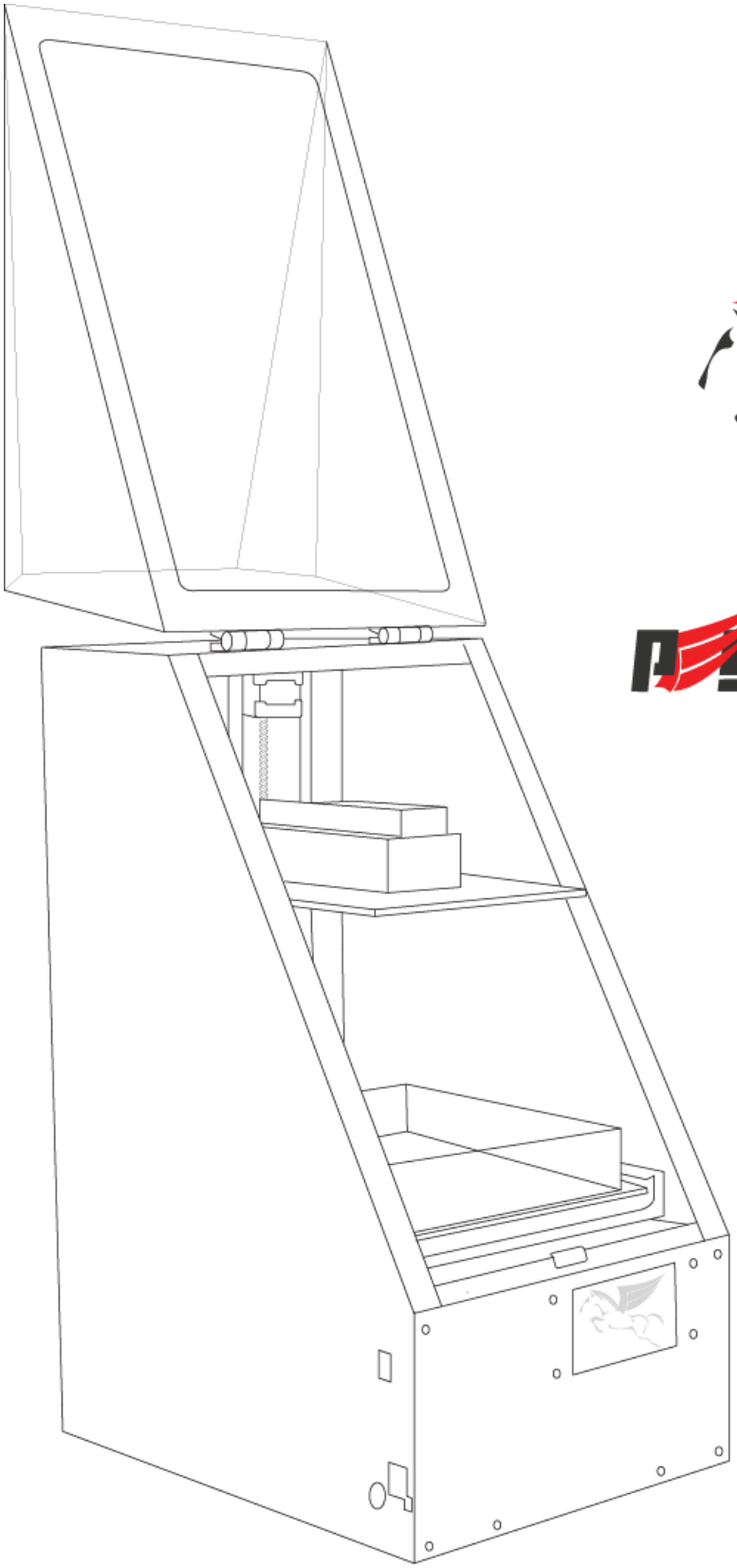

pegasus touch

User Manual

Thank you for your purchase of the Pegasus 3D Printer by Full Spectrum Laser. This manual shows you how to use your Pegasus 3D Printer and our RetinaCreate software. Be sure that you read and understand all of the contents of this user guide before operating your printer. For more information and product selection, please visit www.fslaser.com.

User Manual Contents

Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

SAFETY FIRST

General Safety

Before your first print, be aware of all safety and maintenance procedures with your machine by following these guidelines:

Be sure you have a clean, level and open work space to unbox and install your Pegasus Touch 3D Printer.

The printer must be placed in a location away from direct sunlight or intense artificial light sources, which could prematurely cure your resin. Keep your work area between (60°F/15°C) and (80°F/26°C).

For best results, it is recommended to always run the printer with the yellow cover closed.

Do not open the printer case. This will void your warranty and could expose the user to electrical shock.

NEVER use Isopropyl Alcohol (IPA) to clean non-metal printer components, including the resin tray, lid and printer exterior. Unless otherwise instructed, always use paper products for printer cleaning purposes.

DO NOT block the printer air vents. Regularly clear air vents of all dust, dirt and other debris that might prevent or hinder printer cooling. Keep the machine away from curtains and other flammable materials.

You will be required to use an assortment of tools (see additional tools list) to complete your 3D printer projects. When using any tool, be aware of all safety precautions. In particular, be aware of sharp edges on cutting tools when unboxing your machine and when cutting supports from prints.

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Resin Safety

CAUTION! Full Spectrum Laser photopolymer resin is a mild irritant to the skin and toxic if consumed. Follow these standard safety procedures and handling instructions at all times.

- **DO NOT CONSUME RESIN** in liquid or solid form under any circumstance. If resin is consumed call your local poison control hotline or 911 immediately.
- **Wear protective gloves when handling the resin.** Like all commercial resins, FSL photopolymer resin is a mild irritant to the skin. Always wear latex or nitrile gloves while handling resin. If contact is made with the skin, immediately wash the area with a saline solution or water. If skin irritation continues, consult a doctor.
- Like all commercial resins, FSL photopolymer resin is a severe irritant to the eyes. Goggles are highly recommended. If contact is made with the eyes, immediately wash with a saline solution or cool water. If eye irritation continues, call 911 or consult a doctor immediately.
- **AVOID** contact with food and beverages. Liquid and solid forms of resin are not approved for use with food or drink.
- Liquid and solid forms of resin are not tested or approved for use in medical applications.
- **DO NOT** mix the resin with any other chemicals or substances.
- The resin is light sensitive, so **AVOID** exposure to strong artificial lighting or sunlight. The transparent yellow cover is designed to filter UV light, but strong exterior light may enter and cure the resin. It is important that the unit be kept out of direct sunlight or high-intensity artificial light.
- To avoid contamination, **DO NOT** pour used resin back into the original bottle. It is safe to store resin in the build tray for a period of 24hrs or less between prints. For periods greater than 24 hours, we recommend to empty the build tray and to filter the resin using a 125 micron filter.
- **ALWAYS** store filtered resin in a separate light-proof container.
- We recommend colored resins be gently stirred for 5 minutes before use if left sitting for more than 7 days due to possible pigment settling.
- All resin should be stored in a cool, dry place at or near room temperature between (15°C / 60°F) and (26°C / 80°F).
- To ensure resin flows properly, the work area should be kept between (15°C / 60°F) and (26°C / 80°F).
- Only use resin from Full Spectrum Laser. Using 3rd party resin may damage your machine and void your warranty.

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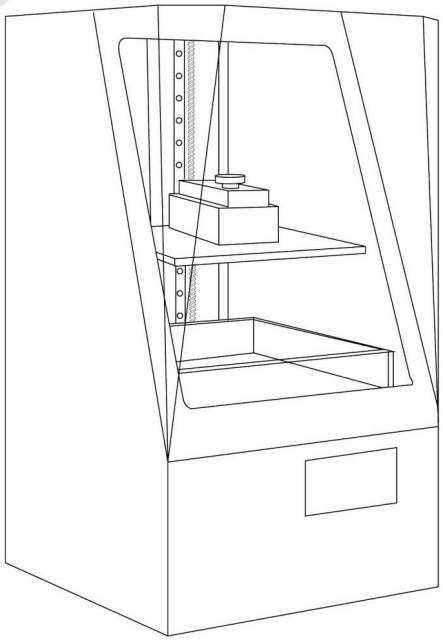
UNBOXING

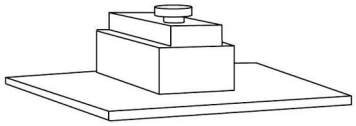
Pegasus Touch 3D Printer

A

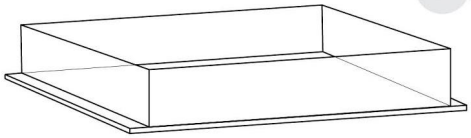


Build Head

B

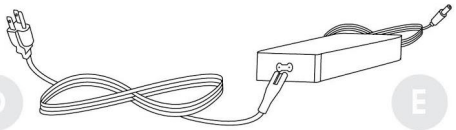


C



Resin Tray (VAT)

Adapter & Power Cable



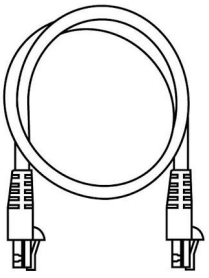
D E

Alchemy Resin Bottle
500 mL

F

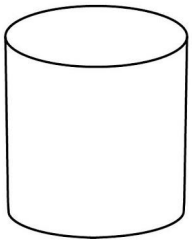
Ethernet Cable

G



Lid Bumper

H



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Pegasus Touch Parts and Accessories

The following parts and accessories are included with your Pegasus Touch 3D Printer.

Packing List

Part	Quantity
A. Pegasus Touch	**1 pc**
B. Build Head	**1 pc**
C. Resin Tray	**1 pc**
D. Adapter	**1 pc**
E. Power cable	**1 pc**
F. 500 mL Starter Resin	**1 bottle**
G. Ethernet Cable	**1 pc**
H. Lid Bumper	**1 pc**

Additional Recommended Tools

Personal Safety

- Nitrile Gloves
- Goggles
- Tongs for removing prints from Isopropyl Alcohol (IPA)

Part Removal:

- Cutting board to prevent resin dripping during removal
- Steel paint scraper
- Razor blade for removing delicate printed parts
- Rubber mallet

Part Finishing:

- Flush cutters for removing supports
- 1-2L glass container
- 99% Isopropyl Alcohol (IPA)
- Paper Towels
- UV curing chamber/station
- Paint Strainers for filtering resin

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UNBOXING PEGASUS TOUCH STEPS

1. **Create a Work Space.** You will need an open, level work space to place your Pegasus Touch 3D Printer. A solid table with adequate room for the printer is recommended. Be sure the workspace is free of fire hazards and is well ventilated.

2. **Carefully Open the box.** Set the box on a flat space near where you will place the machine. Open the box carefully from the top. If you use a cutting tool to open the box, be careful not to allow the cutting edge to touch the machine or any packed accessories. Always use all tools with caution and only as specified by the manufacturer.

3. **Remove Accessories.** Nestled in packing foam, are the following parts and accessories: Resin Tray, Adapter, Build Head, Power Cable, Ethernet Cable, the Lid Bumper and a 500L bottle of resin. Inspect these parts to insure they are accounted for and intact.

4. **Remove the Machine from the box.** With the foam packaging intact, gently lift the machine out of the box and place on a clean flat surface such as the table you plan on keeping it. Be aware that the machine is heavy. Find someone to help you lift it if this is a strain for you. Next slide off the foam packaging. The machine should now be level on your work surface.

5. **Remove Plastic Wrapping.** Completely remove the clear plastic wrap from the machine. Note that under the plastic wrap is a quick start guide and instructions on downloading the software.

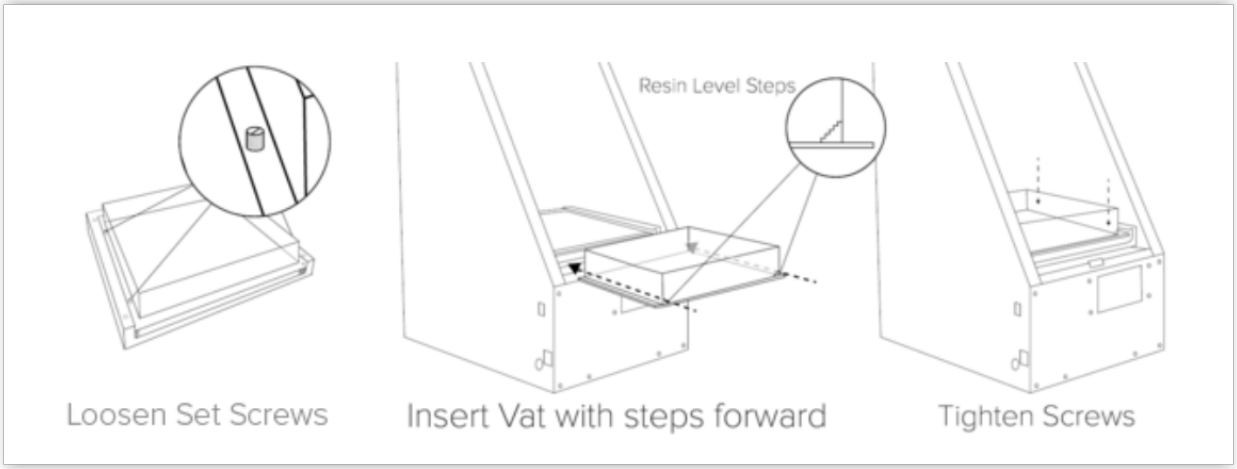
6. **Inspect the machine.** Examine your Pegasus Touch 3D Printer for defects and breakage. If you find any defects or breakage, contact your sales representative immediately. Have pictures of the damage ready to share.

Your machine is now unboxed. The next step will require some minor assembly and downloading the RetinaCreate software.

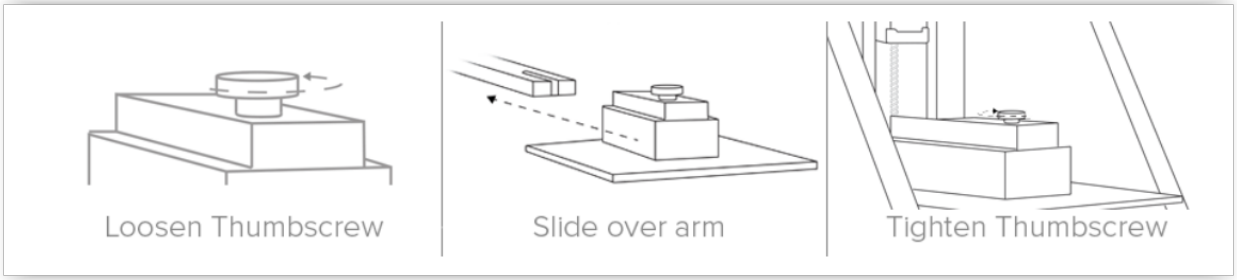
CALIBRATION & ASSEMBLY

Your Pegasus Touch 3D Printer will require some minor calibration of the Resin vat and the Build Head. This is a simple process and should only take about a half an hour to complete.

1. **Insert Resin Tray.** Loosen the set screws with a flathead screwdriver. They do not need to be removed completely, but loosened enough to allow you to place the vat. Slide the resin tray (C) into position. Be sure that the resin level indicator faces forward. Tighten the set screws. The set screws have a retractable ball end. If tightened correctly, the vat will click into place. See diagram below.



2. **Attach Build Head.** Loosen the large thumbscrew on the build head (B). Slide the open end over the build arm and tighten in place. See diagram for details.



3. **Connect Power Supply.** Assemble your power cable (E) by connecting the 2 pin connector to the power adapter (D). Plug in the power supply cord to the back of your printer and then into an available outlet. To power on your machine flip the switch located on the power adaptor. The printer should boot up within 90 seconds.

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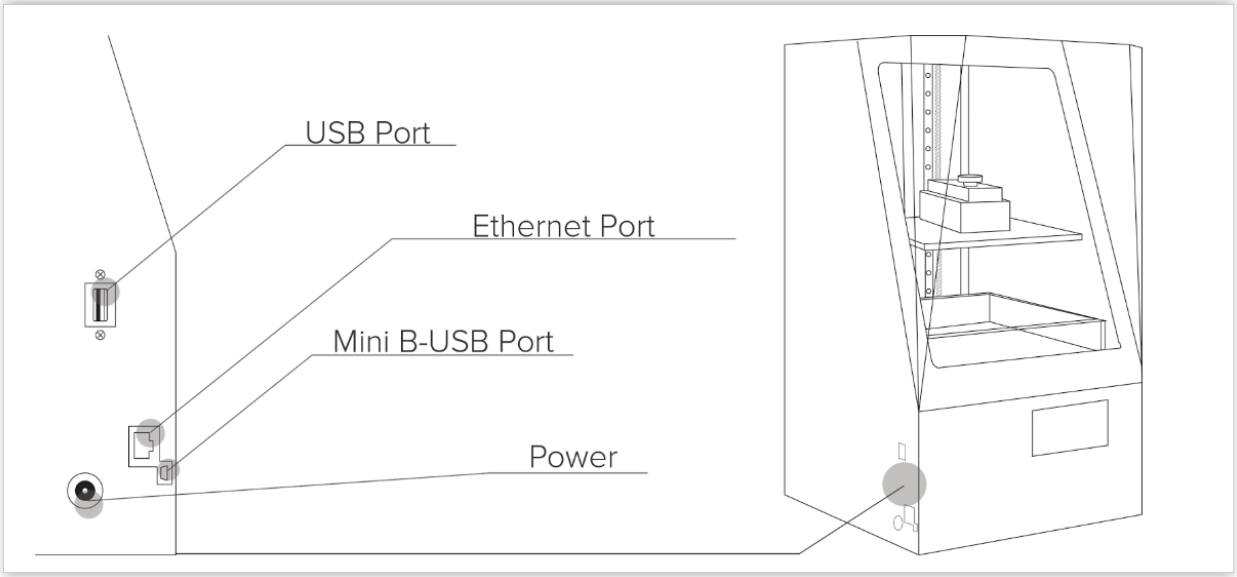


4. **Connect Ethernet Cable.** Plug the included Ethernet Cable (G) into the Ethernet slot on the side of the machine as indicated in the above diagram. Plug the other end into your computer. Ethernet is preferred, but USB-PC connection, WiFi connection, and direct USB thumb drives are also supported (Mini B-USB cable, Wifi dongle, and thumb drive not included).

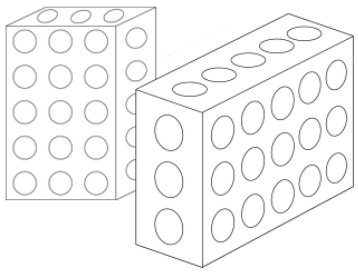
5. **Attach Lid Bumper.** Peel the sticker seal on the end of the lid bumper (H) and place lid bumper on top of the machine, near the center, behind the lid. When the lid is opened completely, it should rest on the bumper.

Leveling & Homing

Leveling and homing are crucial for successful prints. Improper leveling and homing will result in print failures. Visit youtube.com/c/FSL3D for an in depth video tutorial.

LEVELING STEPS

1. **Gather Blocks.** You will need four (4) 123 blocks or other similar square objects that are all exactly the same size.



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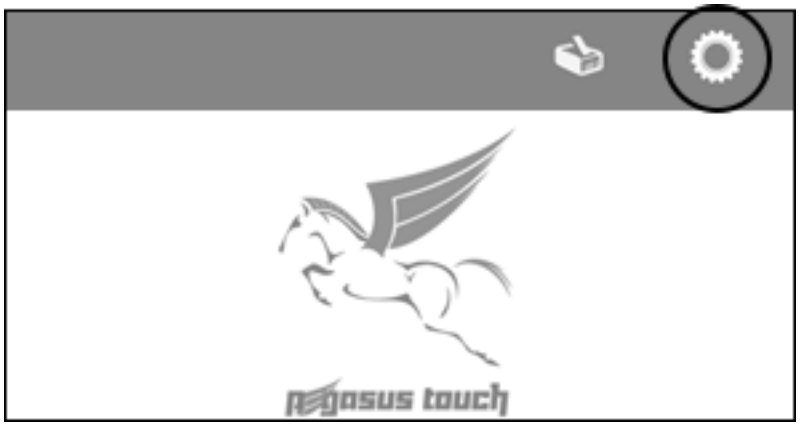
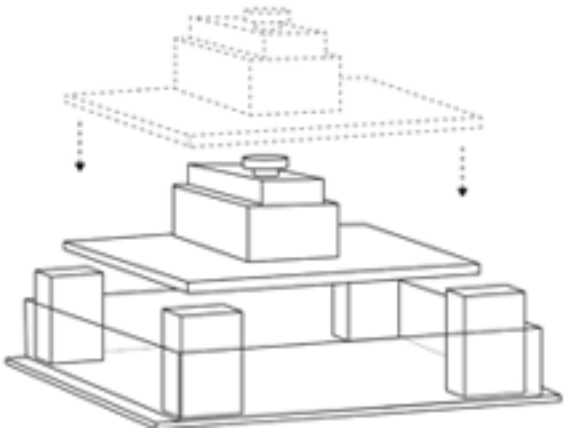
2. **Turn on your Pegasus.** If it isn't on already, turn the machine on and allow it to boot up (90 seconds or so). We will be using the touch screen for this next step. Note that full touch screen instructions are included later in this user manual, but for now just follow along.

3. **Select Calibrate Motor.** On the home screen, select the gear icon in the top right corner. This should bring you to the settings menu. Select "Calibrate Motor".

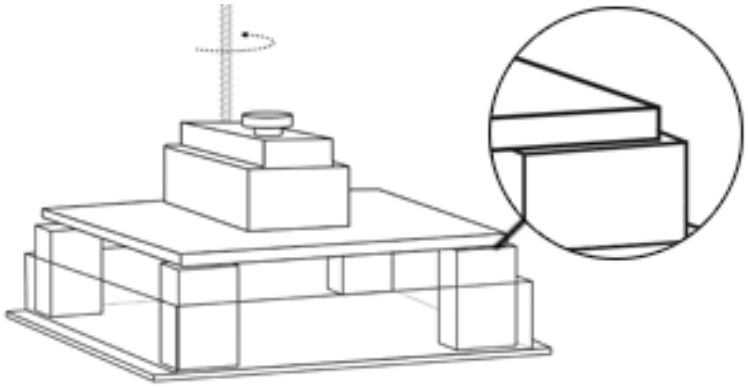


4. **Place Blocks.** Open your printer and place a block on each corner of your vat.

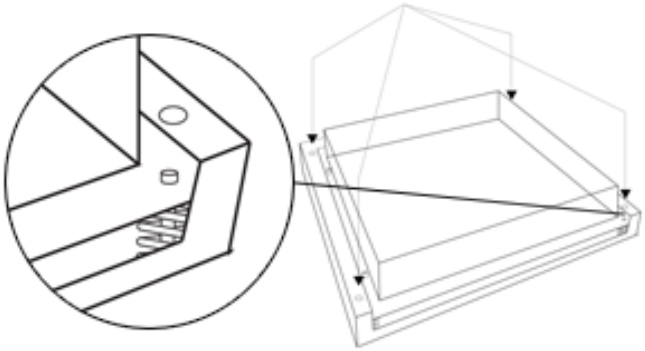
5. **Lower The Build Head.** With the lid open, the menu screen will allow you to jog the motor up or down. Lower the build head until it's near the leveling blocks.



6. **Complete Lowering By Hand.** Complete the lowering by twisting the spine screw by hand. Continue lowering the build head until one of the corners lightly touches a leveling block.

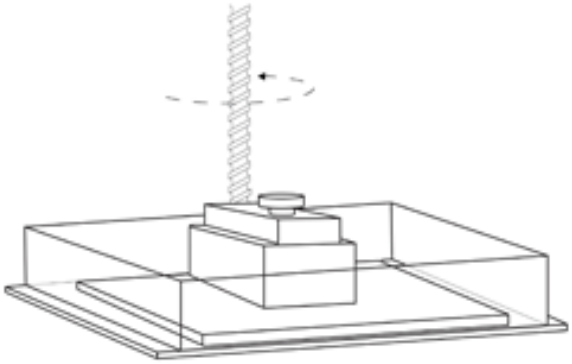


7. **Flush Edges.** Use a 2.5mm hex screwdriver to loosen or tighten the screws around the 4 corners of the vat. This will loosen or compress the springs which will raise or lower the vat. Adjust each corner until all 4 edges are flush with, but do not apply pressure to the leveling blocks.



HOMING STEPS

1. **Lower Build Head.** Use the threads in the back of the machine to lower the build head until it gently touches the vat. It should touch the vat securely in all four corners, but should not apply pressure or compress the springs.



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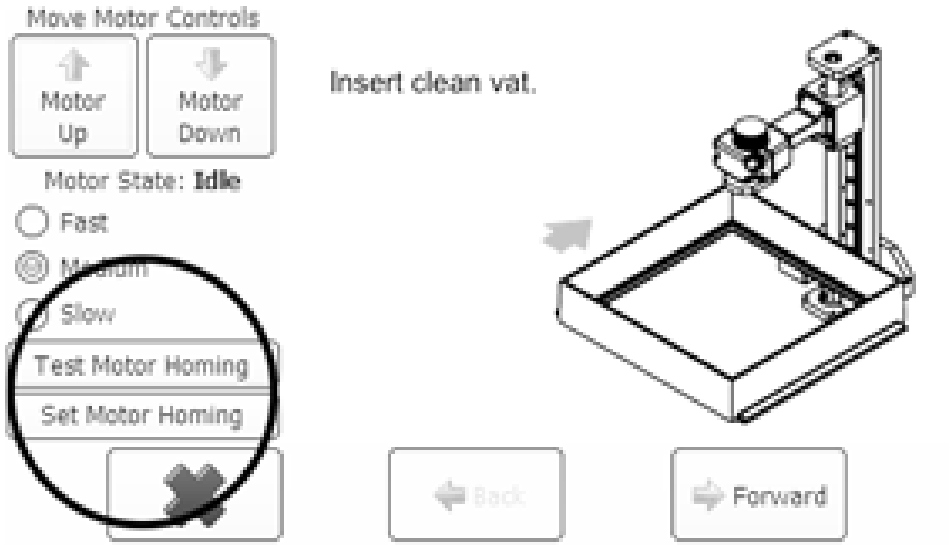
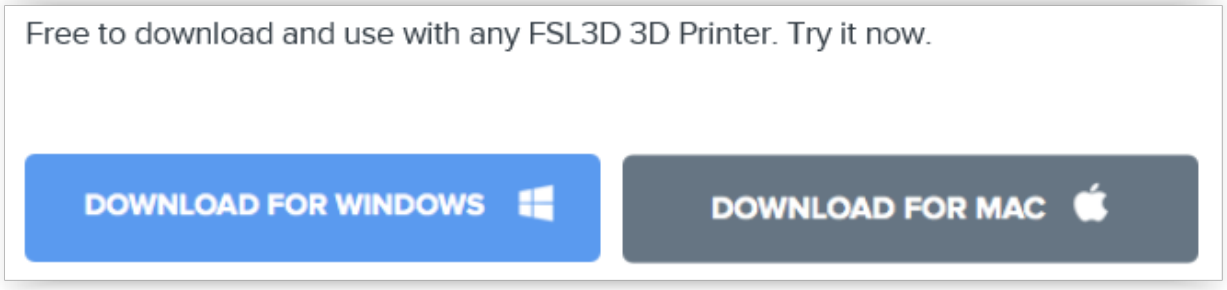
2. **Test Motor Homing.** In the “Calibrate Motor” screen select “Set Motor Homing.” Once this is complete select the “Test Motor Homing” button and verify that it returns to the same location.



Your Pegasus Touch is now calibrated. The last step will be to download and install the RetinaCreate Software. This free software was created by Full Spectrum Laser specifically for our 3d printers.

INSTALLING RETINACREATE SOFTWARE STEPS:

1. **Go to Download Page.** Turn on your computer or laptop, now connected to your Pegasus Touch via the Ethernet Cable. In your favorite browser (Google Chrome, Firefox, etc.) go to **www.fslaser.com/Software/RetinaCreate.** Choose if you are using a PC (Windows) or a Mac and click the appropriate box.



2. **Download Installer.** You will need to download the RetinaCreate installer first. Click Download RetinaCreate Installer to begin the process.

3. **Run Installer.** Once the Installer is downloaded click Run. Approve any security warnings. The software will not harm your computer.

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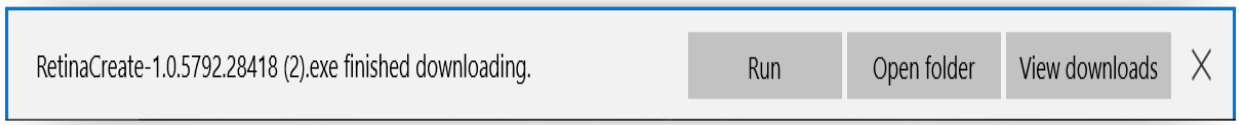
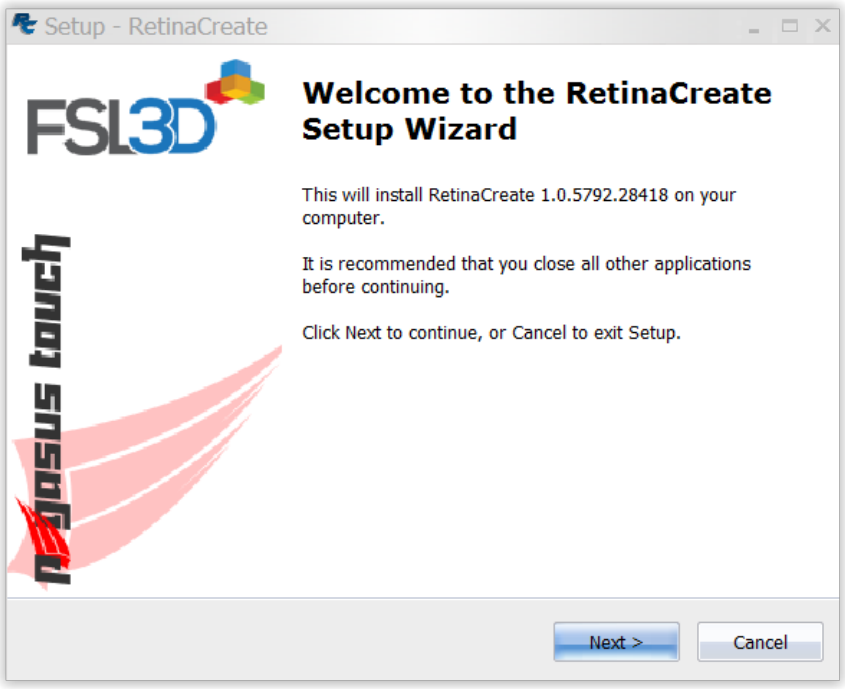
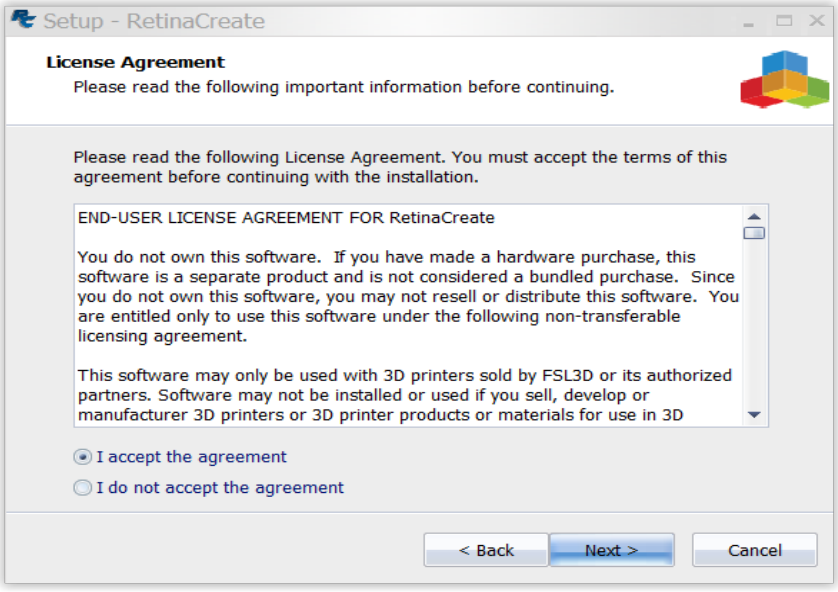


4. **Run Setup.** You will be welcomed by the setup wizard. Click Next.



5. **Accept the License Agreement.** Read and understand the terms of the license agreement and click the button labeled “I accept the agreement”. Then click Next.



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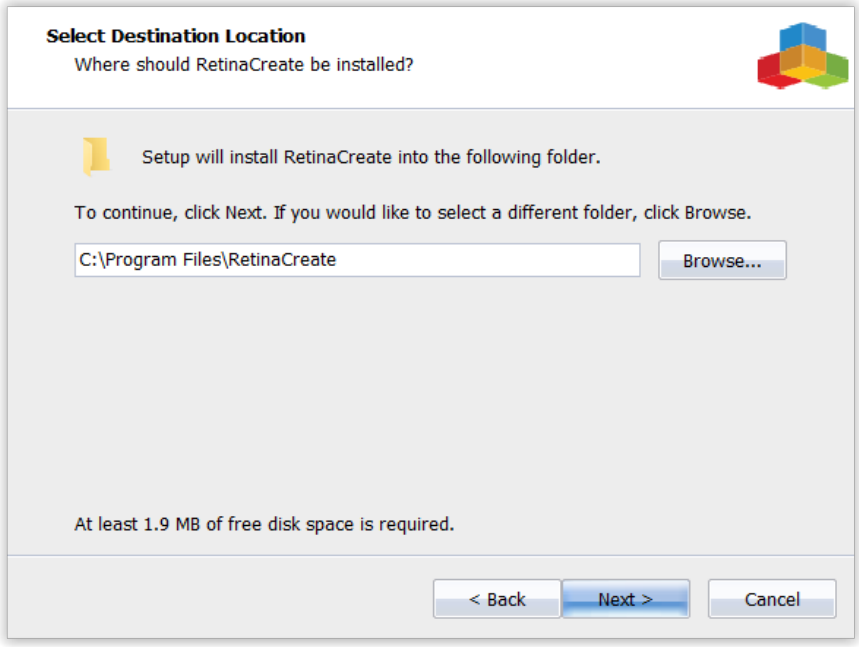
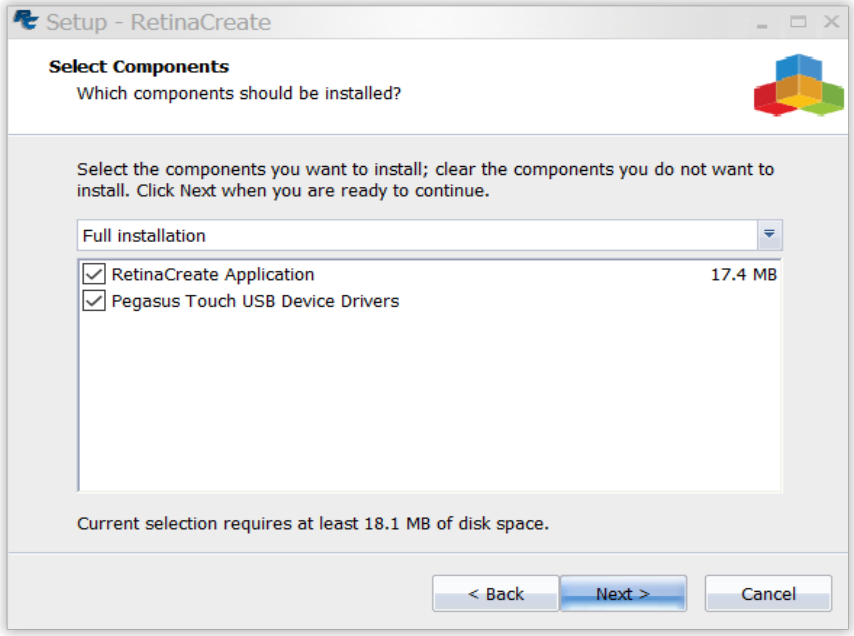
6. **Select Destination.** This is an optional step where you can place the installed software where you wish on your computer. The default destination is listed. Click Next.



7. **Select Components.** This is another optional step allowing you to choose what components you want to add with your install. You can selectively click any component on or off by adding or removing a checkmark next to each one. Or you can choose the default components. After you have made your selections, Click Next.



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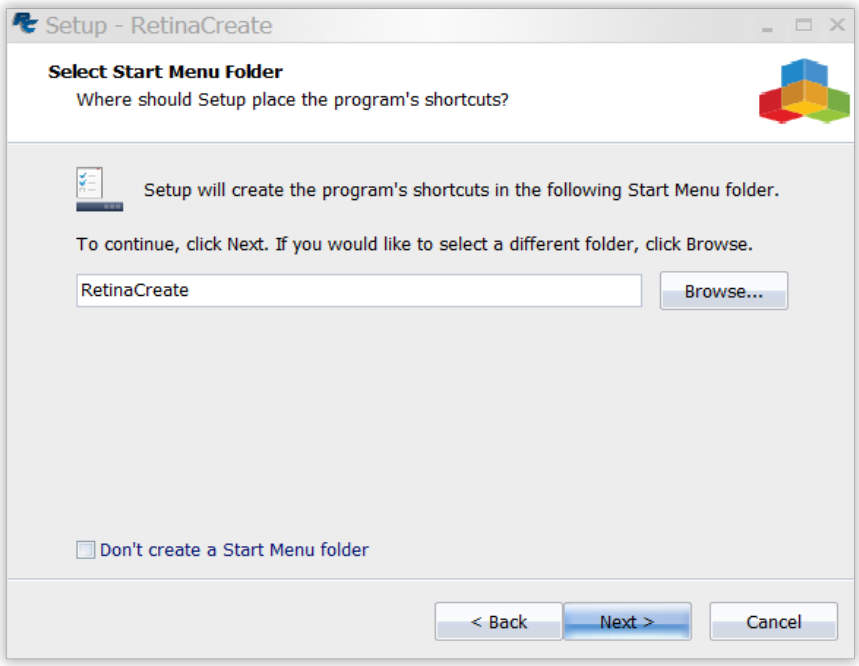
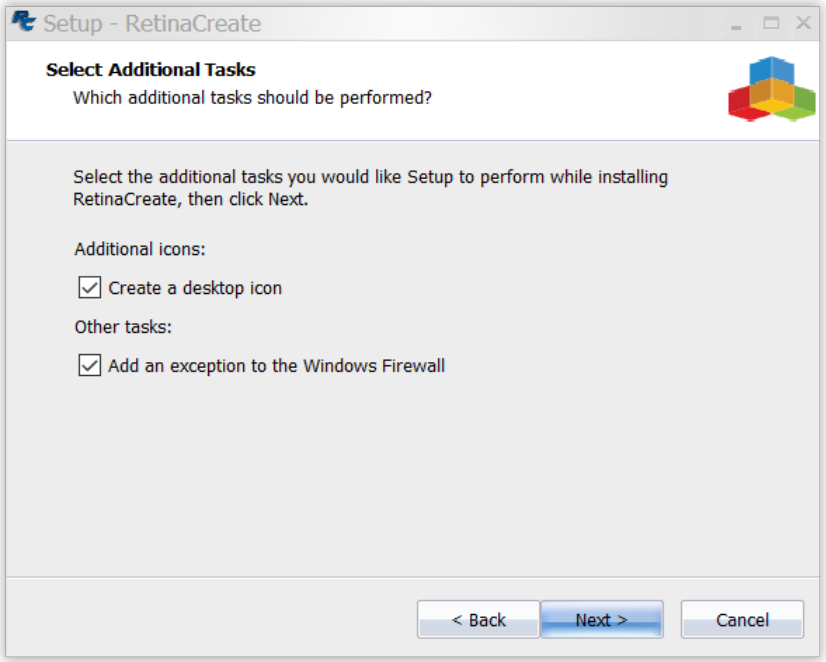
8. **Select Start Menu Folder.** This will name your folder and create a shortcut in your Start Menu folder. It is recommended that you use the default name. Click Next.



9. **Select Additional Tasks.** This window allows the options to create a shortcut desktop icon and tell your computer not to firewall (block) running the program. Both are the default options and are recommended. Click Next.



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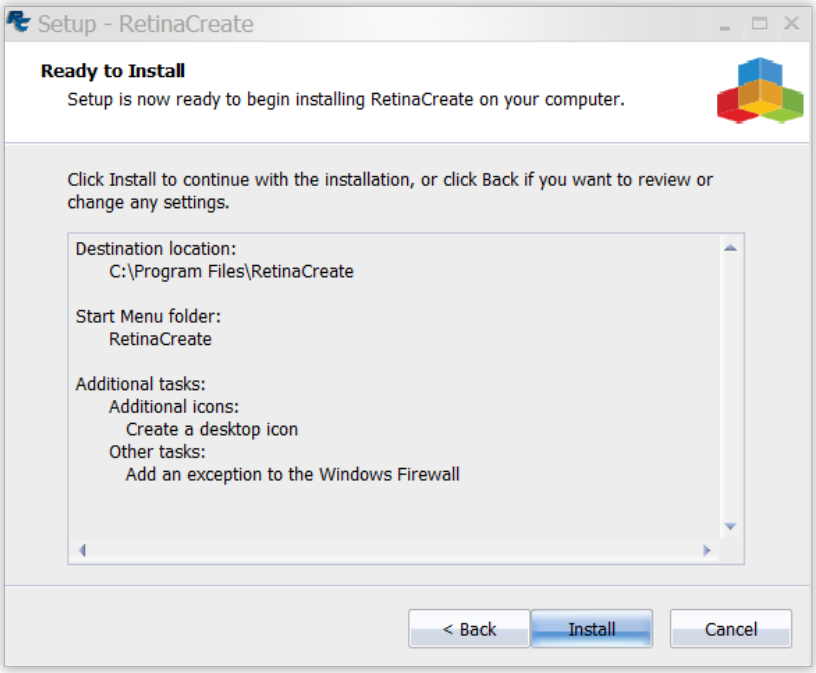
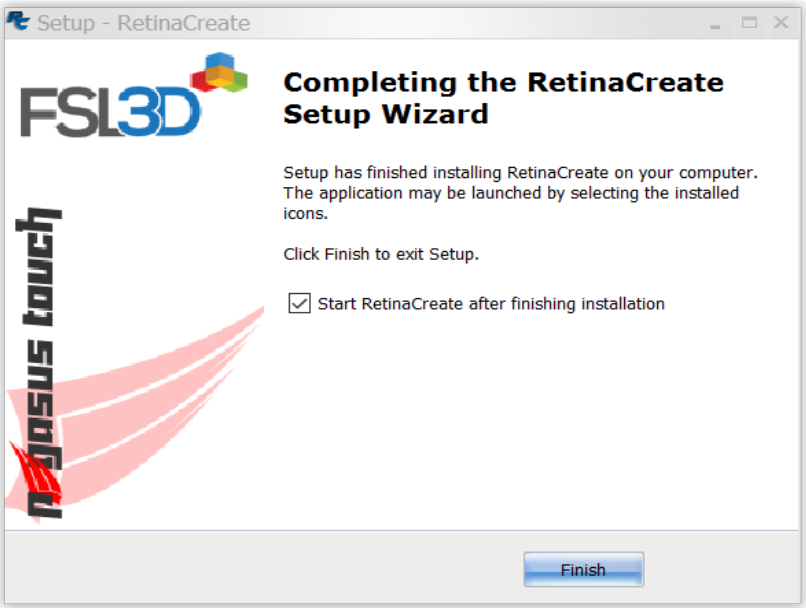
10. **Install RetinaCreate Software.** The RetinaCreate software is ready to install. Click Install and allow the computer time to run the installation.



11. **Finish.** The RetinaCreate Software is now installed. Click Finish to exit setup. You can now launch the program from the desktop icon or your computer's start menu.



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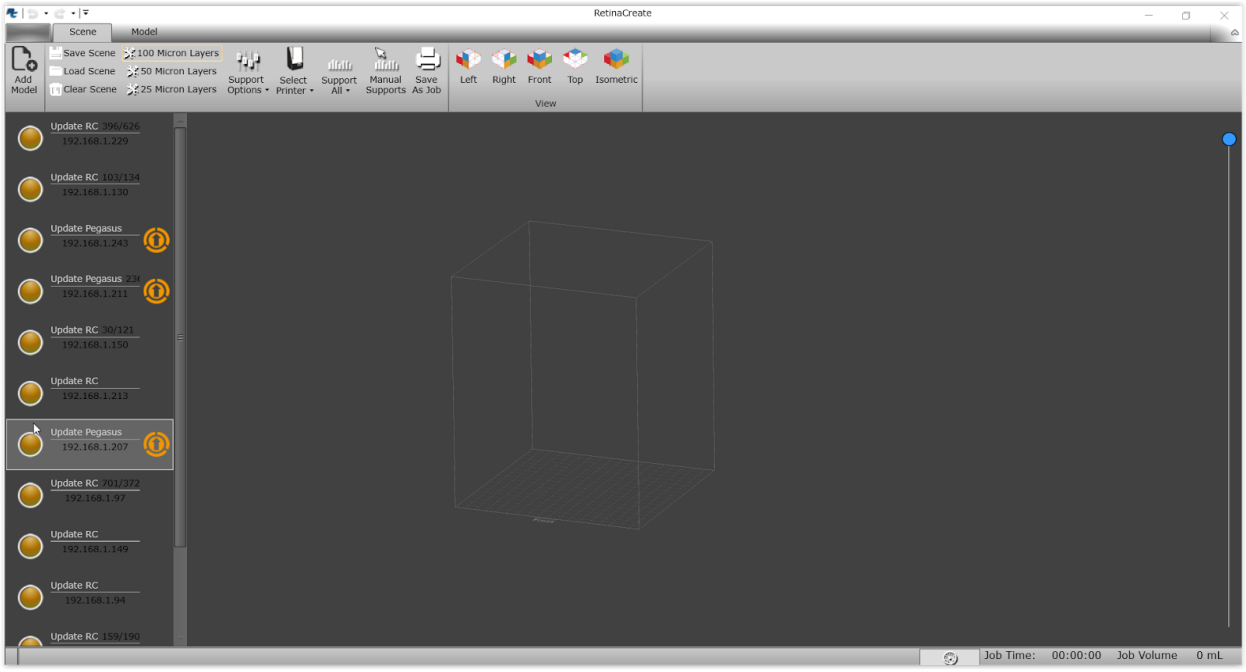
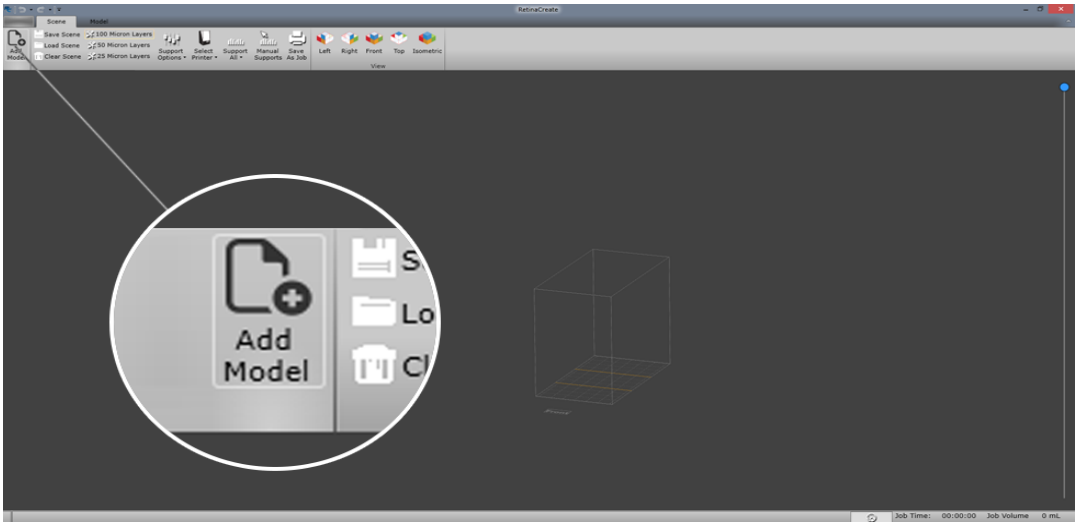
USER INTERFACES

This section will introduce two user interfaces you will be using to operate your Pegasus Touch 3D Printer. The first is the RetinaCreate Software interface. The second is the Pegasus Touch Screen Interface.

RetinaCreate Interface



1. **Add a Model.** Ensure your model is in a ".stl" file format. It can then be "dragged and dropped" into the program. You can also open the file by using the "Add Model" option in the top left corner of the RetinaCreate window as seen in the diagram below.



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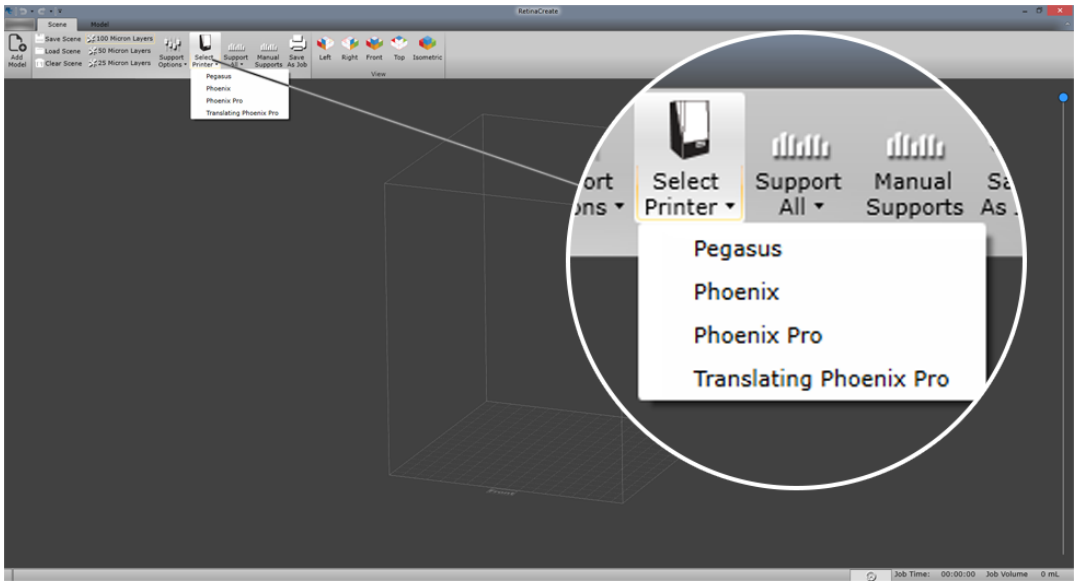
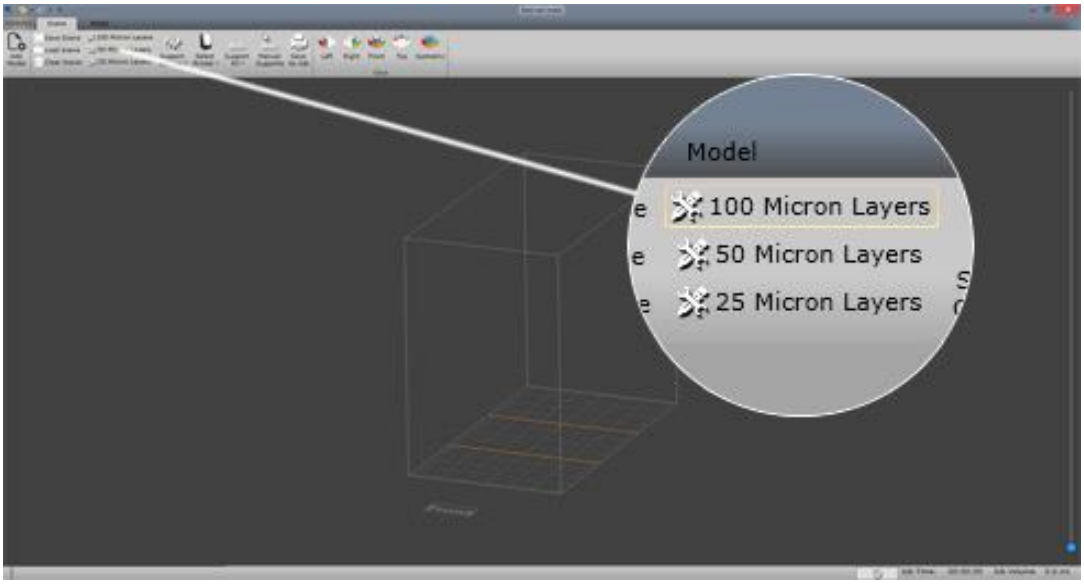
2. **Select Your Printer Type.** Select your printer type by using the “Select Printer” button along the top toolbar. In this case we are using the “Pegasus”. Your Pegasus Touch will not function under any other type of 3d Printer.



3. **Select Layer Thickness.** Using the “100 Micron”, “50 Micron” and “25 Micron” buttons along the top toolbar, select the desired thickness for printing.



Pro Tip! For most prints and most resins we recommend printing at 50 micron layer thickness. If *SpeedCast* resin is being used, we recommend printing at 25 micron layer thickness for optimum resolution.

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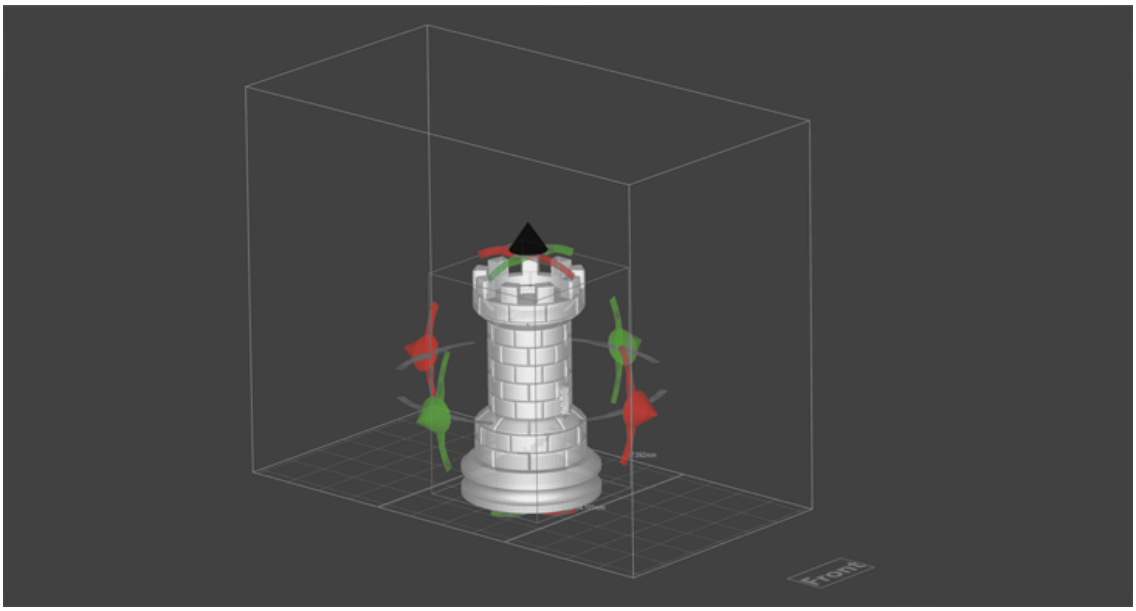
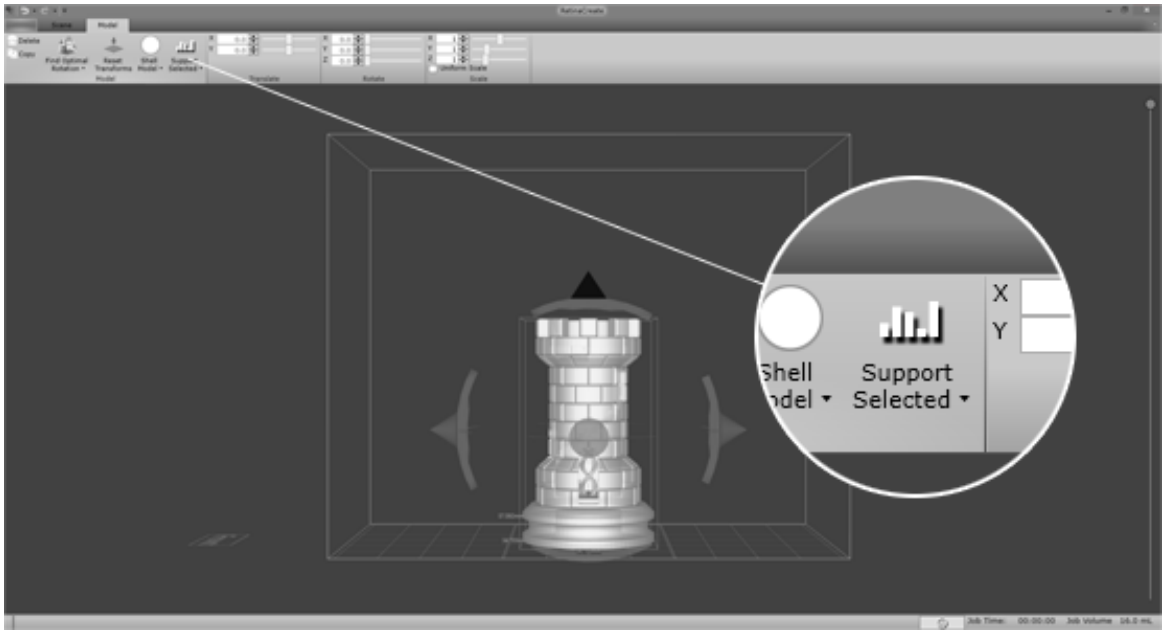
4. **Orientating the Model.** Use the arrows and bars to situate your model in a way that will be the easiest to print. You can move the model Up, Down, Left, and RIght with the arrows as well as rotate the model. This will take some experimenting at first to identify the best positioning.

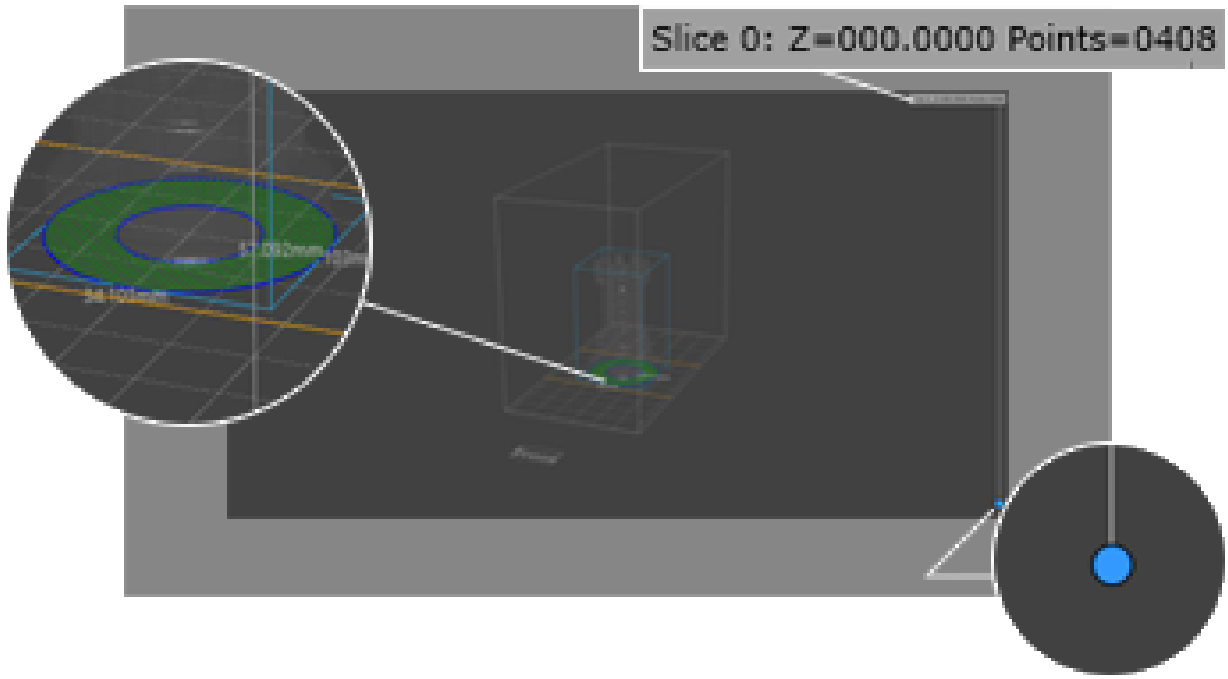


5. **Add Supports.** In general, If the model has a flat surface and does not include a lot of overhang, it is possible that the model may not need supports. However, we recommend using automatic supports to ensure that the print job will be successful, as most models will require supports. To support automatically, select your model and click the graph above “Support Selected”. This will automatically build a base and add supports to overhangs.



Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

If you're printing without a support base, verify that the model is completely flat and making contact with the build head. Use the scroll bar on the right side of the screen to scroll down to slice 0. If Slice 0 is green then you can be sure your model is flat and it should print directly to the build head.



Software Features

Zoom In/Out with Mouse

Roll the mouse wheel up to zoom in and roll down to zoom out.

Rotate with Mouse

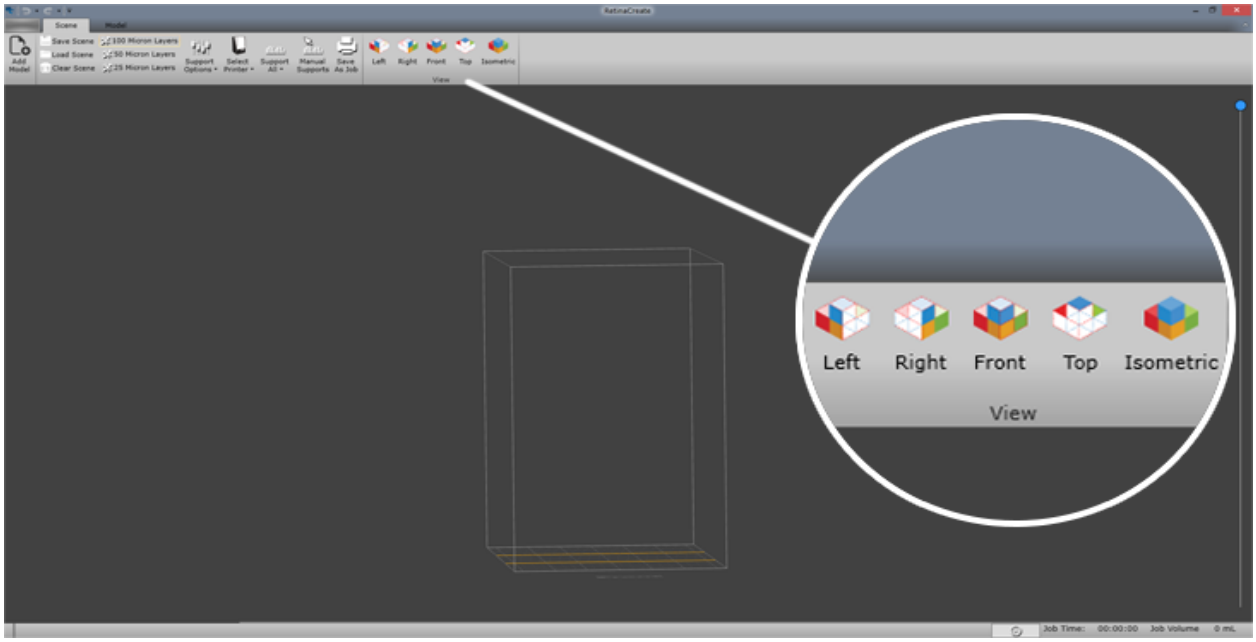
To rotate around the build area, right click and drag anywhere on the screen. Move the mouse to the left to rotate clockwise and to the right to rotate counter-clockwise. Drag the mouse down to achieve top view and drag up to achieve the bottom view.

Pan with Mouse

To move the whole screen on one plane, click the mouse wheel and move the mouse.

View Menu Control

You can also reset your position using the view menu.

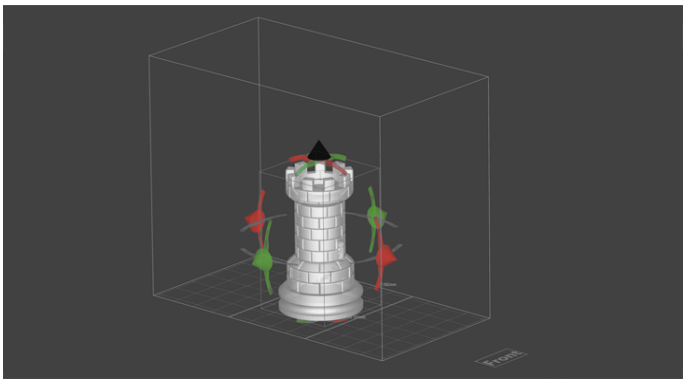


Moving and Orienting Models

To access the Translate, Rotate, and Scale controls, left click on the model that you want to affect. Models that cross over the two yellow boundaries have a possibility of developing minor seam lines.

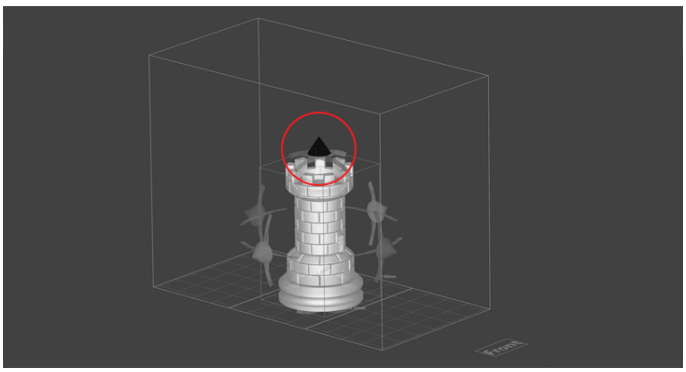
Moving

You will see red, green and black arrows surrounding the model. Red and green arrows will drag the model in the direction that they are pointing. Left click and drag the arrows to move the model.



Sizing

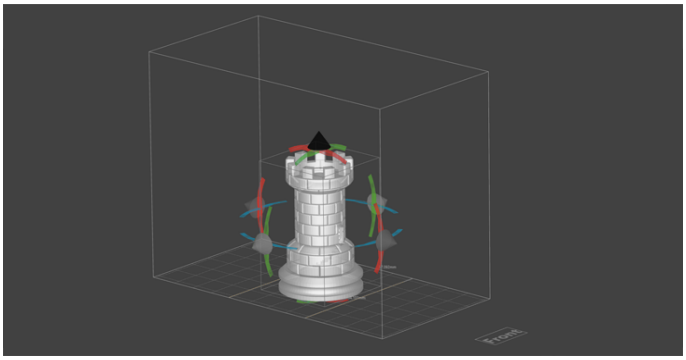
The black arrow on the top of the model pointing upward is to change the size of the model. Left click on the arrow and drag up and down to increase or decrease the dimensions of the model.



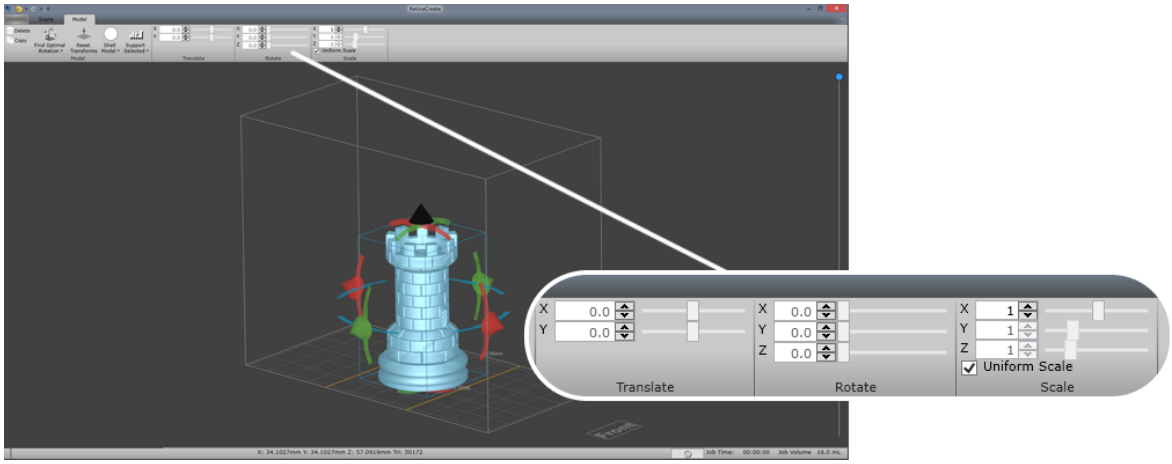
Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

Orienting

The curved bars attached to the arrows are used to rotate the model. Red, green and blue bars represent X, Y, and Z axes respectively. Left click and drag the bars to change (Red) X and (Green) Y orientations of the model. Left click and drag horizontally to change the (Blue) Z orientation of the model.



You can use the top menu to control the same features with numerical values.

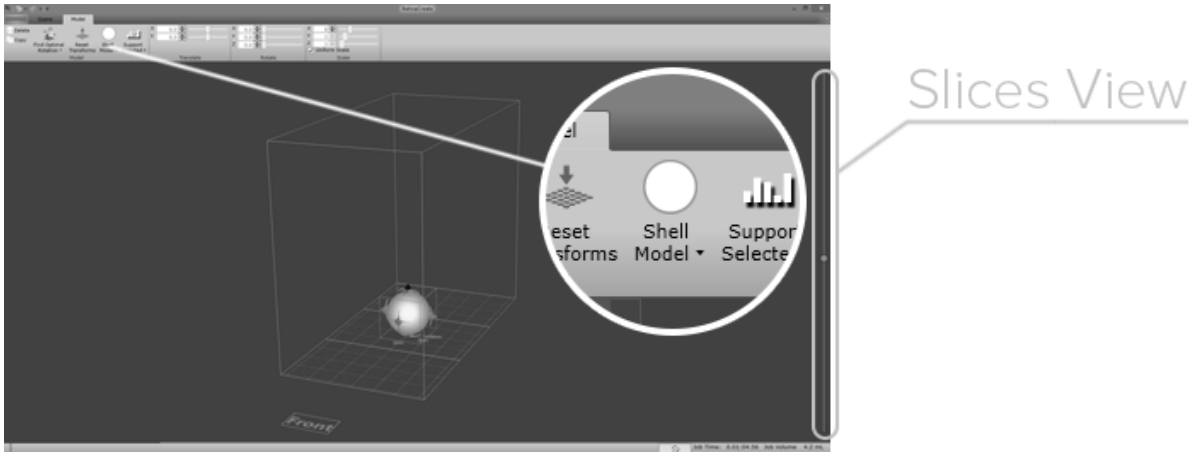


Model Preparation

Shell Model

Shelling a model is a great option that will save resin and give your model inner structural support. The shelling feature will fill your model with a sturdy support structure while maintaining durable outer walls. This allows you to use less resin without compromising durability.

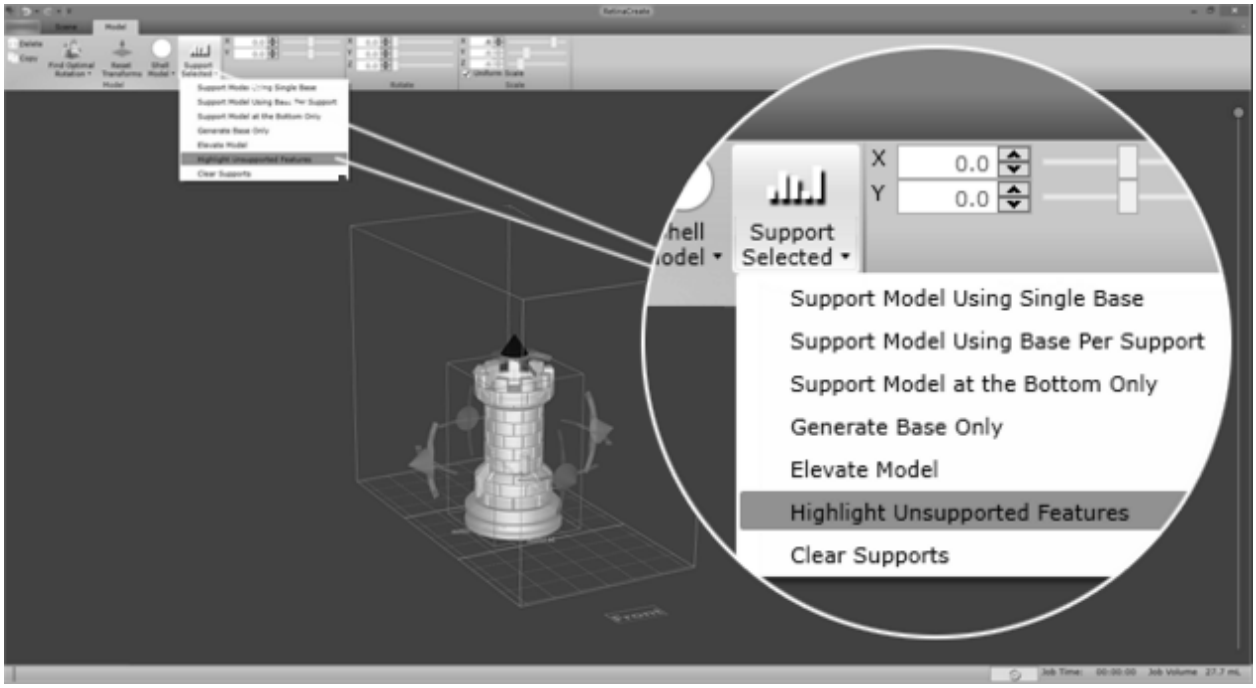
Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.



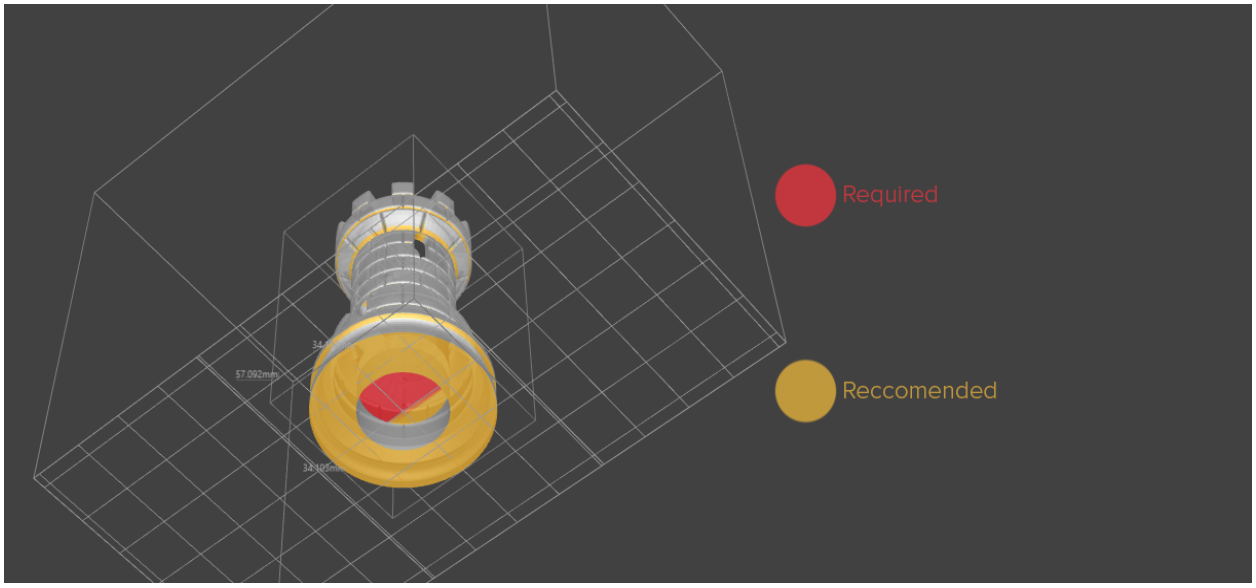
Press the circle above the “Shell Model” to shell your current selection. You can also press the drop down arrow which will give you the options to shell or to remove the shelling.
To view the slices of your object, use the slider on the right hand side of the screen.

Highlight Unsupported Features

Supports are important for a successful print, especially for models with overhangs. Before supporting your model, it’s important to highlight the features that require supports.
Left click your model to select it. Selecting your model will bring up the Model menu. Press the arrow on the “Support Selected” button, to “Highlight Unsupported Features.



Unsupported features will be highlighted in Yellow, and Red. Red features require supports, Yellow features are recommended to add supports, but not usually necessary.



Supporting

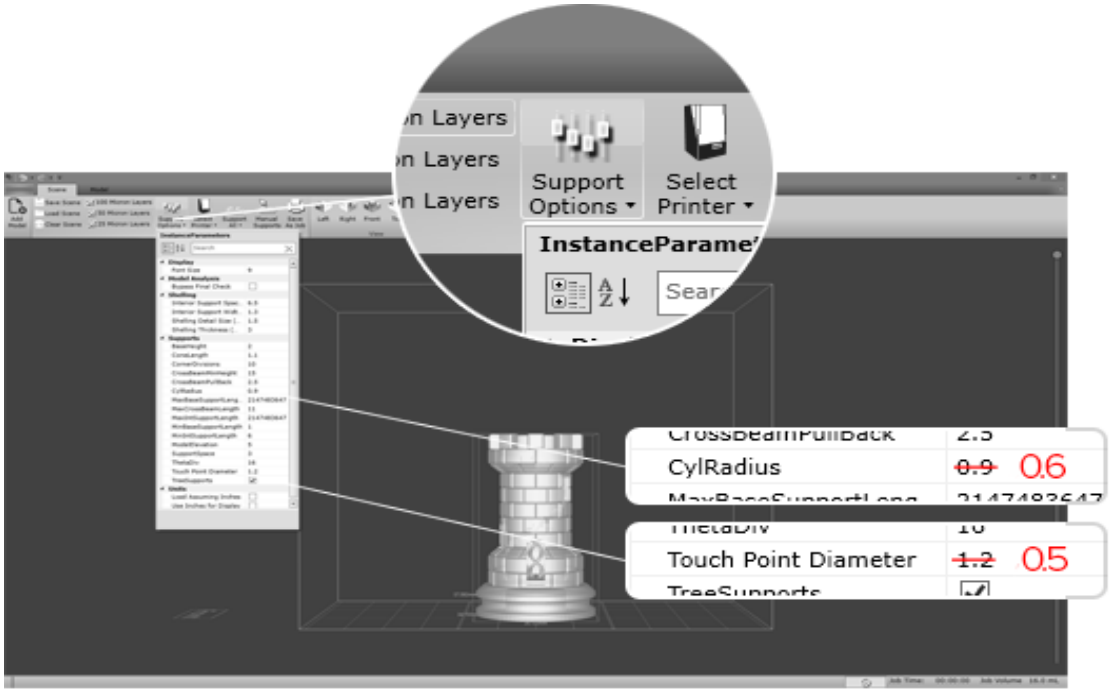
Supports, especially for models with overhangs, are important for a successful prints. Automatic supports will calculate areas that need supporting and will automatically generate trees for optimal success. Automatic supports will tend to overdo supports which may lead to extra resin usage and dimpled surface finish where the supports have connected.

Manual supports typically require less supports which lead to a better finish, but are more difficult and time consuming to place. Automatic supports are recommended for beginning users.

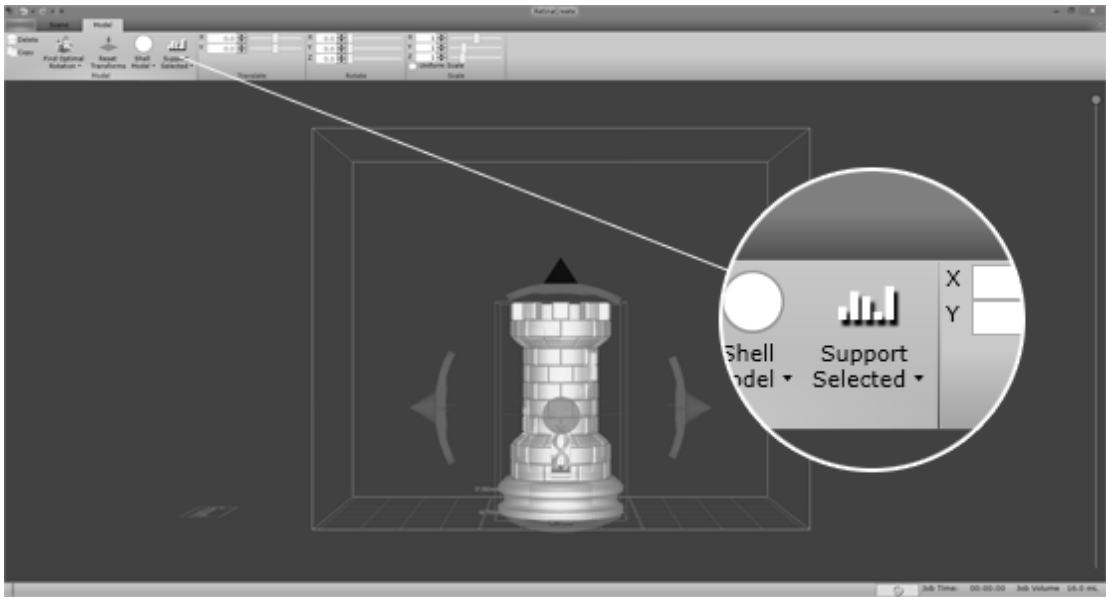
Support Settings

RetinaCreate runs multiple types of printers. To optimize your supports for the Pegasus Touch, click the Support Options in the upper left hand menu. If this option isn't visible, be sure no models are selected.

Change the "CylRadius" from 0.9 to 0.6. This will make your support pillars thinner. Change the "Touch Point Diameter" from 1.2 to 0.5 to lessen the surface area that touches the model.



Automatic Supports

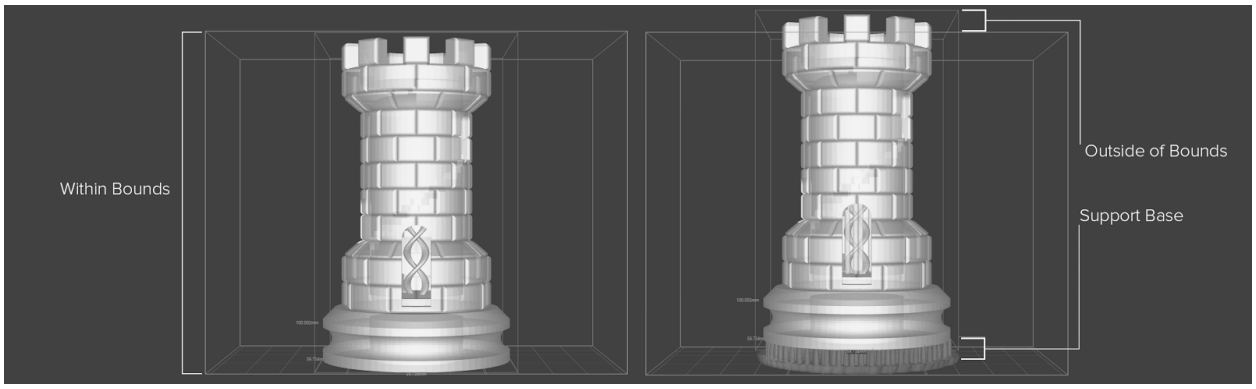


Press the graph above “Support Selected” to add automatic supports to your selected model.

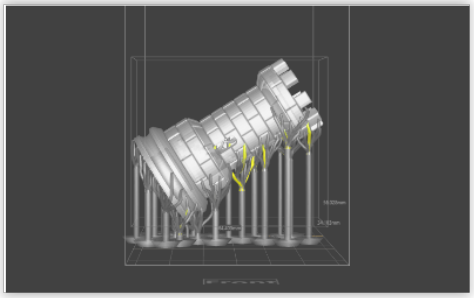
Automatic supports will add a base and will support most of the crucial layers. This function will avoid placing supports if it believes that it will intersect the model, so always verify manually that all sections are supported.

Keep in mind that automatic supports create a base and will raise your model above the build head. After supporting, verify that the model does not exceed the bounds of the printer.

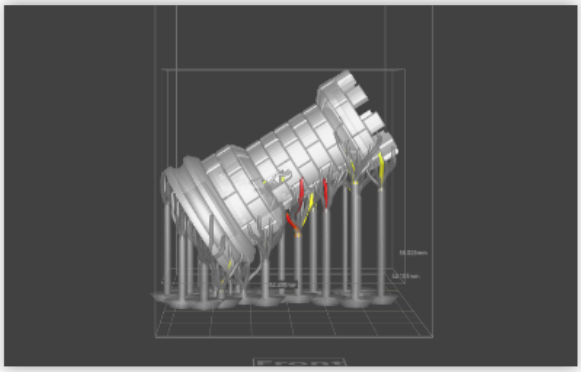
Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.



Automatic Support Modification

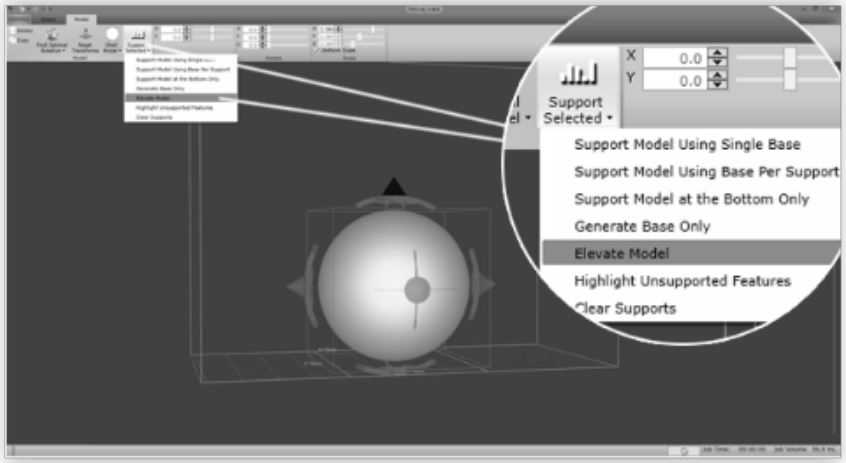


Automatic supports will usually create yellow supports. Yellow supports are recommended and not always necessary. They could be left in place or removed.



Left clicking supports will select them. Selected supports are shown in red. You may select multiple supports.

- Press the delete key to manually delete the selected support.
- Left-click and drag a support to relocate it to another position.

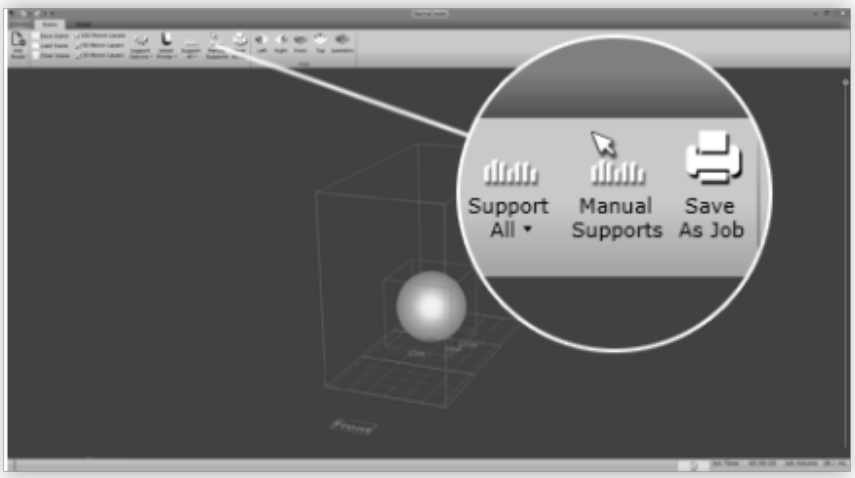


Manual Supporting

Models with flat bases can be printed directly to the build head to avoid dimpling caused by supports. If you would prefer a base, or have an object that can't be printed flat, select "Elevate Model" to add space before supporting.

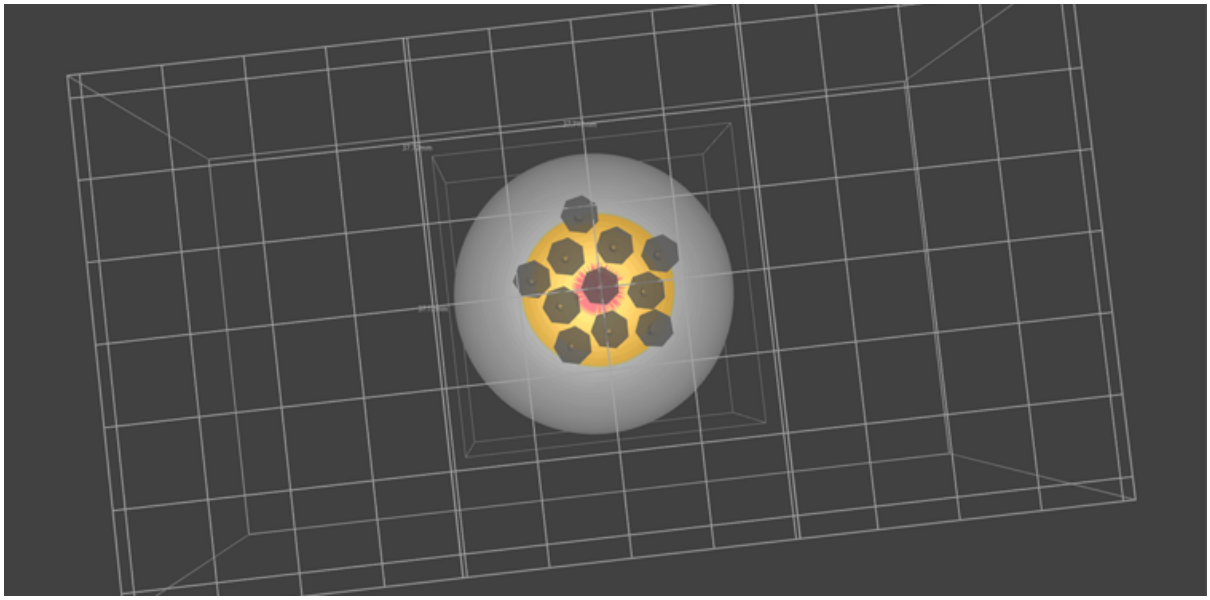
Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

The “Manual Supports” option will appear in the top left menu when no models are selected. Press this button to begin adding supports. Supports can be added by left clicking on the model.



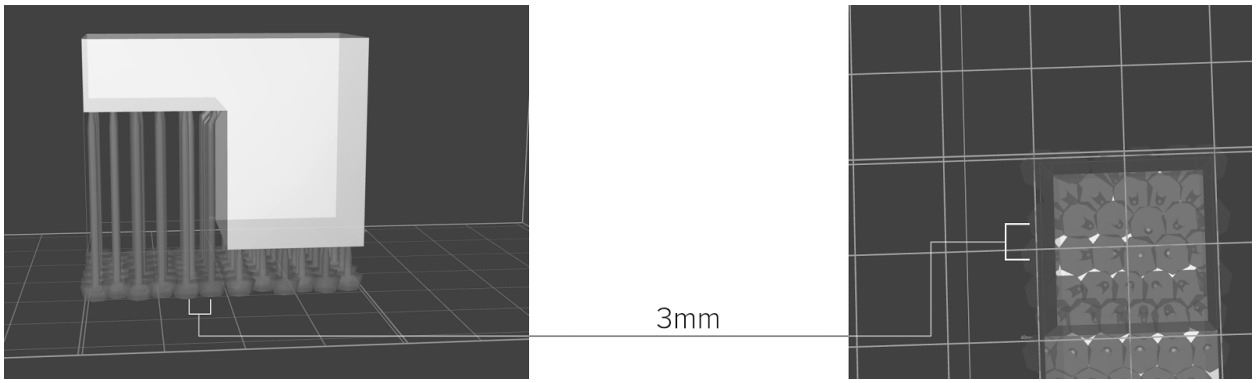
While highlighting unsupported layers, you will see red and yellow sections. Red sections are necessary to produce the print while yellow sections are recommended, but may not always be necessary.

Begin by supporting the necessary red areas then continuing to yellow areas. When adding supports, add them in a symmetrical pattern. This will help distribute the weight evenly when printing.

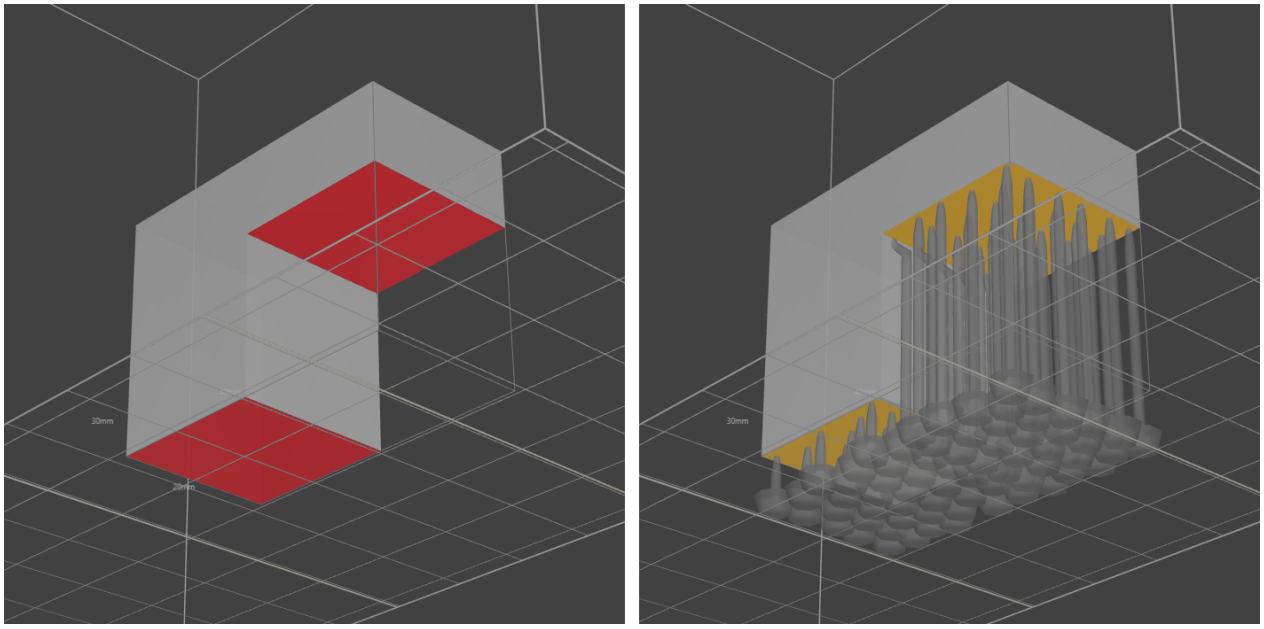


Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

When supporting models with long overhangs, add supports no further than 3mm apart. This can be achieved by placing models so that each support's base touches the surrounding bases.



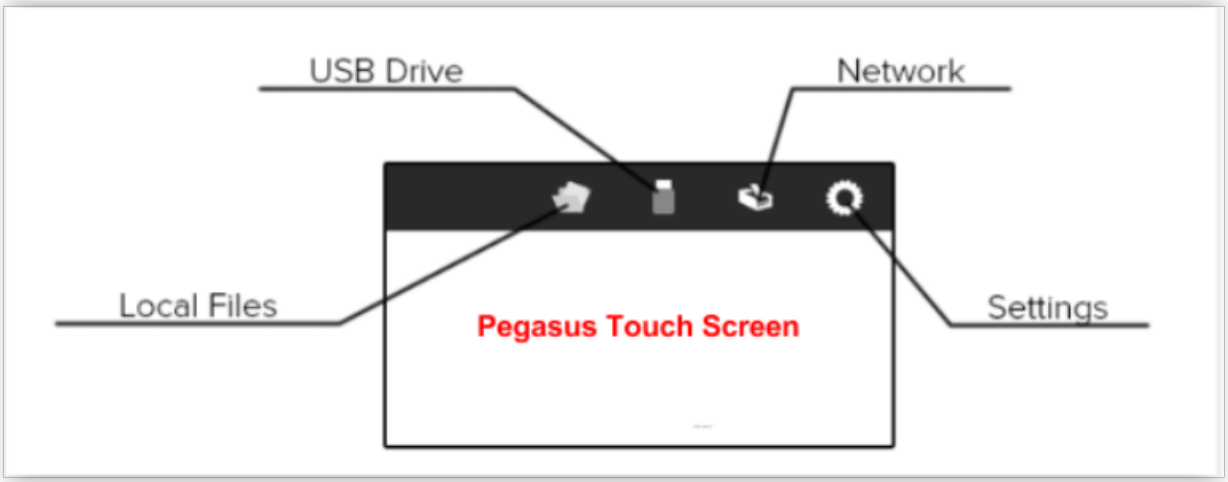
Select the "Highlight Unsupported Features" to refresh the view. If there are no more red areas and all yellow areas look supported, continue to print.



Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

Touch Screen Interface

The Pegasus Touch comes equipped with a touch screen interface on the front of the machine. From this screen you can monitor prints, pause and stop prints, configure network settings, calibrate the printer and print models.

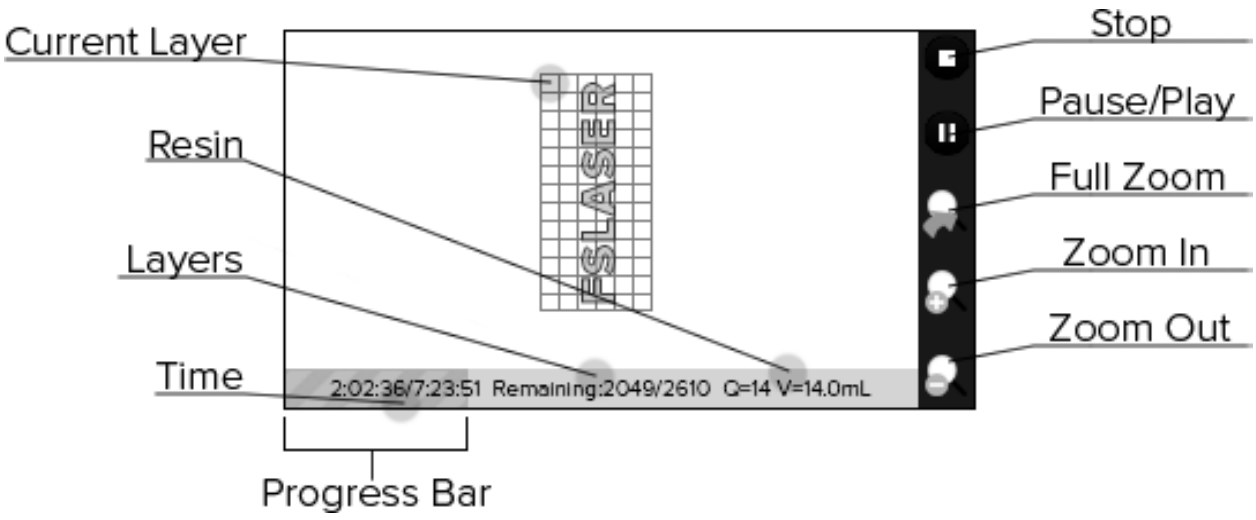


Local Files host the most recently printed files. This will let you print directly without needing to use the original media.

USB Drive icon will appear if you have a USB flash drive connected with the proper file type.
Network icon will assist with connecting to an ethernet or wifi network.
Settings Icon will take you to the settings menu to adjust various printer functions.

Print Monitoring

When the printer is in an active print job, a screen is displayed which allows the user to monitor the job.



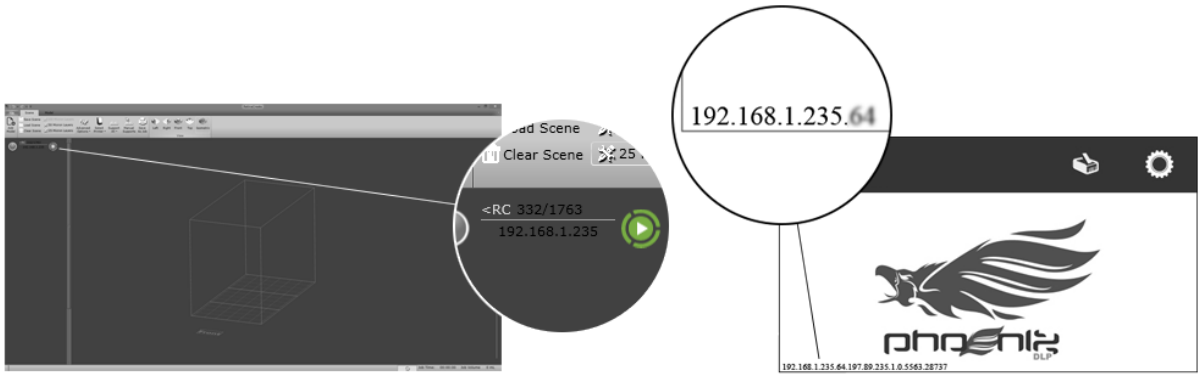
Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

Current Layer shows the current slice that is curing.
Resin notifies how much resin has been used.
Layers shows the remaining Layers/ Total Layers.
Time displays Time Elapsed/ Total Time.
Progress Bar is a yellow bar along the bottom of the screen showing the time elapsed.
Stop to cancel your print.
Pause/Play toggles pause/play to pause the print for refills, and to replay from the last location.
Full Zoom to zoom to the bed to view the laser tracing.
Zoom In incrementally zooms in.
Zoom Out incrementally zooms out.

OPERATIONS

Printing

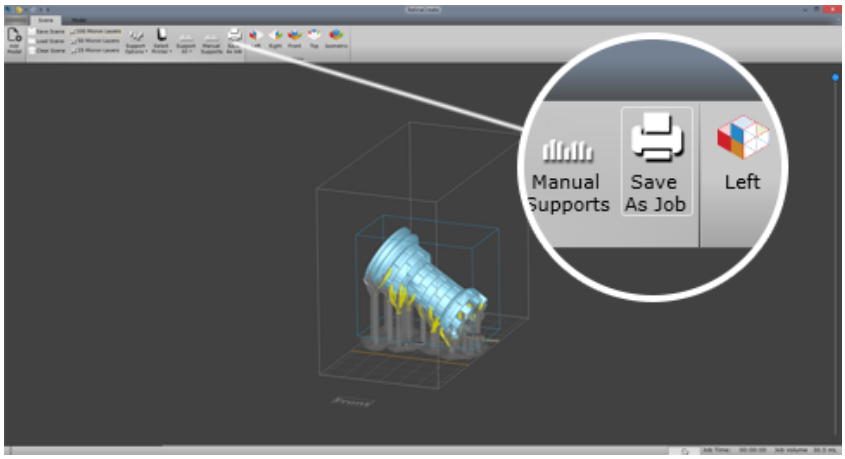
If your printer is connected to a network by ethernet or wifi, RetinaCreate will display the connected printers on the upper left side of your screen. When the printer is ready you will see a green circle, the word ‘Idle’, and the printer’s IP address. Your printer’s IP address can be found at the lower left corner of the touch screen. Click the green circle with a triangle to transfer your file to the printer.



The file will not print automatically. It will take a minute for the menu to pop up on the printer. When the file has transfered, follow the steps on the touchscreen of the computer to begin printing. Do not disconnect your network until the print has started.

Print from USB

Connect your USB drive to the USB port on your printer. Select the USB icon on the top of the screen. This may take 5-10 seconds to appear. If it doesn’t appear, power your printer off then on again keeping the flash drive plugged in. Press the print button and follow the directions on the screen until it begins printing.



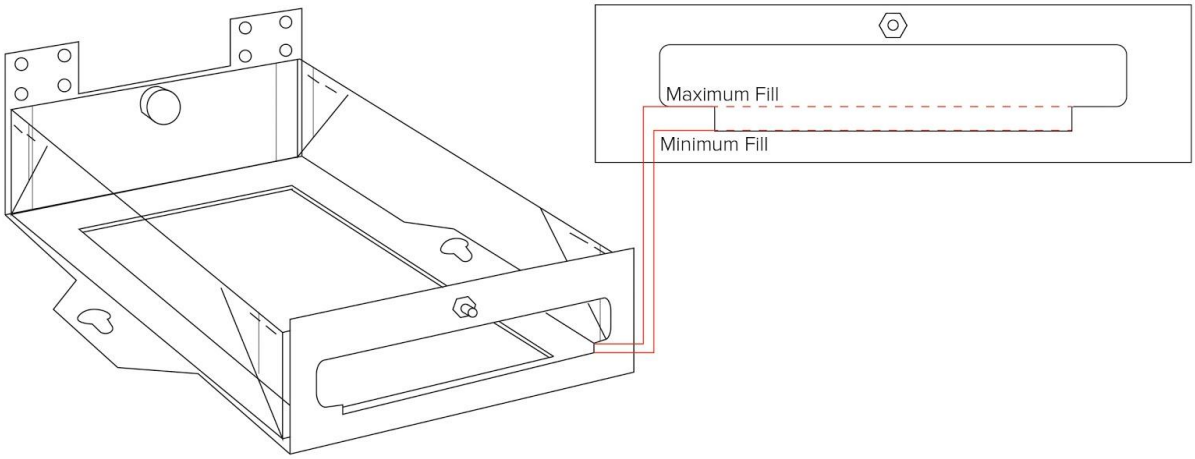
Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

Printing Process

1. **Connect the Printer.** The Pegasus Touch can be connected to a Network via the included Ethernet cable or a wireless network using a wifi adapter (not included). You can also print offline using a USB thumbdrive. With a network, RetinaCreate should display a connected device with an IP address. Your printer's IP address can be found at the lower left corner of the touch screen. Click the green play button in the software to transfer your file to the printer. Note the file will take a minute for the menu to pop up on the printer.

2. **Add Resin.** Before adding resin, using the touch screen, raise your build head out of the way. Now fill your vat with resin just under the maximum fill line. DO NOT OVERFILL. Be sure to read the Resin Safety section of this manual before handling resin.

3. **Print.** When the file has transfered, follow the steps on the touchscreen of the computer to begin printing. To save to a USB thumb drive, press the "Save As Job" button in the top menu. The "Save Scene" button will not save a printable file.



Pre-Printing Checklist

Are you ready to print? Check the list below before you proceed:

- Are all tapes and films removed from all the printer parts?
- Is the build head level?
- Are the resin tray and the build head securely installed?
- Is the resin filled below the recommended maximum fill line?
- Is the printer well connected to the power outlet?
- Is the printer connected to your computer with the Ethernet cable, USB cable or Wifi?

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Post-Printing

Removing the Build Head

- When the model has finished printing, wait at least 10 minutes to allow excess resin to drip back into the vat before opening the lid.
- Wear gloves when handling resin.
- Open the lid.
- Place a board over the resin tray before removing the build head to avoid resin drips over the front of the machine.
- To remove the build head, loosen the large thumbscrew enough so the build head slides out. You do not need to completely remove the screw.
- Remove the build head and transfer it to a safe location for cleaning.
- Always make sure to remove the build head before removing the resin tray. Removing the resin tray first will expose the inner electronics of your printer to resin drips from the build head.
- Close lid to protect the resin from external UV light.

Removing Your Model

Use the edge of a steel paint scraper and wedge it underneath the print. Most prints can be removed delicately with minor force. For stubborn prints, use a hammer or mallet to tap the end of the scraper to help release your print. Be careful not to damage your build head. Continue until the whole model is removed.

Rinsing Uncured Resin

Fill a container with 99% Isopropyl Alcohol (IPA) and place your model inside. Let it soak for 15 minutes to clean excess liquid resin. You may try holding the model with tongs and swirling the model inside the container to remove any loose resin. We recommend you cover the container with a lid to prevent excessive evaporation of the IPA.

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- Clean the build head with paper towels or other paper wipes. You should clean the platform right away after each print.
- Do not wash the resin tray with any chemicals. Cleaning the resin tray with alcohol may cause it to crack. Wipe the resin tray clean with paper towels
- Take the model out of the IPA using the tongs after soaking.

Finishing

- Use the flush cutters to snip away supports.
- Put the model on some paper towels to dry.
- You can finish here, but post curing is recommended for surface finish and print hardness

Post-curing

- Printed objects are by design cured to about 90% strength to extend the useful life of the resin tray.
- To fully cure your prints, expose your prints to a UV light for 30 minutes. Speed Cast resin requires a minimum of one hour of curing. This ensures that the model is completely dry for proper casting burnouts.
- Alternatively, you may place the models in sunlight to cure. Sunlight may cause the clear models to turn slightly yellow as sunlight contains a certain wavelength of light that breaks down color additives in the resin.

Post Processing

- After curing, use sandpaper to remove any imperfections. Rinse in IPA to remove dust. You will not need to post cure again.
- You can use any finishing processes at this point. eg. Painting.

HARDWARE MAINTENANCE

Maintaining the Resin Tray

Be sure that all your components are clean for each new print. For best results in cleaning your resin tray, follow these guidelines:

1. **Remove Resin Tray.** Carefully remove the resin tray from the printer. Avoid spilling any excess resin onto the printer. Refer to the Installation & Assembly section of this user manual for proper assembly and removal of the resin tray.

2. **Save Excess Resin.** At a work sink, pour any excess resin into a clean, light-proof bottle, filtering it with a 125 micron filter. This will remove any unwanted material or debris that may have fallen into the liner during printing. DO NOT mix resins or pour resin back into its original container (see Resin Safety section of this user manual).

3. **Squeegee.** Use a rubber tipped spatula to “squeegee” as much resin out of the liner as possible.

4. **Wash.** Use a mild, room temperature, soapy water solution and wash the Resin tray thoroughly. Be sure to rinse out all the soapy water.

5. **Dry.** Dry thoroughly with a microfiber towel.

6. **Reattach Resin Tray.** Reattach the resin tray as described in the Installation and Assembly section of this manual.

PRO TIPS

Keep the resin tray level at all times to avoid spilling resin onto or inside the machine.

Cleaning the Build Head

The build head is detachable from the printer for easier cleaning and maintenance. It is recommended that you clean the build head thoroughly after each print.

1. **Remove Build Head.** Loosen the large thumbscrew on the build head (B). Slide the Build Head off.
2. **Clean Build Head.** Use a steel paint scraper to remove any hardened excess resin from the build head. Clean off any remaining excess resin using IPAr and a clean paper towel.
3. **Dry.** Make sure build head is dry before reattaching to printer.
4. **Re-Attach Build Head.** Loosen the large thumbscrew on the build head (B). Slide the open end over the build arm and tighten in place. See diagram for details.

Exterior Printer Care

- To keep the body of Pegasus Touch clean, use microfiber cloth to wipe the outside. Avoid products that contain ammonia, e.g. Windex.
- Never clean any part of the exterior or the cover with Isopropyl Alcohol (IPA) since it will cause permanent damage to the printer.
- Never remove the resin tray before removing the build head. Remove the build head first to prevent drips and resin damage to the exterior and interior components of the printer.
- Occasionally use compressed air to clear dust from vents and fans.

Resin Care

Removing Cured Pieces From Failed Prints

In case of a failed print, you will need to remove cured resin remnants from the resin tray. Lightly run a soft rubber spatula across the bottom surface of the liner to find the pieces and dislodge them. Tweezers or other devices with sharp edges may damage the resin tray.

Handling

- Always wear protective gloves when handling resin. If you get any on your skin, wash thoroughly with soap and water immediately, as the resin can cause mild skin irritation.
- Never ingest liquid or cured resin nor drink/eat from printed parts (such as a printed cup).
- Cured resin is safe to touch and handle without gloves or other protection.

Refilling

- Pause the print.
- Pour resin directly into the tray. Do not exceed the maximum fill line as it will spill and damage the printer while printing.

Spills

- Clean up immediately before it hardens.
- To clean printer body use paper towels or clean microfiber cloths.
- IPA may be used to remove resin on surfaces and tools. Do not use IPA on any printer component.

Storage

- Always store the resin in opaque bottles or under the printer cover. Natural light will cure the resin.

Reusing

- You may reuse the remaining resin in the liner, but do not return it to the original bottle since it may result in contamination.
- Filter used resin through paint filters to remove small cured bits of resin.
- Store resin in a lightproof container

Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

Disposal

- Cleaned parts and cured resin may be thrown away as normal waste. They are non-recyclable.
- Resin in liquid form must be cured before disposal. Place the resin in a clear plastic bottle or bag and use sunlight or a UV lamp to cure.

Transportation

To transport the printer, please follow the instructions below.

- Clean excess resin from the build head with paper towels.
- Wrap the build head in plastic wrap and re-attach to the printer.
- Clean resin from the resin tray with paper towels. Never use IPA which may cause cracking. Wrap the liner with plastic and place it back into the printer.
- Lower the build platform by using the motor control. Lower it until the build head touches the base, securing the vat in place.
- Rebox the printer and accessories in the original package as they were received.

Appendix A: Technical Specifications

WEIGHT & DIMENSIONS	Build Area	7” x 7” x 8” (177 x 177 x 228mm)
	Machine Dimensions	11” x 14” x 22.5”
	Weight	29 lbs
PRINTING	Technology	405nm solid state diode laser cured liquid resin
	Laser Beam Spot Size	Average: ~80um FWHM
	XY Position Control	16 bit Digital to Analog Converter (DAC) to closed loop galvanometer (3 micron positioning resolution)
	XY Draw Speed	up to 3000mm/sec laser draw speed
	Z Motor Control	screw driven stepping motor (5 micron step resolution)
SYSTEM	Computer	1GHz processor with 512 MB SDRAM for on board processing, 2 GB internal storage, 8 GB microSD external storage
	Display	4.3” LCD Color Touchscreen
	Interfaces	USB, Ethernet, WiFi (requires optional dongle), USB key
	Power	24V 2.5Amp external power brick (<75w total power draw)

Technical Support is available from 8:00 am (PST) to 5:00 pm (PST) Monday through Friday at support@fslaser.com.

Appendix B: Material Safety Data

A copy of the Material Safety Data Sheets for all resins are located and may be downloaded at the FSL Download site.

Product and Company Information

- Product Name: 3D Printing Resin
- Product Number: Alchemy Resin
- Company: FSL, LLC
- Address: 6216 South Sandhill Road, Las Vegas, NV 89120
- Telephone: 702-802-3100

Composition / Information on Ingredients

- Proprietary Resin.

Hazards Identification

Emergency Overview

- Irritant.
- Irritating to eyes, respiratory system and skin.
- Possible sensitizer.

Properties Affecting Health

- Harmful by inhalation.
- Harmful if swallowed.
- May cause eye / skin irritation.
- Suspect respiratory tract irritation.

Principle Routes of Exposure

- Inhalation: May cause respiratory tract irritation. May cause irritation to nose and throat. Headache. Nausea.
- Oral: Harmful if swallowed.
- Eye Contact: Skin contact causes eye damage.
- Skin Contact: May cause skin irritation. Repeated or prolonged dermal contact may cause sensitization by skin contact.

First Aid Measures

- Oral Exposure: If swallowed, wash out mouth with water provided person is conscious. Call a physician.
- Eye Contact: In the case of contact with eyes, rinse immediately with plenty of water for 15 minutes and seek medical attention.
- Ingestion: If ingested seek medical attention immediately.
- Inhalation: If inhaled, remove to fresh air. If breathing is difficult, give oxygen and call a physician.

Fire Fighting Measures

- Flash Point: Unknown on product.
- Autoignition Temperature: Unknown on product.
- Flammability: Unknown on product.
- Fire Fighting Information: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Emits toxic fumes under fire conditions.
- Extinguishing Media: Water spray, foam, dry chemical or carbon dioxide.

Accidental Release Measures

- Personal Precautions: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
- Environmental Precautions: Keep out of drains and waterways.
- Methods for Cleaning Up: Absorb with an inert material and then place in a chemical waste container and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Handling and Storage

- Handling: User Exposure: Do not breathe vapor. Avoid contact with eyes, skin or on clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.
- Storage: The storage temperature should not exceed 100 °F (38 °C). Keep tightly closed. Store in a cool, dry, well ventilated place. Do not expose to ultraviolet light. High temperatures (>80 °C), pressure and contamination with peroxides may result in autopolymerization of the product.

Exposure Controls / Personal Protection

- Engineering Controls: Ensure adequate ventilation. Safety shower and eye bath. Recommended use in a chemical fume hood.
- Eye Protection: Wear eye / face protection such as safety goggles or glasses with side

shields.
- Hand Protection: Wear chemical-resistant gloves when handling.
- Skin and Body Protection: Wear impermeable gloves and suitable protective clothing. Prevent contamination of skin or clothing when removing protective equipment.
- Ventilation: Provide natural or mechanical ventilation to minimize exposure.

Physical and Chemical Properties

- Appearance: Clear.
- Physical State: Liquid.

Stability and Reactivity

- Chemical Stability: Stable under recommended storage conditions.
- Hazardous Polymerization: Reacts rapidly upon exposure to ultraviolet or blue light.
- Hazardous Decomposition Products: Acrid smoke-fumes, carbon monoxide, carbon dioxide, sulfur oxides, hydrocarbons, nitrogen oxides and perhaps other toxic vapors may be released during a fire involving this product.

Transport Information

- Not regulated for transportation.

Toxicological Information

- Route of Exposure: Inhalation: Material is harmful to mucous membranes and upper respiratory tract.
- Multiple Routes: Causes eye and skin irritation. Harmful by inhalation, ingestion or skin absorption.
- Sensitization: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.
- Signs and Symptoms of Exposure: Nausea, headache, and vomiting.

Ecological Information

- Toxic to aquatic organisms.

Disposal Considerations

- Dissolve or mix with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Appendix C: Warranty Statement and Warranty Information

Full Spectrum Laser (FSL) warranties the Pegasus Touch 3D Laser Printer for a base period of one year. Extended warranty periods are available at the time of purchase.

Contents

1. Covered Parts

To ensure a safe working environment, it is necessary to treat the printer and accessories with care. Please carefully read all instructions before attempting to operate your 3D printer.

2. Not Covered Consumable Parts

The following list of parts are considered consumable and are not covered under any warranty and may need to be replaced periodically.

2.1 Resin

Once cured, resin cannot be reused. However, uncured liquid resin can be reused for the next print. Do not return used resin to the original bottle to avoid contamination. Always store unused resin in a dark cabinet or bottle. Unopened unused resin carries a one year warranty and will be replaced free of charge if it cures in the bottle without light exposure (excludes shipping/handling charges).

2.2 VATs / Build Tray

Experience shows that after the use of 2-4 liters of resin, the anti-stick surface of the VAT may be consumed and that the VAT will need to be replaced. The anti-stick layer of the tray may also begin to cloud after many prints. To limit this and to extend the life of the tray, vary the printing location. You may purchase replacement VATs from FSL.

2.3 Build Platform

Constant removing parts from the build platform will eventually wear down the aluminum surface. Experience shows it to last at least 10 liters or more of printing. You may want to consider spare build platforms if you print / change resin frequently. Spares platforms will allow to begin a new print immediately after the previous print.

3. Excluded Events

The warranty is valid only for normal use and excludes Acts of God, user error and use outside of normal parameters.
Parts exposed to spilled resin are considered user error and are not covered under warranty. Best practices to minimize resin exposure include:

- Always ensure that the printing surface is level as the resin may spill while printing.
- Never fill the VAT with resin past the fill line.
- Always use a 9"x14" cutting board over the VAT whenever removing the build platform to prevent spills.
- Always remove the build platform before removing the VAT to prevent resin from falling into the internal portion of the machine.

4. Return Policy

For products purchased directly from FSL within the first 30 days and if the 3D Printer has been opened, one may return the machine subject to a 20% restocking fee plus shipping fees. This 20% fee results from the need to replenish or replace consumable items. If the 3D printer is returned new, unopened or if the order is cancelled, then only a 5% restocking fee and shipping fees (if any) are applied. Consumable items, e.g. the build plate, VAT or resin, may not be returned if opened. If returned unopened, then only a 5% restocking fee and shipping fees are applied.
For products purchased from 3rd Party Distributors or Resellers, please review the 3rd Party Distributor / Reseller return policy.

5. Shipping Expenses

Within the first 30 days, FSL will replace or repair any defective parts free of charge and pay for ground shipping of parts if one paid FSL for shipping on the original order. Overnight shipping is also available but for an additional charge. If the 3D Printer was picked up in person or delivered through third party shipping methods, FSL considers the parts sold FOB from the FSL warehouse. As a result, the customer must arrange for shipping or pickup of replacement parts, since FSL did not make the original shipping arrangements.
After the first 30 days, FSL will replace or repair any defects within the warranty period free of charge. However, all shipping charges to and from FSL are the responsibility of the customer. The warranty includes parts and labor only. Shipping of defective and replacement components to / from FSL is excluded by the warranty. The customer may arrange their own shipping or drop parts off for exchange at the FSL warehouse free of charge. Typically FSL has most replacement parts on hand for immediate shipment of parts under warranty.

6. Advance Replacement Policy

Within the first 30 days, FSL will advance replace any failed parts free of charge.
After the first 30 days, unless otherwise authorized, all defective parts must be returned to FSL postage paid for evaluation before replacements are issued. FSL's warranty policy is to repair parts whenever possible and replacing them only if they are not able to be repaired. As a result, all warranty parts must be returned first to determine if the parts can be repaired.

7. Accuracy and Tolerance Statement

FSL makes no specific accuracy or tolerance guarantees, but machines are designed with full end user calibration / adjustment. Users may self calibrate their machines to fine tune accuracy requirements. For details contact FSL Technical Support.