goengineer
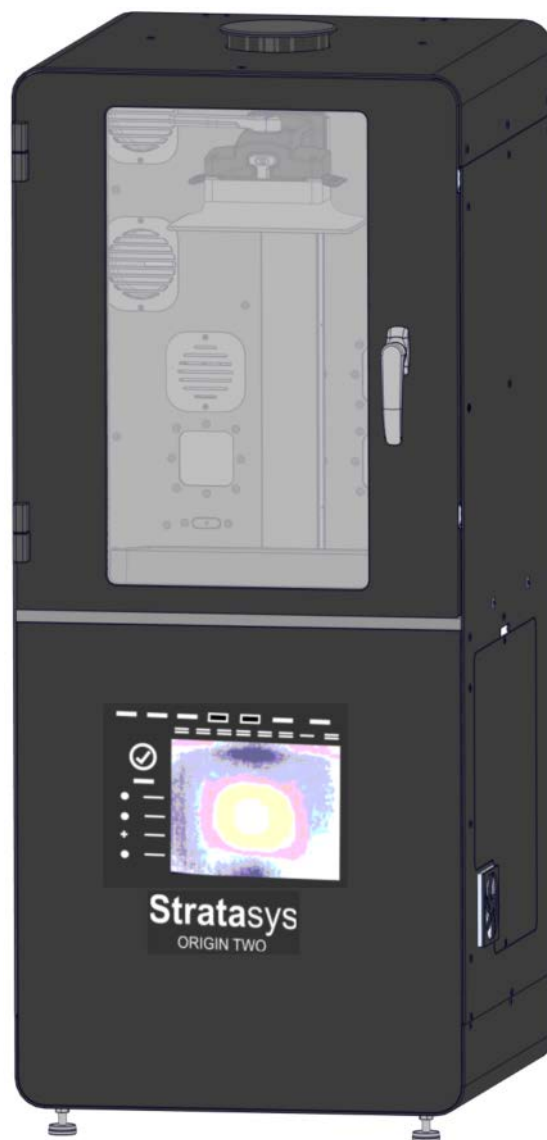
Origin Two
3D Printing System

Stratasys
ORIGIN TWO

stratasys

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Revision History

	Translations of this guide are updated periodically. If you are consuming a translated version, check the English version for latest revision and list of updates.

Revision	Release Date	Description of Changes
A	SEP 2024	Initial Release
B	SEP 2024	Updated Origin Local Hub section

Revision	Release Date	Description of Changes
C	NOV 2024	Updated the footers

Contents

1 Safety

This chapter provides information on service and support for the Origin Two as well as safety information and safety label locations.

Safety Instructions

The following basic safety tips are given to ensure safe installation, operation, and maintenance of Stratasys equipment and are not to be considered as comprehensive on matters of safety. The Origin Two printer is designed to be a safe and reliable additive manufacturing printer. Access to areas of the printer are potentially dangerous.

General Precautions

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

- Do not open the rear panel. The access is restricted and permitted for Stratasys certified technicians only.

- Do not perform any changes to the input voltage switch unless instructed specifically by Stratasys certified technician.

- Before handling resins and solvents, fully read and understand the appropriate Safety Data Sheets (SDS).

- Printers should be installed in a controlled environment with all necessary safety precautions.

- Use printer in a well-ventilated area. If used within an enclosed area, proper air-changes, ventilation, and exhaust systems are required. Contact a Stratasys representative to determine requirements for your specific application.

- Keep printer and material resins away from direct and indirect sunlight.

- When using chamber heating, surface temperature of metal components inside the chamber may exceed 50°C (122°F). Use appropriate precautions such as gloves to avoid burns.

- Use caution when accessing the build chamber because of a pinch point hazard, for example when handling the resin tray.

- ONLY operate with 110V, 3-prong, or 220V, 2-Prong, Grounded Power Connectors.

  DO NOT replace detachable power supply cord with an inadequately rated cord.

Operator Requirements

Operators must read and understand the user guide and learn about the printer's functions and safety conditions. This is achieved from training in the use, handling, maintenance tasks, and all safety measures including location of safety equipment.

> **Warning: Machine Failure Hazard**
> Improper maintenance can be dangerous, and in the worst-case, can be life-threatening.

Proper Personal Protective Equipment (PPE)

Proper PPE should be worn at all times while working around the print bench or handling resins, solvents and cleaners, hazardous waste, etc. PPE should include but is not limited to:

• Nitrile gloves

• Lab coat

• Safety glasses

• Cut-resistant glove and sleeve

Refer to the appropriate Safety Data Sheets for additional safety precautions and required PPE.

Hazard Types

Stratasys recommends that qualified personnel perform all services. All personnel working on or around the printer should know the meaning of the following hazard classifications throughout this guide.

• **Warnings** and **Cautions** precede the paragraph to which they pertain.

> **Warning:**
> Indicates a potentially hazardous situation which, if not avoided, may result in injury or death.

> **Caution:**
> Indicates a situation which, if not avoided, could result in damage to equipment.

• **Notes** follow the relative paragraph.

> Indicates additional information relative to the current topic.

Product Safety Signs

> ⓘ Always read and adhere to safety statements, and be aware of the following safety signs when you see them on the printer.

Stratasys makes every effort to ensure that our printers are safe and reliable at all times. However, there will be times when you must access areas of the printer where potentially high voltages, hot temperatures, and/or moving mechanical components could cause severe injury.

Table 1: Product safety symbols

Warning Symbols	Meaning	Location	Comments
ⓘ	Information		Provides additional information that is helpful to properly use the printer.
⚠	Warning		Exclamation mark: This icon is used for other instances and items for which a standard symbol does not exist.
⚠ WARNING Burn hazard. Hot surface inside. Allow to cool before servicing.	WARNING: Burn Hazard	Front/Bottom of the build chamber door	Risk of burns. Surface temperature of metal components and glass may be hot. • When metal components exceed 50°C (122°F), wear safety gloves and long sleeves. • Do not touch the front and bottom surfaces immediately after printing. • Do not touch surfaces before allowing the build chamber components to cool. • Each material has unique characteristics and hazards when heated. Refer to the *Material Processing Guides* for details about the Origin certified resins on the Stratasys Support Center.
⚠ WARNING Hazardous chemicals located within this enclosure.	WARNING: Hazardous Chemicals	Build Chamber door	The photocured resins in the resin tray may be hazardous. Each resin must be handled with the appropriate precautions in accordance with the *Material Safety Data Sheet* of the resin on the Stratasys Support Center.

Table 1: Product safety symbols (Continued)

Warning Symbols	Meaning	Location	Comments
	WARNING: Electrical Hazards	Near Power switch	Risk of electric shock. Disconnect the power before servicing. **Note:** Opening the rear panel should be performed by certified service personnel only.

Product Safety Label Locations
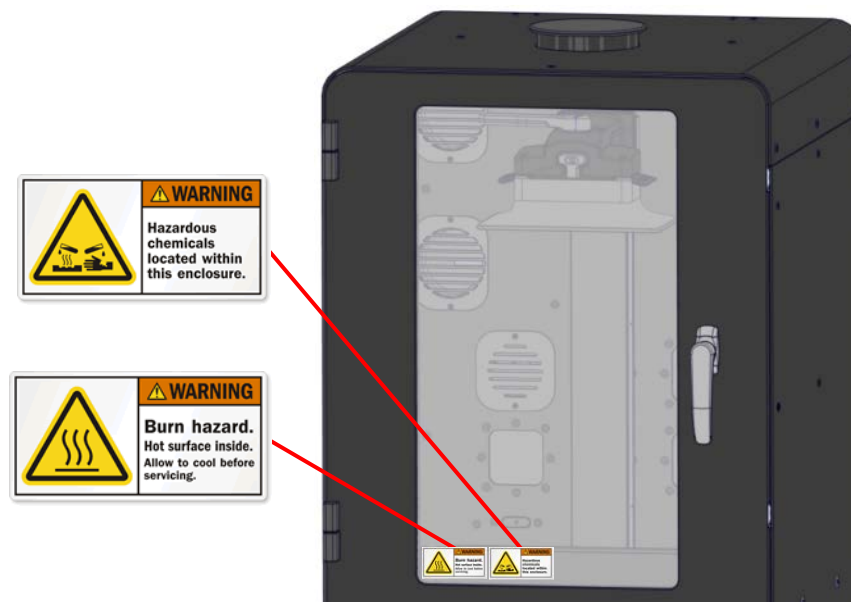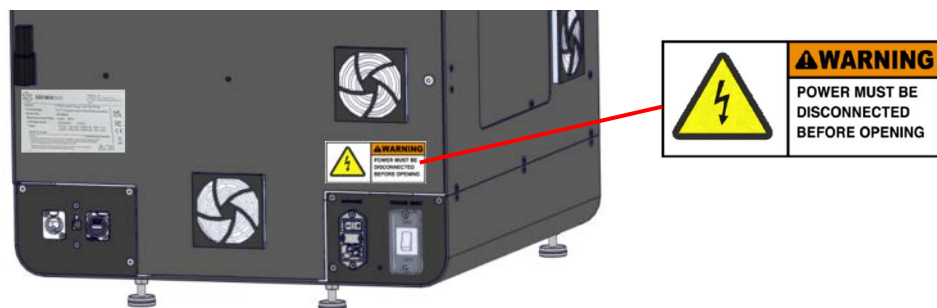
Figure 1: Front view safety label locations

Figure 2: Rear view safety label location

Potential Safety Hazard Areas

The following components and areas of the printer are highlighted as potential safety hazards that may cause system failure or reliability problems if proper safety procedures are not followed.

Interlock Switch

This interlock switch is inside the door. When the door is opened or another non-safe state exists, the power supplied to the projector, the Z motor and its brake release is removed. A red bell notification is displayed on the screen and the printer enters an error mode. In order to reset the error, a printer reboot is required.

> **Warning:**
>
> **Do not defeat (override) the interlock switch.** Doing so could result in serious personal injury. If the interlock switch does not function correctly, do not use the printer, and contact your service provider.

Input Voltage Switch

During site preparation, a Stratasys certified technician sets the input voltage switch.

> **Caution:**
>
> Do not perform any changes to the input voltage switch. Setting the voltage to the wrong rating could result in damage to the circuits. Contact your service provider for support.

Inlet Fuse

> **Warning: Electrical Hazard.**
>
> Do not replace the inlet fuse. Contact your service provider for support.

Rear Panel

> **Warning: Electrical Hazard.**
>
> Do not open the rear panel.

Build Chamber

> **Warning: Hot Surfaces.**
>
> Components are hot. When metal components in the build chamber exceed 50°C (122°F), wear safety gloves and long sleeves.

Midplate

⚠️	**Caution: Pinch Point.** Electromagnets attract the resin tray to the midplate with force that may cause pinching of the fingers between the resin tray and midplate. Always use the integrated handles when moving the resin tray on the midplate.

General Safety Practices

Abide by these general safety practices when working with this printer.

⚠️	**Warning: High Voltage.** High voltage is present in the printer.

⚠️	**Warning: Falling Hazard.** Only use an OSHA or CE approved step stool when accessing the area under the top cover of the printer.

⚠️	**Warning: Hot Surfaces.** Components are hot. When metal components in the build chamber exceed 50°C (122°F), wear safety gloves and long sleeves.

Environmental Requirements

Table 2: Requirements

Item	Description
General	
Materials	Photocurable materials from the Stratasys ecosystem materials partners
Maximal Part Volume (W × D × H)	7.44 in × 4.17 in × 14.52 in (189 mm × 106 mm × 369 mm)
Feature Resolution	Typically <50 µm (<0.002 in) - (material and design-dependent)
Process Energy (UV)	385 nanometer
Chamber Operating Temperature	Up to 140°F (60°C)
Resin Tray Capacity	15–65 fl oz (2 liters max)
Supported File Types	STL and Zip of PNG images
Connectivity Configuration	• Ethernet • Origin Local Hub

Table 2: Requirements (Continued)

Item	Description
Power Requirements	
Power	• 100–120 VAC, 50/60 Hz, 7.1 A, 1 Ph • 200–240 VAC, 50/60 Hz, 3.5 A, 1 Ph
Power Supply Distribution System	TN
Short Circuit Current Rating (SCCR)	1.5 kA
Noise Emissions (Acoustic)	
Idle	Less than 62.8 dBA
Building	Less than 62.8 dBA
Environmental	
Operating Temperature	Range of 64°F–77°F (18°C–25°C)
Relative Humidity	Range of 30%–70% non-condensing
Dust-free	The printer must be kept in an environment free of dust particulates to prevent damage to sensitive internal optics.

Emergency Situations

In the event of accidents or breakdowns, printer operators must:

- Assess the danger associated with the accident or breakdown. Escape routes must be used when exposed to immediate danger.
- To immediately stop printing, disconnect the power cord from the back of the printer or turn off the breaker supplying the power outlet for the printer.
- In the event of a resin spillage, refer to the material SDS.
- Assess the extent of the damage.
- Identify potential dangers, and where appropriate remove the dangerous object, components, etc. and evacuate people from the area.
- Contact emergency services in the even of serious accidents.

2 Printer Setup and Support

This chapter describes the basic setup of the Origin Two.

General Information

This user manual describes the specifications and relevant components of your printer. Recommended procedures are explained to ensure your parts are printed safely and efficiently. Additional sections on cleaning, troubleshooting, and maintenance help provide proper care for your printer.

Intended Use

The Origin Two printer is a manufacturing-grade printer that enables additive mass production of end-use parts for light industrial and dental labs. Programmable Photopolymerization (P^3) precisely orchestrates light, temperature, and a pneumatic separation mechanism for the best possible results. Origin Two can produce detailed featured parts with high-accuracy materials that can be post-processed in minutes.

- The Origin Two operating environment should be physically separated from other functional areas (for example, office space).
- Operators use, control, and maintain the printer for normal operation and a Customer Support Engineer provides onsite training at installation.
- Equipment is not suitable for use in locations where children are likely to be present.

Welcome Kit Contents

The printer's Welcome Kit contains the Welcome Insert document and common tools you need to maintain the printer.

A Welcome Insert document contains instructions for downloading the Origin User Guide (this document). Use Table 1 to identify the contents of the Welcome Kit.

Table 1: Accessories

#	Item	Description
1	Resin Tray	The resin tray will contain the resin used to print parts. It is used to secure the tray sheet which is instrumental in releasing cured layers.
2	Build Platform (2x)	The build platform is the substrate on which the printed model will be attached and anchored during the build process.
3	Tubing	22.4-in (570-mm) tube for pump tubing replacement. See Chapter 6, Maintenance (page 55).
4	Fan Filters (4x)	Replacement fan filters. See Chapter 6, Maintenance (page 55).

Table 1: Accessories (Continued)

#	Item	Description
5	Linear Drive Grease Kit	0.1-fl oz (3-ml) syringe, grease, and tip cover for lubricating the linear drive. See Chapter 6, Maintenance (page 55).
6	Torque Driver, 6 Nm 5 mm	Torque driver set to 4.43 ft lbs (6 Nm) use to secure the tray sheet to the resin tray. See Chapter 6, Maintenance (page 55).
7	Cable, Main Power	Power cable used to provide power from the wall receptacle to the printer. US and EU spec cables are provided.
8	Cable, Ethernet	Used to connect the printer to the Origin Cloud or Origin Local Hub via facility network.
9	Tray Gaskets, Replacement	These gaskets create the seal between the tray and the tray sheet.
10	Accessories, L-keys	A set of L-keys to remove fasteners holding covers to customer serviceable components is included.
11	T-handle, T10 Torx Driver	A T10 Torx driver is included for the fasteners on the side panels.
12	Disassembly tool, Tray	A thumb tool is included to assist in pulling the tray halves apart during tray sheet replacement.

Basic Setup

Follow the Site Preparation Guide to ensure that your facility is effectively and safely prepared for printer installation. Perform the following setup tasks.

Identifying Your Printer

You need the printer's serial number when requesting service. Find the serial number and other information on the printer shipping crate and the printer nameplate as follows:

1. Sticker on the shipping crate—When the printer is delivered, locate the sticker with the serial number on the shipping crate.

2. Printer nameplate on the printer—When contains the serial number. The printer's model number and power requirements are also shown on the nameplate.

   The nameplate is located on the back side of the printer near the bottom, and is typically placed near the printer's power connection. Use the information on the nameplate when identifying your printer with Customer Support.

Figure 1: Nameplate Location

Making the Network Connection

The Origin Industrial and Dental printers require connection to the Origin Cloud through the facility's network. The Origin Local printer also requires connection to the facility's network to reach the Origin Local Hub. An RJ45 network connector is located on the left back corner of the printer (as viewed from the back). See Figure 2 for the network connection location.

1. Remove the Ethernet cable from the Tools and Cables Accessory Box.

2. Connect the Ethernet cable. See Figure 2.

> ℹ️ A 15 ft (4.6 m) network patch cable is supplied with the printer and located in the welcome kit. Facilities having network connection points further from the printer than can be reached by the supplied cable, are responsible for the procurement of an appropriate cable. The maximum Ethernet cable length is 82 ft (25 m).

Connecting the Power Cable

> ⚠️ **Warning: Electrical Shock Hazard.**
>
> A licensed electrician must perform all wiring from the service connection to the system - including all connectors, cables, and proper strain relief.
>
> Comply with all applicable local and national electric codes.

1. Remove the power cable from the Tools and Cables Accessory Box.

2. Plug the receptacle end of the power cable into the back of the printer and the three-prong (US) or two-prong (EU) end into a grounded outlet. See Figure 2.

> ℹ️ Contact your Stratasys representative before first use or after moving the printer.

Figure 2: Back Connections
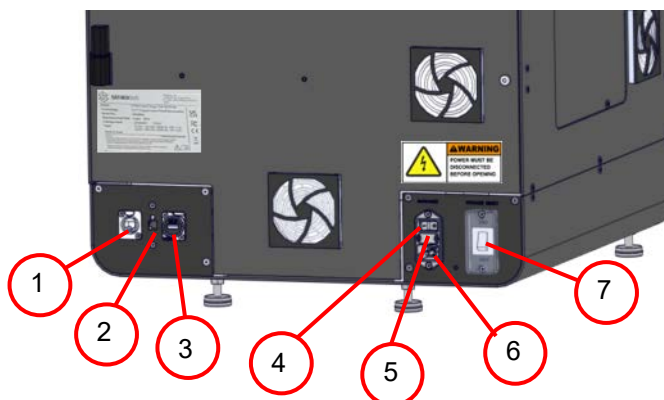
Table 2: Rear view—Back connections

#	Description
1	Ethernet port
2	ProAero control cable connector
3	USB port
4	Power switch
5	Inlet fuse
6	Power cable connection
7	Input voltage switch

Service and Software Support

If you have a problem with your printer that is not covered in this guide, contact Stratasys Customer Support. Contact information is available from the Stratasys website at: https://support.stratasys.com/en/contact-us.

When calling in for service, always have your printer's hardware serial number available (see "Identifying Your Printer" (page 10)).

Stratasys Online Resources

Stratasys encourages you to learn more about additive technologies and your Stratasys printer. A wealth of information is available on our online platforms.

Subscribe to our customer newsletter for quarterly updates on Stratasys knowledge and training. You can learn about the release of new documentation and learning resources.

Stratasys Academy

Stratasys Academy is your online learning platform where you can quickly learn and acquire skills on additive technologies and your Stratasys printer.

To guide you in your learning, our online academy provides a variety of resources such as an extensive library of videos and eLearning modules. We periodically update the site with new content. Start your learning journey today.

Figure 3: Stratasys Academy
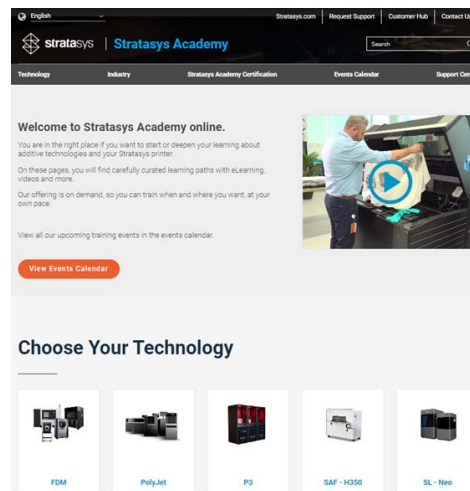
Stratasys Support Center

The Support Center is a knowledge base that includes information about design, applications, printing material, and links to many other resources.

In addition, you can check the latest revision of the user guide for your Stratasys 3D printer and download documents in different languages.

The Support Center is available in multiple languages. You can change the display language using the language drop-down menu in the top-left corner of the homepage.

Figure 4: Support Center
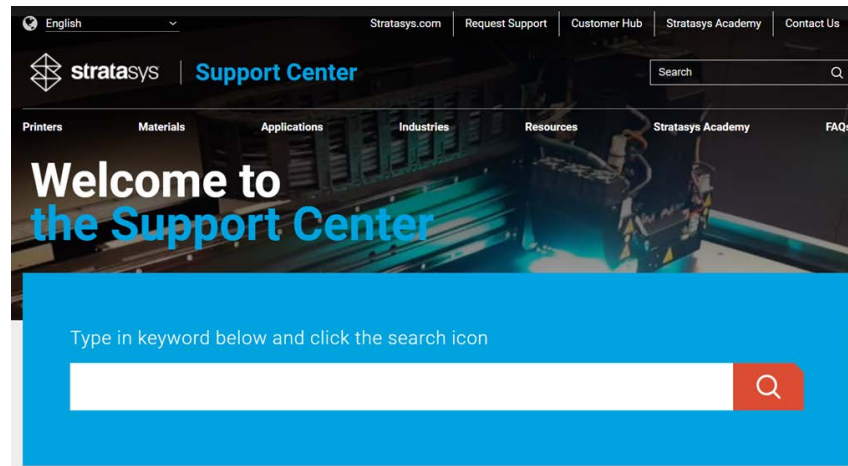
Stratasys Academy YouTube Channel

The Stratasys Academy YouTube Channel features instructional videos about how to operate and maintain Stratasys printers. The channel includes dedicated playlists for different printers and special topics like post-processing.

Make sure to check out this new Stratasys Academy Channel and remember to subscribe!

Figure 5: Stratasys Academy YouTube Channel
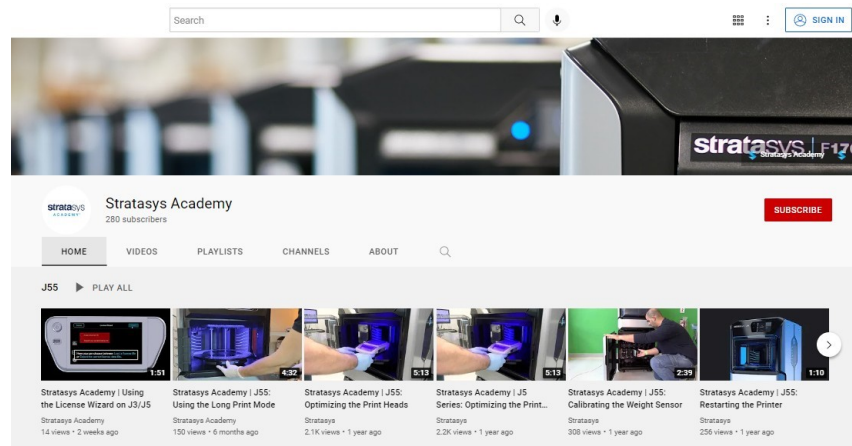
GrabCAD Community

The Tutorials section of the GrabCAD Community portal is a valuable resource for Stratasys-sponsored and user-generated 3D printing tips. You can also ask 3D-related questions on the portal and download free CAD files.

Figure 6: GrabCAD Community
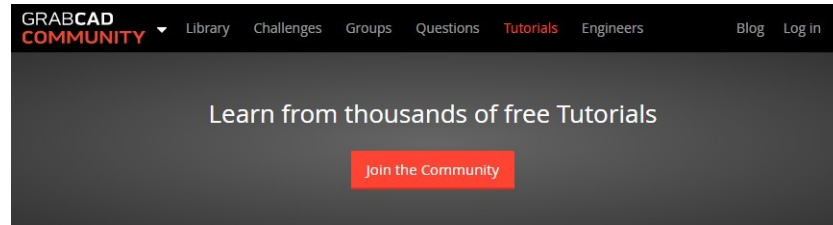
3 System Components

This chapter describes the components of the Origin Two printer. Information regarding the materials and tips that can be used by the printer are also included in this chapter.

Printer Overview

Main Components

> ⚠️ **Warning:**
> Do not power on when the back panel is not secured in place.

This printer has been designed to allow easy access to the most frequently accessed areas on the system. System components are highlighted in Figure 1 and Figure 2, and described in Table 1 and Table 2.

Figure 1: Front View - System Components
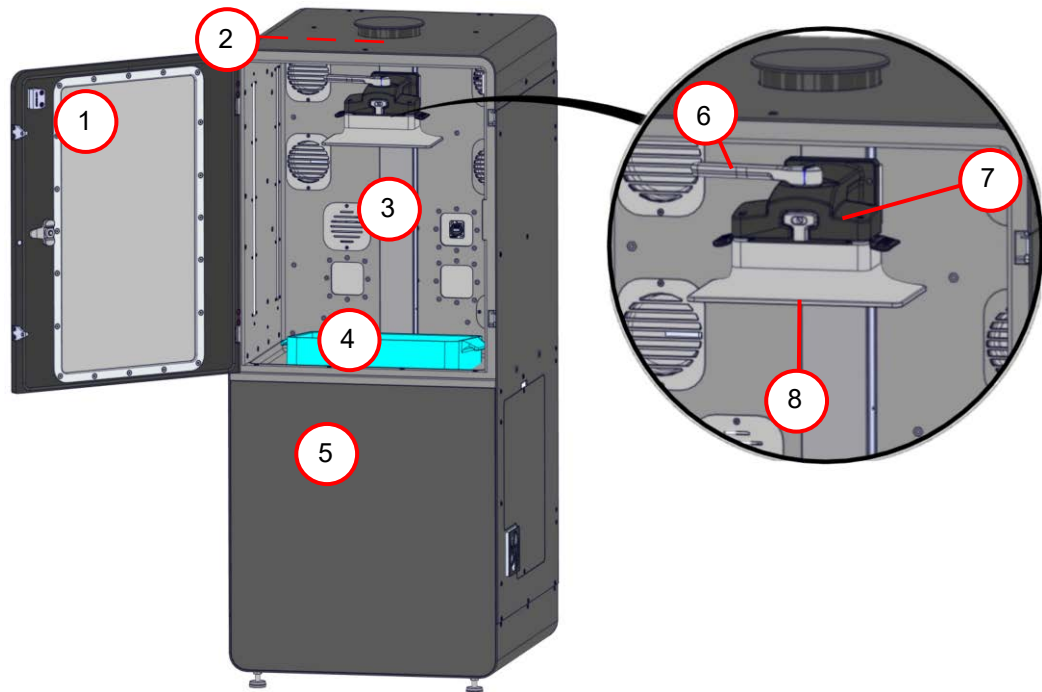
Table 1: Front view—System components

#	Description
1	Door and interlock switch
2	Exhaust grille
3	Linear drive
4	Resin tray (shipped separately)
5	Touchscreen
6	Lever (closed position)
7	Build arm
8	Build platform

Figure 2: Rear View - System Components
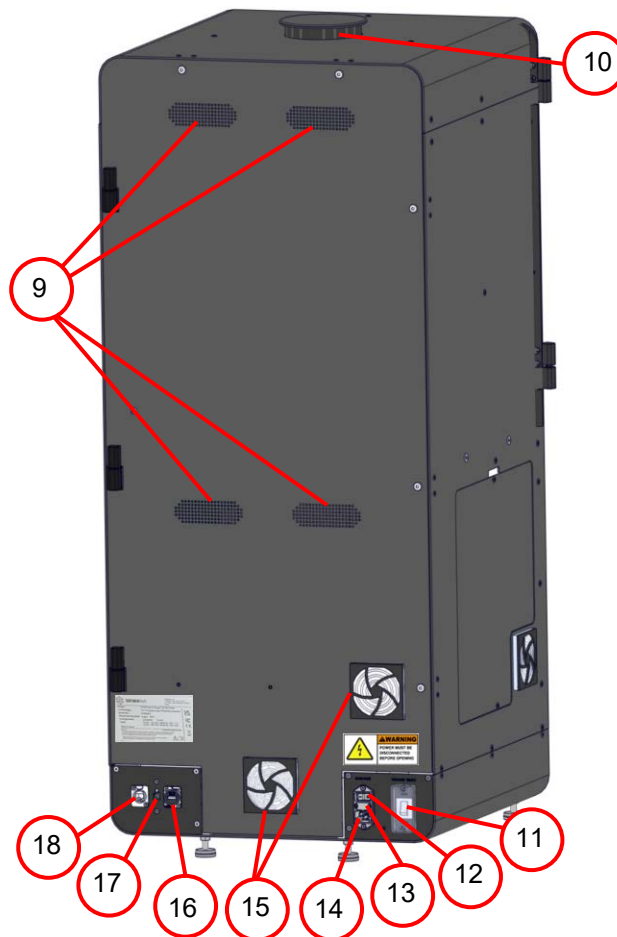
Table 2: Rear view—System components

#	Description
9	Vents (4 total)
10	Exhaust cap
11	Input voltage switch
12	Power switch
13	Inlet fuse
14	Power cable connection
15	Fans
16	USB port
17	ProAero control cable connector
18	Ethernet port

Software

Firmware

The Origin Two Printer runs on a high-performance and secure Linux embedded computer platform. Upgrades and updates are pushed automatically as required, and take effect after a system reboot. Origin Local receives quarterly updates which require manual downloads.

Installing GrabCAD Print™

Install the GrabCAD Print software on a facility workstation.

1. Navigate to http://help.grabcad.com/article/197-sign-up-download-and-install and follow the on-screen instructions.

2. After installing GrabCAD Print, navigate to *File > Preferences > P3* and login or create an Origin account.

   For Origin Local, select *Origin Two Local* and enter the Origin Local Hub IP or web address.

3. If a new account was created, contact your Stratasys representative to complete the registration.

For more information on GrabCAD Print for Origin, refer to the Help at: https://help.grabcad.com/article/283-grabcad-print-for-origin.

Connecting to the Origin Two Printer

Origin Two printers associated with your Origin account automatically populate in GrabCAD Print after your accounts are connected via the P3 settings.

4 User Interface

This chapter provides an overview of the Origin Two printer user interface (Touchscreen). Specific printer operation information and procedures can be found in Chapter 5, Operating the Printer (page 26). You must power ON the printer prior to using the Touchscreen (see "Powering ON the Printer" (page 26) for instructions).

Overview

The Touchscreen enables you to access printer functionalities such as releasing the door lock and showing the print progress.

- To use with the printer, tap anywhere on the touchscreen. This activates the home screen. The home screen displays several buttons, sensor readings, and shows the progress of a print.

- If the strike bars are installed on the door, tap **Open Door** to release the door locks so that the printer may be opened.

- To magnetically release a tray from the printer, tap **Release Tray**.

- Four options on the side of the screen are available to display the following screens: **Select Job**, **System**, **Analytics**, and **Network**. See Figure 1.

Figure 1: Touchscreen Overview
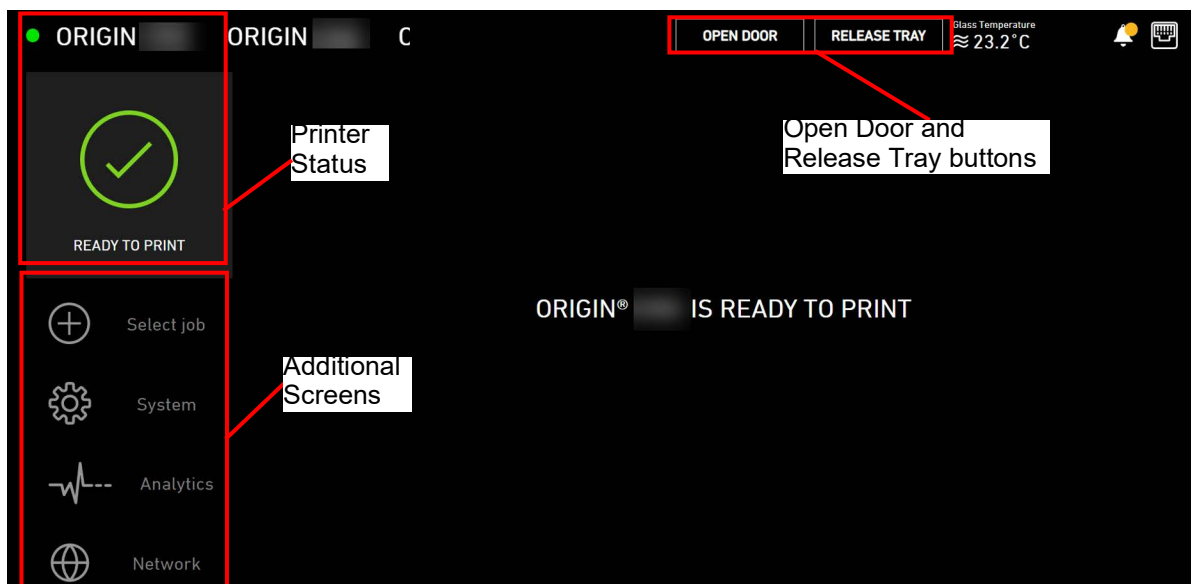
> ⓘ If the included strike bars are installed and the printer is actively printing, system locks prevent the door from releasing.

Job Selection

Tapping **Select Job**, displays the job selection screen with a list of all models uploaded to the printer starting with the most recently uploaded file. Newly submitted jobs take some time to process. A loading icon appears next to the print until it is ready.

Tap any file to view a thumbnail and specifications of the print. When the printer is prepared and ready to print a file, tap **Start** to begin the print.

Figure 2: Select Print screen

Print job

Start button
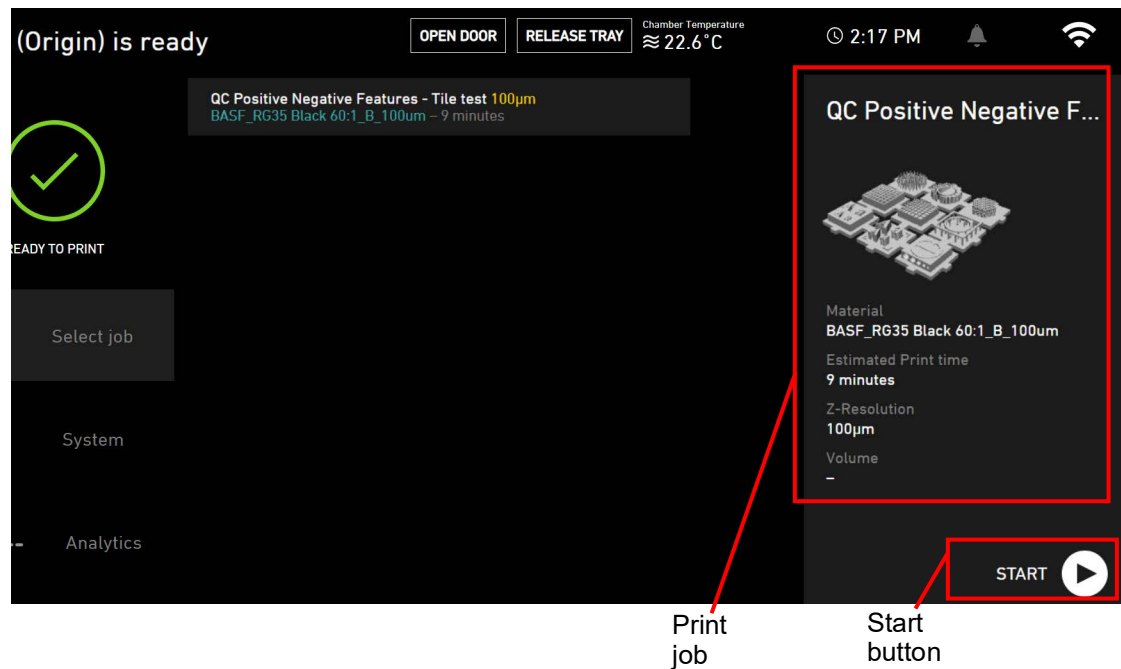
System Settings

Tapping **System** displays the system settings screen with general system specifications and system utilities, such as:

- Chamber light controls
- Projector controls
- Heating controls

- Other diagnostics

Figure 3: System Settings screen
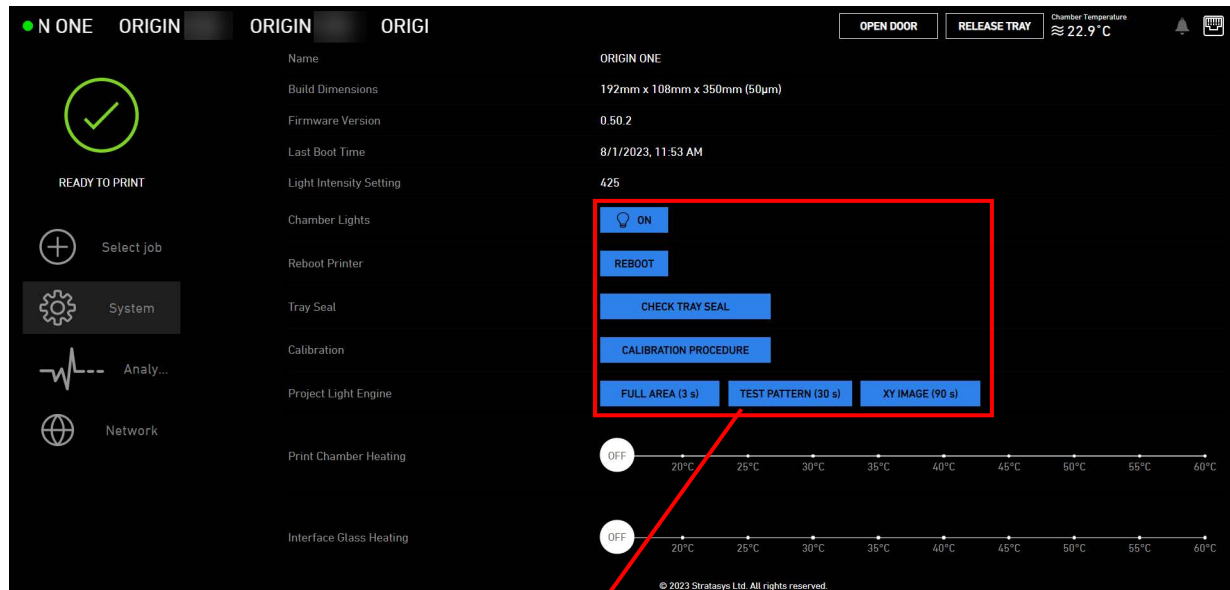
System utility
controls

System Utility Controls

- Chamber Lights: To turn the build chamber's interior lights on/off, tap the light bulb icon.

- Project Light Engine:

  - Tapping **Project Full Area** causes the projector to illuminate its maximum area, which can be used to check function or during troubleshooting.

  - Tapping **Project Test Pattern** displays a test pattern, which can be used to check the focus of the projector.

- Print Heating: The slider bars allow you to adjust the heat settings for the chamber heater and the midplate glass heater.

Analytics

Tapping **Analytics** displays a screen that provides sensor data, plots, and other system analytics for monitoring of the print process.

Figure 4: Analytics screen
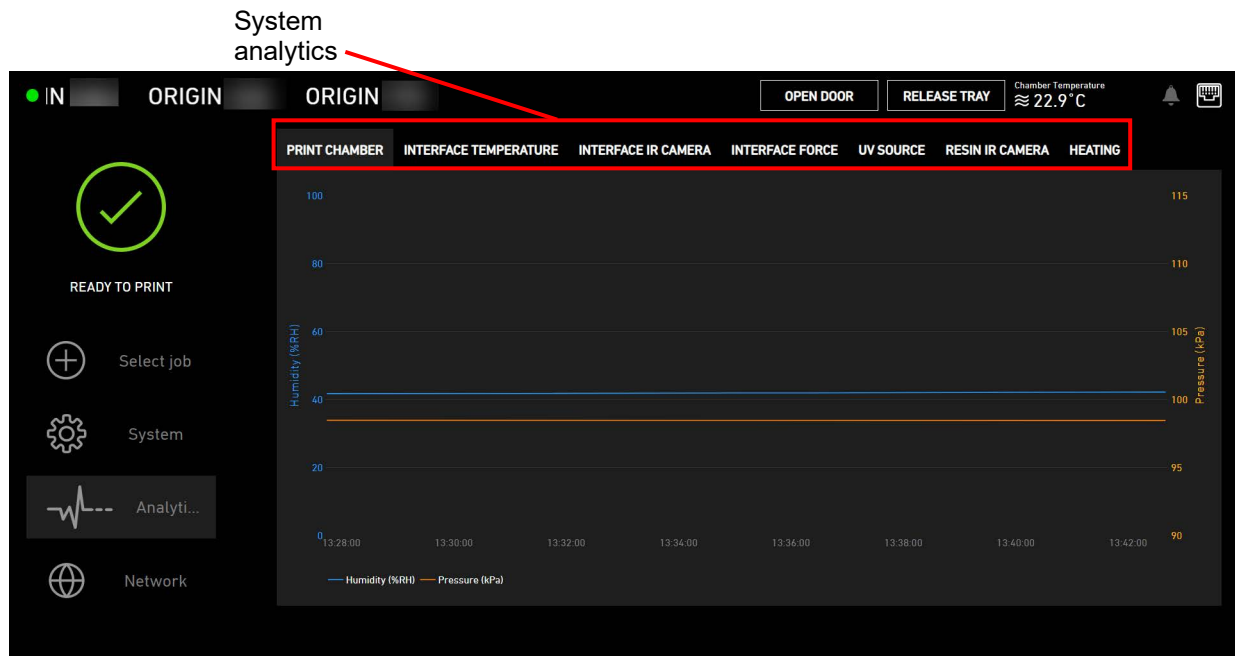
System Analytics

- Print Chamber: Tapping **Print Chamber** displays readings for the humidity and pressure of the print chamber (build chamber).

- Interface Temperature: Tapping **Interface Temperature** displays the average and maximum temperatures that the IR camera reads from the midplate glass.

- Interface IR Camera: Tapping **Interface IR Camera** displays a thermal image of the midplate glass. Print layers can be viewed here in real time as heat from the exothermic reaction of cured resin is transferred to the midplate glass.

- Interface Force: Tapping **Interface Force** displays the measured current (proportional to force) being sent to the linear drive to move the build arm.

- UV Source: Tapping **UV Source** displays the temperature of LED light from the projector. It also displays the readings from the internal light sensor.

- Heating: Tapping **Heating** displays the measured temperature of the build chamber and midplate glass.

Viewing Print Job Information
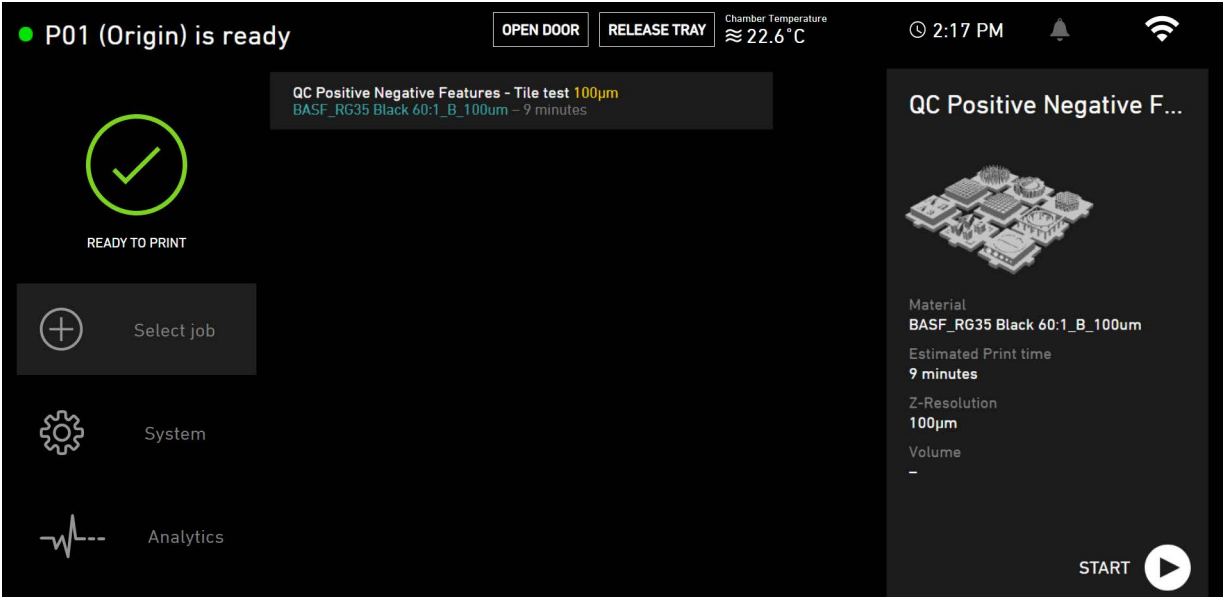
Print Status Display

- Idle status
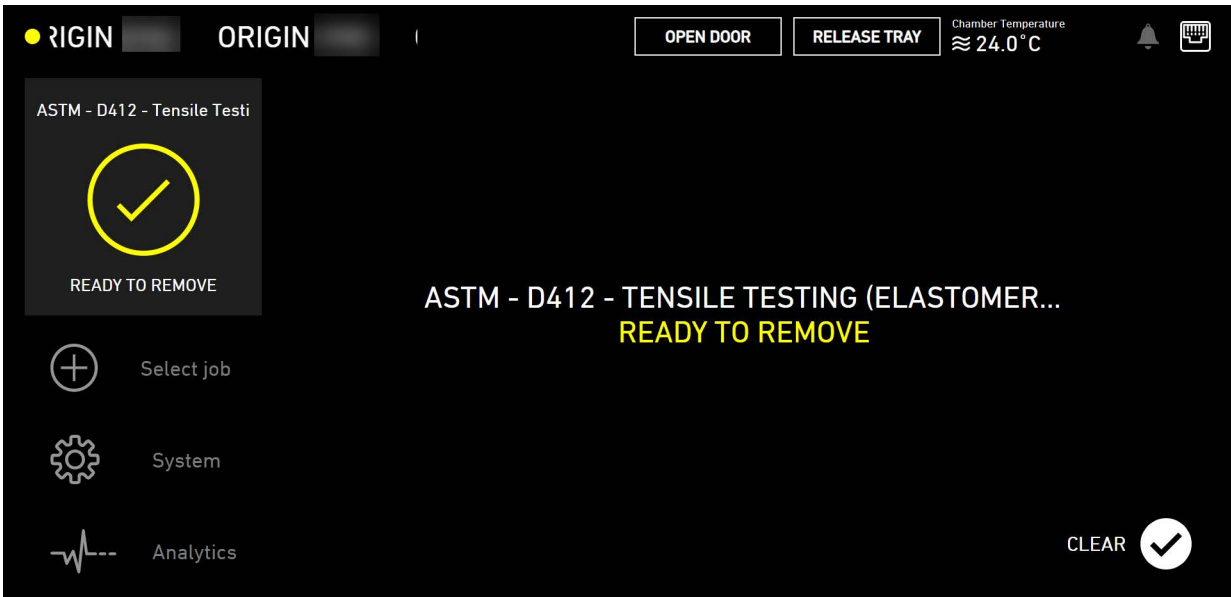
• Printing status

Figure 7: Print Status Display - Printing
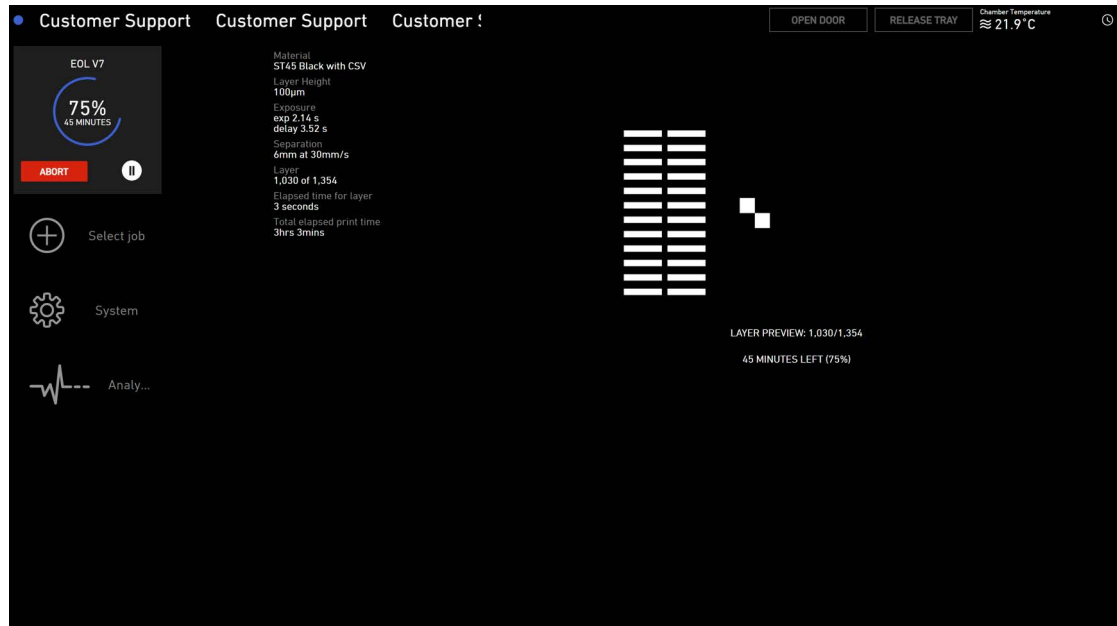
Network Configuration

Each Origin Two printer has specific network configuration requirements that must be met to ensure printer functionality. Refer to the Origin Site Preparation Guide.

Static IP Configuration

A static IP address can be used for your Origin network configuration. To set up a static IP address, the following information is required:

• Static IP address

• Router prefix

• Gateway

1. To configure a static IP address, from the touchscreen, navigate to the Network tab and tap **Static IP**.

Figure 8: Tap Static IP
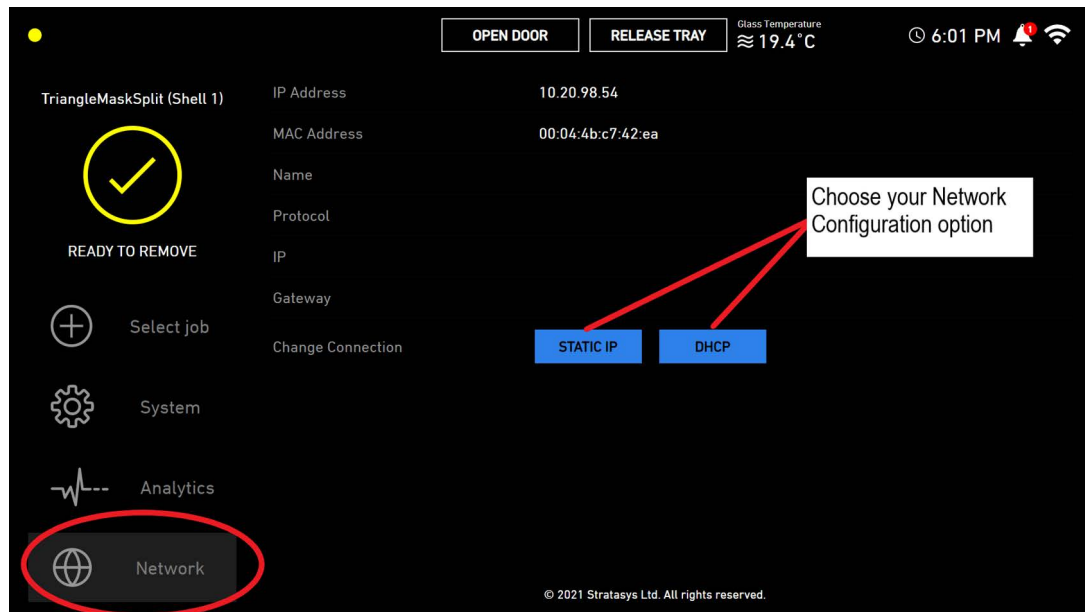
2. Enter the *Static IP* address, *Router Prefix*, and *Gateway* information.

Figure 9: Static IP setup
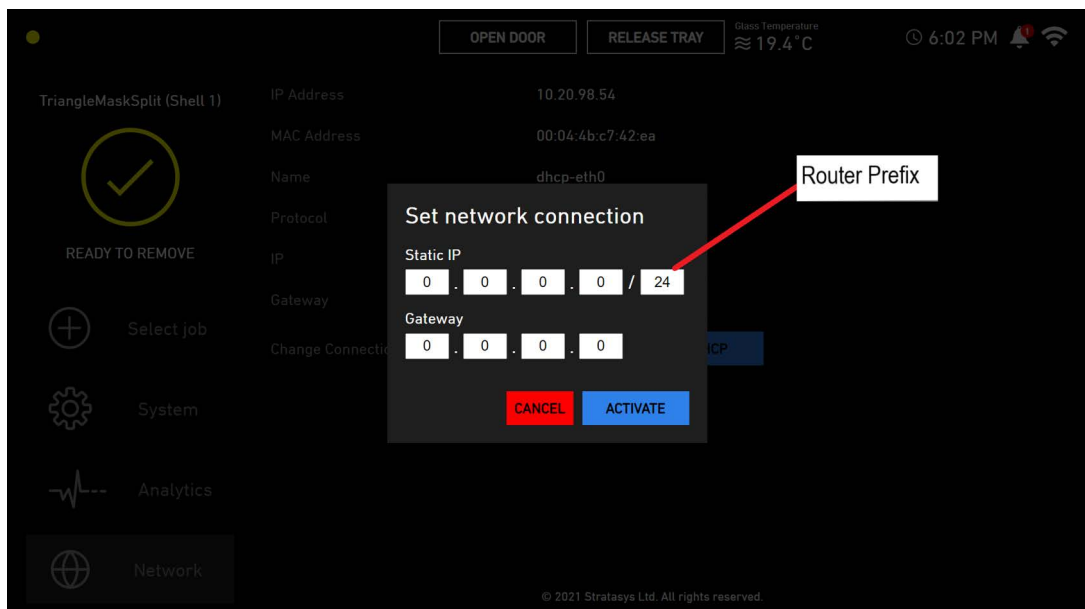
3. Tap **Confirm** after entering each bit segment of the address.

Figure 10: Tap Confirm
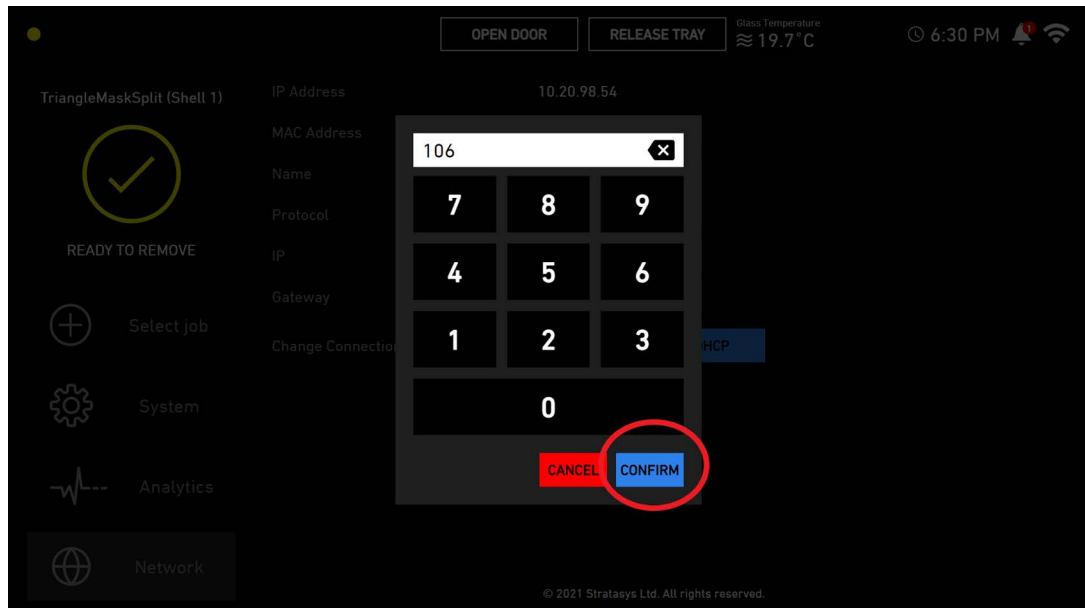
4. After the static IP information is entered, tap **Activate** to enable the new network configuration. The Static IP address assignment is now complete.

Figure 11: Tap Activate
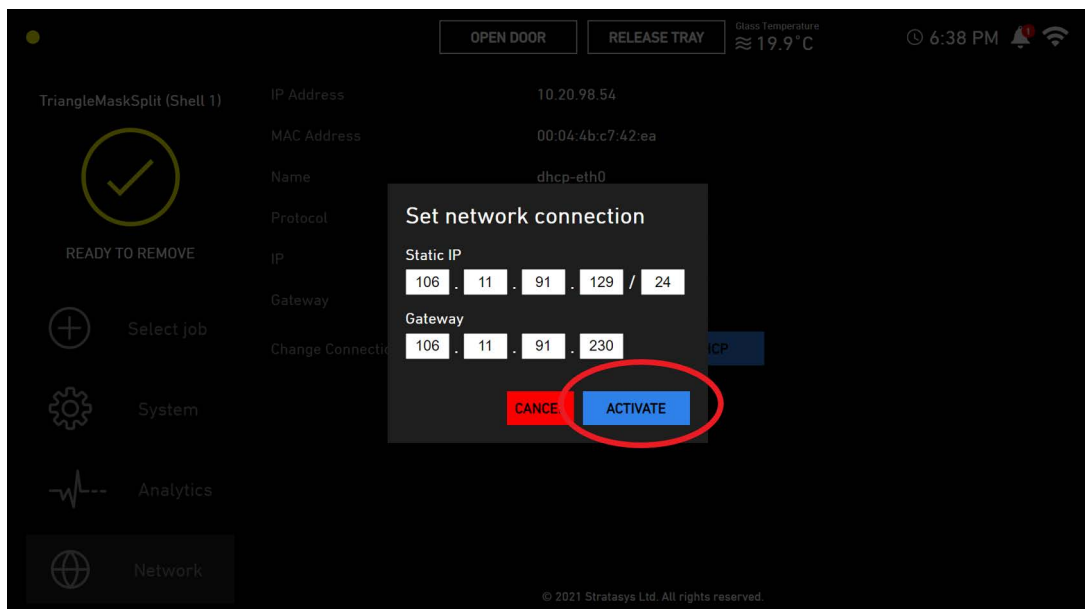
5 Operating the Printer

This chapter explains basic steps in operating the Origin Two printer.

Basic User Operations

Powering ON the Printer

To power ON the printer:

1. Confirm the power and Ethernet cables are connected.

   See "Making the Network Connection" (page 11) and "Connecting the Power Cable" (page 11).

2. Position the power switch to ON (see Figure 1).

Figure 1: Power switch location and back connections
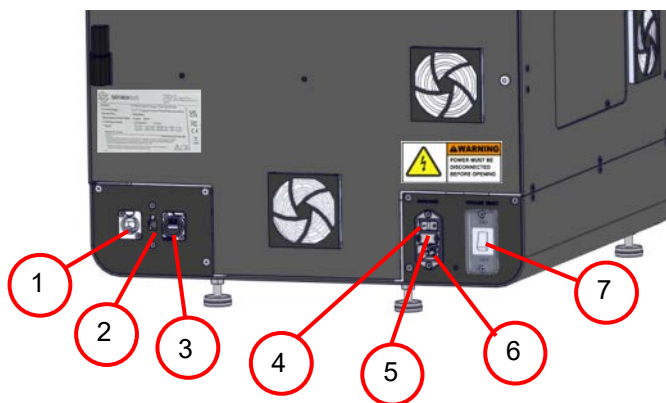
Table 1: Rear view—Power switch and back connections

#	Description
1	Ethernet port
2	ProAero control cable connector
3	USB port
4	Power switch
5	Inlet fuse
6	Power cable connection
7	Input voltage switch

3. The system boot cycle takes approximately 30 seconds. After the boot cycle is complete, a green check mark and the printer name displays on the user interface screen (see Figure 2). This indicates the printer is powered on and connected.

Figure 2: Boot screen display message (successful)
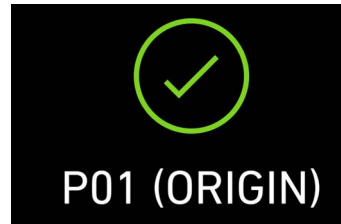
4. If you see an "unable to connect" message (see Figure 3), confirm the Ethernet cable is plugged into an active port and the network and firewall are properly configured.

> ℹ️ If your printer has been powered off for several hours, wait 20-30 minutes for the printer to establish a network connection.

Figure 3: Boot screen display message (error)

5. Contact Stratasys support if network issues persist or if the screen displays any other message.

Pre-Print Procedures

Installing the Build Platform

1. Slide the build platform into the build arm until the surfaces are aligned, and then rotate the lever clockwise to the closed position (left).

Figure 4: Installing build platform
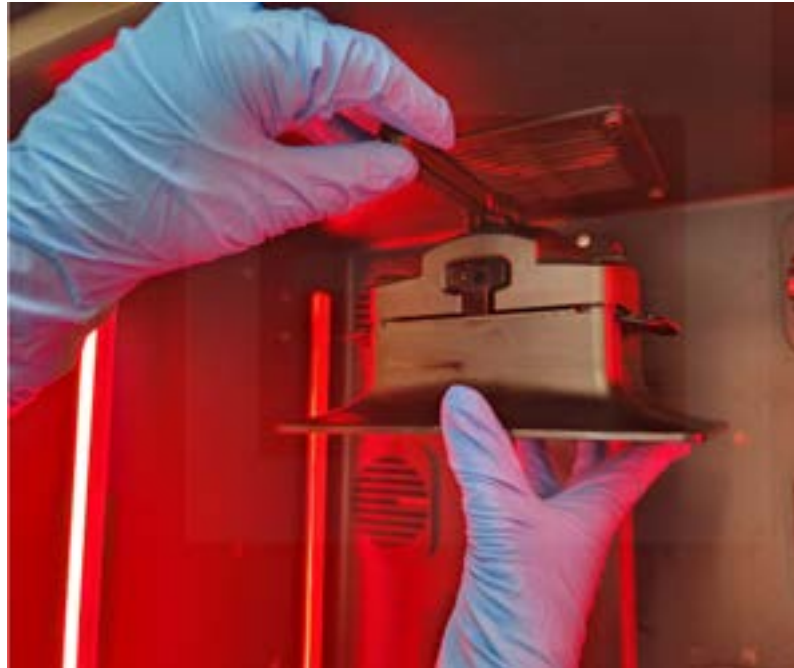
Pre-Build Checklist

File Preparation

- Model is supported sufficiently.
- Correct material settings are applied.
- First layer image verified on the Touchscreen.

Printer Preparation

- Build platform is properly installed.
- Build platform is clean and smooth. Use acetone, when possible, to clean the build platform.
- Midplate glass and midplate magnets are cleaned.
- Tray sheet is free of wrinkles or defects.
- Tray sheet sanitation was performed if a previous print failed.

- Resin is well-mixed. Shake the resin bottle before pouring or stir the resin in tray.

- Resin in tray matches the resin selected for the print.

- There is enough resin in the tray to complete the print.

- The build platform is pushed into the build arm so that they are aligned and the lever is in the closed position (left).

Filling and Installing a Tray Into the Printer

1. Inspect the O-ring on the bottom of the tray for dust or debris, and wipe it with a solvent wipe, if needed.

Figure 5: Empty tray

2. Place a clean tray right side up on a flat surface and pour the desired resin into the middle of the tray.

It is recommended to fill the tray to at least 300 mL. Larger prints may need more resin. The standard safety margin is to add the volume of your build +20% to the tray. Wipe off the lip of the resin container when finished pouring and return to its storage area.

3. Lift the resin tray using the provided handles and install it in the build chamber.

Take extra care to avoid contact with the inner walls of the printer as well as the glass window. The magnetic clamp will automatically engage. Tapping **Release Tray** on the Touchscreen assists in adjusting the tray to its secure location. The magnetic locks disengage and, after five seconds, re-engage automatically. After being properly secured, the tray should not move when pulled.

> ⚠️ **Caution: Pinch Point**
> Electromagnets attract the resin tray to the midplate with force that may cause pinching of the fingers between the resin tray and midplate. Always use the integrated handles when moving the resin tray on the midplate.

4. Ensure that the tray is properly seated by performing the following:

    a. Attempt to lift the tray handles at each corner of the tray (one at a time), and ensure that each corner is firmly engaged.

    b. Press down firmly on each corner of the tray (one at a time), and ensure that the tray does not move or rock.

Figure 6: Installed tray

Post-Print Procedures

Removing Parts From Build Platform

This section describes removing printed parts from the build platform using personal protective equipment. The scraper is used to carefully slide on the build platform surface to detach the printed parts.

> ⓘ To remove dental parts from the build platform, see "Using the Dental Part Removal Jig" (page 35).

> ⓘ Each material requires a unique cleaning process. Refer to the *Material Processing Guides* for details about the Origin certified resins on the Stratasys Support Center.

Required Tools

• Scraper with 4-in blade (100 mm)

• Safety glasses

• Cut-resistant glove

- Cut-resistant sleeve

- Nitrile gloves

- Cleaning cloth

- Acetone

Figure 7: Scraper for part removal

Figure 8: Cut-resistant glove

Procedure

1. Put on safety glasses.

2. Put the cut-resistant sleeve on your non-dominant arm.

3. Put the cut-resistant glove on your non-dominant hand.

⚠	**Warning: Sharp Object Hazard**
	Directing the scraper blade toward body parts can result in injury. Wear proper personal protective equipment when handling the scraper to prevent cuts.

4. Put nitrile gloves on both hands.

    On the non-dominant hand, put the nitrile glove over the cut-resistant glove.

⚠	**Warning: Toxic and Corrosive Materials**
	Prolonged contact with resins can cause skin irritation. Put on protective gloves before continuing.

5. Place a cleaning cloth on a tray.

6. Remove the build platform from the printer by rotating the lever counter clockwise to the open position (to the right) and then slide the build platform away from the build arm.

Figure 9: Removing the build platform from the printer
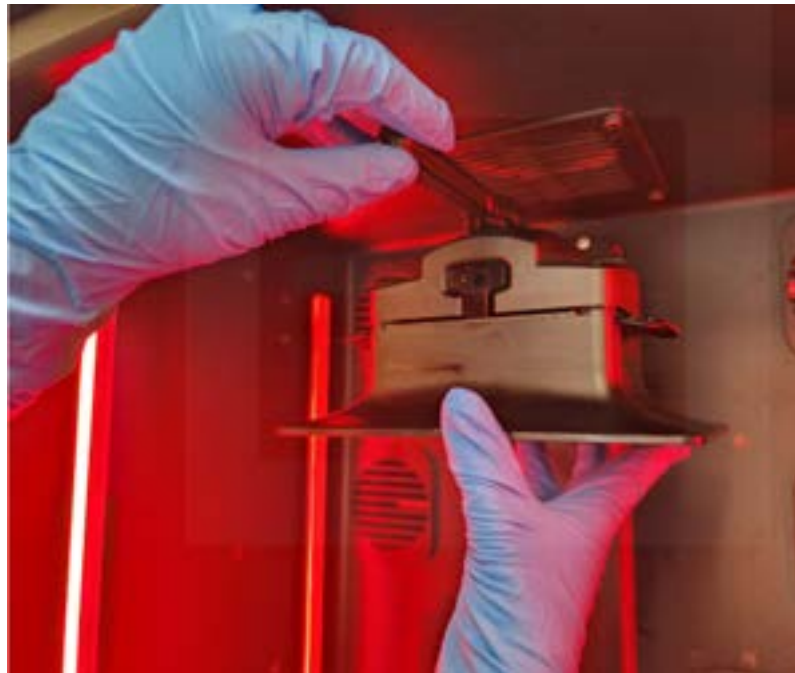
7. Place the build platform with attached parts on the tray.

8. Firmly hold the build platform from the adapter side firmly with your non-dominant hand, while applying downward pressure.

Figure 10: Holding the build platform and scraper—cut-resistant glove is under the nitrile glove on the non-dominant hand
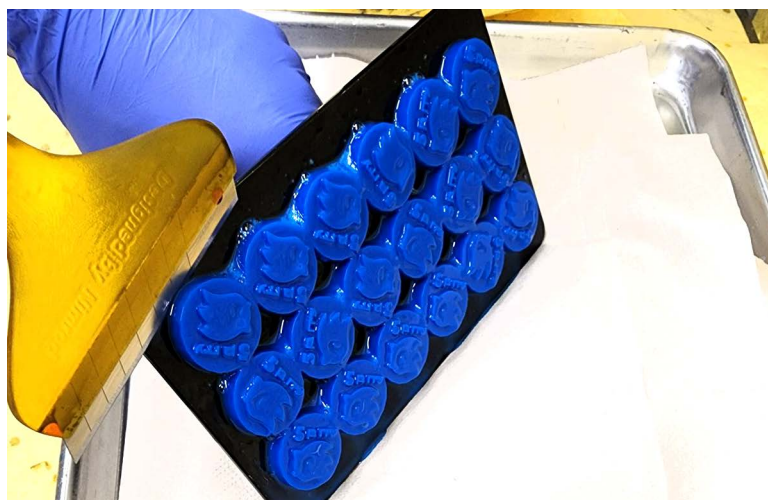
9. Using the scraper, remove the printed parts from the build platform surface:

   a. Firmly and carefully scrape along the face of the build platform.

   b. Increase pressure until the part separates from the build platform.

> **Warning: Sharp Object Hazard**
>
> Directing the scraper blade toward body parts can result in injury.
>
> - Hold the build platform securely while keeping fingers and hands clear of the build platform surface.
> - Always push the scraper away from you.

Figure 11: After increasing pressure, part is removed from the build platform
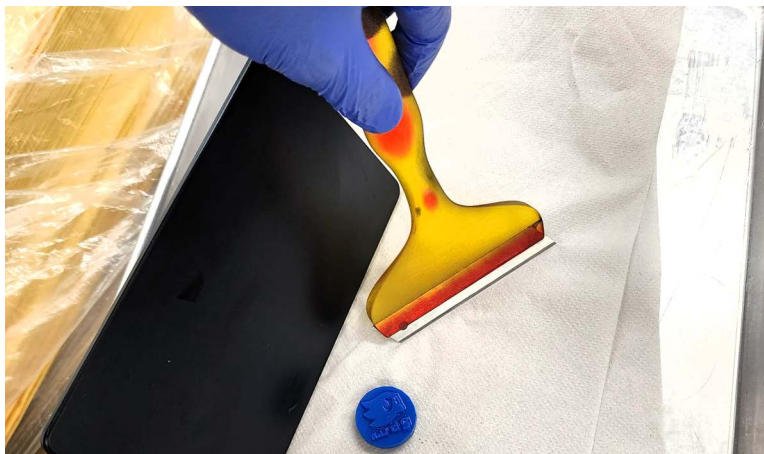
10. Using a cleaning cloth and acetone, wipe the build platform clean.

Replacing the Scraper Blade

This section describes replacing the scraper blade from the scraper used to slide on the build platform surface to detach the printed parts.

Required Tools

- Scraper with 4-in blade (100 mm)
- Replacement blade
- Safety glasses
- Cut-resistant glove
- Nitrile gloves
- Pliers

Procedure

1. Put on safety glasses.

2. Put the cut-resistant glove on your non-dominant hand.

3. Put nitrile gloves on both hands.

   On the non-dominant hand, put the nitrile glove over the cut-resistant glove.

> ⚠️ **Warning: Toxic and Corrosive Materials**
> Prolonged contact with resins can cause skin irritation. Put on protective gloves before continuing.

4. Press down on the blade release tab with your non-dominant hand, and use pliers to remove the blade from the scraper.

> ⚠️ **Warning: Sharp Object Hazard**
> Directing the scraper blade toward body parts can result in injury. Wear proper personal protective equipment when handling the scraper to prevent cuts.

Figure 12: Gripping the blade with pliers—cut-resistant glove is under the nitrile glove on the non-dominant hand

Figure 13: Removing the blade with pliers
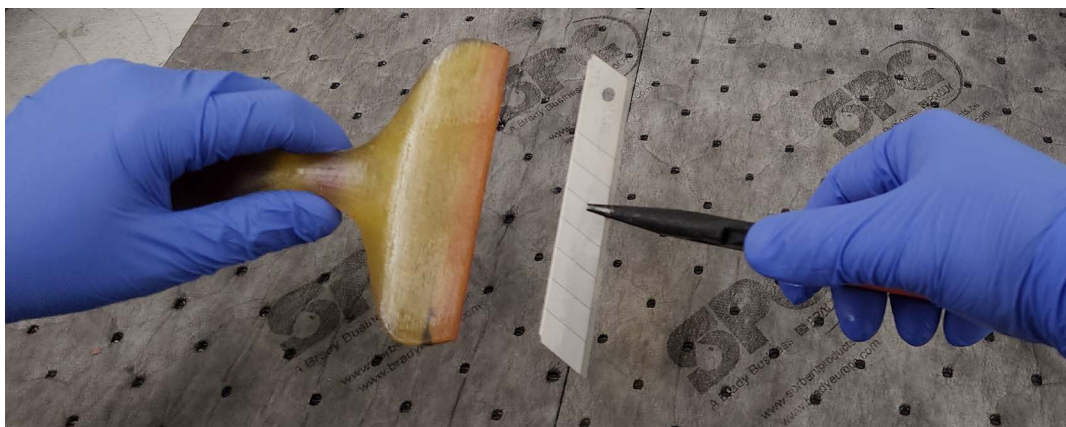
5. Use pliers to carefully insert the replacement blade into the scraper.

Using the Dental Part Removal Jig

This section describes removing parts printed with Biocompatible Origin DM200™ resin from the build platform.

- *Dental part removal jig*—Custom jig designed to hold the build platform with the following benefits:

    - Ensures that the blade does not scratch or peel the coating of the build platform.

    - Achieves an optimal blade approach for the best model removal while protecting the build platform coating.

    - The rotation of the jig provides a more convenient sliding access of the scraper jig from any angle of the build platform.

Figure 14: Part removal jig

- *Low adhesion build platform*—Build platform that is coated with a lLow adhesion material that maintains accuracy and quality models, while significantly reducing the forces needed for the part removal from the build platform. The low adhesion build platform is designed for use with Biocompatible Origin DM200 and Keystone materials.

Figure 15: Low adhesion build platform
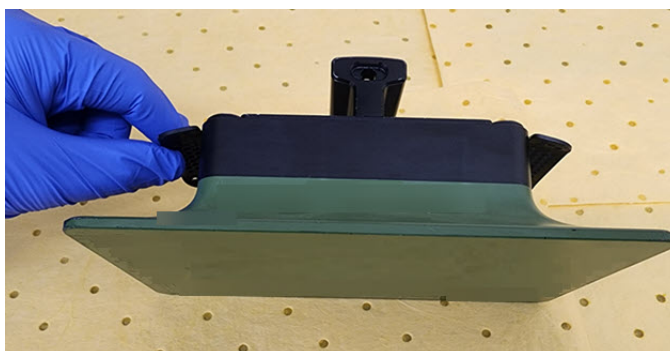
- *Dental scraper jig*—Custom jig with dedicated blade angles that slides on the build platform surface. This allows you to control the blade angle for easy detachment of the parts while protecting the build platform coating.

Figure 16: Scraper jig

Removing Dental Parts from the Build Platform

⚠️	**Warning: Skin Contact Hazard** Prolonged contact with resin can cause skin irritation. Do not continue before putting on protective gloves.

Required Tools

- Low-adhesion build platform (Green)

⚠️	**Caution:** To preserve the build platform quality and shelf life, use only the dedicated scraper for part removal and take safety measures to prevent scrapes or damage to the coating. Don't place the build platform printing surface on any surface, as it could be scratched.

- Safety glasses
- Nitrile gloves
- Dental part removal jig
- Dental scraper jig (with scraper holding jig)
- Isopropanol
- Acetone

Procedure

1. Put on safety glasses.
2. Put on nitrile gloves.
3. Place a tray below the build platform to prevent dripping.
4. Remove the build platform from the build arm.

5. Place the build platform with the attached models on tray.

Figure 17: Build platform placed on the tray

6. Carefully carry the tray to the part staging/cleaning area.
7. Clean the build platform using a clean cloth and isopropanol.
8. Place the build platform in the dental part removal jig.

Figure 18: Inserting the build platform in the part removal jig
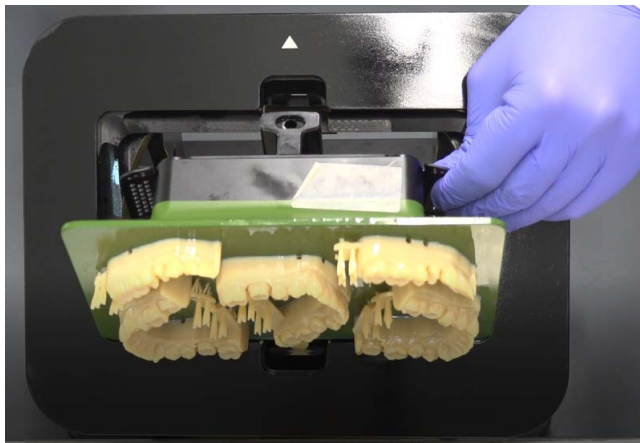
9. To rotate the dental part removal jig, pull the pin on the left side of the dental part removal jig and rotate it for easier access to the models on the build platform.

The dental part removal jig locks into detents every 45 degrees.

Figure 19: Pulling pin for rotating part removal jig

10. Place one hand on the dental part removal jig handle, while your other hand holds the dental scraper jig flat on the build platform.

Make sure that the blade touches the models without scraping the build platform coating.

> ⚠️ **Warning: Sharp Object Hazard**
>
> The dental scraper jig blade is sharp and can result in injury if the dental part removal jig is mishandled. Keep your free arm on the dental part removal jig handle to keep it out of the way of the blade.

Figure 20: Holding the part removal jig handle and the scraper jig

11. Start the motion of sliding the dental scraper jig on the part removal jig frame and the build platform and moderately accelerate before the scraper hits the model to detach it from the build platform.

During the motion, apply a moderate downward force onto the build platform.

12. Clean the build platform and part removal jig using a clean cloth and isopropanol.

13. Wipe the build platform with acetone before starting the next build.

Replacing the Dental Scraper Jig Blade

Replace the dental scraper jig blade if there is any visible damage to the blade or it becomes difficult to remove models from the build platform.

Required Tools

- 2.5-mm hex key

- Dental scraper jig

- Scraper holding jig

- Replacement blade, provided with the dental scraper jig or available as ORIG-00309-S

- Nitrile gloves

- Pliers

> ⚠️ **Caution**
>
> To prevent damage to the build platform coating, only use blades provided by Stratasys.

Figure 21: Scraper jig blade replacement tools

Table 2: Replacement blade, hex key, and dental scraper jig

#	Description
1	Replacement blade
2	Hex key 2.5 mm
3	Dental scraper jig (and scraper holding jig)

Procedure

1. Put on nitrile gloves.

2. Hold the scraper jig with the bottom facing upward above a working table and using the 2.5-mm hex key, loosen the 2 hex screws (without removing them).

   5 full rotations is sufficient to loosen the scraper.

⚠	**Warning: Sharp Object Hazard** The scraper blade is sharp and can result in injury if mishandled.

Figure 22: Loosen the screws

3. Using pliers, carefully remove the existing blade by pulling it away from the dental scraper jig and then discarding the blade properly.

4. Using pliers, insert the replacement blade into the dental scraper jig with the beveled edge facing away from the jig.

5. Squeeze the blade-holding end of the dental scraper jig tightly against the blade and slide the blade to ensure it is centered horizontally in the scraper jig.

Figure 23: Centering blade horizontally
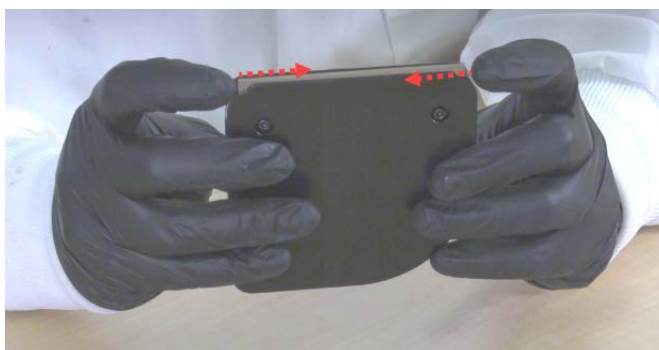
6. Hold the dental scraper jig with the bottom and blade facing upward.

7. Using the 2.5-mm hex key, finger-tighten the 2 hex screws.

   The blade remains in place, but is movable with some force.

8. Insert the dental scraper jig (with the blade) into the scraper holding jig.

   This validates that the blade is centered and parallel to the scraping surface.

Figure 24: Scraper holding jig - scraper fixation edge
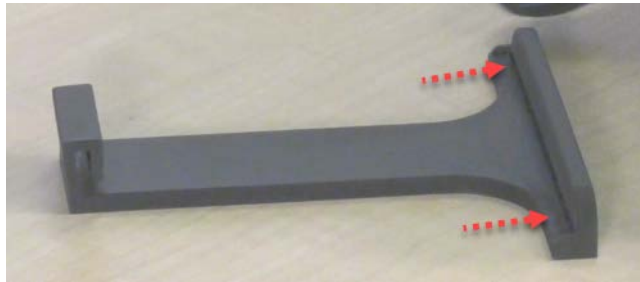
Figure 25: Placing scraper jig into scraper holding jig

9. Center the blade and push the blade against the scraper holding jig to ensure the blade is securely in the scraper jig, and then push down.

   The scraper jig snaps into place in the scraper holding jig.

10. Using the 2.5-mm hex key, snugly tighten the 2 hex screws on the bottom of the dental scraper jig.

11. Remove the dental scraper jig from the scraper holding jig and slide it along a flat surface to ensure the blade is flat and does not scratch the surface.

Cleaning Printed Parts

> ⚠️ **Warning: Skin Contact Hazard**
>
> Prolonged contact with resin can cause skin irritation. Do not continue before putting on protective gloves.

1. Clean the parts by soaking them sequentially in each solvent bath container, using the sonicator as desired:

   - BATH 1 - Dirtiest Solvent - Recommendation: Glycol Ether TPM or 99% IPA

   - BATH 2 - Fresh Solvent - Recommendation: 99% IPA

   Two minutes in each bath in the sonicator is usually adequate for most resins, but this varies based on part geometry and resin type.

2. After the parts have been soaked in BATH 2, wipe clean and let air dry, or blast with compressed air to clean deep crevices.

   Be sure to let parts fully dry before moving onto post curing to avoid print defects caused by any remaining solvents.

Figure 26: Multiple baths

Post-Print Curing (Origin Cure™ Only)

> ℹ️ Each material requires a unique UV postcuring process. Some require thermal postcuring. Refer to the *Material Processing Guides* for details about the Origin certified resins on the Stratasys Support Center.

1. For Origin Cure, place the parts in the curing equipment.

2. In the Origin Cure UI, select the specific material profile.

3. Run the program until fully cured.

Removing/Emptying the Resin Tray

> ⚠️ **Warning: Skin Contact Hazard**
>
> Prolonged contact with resin can cause skin irritation. Do not continue before putting on protective gloves.

Resin can be left in the tray between prints. However, if a part fails or if you need to switch to another resin, the resin tray should be removed and cleaned. The resin can be filtered and reused.

1. To release the resin tray, tap **Release Tray** on the touchscreen. This disables the magnets for 5 seconds.

2. Gently remove the resin tray with uncured resin from the printer and carry over to the cleaning area.

> ⚠️ **Caution: Pinch Point.**
>
> Electromagnets attract the resin tray to the midplate with force that may cause pinching of the fingers between the resin tray and midplate. Always use the integrated handles when moving the resin tray on the midplate.

3. Using a 190-µm paint filter, pour any remaining resin through the filter and into a small plastic container. See Figure 27.

Figure 27: Empty resin tray

4. Pour the filtered resin back into its original container using a funnel.

Cleaning Resin Tray and Build Platform

1. Spray IPA over the build platform and tray and wipe clean with delicate wipes or paper towels.

> ⚠️ **Warning: Skin Contact Hazard**
> Prolonged contact with resin can cause skin irritation. Do not continue before putting on protective gloves.

Figure 28: Clean parts with IPA
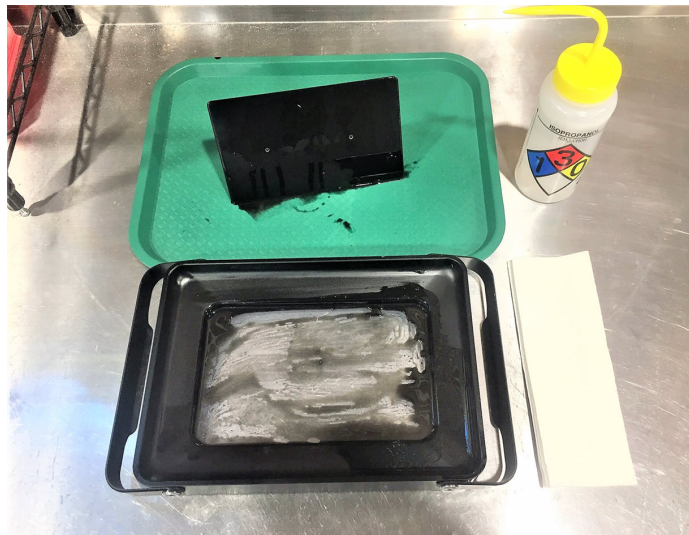
2. Repeat until all resin has been removed from the build platform and print tray.

Figure 29: Cleaned build platform and print tray

3. Any material that comes into contact with uncured resin (support structures, wipes, gloves, etc.) should be properly disposed of as hazardous material per local regulations.

Powering OFF the Printer

To power the printer OFF:

1. Ensure that the printer is stopped (idle) and is not building.

2. Press the power switch located on the back of the printer (see Figure 1 for button location).

Figure 30: Power switch location and back connections
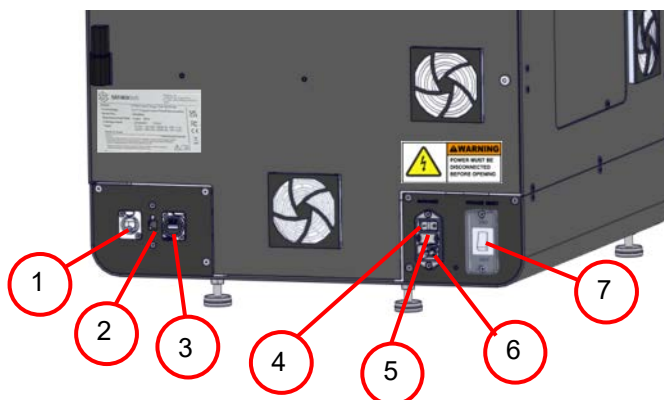
Table 3: Rear view—Power switch and back components

#	Description
1	Ethernet port
2	ProAero control cable connector
3	USB port
4	Power switch
5	Inlet fuse
6	Power cable connection
7	Input voltage switch

Adjustments

Adjusting Dreve Programs for Origin Dental

Most Origin Dental materials are validated using the Dreve PCU LED post-curing unit. Follow the instructions to update the curing settings.

1. Retrieve the latest .TXT file from the Guides section in https://support.stratasys.com/en/materials/p3/origin-one-dental-materials.

2. Load the .TXT file onto a blank USB flash drive. Do not change the name of the file.

> **i** If the USB flash drive contains any files other than the .TXT file, the import may fail.

3. Power on the Dreve PCU LED while pressing down on the **Operation** button.

4. Enter access code **217**.

5. Connect the USB flash drive to the back of the Dreve PCU LED.

6. Import the TXT file by selecting **Config Import** under **Data Exchange.**

Origin Local Hub

The Origin Local Hub is designed for customers that are unable to connect to the Origin Cloud due to government contracts, specific IP requirements, or HIPPA restrictions. The printer is identical to the Origin Industrial with two exceptions:

- It contains no transmitting components.

- It is configured to connect through the local area network to the Origin Local Hub, rather than the Origin Cloud.

The Origin Local Hub and up to 10 Origin Local printers must be connected to the same network switch and subnet as the computer workstation sending print jobs. The network switch is not required to be connected to the Internet, as the devices only communicate locally. Facility IT professionals may prefer for the Origin Local Hub to be on a separate air-gapped network, rather than the shared facility LAN.

Connecting to the Origin Local Hub

The Origin Local printer and Origin Local Hub are connected through a facility network at installation. Interactions with the Origin Local Hub are performed through a workstation browser or GrabCAD Print.

> **i** Connect a keyboard and mouse to the Origin Local Hub workstation.

Admin Tools

An administrative section is built in to the Origin Local Hub to assist in modifying printer settings and upgrading firmware without requiring connection to the Cloud.

Navigate to *http://<**Origin Local Hub IP Address**>/admin* to access the *Admin Tools* page. The top of the page displays all available tabs.

Figure 31: Admin tools bar

Home	Printers	Firmware	Projectors	Tags

Home Tab

The *Home* tab contains options to launch the Local Hub Admin console or upload an OpenAM™ for a P3 license file.

Figure 32: Home tab
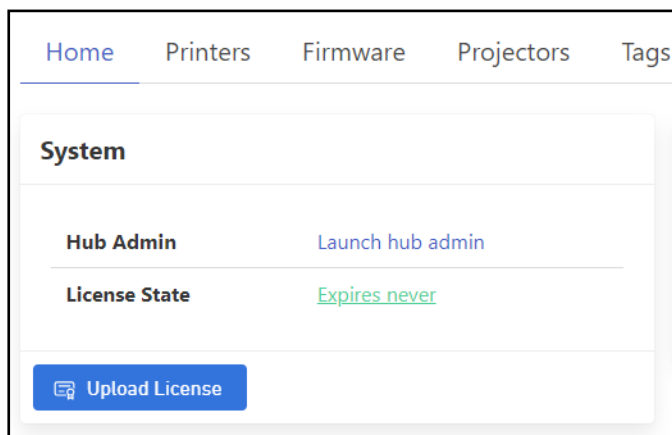
Admin Console

The Local Hub Admin console contains sections to backup Local Hub files, modify system settings, and upgrade Hub firmware.

Enabling HTTPS in the Local Hub Admin Console Settings

1. To launch the Local Hub Admin console, do one of the following

   • Open browser and navigate to **http://<Actual Origin Local Hub IP Adress>***:8080* (ex: *http://192.168.1.20:8080*).

- • From the Admin Tools *Home* tab, click **Launch hub admin**.

Figure 33: Local Hub Admin console
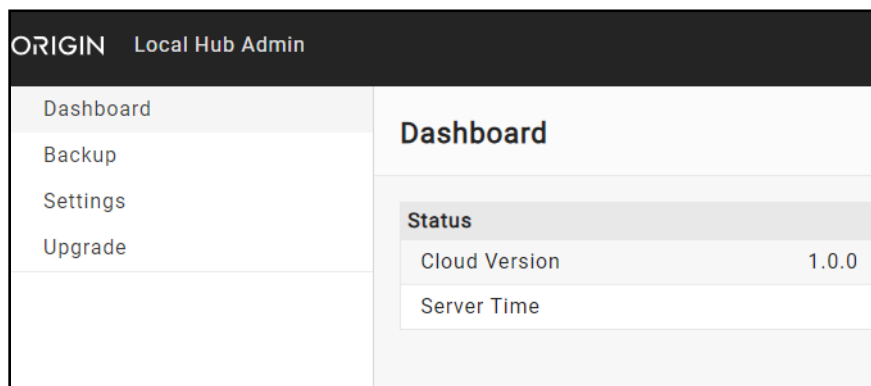
2. From the *Settings* tab, under the *Certificates* section, click **Setup Certificate using CSR Wizard**.

Figure 34: Settings-Local Hub Admin
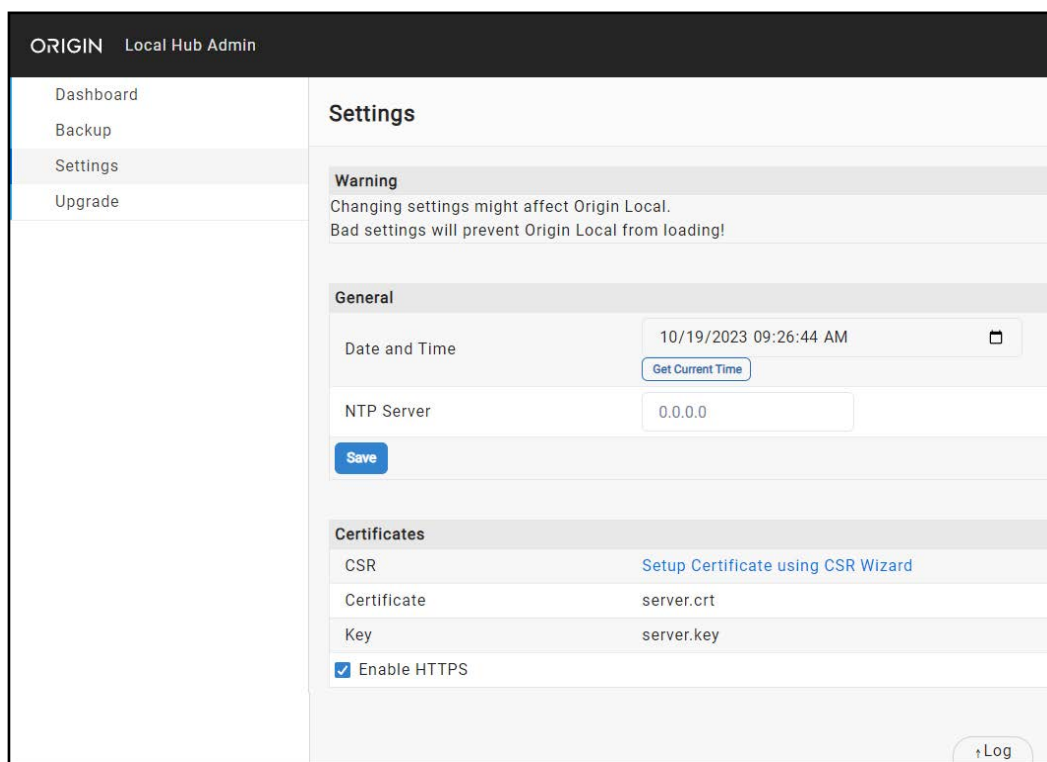
3. In the *CSR Wizard* screen, set the fields as follows:

Figure 35: CSR Wizard-Local Hub Admin

a. *IP*—Enter your *Origin Local Hub IP Address*.

b. *Host*—Enter your *<Origin Local Hub Hostname>*. This can be "*origin-hub*".

c. *FQDN*—If DNS is used, enter the domain name.

d. *Step 1*—Click **Generate a request**.

    This initiates a download of the *request.csr* file into your *Downloads* folder to share with your IT department.

e. *Step 2*—Follow the instructions as follows:

    i.   Contact your IT department.

    ii. Send the *request.csr* file.

    iii. Request a signed certificate in *p7b* file format, which is Base 64 encoded.

f. *Step 3*—Upload the signed certificate in *p7b* file format.

4. Verify that the signed certificate is successfully uploaded, as follows:

    •   If successful, the main *Settings* screen is displayed.

    •   If unsuccessful, the *CSR Wizard* page remains displayed.

5. If the certificate upload is not successful, repeat step 2–step 4.

Figure 36: Settings-Local Hub Admin

6. Verify the *Enable HTTPS* flag is selected.

7. From the *Settings* screen, verify that the HTTPS works by opening a new browser tab and navigating to **https://<Actual Origin Hub IP Address>**/admin (ex: *https://192.168.1.20/admin*).

Backing up Origin Local Hub Files

1. To launch the Local Hub Admin console, do one of the following

   • Open browser and navigate to **http://<Actual Origin Local Hub IP Adress>**:8080 (ex: *http://192.168.1.20:8080*).

   • From the Admin Tools *Home* tab, click **Launch hub admin**.

2. From the *Backup* tab, click **Create Backup**.

    A system log is displayed on the bottom of the page to show the status.

Figure 37: Backup-Local Hub Admin

3. If desired, in the *Actions* column, click **Download** ⬇ to save a copy of the backup file to your workstation.

Restoring Files to the Origin Local Hub

Restore file to the Origin Local Hub by performing one of the following:

Restoring Backup Files Using the Local Hub Admin

1. To launch the Local Hub Admin console, do one of the following

    - Open browser and navigate to **http://<Actual Origin Local Hub IP Adress>***:8080* (ex: *http://192.168.1.20:8080*).

    - From the Admin Tools *Home* tab, click **Launch hub admin**.

2. In the *Backup* tab, locate the row with the desired backup file.

3. In the *Actions* column, click **Restore this backup**.

Figure 38: Restore-Local Hub Admin
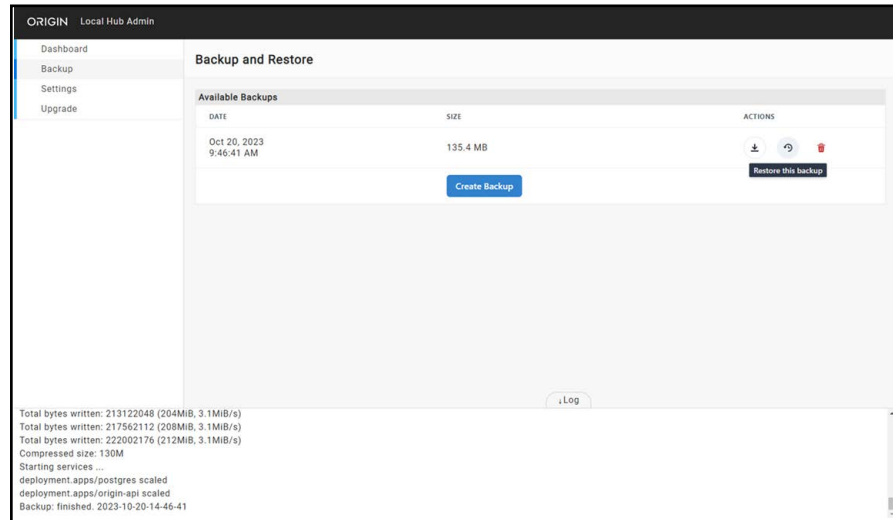
4. Select *Continue* to apply.

Restoring Backup Files Using a USB Drive

1. On an empty USB flash drive, save the previously downloaded backup file from your workstation.

2. On the Origin Local Hub, press the *Power* switch, to shut down.

3. Insert the USB flash drive with the backup file to an available USB port on the Origin Local Hub.

4. On the Origin Local Hub, press the *Power* switch, to power on.

   During the boot sequence, the Origin Local Hub checks for available backup files on USB sources and automatically applies the file, if available.

5. After the backup is restored, remove the USB flash drive from the Origin Local Hub.

> **i** If the USB flash drive is left installed, an inadvertent recovery will occur on the next boot sequence.

Upgrading Origin Local Hub Firmware

1. Download the latest Origin Local Hub upgrade file in *TGZ* format from the Stratasys Support Center.
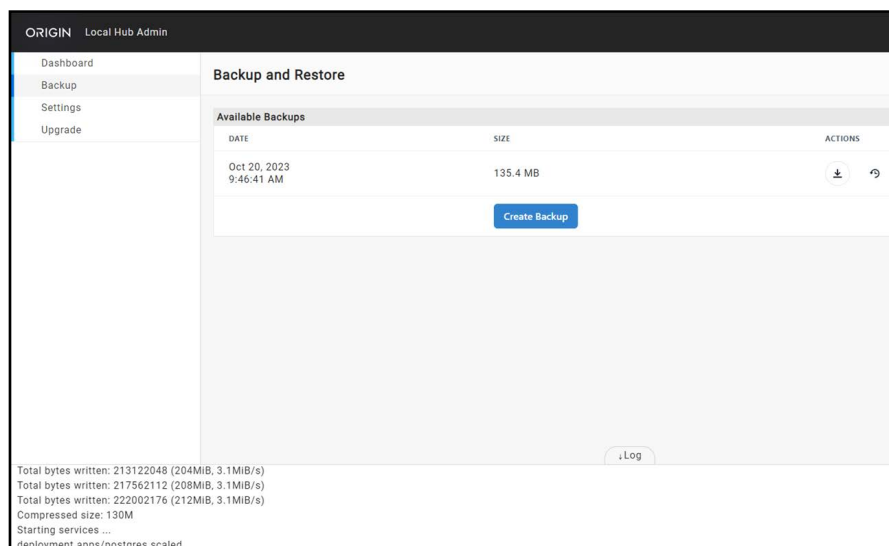
2. To launch the Local Hub Admin console, do one of the following

   • Open browser and navigate to **http://<Actual Origin Local Hub IP Adress>***:8080* (ex: *http://192.168.1.20:8080*).

   • From the Admin Tools *Home* tab, click **Launch hub admin**.

3. From the *Upgrade* tab, click **Choose File** to browse and select the *TGZ* upgrade file.

Figure 39: Upgrade-Local Hub Admin
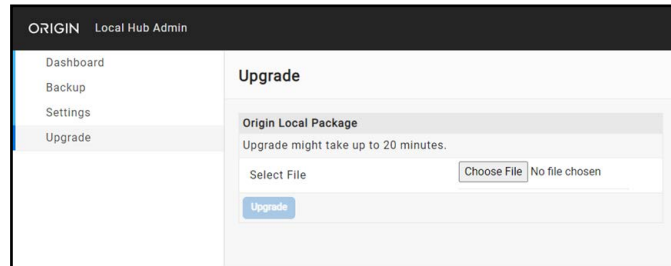
4. After the file is uploaded successfully, select **Upgrade**.

    The Origin Local Hub applies the upgrade file, which may include multiple booting sequences and lasts approximately 20 minutes.

5. After the upgrade is complete, do the following:

    a. Refresh any browser pages.

    b. Close GrabCAD Print.

    c. Re-open GrabCAD Print.

6. **(For Origin Local Hub Firmware v0.56.5 and later)**, do the following:

    a. In the Admin Tool > *Home* tab, navigate to the *License State* field.

    b. To verify that the *Version Hash* corresponds to the current Origin Local Hub Firmware version, contact your regional support center.

Figure 40: *Version Hash* value

Printers Tab

The **Printers** tab displays a list of the printers connected to the Origin Local Hub and their status.

1. Clicking the printer name displays advanced printer settings.

> ℹ️ Only modify these settings under the direction of your regional support center.

Firmware Tab

Figure 41: Firmware tab

The **Firmware** tab displays a list of the firmware versions uploaded to the Origin Local Hub.

1. Click **Upload New Firmware** to browse the available files.

2. Select a new version provided by your regional support center.

Projectors Tab

Projector calibration files can be uploaded for new or compromised projectors.

Tags

Firmware tags can be created to run separate firmware versions on different printers.

6 Maintenance

This chapter describes various maintenance tasks that need to be performed on the Origin Two printer routinely.

Overview

Origin Two was designed to reduce the need for frequent maintenance or replacement of consumables. This section will help you to identify and plan for situations where a printer may require operator-performed maintenance.

Rebooting

To increase printer reliability, it is recommended to reboot the Origin Two printer weekly. Additionally, the Origin Local Hub must be rebooted monthly to reset its framework.

Cleaning

Cleaning the Midplate Glass

Frequency

Check before every print

Required Tools

- Nitrile gloves
- Single-use, lint-free wipe
- Acetone

Procedure

> ⚠️ **Warning: Skin Contact Hazard**
> Prolonged contact with solvents can cause skin irritation. Do not continue before putting on protective gloves.

1. Fold a single-use, lint-free wipe (such as a Kimtech^{TM} wipe).
2. Soak the single-use wipe liberally in acetone.
3. Draw the wipe lightly across the surface of the glass.
4. Dispose of the single-use wipe.
5. Repeat step 1-step 4 until the entire glass surface is wiped, ensuring that no smudges or residue remains.

Page 55

Cleaning Printer Components

Frequency

Check before every print

Required Tools

- Nitrile gloves
- Single-use, lint-free wipe
- IPA

Procedure

> ⚠️ **Warning: Skin Contact Hazard**
> Prolonged contact with solvents can cause skin irritation. Do not continue before putting on protective gloves.

Printer components that routinely come into contact with resin should be cleaned with IPA after each print job. The interior and exterior of the printer may be cleaned with IPA as needed.

Tray Sanitation

Frequency

After any build failure

Required Tools

- Nitrile gloves
- Playing card or similar thin flexible object

Procedure

> ⚠️ **Warning: Skin Contact Hazard**
> Prolonged contact with solvents can cause skin irritation. Do not continue before putting on protective gloves.

1. Tap **Project full area** on the touchscreen.
2. Put on nitrile gloves.
3. Use a playing card, or similar thin flexible object, to lift one corner of the cured image.
4. Remove the cured image from the tray.

Cleaning/Replacing Fan Filters

Frequency

Check after 1 month, repeat as necessary for your print environment.

Required Tools

- Replacement Fan Filters (SKUB-00024-000) or (ORIG-00039-S)

- Towelette / Kimtech Wipe

Procedure

1. Locate the fan filter on the back panel of the printer.

Figure 1: Fan filter
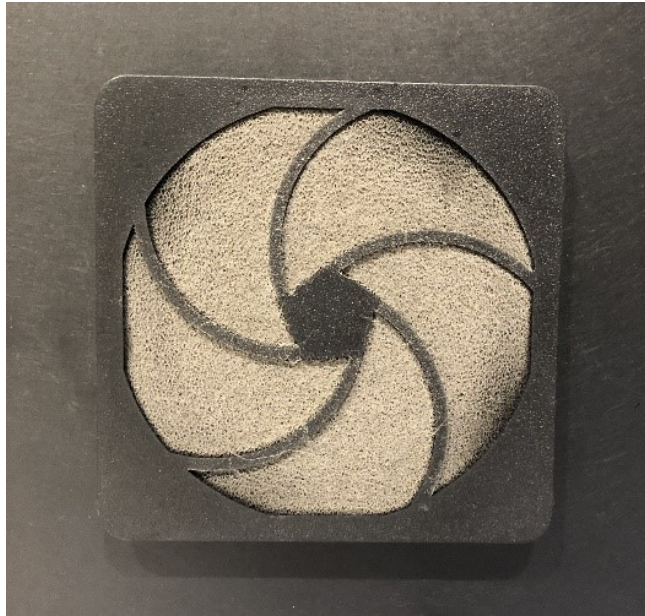
> ⓘ The fan filters are held in place by the fan filter cover. The fan filter cover is attached to the back panel by a clip on either side.

2. Remove the fan filter cover by disengaging the fan filter cover clips.

Figure 2: Disengage cover clips
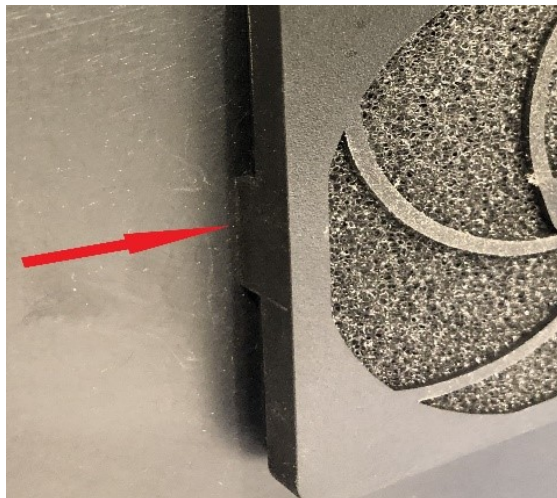
3. Clean under tap water then dry, or replace the old filter with a new filter from the accessory tools box.

4. Prior to installing the replacement filter, use a towelette to remove any dust and debris from the fan filter cover.

Figure 3: Replacement fan filter

5. Reinstall the fan filter cover and replacement filter. Engage both fan filter cover clips to secure the fan filter cover to the back panel.

Figure 4: New fan filter

Lubricating the Linear Drive

Frequency

Every 12 months

Required Tools

- Syringe with Linear Drive Grease
- Flashlight
- Screwdriver

Procedure

1. Open the printer door and remove the resin tray, if installed. Leave the door open.

> ⚠️ **Caution: Pinch Point**
>
> Electromagnets attract the resin tray to the midplate with force that may cause pinching of the fingers between the resin tray and midplate. Always use the integrated handles when moving the resin tray on the midplate.

2. Locate the linear drive grease kit within the accessory tools box.

Figure 5: Linear drive grease kit
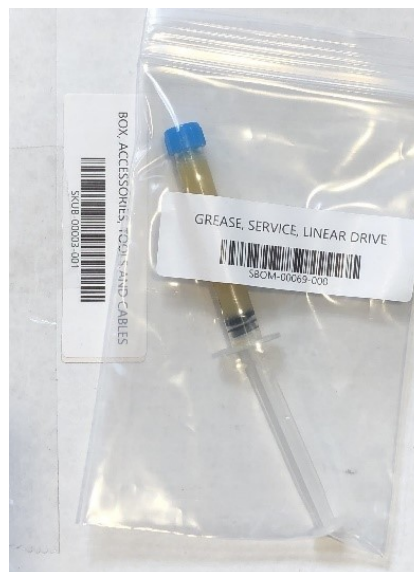
3. Remove the blue cap from the grease syringe.

4. Using the gap between the linear drive (PMEC-10015-000) and cover, access the ball screw shaft. Using the grease syringe, apply grease directly to the ball screw shaft.

5. Apply a 0.1 ml bead of linear drive grease every 2 inches along the ball screw shaft.

Tray Maintenance

Replacing Tray Sheets

Frequency

Replace as needed. Additionally, Stratasys recommends replacing tray sheets when changing from a dark material to a light material or when changing from an industrial material to a medical-grade material.

Required Tools

- Nitrile gloves

- 5-mm hex 6-Nm T-handle driver

> ℹ️ Some older systems use a different tray style with a 4-mm hex 4-Nm T-handle driver. Reference images below show the older style.

- Resin tray thumbscrew

Procedure

> ⚠️ **Warning: Skin Contact Hazard**
> Prolonged contact with solvents can cause skin irritation. Do not continue before putting on protective gloves.

1. Using a 5-mm hex 6-Nm T-handle driver, remove 8 screws from the bottom of the tray.

Figure 6: Tray and tools

2. Remove the tray bottom by inserting the thumbscrew into the threaded hole on either side of the tray and lifting the tray bottom out of the tray.

Figure 7: Remove tray bottom

3. Remove the two black tray gaskets and the tray sheet from the tray.

Figure 8: Remove tray gaskets and tray sheets

4. Dispose of the used tray sheet in a hazardous waste receptacle.

5. Retain the tray gaskets for cleaning.

6. Use clean paper towels and solvent (acetone or isopropyl alcohol) to clean resin from the tray top. Use isopropyl alcohol (IPA) to clean the tray bottom.

> ⚠️ **Caution:**
> Do not use acetone to clean the tray bottom. Damage to the O-rings will result.

7. Use acetone to remove resin from the tray threads. Remove any remaining residue from the tray threads with compressed air or paper towels.

Figure 9: Clean tray components

8. Remove any remaining resin from gaskets using paper towels and IPA.

9. If needed, sonicate the gaskets in an IPA bath.

> ℹ️ Sonicate gaskets in an IPA bath for no more than 30 seconds per cleaning.

> ⚠️ **Caution:**
> Do not use acetone to clean the tray bottom. Damage to the O-rings will result.

10. Dry gaskets using an air compressor or paper towels. Ensure that the gaskets are wiped clean before setting aside to dry.

Figure 10: Cleaned Gaskets
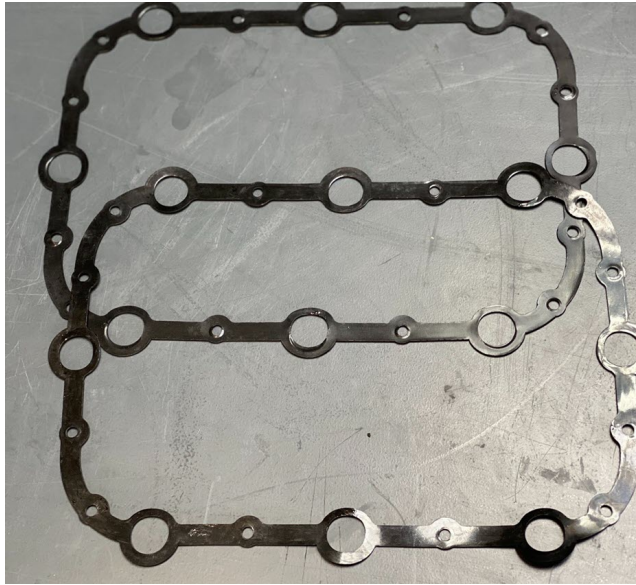
11. After thoroughly drying, insert a clean gasket into the tray top. Ensure that all the pins are inserted through the gasket holes and that the gasket is laying flat.

Figure 11: Gasket on tray

12. Insert a new tray sheet over the gasket and into the tray top. Confirm that all the pins are inserted through the holes in the sheet.

Figure 12: Tray sheet

13. Insert the second gasket over the tray sheet. Confirm that all the pins are inserted through the gasket holes and that the gasket is laying flat over the tray sheet surface.

Figure 13: Second gasket

14. Place the tray bottom onto the sheet and press down gently.

> ⚠️ **Caution:**
> Remove the thumbscrew before tightening the tray bolts to prevent interference between the thumbscrew and the tray bottom.

15. Remove the thumbscrew from the tray bottom.

Figure 14: Tray on sheet
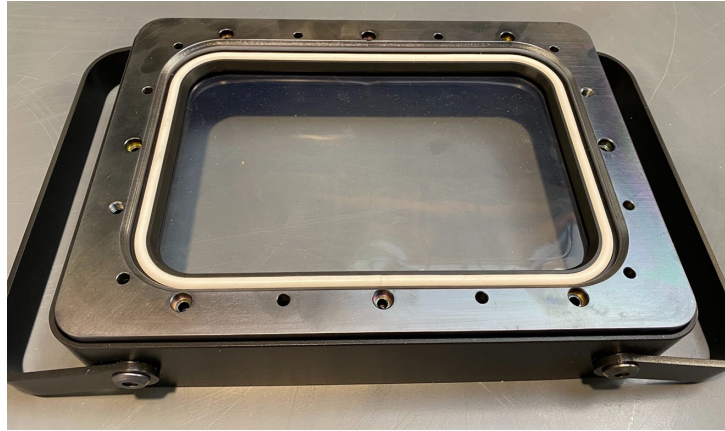
16. Insert the 8 tray bolts into the tray bottom.

Figure 15: Tray bolts inserted into the tray bottom

17. Using the 6-Nm torque drive, tighten the 8 bolts in a star pattern until the bolt heads are flush with the tray bottom.

Figure 16: Tighten bolts
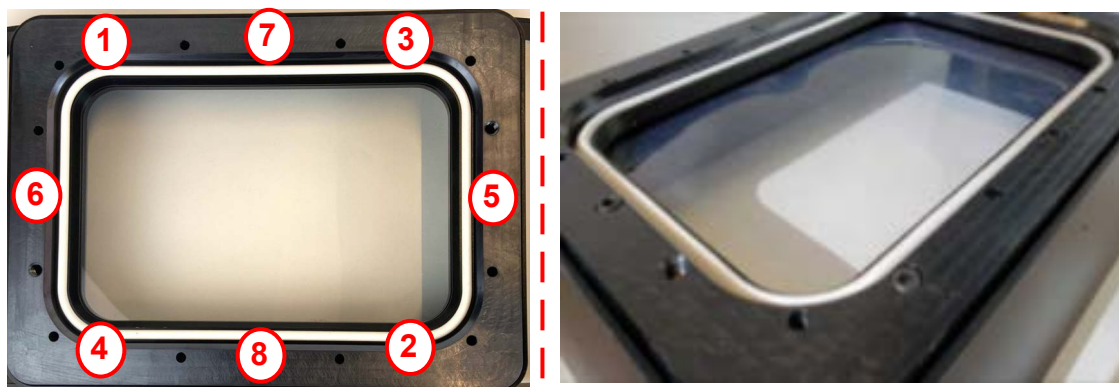
18. Tighten the tray bolts, using the same star pattern shown in Figure 16, by holding the torque driver shaft with the index finger, middle finger, and thumb.

Tighten the bolts until they are finger-tight.

Figure 17: Finger tighten tray bolts

19. When all eight bolts are finger-tight, use the 6-Nm torque driver, in the same star pattern, to tighten all bolts to 6 Nm.

20. Repeat tightening all bolts to 6 Nm in a circular pattern two times.

7 Troubleshooting

This chapter describes troubleshooting steps that can be performed to correct basic problems with the Origin Two printer.

Getting Help

If you have a problem with your printer or the printer's materials that is not covered in this guide, or if you need to order replacement parts, contact Customer Support for your region. Contact information is available from the Stratasys website at: http://www.stratasys.com/customer-support/contact-customer-support.

If needed, write to Customer Support North America at:

Stratasys, Inc.
Customer Support
7665 Commerce Way
Eden Prairie, MN 55344 USA

Before calling for service or supplies, always have the following information ready:

- Your printer's serial number (see Figure 1 (page 11) for information on locating the printer's serial number).

- If your printer stops functioning or any components become damaged, contact Stratasys Support and provide the following information:

  - Date and time

  - Printer Serial number (found on the product label in the back of the printer)

  - Description of part and damage

  - Description of events leading to part damage

  - Print parameters used (if fault occurs during print)

  - Job Information:

    i.   In GrabCAD Print, open the *Schedule* view.

    ii. Display the job details by navigating to the job and clicking on it.

iii. Copy the *Job ID* and *Print ID* and send this information to your regional support center.

Figure 1: Job information
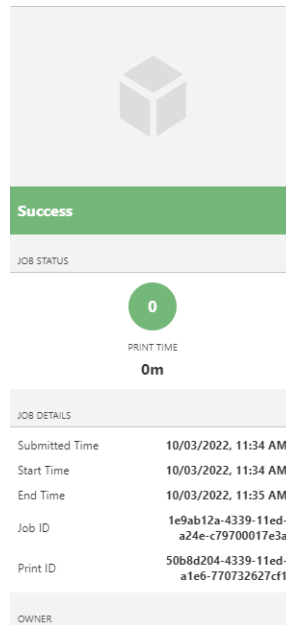
Finding a Remedy

The following table lists various troubleshooting scenarios you may encounter when operating the printer and methods for resolving these scenarios.

Table 1: Troubleshooting scenarios and possible solutions

Symptom	Possible Solution
The printer crashes or becomes unresponsive	Power cycle the printer.
Parts are failing	Using a radiometer, check the irradiance of the projector (irradiance can drop over time).
Parts are failing even though irradiance is fine	Increase exposure duration.
Parts aren't sticking to the build platform	Increase exposure delay for the first layer and/or increase exposure duration for the first layer. Contact Customer Support to recalibrate the build arm and build platform first layer calibrations. Contact information is available from the Stratasys website at: https://support.stratasys.com/en/contact-us.
Parts are warping during post-cure	Lower the light intensity of the UV curing apparatus or do multiple lower intensity post cures.

Table 1: Troubleshooting scenarios and possible solutions

Symptom	Possible Solution
Top flat surfaces of parts look dimpled or wrinkled	Check the tray sheet for creases or dimples and replace it, if present.
Vertical walls have thin vertical lines	Check for dust between the midplate glass and tray sheet.
Vertical walls have obvious horizontal layer lines	Replace the tray sheet; contact your regional support center if the problem continues.
The printer encounters resin ingress	Contact your regional support center for further instruction.
The tray gaskets tear or deform	Contact your regional support center or visit the Stratasys Customer Hub to order new gaskets.
Missing features at the edge of the build area	While wearing UV safety glasses, verify the image is centered by tapping **Project Full Area** on the **System** tab. Contact your regional support center if adjustment is necessary.

Troubleshooting Issues and Solutions

Stuck Build Platform Mitigation Procedure

The following is the step-by-step procedure for mitigation when a build platform is stuck in the resin tray and unable to home.

Procedure

1. Contact Stratasys Customer Support to enable the printer's Dev Mode.

2. Reboot the printer by using the power switch located on the back of the printer.

3. Tap the **System** tab on the printer touchscreen.

Figure 2: System tab

4. Locate the pneumatic controls: **Force Separation**, **Inflation**, and **Deflation** buttons.

Figure 3: Pneumatic controls

5. Deflate by tapping **2 s** using the **Deflation** controls. Wait two seconds before going to the next step.

6. Two seconds after deflating, inflate by tapping **0.8 s** two times using the **Inflation** controls.

7. Repeat the deflation and inflation process three times.

8. After inflating and deflating three times, tap **AGGRESSIVE** in the **Force Separation** controls.

9. Reboot the printer.

10. If the build platform moves to home, clean the build platform and sanitize the tray.

11. If the build platform does not move to home, repeat the procedure.

12. Contact Stratasys Customer Support to disable the printer's Dev Mode.

Solutions for First Layer Adhesion Issues

Issue: The part fails to adhere to the build platform or the part detaches from the build platform mid print.

Possible root causes include the following: Insufficient first layer projector exposure duration, Insufficient first layer projector exposure delay time, build platform calibration issues, separation forces are too high, irradiance degradation issues, build job not properly oriented to the build platform (build prep error).

1. Insufficient first layer projector exposure duration.

    •   Parts require sufficient first layer projector exposure duration to ensure adhesion to the build platform. If the first layer projector exposure duration is too low, then parts do not adhere properly.

    •   **Solution:** Increase first layer projector exposure duration.

2. Insufficient first layer projector exposure delay time.

   • Projector exposure delay times affect the thickness of any given layer. Lower projector exposure delay times result in thicker layers, while longer projector exposure delay times result in thinner layers down to a minimum thickness. If the first layer projector exposure delay time is too short, first layer adhesion issues result in a thicker first layer, which is unable to be cured through, may occur.

   • **Solution:** Increase the first layer projector exposure delay time.

3. Build platform calibration not performed or performed incorrectly.

   • The purpose of the build platform calibration procedure is to ensure that the build platform is parallel to and in contact with the midplate glass. This is critical to first layer performance as this will effectively dictate your first layer thickness (along with exposure delay). Like the insufficient first layer exposure delay issue mentioned previously, having a first layer that is too thick, causes first layer adhesion issues due to the inability to cure through that thickness.

   • **Solution:** Contact Customer Support to recalibrate the build arm and build platform first layer calibrations. Contact information is available from the Stratasys website at: https://support.stratasys.com/en/contact-us.

4. Separation forces are too high.

   • Three major factors play into separation forces: the viscosity of the resin, the stickiness of the resin in its green state, and the proximity of the part or build platform to the midplate glass. Separation forces are generally the highest on the first few layers, and decrease as the number of layers increases. If separation forces are too high on the first layer, it is possible that the layer can detach from the platform.The only exception to this general trend is if a full build area "brick" part is being built, in which case, the separation force will remain fairly consistent throughout the print.

   • **Solution:** Decrease separation start speed of the first layer. Alternatively, use a CSV override to carefully control settings on a per layer basis. This allows for controlling layer thicknesses and separation speeds, which are directly related to experienced forces.

5. Irradiance Degradation

   • Ensuring the projector is at the correct irradiance is crucial to ensuring the success of any print regardless of material. If the projector irradiance has degraded to such a point that it is unable to reach the minimum threshold required for the initiation of polymerization for a given material, then the build job will fail.

   • **Solution:** Measure and adjust projector irradiance such that the projector is in the range $5.25 \text{ mW/cm}^2 - 5.45 \text{ mW/cm}^2$ at center point. Contact a Stratasys representative for the proper procedure for measuring and adjusting projector irradiance.

Solutions for Transition Region Adhesion Issues

Issue: The first layer adheres to the platform, but the transition region does not adhere to the first layer.

Possible root causes: Insufficient transition region projector exposure duration, Insufficient transition region projector exposure delay time, separation forces are too high, or irradiance degradation issue.

1. Insufficient transition region projector exposure duration.

    • Any given layer requires sufficient projector exposure duration to ensure adhesion to the previous layer.

    • **Solution:** Increase transition region projector exposure duration.

2. Insufficient transition region projector exposure delay time.

    • Projector exposure delay times affect the thickness of any given layer. Lower projector exposure delay times result in thicker layers while longer projector exposure delay times result in thinner layers until a minimum thickness is reached. Thus, interlayer adhesion issues will occur if the projector exposure delay time is too short. The resulting overly thick layers will be unable to be properly cured.

    • **Solution:** Increase transition region projector exposure delay time.

3. Separation forces are too high.

    • Three important factors in separation force are the viscosity of the resin, the stickiness of the resin in the green state, and the proximity of the part or build platform to the midplate glass. Separation forces are generally highest on the first few layers, and they decrease as the layers advance. The only exception to this general trend is if a full build area "brick" is being printed. In this case, the separation force remains fairly consistent throughout the build job. If separation forces are too high on the first layer, it is possible that the layer will detach from the platform.

    • **Solution:** Decrease the separation start speed of the transition region. Alternatively, a CSV override is used to carefully control settings on a per layer basis. This allows for effective control of layer thicknesses, and separation speeds which are directly related to experienced forces.

4. Irradiance Degradation

    • Correct projector irradiance is a key component in ensuring the success of a build job. If projector irradiance degrades to the point that it is unable to reach the minimum threshold required to initiate the polymerization for the material, then the build job will fail.

    • **Solution:** Measure and adjust projector irradiance such that the projector is in the range 5.25 mW/cm^2 – 5.45 mW/cm^2 at centerpoint. Contact a Stratasys representative for the procedure to measure and adjust the projector irradiance.

Solutions for Unwanted Material Layer Lines on Parts

Issue: Printed parts exhibit unwanted material layer lines.

Possible root causes: Improper tray seal, deformed teflon membrane, layer shifts due to build platform movement, changing print settings or pausing mid print, teflon and midplate glass cleanliness, or solid or cured residue in tray.

1. Improper tray seal.

   - The tray must be properly sealed for a successful build job. A good tray seal prevents resin from leaking into the printer. This also ensures the teflon membrane is laminated flat against the midplate glass during printing. If the teflon membrane does not laminate flat against the midplate glass, unwanted material layer lines on the part may occur due to a deformed layer.

   - **Solution:** Ensure the tray seals correctly by using the procedure described in "Filling and Installing a Tray Into the Printer" (page 29). If the tray does not seal properly, take the corrective steps to ensure a good seal.

2. Deformed Teflon membrane.

   - The teflon membrane is a consumable part. After repeated printing, it will show signs of deformation. Like the improper tray seal issue discussed above, a deformed teflon membrane can cause unwanted material layer lines on the part due to a deformed layer.

   - **Solution:** Disassemble the tray, clean the tray and gaskets, and replace the teflon membrane according to the procedure described in "Replacing Tray Sheets" (page 60).

3. Layer shifts due to unwanted build platform movement.

   - The build platform and build arm must remain as rigid as possible during a print. If the build platform or build arm moves during print, layer shifts on the part will result. This typically occurs due to improper build platform installation or calibration.

   - **Solution:** Confirm the build platform is properly installed by attempting to move it manually. If it can be moved, install and calibrate the build platform.

4. Changing print settings or pausing the system mid print.

   - Changing print settings or pausing a build will result in unwanted material layer lines.

   - **Solution:** Avoid pausing build jobs unless absolutely necessary. Currently, there are three defined build job regions in the material settings: First layer, Transition region, and Model region. As such, there will always be at least two material layer lines per part. A csv override in the transition regions can mitigate the prominence of the layer lines.

5. Teflon and midplate glass cleanliness.

   - Clean teflon and midplate glass is critical to printer performance. Performing a print on a dirty midplate glass or with a dirty sheet of teflon (bottom surface) can cause the teflon to stick to the midplate glass and not delaminate completely. This can result in the layer becoming deformed.

   - **Solution:** Inspect the midplate glass and the teflon membrane. If dirty, clean them using the procedure described in "Cleaning the Midplate Glass" (page 55).

6. Solid or cured residue in the tray.

- Solid material within the resin tray can affect build job quality and result in part failures. When the size of the solid pieces exceeds the build job layer height (which is generally the case as we set the default to 100um layers) the pieces can become wedged between the midplate glass and the build job.

  This prevents the build platform from driving down to the desired position. The result is an increase in layer thickness that can cause unwanted material layer lines if the projector exposure duration is able to cure through the additional thickness. Complete or partial delamination can result if the projector exposure duration is unable to cure through the additional thickness.

- **Solution:** Inspect the tray for any solid residue. Filter the resin if any is found.

Solutions for Part Delamination Issues

Issue: Printed part has complete or partial delamination. Delaminations is defined as a clean break at the interface of two layers. Delaminations always have a clean, straight, or non-jagged break.

Possible Root Causes: Insufficient projector exposure duration in the model region, Insufficient projector exposure delay in the model region, Insufficient separation distance in the model region, separation forces are too high, or solid or cured residue in tray.

1. Insufficient model region projector exposure duration.

- Any given layer requires sufficient projector exposure duration to ensure adhesion to the previous layer.

- **Solution:** Increase model region projector exposure duration.

2. Insufficient model region projector exposure delay time.

- Projector exposure delay times affect the thickness of any given layer. Lower projector exposure delay times result in thicker layers, while longer projector exposure delay times will result in thinner layers down to a minimum thickness. If the first layer projector exposure delay time is too short, first layer adhesion issues resulting in a thicker first layer, which is unable to be cured through may occur.

- **Solution:** Increase model region projector exposure delay time.

3. Insufficient separation distance in the model region.

- The separation distance allows for proper separation of the layer from the Teflon while also permitting proper resin to flow into the area previously occupied by the cured layer. If the separation distance is too low, partial separation from the Teflon membrane may result. This can then result in either a partial or complete delamination.

- Solution: Increase separation distance in the model region.

4. Separation forces too high.

- Three important factors in separation force are the viscosity of the resin, the stickiness of the resin in the green state, and the proximity of the part or build platform to the midplate glass.

  Separation forces are generally highest on the first few layers, and they decrease as the layers advance. The only exception to this general trend is if a full build area "brick"

is being printed. In this case, the separation force remains fairly consistent throughout the build job. If separation forces are too high on the first layer, it is possible that the layer will detach or delaminate from the previous layer.

- **Solution:** Decrease the separation start speed of the transition region. Alternatively, a CSV override is used to carefully control settings on a per layer basis. This allows for effective control of layer thicknesses, and separation speeds which are directly related to experienced forces.

5. Solid or cured residue in tray.

- Solid material within the resin tray can affect build job quality and result in part failures. When the size of the solid pieces exceeds the build job layer height (which is generally the case as we set the default 100-μm layers) the pieces can become wedged between the midplate glass and the build job.

   This prevents the build platform from driving down to the desired position. The result is an increase in layer thickness that can cause unwanted material layer lines if the projector exposure duration is able to cure through the additional thickness. Complete or partial delamination can result if the projector exposure duration is unable to cure through the additional thickness.

- **Solution:** Inspect the tray for any solid residue and filter the resin if any is found.

8 Regulatory and Environmental Info

Declaration of Conformity

The Origin Two printer conforms to various EU directives, including Machinery Directive 2006/42/EC, Electromagnetic Compatibility Directive 2014/30/EU, and RoHS Directive 2015/863/EU. Declaration of Conformity information is available from your Stratasys representative. Contact your local regional office for a copy of this documentation.

Electromagnetic Compatibility (EMC)

EMC Class A Warning

> ⚠️ **Warning: Radio interference**
> This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Flicker Test Compliance

The Origin Two printers do not comply with the Flicker test IEC 61000-3-3 when the printers operate above 220 VAC with the heaters on.

FCC Class A Statement (U.S.A.)

> ℹ️ This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

FCC Supplier's Declaration of Conformity:

47 CFR 2.1077 Compliance Information

Unique Identifier: Origin Two

Responsible Party —US Contact Information:

Stratasys, Inc.

7665 Commerce Way

Eden Prairie, MN

55344 USA

+1-800-801-6491

P3.Support.US@Stratasys.com

FCC Compliance Statement:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canada Electromagnetic Compatibility (EMC)

Normes de Sécurité (Canada)

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le réglement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

DOC Statement (Canada)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Material Safety Data Sheets

You can obtain current Material Safety Data Sheets for printer materials from the Stratasys website at: http://stratasys.com/materials/material-safety-data-sheets.

Waste Electrical and Electronic Equipment Directive (WEEE) Symbol

In the European Union (EU), this symbol indicates that when the last user wishes to discard a product, it must be sent to appropriate facilities for recovery and recycling. For information about proper disposal, check your purchase contract, or contact the supplier of the equipment.

UK Conformity Assessed (UKCA) Marking

UK CA

This conformity mark indicates that the printer conforms with the applicable requirements for products sold within Great Britain.

Conformité Européenne (CE) Marking

CE

This European conformity mark indicates that the printer conforms with European health, safety, and environmental protection standards.

GrabCAD and GDPR

GrabCAD complies with the European Union's General Data Privacy Regulation. For any questions, contact support@grabcad.com.

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