



stratasys®

Origin One
3D Printing System
Version 2.7



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Revision Log



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

The following table lists the main changes in each revision of the document.

Revision	Date	Description of Changes
A	February 2022	First release of this document.
B	March 2022	Removed lag feet instructions.
C	October 2022	Added Origin Local Requirements and GrabCAD Install
D	June 2023	Added “Stand Assembly” under “Mounting Configurations”
E	March 2024	<ul style="list-style-type: none"> Added requirement for RCD. Added requirement for over-current protective device. In Main Components section, showed the position of the power cable connector Copied requirement of RCD and over-current device to “Site Preparation Key Points” section Removed “Third-Party Software” section. Removed “Proper Lifting and Relocation (without Forklift)” section
F	April 2024	Removed section: “Proper Lifting and Relocation (Without Forklift)”

Safety

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. Although the Origin One printer is designed to be safe and reliable, access to areas of the printer are potentially dangerous.

- Connect equipment to a grounded facility power source. Do not defeat or bypass the ground lead.
- Know the location of equipment branch circuit interrupters or circuit breakers and how to turn them on and off in case of emergency.
- Know the location of fire extinguishers and how to use them. Use only ABC type extinguishers on electrical fires.
- Know local procedures for first aid and emergency assistance at the customer facility.
- Use adequate lighting at the equipment.
- Maintain the recommended range of temperature and humidity in equipment area.
- Do not use this product in an environment containing volatile or flammable compounds.

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Before handling resins and solvents, fully read and understand the appropriate Safety Data Sheets (SDS).
- Keep resins and solvents away from skin, eyes, and clothes.
- 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 and safety glasses.
- Do not look directly at projected UV light during operation, as UV exposure can cause eye damage.
- It is recommended to install an eyewash station near the printer, for emergency use.
- For more in-depth information regarding the safe use of 3D printing resins, please review the resin handling safety guidelines [here](#).

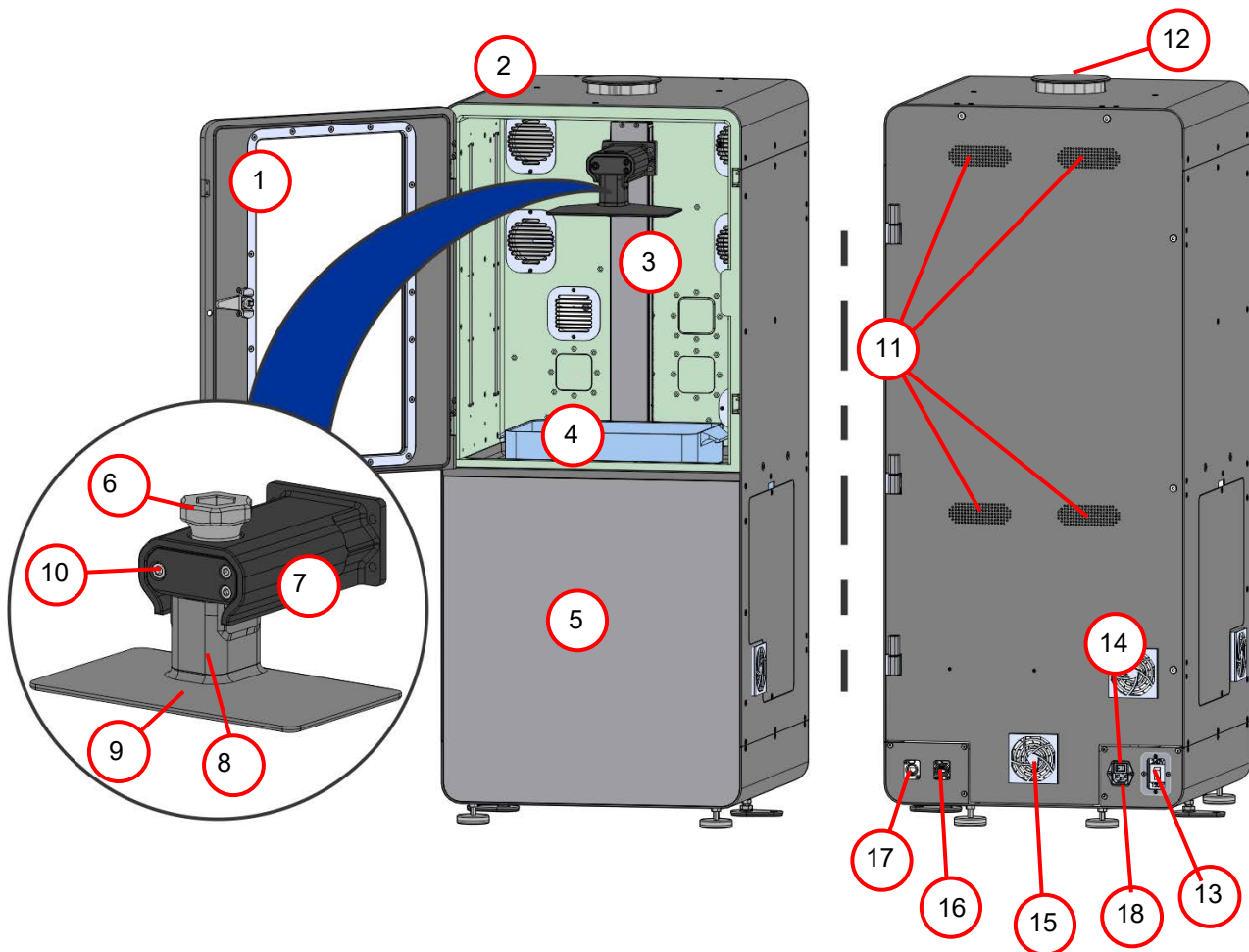
About the Origin One Printer

The Stratasys Origin One is a manufacturing-grade printer that enables additive mass production of end-use parts. Programmable Photopolymerization (P³) precisely orchestrates light, temperature, a pneumatic separation mechanism for the best possible results. Origin One can produce detailed features with high-accuracy materials, and parts produced can be post-processed in minutes.

Features

- Model: Origin One
- Process type: P3
- Supports all common 3D and CAD file formats through GrabCAD[®] Print
- Envelope Size: 7.56 x 4.25 x 14.57in / 468 in³ (192 x 108 x 370mm / 7672 cm³)
Maximum length on diagonal: 8.6 in (220 mm)
- Feature Resolution: Typically <50µm (material and design-dependent)
- Process Energy: UV (385nm) and Thermal
- Chamber operating temperature: up to 140°F (60°C)
- Photocurable materials from the Stratasys ecosystem materials partners.
- Resin tray capacity: 15 - 65 fl oz (2 liters max)
- Touchscreen graphical user interface
- Ethernet port for network connectivity
- USB port for service
- IR Camera for on-screen monitoring

Main Components



ID	Description	ID	Description
1	Door	10	Calibration screw
2	Hood	11	Vents (4 total)
3	Linear drive	12	Exhaust cap
4	Resin Tray (shipped separately)	13	Input voltage switch
5	Touchscreen	14	Power switch
6	Thumbscrew	15	Fans
7	Build arm	16	USB port
8	Adapter	17	Ethernet port
9	Build platform	18	Power cable connection

How to Use This Guide

This guide provides information for selecting an appropriate location for the Origin One printer. This guide also provides instructions for unpacking and preliminary set-up. Information of particular importance is presented in one of three formats:



A **Warning:** indicates a procedure that may cause injury to an operator if the procedure is not followed.

A **Warning:** will precede the paragraph of instruction to which it relates.



A **Caution:** indicates a procedure that may cause damage to equipment if the procedure is not followed.

A **Caution:** will precede the paragraph of instruction to which it relates.



A **NOTE** is used to highlight a specific point or to provide an operational tip. While useful, a **NOTE** does not indicate a procedure that can cause injury or damage if it is not followed.

A **NOTE** will follow the paragraph of instruction to which it relates.

Installation Site Requirements

Select the installation site for the Origin One printer based on the following:

1. Space Requirements
2. Environmental Requirements
3. Electrical Requirements
4. System Ventilation Requirements
5. LAN Requirements

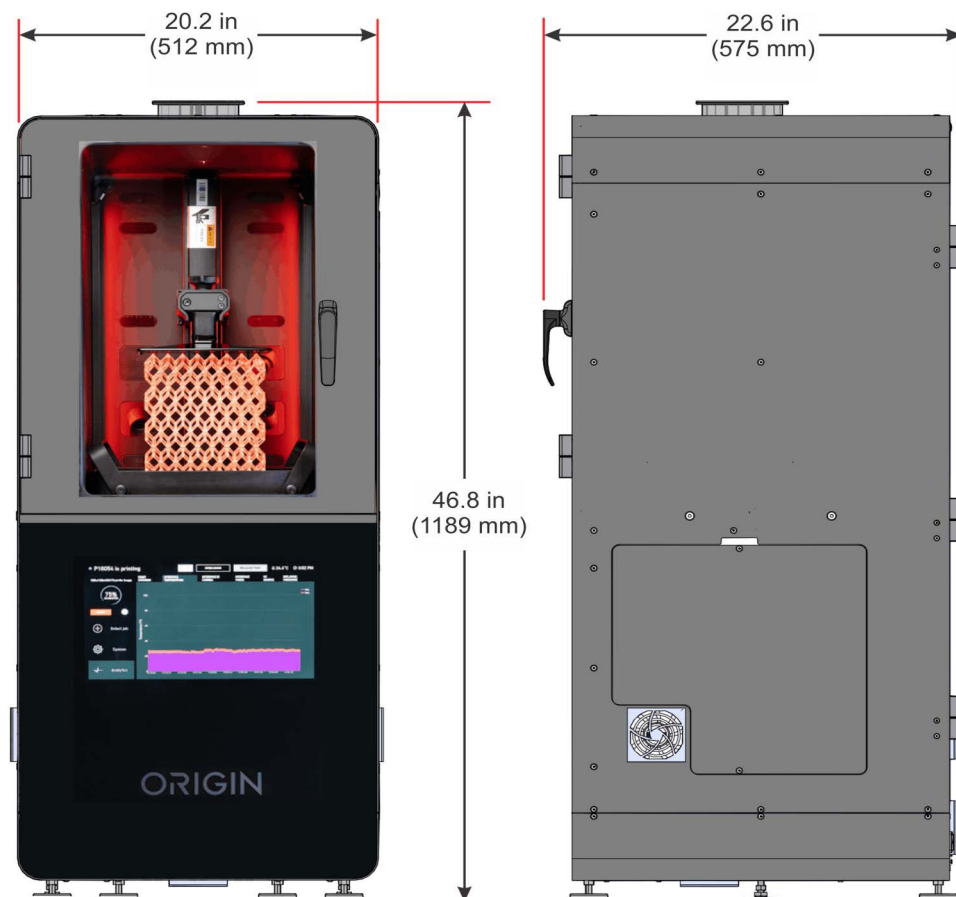
Space Requirements

Physical Dimensions and Weights

Make sure that the installation site floor space can accommodate the printer's weight and dimensions, plus required clearances. The installation location must be a flat, level surface that is stable. It is recommended to install the Origin One printer on a 24 inch high benchtop or rack: 25 inches deep (minimum) and 25 inches wide (minimum) with at least 38 inches of vertical clearance. For optimal printer setup, Stratasys recommends the following work-table ([link](#)), or equivalent.

Status	Weight	Dimensions/Weights
Printer Crated	316 pounds (143.5 kg)	Width: 30 inches (762 mm) Depth: 35 inches (889 mm) Height: 55 inches (1397 mm)
Printer Uncrated	180 pounds (81.6 kg)	Width: 20.2 inches (512 mm) Depth: 22.6 inches (575 mm) Height: 46.8 inches (1189 mm)

Figure 1: Origin One 2.7 Overall Dimensions

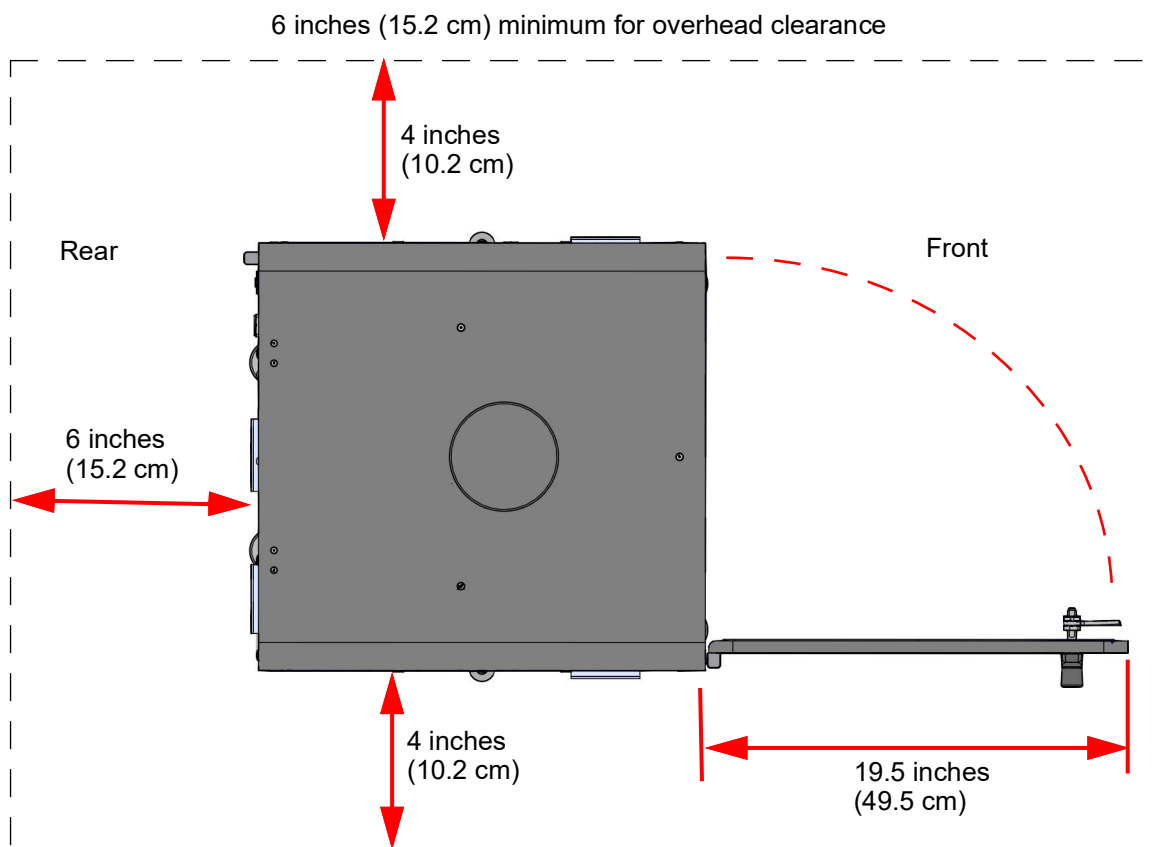


Minimum Operational Clearances

Sufficient rear and side clearances allow for proper air circulation, while sufficient front clearance allows enough room for the build chamber door to be opened.

Side Clearance	Minimum 4 inches (10.2 cm) on each side
Rear Clearance	Minimum 6 inches (15.2 cm)
Front Clearance	Minimum 15 inches (38.1 cm)
Overhead Clearance	Minimum 6 inches (15.2 cm)

Figure 2: Minimum Clearances



Mounting Configurations

It is recommended to install the printer on one of the following mounting configurations, specified below.

Custom Stand Assembly

The customer can mount the printer on a stand supplied by Stratasys at specific customer request. For information on how to install the stand, refer to the User Guide.

Bench/Mounting Rack Setup Configurations

The customer can mount the Origin One printer on a 24 inch high benchtop or rack: 24 inches deep (minimum) with at least 38 inches of vertical clearance. A customers individual setup configuration will depend on the application and how many printers are present:

- A single printer will benefit from having all the required equipment on the same bench
- Multiple printers may benefit by having all of the printers located on the same bench, and post-processing equipment located in a separate processing station or area.



Your Stratasys representative can help you determine the best setup based on your available space.

Figure 3: Single Printer Setup Example (Printer and Post-Processing)

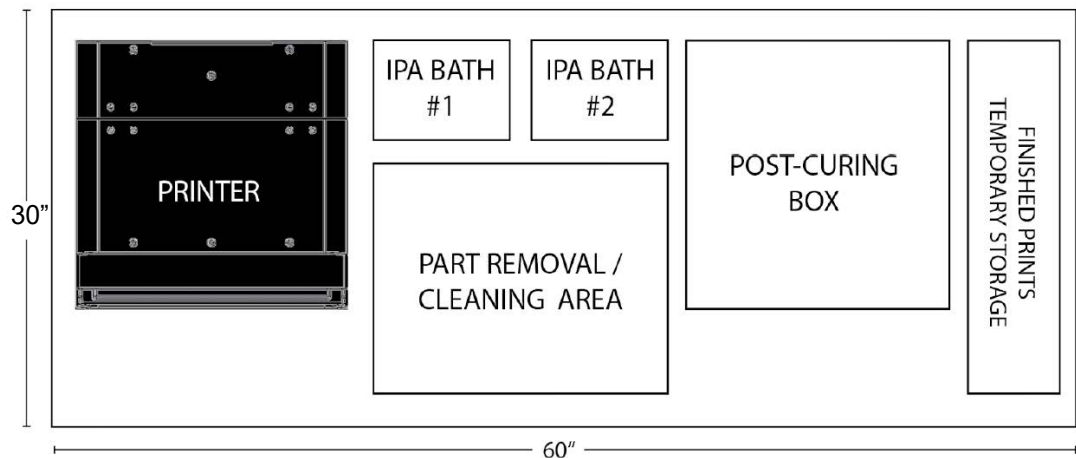
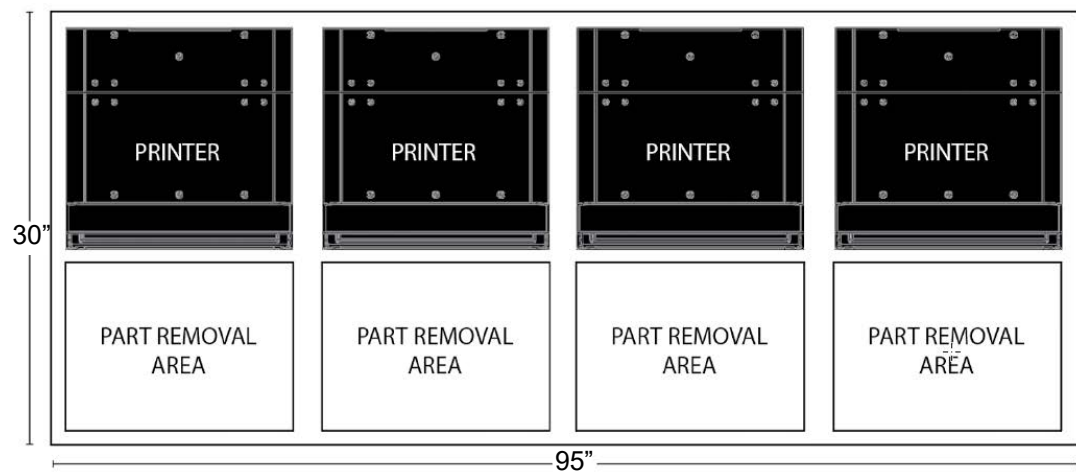
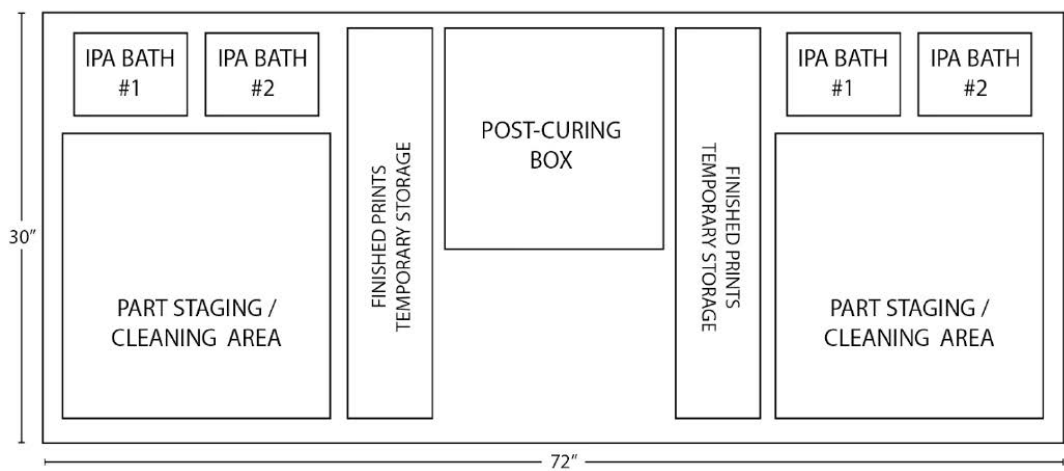


Figure 4: Multiple Printer Setup Example (Printers)



i Allow 100-150mm (4"- 6") of space between printers when placed side by side to allow an operator to easily reach the master power switch in the rear of the machine. Alternatively, use a separate, easily-accessible power strip with individual switches.

Figure 5: Multiple Printer Setup Example (Post-Processing)



Environmental Requirements

- The Origin One printer should be installed in a controlled environment with all necessary safety precautions.
- The Origin One printer operating environment should be physically separated from other functional areas (e.g. office space).
- The Origin One printer operating temperature shall be in the range of 59°F to 86°F (13°C to 30°C), with relative humidity range of 30% to 70% non-condensing.
- Keep the Origin One printer and material resins away from direct or indirect sunlight.
- Keep the Origin One printer and material resins in an environment with minimal exposure to dust and airborne particulates. The printer should be isolated from dust producing sources (e.g. powder bed fusion printers, milling equipment, etc.)

**Caution:**

The Origin One printer includes sensitive optical equipment that can be damaged when subject to even small quantities of dust. It is the customer's responsibility to make sure that the space in which the printer is installed is free of dust.

Electrical Requirements

- 100-120 or 200-240 VAC, 50/60 HZ, 700 W, 1 phase
- Only operate the Origin One printer with the 110V (**IEC 320-C13**) or 220V (**CEE7/7RA TO IEC320-C13**) grounded power connector provided with the printer. Do not replace the detachable power supply cord with an inadequately rated cord.
- It is the customer's responsibility to ensure that an over-current protective device, such as a circuit breaker, is installed and is dedicated to the printer.
- It is the customer's responsibility to ensure that a residual current protective device (RCD), with a rated residual operating current not exceeding 30 mA, is installed as part of the equipment or part of the building installation. Types RCB/RCCB/GFCI may be used according to local electrical regulations or any other standard that might apply.

System Ventilation Requirements

Use the Origin One printer in a well-ventilated area. If used within an enclosed area, proper air-changes, ventilation, and exhaust systems are required.

- Suggested ventilation: 8 - 10 air changes per hour.
- Check with the local regulatory agency or your EHS department to ensure that the system has sufficient ventilation for your requirements.
- Origin One printers support the option for a direct exhaust fume extraction system or the use of a ProAero fume extraction unit. Please reach out to your Stratasys representative for additional details if this is the preferred solution.
- **Cleaning Station:** It is recommended to operate your cleaning station under a qualified fume hood to reduce the emissions of volatile organic compounds (VOCs) produced by organic solvents. It is also recommended to have a compressed air source near the cleaning station to assist with cleaning and drying parts.

Origin One Industrial/Origin One Dental LAN Requirements

This section should be forwarded to your appropriate IT personnel well ahead of installation for appropriate review as well as proper firewall configuration. The customer IT questionnaire shown below must be filled out and submitted to your Stratasys representative prior to the shipment of an Origin One printer.

Overview

Origin One Industrial and Dental printers establish TLS secured connections via a VPN tunnel to Origin's Cloud, which is deployed within Google Cloud Platform.

Each Origin One printer creates and operates an internal VPN gateway, and connects to a single Stratasys-operated VPN gateway in Google Cloud Platform over UDP. No additional VPN appliance or customer-managed gateway is necessary. Communication is through ChaCha20 symmetric 256-bit encryption with Poly1305 for message authentication.

Stratasys connects Origin One printers to the Origin cloud platform via VPN because it is secure and robust, simple to configure, and has zero maintenance overhead. With this method, all communication is protected by an additional layer of end-to-end encryption, while in motion and at rest, and authentication.

Information sent to the cloud via GrabCAD Print uses TLS 1.2 with AES 128-bit encryption.

For information on endpoints and ports utilized, see:

<https://help.grabcad.com/article/202-troubleshooting-grabcad-print>.

For more information on data security, refer to the Terms of Service from:

app.origin.io and <https://help.grabcad.com/article/232-your-data-on-grabcad>

Firewall Configuration

Table 1: Firewall Rules

Protocol	Source IPs	Source Ports	Destination IPs	Destination Ports
UDP	<Printer Subnet Range>	51000 - 51999	35.232.242.122	51820
UDP	35.232.242.122	51820	<Printer Subnet Range>	51000 - 51999

Each Origin One printer acts as its own VPN endpoint on your end and connects to the Origin cloud VPN gateway at **35.232.242.122:51820**.

Origin One printers will use a UDP port in the range of **51000-51999** on your internal network. The UDP port range is required so Network Address Translation (NAT) functionality in your firewall can route inbound packets to the correct printer. At least one unique port must be allocated per installed printer. Proxy servers typically do not support the UDP connection required for Origin One printers.

Origin printers will automatically send keep-alive packets to keep UDP connections open. On the VPN port, printers will only accept authenticated packets from the gateway, and vice versa.

Note that the **<Printer Subnet Range>** and internal **51000-51999** port range are default configuration values. If you prefer a specific subnet or internal port range, contact your regional support center.

Additional Configuration

Origin printers use DHCP by default, but may be configured to static IP addresses on the subnet of your choice. The printers use **10.144.0.0/16** internally for VPN communication. DHCP must not assign addresses in the **10.144.0.0/16** subnet, otherwise address conflicts will be created.

Locally, the printers may have SSH port **22** open, to support authorized onsite service by Origin personnel.

Origin One Local Requirements

The Origin One Local is designed for customers unable to connect to the Origin Cloud due to government contracts, specific IP requirements, or HIPPA restrictions. The printer is identical to the Origin One Industrial, except that it contains no transmitting components and it is configured to connect through local area network to the Origin Local Hub rather than the Origin Cloud.

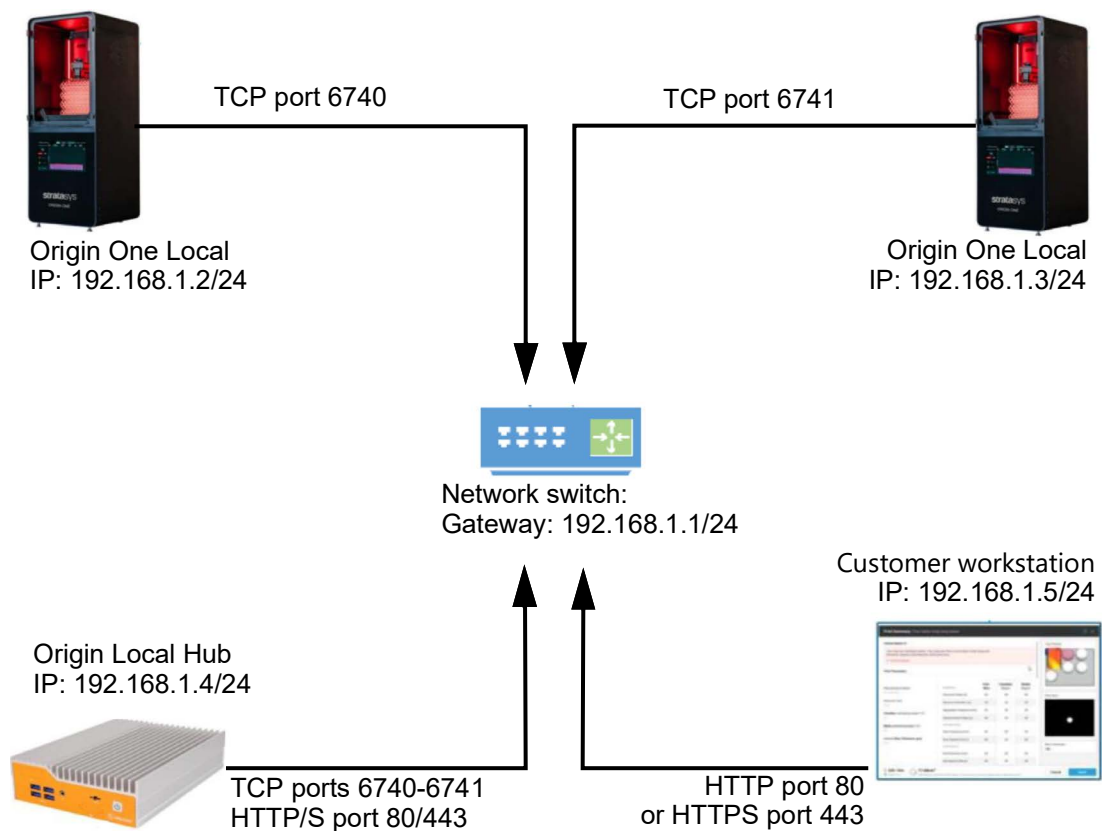
The Origin Local Hub and up to 10 Origin One Local printers must be able to connect to the same network switch as the computer workstation sending print jobs. The network switch is not required to be connected to the Internet, as the devices only communicate locally. The Origin One Local and Origin Local Hub communicate via TCP on ports 6740-6749.

Your IT personnel must have the network settings for the Origin Local Hub and any Origin One Local printers available at the time of installation.



An example of a suitable air-gapped network, is provided below. A connected LAN or VLAN is also suitable.

Figure 6: Network (example)



Origin Local Hub Requirements

The Origin Local Hub is an industrial computer containing proprietary firmware which interacts with the Origin One Local printer on the LAN, replacing the requirement to access the Origin Cloud.

Space

- **Dimensions (WxHxD):** 11.93 x 2.56 x 8.27 inches (303 x 65 x 210 mm)
- **Operational Clearance:** Side, rear and front 4 inches (10.2 cm), Overhead 6 inches (15.2 cm)

Environmental

- **Operating Temperature:** 0-50C (32-122F)

Electrical

- 100-240VAC, 50/60Hz, 220W
- Only operate the Origin Local Hub with the supplied 20VDC 11A power supply and NEMA 5-15P or CEE 7/7RA power cord.

LAN

- Ethernet connection through CAT6 or higher cable. A 14 foot (4.26 m) cable is included.
- Connection to the Origin Local Hub from the customer workstation must be allowed through HTTP port 80, HTTPS port 443, and port 8080.

Accessories

- To assist in installation, a computer monitor and HDMI or DisplayPort cable must be available for configuring the Origin Local Hub.

Unpacking the Printer



Make sure that there is at least 36 inches (90 cm) of clearance around the shipping crate before you begin the process of unpacking the printer.

Inspect Crate for Damage

Inspect the shipping crate for signs of exterior damage. Report evidence of excessive damage to Stratasys and the shipping company. If possible, take a picture to share with your installation representative. This photo will assist in determining the cause of damage.



If damage has been detected, do not continue unpacking until a certified Stratasys technician has been contacted.

Required Tools and Equipment

- 2 people (qualified movers) minimum
- Basic hand tools (powered screwdriver or drill with Phillips bit).
- Utility knife.
- A pallet jack or forklift may be required to move the printer.

Unpacking the Printer

1. Using a screwdriver, remove the clips (6) that secure the top panel to the crate (Figure 7).
2. Remove the top crate panel.

Figure 7: Removing the Shipping Crate Top Panel



3. Remove and set aside the loose accessories boxes beneath the top crate panel.



Store the loose accessories boxes in a safe place for your Stratasys Representative to access during installation.

Figure 8: Accessories Boxes

Accessories and
Shipped-Loose Items



4. Remove and dispose of the loose cardboard and foam pad beneath the accessories boxes.

5. Using a forklift, position the crate in a vertical orientation. Make sure to prevent the printer from falling forward out of the crate.

Figure 9: Standing the Shipping Crate



6. Remove the printer from the shipping crate.
7. Remove the plastic bag from the outside of the printer.



Caution:

Use care if cutting the plastic bag to avoid scratching the printer's surfaces.

8. Inspect the printer's exterior for dents and scratches. Immediately report any damage to Stratasys and the shipping company.
9. Move the printer and accessories to the approximate printer operating location.



Position the printer as described in "Minimum Operational Clearances" (page 5). Refer to Chapter 2 of the Origin One User Guide for final setup instructions.



If the custom Origin Stand is to be installed, refer to the User Guide for installation instructions.

Software Setup

Origin One printers are cloud connected and managed through a secondary login to GrabCAD Print.

Installing GrabCAD Print

Install the GrabCAD Print software on a facility workstation. Follow the on-screen instructions at:

<http://help.grabcad.com/article/197-sign-up-download-and-install>

After installing GrabCAD Print, navigate to File > Preferences > P3 DLP and login or create an Origin account. If a new account was created, please contact your Stratasys representative to complete registration.

For more information on GrabCAD Print for Origin, view the user guide at:

<https://help.grabcad.com/article/283-grabcad-print-for-origin>

Post Processing Equipment

The following components should be obtained to create an efficient post-processing procedure for any printed parts. For more information on the post-print procedure, refer to the *Origin One User Guide*.

- Solvents: Isopropyl alcohol 99% (IPA), Acetone, and Glycol Ether TPM
- Sonicator for micro-cleaning
- * UV and thermal post-curing equipment

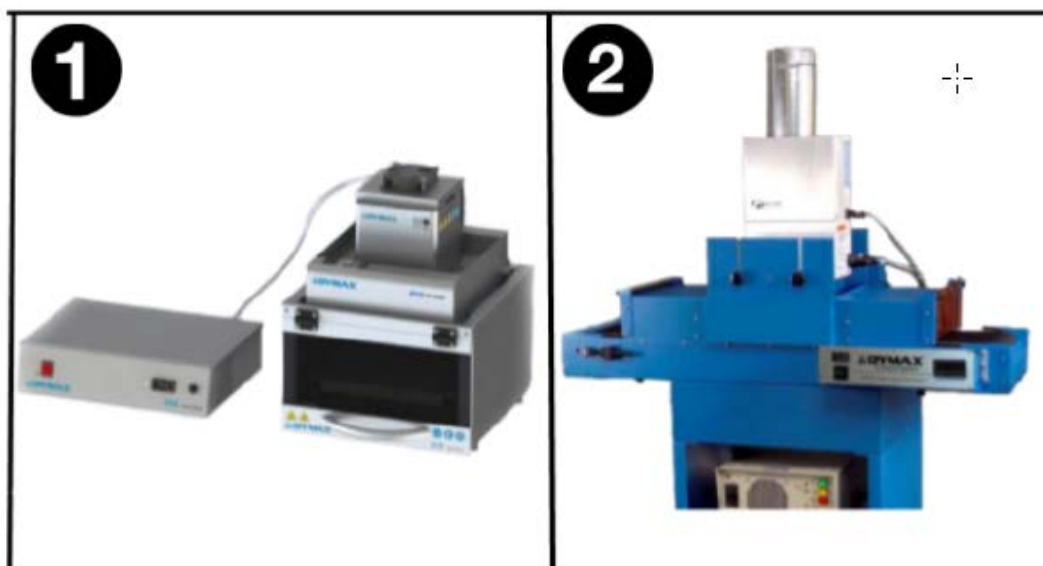


A sonicator is not required, but makes cleaning parts faster and more thorough. Stratasys recommends the Branson CPX8800H.

*UV and thermal post-curing equipment:

Stratasys recommends a mercury-arc flood system (1) for UV post-curing due to the broad-spectrum UV required to properly post-cure certain materials. Customers producing very large parts and/or high volumes of parts would benefit from the increased throughput of a mercury-arc conveyor system (2). Dymax ECE 5000 systems are recommended to provide an optimal post-cure environment.

Figure 10: Recommended UV Post-curing Equipment



For dental and medical applications, the Dreve PCU LED N2 cure box is recommended. Additionally, LOCTITE® 3D 3955 and P3 Deflect® 120 require the use of a programmable convection oven to reach optimal end properties. Your Stratasys representative will help you determine the best solution for your application.

Figure 11: Dreve Cure Box for Dental and Medical Applications



Additional Tools and Supplies

Post-processing

- Scraper tools (e.g. scraping blades with handles)
- Long tweezers
- Snippers for support removal
- Cut glove and cut sleeve

Resin Handling

- Sealed storage cabinets (refer to appropriate SDSs for proper storage requirements)
- Conical strainers/filters (190µm mesh)
- Plastic cups to catch filtered resin
- Nitrile gloves

Cleaning and Maintenance

- Lint-free single-use wipes
- Paper towels
- Isopropanol 99% (IPA)
- Acetone
- Solvent-resistant spray bottles
- Hazardous material trash cans with foot pedals
- Compressed air source and controlled nozzle

Other Storage

- Tool storage bins
- WorPart storage shelves and bins
- Sealed hazardous waste storage bins

Frequently Asked Questions (FAQ)

Can I configure the Origin One for Wi-Fi connection?

No, the Origin One is not configurable for Wi-Fi connection.

Does the Origin One require a dedicated laptop to be connected at all times?

No, the Origin One is a standalone system with a touchscreen interface for basic operation. Print jobs are managed, prepared, and sent to the printer via GrabCAD Print or the Origin Platform on the Origin Local Hub.

How can I order new materials?

Contact your Stratasys representative to discuss our array of specialized resins.

How much material do I need for a print?

We recommend filling the tray with enough material resin based on the volume of your print job, plus an additional buffer of at least 300 mL of resin. For large prints or long production runs, do not exceed a resin level of 10 mm below the top of the tray.

What happens to unused material after a print?

Unused material can generally be reused in subsequent prints. Resin can be filtered using a fine mesh filter (such as a 190µm paint filter) if contaminated with residual, cured particles after a failed print.

Do I need to bolt the printer to the floor?

No, the printer is designed to be freestanding on a rigid platform.

Does the machine need to be level?

To accommodate using the full stated capacity of the resin tray, the printer must be leveled to $\pm 1\%$. Place a digital spirit level on the mid-plate glass, and adjust the 4 leveling feet of the printer until the bubble is within 1% for the entire XY plane.

Are there any ambient light concerns?

Yes. Material resins are sensitive to UV light, which is found in sunlight. Even though resin packaging containers are opaque, keep printers and resin away from sunlight and any other UV sources to avoid affecting material resin properties.

What is the average pot life (open container) of your materials?

One to two weeks.

What is the average shelf life (closed container) of your materials?

One year from manufacture date.

Is there any risk of physical injury?

Injury may result from hands becoming trapped under the build platform or above the build arm assembly while it is descending or ascending. Although the printer is designed to be safe when operated according to this manual, unforeseen accidents can happen, and operators should use care during the operation of any 3D printing system or processing equipment.

Site Preparation Key Points

Electrical Installation Requirements

- A dedicated outlet that can supply 100-120 or 200-240 VAC, 50/60 HZ, 700 W, 1 phase has been installed. For other voltage ranges an external transformer will be needed.
- The grounded electrical outlet is within 2 meters (80 inches) of the printer.
- The grounded electrical outlet is able to accept a 110V (IEC320-C13) or 220V (CEE7/7RA TO IEC320-C13) grounded power connector.
- It is the customer's responsibility to ensure that an over-current protective device, such as a circuit breaker, is installed and is dedicated to the printer.
- It is the customer's responsibility to ensure that a residual current protective device (RCD), with a rated residual operating current not exceeding 30 mA, is installed as part of the equipment or part of the building installation. Types RCB/RCCB/GFCI may be used according to local electrical regulations or any other standard that might apply.
- The LAN connection is within 4 meters (14 feet) of the printer.
- For Origin Local Hub installation, a network switch or router is available if the printers and Hub cannot be on the shared LAN.

Environmental Requirements

- The site's environmental temperature is between 59°F to 86°F (13°C to 30°C).
- The site's environmental humidity is between 30% to 70%, non-condensing.
- The site's altitude does not exceed 6561.68 feet (2000 m).
- The site's environment has limited airborne particulates and is isolated from dust generating sources.

Required Installation Tasks

- Origin account within GrabCAD Print has been set up and is accessible to the customer, unless the customer has purchased an Origin One Local printer.
- The Welcome Kit and startup materials have been removed from the shipping crate.
- Resin is available for printing.
- Post-processing equipment has been installed and is ready for use.
- Site preparation checklist completed and provided to Stratasys representative.



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