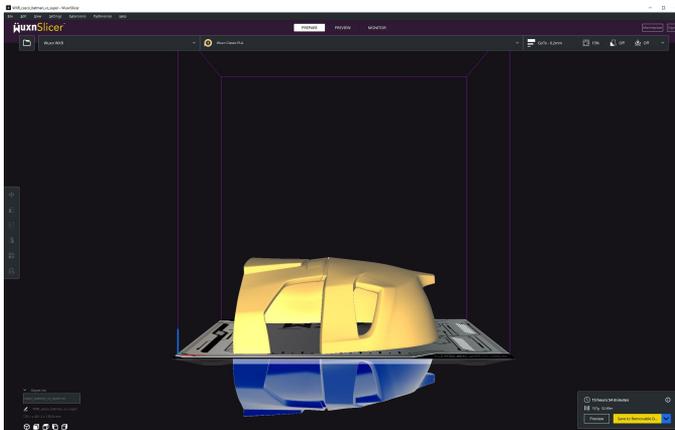
Select the 'Slice' option to generate a G-code for one portion of the model, then repeat the process for the remaining parts.
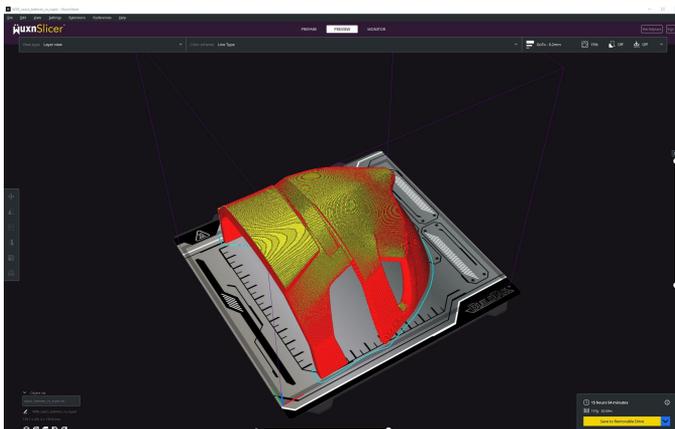
WuxnSlicer Tips

What is Support Material?

As a 3D part is printed layer-by-layer the filament must be supported or it will fall due to the force of gravity. We can enable Support Material as a sacrificial part to "prop up" the geometries that form bridges or overhangs.

WuxnSlicer automatically pinpoints the areas of your 3D model that require support material, and highlights them in red for easy identification.
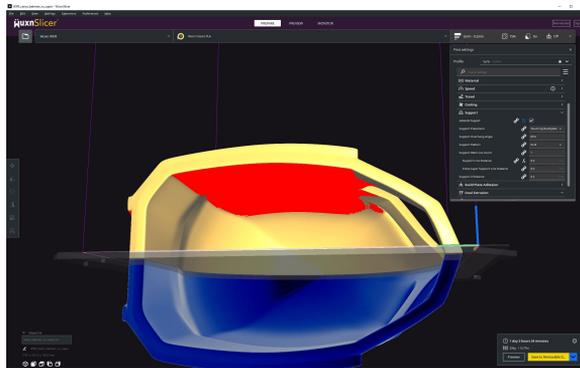
To enable the support material select "Generate Support" from the drop down menu in the Print Settings. The newly added support material will be highlighted in blue within the Preview Window.
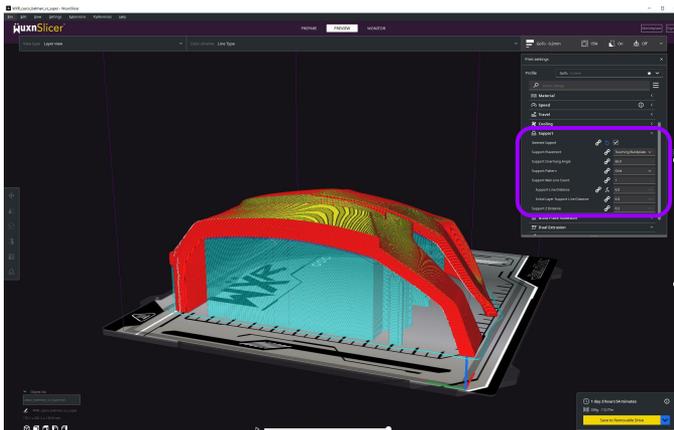
Materials

In FDM (Fused Deposition Modeling) 3D printing, filaments are the thermoplastic materials that are used as the "ink" for the printer. The filament is loaded into the printer and is melted by a heating element, and then extruded through a nozzle to build up the object layer by layer. The filament solidifies as it cools, creating a solid object. The most common filaments used in FDM printing include PLA, PETG, and ASA.

All of the filaments require different temperatures, printing speeds, cooling rates, and flow rates for accurate results.

Calibrating a new material can be a difficult procedure. WuxnSlicer has simplified this process with preconfigured settings for different materials.

We highly recommend starting with PLA first, as it is the easiest material to work with.

3D Printing Filaments
Level of Difficulty

PLA ⟶ PETG ⟶ ASA ⟶ ABS ⟶ TPU ⟶ PA ⟶ PC

(easiest)   (most difficult)

Please be aware that this list is not exhaustive. We will only be discussing the filaments that are most commonly used.

Materials

PLA (Polylactic Acid)
PLA is a biodegradable thermoplastic polymer made from natural resources such as corn starch, sugarcane, or other types of starch. PLA is the most widely used filaments in 3D printing because it is easy to use and produces high-quality prints. PLA filament is non-toxic, has a low melting point, and produces minimal odor when printing.

Nozzle Temperature = 185-225 °C
Bed Temperature = 50-60 °C
Fan Speed = 100 %

Advantages

- Biodegradable
- Easy to print
- Non-toxic
- Wide color selection
- Affordable

Disadvantages

- Low temperature resistance
- Not ideal for outdoor use
- Brittle

Materials

PETG (Polyethylene terephthalate glycol)
PETG is a type of thermoplastic polymer filament that is commonly used in 3D printing. It is a strong, durable, and has high thermal resistance. One of the main advantages of PETG filament is its strength and flexibility. It is stronger than PLA and is also more flexible, which makes it a good choice for parts that need to withstand high stress and pressure. PETG filament is also known for its high thermal resistance which makes it a good choice for parts that will be exposed to heat.

Nozzle Temperature = 220-265 °C
Bed Temperature = 70-90 °C
Fan Speed = 0-50 %

Advantages

- High temperature resistance
- Easy to print
- Good strength and ductility
- Transparent and glossy
- Low warping
- Food safe

Disadvantages

- Prone to stringing
- Can be brittle when printed at low temperatures
- Not UV resistant and may yellow over time

Important Tip - It is best to dry PETG filament in a oven at 65 degrees Celsius for 4-6 hrs before printing. This will remove the moisture within the filament and minimize stringing.

Materials

ASA (Acrylonitrile Styrene Acrylate)
ASA is a thermoplastic filament that is becoming more popular. It is known for its weather resistance, high UV resistance and high impact strength. ASA has similar printing characteristics to ABS but with improved resistance to environmental factors such as sunlight, heat, and moisture. ASA is commonly used in outdoor applications and products that require long-term exposure to environmental elements.

Nozzle Temperature = 220-270 °C
Bed Temperature = 90-110 °C
Fan Speed = 0-20 %

Advantages

- Excellent weather and UV resistance
- High impact and wear resistance
- Suitable for outdoor use
- High temperature resistance
- Good chemical resistance
- Can be vapour smoothed or glued together using acetone

Disadvantages

- Difficult to print
- More brittle than ABS
- Prone to warping and layer separation
- Poor bed adhesion
- Unpleasant odor during printing

Important Tip - It is best to print ASA filament in a heated enclosure to reduce layer separation and warping.

Materials

ABS (Acrylonitrile Butadiene Styrene)
ABS filament is known for its toughness, strength, and heat resistance. It is a good choice for various 3D printing applications including toys, phone cases, and automotive parts. However, ABS filament is known to produce unpleasant odors during printing. Also, ABS filament is difficult to print with because it is prone to warping and layer separation.

Nozzle Temperature = 230-255 °C
Bed Temperature = 95-110 °C
Fan Speed = 0-20 %

Advantages

- Strong and durable
- High temperature resistance
- Good chemical resistance
- Can be vapour smoothed or glued together using acetone

Disadvantages

- Difficult to print
- Prone to warping and layer separation
- Poor bed adhesion
- Unpleasant odor during printing

Important Tip - It is best to print ABS filament in a heated enclosure to reduce layer separation and warping.

Materials

TPU (Thermoplastic Polyurethane)
TPU filament is a type of flexible and durable thermoplastic material. It is known for its high elasticity, impact resistance, and toughness. It is often used to create flexible parts such as phone cases and footwear components. TPU filament is also resistant to oils, chemicals, and UV light, making it a versatile material for a range of applications.

Nozzle Temperature = 185-240 °C
Bed Temperature = 40-80 °C
Fan Speed = 20 %

Advantages

- Flexibility and elasticity
- Abrasion resistance
- Good impact resistance
- Tough and durable
- Water resistance

Disadvantages

- Must be printed slowly
- Prone to stringing
- Requires extra steps to load filament. Loosen the extruder tension bolt by ½ revolutions.
- High moisture absorption

Materials

PA (Polyamide)

Polyamide (PA) filament, also known as Nylon filament, is a thermoplastic material commonly used for 3D printing. It is a strong and durable material that is often used for industrial applications where high strength and impact resistance are required.

Nozzle Temperature = 240-285 °C
Bed Temperature = 70-115 °C
Fan Speed = 50 %

Advantages

- Great mechanical properties
- High strength and durability
- Chemical resistance

Disadvantages

- High printing temperatures required
- Difficult to print
- Prone to warp but less than ASA/ABS
- Moisture sensitivity

Important Tip - Nylon filament absorbs moisture at the highest rate of all the common filament types. It is best to print nylon with the filament in a dry box with the machine in a heated enclosure.

Materials

PC (Polycarbonate)
PC filament is a strong thermoplastic characterized by its excellent impact resistance, high rigidity, heat resistance, and fire retardancy. It is ideal for harsh environments where materials are put to the test, meaning it can withstand extreme temperatures and pressures.

Nozzle Temperature = 220-275 °C
Bed Temperature = 100-115 °C
Fan Speed = 10 %

Advantages

- Very high strength
- Very high impact resistance
- High temperature resistance

Disadvantages

- High printing temperatures required
- Warping
- Stringing
- Poor bed adhesion
- Low chemical resistance

Materials

Composite Materials

A composite is made from a combination of two or more materials. All the common FDM 3D printer filaments mentioned can also be found in composite form. To create composites, manufacturers often add materials such as wood, glass, carbon fiber, and metal to enhance properties. Some even add materials that make the filament glow in the dark.

It's worth noting that composites can be more abrasive and wear out your brass nozzle faster. We suggest upgrading your Wuxn WXR to a hardened steel nozzle to mitigate this.

Some examples of composite materials are:

1. PLA carbon fiber-reinforced - This material will print just like traditional PLA but offer improved strength. This filament will require a hardened steel nozzle.
2. Glass-reinforced nylon - This material will print similarly to traditional nylon but offer improved impact resistance. This filament will require a hardened steel nozzle.

Material Storage

Moisture from the air can affect 3D printing filaments, leading to brittleness, increased stringing, and voids in printed parts. For best results, store filament in a dry box with vacuum sealing, desiccants, and optional heating. If a dry box is not available, an oven can be used to heat the filament and remove moisture.

Consult the chart for the proper temperature and heating durations:

Materials	Dryer Temp.	Drying Time
PLA	113℉ / 45°C	6-8 hrs
PETG	149℉ / 65°C	4-6 hrs
ASA	149℉ / 65°C	4-6 hrs
ABS	149℉ / 65°C	4-6 hrs
TPU	122℉ / 50°C	4-6 hrs
PA	158℉ / 70°C	>12 hrs
PC	149℉ / 65°C	4-6 hrs

Note - Use this chart only as a guide. Some filaments may require more or less drying time.

Maintenance & Care

Every Wuxn WXR is thoroughly inspected, fully assembled, and tested prior to shipment to ensure that it is ready to run straight out of the box. However, all mechanical systems will degrade over time and maintenance is required to keep your 3D printer functioning properly.

Regular Maintenance Items

Print Surface Preparation
The most common item requiring attention is the print surface. If any oil, dirt, or grease accumulates on the print surface the parts will not adhere properly. Clean the print surface with 99% isopropyl alcohol every 10-30 prints. You can reduce this frequency by handling the print surface at the outer edges and storing the Wuxn WXR in a clean work environment.

Note: Never clean your print surface while the item is still hot. Allow the surface to cool down to room temperature before proceeding.

Isopropyl Alcohol GHS Label: Chemical Danger, Highly Flammable Liquid And Vapor, Causes Serious Eye Irritation and Drowsiness or Dizziness with Prevention and Response.

Maintenance & Care

Linear Guide Rail Lubrication

The second most common item thats needs regular maintenance is the X and Y linear guide rails. It is best practice to lubricate the linear guide rails every 2-3 months with low viscosity oil. We highly recommend using Lucas Extreme Duty Gun Oil because of its low viscosity and needle nozzle applicator.

Lubrication Process

- Clean and remove the dirt, oil, and grease from the desired linear guide rail using a microfibre cloth.
- Locate the linear guide rail pillow block lubrication hole.
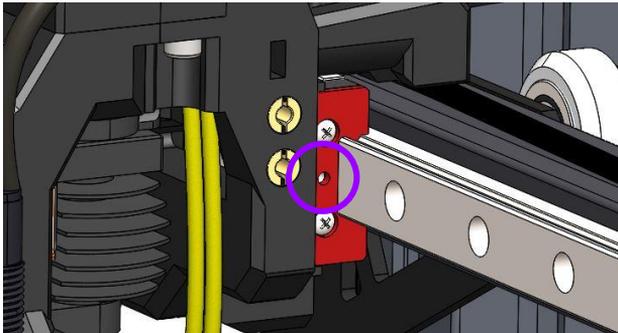
- Apply lubrication in the pillow block hole until full.
- Reposition the pillow block and expose the second lubrication hole on the opposite side.
- Apply lubrication in the second pillow block hole.
- Repeat this process for the remainder of linear guide rails.

Maintenance & Care

Adjusting Belt Tension

For best performance of the Wuxn WXR, certain belt tensions are required. Improper belt tension will result in layer shifting, ringing, or inconsistent sensorless homing. The belt tension for both the X and Y axis should be checked every 3-4 months.

Belt Tensioning Process

- Download the belt tension meter from our Github page here.
- Home the X and Y axes through the TFT display. We want the extruder and hotbed at the zeroth positions to expose the belts.
- Place the tension meter on the belt by wrapping the belt over, under, and over the three levers on the meter. Once the tension meter has been placed, the needle indicator will automatically deflect to a higher position.
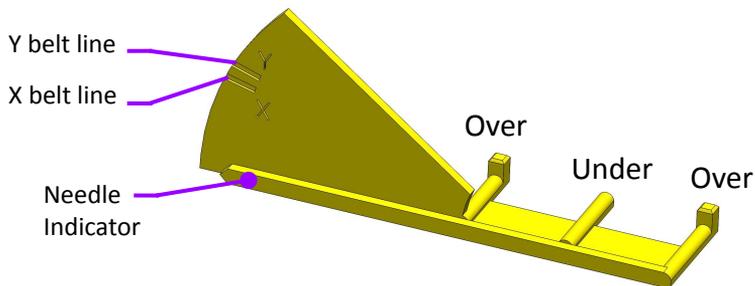
- Verify that the tension for the X and Y axis belt is set correctly. The X axis belt should displace the needle indicator to the bottom X belt line. The Y axis belt should displace the needle indicator to the top Y belt line.
- If the tension is not set correctly adjust the X or Y belt tensioner bolts (see page 14 and 15). The needle indicator tip should be centered within the X or Y belt line, depending on the axis being inspected. Loosen the two bolts to lower the needle indicator and tighten the two bolts to raise the needle indicator.

> **Important** - The belt tension meter must be printed with Wuxn Classic PETG and the GoTo profile. If the tension meter is printed with a different material or manufacturer the results will not be accurate.

Maintenance & Care

Z Wheel Tensioning

The Z-axis motion of the Wuxn WXR is achieved with six "V" wheels. The inner wheel on each side has an eccentric nut that is used to adjust the tension. Use a 10mm wrench and turn this nut until you are just able to move that wheel smoothly with your finger. It should NOT spin freely but it should just touch the extrusion enough to keep the gantry straight.

V Wheel Adjustment Process

2 Verify Z Axis unit does not rock and keeps straight path.

1 Rotate eccentric nut at small increments and check that the inner wheel can rotate smoothly with a finger.
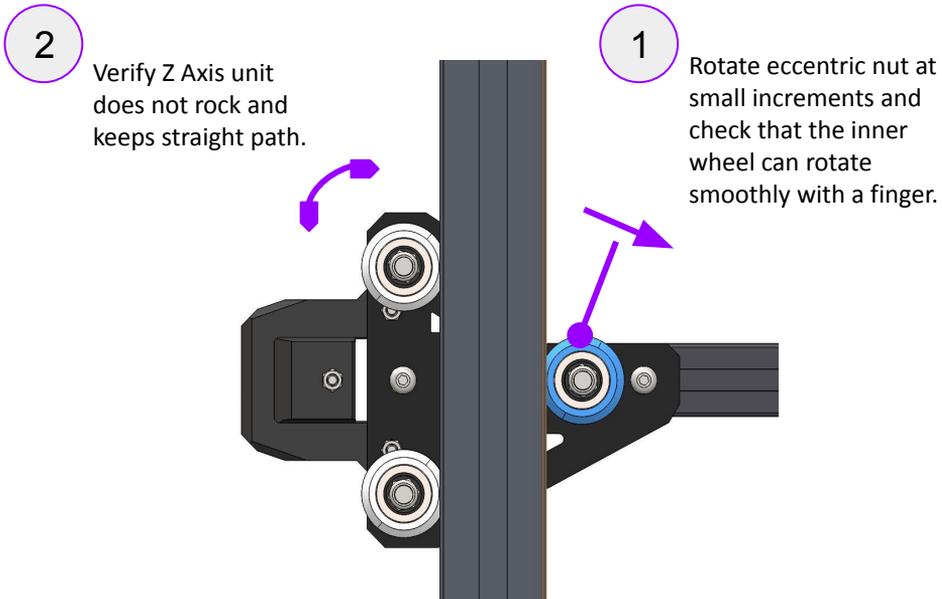
Important - If the "V" wheels tensioning is too tight the Z-axis movement will bind and eventually lead to flat spots on the wheels. Alternatively, if the "V" wheels tension is too loose the Z-axis movement will lose positioning.

When the Z axis binds or loses position the vertical layers on a 3D print will experience *Z Banding* (smashed or inconsistent vertical layer(s)).

Maintenance & Care

Replacing the Nozzle

The Wuxn WXR comes standard with a 0.4mm brass nozzle. This nozzle will wear down over time and reduce the print quality. The nozzle should be replaced after printing with 100 - 200 kg of filament. When printing with composite materials we recommend upgrading to a hardened steel nozzle.

Nozzle Replacement Process

1. Preheat the nozzle to 285°C. Heating the nozzle is essential to this process and the temperature should be achieved before any tools are used.
2. Unload the filament from extruder.
3. Increase access to the nozzle by moving the Z axis to 225mm height.
4. Hold the heater block with a 16mm wrench. Use a 7mm socket or needle nose pliers and unscrew the brass nozzle from the heater block.
5. Make sure that the nozzle temperature is steady at 285°C. Carefully thread the new nozzle into the heat block and secure*. Don't forget to use the wrench to hold the heater block.
6. Use the "PID" tool in the Wuxn Wizards to calibrate your updated hotend. (Main Menu > Wizards > PID)
7. Insert filament and you are ready to print.

*To avoid damage to the hotend, this process is best performed with the *1.5 N*m Nozzle Torque Wrench*. The torque wrench can be purchased from Wuxn3D or Slice Engineering.

⚠️

CAUTION: Heated parts can cause severe burns! Be extra careful around the hotend thermistor leads, they can be broken off easily.

Maintenance & Care

Wuxn Gears Maintenance

Over time filament shavings and other contaminants can accumulate on the Wuxn gears. These contaminants degrade print performance. The gears should be cleaned after printing with 100 - 200 kg of filament.

Wuxn Gears Tensioning and Cleaning Process

- Unload filament from the extruder.
- Loosen and remove the extruder tensioning bolt. Be careful not to drop or lose the spring or M3 nut.
- Rotate the extruder idler door open like a door hinge.
- Use a small brass brush or Q-tip and clean the contaminants from the gears.
- Once the gears have been cleaned, close the extruder idler door and fasten the extruder tensioning bolt. The end of the extruder tension bolt should be flush with the outside of the M3 nut.

Spring

Extruder Idler Door

Extruder Tensioning Bolt

Wuxn Gears

M3 Nut
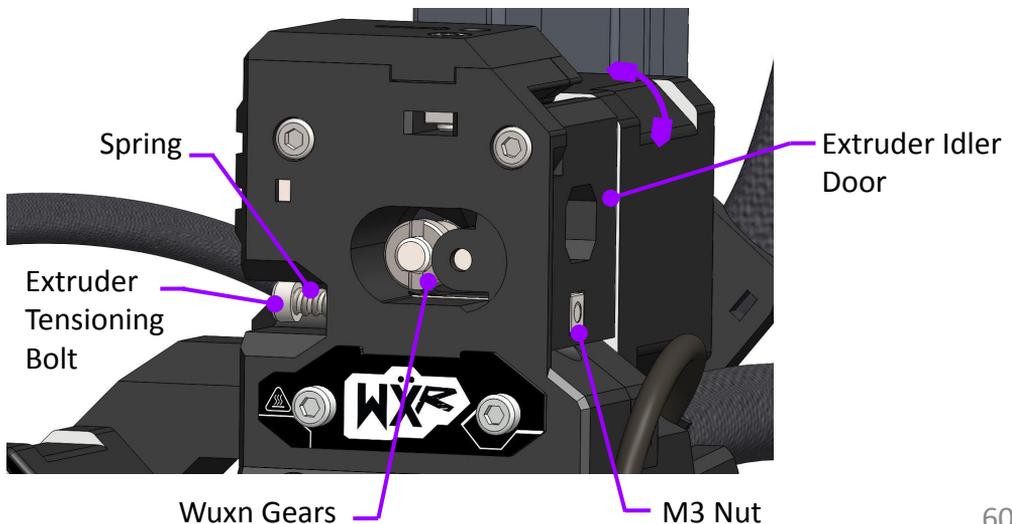
Print Quality Issues

Here are a list of common 3D printing issues that may occur:

- **Warping:** This occurs when the edges of the printed object curl or lift away from the build plate during printing.
  Solution: Clean the print surface with 99% isopropyl alcohol at room temperature. If the issue persists, lower the Z height while printing. If you believe the Z height value is correct, try adding a brim or raft in WuxnSlicer under Build Plate Adhesion. However, the build plate temperature may need to be increased as well.
- **Stringing:** This occurs when small strings of plastic material are left between different parts of the print.
  Solution: Dry the filament and remove the moisture, please see our Material Storage guide on page 53. If the stringing persists, lower the nozzle temperature in intervals of 5 °C until the stringing is gone.
- **Ringing:** This is a wavy pattern that may appear on the surface of your print due to printer vibrations or wobbling. Typically, you will notice this pattern when the extruder is making a sudden direction change, such as near a sharp corner.
  Solution: Verify that your X and Y belt tension is set correctly, see page 56. If the issue persists, slow down the printing speeds on the TFT display or through WuxnSlicer.
- **Inconsistent Extrusion:** Inconsistent extrusion or pulsing extrusion is when the filament varies in width. This will result in a "wavy" like extrusion of filament.
  Solution: Use the Wuxn Wizard items "PID" and then "E-Steps" to calibrate the temperature and flow rate.

This list is not exhaustive of all the print quality issues that may arise. Please see Simplify3D Print Quality Troubleshooting Guide to learn more or contact our team at support@wuxn3d.com.

Print Quality Issues

- **Over-extrusion:** This occurs when the printer extrudes too much filament, resulting in the printed object having thicker layers than intended.
  Solution: It can be caused by the extrusion multiplier being set too high, or by the nozzle being too close to the build plate.
- **Under-extrusion:** This occurs when the printer extrudes too little filament, resulting in the printed object having thinner layers than intended or gaps.
  Solution: This can be caused by the extruder motor not pushing the filament through the nozzle at the right rate or the filament getting blocked in the extruder.
- **Z Banding:** Z banding, sometimes known as ribbing, is an issue sometimes seen on 3D prints from FDM printers. It refers to the appearance of obvious lines on the exterior, typically occurring in regular intervals.
  Solution: Verify that your Z wheel tensioning is set correctly, see page 57. If the issue persists, your lead screw nut may need replaced if there is excess rocking in your Z axis.
- **Overheating:** Overheating can refer to the hotend or the 3D printed part. If the hotend is overheating this will lead to a clog in your extruder assembly. If there is overheating in your 3D printed part the geometry will not retain its shape and deform or sag.
  Solution: Increase the part cooling or decrease the printing speed to reduce part overheating. Do not print PLA filament in a heated enclosure or overheating of the part will occur. If overheating of the hotend occurred verify that your hotend fan is functioning properly.

This list is not exhaustive of all the print quality issues that may arise. Please see Simplify3D Print Quality Troubleshooting Guide to learn more or contact our team at support@wuxn3d.com.

Common Mechanical Issues

Lead Screw Separation

An issue that may occur with the Wuxn WXR is "lead screw coupler separation". The lead screw coupler is composed of three components that may separate during shipment due to excessive forces and vibration. Under normal conditions the lead screw coupler has an air gap of 0.5-1 mm gap between the three components. If you observe a larger air gap between the components use:
"Menu>Wizards>Set Z", then follow the prompts.

Top

Lead Screw coupler

0.5-1 mm Air Gap

Plastic Insert

Bottom
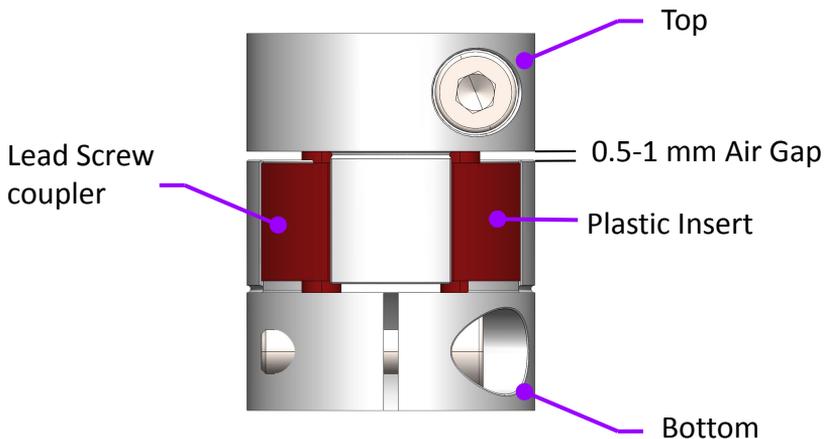
If the couplers continue to separate during normal operation, the Wuxn WXR machine has binding or machine alignment issues. Please contact our team at support@wuxn3d.com so we can further assist you.

Common Mechanical Issues

Incorrect Nozzle Height

Nozzle height also referred to as Z height is the distance between the nozzle and the print surface. From the factory the Wuxn WXR Z height is set to -1.0mm and this refers to the zeroth position.

When changing temperatures, print surfaces, nozzles, or the parts are not adhering properly the Z height may need adjustment.
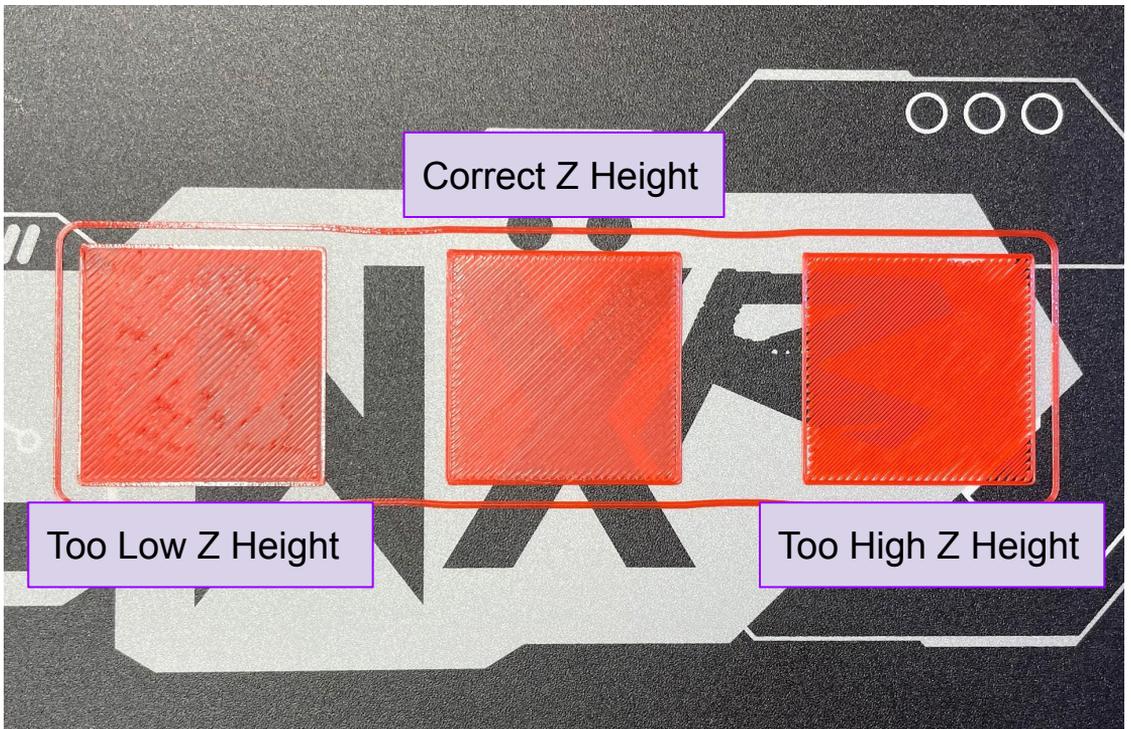
The Z height can be adjusted in the "Z Height" menu during the initial printing process. After, the correct Z height is established, select "save" to make the adjustment permanent.

Common Mechanical Issues

Homing Malfunction

The Wuxn WXR determines the starting point for the X, Y, and Z axis by homing. Typically, this is established in the X and Y directions by briefly touching the printhead and print surface with the end stops.

However, sometimes the homing process may fail and result in repeated collisions or miss the end stop if it homes too early.

To resolve this issue, follow these steps:

1. Turn off the Wuxn WXR.
2. Manually move the X or Y axis to check for smooth motion. If the axis is difficult to move, refer to the "Linear Guide Rail Lubrication Process" on page 55.
3. Once the axis is confirmed to move freely, adjust the belt tension to the correct setting. If the belt tension is too loose, it may cause repeated impacts. If it is too tight, it may cause the homing process to miss the endstop. See the "Adjusting Belt Tension Process" on page 56 for more information.
4. With smooth axis motion and correct belt tension, the homing process will work as intended.

Common Mechanical Issues

Clogged Hotend

A clogged hotend on a 3D printer is a blockage in the nozzle of the hotend, which stops the plastic filament from passing through and reaching the print surface. This can be caused by factors such as the wrong filament type, incorrect Wuxn gear tensioning, improper Z height, or incorrect temperature settings during printing.

A hotend can be either fully or partially clogged. A partially clogged hotend will typically show signs in the middle of a print job, with visible gaps or voids. On the other hand, a fully clogged hotend won't extrude filament at all and will produce a distinct clicking sound from the Wuxn gears.

To fix a partial clog, you need to:

- Unload the filament from the extruder.
- Check the Wuxn gears to make sure they are cleaned and properly tensioned (refer to page 59).
- Preheat the nozzle to 285°C.
- Increase access to the nozzle by moving the Z axis to 225mm height.
- Insert a 0.4mm acupuncture needle into the filament path through the nozzle and repeat the process until no more filament residue sticks to the needle.
- Load the filament and purge the new material at 285°C to push out any remaining filament.

If the problem persists, it means the Wuxn WXR hotend is fully clogged and needs to be disassembled and cleaned. For more information on how to clear a fully clogged hotend, please contact support@wuxn3d.com.

Common Mechanical Issues

Layer Shifting

Layer shifting in 3D printing refers to a situation where the print head of the printer moves or shifts in the wrong direction, causing misalignment of the layers being printed. This results in a visibly obvious step or gap between two consecutive layers, affecting the quality and accuracy of the final print.

Single layer shift

Multiple layer shifts
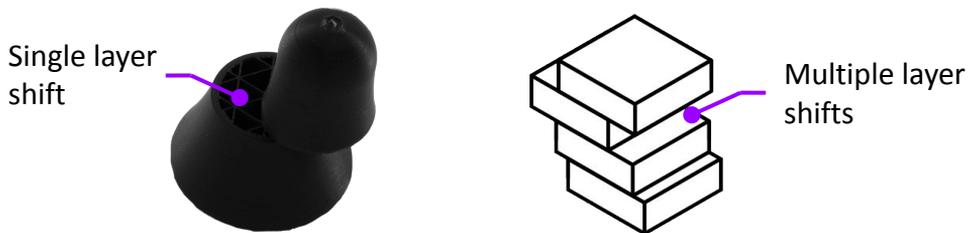
A single layer shift is caused by the printer being obstructed somewhere along the way.

Multiple layer shifts is caused by too much force on said axis, causing the stepper motors to lose steps.

How to Fix?

- Do not touch or grab any of the components on the Wuxn WXR while printing.
- Verify that your Wuxn WXR hardware is working properly. The linear guide rails must be properly clean and lubricated, belt tension must be set correctly, and all corresponding axes hardware must be aligned and tightened properly. Please see "Maintenance" to learn more.
- Slow down printing speeds.
- Increase part cooling.

If the problem persists, please contact support@wuxn3d.com.

Accessories

Enhance the performance of your Wuxn WXR with our accessories. Speed up printing by upgrading your nozzle diameter from 0.4 mm to 0.6 mm. If your printed parts lack strength, consider switching to a different material. To alter the pattern of your first layer, try using a different print surface.

Customer Feedback

Share your experience with the Wuxn WXR online and tag us at #WuxnWXR or submit a customer review on the Wuxn website!

Open Source Files

The Wuxn WXR firmware, software, and 3D printed components have been made open source and are available for download.

Access our Github pages to change the color of your Wuxn WXR, fix broken printed parts, or build and compile the code.

- https://github.com/wuxn3d/Wuxn_Firmware
- https://github.com/wuxn3d/WuxnSlicer
- https://github.com/wuxn3d/Wuxn_Hardware
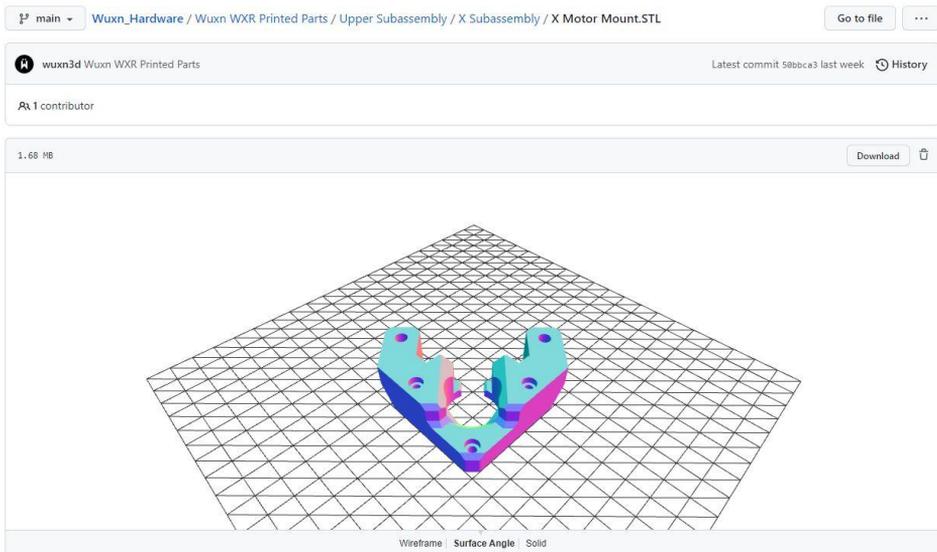
Support & Warranty

Customer Care

The 60-day Limited Warranty is valid for products purchased from www.wuxn3d.com only, starting from the date of the original retail purchase. We will provide customer service for any defects in quality or materials under normal, non-commercial use.

1. This warranty provides, at no extra cost to you all parts necessary to ensure your machine is in proper operating condition during the warranty period.
2. We will provide replacement parts for your machine if found to be defective due to faulty materials, and workmanship assembly within 60 days of purchase.

What is not Covered

- Wuxn shall not be liable for costs of replacement of a product incurred as a result of: accidental damage, faults caused by negligent use or care, misuse, careless operation or handling of the product which is not in accordance with this *Quick Start Guide* or *User's Manual*.
- Machines purchased from unauthorized dealer.
- Use of parts and accessories other than those produced or recommended by Wuxn.
- Repairs or alterations carried out by unauthorized parties or agents.

Warranty Service

➔ If you have a query about your Wuxn product, please contact the Wuxn customer service email: info@wuxn3d.com
➔ Please inform us of your model name/number, purchase date, order number, machine problem, and how we might assist you.

Notes:

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