



## User Manual

Version 3.4

Glowforge Pro | Glowforge Plus | Glowforge Basic





# Introduction

We are over-the-moon excited to introduce you to your Glowforge 3D Laser Printer. It's here. You're here. This is a big deal.

With your Glowforge, you're going to do incredible things. You'll build that custom storage solution that you can't seem to find in stores. You'll make the best birthday present your aunt has ever received.

You'll start a business that knocks the socks off of every customer. You'll do things you haven't even dreamed of yet.

But before you can do any of that, there's this.

Our job is to make sure that every part of the Glowforge experience is delightful. We're sorry, but it is important that you read a few pages that are not delightful: the ones about safety. They're a little dry, and a bit scary. Most of this manual is dedicated to helping you create beautiful things, but this part was written by our safety team, in the most direct language possible, to make absolutely certain you can operate your Glowforge printer safely.

Then, after the safety talk, we'll get back to the fun part: unboxing, the easiest laser setup you've ever seen, and... Laser Time! Your very first Glowforge prints.

We're deeply humbled to be able to count you among our brilliant, thoughtful, creative, and inspiring customers. We can't wait to see the amazing things you'll do.

PS: If you see anything that is unclear or seems incorrect, please visit us at [support.glowforge.com](https://support.glowforge.com) for more information and support.

# Safety

Now, it's time to get serious. Improperly operating the Glowforge unit can cause fire, eye or skin injury from laser exposure, or exposure to chemicals that may be health hazards. These can result in serious injury or even death.

## Before you start

- Read this manual before using your Glowforge printer, and ensure everyone else who uses it reads this too.
- Always follow all instructions in this section and in the Glowforge App.
- Children require the supervision and assistance of an adult at all times.
- Do not use your Glowforge printer while under the influence of alcohol or drugs.



- Lasers are subject to regulations and standards, particularly when installed in an educational institution or place of work. Ensure that you comply with all applicable rules.
- Do not touch the head or arm of the Glowforge unit while the power is on. If you do so by accident, turn it off, then back on again to prevent the possibility of damage.
- Under rare circumstances, materials or components inside your Glowforge may become hot during printing. Use caution before touching surfaces inside the printer.
- Parts of this product are made of glass that could break under impact. Should that happen, be careful to avoid injury by broken glass pieces.



## Electrical Safety

To reduce the risk of electric shock or fire:

- Do not try to service, repair, or modify the Glowforge unit.
- Never try to access the wiring of the Glowforge unit.
- Do not open the power supply or any other sealed portion of the Glowforge unit.
- If the Glowforge unit is damaged, unplug the power cord and contact us at [glowforge.com/help](https://glowforge.com/help) immediately.
- In the event of any emergency or malfunction, unplug the power cord on the back of the unit.
- Use only a properly grounded outlet that meets local building codes and has at least 800 watts of power available.
- The power cord is intended to serve as the disconnect device. Make sure the outlet is near the equipment and easily accessible, so you can unplug the unit if needed.
- The minimum rating of the circuit breaker, also known as an over-current protective device, on this circuit feeding the outlet should be at least 15 amps.

## Fire Safety

The Glowforge unit's laser cuts and engraves with a beam of high-intensity infrared light. The laser can generate extremely high temperatures in the material being cut or engraved. Under some circumstances, it is possible for the material inside the Glowforge unit to ignite and for the flame to spread outside of the area being cut or engraved. If ignited, the flame could destroy your unit and spread, potentially setting fire to the building.

### Fire Risk

- Do not put anything inside the Glowforge printer that is not laser-compatible, even if you do not intend to cut or engrave it. Learn more about laser-compatible materials below.
- Do not stack materials; for example attempting to cut two or more sheets of material at a time. Multiple sheets are more likely to burn.
- Clean out leftover bits inside the Glowforge unit when it builds up. (See "Cleaning")
- Do not place things on top of the Glowforge unit. Do not store things that can catch fire above it.
- Do not store sources of flammable vapors like oil-based paint, acetone, gasoline, or alcohol in the same room as your Glowforge unit. Flammable vapors could be ignited during operation.
- When a print is complete, certain materials, like plastics, can remain hot. Allow them to cool down before you touch them.



## Keep watch during operation

- Never leave the Glowforge unit unattended while operating – either when it's paused and ready to print (with the button flashing) or while it's actually printing (with the button on). Always stay within sight and look inside frequently.
- A small, candle-like flame where the laser beam strikes the material is normal. This flame should move with the laser and should not remain lit when the laser has moved past.
- If there is a lasting flame inside the Glowforge unit that does not extinguish when the laser has moved past:
  1. Pull the plug on the back of the unit.
  2. If it is safe to do so, extinguish the fire with a wet towel. Note that water may damage your Glowforge.
  3. If that is not an option, then if it is safe to do so, extinguish the fire with a fire extinguisher. Note that fire extinguishers may cause damage to your Glowforge.
  4. If the fire cannot be safely extinguished or if it spreads outside the Glowforge unit, call your local emergency number (for example 911) and evacuate the building.
  5. Do not operate the unit further until you have contacted Glowforge for service information at [glowforge.com/help](http://glowforge.com/help).

## Laser Safety for all Glowforge Printers (except where noted)

### Laser Products

The Glowforge Basic 3D Laser Printer and the Glowforge Plus 3D Laser Printer are Class 1 laser products which contain an embedded Class 4 laser. The Glowforge Pro 3D Laser Printer is a Class 4 laser product. The laser in your Glowforge emits enough infrared light to cause instant skin and eye injury, or start a fire. This infrared laser light is invisible. The Glowforge unit has a case and glass lid which block harmful levels of infrared and ultraviolet light to allow you to operate the laser safely.

**CAUTION!** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

### Do not use if glass or case are damaged or modified.

Any damage or modifications could allow dangerous contact with moving and/or electrical parts, and/or allow infrared and ultraviolet light, heat, smoke, and fumes to escape.

Safety interlock switches on the front door turn off the laser immediately if they are opened. Do not place magnets near the lid or doors as they can interfere with the switches. Do not try to defeat the switches.



## Do not modify or service

**CAUTION!** Attempting to modify or service the Glowforge unit may result in hazardous laser light exposure.

To reduce the risk of injury:

- Do not attempt service. All service must be performed only by the Glowforge factory or by factory-authorized technicians.
- Do not attempt to alter or modify the unit.
- Only use the front door or top lid to open the case. Do not try to open the case any other way, such as by drilling holes, removing fasteners, or removing coverings.
- Do not try to disassemble or open sealed portions of the Glowforge unit, including any protective coverings or housings.
- If the crumb tray is removed, use extreme caution to ensure that the laser only strikes laser-compatible material, and does not touch the metal bottom of the unit which could cause a reflection and damage the unit.

## Glowforge Pro Only: Class 4 Laser Safety & LSO Training

Because the Glowforge Pro has pass-through slots, it is a Class 4 laser device. For safe operation, a Class 4 laser device should be operated under a laser safety program under the control of a Laser Safety Officer (LSO). Training for LSOs normally costs more than \$1,000, but Glowforge has worked with leading laser safety training experts to prepare materials so that you can act safely as the LSO for your Glowforge Pro.

**These materials will train you to operate your Glowforge Pro in Class 1 conditions, which do not require additional special precautions.** If you need to operate your Glowforge Pro in Class 4 conditions, these materials will explain what you must do in order to operate it safely. They will also provide you with an overview of laser physics and safety concerns, and processes to follow.

You must read, understand, and follow the Glowforge Pro Training Materials to use your Glowforge Pro.

The Glowforge Pro LSO Training materials are emailed to all Glowforge Pro owners as a password-protected PDF.

If your LSO instructs you to connect the external safety interlock to an access control system, test the system's functionality before putting the laser into use.



## Smoke and Fume Safety

When you use your Glowforge, the laser creates visible and invisible aerosols, gases, vapors, and particulates (referred to here as “smoke and fumes”). The smoke and fumes can include carbon monoxide and other chemicals which present health hazards, as well as being unpleasant and stinky. The chemical composition of the smoke and fumes depend on the material being lasered. Smoke and fumes from laser-compatible materials are controlled by exhaust or filtration.

### Exhaust

Only operate your Glowforge unit when it is exhausted to the outdoors or through the Glowforge Air Filter. Failure to exhaust will cause smoke and fumes to escape into the room, presenting a risk of health hazards or death.

If you exhaust outdoors, be sure that the exhaust location won’t be bothersome to neighbors or passers-by, and don’t forget to check your local rules for air quality regulations that may apply to you.

To prevent smoke and fumes from escaping the unit, do not open the lid until the fans stop.

Follow all of the instructions in “Setting Up” carefully.

There may be some odor present while printing. However, if you detect a strong, sharp smell that also causes eyes, nose, or throat irritation, or if there is visible smoke escaping while the lid is closed, stop immediately and re-check your exhaust setup. If the irritation and/or smoke emissions do not abate, discontinue using your Glowforge and contact support.

Pro Users: There may be small openings around the edges of the passthrough slot. This is expected; your Glowforge Pro’s powerful fans will whisk smoke and fumes away into the exhaust hose.

### Safety Equipment

Be sure carbon monoxide detectors are installed and tested in the building as recommended by local codes and manufacturer recommendations.

## Materials Safety

### Laser-Compatible Materials

“Laser-compatible” refers to materials that can be safely processed with the CO<sub>2</sub> laser in the Glowforge unit. Materials that are not laser-compatible may catch fire, emit hazardous smoke and fumes that



cannot be controlled by exhaust or filtration, and are a health hazard to you, your neighbors, and your Glowforge printer. For this reason, you must only put laser-compatible materials in the Glowforge unit.

### Proofgrade™ materials

Glowforge sells a line of Proofgrade materials that are laser-compatible and give top-quality results when used with the Glowforge printer. To learn more about Proofgrade materials, go to [glowforge.com/materials](https://glowforge.com/materials).

### Laser-compatible materials from other suppliers

Other suppliers like Inventables.com sell material that they indicate is laser-compatible. If you are uncertain, ask the supplier if the material may be processed safely with a CO<sub>2</sub> laser.

### Food Safety

Many food products can be engraved, and some can even be cut. However, residue from prints on acrylic or other materials might be present in your Glowforge and could contaminate food that you put in your Glowforge. For that reason, if you use your Glowforge for materials other than food, then don't eat any food you put inside it.

### What if I'm not certain whether my materials are laser-compatible?

If you aren't completely sure that your material is laser-compatible, do not put it in the Glowforge unit.

- **Some materials look similar to laser-compatible materials, but are different.** For example, vinyl can be mistaken for some laser-compatible materials but emits harmful smoke and fumes.
- **Materials may have contaminants, coatings, or additives that are not laser-compatible.** For example, certain plywood glues, inks, adhesives, dyes, and paints may not be laser-compatible.
- **Some materials can reflect the laser and damage your Glowforge unit.** For example, copper and chrome can reflect the infrared laser light.

### Materials must fit

Materials that do not fit properly may obstruct operation and result in damage and increased risk of fire.

- Materials must be no more than 21 in (53.3 cm) wide and must not be so long as to touch the end of the Glowforge unit. Material must be less than ½ in (1.2 cm) tall if the crumb tray is in, or less than 2 in (5.0 cm) tall if it is removed.
- Materials must not extend past the side of the crumb tray (if it is being used) or the metal bottom of the print area (if not).
- Do not place rolled-up material in the Glowforge. It may be too tall, or unroll during printing, obstructing operation.



## Materials must be flat

- Materials must be flat so they rest on the crumb tray.
- While a bulge is acceptable, for example from warped wood, the highest point of the material may not extend more than  $\frac{1}{2}$  in (1.2 cm) above the crumb tray.
- Material must never double back on itself, for example curling up.
- Should material curl or bend so it reaches more than  $\frac{1}{2}$  in (1.2 cm) above the crumb tray during a print, turn off the power immediately.
- If the material has a protective paper or plastic coating, that coating must be firmly affixed to the material. If it begins to peel off, discard the material and do not print on it.

## Operating Environment

To prolong the life of your Glowforge unit and to reduce the risk of fire or mechanical failure, do not put the Glowforge unit where it could experience:

- Extreme temperature or humidity
  - Temperatures below 40 degrees Fahrenheit (5 Celsius) or over 120 degrees Fahrenheit (48 Celsius)
  - Extreme humidity conditions (below 10% or more than 75%)
  - If venting outdoors, ensure that changing conditions do not cause extreme temperatures or humidity to enter the Glowforge unit through the exhaust hose. Disconnect the hose from the outside air when the Glowforge is not in use.
- Direct sunlight
- Rain, moisture, or liquids
- Excessive hair, dust, or small particles
- Loose materials such as paper or a tablecloth that could be sucked into the air intake on the bottom of the Glowforge

Print when the ambient temperature is within the following ranges. Printing outside these ranges may cause your print to pause periodically or fail to complete.

- Basic and Plus: Between 60 degrees Fahrenheit (16 Celsius) and 75 degrees Fahrenheit (24 Celsius)
- Pro: Between 60 degrees Fahrenheit (16 Celsius) and 81 degrees Fahrenheit (27 Celsius)

## Stop Using Your Glowforge Unit If....

If any of the following occur, immediately turn off the power switch, unplug the unit, and contact us at [glowforge.com/help](https://glowforge.com/help). Do not use your Glowforge unit again until the issue has been addressed by support.



- The default settings for a piece of Proofgrade™ material do not cut through the material even after cleaning the lens and windows
- There is a fire in the unit which persists after the laser turns off
- The head stops moving but the laser is on
- The unit's button turns any color other than white, yellow, or teal
- You see any damage or discoloration to the case
- There are any cracks or chips in the glass tube or lid
- You see any moisture present inside the Glowforge unit
- You see any damage to the interior components of the Glowforge unit
- You notice unusual light coming from the unit that was not occurring previously.
- You notice an unusual sound coming from the unit that was not occurring previously



**DE:** *Informationen zur Sicherheit finden Sie im Anhang.*



**IT:** *Trovare informazioni sulla sicurezza nell'appendice.*



**ES:** *Encuentre información sobre seguridad en el apéndice.*



**FR:** *Retrouvez les informations de sécurité en annexe.*



## Glowforge Models

	Pro	Plus	Basic
CDRH Classification	Class 4	Class 1	Class 1
Warranty	12 months	12 months	6 months
Laser power rating	45W	40 W	40 W
Upgraded hardware for improved speed	✓	✓	
Enhanced top speed	3x	2x	1x
Faster cut speed	120%	100%	100%
Enhanced cooling for all day use	✓		
Giant sized prints with Passthrough slot See "Using Your Glowforge Pro"	✓		
TUV Certified to UL Standards (only when indicated on label on back of unit)	✓	✓	✓



# Glowforge Regulatory Information

In the United States, lasers are regulated by the federal Center for Devices and Radiological Health (CDRH), a subsidiary of the federal Food & Drug Administration (FDA). The CDRH and the FDA, in conjunction with other agencies, help ensure that laser devices, from CD players to industrial lasers, can be used safely.

The Glowforge Basic unit is a Class 1 laser product containing an embedded Class 4 CO<sub>2</sub> laser and a Class 1 laser diode. Because the Class 4 laser is fully contained in a Class 1 enclosure, this laser product is designated as a Class 1 laser product during all procedures of operation.

The Glowforge Plus unit is a Class 1 laser product containing an embedded Class 4 CO<sub>2</sub> laser and a Class 1 laser diode. Because the Class 4 laser is fully contained in a Class 1 enclosure, this laser product is designated as a Class 1 laser product during all procedures of operation.

The Glowforge Pro unit is a Class 4 laser product containing an embedded Class 4 CO<sub>2</sub> laser and a Class 1 laser diode. It is designated as a Class 4 laser product.

The included CO<sub>2</sub> laser has the following characteristics:

- Wavelength: 10.6 μm continuous wave (CW)
- Internal laser power: less than 100 watts peak
- Beam diameter: less than 5mm at aperture
- Beam divergence: less than 1.2mrad

The included laser diode has the following characteristics:

- Wavelength: 635nm - 650nm CW
- Internal laser power: less than 0.39 milliwatts peak

The Glowforge unit is manufactured by:

Glowforge  
2200 1st Avenue South, First Floor  
Seattle, WA 98134

For more information or support visit [support.glowforge.com](https://support.glowforge.com).



## The following label information applies to the Glowforge Basic

This label appears on the back of every Glowforge Basic, with an appropriate serial number, in the spot indicated by the arrow in the diagram below.



Manufacturer's Label



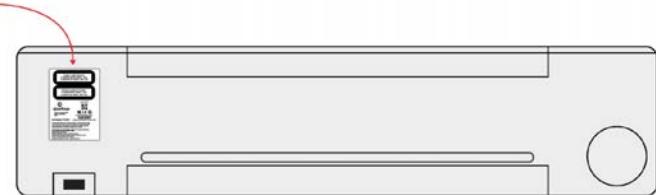


## The following label information applies to the Glowforge Plus

This label appears on the back of every Glowforge Plus, with an appropriate serial number, in the spot indicated by the arrow in the diagram below.



Manufacturer's Label



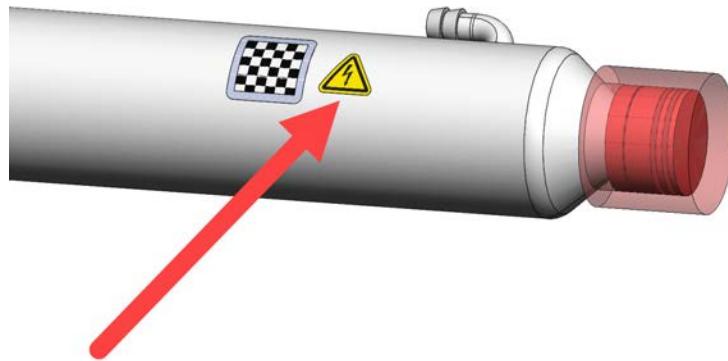
Rear View of Unit



## The following label information applies to the Glowforge Basic, Plus and Pro

This label appears on the laser tube in the spot indicated by the arrow in the diagram below and indicates that there is a high voltage shock hazard.

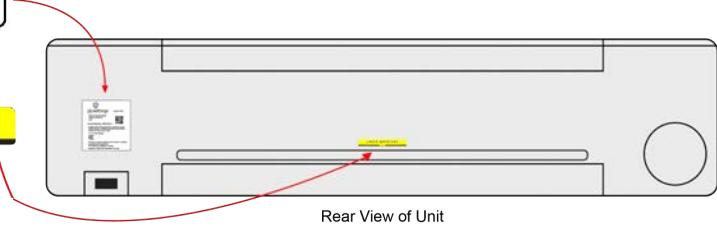
Cette étiquette apparaît sur le tube laser à l'endroit indiqué par la flèche dans le diagramme ci-dessous et indique qu'il y a un risque d'électrocution à haute tension.



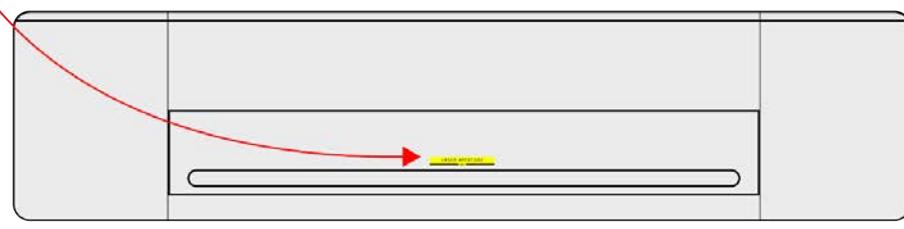


## The following label information applies to the Glowforge Pro

The Manufacturer's Label and Aperture Label will appear on the back of every Glowforge Pro, with an appropriate serial number, in the positions indicated.

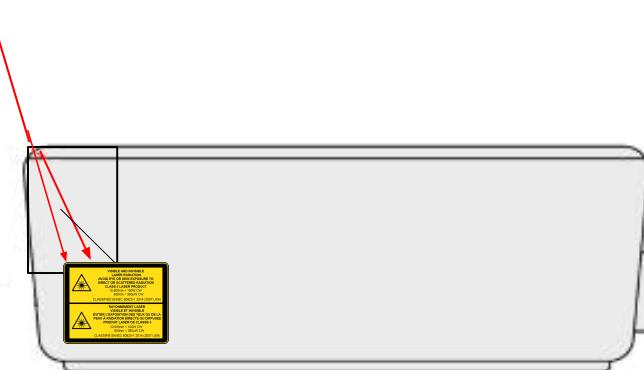


This Aperture Label appears on the front of every Glowforge Pro in the position indicated.





The Hazard and Explanatory Label appear on the right side of every Glowforge Pro in the position indicated.



Right Side View of Unit



# Unboxing & Setting Up

## Let's Get Started

If you've read about Safety, you now know everything you need to operate your Glowforge safely, and that's pretty cool. Thank you for your patience. Now, it's time to get lasering!

Unboxing shouldn't take too long – we can't wait for you to get started with your first print, either. In just a few minutes, you're going to have a working laser in your home (or office, classroom, workshop, or design studio)! Of course, if you encounter any challenges along the way, you can find information and support by visiting [support.glowforge.com](https://support.glowforge.com). Before you start, be sure you have a stable surface on which to place your Glowforge where you'll have nearby access to an electrical outlet and exhaust vent.

Let's get started, shall we?

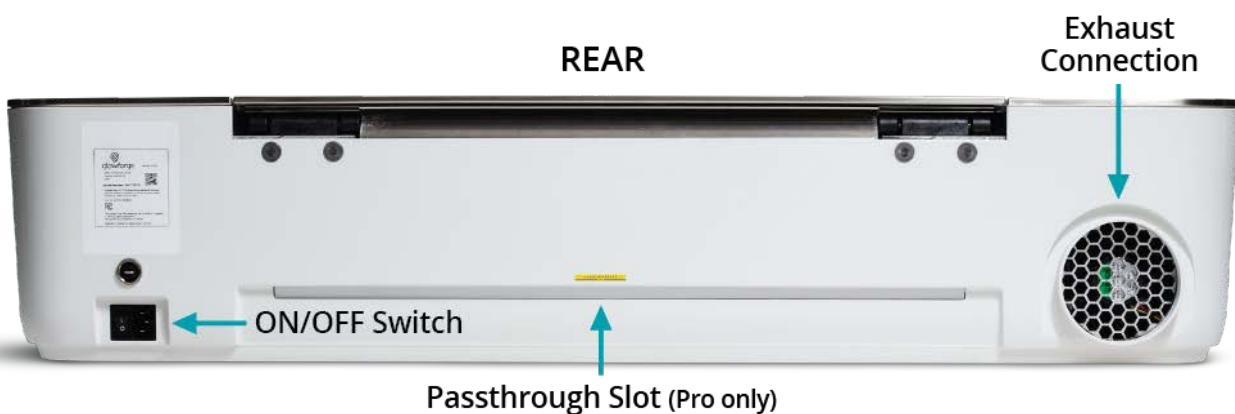
## Any damage?

If your packaging or any part of your Glowforge shipment is visibly damaged on arrival, we want to make it right as soon as possible! Send photos of the damage at [glowforge.com/help](https://glowforge.com/help) and wait until you hear back from us. If the Glowforge itself is visibly damaged, do not plug it in or attempt to operate it; contact us immediately.



## Getting Acquainted

Here's a quick tour of parts you'll need to know:





## Your Glowforge 3D Laser Printer & Accessory Pack

Your shipment arrived in one or two boxes plus another one for the air filter if you ordered one. The largest box contains your Glowforge printer and (shipped inside your Glowforge for safety) the printer head and power cord. We suggest telling the neighbors the box contains a big microwave, so they don't pester you all day to use it.

The box that's short and wide is your Glowforge Accessory pack. This is either in the large box or a stand alone package. It contains your Proofgrade™ materials along with your accessories. Set it to the side for just a few minutes.



## Remove straps and edge protectors (selected packages)

If your Glowforge box has straps and edge protectors as shown, cut the straps and remove the edge protectors. You do not need to save these with the rest of your packaging.





## Open Handle Locks (selected packages)

We've designed the packaging to make it easy to get your Glowforge out. If your box doesn't have the white handle locks, skip this and go to the Choose a Location section.

The box is specially designed to protect your Glowforge through all shipments, domestic and international. Be sure to keep the box and packing materials, as you'll need them if you want to transport your Glowforge again or for any warranty repair.

1

### Identify Handle Locks

Your Glowforge box is locked tightly by 4 handle locks on the bottom of our box.)



2

### Unlock the 4 Handle Locks

Hold the white tab on the right side of each white box handle.



**3**

### Open the Handle Locks

Pull each white tab from right to left, opening the handle like a door.

**4**

### Remove the Handle Locks

Gently pull the frame of the white handle to remove it from the box.

**5**

### Keep all 4 Handle Locks

These lock the Glowforge box together and are required for proper shipping of your Glowforge printer.





## Choose a Location

### 1 Choose a location in a well-ventilated room with a 4" (10.1 cm) outdoor exhaust vent.

This is the same type of vent used to connect a dryer. The exhaust vent should be at least 3 feet (0.9 m) from property lines and openings into a building, and at least 10 feet (3.0 m) from mechanical air intakes. You can also put the hose out an open window, so long as the end of the hose is at least 3 feet (0.9 m) from the window and meets the other criteria above.



### 2 Prepare a Surface

Get a hard, flat, and stable surface ready. If the surface is unstable, uneven, or too small, then you could have inaccurate prints, the doors may not close properly, and the camera might be misaligned. You could even damage your Glowforge.

### 3 Unseal your Glowforge box

Carefully cut both strips of tape sealing the underside of your Glowforge box.

### 4 Remove the Lid. First peek: that's your very own Glowforge!

### 5 Remove the top layer of protective foam. If your Accessory pack shipped inside your Glowforge box, you'll find the protective foam underneath the top pad.

### 6 Unfold the plastic covering so that you can lift your Glowforge out.

Your Glowforge is shipped in a protective plastic bag to protect it from the elements during shipping. Unfold the plastic bag without cutting or tearing it, and move it to the sides so you can reach in. Be sure to keep the plastic bag in case you need to ship your Glowforge again.



7

**Have two people lift the Glowforge printer out of the box.**



8

**Leave a Little Room**

Place the printer with at least an inch of clear space in all directions. Do not block the air intake on the bottom right side of the Glowforge printer.

9

**Confirm Safety Equipment**

Confirm that your safety equipment meets requirements: See Fire Safety, Smoke and Fume Safety.

### Remove Printer Head and Important Orange and Red Bits

We've secured your Glowforge with two foam blocks and several important orange and red bits. In addition to providing support during travel, the rear foam block also holds your Printer Head.

1

Remove the tape from the front of your Glowforge, then lift the lid & lower the front door.



**2**

### Remove the Front Foam Block

Gently pull out the foam closest to the lowered front door.

**3**

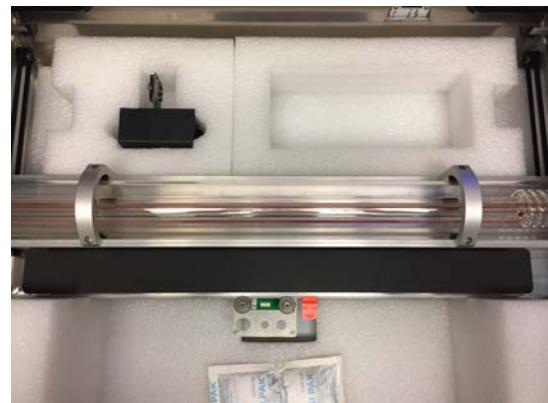
### Remove Knobs

To the left and right, you'll find red knobs. Unscrew and pull them out.

**4**

### Reveal Printer Head and Lens Tool

Remove the top layer of the rear foam block to reveal your printer head and lens tool.



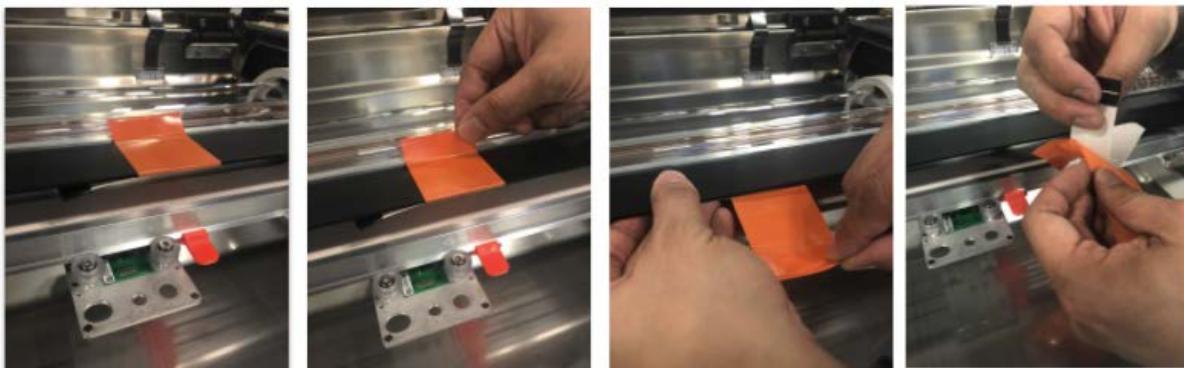


## 5 Remove Rear Foam Block

Gently remove the rear foam block, including the Printer Head and lens tool. Set these aside for now. Don't worry! You'll power up your Glowforge in mere minutes.

## 6 Remove Orange Tape from Laser Arm

Pull the tape from the point farthest away from you towards you, then gently remove it from the wire ribbon. You don't need to save the tape!



## 7 Remove Clip

Under the glass tube, you'll find an orange clip. Push down on it and it will pop off.



## 8 Remove Red Strips

Push the laser tube back gently, then lift off the two red silicone strips.





## Glowforge Pro Only: Removing your Pro Shields (optional)

Your two Pro Shields arrive installed inside your Glowforge Pro. They finger-screw right into the front and back passthrough slots of your Glowforge Pro to ensure that nothing - material or laser light - comes in or out when the slot is not in use.

The Pro Shields should always be installed except while the passthrough slot is in use. The Laser Safety Officer (LSO) training provided to Pro customers has important information about the Pro Shields. Please re-read it before removing them.

Should you need to remove them, follow these instructions:

### 1 Turn off your Glowforge

Turn off your Glowforge using the power switch on the back. The lights and button should be off.

### 2 Lower the front door and remove the crumb tray

Lift the lid, then lower the front door. Lift the crumb tray slightly and slide it towards you to remove it. Be careful not to tilt the crumb tray up, or it will knock into the laser arm and rails. Leave the front door open.

### 3 Remove the front Pro Shield from the front door of your Glowforge

With the front door opened, turn the black finger screws on either end of the Pro Shield counterclockwise to unscrew them, then lift the shield away from the front door.



### 4 Using two hands, gently pull the laser arm to the front of your Glowforge

This will expose the rear Pro Shield so you can easily remove it.

**5****Remove the back Pro Shield from the inner back wall of your Glowforge**

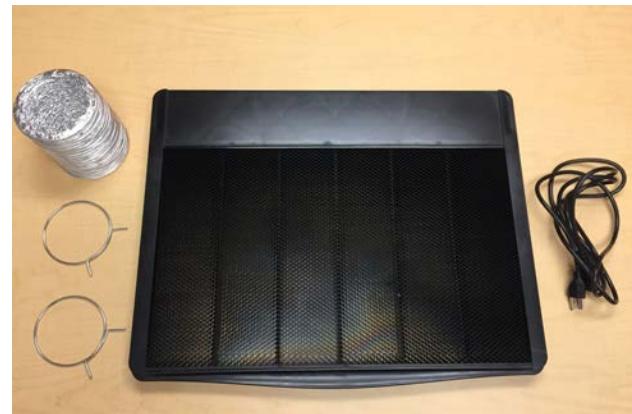
Turn the black finger screws on either end of the Pro Shield counterclockwise to unscrew them, then lift the shield away from the wall.

**6****Reinstall your crumb tray, close the front door, and turn on your Glowforge!**

Instructions for [installing your crumb tray](#) are available.

## Your Glowforge Accessory Pack

It's time to open your Glowforge Accessory Pack. Inside you'll find your jet black ferrous steel crumb tray, power cord, an exhaust hose, and two ring clamps.



Glowforge Pro only: For more information about Pro Shields, see the Glowforge Pro Training Materials.



## Slide In the Crumb Tray

The black and metal crumb tray sits inside the bed of your Glowforge, supports the material you place inside, and catches leftover print bits to keep your Glowforge nice and tidy. It has four little feet that rest in four little dimples. The handle goes in front, and the feet go on the bottom.

**1** Lift the lid of your Glowforge & lower the front door

**2** Gently move the Laser Arm. Using two hands, gently push the laser arm away from you until it's near the back of the printer.

**3** Pick up the Crumb Tray. Pick up the crumb tray - make sure the handle is in front and the wide black plastic strip is in the back.



**4** Slide in the Crumb Tray. Slide it in until you feel the feet settle into the dimples in the base of the Glowforge printer.

**5** Make Sure the Handle is in Front. Check that the handle's in the front, and the wide black part is in the back, just like the picture. Otherwise, you'll have mysterious printing problems, and feel silly when we ask you if your tray is in backwards.

**6** Close the Front Door

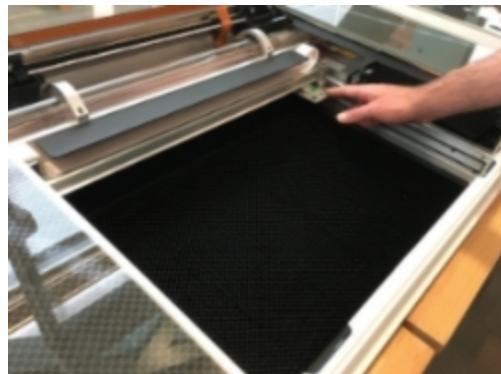


## Snap in the Printer Head

Never connect or disconnect the printer head while the Glowforge is plugged in or you might break something.

### 1 Position the Laser Arm and Metal Plate

Gently slide the metal plate on the laser arm all the way to the right, then push the arm to the back of the printer.



### 2 Carefully Pick Up the Printer Head

Do not touch any part of the printer head that is not flat black metal. Be especially careful of the yellow window on the side of the head. Remove the printer head from the white foam tray and remove the orange foam cylinder from inside the head.



### 3 Pick Up the Wire Ribbon

Holding only the finished black surfaces of the printer head, pick up the printer head and wire ribbon as shown.



**4**

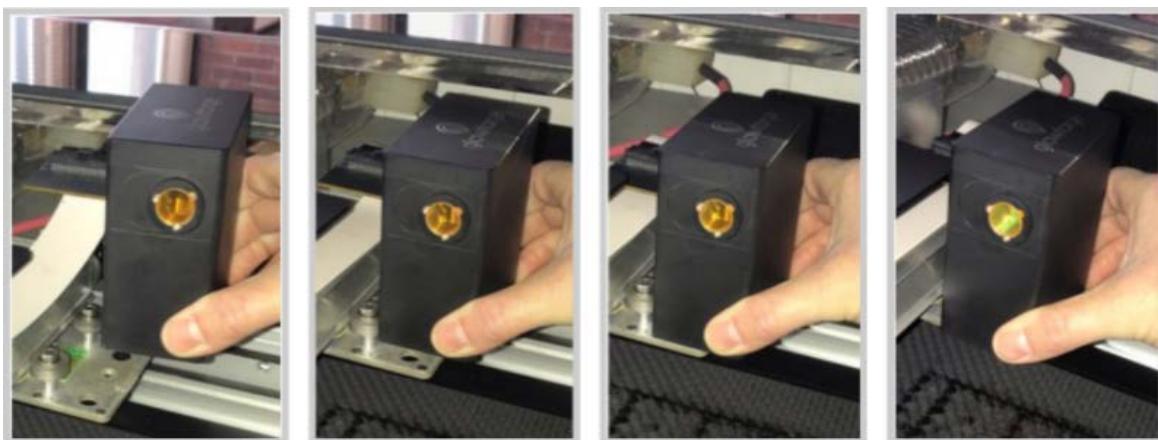
### Slide the Ribbon Into the Head

Make sure the tab on the wire ribbon is facing up. Slide the ribbon into the head until it clicks.

**5**

### Attach the Head

As shown, lower the printer head over the metal plate so that it rests next to the two round posts. Then push it gently away from you – you'll feel a “click” as magnets pull the printer head until it sits snugly atop the metal plate.

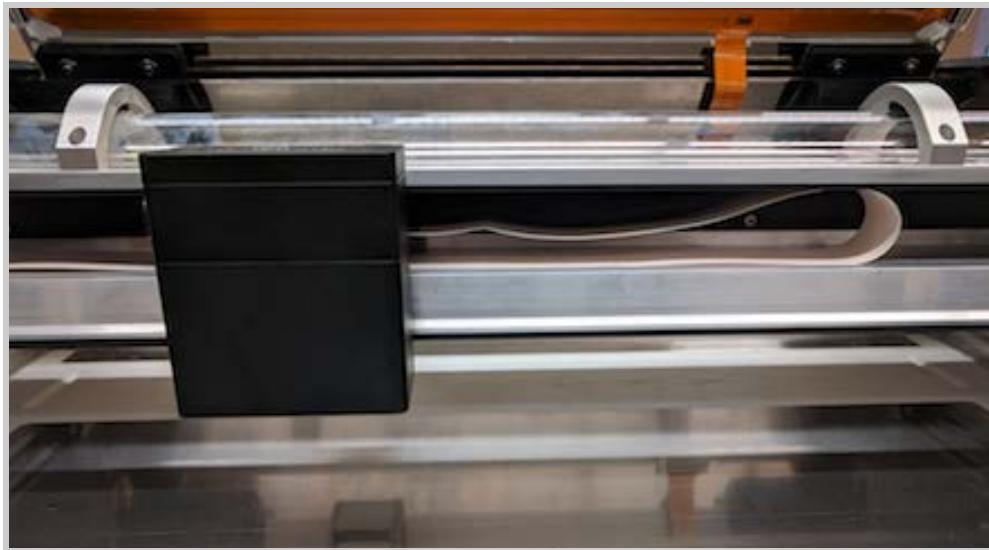
**6**

Make sure the head slides freely and move it to the center

- Using both hands, gently move the laser arm to the center of the bed.
- Gently slide the head all the way to the left, then right.



- If it doesn't slide easily, make sure that the ribbon cable is a simple loop with no twists, as shown.



- Move the head back to roughly the center of the bed, under the lid camera.

7

Close the front door and lower the lid on your Glowforge.

8

### Save Everything!

If you need to ship your Glowforge, for example for warranty service, you'll need all the original parts: boxes, handle locks, foam, plastic covering, and important orange and red bits. Store them safely - replacement packing materials are \$249.





## Set Up Exhaust

### 1 Connect Hose to printer

Use the hose provided. Slide the ring clamp around the hose then squeeze the two ends of the clamp together to fit the hose and clamp over the exhaust connection on the back of your Glowforge printer. Let go, then check to be sure the clamp is settled over the white ring around the exhaust and will not come off with a gentle tug.



### 2 Connect Hose to Outdoors

Connect the other end of the hose to the outdoors through a window or a vent that connects directly outside. Do not use a vent that extends the length of the hose past 8 feet (2.4384 m) or adds any turns. Keep the hose as straight as you can, with no more than two turns of 90 degrees or less. Make sure the hose isn't twisted, pinched, kinked, or flattened.

### 3 Disconnect Hose After Use

Changing weather conditions may cause hot, cold, or humid air to enter your Glowforge that could damage it. When your Glowforge is not in use, remove the hose from the vent or window, or disconnect it from your Glowforge.

## Connect to Electrical Power

1. Make sure your Glowforge is turned off (O is depressed) and then connect the power cord.
2. Plug the Glowforge into a grounded wall outlet with 800 watts of power available. Make sure you connect the printer directly to a wall outlet and not a surge protector or power strip.



3. Turn on your Glowforge by pressing the switch so the “I” side is depressed.
4. Lights will come on, the head will move, and you might hear a bubbling sound. The printer’s button will glow teal. Your Glowforge is on!

## Sign in and connect your Glowforge to Wi-Fi

Your Wi-Fi network must be 2.4 GHz b/g/n and WPA2, WPA, WEP, or open. Note that every user must have their own account. If another user needs an account, [follow the instructions on our support site](#). It is a violation of your agreement to allow anyone other than you to use your Glowforge online account.

### 1 Get Ready

Find a device that uses Wi-Fi to access the internet, like a laptop computer. Go to [community.glowforge.com](http://community.glowforge.com) and make sure the page loads correctly.



### 2 Begin Setup

To begin setup, go to [setup.glowforge.com](http://setup.glowforge.com)

### 3 Sign In

Your username is the email you used when placing your order. If you have not used your Glowforge account yet, you can set up your password by clicking “Forgot password?” You’ll receive an email to help you create or reset your password.

**Glowforge Owners**

remember me

[forgot password?](#)  
[no password?](#)

SIGN IN

### 4 Enable Airplane Mode

If you are using a phone or other device that can access the internet through the cellular network, turn on airplane mode. Otherwise, it will use the cellular network, and won’t communicate with your Glowforge in the next step.

**5**

### Connect to Your Glowforge Printer's Wi-Fi

Your Glowforge is now broadcasting a special Wi-Fi channel so you can connect to it and finish setting it up. Follow the instructions on screen to connect to your Glowforge printer's Wi-Fi. You will not be able to access the internet again until you either finish, or stop and reconnect to your usual Wi-Fi network.

**6**

### Your Glowforge Will Begin to Calibrate

When you connect successfully, the printer head will center and begin its calibration process before completing and moving back to the printer's back left corner.

**7**

### You Are Connected

Your Glowforge is now connected to the internet and ready to print!

## Proofgrade™ Materials

### Your Proofgrade Materials

Every new Glowforge comes with a selection of Proofgrade materials. Proofgrade materials are designed especially for your Glowforge to help you get perfect prints every time. They come with a protective layer that dramatically improves the print quality and allows you to draw directly on the material for use with Trace. Each piece of Proofgrade material has been labeled with a code that your Glowforge can read, which tells it exactly which settings to use to produce pristine cuts and engravings.





# Using Your Glowforge Pro

**Be sure to review Laser Safety before operating your Glowforge Pro.**

## Moving material through the passthrough slot

- Your material must move from front to back.
- If your material is long enough to stick out either end, make sure that you support it so that the part inside your Glowforge stays flat on the crumb tray.
- If you've made a lot of cuts, it can help to open the lid and remove the pieces before you slide your material along. (A little tape can work wonders here to help you extract little pieces that are hard to pick up otherwise.)
- When you're moving your material, It's ok to pull it from the back, and you can pull hard if you need to!
- As you slide your material, you may need to adjust your supports -- make sure that your material continues to lie flat on the crumb tray.



## Pro Shields

### Installing and removing your Pro Shields

Your Pro Shields finger-screw right into the front and back passthrough slots of your Glowforge Pro to ensure that nothing - material or laser light - comes in or out when the slot is not in use.





The Pro Shields should always be installed except while the passthrough slot is in use. The Laser Safety Officer (LSO) training provided to Pro customers has important information about the Pro Shields.

## Installing your Pro Shields

### 1 Turn off your Glowforge

Turn off your Glowforge using the power switch on the back. The lights and button should be off.

### 2 Lower the front door and remove the crumb tray

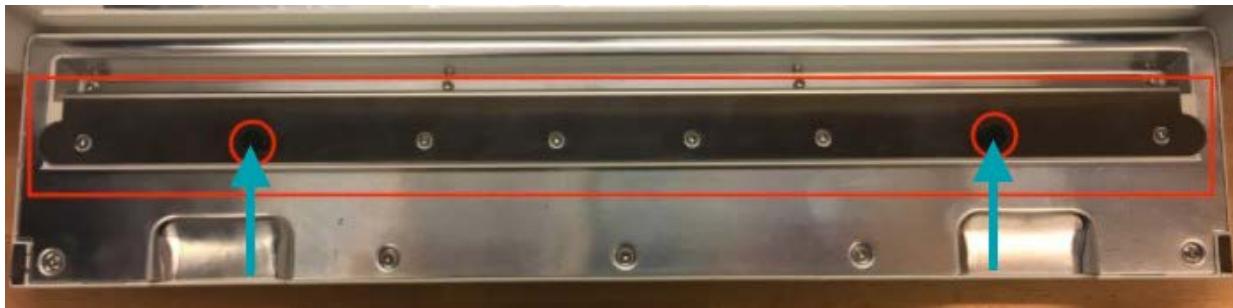
Lift the lid, then lower the front door. Lift the crumb tray slightly and slide it towards you to remove it. Be careful not to tilt the crumb tray up, or it will knock into the laser arm and rails. Leave the front door open.

### 3 Install the front Pro Shield

1. The front Pro Shield has a rectangular edge and six circular holes which align perfectly with the screws already in the front door of your Glowforge.
2. With the rectangular edge facing away from you, align the two black screws on the front Pro Shield with the two open screw holes near the passthrough slot. The rectangular edge of the Pro Shield should be facing the inside of the Glowforge as pictured.
3. Using your fingers, screw the two black knobs clockwise to secure your Pro Shield.

### 4 Using two hands, gently pull the laser arm to the front of your Glowforge

This will expose the back of your Glowforge so you can easily install the back Pro Shield.



### 5 Align the back Pro Shield against the passthrough slot on the inside of the Glowforge

The back Pro Shield is an oval and has no screw holes aside from a black finger screw on either end. Using your fingers, screw the two black knobs clockwise to secure your Pro Shield.



- 6** Reinstall your crumb tray, close the front door, and turn on your Glowforge!  
Instructions for [installing your crumb tray](#) are available if you'd like a refresher.

## Removing your Pro Shields (optional)

**1 Turn off your Glowforge**

Turn off your Glowforge using the power switch on the back. The lights and button should be off.

**2 Lower the front door and remove the crumb tray**

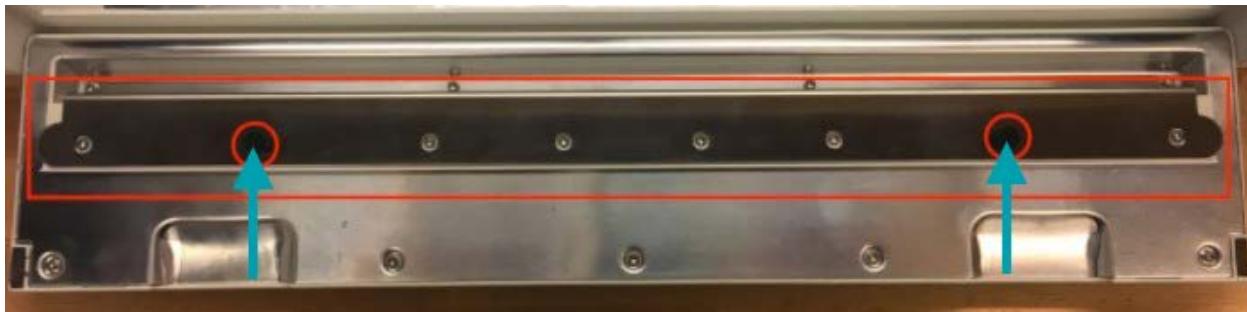
Lift the lid, then lower the front door. Lift the crumb tray slightly and slide it towards you to remove it. Be careful not to tilt the crumb tray up, or it will knock into the laser arm and rails. Leave the front door open.

**3 Remove the front Pro Shield from the front door of your Glowforge**

With the front door opened, turn the black finger screws on either end of the Pro Shield counterclockwise to unscrew them, then lift the shield away from the front door.

**4 Using two hands, gently pull the laser arm to the front of your Glowforge**

This will expose the rear Pro Shield so you can easily remove it



**5****Remove the back Pro Shield from the inner back wall of your Glowforge**

Turn the black finger screws on either end of the Pro Shield counterclockwise to unscrew them, then lift the shield away from the wall.

**6****Reinstall your crumb tray, close the front door, and turn on your Glowforge!**

Instructions for [installing your crumb tray](#) are available.

## Cleaning, Service, & Moving

### Power Off

Always turn your Glowforge off before cleaning

### Floor and crumb tray

Remove leftover cutting and engraving bits from the floor and the crumb tray whenever there is a buildup. Bits on the tray can prop your material up in the air, and a buildup of cutting and engraving bits can create a fire hazard.

**1**

To remove the crumb tray, lift the lid, then swing down the front door. Lift the crumb tray slightly and slide it towards you. Be careful not to tilt the crumb tray up, or it will knock into the printer head and rails.

**2**

Tilt the tray handle side down over a trash bin and empty out all the tiny remains of past projects that have fallen through the metal grid. If necessary, turn the tray upside down and shake out anything that's left. Use cotton swabs to gently remove bits that get caught. Be careful not to bend the grid.

**3**

Wipe the metal floor of the Glowforge printer with a soft cloth to sweep away any bits.



- 4 Pay special attention that the four dimples where the crumb tray sits are clean. If anything sits in those dimples, the Glowforge printer may not be able to focus correctly, and the camera will be out of alignment.



- 5 Return the crumb tray to the original location, sliding it in horizontally. Be careful not to contact the printer head or the rails. When it is in place, the tray's four feet will drop into the small dimples and it will no longer slide.

### Things that need wiping

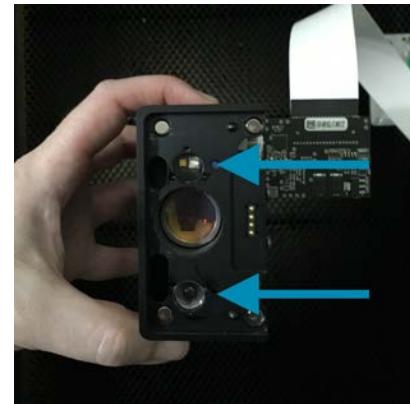
After every 40 hours of printing, use ZEISS lens cleaning wipes (available on Amazon and many other stores) to clean the cameras, laser lens, and windows. This will keep the printer working properly and prevent permanent damage to your printer.

- 1 Turn off your Glowforge. Grasp the printer head as shown, and pull gently up and back to disengage the magnets and remove it.





- 2** Turning the printer head over, use a ZEISS cleaning wipe to gently wipe the small window on either side of the lens.



- 3** Gently insert the lens tool into the bottom of the head with the “Remove” arrow pointing in. When you hear the magnet click, withdraw the tool and the lens.



- 4** Gently slide the lens off the lens tool and wipe both sides with a lens wipe. Be careful to touch only the metal ring to avoid fingerprints on the lens.





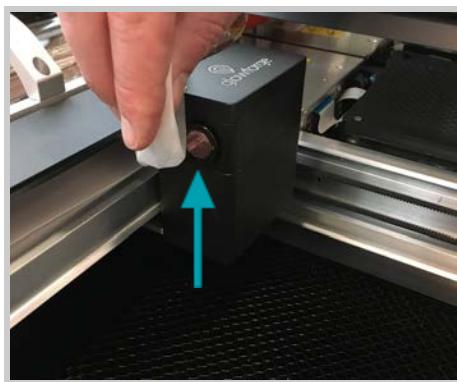
- 5** Flip the lens tool until the “Install” arrow points up. Set the lens down on the lens tool. The open side goes away from the blue plastic, so it looks like a bowl on top of the tool. It will sit firmly on the tool and will not wiggle. Slide the lens tool up into the printer head until the magnet clicks, then remove the tool.



- 6** Review instructions for snapping in your printer head, then put the head back on.



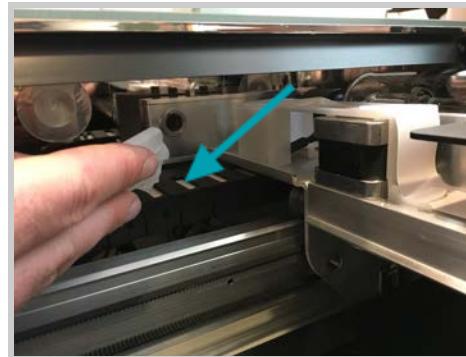
- 7** Wipe the window on the left side of the head.





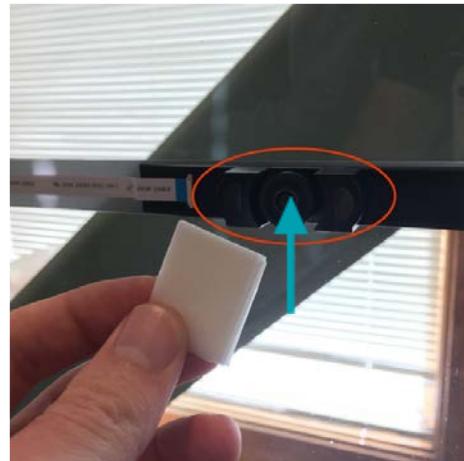
8

Carefully reach over the left rail and wipe the laser window on the left side of the bed.



9

Finally, gently wipe the lens of the wide angle camera on the printer's lid.



10

It's normal for some dust to accumulate inside your Glowforge. It is not necessary, but you can wipe the laser tube or the inside of the case with additional ZEISS cleaning wipes. Allow any moisture to dry completely before turning on your Glowforge again.

### **Wiping the Mirror in the Printer Head**

After approximately every 120 hours of printing, use ZEISS lens cleaning wipes (available on Amazon and many other stores) to clean the mirror in your Printer Head.

1

Turn off your Glowforge.

2

Open the lid and gently move the printer head to the center of the laser arm.

**3**

The top of the printer head is held on by strong magnets. Grasping only the top, pull up carefully to remove it and set it aside.

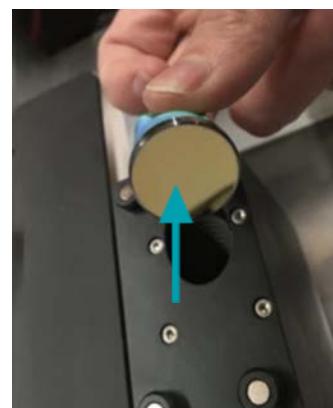
**4**

Gently pick up the mirror.

**5**

Inspect and clean the mirror.

- Be careful not to touch the mirror surface with your bare fingers.
- Using a Zeiss wipe, gently wipe the surface of the mirror.
- Use several passes until the mirror is clean, each time moving to an unused portion of the lens wipe.



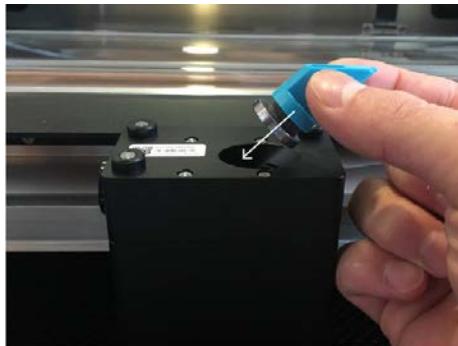
**Note:** If the mirror has a spot in the middle of it after cleaning, or is generally unable to be cleaned to a reflective finish, it needs to be replaced. Please take a photo, share it with us, and skip the rest of these instructions.



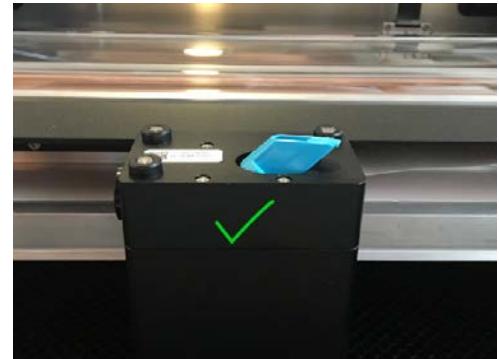
## 6 If the mirror is unblemished, replace it carefully

**Important:** Replacing the mirror incorrectly can permanently damage your Glowforge. Fortunately, we designed it to be easy!

- Hold the mirror by the handle and gently slide it into the notch with the mirror at a 45 degree angle to the top of the Printer Head.

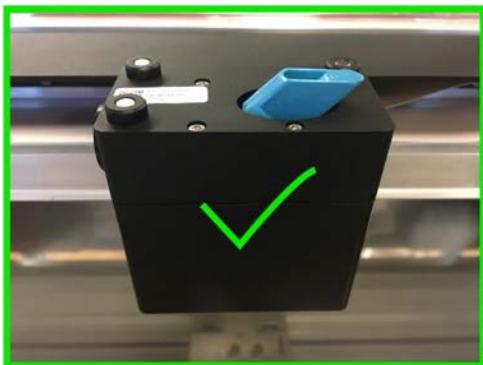


## 7 Set the mirror gently back into the notch so that the Glowforge logo on the handle faces up and is parallel to the floor. It will rest softly in place - there is no need to push it in.





The mirror handle should look like this:



It should NOT look like any of the below:



- 8 Tap the blue handle once. This will help ensure that the mirror is resting properly in place.

- 9 Replace the top of the printer head.

- 10 Close the lid of your Glowforge and turn it on.



## Additional Tidying

It's normal for some dust to accumulate inside your Glowforge. It is not necessary, but you can clean the circuit boards, laser tube, and inside the case.

To avoid damage to your Glowforge, follow these instructions very closely:

### 1 Turn off Your Glowforge

### 2 Remove the Crumb Tray

Follow the instructions to remove the Crumb Tray for access to additional surfaces. Do not remove any other parts and do not loosen or remove any fasteners.

### 3 Blow Dust off the Circuit Board on the Printer Head

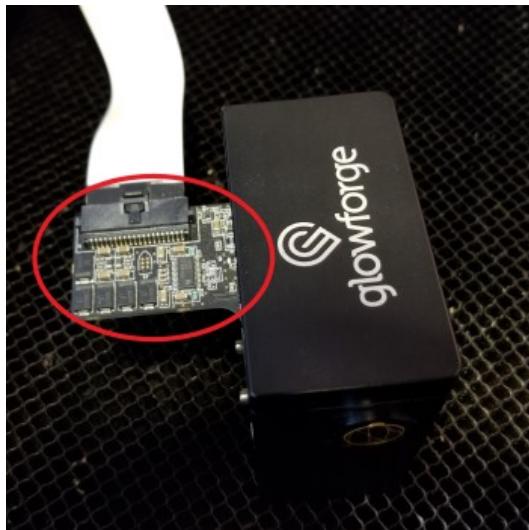
Over time, debris can build up on the circuit board on your Printer Head. It's not necessary to clean it. But if you'd like to, here's how:

- Grasp the Printer Head as shown, and pull gently up and back to disengage the magnets and remove it.





- Without disconnecting the wire ribbon, use canned air to blow the dust away from the circuit board.



- Review instructions for snapping in your Printer Head, then put the printer head back on.



4

#### Blow Dust off the Circuit Board in the Case

There's another circuit board on the left side of your printer. It's not necessary to clean this one either. If you'd prefer to, follow the steps here:

- Use both hands to gently move the laser arm to the front of the bed. You'll see the circuit board on the left side of your printer.



- Use canned air to blow the dust away.



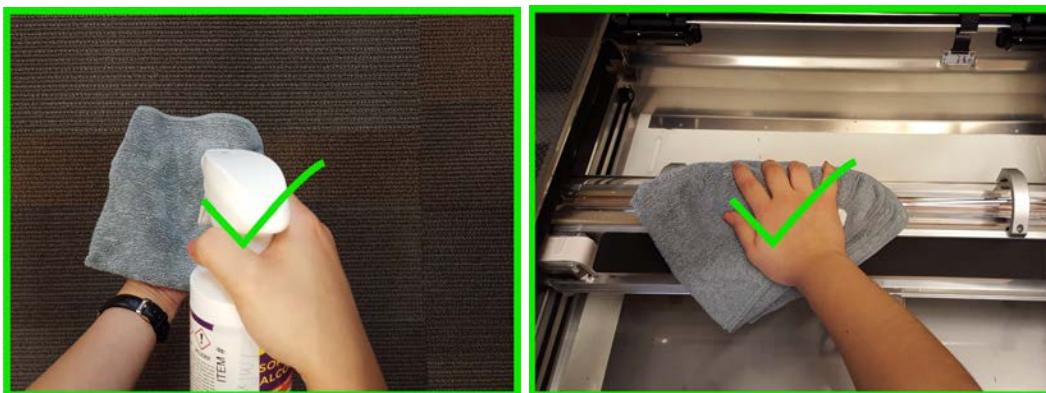
- Use both hands to roll the laser arm back to the middle of the bed.

5

## Spray a Lint-Free Cloth

If you want to use Isopropyl Alcohol, spray it on a lint-free cloth, then wipe debris away with the damp cloth.

**Important:** Never spray liquid on or in your Glowforge printer.



6

## Allow All Moisture to Dry Completely

Wait for your Glowforge printer to dry completely before turning it back on.



## Exhaust

- 1 Remove Hose from printer.** Squeeze the two ends of the ring clamp together and pull the clamp and the hose away from your Glowforge to remove them.
- 2 Use a vacuum** to remove dust and debris from your Glowforge printer's exhaust connection as well as from your outdoor exhaust vent.
- 3 Replace your hose**, or use a vacuum to remove dust and debris from the hose. The exhaust is a standard 4" (10.1 cm) exhaust vent, similar to what you would use with a clothes dryer. You can see it here:



<http://www.homedepot.com/p/GE-4-in-x-8-ft-Dryer-Duct-PM8X73DS/100050673>

## Service

The Glowforge printer may not be serviced or repaired by the user. Should service or repair be required, it must be returned to the factory; contact [glowforge.com/help](http://glowforge.com/help) for instructions.



## Moving Your Glowforge

### Moving to a new Wi-Fi network

- 1** Using a device that connects to the internet via Wi-Fi, go to [setup.glowforge.com](https://setup.glowforge.com) and sign in.
- 2** Turn on your Glowforge and wait until all motion has stopped for 30 seconds.
- 3** Hold down the button on your Glowforge for ten seconds, until it glows with a teal color.
- 4** Follow the instructions on screen to connect your Glowforge to Wi-Fi.

**Glowforge Owners**

email

password

remember me      [forgot password?](#)      [no password?](#)

**SIGN IN**

## Packaging Your Glowforge

Whether it's for a big move, taking your Glowforge to an event, or for any warranty repair, you'll need to package your Glowforge properly with the original boxes, foam blocks, and important orange and red bits. The box is specially designed to protect your Glowforge through all shipments, domestic and international. Leaving out any pieces can endanger your Glowforge. For example, if you move your Glowforge without the red knobs that lock the laser arm in place, you might break the laser tube.

Should you need to purchase a replacement shipping box for \$249, they are available in our [online shop here](#).

### Power Off and Unplug Your Glowforge

Always turn your Glowforge off before packaging any part of your printer. Unplug your printer and set the power cord aside.

### Remove the Printer Head

- 1 Position the Laser Arm**  
Gently push the laser arm to the back of the Glowforge
- 2 Remove the Printer Head**  
Holding only the finished black surfaces, grasp the printer head as shown. Pull gently up and back to disengage the magnets and remove the head.



**3**

### Unplug the Wire Ribbon

Push down fully on the wire ribbon tab to unplug

the wire ribbon from the printer head. Pull the wire ribbon gently away and tuck it into the laser arm.

**4**

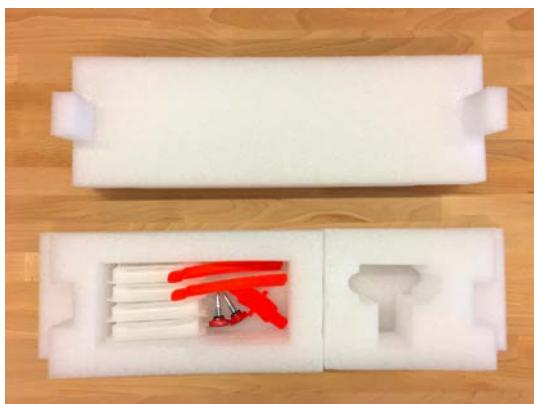
### Insert the Orange Foam

Being careful to only touch the finished black surfaces, insert the orange foam into the head

**5**

### Place Printer Head and Power Cord in Foam Block

Remove all the packaging pieces stored in the white rear foam block. Gently lay the printer head and power cord into the foam as pictured. (Note: Do not return power cord during a repair or warranty replacement.)





## Remove the Crumb Tray and Exhaust

Remove the crumb tray and exhaust vent following the instructions below. The crumb tray, exhaust hose, and lens tool are packed in the Accessories Box.

### 1 Lower the Front Door and Remove the Crumb Tray

Lift the lid, then lower the front door. Lift the crumb tray slightly and slide it towards you. Be careful not to tilt the crumb tray up, or it will knock into the laser arm and rails.

### 2 Empty Your Crumb Tray

Lower the front lip of the crumb tray and dump the contents of the crumb tray catch area. Afterwards, you may invert the crumb tray to remove anything that may be left.

### 3 Wipe the Floor of Your Glowforge

Wipe the metal floor of the Glowforge printer with a soft cloth to sweep away any bits.

### 4 Remove the Exhaust

Squeeze the ends of the ring clamp together and pull it and the hose off the exhaust vent with a gentle tug.



**5**

### Pack Accessory Box

Place the crumb tray, exhaust vent, and ring clamps in your Glowforge Accessory Pack box



## Pack the printer Safely

It's important to package your Glowforge properly with the original boxes, foam blocks, and important orange and red bits.

**1**

### Place Red Strip on Both Rails

Push the laser arm to the back of the printer. Set the red silicone strips on the rails near the center of the printer with the knobby bit close to you as pictured.

**2**

### Position Laser Arm

Slide the laser arm forward so that it's resting on the silicone strips. You'll need to pick it up just a bit at the front, then the back, like taking a baby carriage up a curb.

**3**

### Attach the Clip

The clip snaps onto the bottom of the laser arm and pokes up into the metal plate. Align the left tab of the clip with the hole on the right side of the plate, then hook the back of the laser arm and pull the clip towards you and up. (It's much easier than it sounds.) When the clip is in place, the metal plate will no longer slide from side to side.

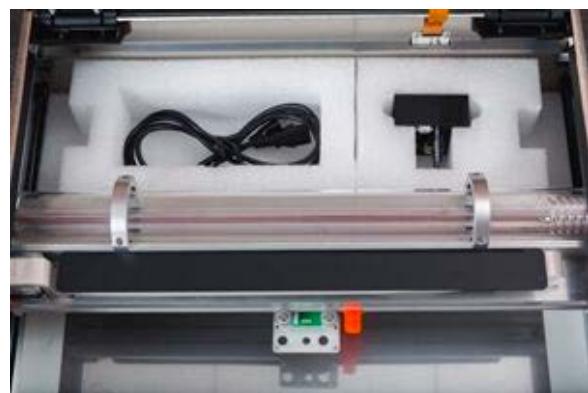




## 4

### Insert the Rear Foam Block

With the lid removed, insert the foam block containing the printer head and power cord into your Glowforge. The bottom will lay flat against the floor of your printer.



## 5

### Screw in Red Knobs

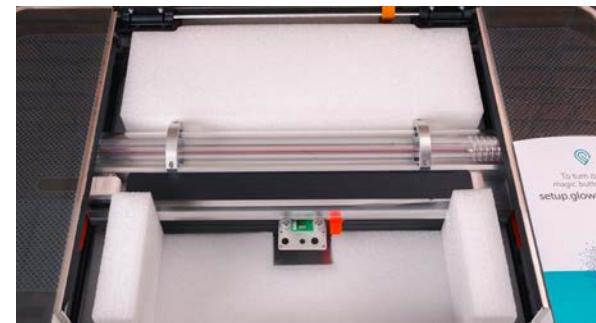
Locate the holes near the center of each rail. On both sides, screw the red knob through the hole in the laser arm to secure the laser arm to the rail. They must be screwed in as tight as your fingers will permit, but do not use a tool to tighten them.



## 6

### Insert the Rear Foam Lid and Front Foam Block

Place the lid of the rear foam block, covering the printer head and power cord. Place the final foam block in the front of your printer and close the front door.



**7**

### **Close the Lid and Box Glowforge**

Make sure the two black foam shells are in the bottom of the box. Have two people lift the Glowforge printer into the box. The printer will fit snugly into the foam inserts.

**8**

### **Place Top Foam**

Place the top layer of foam over your Glowforge. These pieces lay flat on your Glowforge.



If your Accessory pack shipped in the same box as your Glowforge, insert the top pad above the protective foam and place the Accessory pack on top of the pad.

**9**

### **Prepare to Lock Your Packaging**

Place the lid of your Glowforge Box over the printer and get out the four locking clips.





10

### Unlock All Four Handle Locks

Use the pull tab to open the handles. Position the two back flaps so they face directly inside the box.



11

### Insert Handle Locks

Insert all four handle locks so they sit flush against the outer box. Use your finger to gently lock the inner tabs down and up into their final position.





12

### Lock the Handle Locks In Place

Close the securing handle door and press to ensure it is locked in place. Your packaging should now be locked together and ready for transport.





# Make Your First Prints

## So you set up your Glowforge. Now what?

We've put together four easy designs that will introduce you to a range of essential Glowforge techniques. Just follow the step-by-step instructions, and you'll have the building blocks for years of creative printing.

## Learn Glowforge basics in four easy prints

Make these four prints and you'll learn the basics of creating and printing with your Glowforge. Try them in order and see just how easy and fun it is!

- **Print a catalog design** - When you sign in to [app.glowforge.com](https://app.glowforge.com), and go to the Dashboard, you'll see that we've started you off with a few of our favorite designs. You can find more at [catalog.glowforge.com](https://catalog.glowforge.com).
- **Trace and print a sketch** - Drawings or printed images can transform into digital designs that you can print on dozens of materials.
- **Print a design from scratch** - You can use shapes, text, and millions of graphics to create your own original designs. These creative tools are a part of the free 14-day Glowforge Premium trial included with the purchase of your Glowforge.
- **Print a design you've uploaded** - After your first three prints, you may want to create a design of your own using 3rd-party design software, or purchase a design from other makers. This article shows you how to print those designs.

## Continue learning and creating

When you've completed these four prints, you'll have performed a tour of the essential workings of your Glowforge – but that's just the beginning. The possibilities are endless, and every single day we see something we've never seen made on Glowforge before, made by people just like you.

We've put together a few more articles (titles on the left) that'll help you get the most out of your Glowforge and optimize your designs step-by-step. To keep learning more, as you complete one topic and activity, just click **Next** at the bottom of the article and continue on.

We'd love to see what you bring to life with your Glowforge. Just share on social and tag with [#glowforge](#).

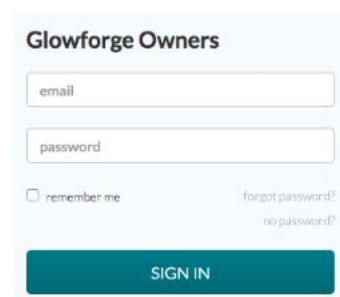


## 1: Print a Catalog Design

### Make a Gift of Good Measure keychain

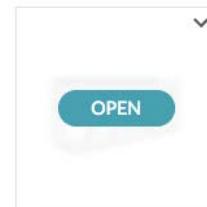
With this design, your first print will be both beautiful and useful. You can put this tool to work on your keychain or make several and hand them out to friends. And, you can make it in inches or metric.

- 1 Go to [app.glowforge.com](https://app.glowforge.com) and sign in.



The screenshot shows the 'Glowforge Owners' login page. It features two input fields for 'email' and 'password', a 'remember me' checkbox, and links for 'forgot password?' and 'no password?'. A large teal 'SIGN IN' button is at the bottom.

- 2 On the **Dashboard**, point to the **Gift of Good Measure** keychain design that you want (inches, or metric), and then click **Open**.



- 3 Place a piece of material from your **Proofgrade starter kit** in the bed of your **Glowforge**. Make sure the QR code is whole and visible. If it's not, you can select the material manually after you upload your file, just click Unknown at the top left of the screen, and then select from the list.



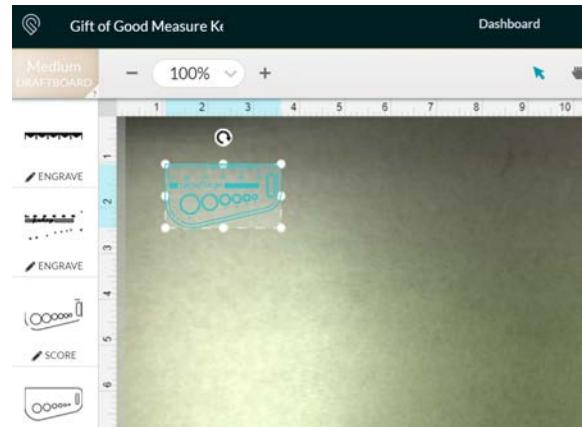
#### Notes

- To get the best print, it's best to leave a bit of space between the edge of the design and the edge of the material.
- If you're using a large piece of Proofgrade material, you will not see the entire piece of material. That's ok as long as you can see the design.



#### 4 Place and size your design.

You will see an image of your material in the workspace of the Glowforge app. Click and drag your design to place it where you want it on your material, and if you want to, resize it. The design will print approximately where you place the outline on the workspace.



#### 5 Time to print.

When you're happy with the placement and size of your design, in the app, click **Print** in the upper right-hand corner. The printer head will scan the material for a precise laser focus and the print sidebar will open. You'll see how long your design will take to print, and the button on your Glowforge will begin blinking.



#### 6 And now, the laser!

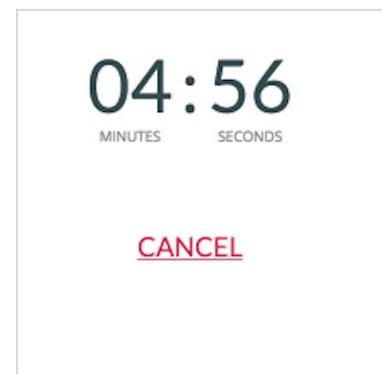
Press the blinking button on your Glowforge. It's important that you keep watch on your Glowforge while it is printing – luckily, it's really fun to watch a laser in action.

#### 7 Need to walk away?

If you need to step away, you can pause printing any time by pressing the white button. To resume, just press the button again and the print will continue. We take care of all the magic so that there's no visible interruption.

**Note:** If you open the lid or click **Cancel** it will cancel the print.

Just remember, don't leave your Glowforge unattended while it is printing.





8

### Reveal your Gift of Good Measure.

When the laser finishes, the fans will continue to whisk away the last wisps of exhaust for a few moments. Wait for the fans to stop, remove your print, and then peel away the protective layer to reveal the engraved material underneath.

**Tip:** To make this easier, you can put Gorilla Tape over the protective layer, and then peel both away.

Put your keychain through the slot and you're ready to measure anytime!



## 2: Trace and Print a Sketch

### Make a snap and store box with your personal touch

It's time to customize a print with your very own artwork. Not one for artwork, you say? Don't worry - with your Glowforge, even simple doodles look good.

It's easy. You'll draw something on paper, and then the camera in the lid of your Glowforge will convert your drawing to a digital file. You'll then add your drawing to a design we've provided to create a box that's uniquely yours.

### Laser design basics

Before you continue, it's useful to understand the three things your laser does.

- **Cut:** The laser moves slowly along a path, at full power, to cut all the way through the material.
- **Score:** The laser moves quickly along a path, at lower power, to draw a line that does not go all the way through the material.
- **Engrave:** The laser moves quickly back and forth, turning on and off thousands of times per second, to create an image on the surface.



## Create and customize your Snap and Store box



1

Go to [app.glowforge.com](https://app.glowforge.com) and sign in.

### Glowforge Owners

remember me

[forgot password?](#)

[no password?](#)

**SIGN IN**

2

On the **Dashboard**, point to the **Snap and Store Box** design, and click on the design thumbnail.

3

### Create your art.

You have a host of options to create your unique box lid. Here are a few ideas to choose from. Pick whichever one inspires you, try them all, or create your own!



### The Artist

Draw a picture with a black marker on a white piece of paper. Stay away from the edges so there's some white on every side of your drawing.

**Tip:** In the middle of your drawing, leave room for the box handle.

### The Poet

Using a black marker, write a favorite quote or song lyric, or sign your name on a blank white piece of paper.

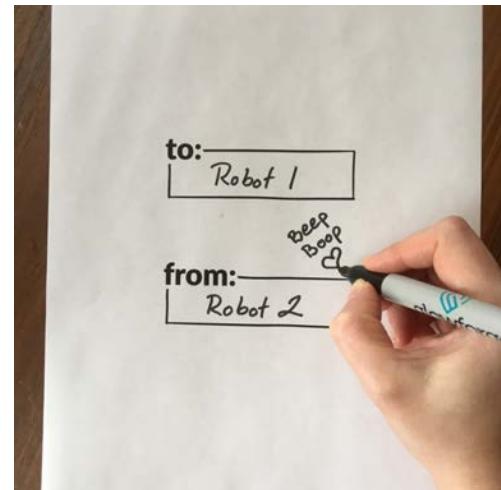
### The Good Friend

Print [this template](#) out on a paper printer (not your Glowforge!) and use a black marker to fill in the blanks.

### The Shadow Master

Grab something nearby: a shoe, a leaf, a doll, your other hand - and plunk it on a blank white piece of paper. Trace around the edges with a black marker.

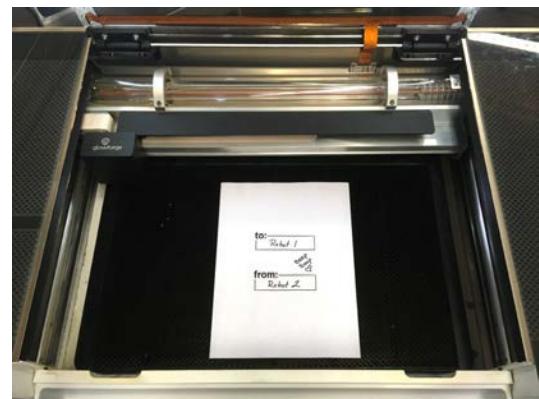
We'll use The Good Friend option for our example:



4

### Put your art in your Glowforge.

Lift the lid of your Glowforge, place your artwork in the center of the bed, and close the lid.

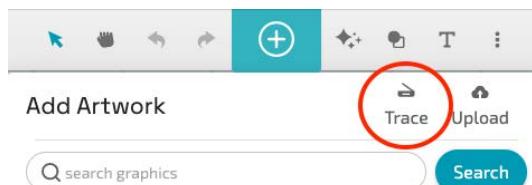




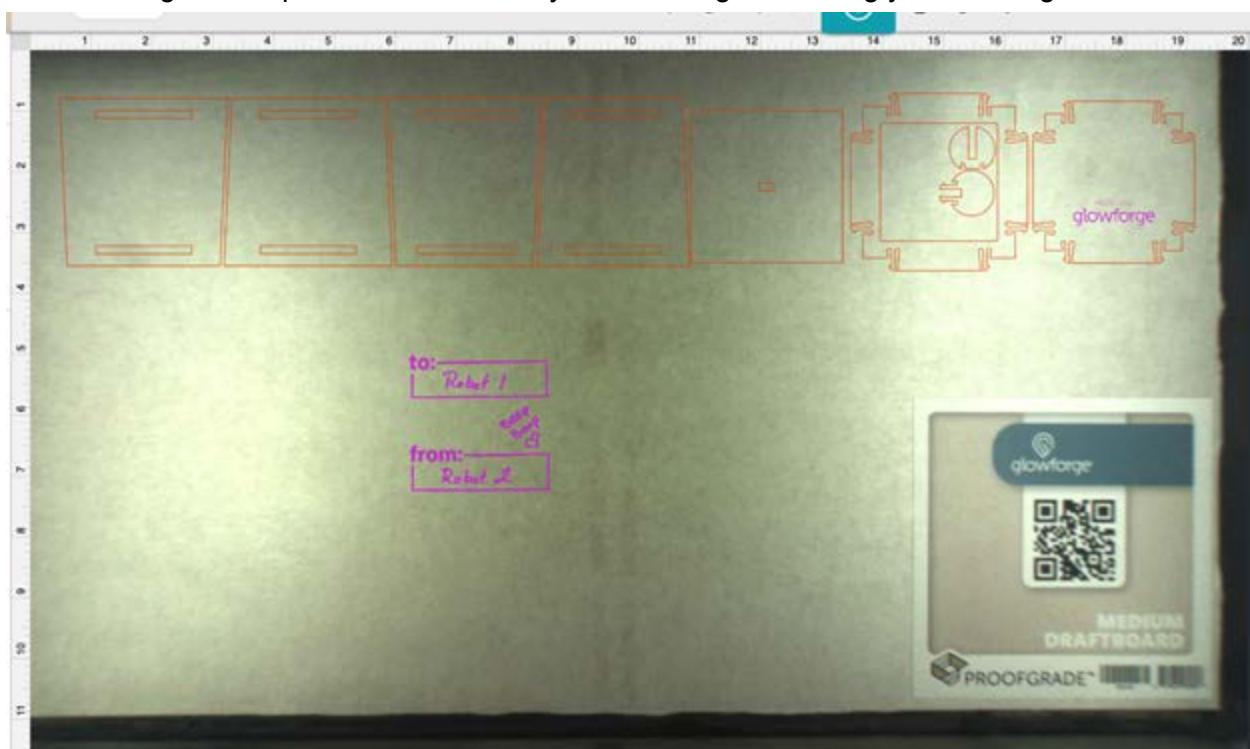
5

### Add your artwork to the print design.

In the middle of the app, click the **Import artwork** button, and then click **Trace**.



In the app, when the workspace loads, you'll see the box design and a picture of the bed of your Glowforge, including your drawing.

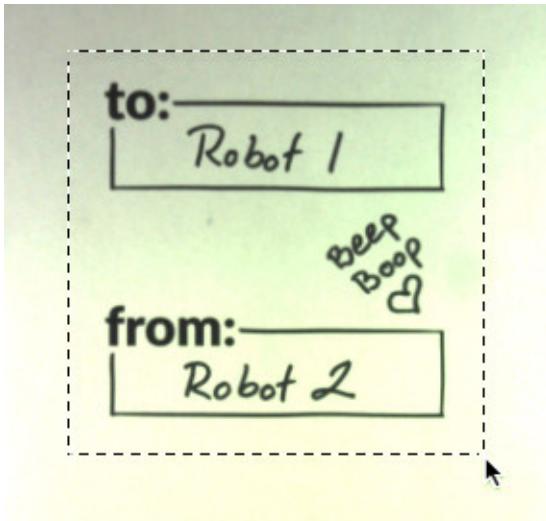


6

### Select your artwork.

When you see the image of your drawing in the app, click and drag a square around the artwork that you want to trace. You'll see a preview of what your Glowforge will engrave. Anything in black will be engraved, and nothing else will be.

If you want to change your selection, click **Undo** in the app and try again.





7

To refine details, click the item you want to change, and then use these keyboard shortcuts to make changes.

Change	Windows	Mac
To darken a line	Control + Up Arrow	Command + Up Arrow
To lighten a line	Control + Down Arrow	Command + Down Arrow
To remove small details like dirt and noise	Control + Shift + Up Arrow	Command + Shift + Up Arrow
To restore small details	Control + Shift + Down Arrow	Command + Shift + Down Arrow
To delete a design item	Delete key	Delete key

8

### Choose what to cut.

If you drew a closed shape, you can click it to cut it out. For example, in this image, we clicked inside of the heart so that it will be cut out.

to: Robot 1



from: Robot 2

9

### Place your artwork.

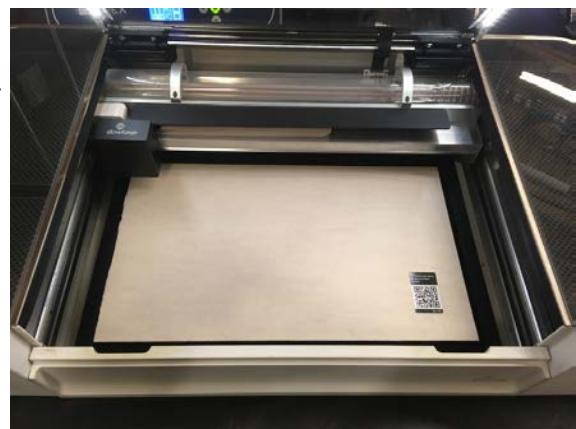
When you're happy with your trace, in the upper right, click **Place Artwork**. This will take you back to the workspace with your newly digitized artwork sitting on top of your piece of paper.

PLACE ARTWORK

10

### Remove the drawing, and insert your material.

Place a piece of medium Proofgrade plywood on the center of the printer bed (it is very important you use medium Proofgrade Plywood so that the pieces fit together), and then close the lid.





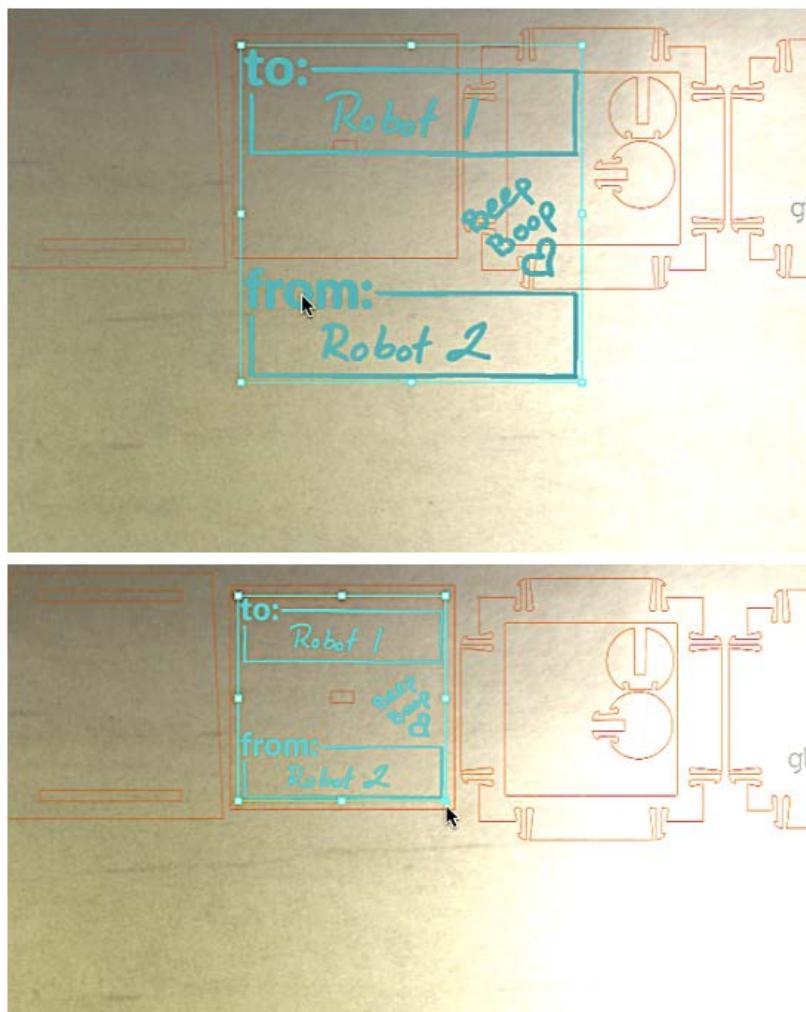
11

### Size your artwork and place it in the design.

In the app, the workspace shows both design and artwork above your material.

- A. Drag the box design to the part of the board where you'd like it printed. The top left corner will help you to save material.
- B. Place your traced artwork within the design. In this example, we've dragged the artwork onto the box lid.
- C. Click and drag a corner to shrink your artwork to fit where you want to put it. Any artwork outside the outer lines of the box design will be cut off. Be careful not to resize the box design!
- D. To fine-tune placement, you can nudge selected objects using your arrow keys. To get bigger nudges, hold the Shift key while using the arrow keys.

**Tip:** You can place artwork on any of the box's surfaces. Just note that two of the sides are cut out upside down to save material, so make sure your artwork is placed the right way up for the surface it's on.



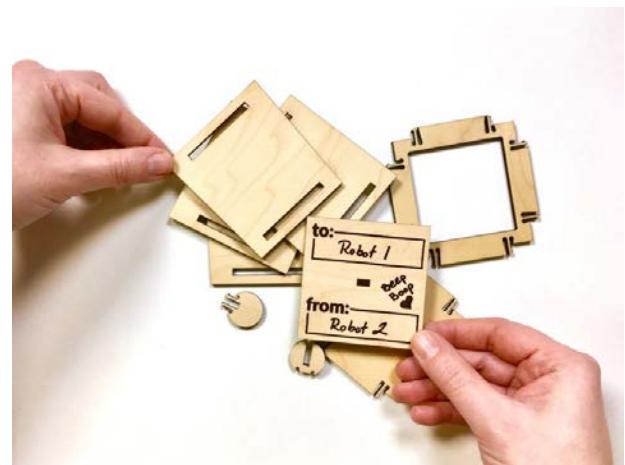


## 12 Print!

When you are satisfied with your print steps, click **Print** in the app, and when the button on your Glowforge starts glowing, press it.

## 13 Watch your Glowforge (always!) while it's printing.

When the button stops glowing and the fans stop, remove your print, peel off the protective layer, and get ready to assemble.



## 14 Put it together.

To get the step-by-step instructions to turn that beautiful collection of box pieces into an actual Snap and Store Box:

- A. Go back to your workspace where you were printing the box (if you don't have the box open on screen - open it again), and click on the 3 dot **More** options menu.
- B. Click **Design Details**, and then the instructions will show on the right.
- C. Follow the steps, and you'll be holding your finished box in just minutes.



### 3: Make a Gift Tag from Scratch using Premium Creative Tools

We love giving gifts – especially ones we've made ourselves – and a custom gift tag is the perfect finishing touch.

There are four basic steps to create your customized gift tag with your Glowforge – it only takes a few minutes! First, you will select the overall tag design, next you'll create a hole at the top of the tag, then add your text, and finally, print!

For this design, you'll use some of the Premium design tools. You get 14 days of free access to [Glowforge Premium](#) included with the purchase of your Glowforge.



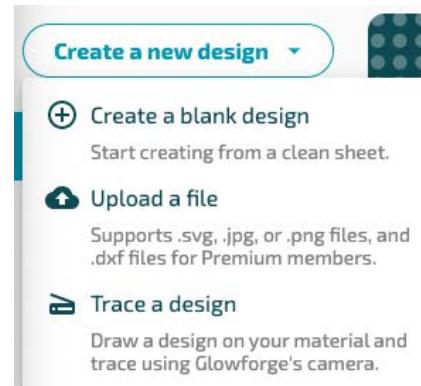
#### First, create the tag design

- 1** Go to [app.glowforge.com](https://app.glowforge.com), and sign in.
- 2** Place a piece of material from your Proofgrade starter kit in the bed of your Glowforge. The remaining material you used for your Gift of Good Measure would be perfect.



**Note:** Make sure the QR code is whole and visible. If it's not, you can select the material manually after you upload your file, just click **Unknown** at the top left of the screen.

- 3** On the Dashboard, click **Create a new design**, and then click **Create a blank design**.



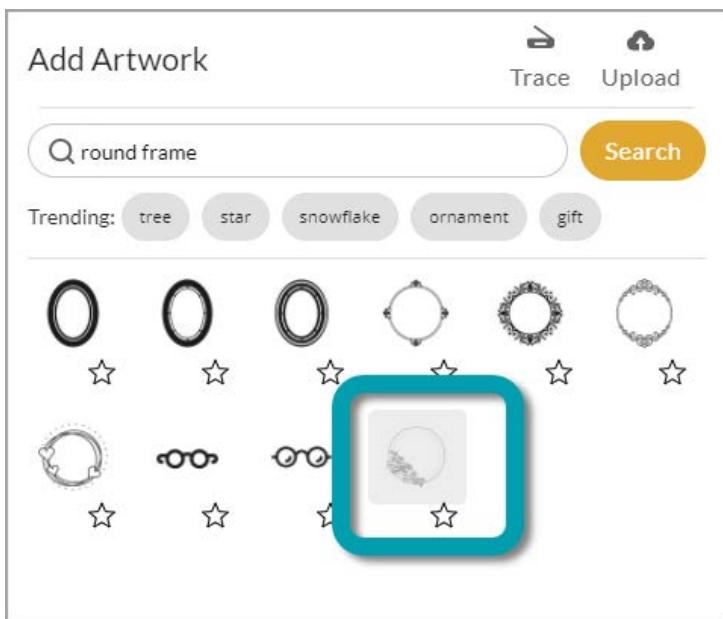
On the top of the workspace, click **Import artwork**.



- 5** In the search box, type “round frame,” and then click **Search**.

- 6** In the search results, select the frame with the flower design on the bottom left of the circle.

**Note:** It takes a moment for the artwork to be imported to the workspace.



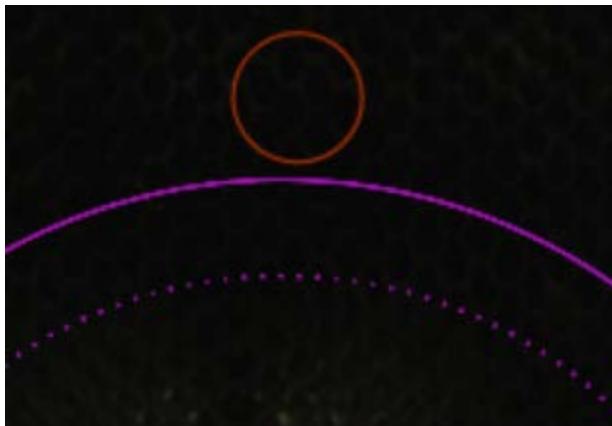
- 7** When the artwork appears on the workspace, drag one of the corners to enlarge it to the size you want. Make sure to leave enough space for the text that you will add.



**Tip:** To make the design easier to work with, you can make it larger for while you are designing, and then when you are finished and happy with your design, you can resize it smaller before you print.

### Next, add a hole to the top of the tag

- 1 Click **Insert shape** , and then click **Insert circle** .
- 2 Drag one of the corners and resize the circle to make it significantly smaller than the tag.
- 3 Drag the small circle to the top of the tag, just above the larger circle (almost, but not quite touching). This circle will be cut to make the hole for tying at the top of the tag. The top should look something like this.



- 4 Click and hold on a spot well outside of your tag, and then drag diagonally to select the entire design. When the entire design is selected, a toolbar appears on the right of the workspace.
- 5 On the toolbar, click **Create outline** , and then click **Create New Outline**. This creates an outline of the entire design that will be cut when you print.

**Note:** You can see the print steps in the workspace on the left. If you are using Proofgrade material, the correct Cut and Engrave settings will be automatically selected for you.



## Then, add your personalized text



- 1** Click **Insert text**. The text box appears on the workspace.  
With Glowforge Premium, you have access to over 900 professional fonts.
- 2** In the text box, type your “To” message, select the font that you want from the drop-down menu, and then drag, resize, and place the text box where you want it.
- Tip:** With more than 900 fonts to choose from, that's quite a list to scroll. You can keep your favorites near the top - just click the star next to the ones you like.
- 3** Add another text box. Type your “From” message in the text box, and then drag and resize your text the way you want it.
- 4** Add a final text box for your special occasion message. Again, type your message, select your font, and then drag and resize your text the way you want it.
- 5** When you're happy with your design, to move and/or resize the whole design before you print, click and hold on a spot well outside of your tag, and then drag diagonally to select the entire design.
- 6** With the whole design selected, you can resize, and then drag to place the tag where you want it to print on your material.

## Now, Print!

To print your design, click **PRINT** in the top right of the workspace. Then, when the button on your Glowforge starts blinking, press it and watch the laser go.

And just like that, you're ready to tie a bow and custom tag on your present. A great gift and a custom tag? Unforgettable!

## 4: Print a Design You've Uploaded

As you explore all you can create and print with your Glowforge, you'll likely find there are times when you want to create a design with third-party design software (such as Adobe Illustrator, Inkscape, or similar) or purchase a pre-made design from another maker.

In order to print those designs, you'll download them from their initial location, and then upload them to your **Dashboard** at [app.glowforge.com](https://app.glowforge.com). Here's how.



## Download the design from its original location

For our example, you'll create a handsome and useful pencil case.

- Go to [Premium Designs Pencil Case](#) and download and save the design. (To download the design, click Download, Save as, or similar in your PDF viewer.)



If you have already purchased a design or created one using design software, just make sure it is saved to your desktop.

## Prepare and create your print

- 1 Go to [app.glowforge.com](#) and sign in.

Glowforge Owners

  
  
 remember me      [forgot password?](#)  
[no password?](#)  

- 2 Place the material you want to use on the printer bed of your Glowforge.

For best results, we recommend Proofgrade plywood. Make sure the QR code is whole and visible. (If it's not, you can select the material manually after you upload your file. To do that, click **Unknown** at the top left of the screen, and then select your material from the list.)

**3****Upload the design.**

On the **Dashboard**, click **Create**, then **Upload** from file, and then select the pencil case design from where you saved it. Your design will open in the workspace. The design will appear as separate print steps on the left of the workspace.

**4****Place your design.**

Drag your whole design to place it where you want it on your material.

**Note:** To make sure that assembling the box works, don't resize the pencil box.

**5****Print!**

When you are satisfied with the placement of your design, click **PRINT** in the app, and then when the button on your Glowforge button starts glowing, press it and watch it print.

Now it's time to put the pencil case together.

### Assemble the pencil case

Just follow these steps, and you'll have a handy place for your pens and pencils in no time.

**Skills:** None required

**Assembly time:** 5 minutes

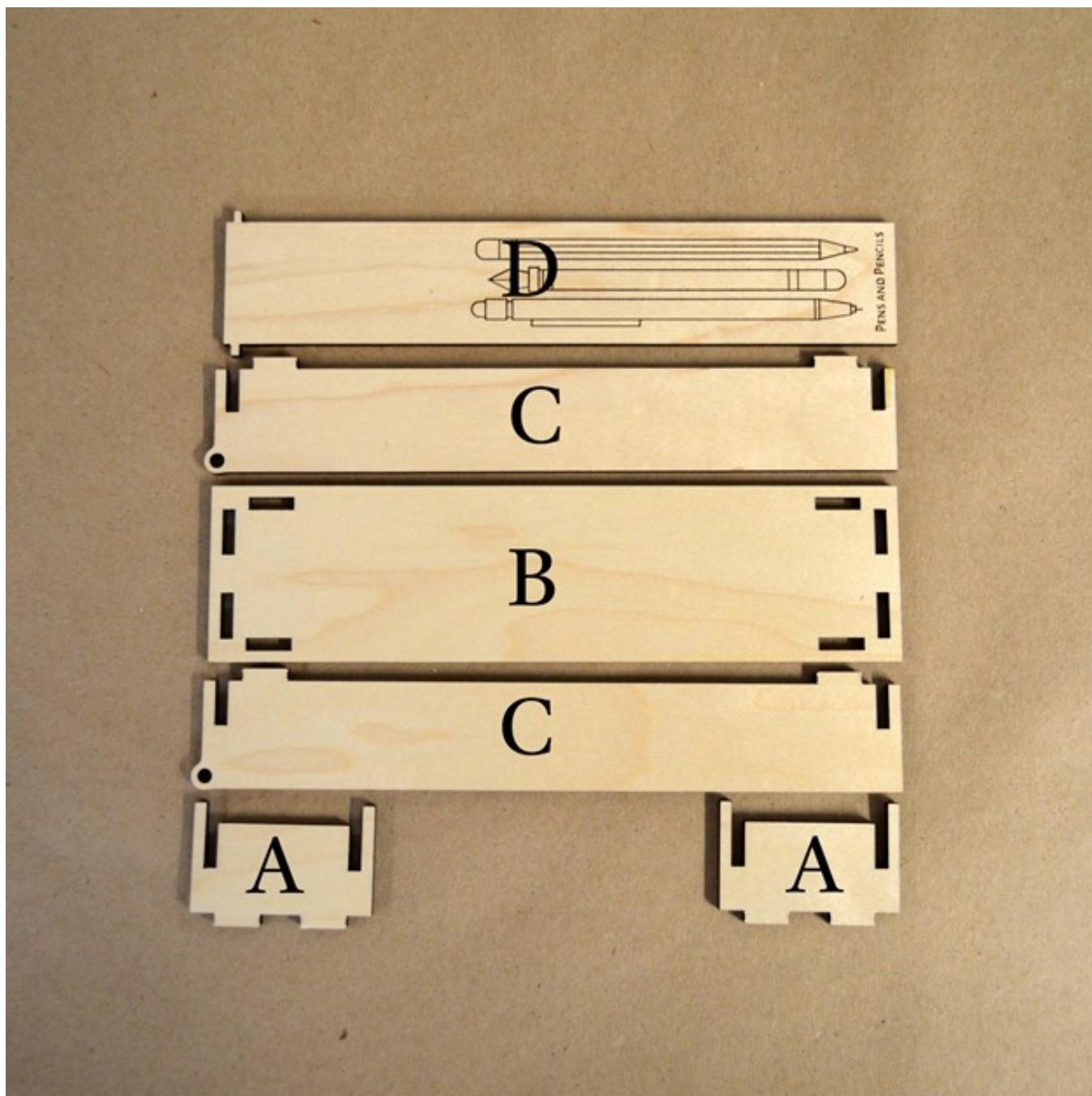
**Supplies:** Optional: Glue

**Tools:** No tools required

**Material:** Medium Plywood (approx 1/8 in, 1 sheet)



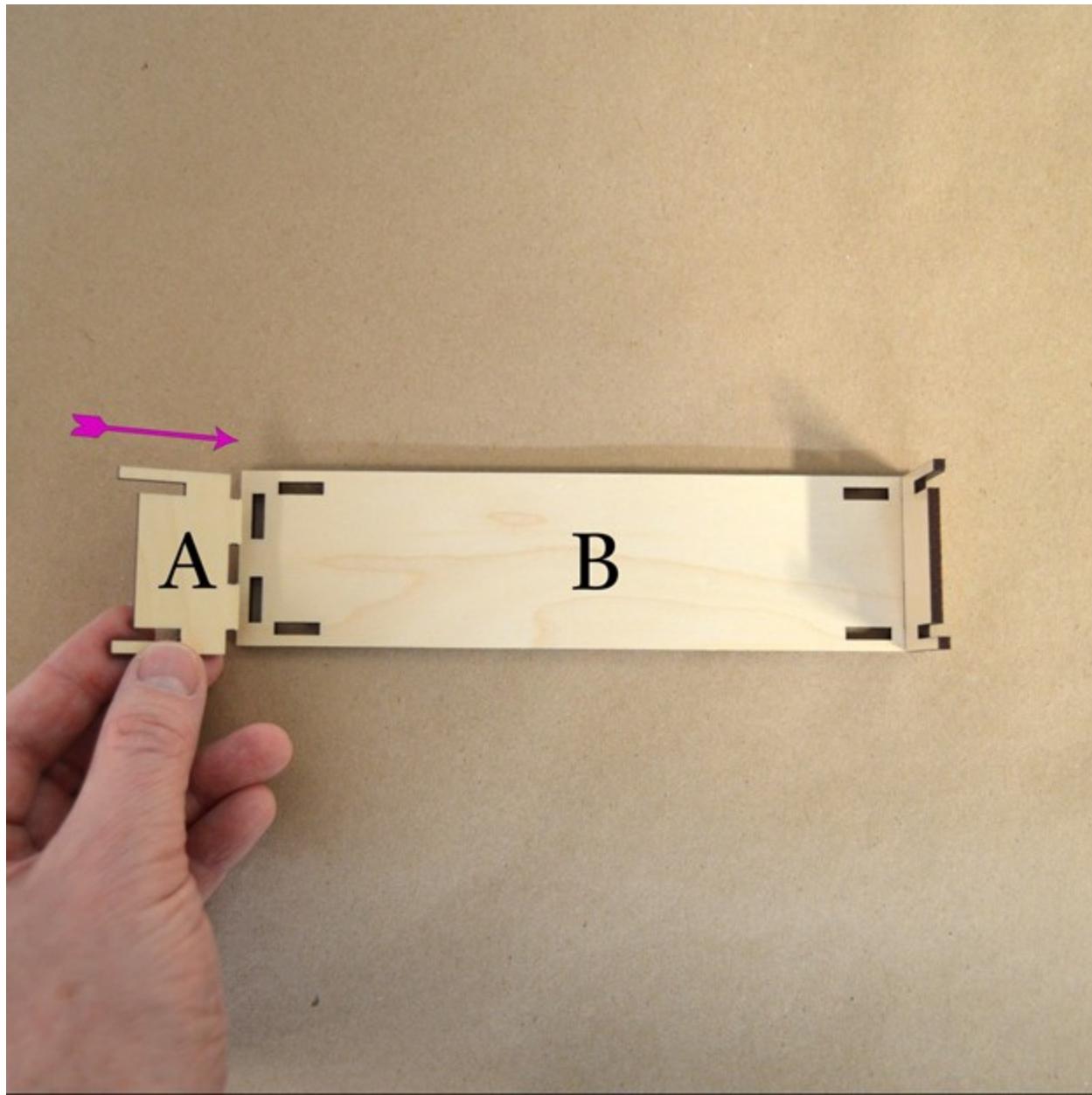
### Step 1: Gather and identify your pieces





### Step 2: Assemble the end pieces

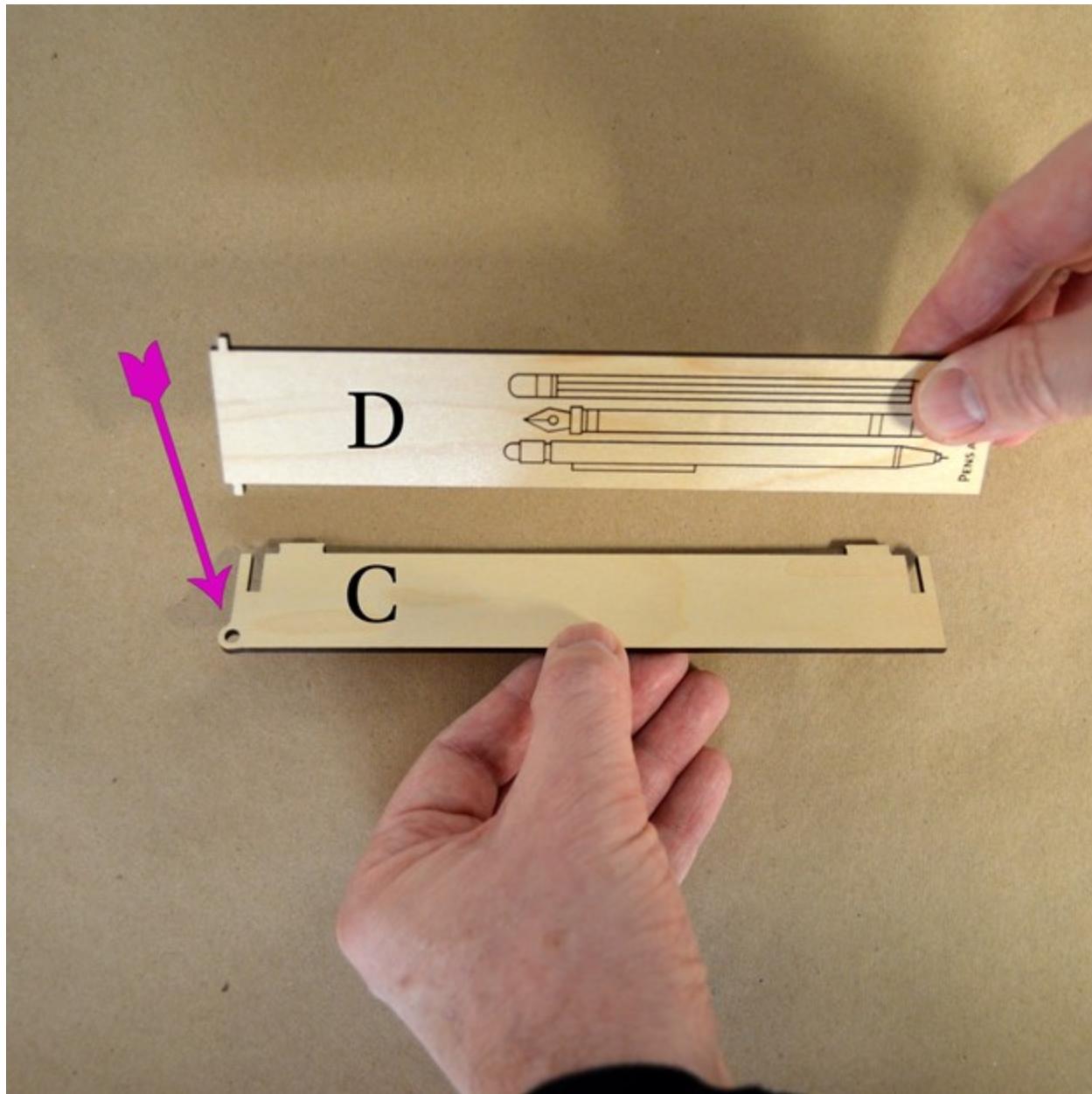
Firmly push both parts A into the end slots of part B as indicated.





### Step 3: Assemble the sides and lid

Insert the tab on part D into the hole in part C.

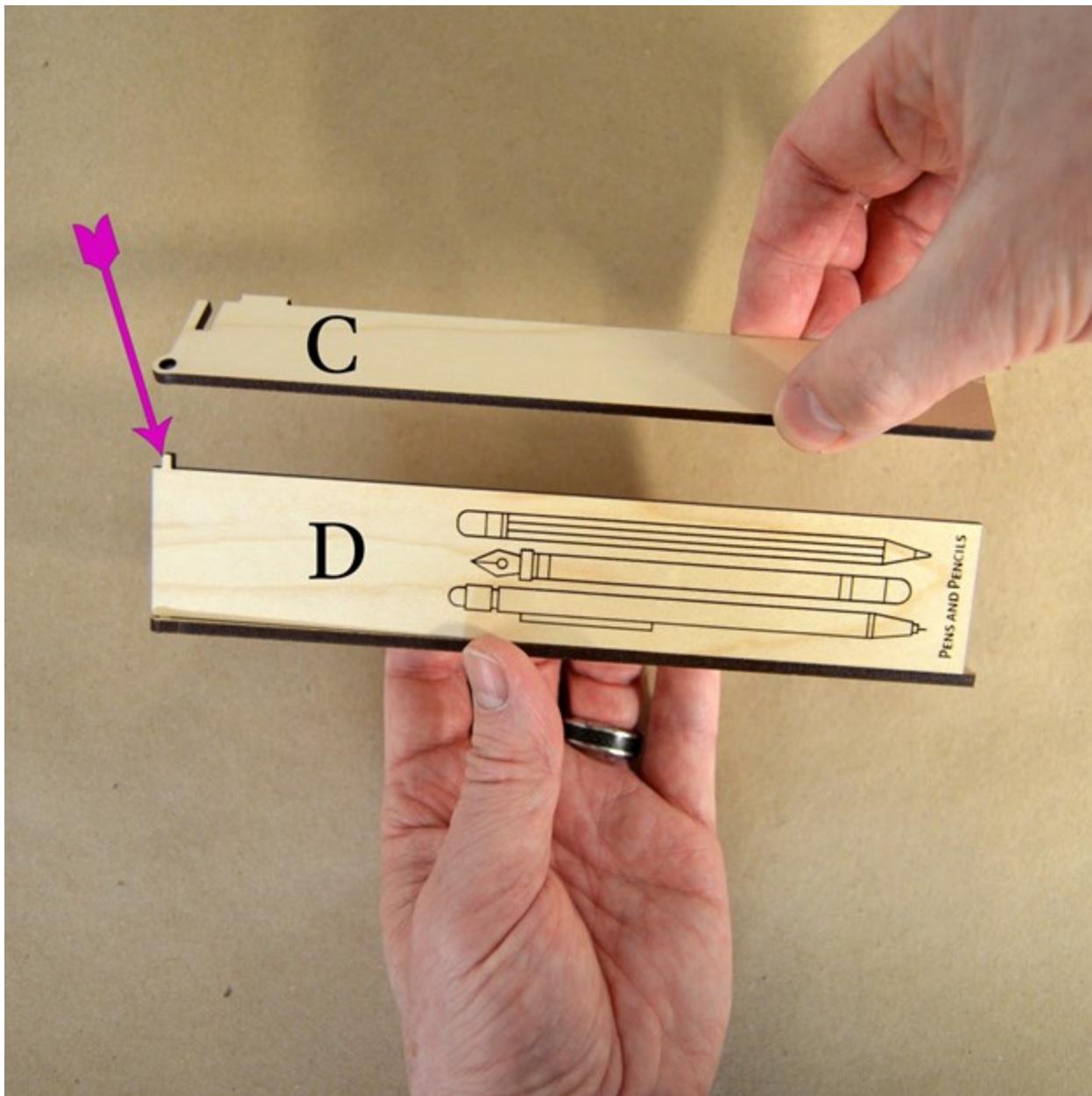




#### Step 4: Put it all together

While holding the assembly, insert the other tab on part D into the hole on the other part C.

Join the two assemblies together by sliding the slots of both assemblies together as indicated and sliding the tabs into the holes firmly.





Gather your pens and pencils together and enjoy!



## Make a Gift Tag from Scratch using Inkscape

### What Your Laser Can Do

To create a great design for your Glowforge, it's useful to understand the three things your laser can do.

- **Cut:** The laser moves slowly along a path, at full power, to cut all the way through the material.
- **Score:** The laser moves quickly along a path, at lower power, to draw a line.
- **Engrave:** The laser moves quickly back and forth, turning on and off thousands of times per second, to create an image on the surface.

If you're not familiar with vector design, it starts with two simple ideas: a stroke (which is an outline) and a fill (which is a filled-in shape). When you upload your file, strokes become cuts and fills become engravings. You can then switch a stroke to a score.

Each color is a different step in the printing process. You can assign different settings to each color.

For example, if you want one shape to be engraved lightly and another more deeply, fill each shape with a different color. Before printing, you can choose a light engrave setting for one and a dark setting for the other.



There are many vector graphics editors out there, but we'll use Inkscape for this example because it's free and available for both Mac and PC. Note that we can provide support for customers who are using either Inkscape or Adobe Illustrator.

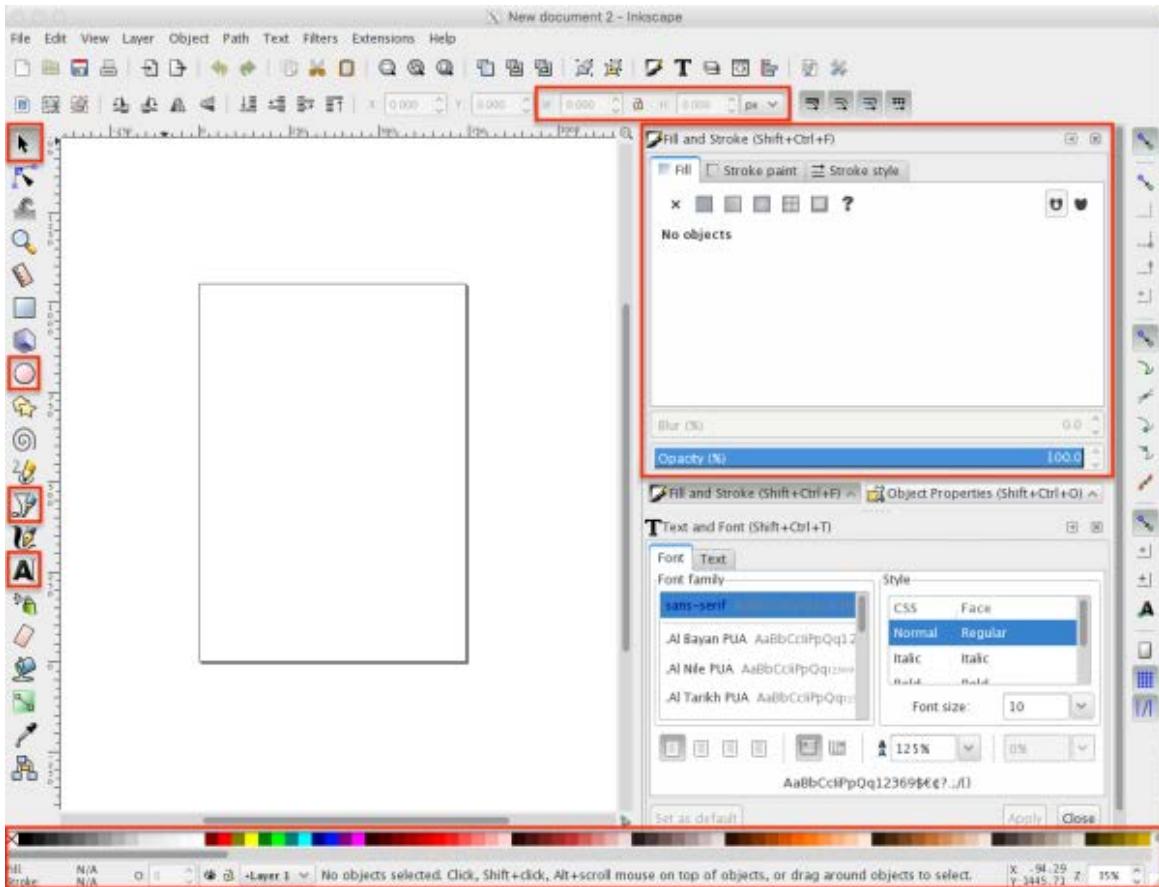


## Get Oriented to Inkscape

Inkscape is a free professional quality vector graphics editor. We've provided a little [information about Inkscape](#) and how to install it for those who aren't familiar with it. Once you're done installing, go ahead and open Inkscape.

You'll see a screen with a lot of icons and menus. It might look a little different, so find the items we've circled in red that we'll use for this tutorial.

1. Along the left side in this picture, the tool menu offers the select tool, the circle tool, the pen (or Bezier) tool, and the text tool.
2. Near the top, you'll see some boxes for adjusting the height and width of shapes.
3. On the right, there's room for several dialog boxes. If you don't see these, you can click "View" in the menu, then "Show/Hide Dialogs."
4. At the bottom you'll see the Palette. If you don't, go to the "View" Menu, click "Show/Hide," and then select the "Palette."
5. In the middle, there's a picture of a blank page -- that's where you'll draw!



## Cut out three circles

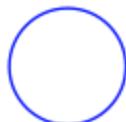
To cut, the laser moves slowly along a path at full power. When you want a cut, you'll create a path that has a stroke of some color and does not have a fill. Other stroke settings like thickness or opacity don't matter and are ignored.

- 1 Click on the Circle Tool on the left side of your screen



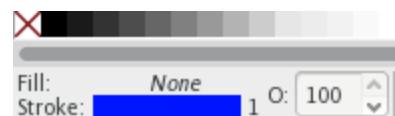
- 2 Click and drag on the blank document to draw a circle

Don't worry about the size - we'll adjust it later.



- 3 Choose a Color

Hold the Shift key and click a color in the palette. It doesn't matter which you choose; let's say a nice dark blue. If you look





at the bottom left corner of the screen, you'll see the current settings for your new circle: Fill (None) and Stroke (Blue).

If your circle doesn't turn blue when you click the color, make sure that the box next to the O (just to the right of the blue bar in the image) says "100." O stands for "Opacity," and if your Opacity is 0, your stroke or fill will be invisible.

**4**

#### Adjust the Size of the Circle

Adjust the size of the circle near the top of the screen.

First change the measurements from "px" (Pixels) to "in" (Inches), then type 3 in the W (Width) and H (Height box)

W: 3.000 ↕  H: 3.000 ↕ in ↕

**5**

#### Click and drag to create a second circle

Choose the same color as before, so it will use the same cut settings as the first one. Set the size to .2 in wide and high.

W: 0.200 ↕  H: 0.200 ↕ in ↕

**6**

#### Duplicate the Small Circle

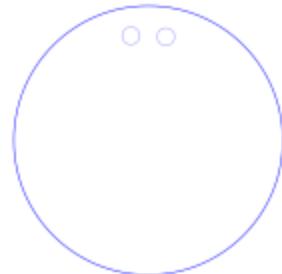
Click the black arrow for the Selection tool in the upper left, then click on your smaller circle, and choose Edit > Duplicate from the menu. (If you're on a Mac, resist the temptation to use copy and paste; duplicate works better!)



**7**

#### Place Your Circles

Drag the newly created circle off of the top of the original so it looks like this design. You'll now have three blue circles.





## Write a Message to Engrave

In an engrave, the laser moves quickly back and forth, turning on and off thousands of times per second, to create an image on the surface. Engraving lets you customize the things you make with words, drawings, or art. To define an engrave, create a fill without a stroke. We're going to start with text.

### 1 Click the Text Tool



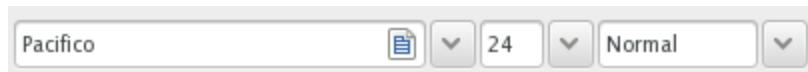
### 2 Type a Message

Click on your drawing (it doesn't matter where), and then type a short message.

*Congratulations  
Kathy!  
09/23/2018*

### 3 Choose a Font

You can choose a font for your text to make it more special. While you have the text tool selected, you'll see this menu at the top of the screen. If you've typed text that you want to change, highlight it first. Now click the arrow to the right of the font name to choose a new font. Change the number to make it bigger or smaller.



If you want to make your design stand out, [Google Fonts](#) has a host of choices that you can download and print for free. Using more than one font size adds a little elegance, too.

To change the spacing between lines of text, edit the number in this box.



### 4 Convert Your Text

Click and drag inside your text box to select all of your text, then choose "Path" from the menu bar and click "Object to Path." You can't edit your text any more, but now it will print properly.



## Create a Score to Highlight Your Work

To score, the laser lowers its power and moves quickly along a path. It's like a cut that doesn't go all the way through. It's a nice quick way to create a bold visual effect and scoring is much faster than engraving.

### 1 Duplicate Your Circle

Click the black arrow for the Selection tool in the upper left, then click your large circle, and, once again, go to Edit > Duplicate. It won't look like anything happened unless you pay very close attention -- the blue line will appear a tiny bit thicker.

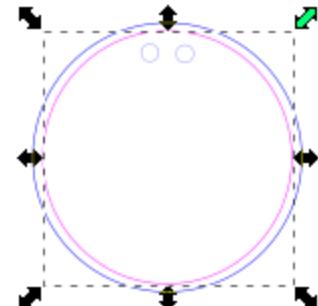
### 2 Pick a New Color

Hold the shift key and select a pink from the palette. Making it a different color means you can apply a different setting to it in the Glowforge App.

Fill: None  
Stroke: Pink

### 3 Shrink your Circle a Little

Hold the shift key, click a corner of the circle's selection box, and drag it towards the center of the circle just a bit. Holding shift keeps the pink circle centered as you resize it.



## Keep Scoring!

Want a little emphasis? Add a line... or a few.

### 1 Click on the Pen Tool



### 2 Create a Straight Line

Hold down the Control key (even if you're on a Mac) and click and drag to create a straight line. When you're finished, double-click on the end point of the line.



### 3 Pick a Color

Hold the Shift key and click a red color in the palette. Check the bottom left corner to see what you've selected: Fill (None) and Stroke (Red).

Fill: None  
Stroke: Red



4

#### Finish your Score Lines

Use the selection tool (the black arrow) to select your line, then click Edit > Duplicate from the menu. This will create a new line right on top of the old one. Click and drag it to separate it from the original. We created four lines in our design.



### Fine Tune Your Design

1

#### Position Your Gift Tag Elements

Use the Selection tool to click and drag each piece of your Gift Tag into place.



2

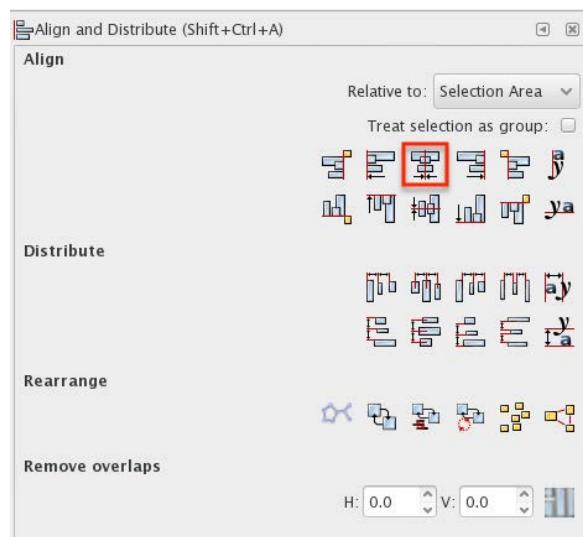
#### Finalize Score Lines

You can make your red lines longer or shorter by clicking and dragging their end points, or by changing the width, the way you changed the circle sizes above.

3

#### Align Shapes

To center things neatly, hold shift and click each element that you want lined up. Click Object > Arrange, then choose the “center” icon.



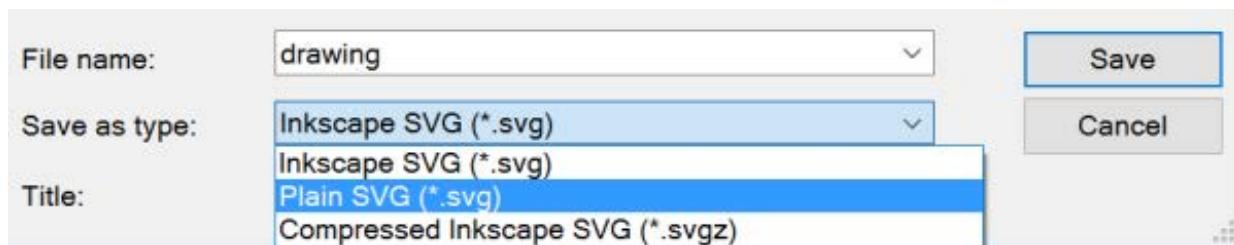


Congratulations - Your Design is Complete



## Save Your File

1. Go to the “File” Menu and click “Save As”
2. Type your File name
3. Choose “Plain SVG”



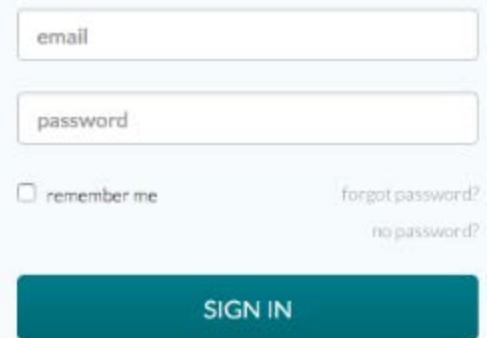


## Arrange Your Print

### 1 Sign In

Go to [app.glowforge.com](https://app.glowforge.com) and sign in.

### Glowforge Owners



The sign-in form consists of two input fields: 'email' and 'password'. Below the fields are two checkboxes: 'remember me' and 'no password?'. To the right of the checkboxes are links for 'forgot password?' and 'no password?'. A large teal 'SIGN IN' button is at the bottom.

### 2

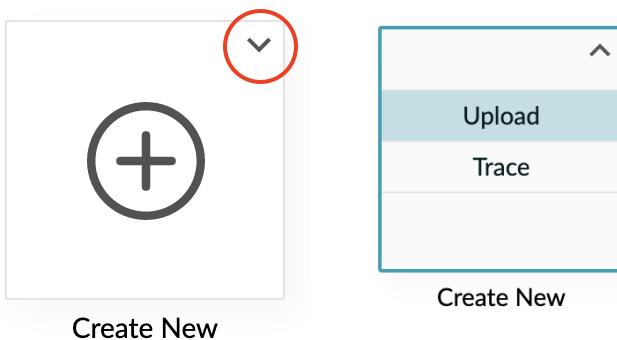
Place Material in the Bed of Your Glowforge  
The remaining hardwood you used for your Founder Ruler would be perfect. Make sure the barcode is whole and visible. (If it's not, you can select the material manually after you upload your file - just click "Unknown" at the top left of the screen.)

### 3

#### Upload Your File

Go to [app.glowforge.com](https://app.glowforge.com) to get to the Dashboard. Then click on the arrow at the top right of the "Create New" box, and click the "Upload" button. Choose the file you saved.

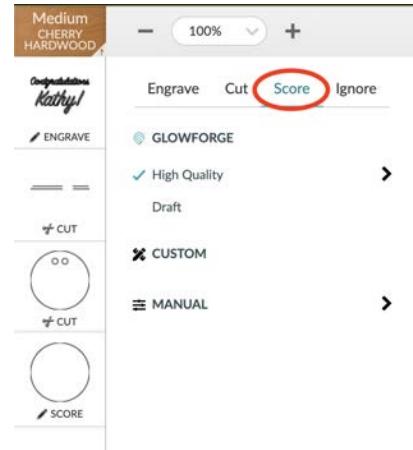
Your design will open in the Workspace. Each color in your drawing will appear as a separate print step on the left side of the screen.



### 4

#### Select A Step

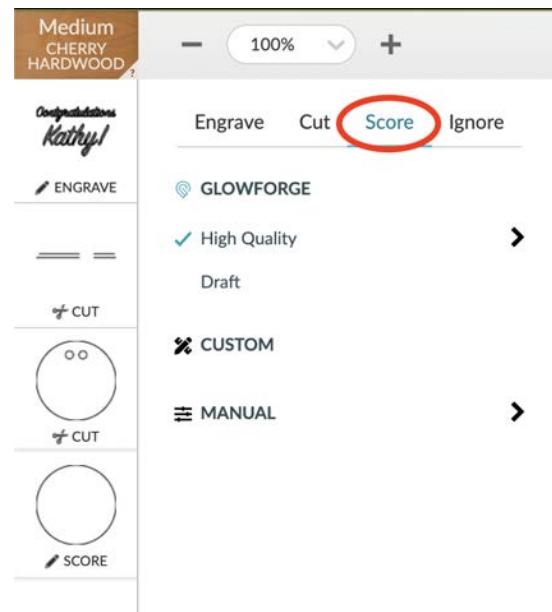
Click on the step showing the single circle (the one that was pink).



**5**

### Convert to score

Click on “Score”, so it prints this circle with a score line instead of cutting it out.



Repeat this process for the lines that you drew so they are scored as well

**6**

### Place Design on Material

Drag your whole design to place it where you want

it on your material. You can resize it if you want to, too.

## And Now... Print!

1. When you’re ready, press “Print”.
2. The Print Window will show you an animation of your upcoming print, and will also display the estimated time for your print.
3. When the button on your Glowforge starts blinking, press it and watch the laser go pew pew pew.
4. Remove your print, peel off the protective layer and admire your creation!





# Finding Community & Support

Having trouble? Want to do something new? We'll do our best to help you succeed!

## Community Forum

Most Glowforge owners have registered at the [Glowforge Community Forum](#), where hundreds of Glowforge owners post each day. You'll find some incredibly talented (and helpful) folks who can provide assistance, suggestions, and ideas to help you make the most of your Glowforge.

Here's an easy way to start:

- If you've got a specific question or idea (like you want to make a new band for your watch), [try searching](#) to see what folks have written on the topic.
- If you just want to browse the forum, we recommend starting with our [Made on a Glowforge](#) topic, where you can find hundreds of laser projects that our community either has made or wants to make.
- Once you've read a bit to get an idea of how it works, post pictures of what you make. People will love it!

## Support Online

Go to [support.glowforge.com](#) to find guidance any time of day or night. The Learn By Doing area includes tutorials to get you started with your Glowforge, and you'll also find Troubleshooters in case anything doesn't go according to plan.

## Support by Email

We are here for you! Contact us at [glowforge.com/help](#) with your questions, challenges, feedback, and even your stories of perfect prints. Our goal is to reply within hours on weekdays, and always within three days.

We provide the best support when we fully understand what you're facing. Please send:

- A description of the steps you took, what happened and what you expected
- The date and time of the issue
- The name of your file, if there was a file involved
- The name of your Internet browser and Operating System
- A screenshot or photo of what happened



## Appendix A

### Sicherheitsaspekte

Jetzt kommen wir zu einem wichtigen Thema. Die unsachgemäße Bedienung des Glowforge-Gerätes kann zu Feuer-, Augen- oder Hautverletzungen durch Lasereinwirkung oder durch den Kontakt mit Chemikalien führen, die eine gesundheitsgefährdend sein können. Diese Verletzungen können zu schweren Verletzungen oder sogar zum Tod führen.

#### Vor der Benutzung

- Lesen Sie diesen Abschnitt vor dem Einsatz Ihres Glowforge-Druckers, und achten Sie darauf, dass etwaige andere Nutzer des Druckers ihn auch lesen.
- Befolgen Sie immer alle in diesem Abschnitt und in der Glowforge App enthaltenen Anweisungen.
- Kinder dürfen den Drucker nur unter der Aufsicht und mit der Unterstützung eines Erwachsenen benutzen.
- Verwenden Sie Ihren Glowforge-Drucker nicht unter dem Einfluss von Alkohol oder Drogen.
- Laser unterliegen Vorschriften und Normen, die insbesondere bei der Installation in einer Bildungseinrichtung oder einem Arbeitsplatz gelten. Stellen Sie sicher, dass Sie alle geltenden Regeln einhalten.
- Berühren Sie nicht den Kopf oder Arm des Glowforge-Gerätes, während es eingeschaltet ist. Falls das trotzdem versehentlich passiert, schalten Sie das Gerät aus und wieder ein, um Schäden zu vermeiden.
- Teile dieses Produkts sind aus Glas gefertigt, das beim Aufprall brechen kann. In diesem Fall ist darauf zu achten, dass keine Verletzungen durch Glasscherben entstehen.



## Elektrische Sicherheit

Zur Reduzierung der Gefahr von Stromschlägen oder Bränden:

- Versuchen Sie nicht, das Glowforge-Gerät zu warten, zu reparieren oder zu modifizieren
- Versuchen Sie niemals, auf die Verkabelung des Glowforge-Gerätes zuzugreifen
- Die Stromversorgung oder andere versiegelte Teile des Glowforge-Gerätes dürfen nicht geöffnet werden
- Bei Schäden am Glowforge-Gerät ziehen Sie den Netzstecker und kontaktieren Sie sofort [glowforge.com/help](http://glowforge.com/help)
- Bei Notfällen oder Fehlfunktionen ziehen Sie den Netzstecker auf der Rückseite des Gerätes
- Verwenden Sie nur eine ordnungsgemäß geerdete Steckdose mit mindestens 800 Watt
- Das Netzkabel ist als Trennvorrichtung vorgesehen. Stellen Sie sicher, dass sich die Steckdose in der Nähe des Geräts befindet und leicht zugänglich ist, damit Sie das Gerät bei Bedarf ausstecken können.
- Die maximale Nennleistung des Leistungsschalters, die auch als Überstromschutzeinrichtung bezeichnet wird, sollte bei dieser Stromkreiseinspeisung 15 Ampere betragen.

## Brandschutz

Der Laser des Glowforge-Geräts schneidet und graviert mit einem Strahl aus hochintensivem Infrarotlicht. Der Laser kann extrem hohe Temperaturen im zu schneidenden oder zu gravierenden Material erzeugen. Unter bestimmten Umständen kann sich das Material im Inneren des Glowforge-Gerätes entzünden, wobei sich die Flamme außerhalb des zu schneidenden oder zu gravierenden Bereichs ausbreiten kann. Die Flamme könnte Ihre Einheit zerstören und sich weiter ausbreiten und zu einem Feuer im Gebäude führen.

### Brandgefahr

- Legen Sie keine Gegenstände in den Glowforge-Drucker, die nicht laserfähig sind, auch wenn Sie nicht beabsichtigen, diese zu schneiden oder zu gravieren. Im Folgenden erfahren Sie mehr über laserfähige Materialien.
- Stapeln Sie Materialien nicht, z.B. indem zwei oder mehr Materialblätter auf einmal geschnitten werden sollen. Mehrere Schichten neigen eher zur Flammenbildung.
- Reinigen Sie etwaige Materialreste im Inneren des Glowforge-Gerätes (siehe "Reinigung").
- Stellen Sie keine Gegenstände auf das Glowforge-Gerät. Lagern Sie keine Gegenstände darüber, die darüber Feuer fangen können.
- Lagern Sie keine brennbaren flüchtigen Chemikalien wie etwa Farbe, Aceton, Benzin oder Alkohol im selben Raum wie Ihr Glowforge-Gerät. Während des Betriebs können sich brennbare Dämpfe entzünden.



- Nach dem Abschluss des Druckvorgangs können bestimmte Materialien wie etwa Kunststoffe weiterhin heiß sein. Lassen Sie diese abkühlen, bevor Sie sie berühren.

## Aufsicht während des Betriebs

- Lassen Sie das Glowforge-Gerät während des Betriebs niemals unbeaufsichtigt - bleiben Sie dabei aufmerksam.
- Eine kleine, kerzenartige Flamme an dem Punkt, an dem der Laserstrahl auf das Material trifft, ist normal. Diese Flamme sollte sich mit dem Laser bewegen und nicht brennen, nachdem der Laser weiter gezogen ist.
- Wenn sich im Inneren des Glowforge-Gerätes eine bleibende Flamme entwickelt hat, die nicht erlischt, wenn der Laser weiter gezogen ist:
  1. Ziehen Sie den Stecker auf der Rückseite des Gerätes.
  2. Löschen Sie das Feuer mit einem feuchten Handtuch, insofern dass ohne Risiken möglich ist. Beachten Sie, dass Wasser Ihr Glowforge-Gerät beschädigen kann.
  3. Falls das nicht möglich ist, löschen Sie das Feuer mit einem Feuerlöscher, insofern dass ohne Risiken möglich ist. Beachten Sie, dass Feuerlöscher Schäden an Ihrem Glowforge-Gerät verursachen können.
  4. Falls der Brand nicht sicher gelöscht werden kann oder sich außerhalb des Glowforge-Gerätes ausbreitet, rufen Sie Ihre lokale Notrufnummer (z.B. 911) an und evakuieren Sie das Gebäude.
  5. Nehmen Sie das Gerät erst dann wieder in Betrieb, wenn Sie sich mit Glowforge in Verbindung gesetzt haben und Serviceinformationen über [glowforge.com/help](https://glowforge.com/help) erhalten haben.

## Laserschutz für alle Glowforge-Drucker (sofern nicht anders angegeben)

### Laserprodukte

Der Glowforge Basic 3D-Laserdrucker und der Glowforge Plus 3D-Laserdrucker sind Laserprodukte der Klasse 1, die einen integrierten Laser der Klasse 4 enthalten. Der Glowforge Pro 3D-Laserdrucker ist ein Laserprodukt der Klasse 4. Der Laser in Ihrer Glowforge sendet genügend Infrarotlicht aus, um sofortige Haut- und Augenverletzungen zu verursachen oder ein Feuer zu entfachen. Das generierte Infrarot-Laserlicht ist unsichtbar. Die Glowforge-Einheit verfügt über ein Gehäuse und einen Glasdeckel, die schädliches Infrarot- und Ultraviolettlicht blockieren, damit Sie den Laser sicher bedienen können.



**VORSICHT!** Die Verwendung von Steuergeräten oder Einstellungen oder die Durchführung anderer als der hierin beschriebenen Verfahren können zu einer gefährlichen Strahlenexposition führen.

**Verwenden Sie das Gerät nicht, wenn Glas oder Gehäuse beschädigt oder verändert sind.**

Beschädigungen oder Modifikationen können zu gefährlichem Kontakt mit beweglichen und/oder elektrischen Teilen führen und/oder dazu, dass Infrarot- und Ultraviolettlicht, Hitze, Rauch und Dämpfe entweichen.

Das Öffnen der Sicherheitsverriegelungsschalter an der Vordertür schalten den Laser sofort aus. Platzieren Sie keine Magnete in der Nähe des Deckels oder der Türen, da diese die Schalter stören können. Versuchen Sie nicht, die Schalter zu überbrücken.

**Das Gerät nicht modifizieren oder warten**

**ACHTUNG!** Modifikationen oder Wartungsarbeiten am Glowforge-Gerät können zu einer gefährlichen Laserlichtbelastung führen.

Um das Verletzungsrisiko zu reduzieren:

- Versuchen Sie nicht, die Wartung durchzuführen. Wartungsarbeiten dürfen nur vom Glowforge-Werk oder von durch den Hersteller autorisierten Technikern durchgeführt werden.
- Versuchen Sie nicht, das Gerät zu verändern oder zu modifizieren.
- Verwenden Sie zum Öffnen des Gehäuses nur die vordere Klappe oder den oberen Deckel. Versuchen Sie nicht, das Gehäuse auf andere Weise wie etwa durch Bohren von Löchern, Entfernen von Befestigungselementen oder Entfernen von Abdeckungen zu öffnen.
- Versuchen Sie nicht, versiegelte Teile des Glowforge-Geräts wie etwa die Schutzabdeckungen oder das Gehäuse zu zerlegen oder zu öffnen.
- Wenn Sie das Krümelfach entfernen, achten Sie besonders darauf, dass der Laser nur auf laserkompatibles Material trifft und nicht die Metallunterseite des Geräts berührt, da dies zu Reflexionen und Schäden am Gerät führen kann.

**Glow Nur für Glowforge Pro: Lasersicherheits- und LSO-Training der Klasse 4**

Da der Glowforge Pro Durchgangsschlitz hat, handelt es sich um ein Lasergerät der Klasse 4. Für den sicheren Betrieb sollte ein Lasergerät der Klasse 4 im Rahmen eines Laserschutzprogramms betrieben werden, das von einem Laserschutzbeauftragten (LSO) gesteuert wird. Das Training für LSOs kostet normalerweise mehr als 1.000 US-Dollar. Glowforge hat jedoch mit führenden Laserschulungsexperten zusammengearbeitet, um Materialien vorzubereiten, die Ihnen als LSO für Glowforge Pro den sicheren Betrieb ermöglichen.



**Die vorliegenden Informationen schulen Sie im Umgang mit Ihrer Glowforge Pro unter Klasse 1 Bedingungen, die keine zusätzlichen besonderen Vorsichtsmaßnahmen erfordern.** Wenn Sie Ihren Glowforge Pro unter Klasse 4 Bedingungen betreiben wollen, erklären Ihnen diese Materialien, wie Sie den sicheren Betrieb gestalten sollten. Die Materialien vermitteln Ihnen auch einen Überblick über die Laserphysik und Sicherheitsaspekte sowie die zu befolgenden Prozesse.

Sie müssen für die Verwendung der Glowforge Pro die Schulungsmaterialien lesen, verstehen und befolgen.

Die Glowforge Pro LSO-Schulungsmaterialien werden per E-Mail als passwortgeschützte PDF-Datei an alle Glowforge Pro-Besitzer gesendet.

## Rauch- und Dampfsicherheit

Beim Einsatz Ihres Glowforge-Geräts erzeugt der Laser sichtbare und unsichtbare Aerosole, Gase, Dämpfe und Partikel (hier als "Rauch und Dämpfe" bezeichnet). Der Rauch und die Dämpfe können Kohlenmonoxid und andere Chemikalien enthalten, die gesundheitsschädlich sind, sowie unangenehm und übel riechend sein können. Die chemische Zusammensetzung des Rauches und der Dämpfe hängt vom gelaserten Material ab. Der Rauch und die Dämpfe aus laserkompatiblen Materialien werden durch Abluft oder Filtration kontrolliert.

### Abluft

Verwenden Sie Ihr Glowforge-Gerät nur, wenn es nach draußen oder durch den Glowforge-Luftfilter entlüftet wird. Andernfalls können Rauch und Dämpfe in den Raum entweichen, was zu Gesundheitsgefahren oder zum Tod führen kann.

Wenn die Abluft nach draußen geleitet wird, stellen Sie sicher, dass die Position der Auspuffanlage für Nachbarn oder Passanten nicht störend ist. Vergessen Sie nicht, die für Sie geltenden örtlichen Vorschriften zur Luftverschmutzung zu beachten.

Um zu verhindern, dass Rauch und Dämpfe aus dem Gerät entweichen, öffnen Sie den Deckel nicht bevor der Lüfter abgeschaltet wurde.

Befolgen Sie alle Anweisungen unter „Einrichten“ sorgfältig.

Beim Drucken kann ein gewisser Geruch entstehen. Wenn Sie allerdings einen starken, scharfen Geruch feststellen, der Augen-, Nasen- oder Rachenreizungen verursacht, oder wenn Rauch sichtbar ist, während der Deckel geschlossen ist, stoppen Sie das Gerät sofort und überprüfen Sie die Abluftanlage. Wenn die Reizung und/oder die Rauchentwicklung nicht nachlässt, nehmen Sie Ihr Glowforge-Gerät außer Betrieb und kontaktieren Sie den Support.



Pro-Nutzer: An den Rändern des Durchgangsschlitzes können kleine Öffnungen vorhanden sein. Diese Öffnungen sind erforderlich; die leistungsstarken Lüfter Ihres Glowforge Pro führen den Rauch und die Dämpfe in den Abluftschlauch.

## Sicherheitsausrüstung

Stellen Sie sicher, dass Kohlenmonoxid-Detektoren gemäß den örtlichen Vorschriften und Herstellerempfehlungen im Gebäude installiert und getestet werden.

## Materialsicherheit

### Laserfähige Materialien

"Laserfähig" bezieht sich auf Materialien, die mit dem CO<sub>2</sub>-Laser im Glowforge-Gerät sicher verarbeitet werden können. Nicht laserfähige Materialien können Feuer fangen oder gefährlichen Rauch und Dämpfe abgeben, die nicht durch Abluft oder Filtration kontrolliert werden können, und stellen damit eine Gefahr für Sie, Ihre Nachbarn und Ihren Glowforge-Drucker dar. Aus diesem Grund dürfen Sie nur laserfähige Materialien in die Glowforge-Einheit einlegen.

#### Proofgrade™-Materialien

Glowforge vertreibt eine Reihe von Proofgrade-Materialien, die laserfähig sind und mit dem Glowforge-Drucker Spitzenergebnisse liefern. Wenden Sie sich an [support.glowforge.com](https://support.glowforge.com) für mehr Informationen über Proofgrade-Materialien.

#### Laserfähige Materialien von anderen Lieferanten

Andere Anbieter wie Inventables.com verkaufen Material, von dem sie angeben, dass es mit dem Laser kompatibel ist. Wenn Sie sich nicht sicher sind, fragen Sie den Lieferanten, ob das Material sicher mit einem CO<sub>2</sub>-Laser verarbeitet werden kann.

#### Was ist, wenn ich nicht sicher bin, ob meine Materialien laserfähig sind?

Wenn Sie nicht ganz sicher sind, ob Ihr Material laserfähig ist, legen Sie es nicht in das Glowforge-Gerät.

- **Einige Materialien sehen laserfähigen Materialien ähnlich.** Vinyl und Glasfaser können etwa mit laserfähigen Materialien verwechselt werden, wobei sie jedoch schädlichen Rauch und Dämpfe abgeben.
- **Materialien können Verunreinigungen, Beschichtungen oder Zusätze aufweisen, die nicht laserfähig sind.** Beispielsweise können bestimmte Sperrholzklebstoffe, Tinten, Klebstoffe, Farbstoffe und Farben nicht laserfähig sein.
- **Einige Materialien können den Laser reflektieren und Ihre Glowforge-Einheit beschädigen.** So können etwa Kupfer und Chrom das Infrarotlaserlicht reflektieren.



## Die Materialien müssen in das Gerät passen

Materialien, die nicht richtig in das Gerät passen, können den Betrieb behindern und zu Schäden führen und die Brandgefahr erhöhen.

- Die Materialien dürfen nicht mehr als 21 Zoll breit und das Ende des Glowforge-Geräts nicht berühren. Das Material muss weniger als  $\frac{1}{2}$  Zoll hoch sein wenn das Krümelfach eingelegt ist oder weniger als 2 Zoll, wenn es ausgebaut ist.
- Die Materialien dürfen nicht über die Seite des Krümelfachs (falls verwendet) oder über den Metallboden des Druckbereichs (falls es entfernt wurde) hinausragen.
- Legen Sie kein aufgerolltes Material in das Glowforge-Gerät. Möglicherweise ist es zu hoch oder rollt sich während des Druckvorgangs auf und behindert den Betrieb.

## Die Materialien müssen flach sein

- Die Materialien müssen flach genug für das Krümelfach sein.
- Während beispielsweise bei verzogenem Holz leichte Erhöhungen akzeptabel sind, darf der höchste Punkt des Materials eine Höhe von  $\frac{1}{2}$  Zoll über dem Krümelfach nicht überschreiten
- Das Material darf sich nicht verkrümmen oder aufrollen.
- Sollte sich das Material krümmen oder verbiegen, so dass es mehr als  $\frac{1}{2}$  Zoll Höhe erreicht über dem Krümelfach erreicht, schalten Sie die Stromversorgung sofort aus.
- Falls das Material eine Schutzschicht aus Papier oder Kunststoff aufweist, muss diese Beschichtung fest mit dem Material verbunden sein. Wenn sich diese Schicht ablöst, werfen Sie das Material weg und bedrucken Sie es nicht.

## Betriebsumgebung

Um die Lebensdauer Ihrer Glowforge-Einheit zu verlängern und das Risiko eines Feuers oder eines mechanischen Ausfalls zu verringern, stellen Sie das Glowforge-Gerät nicht in der folgenden Umgebung auf:

- Extreme Temperaturen oder Luftfeuchtigkeit
  - Temperaturen unter 40 Grad Fahrenheit (5 Grad Celsius) oder über 120 Grad Fahrenheit (48 Grad Celsius)
  - Extreme Luftfeuchtigkeit (unter 10% oder mehr als 75%)
  - Wenn Sie die Abluft nach außen geführt wird, stellen Sie sicher, dass bei wechselnden Bedingungen keine extremen Temperaturen oder Feuchtigkeit durch den Abluftschlauch in das Glowforge-Gerät gelangen. Trennen Sie den Schlauch von der Außenluft, wenn das Glowforge-Gerät nicht verwendet wird.
- Direktes Sonnenlicht
- Regen, Feuchtigkeit oder Flüssigkeiten
- Haar, Staub oder kleine Partikel



- Lose Materialien wie Papier oder Tischdecken, die in den Lufteinlass an der Unterseite des Glowforge-Geräts angesaugt werden könnten

Das Drucken ist möglich, wenn die Umgebungstemperatur innerhalb der folgenden Bereiche liegt; Außerhalb dieser Bereiche kann es sein, dass der Druck periodisch angehalten oder nicht abgeschlossen wird.

- Basic und Plus: zwischen 60 Grad Fahrenheit (16 Grad Celsius) und 75 Grad Fahrenheit (24 Grad Celsius)
- Pro: zwischen 60 Grad Fahrenheit (16 Grad Celsius) und 81 Grad Fahrenheit (27 Grad Celsius)

## Verwenden Sie Ihr Glowforge-Gerät nicht, wenn....

Einer der folgenden Fälle eintritt, schalten Sie das Gerät sofort aus, ziehen Sie den Netzstecker heraus und setzen Sie sich mit [glowforge.com/help](https://glowforge.com/help) in Verbindung. Verwenden Sie Ihr Glowforge-Gerät erst wieder, wenn das Problem durch den Support behoben wurde.

- Die Standardeinstellungen für ein Proofgrade™-Material durchschneiden das Material selbst nach dem Reinigen der Linse und der Fenster nicht
- Flammen im Gerät, die selbst nach dem Ausschalten des Lasers bestehen bleiben
- Der Kopf bleibt stehen, der Laser ist jedoch eingeschaltet
- Die Taste des Geräts zeigt eine andere Farbe als Weiß, Gelb oder Blaugrün
- Gehäuse weist Schäden oder Verfärbungen auf
- Risse oder Splitter in Glasrohr oder Deckel
- Feuchtigkeit im Glowforge-Gerät
- Schäden an den inneren Komponenten des Glowforge-Gerät sichtbar
- Sie bemerken ungewöhnliches Licht von dem Gerät, das zuvor nicht aufgetreten ist.
- Sie bemerken ungewöhnliche Geräusche von der Einheit, die zuvor nicht aufgetreten sind



## ■ Sicurezza

È il momento di fare sul serio. L'uso improprio dell'unità Glowforge può causare un incendio, lesioni agli occhi o alla cute da esposizione al laser o da esposizione a sostanze chimiche che possono rappresentare un rischio per la salute. Le conseguenze possono essere gravi o addirittura letali.

### Prima di cominciare

- Leggere attentamente questo capitolo prima di utilizzare la stampante Glowforge e accertarsi che chiunque la utilizzi lo legga.
- Seguire sempre tutte le istruzioni contenute in questo capitolo e nella App Glowforge.
- Nel caso di bambini è necessaria sempre la supervisione di un adulto.
- Non utilizzare la stampante Glowforge sotto l'effetto di alcolici o di farmaci.
- I laser sono soggetti a norme e regolamenti, in particolare se installati in istituti scolastici o nel posto di lavoro. Accertarsi di rispettare tutte le regole in vigore.
- Non toccare la testa o il braccio dell'unità Glowforge mentre la corrente è attiva. Se ciò accade inavvertitamente, spegnere l'unità e riaccenderla per evitare eventuali danni.
- Alcune parti del prodotto sono di vetro soggetto a rottura in caso di urto. Se ciò dovesse accadere evitare lesioni da frammenti di vetri rotti.



## Sicurezza elettrica

Per ridurre il rischio di elettrocuzione o di incendio:

- Non cercare di eseguire manutenzione, riparazioni o modifiche dell'unità Glowforge
- Non cercare mai di accedere ai cavi dell'unità Glowforge
- Non aprire la sezione di alimentazione elettrica o altre sezioni sigillate dell'unità Glowforge
- Se l'unità Glowforge è danneggiata, staccare il filo di alimentazione elettrica e rivolgersi immediatamente a [glowforge.com/help](https://glowforge.com/help)
- In caso di emergenza o di malfunzionamento staccare il cavo di alimentazione sul retro dell'unità
- Utilizzare solo una presa con adeguata messa a terra e disponibilità di almeno 800 Watt
- Il cavo di alimentazione serve per scollegare il dispositivo. Accertarsi che la presa sia vicina all'apparecchio e facilmente accessibile in modo da poter scollegare l'unità se necessario.
- Nel circuito di alimentazione della presa la potenza massima dell'interruttore, noto anche come dispositivo di protezione da sovraccorrenti, deve essere di 15 amp.

## Sicurezza antincendio

Il laser dell'unità Glowforge taglia e incide con un raggio di luce a infrarossi ad alta intensità. Il laser può generare temperature estremamente elevate nel materiale che viene tagliato o inciso. Secondo le circostanze il materiale all'interno dell'unità Glowforge può accendersi e la fiamma può spandersi al di fuori dell'area di taglio o di incisione. In caso di accensione la fiamma potrebbe distruggere l'unità e diffondere l'incendio all'edificio.

### Rischio di incendio

- Non introdurre nella stampante Glowforge nulla che non sia laser-compatibile, anche se non si ha intenzione di tagliare o incidere ciò che si vuole introdurre. Ulteriori informazioni su materiali laser-compatibili nel seguito.
- Non impilare i materiali; per esempio cercando di tagliare due o più fogli di materiale in una volta. Più fogli possono provocare più facilmente un incendio.
- Eliminare i residui all'interno dell'unità Glowforge appena si formano. (Vedere "Pulizia")
- Non collocare oggetti sopra l'unità Glowforge. Non depositarci sopra qualcosa che potrebbe prendere fuoco.
- Non depositare fonti di vapori infiammabili come vernici, acetone, benzina o alcool nello stesso locale in cui si trova l'unità Glowforge. I vapori infiammabili potrebbero prendere fuoco durante il funzionamento.
- Quando una stampa è completata determinati materiali, come la plastica, possono restare molto caldi. Lasciarli raffreddare prima di toccarli.



## Sorvegliare costantemente il funzionamento

- Non lasciare mai l'unità Glowforge incustodita mentre è in funzione – tenerla sempre sott'occhio. Guardare spesso all'interno.
- Una fiammella simile a quella di una candela dove il raggio laser colpisce il materiale è normale. La fiamma dovrebbe muoversi con il laser e non restare accesa dopo il passaggio del laser.
- Qualora la fiamma sia costantemente presente all'interno dell'unità Glowforge senza spegnersi dopo il passaggio del laser:
  1. Staccare la spina sul retro dell'unità.
  2. Se ritenuto sicuro, spegnere il fuoco con un panno bagnato. Tenere presente che l'acqua può danneggiare l'apparecchio Glowforge.
  3. Qualora ciò non sia possibile, se ritenuto sicuro, spegnere il fuoco mediante un estintore. Tenere presente che gli estintori possono danneggiare l'apparecchio Glowforge.
  4. Qualora non sia possibile estinguere il fuoco in sicurezza o se le fiamme si propagano al di fuori dell'unità Glowforge, chiamare il numero del pronto intervento (per es. 911) ed evacuare l'edificio.
  5. Non riprendere l'utilizzo dell'unità prima di aver richiesto informazioni di assistenza a Glowforge all'indirizzo [glowforge.com/help](https://glowforge.com/help).

## Sicurezza laser per tutte le stampanti Glowforge (salvo diversa indicazione)

### Prodotti laser

La stampante base Glowforge 3D Basic e la stampante laser Glowforge Plus 3D sono prodotti laser di Classe 1 contenenti un laser Classe 4 incorporato. La stampante laser Glowforge Pro 3D è un prodotto laser Classe 4. Il laser della vostra Glowforge emette luce a infrarossi sufficiente a provocare immediate lesioni alla cute e agli occhi, o a innescare un incendio. Questa luce laser a infrarossi è invisibile. L'unità Glowforge ha un involucro e un coperchio di vetro che blocca i livelli pericolosi di luce a infrarossi e ultravioletta per consentire di utilizzare il laser in sicurezza.

**ATTENZIONE!** L'impiego di comandi o di regolazioni o l'adozione di procedure diverse da quanto qui specificato può provocare il rischio di esposizione a radiazioni.

**Non utilizzare se il vetro o l'involucro sono danneggiati o modificati.**



Qualsiasi danno o modifica può provocare il contatto pericoloso con particolari in movimento e/o parti elettriche e/o la fuoriuscita di luce a infrarossi o ultravioletta, di calore, fumo e vapori.

Gli interruttori con interblocco di sicurezza sullo sportello anteriore spengono immediatamente il laser in caso di apertura. Non collocare magneti vicino al coperchio o agli sportelli in quanto potrebbero interferire con gli interruttori. Non cercare di escludere gli interruttori.

### **Non eseguire modifiche né manutenzione**

**ATTENZIONE!** Il tentativo di eseguire modifiche o interventi di manutenzione dell'unità Glowforge può causare la pericolosa esposizione a luce laser.

Per ridurre il rischio di lesioni:

- Non cercare di eseguire interventi di manutenzione. Tutti gli interventi di manutenzione devono essere eseguiti solo dalla fabbrica Glowforge o da tecnici autorizzati dalla fabbrica.
- Non cercare di alterare o modificare l'unità.
- Per aprire l'involucro servirsi unicamente dello sportello anteriore o del coperchio superiore. Non cercare di aprire l'unità in altro modo, per esempio praticando dei fori, togliendo i dispositivi di fissaggio o le coperture.
- Non cercare di smontare o di aprire le parti sigillate dell'unità Glowforge, inclusa qualsiasi copertura o alloggiamento di protezione.
- Se si estrae il vassoio degli scarti, prestare la massima attenzione e accertarsi che il laser colpisca solo materiale laser-compatibile e non tocchi il fondo metallico dell'unità causando riflesso e danneggiando l'unità.

### **Solo per Glowforge Pro: Sicurezza Laser Classe 4 & Addestramento LSO Incaricato Sicurezza Laser**

Poiché Glowforge Pro ha feritoie passanti, è un dispositivo laser di Classe 4. Per sicurezza un dispositivo laser di Classe 4 deve essere utilizzato secondo un programma di sicurezza laser sotto il controllo di un incaricato sicurezza laser (Laser Safety Officer (LSO)). L'addestramento degli LSO costa normalmente più di \$1,000, ma Glowforge ha collaborato con i principali esperti di sicurezza laser alla preparazione di materiali utili per operare in sicurezza come LSO per la vostra Glowforge Pro.

**Questi materiali preparano all'utilizzo di Glowforge Pro in condizioni di Classe 1, che non richiedono ulteriori particolari precauzioni.** Qualora si intenda utilizzare Glowforge Pro in condizioni Classe 4 questi materiali illustrano come comportarsi per garantire l'utilizzo in sicurezza. Forniscono anche una panoramica con nozioni di fisica del laser e di sicurezza, nonché delle procedure da applicare.



Per utilizzare Glowforge Pro è necessario leggere, comprendere e seguire i materiali di addestramento Glowforge Pro.

I materiali di addestramento per incaricati sicurezza laser Glowforge Pro LSO vengono spediti per posta elettronica a tutti i possessori di Glowforge Pro in PDF protetto da password.

## Sicurezza contro fumo e vapori

Durante l'uso di Glowforge il laser produce aerosol, gas, vapori e particolato visibili e invisibili (qui citati come "fumo e vapori"). Il fumo e i vapori possono includere monossido di carbonio e altre sostanze chimiche pericolose per la salute, oltre che sgradevoli e puzzolenti. La composizione chimica del fumo e dei vapori dipende dal materiale trattato con il laser. Il fumo e i vapori originati da materiali laser-compatibili sono controllati dallo scarico o mediante filtrazione.

### Scarico

Far funzionare l'unità Glowforge solo quando lo scarico è diretto verso l'esterno o mediante filtro dell'aria Glowforge Air Filter. Il mancato scarico provoca la fuoriuscita di fumo e di vapori nel locale con rischio per la salute o pericolo di morte.

In caso di scarico verso l'esterno assicurarsi che la collocazione del condotto di scarico non disturbi i vicini o i passanti; non dimenticare di verificare i regolamenti locali in materia di qualità dell'aria, eventualmente applicabili.

Per evitare la fuoriuscita di fumo e di vapori dall'unità, non aprire il coperchio prima dell'arresto dei ventilatori.

Seguire con attenzione tutte le istruzioni di cui al capitolo "Messa in opera".

È possibile la presenza di odore durante la stampa. Qualora l'odore sia forte, penetrante e provochi anche irritazione agli occhi, al naso o alla gola, o in caso di fumo visibile che fuoriesce dal coperchio chiuso, arrestare immediatamente il processo e controllare nuovamente lo scarico. Se l'irritazione e/o l'emissione di fumo non cessano, interrompere l'utilizzo di Glowforge e rivolgersi al servizio assistenza.

Utenti Pro: Potrebbero esserci piccole aperture attorno ai bordi della fessura passante. Tutto ciò è previsto: le potenti ventole di Glowforge Pro's spingono via fumo e vapori nel tubo di scarico.

## Apparecchiatura di sicurezza

Accertarsi che rivelatori di monossido di carbonio siano installati nell'edificio e vengano verificati come raccomandato dalle normative locali e dalle indicazioni del fabbricante.



## Sicurezza dei materiali

### Materiale laser-compatibili

Il termine "laser-compatibile" si riferisce a materiali che possono essere lavorati in sicurezza con laser CO<sub>2</sub> nell'unità Glowforge. Materiali non laser-compatibili possono prendere fuoco, emettere fumo e vapori pericolosi che non possono essere controllati dallo scarico o dalla filtrazione, e rappresentano un rischio sanitario per voi, per i vicini e per la stampante Glowforge. Per questo motivo si deve introdurre nell'unità Glowforge solo materiale laser-compatibile.

#### Materiali Proofgrade™

Glowforge vende una linea di materiali Proofgrade laser-compatibili e in grado di ottenere risultati di ottima qualità se utilizzati con la stampante Glowforge. Per maggiori informazioni sui materiali Proofgrade rivolgersi a [support.glowforge.com](https://support.glowforge.com).

#### Materiali laser-compatibili di altri fornitori

Altri fornitori come Inventables.com vendono materiale che viene indicato come laser-compatibile. Nel dubbio chiedere al fornitore se il materiale può essere lavorato in sicurezza con un laser CO<sub>2</sub>.

Che cosa fare in caso di incertezza sulla compatibilità laser dei propri materiali?

Se non si è assolutamente certi che il materiale è laser-compatibile, non introdurlo nell'unità Glowforge.

- **Alcuni materiali sembrano simili ai materiali laser-compatibili ma sono differenti.** Per esempio il vinile o la fibra di vetro possono essere considerati erroneamente materiali laser-compatibili, invece emettono fumo e vapori dannosi.
- **I materiali possono contenere contaminanti, rivestimenti o additivi non laser-compatibili.** Per esempio certe colle per compensato, inchiostri, adesivi, coloranti e vernici possono essere non laser-compatibili.
- **Alcuni materiali possono riflettere il laser e danneggiare l'unità Glowforge.** Per esempio il rame e il cromo possono riflettere la luce laser a infrarossi.

### I materiali devono essere idonei

I materiali che non si adattano adeguatamente possono ostacolare il funzionamento e causare danni o aumentare il rischio di incendio.

- I materiali devono avere larghezza max. di 53,3 cm e lunghezza tale da toccare l'estremità dell'unità Glowforge. Lo spessore del materiale deve essere inferiore a 1,2 cm con il vassoio di raccolta scarti montato, oppure meno di 5,0 cm se il vassoio è stato rimosso.
- I materiali non devono estendersi oltre il lato del vassoio di raccolta scarti (se montato) o il fondo di metallo della zona di stampa (se il vassoio non è montato).



- Non posizionare materiale arrotolato nell'unità Glowforge. Potrebbe avere uno spessore eccessivo, oppure svolgersi durante la stampa ostacolando il funzionamento.

## I materiali devono essere piani

- I materiali devono essere piani in modo da restare stesi sul vassoio di raccolta scarti.
- Mentre una lieve protuberanza o rigonfiamento è accettabile, per esempio per legno incurvato o deformato, il punto più alto del materiale non deve superare 1,2 cm sopra il vassoio di raccolta scarti.
- Il materiale non deve essere arrotolarsi né accartocciarsi.
- Se durante la stampa il materiale si arrotola o si piega al punto da superare 1,2 cm di altezza sopra il vassoio di raccolta scarti scollegare immediatamente l'alimentazione di energia elettrica.
- Se il materiale è protetto da un rivestimento di carta o di plastica, esso deve essere saldamente fissato al materiale. Se comincia a staccarsi, rimuoverlo dal materiale e non stamparci sopra.

## Ambiente di lavoro

Per prolungare la durata dell'unità Glowforge e ridurre il rischio di incendio o di guasto meccanico, non collocare l'unità Glowforge in ambiente caratterizzato da:

- Temperatura o umidità estreme
  - Temperature al di sotto di 5°C o al di sopra di 48°C
  - Condizioni di umidità estrema (meno del 10% o più del 75%)
  - In caso di scarico all'esterno, accertarsi che la variazione delle condizioni atmosferiche non causi l'introduzione di temperature o umidità estreme all'interno del tubo di scarico dell'unità Glowforge. Staccare il tubo del collegamento con l'aria esterna quando l'unità Glowforge non è in uso.
- Luce solare diretta
- Pioggia, umidità o liquidi
- Eccesso di peli, polvere o particelle minute
- Materiali liberi come carta o tovaglia che potrebbe essere risucchiata nel punto di ingresso dell'aria sul fondo dell'unità Glowforge

Stampare quando la temperatura ambiente è nella gamma qui indicata. Stampare al di fuori di tale gamma può causare pause di stampa o stampa incompleta.

- Basic e Plus: Tra 16°C e 24°C
- Tra 16°C e 27°C



## Interrompere l'utilizzo dell'unità Glowforge se ....

Se si verifica una delle seguenti circostanze, spegnere immediatamente l'interruttore di alimentazione dell'energia, scollegare l'unità e rivolgersi a [glowforge.com/help](https://glowforge.com/help). Non riprendere l'utilizzo dell'unità Glowforge fino a completa risoluzione da parte del servizio assistenza.

- Le impostazioni predefinite per un pezzo di materiale Proofgrade™ non eseguono il taglio del materiale anche dopo aver pulito la lente e le finestre
- Incendio in corso nell'unità che continua anche dopo aver spento il laser
- La testina si arresta ma il laser è acceso
- Il pulsante dell'unità cambia colore e non è più bianco, giallo o verde ottanio
- Si notano danni o scolorimento dell'involucro
- Cricche o trucioli nel tubo di vetro o sul coperchio
- Presenza di umidità all'interno dell'unità Glowforge
- Danni ai componenti interni dell'unità Glowforge
- Una luce insolita proveniente dall'unità, non presente in precedenza.
- Suoni insoliti provenienti dall'unità, non verificatisi in precedenza



## Seguridad

Considerar estas instrucciones con seriedad. El uso inapropiado de la impresora Glowforge puede causar incendios, lesiones en los ojos o en la piel por la exposición al láser o a químicos que pueden ser peligrosos para la salud. Estos pueden causar lesiones serias o incluso la muerte.

### Antes de comenzar

- Lea esta sección antes de usar su impresora Glowforge y asegúrese de que quien la use lea este contenido también.
- Siempre siga todas las instrucciones en esta sección y en la Aplicación de Glowforge.
- Los niños requieren la supervisión y la ayuda de un adulto en todo momento.
- No use su impresora Glowforge bajo la influencia de alcohol o drogas.
- Los láseres están sujetos a reglas y a normas, especialmente si se instalan en instituciones educativas o lugares de trabajo. Asegúrese de cumplir con todas las normas aplicables.
- No tocar el cabezal o brazo de la impresora Glowforge mientras la energía está conectada. Si lo hace por accidente, desconéctelo, y conéctelo de nuevo para evitar que se produzcan daños.
- Algunas partes de este producto están hechas de vidrio que podría romperse si se somete a impactos. Si esto ocurriese, tenga cuidado para evitar lastimarse con las piezas de vidrio rotas.



## Seguridad Eléctrica

Para reducir el riesgo de descarga eléctrica o incendio:

- No intente revisar, reparar o modificar la impresora Glowforge.
- No intente nunca acceder a la instalación eléctrica de la impresora Glowforge.
- No abra el suministro eléctrico ni ninguna parte sellada de la impresora Glowforge.
- Si la impresora Glowforge se daña, desenchufe el cable y póngase en contacto con [glowforge.com/help](http://glowforge.com/help) de inmediato.
- En caso de emergencia o mal funcionamiento, desenchufe el cable de alimentación de la parte trasera de la unidad.
- Use una toma de corriente adecuadamente conectada a tierra con al menos 800 vatios disponibles.
- El cable de alimentación está diseñado para funcionar como elemento de desconexión. Asegúrese de que la salida esté cerca del equipo y sea de fácil acceso para que pueda desenchufar la unidad de ser necesario.
- La intensidad máxima del disyuntor, también conocido como dispositivo de protección de sobre corriente, en este circuito que alimenta el tomacorriente debe ser de 15 amperios.

## Seguridad Contra Incendios

El láser de la impresora Glowforge corta y graba con un haz de luz infrarroja de alta intensidad. El láser puede generar temperaturas extremadamente altas en el material que se está cortando o grabando. En determinadas circunstancias, es posible que el material dentro de la impresora Glowforge se prenda fuego y que la llama se difunda fuera de la zona que se está cortando o grabando. Si se prende fuego, la llama podría destruir su unidad, difundirse y potencialmente incender el edificio.

### Riesgo de Incendio

- No coloque nada dentro de la impresora Glowforge que no sea compatible con láser, incluso si no tiene la intención de cortarlo o grabarlo. Conozca más acerca de materiales compatibles con el láser más adelante en este manual.
- No apile materiales, por ejemplo, al intentar cortar dos o más hojas de material a la vez. Múltiples hojas son propensas a quemarse.
- Limpie los sobrantes dentro de la unidad cuando se acumulen. (Vea “Limpieza”)
- No coloque nada sobre la impresora Glowforge. No acumule cosas que puedan incendiarse sobre ella.
- No almacene fuentes de vapores inflamables como pintura, acetona, gasolina o alcohol en la misma habitación en la que guarda su impresora Glowforge. Los vapores inflamables podrían encenderse durante el funcionamiento.



- Cuando una impresión se haya completado, ciertos materiales, como el plástico, pueden permanecer calientes. Permita que se enfríen antes de tocarlos.

## Vigile mientras está en funcionamiento

- Nunca descuide la impresora Glowforge mientras está en funcionamiento: manténgase siempre atento a ella. Mire el interior con frecuencia.
- La presencia de una llama pequeña, similar al de una vela, en donde el haz de láser trabaja el material es normal. Esta llama debe moverse con el láser y no debe permanecer encendida cuando el láser se ha movido.
- Si todavía hay una llama dentro de la impresora Glowforge que no se extingue cuando el láser se ha movido:
  1. Tire del cable detrás de la unidad.
  2. Si es seguro hacerlo, extinga el fuego con una toalla húmeda. Tenga en cuenta que el agua puede dañar su Glowforge.
  3. Si ello no es una opción, y si es seguro hacerlo, extinga el fuego con un extintor para incendios. Tenga en cuenta que los extintores para incendios pueden dañar su Glowforge.
  4. Si el fuego no se puede extinguir de forma segura o si se propaga hacia afuera de la unidad Glowforge, llame a su número de emergencia local (por ejemplo 911) y evacue el edificio.
  5. No siga utilizando la unidad hasta ponerse en contacto con Glowforge a [glowforge.com/help](http://glowforge.com/help) para obtener información de servicio.

## Seguridad del láser para todas las impresoras Glowforge (excepto cuando se indique lo contrario)

### Productos Láser

Las impresoras láser Basic 3D de Glowforge y la Plus 3D de Glowforge son productos con láser Clase 1, que contienen un láser Clase 4 incrustado. La impresora láser Pro 3D de Glowforge es un producto con láser Clase 4. El láser en su Glowforge emite la suficiente luz infrarroja como para provocar daños inmediatos en la piel o en los ojos, o iniciar un incendio. Esta luz láser infrarroja es invisible. La impresora Glowforge tiene una caja y una tapa de vidrio que bloquea los niveles dañinos de luz infrarroja y ultravioleta para permitirle operar el láser de forma segura.

**¡PRECAUCIÓN!** El uso de otros controles o ajustes, o la realización de procedimientos distintos a los especificados aquí podrían ocasionar una exposición peligrosa a la radiación.



### **No utilice si el vidrio o la caja están dañados o modificados.**

Cualquier daño o modificación podría permitir un contacto peligroso con partes móviles o eléctricas o el escape de luz infrarroja y ultravioleta, calor, humo o vapor.

Los interruptores de bloqueo de seguridad en la puerta frontal apagan el láser inmediatamente si se encienden. No colocar imanes cerca de la tapa o puertas ya que pueden interferir con los interruptores. No intente inhabilitar los interruptores.

### **No modifique o revise el producto**

**¡PRECAUCIÓN!** Cualquier intento de modificación o revisión de la impresora Glowforge puede ocasionar una exposición peligrosa a la luz láser.

Para reducir el riesgo de lesiones:

- No intente revisarla. Todas las tareas de revisión deben ser realizadas por la fábrica de Glowforge o por técnicos autorizados por la fábrica.
- No intente alterar o modificar la unidad.
- Solo use la entrada delantera o tapa superior para abrir la caja. No intente abrir la caja de ninguna otra forma, como, por ejemplo, taladrando orificios, retirando cierres o quitando cubiertas.
- No intente desmontar o abrir las partes selladas de la impresora Glowforge, incluidas las cubiertas protectoras o carcasa.
- Si se quita la bandeja, preste mucha atención para asegurarse de que el láser solo se aplique a material compatible con láser y de que no toque el fondo metálico de la unidad, lo que podría causar un reflejo y dañar la unidad.

### **Para Glowforge Pro únicamente: Seguridad para Láser Clase 4 y Capacitación para RSL**

Debido a que Glowforge Pro tiene espacios que permiten acomodar el material, es un dispositivo láser Clase 4. Para operarse de forma segura, un dispositivo láser Clase 4 debe operarse según un programa de seguridad láser bajo el control de un Responsable en Seguridad Láser. La capacitación para RSL normalmente cuesta más de \$1000, pero Glowforge ha trabajado con expertos líderes en capacitación en seguridad láser para preparar materiales para que pueda actuar de forma segura como el RSL para su Glowforge Pro.

**Estos materiales lo capacitarán para operar su Glowforge Pro en condiciones Clase 1, que no requieren precauciones especiales adicionales.** Si necesita operar su Glowforge Pro en condiciones Clase 4, estos materiales explicarán qué debe hacer para poder operarla de forma segura.



Estos también le proporcionarán una introducción a la física del láser y a cuestiones de seguridad y a los procesos a seguir.

Debe leer, entender y seguir los materiales de Capacitación de Glowforge Pro para usar su Glowforge Pro.

Los materiales de Capacitación RSL Glowforge Pro se envían por correo electrónico a todos los dueños de Glowforge Pro en un PDF protegido con contraseña.

## Seguridad contra humo y gases

Cuando use su Glowforge, el láser crea aerosoles visibles e invisibles, gases, vapores y partículas (aquí denominadas “humo y gases”) El humo y los gases pueden incluir monóxido de carbono y otros químicos que presentan riesgos para la salud, además de ser desagradables y malolientes. La composición química del humo y de los gases depende del material del láser. El humo y los gases de los materiales compatibles con el láser se controlan mediante evacuación o filtrado.

### Evacuación

Solo opere su impresora Glowforge cuando haya evacuación al exterior o a través del Filtro de Aire Glowforge. Si el humo y los gases no se evacuan, saldrán hacia la habitación, presentando un riesgo para la salud o peligro de muerte.

Si los evaca al exterior, asegúrese de que la ubicación de evacuación no será un problema para los vecinos o transeúntes, y no se olvide de revisar las normas locales para las regulaciones en materia de calidad de aire aplicables.

Para evitar que el humo y el vapor se escapen de la unidad, no abra la tapa hasta que el ventilador se detenga.

Siga todas las instrucciones en “Setting Up” (“Instalación”) cuidadosamente.

Es posible que haya olor presente durante la impresión. No obstante, si detecta un olor fuerte y penetrante que también causa irritación en los ojos, la nariz o la garganta, o si sale humo visible cuando la tapa está cerrada, deténgase de inmediato y vuelva a revisar la instalación de la evacuación. Si no se reduce la irritación o las emisiones de humo, interrumpa el uso de su Glowforge y póngase en contacto con el servicio técnico.

**Usuarios de la Pro:** Es posible que haya pequeñas aperturas en los bordes del espacio de acomodación del material. Esto se espera: los potentes ventiladores de su Glowforge Pro llevarán rápidamente el humo y los gases hacia la manguera de evacuación.



## Equipo de Seguridad

Asegúrese de que los detectores de monóxido de carbono se instalen y se prueben en el edificio como aconsejan los códigos locales y las recomendaciones del fabricante.

## Seguridad de materiales

### Materiales Compatibles con Láser

“Compatibles con láser” hace referencia a los materiales que pueden procesarse de forma segura con el láser de CO<sub>2</sub> en la impresora Glowforge. Los materiales que no sean compatibles con láser pueden incendiarse, emitir humo y gases peligrosos que no pueden controlarse mediante evacuación o filtrado, y ponen en riesgo su salud, la de sus vecinos y su impresora Glowforge. Por esta razón, solo debe poner materiales compatibles con láser en la impresora Glowforge.

#### Materiales Proofgrade™

Glowforge vende una línea de materiales Proofgrade que son compatibles con láser y dan resultados de primera calidad cuando se usan con la impresora Glowforge. Para conocer más sobre materiales Proofgrade, póngase en contacto con [support.glowforge.com](mailto:support.glowforge.com).

#### Materiales compatibles con láser de otros proveedores

Otros proveedores como Inventables.com venden materiales que indican que son compatibles con láser. Si no está seguro, pregúntele al proveedor si el material puede procesarse de forma segura con un láser de CO<sub>2</sub>.

#### ¿Qué sucede si no estoy seguro de la compatibilidad de mis materiales con el láser?

Si no está completamente seguro de que su material es compatible con láser, no lo coloque en la impresora Glowforge.

- **Algunos materiales son parecidos a los materiales compatibles con láser, pero son diferentes.** Por ejemplo, el vinilo y la fibra de vidrio se pueden confundir con materiales compatibles con el láser, pero emiten humo y gases nocivos.
- **Los materiales pueden tener contaminantes, recubrimientos o aditivos que no son compatibles con láser.** Por ejemplo, ciertos pegamentos, tintas, adhesivos y pinturas de contrachapado pueden no ser compatibles con láser.
- **Algunos materiales pueden reflejar el láser y dañar su impresora Glowforge.** Por ejemplo, el cobre y el cromo pueden reflejar la luz láser infrarroja.



## Los materiales deben caber

Los materiales que no quepan adecuadamente pueden obstruir la operación y ocasionar daños y aumentar el riesgo de incendio.

- Los materiales no deben tener más de 21 pulgadas de ancho y no deben ser tan largos como para tocar el final de la impresora Glowforge. Los materiales tener una altura inferior a  $\frac{1}{2}$  pulgadas si la bandeja está colocada, o inferior a 2 pulgadas si se ha quitado.
- Los materiales no deben extenderse más allá del largo de la bandeja (si se está utilizando o del fondo de metal del área de impresión, si no).
- No coloque materiales enrollados en su Glowforge. Pueden ser demasiado altos o desenrollarse durante la impresión y obstruir la operación.

## Los materiales deben ser planos

- Los materiales deben ser lo suficientemente planos como para caber cómodamente en la bandeja.
- Mientras que una protuberancia es aceptable, por ejemplo, de una madera combada, el punto más alto del material no puede extenderse más de  $\frac{1}{2}$  pulgadas sobre la bandeja.
- El material no debe nunca doblarse por sobre sí mismo, por ejemplo, combándose.
- Si un material se curva o dobla y alcanza más de  $\frac{1}{2}$  pulgadas sobre la bandeja durante una impresión, apague la impresora de inmediato.
- Si el material tiene un papel protector o cubierta de plástico, esa cubierta debe estar firmemente adherida al material. Si comienza a desprenderse, descarte el material y no imprima sobre él.

## Entorno Operativo

Para prolongar la vida de su impresora Glowforge y para reducir el riesgo de incendio o falla mecánica, no coloque su Glowforge en donde pueda experimentar:

- Temperatura extrema o humedad;
  - Temperaturas inferiores a 40 grados Fahrenheit (5 Celsius) o superiores a 120 grados Fahrenheit (48 Celsius).
  - Condiciones extremas de humedad (inferiores a 10% o superiores a 75%).
  - Si la ventilación es exterior, asegúrese de que condiciones cambiantes no provoquen el ingreso de temperaturas extremas o humedad en su impresora Glowforge a través de la manguera de evacuación. Desconecte la manguera del aire exterior cuando la Glowforge no esté en uso.
- Luz solar directa;
- Lluvia, humedad o líquidos;
- Exceso de pelo, polvo o partículas pequeñas;



- Materiales sueltos como papel o mantel que podrían aspirarse en la toma de aire en la parte inferior de la Glowforge.

Imprima cuando la temperatura ambiente se encuentre dentro de los siguientes rangos. La impresión fuera de estos rangos puede causar que su impresión se pause periódicamente o no pueda completarse.

- Basic y Plus: Entre 60 grados Fahrenheit (16 Celsius) y 75 grados Fahrenheit (24 Celsius).
- Pro: Entre 60 grados Fahrenheit (16 Celsius) y 81 grados Fahrenheit (27 Celsius).

## Interrumpa el uso de su Glowforge si...

Si ocurre alguna de las siguientes situaciones, apague el interruptor de encendido de inmediato, desenchufe la unidad y contacte a [glowforge.com/help](https://glowforge.com/help). No use su Glowforge de nuevo hasta que el servicio técnico haya resuelto el problema.

- La configuración predeterminada para una pieza de material Proofgrade™ no corta a través del material incluso después de limpiar el lente y las ventanas.
- Hay fuego en la unidad y persiste después de que el láser se apaga.
- El cabezal se detiene, pero el láser continúa encendido.
- El botón de la unidad se pone de otro color que no es blanco, amarillo ni verde azulado.
- Ve algún daño o decoloración en la caja.
- Hay grietas o astillas en el tubo de vidrio o tapa.
- Ve humedad dentro de la unidad.
- Ve algún daño en los componentes interiores de la impresora Glowforge.
- Observa una luz inusual proveniente de la unidad que anteriormente no estaba ocurriendo.
- Observa un sonido inusual proveniente de la unidad que anteriormente no estaba ocurriendo.



## ■ ■ Sécurité

Revenons au sérieux. Une utilisation incorrecte de l'imprimante Glowforge peut provoquer un incendie, des lésions oculaires ou cutanées dues à l'exposition au laser ou une exposition à des produits chimiques pouvant présenter des risques pour la santé. Ceux-ci peuvent entraîner des blessures graves, voire la mort.

### Avant de commencer

- Lisez cette section avant d'utiliser votre imprimante Glowforge et assurez-vous que chaque personne qui utilise l'imprimante l'a également lue.
- Suivez toujours toutes les consignes données dans cette section et sur l'application Glowforge.
- Les enfants doivent être constamment sous la supervision et l'assistance d'un adulte.
- N'utilisez pas votre imprimante Glowforge si vous avez consommé de l'alcool ou des drogues.
- Les lasers sont soumis à des réglementations et à des normes particulières, notamment lorsqu'ils sont installés dans un établissement scolaire ou sur un lieu de travail. Assurez-vous de respecter toutes les règles applicables.
- Ne touchez pas la tête ou le bras de l'imprimante Glowforge lorsque l'appareil est sous tension. Si vous y touchez par erreur, éteignez-la, puis rallumez-la pour éviter tout dommage.
- Certaines pièces de cet appareil sont en verre et risquent de se briser sous un impact. Si tel est le cas, faites attention de ne pas vous blesser avec les morceaux de verre.



## Sécurité électrique

Pour réduire le risque d'électrocution ou d'incendie:

- N'essayez pas de faire l'entretien, de réparer ou de modifier l'imprimante Glowforge
- N'essayez jamais d'accéder au câblage de l'imprimante Glowforge
- N'ouvrez pas le bloc d'alimentation ni aucune autre partie fermée hermétiquement de l'imprimante Glowforge.
- Si l'imprimante Glowforge est endommagée, débranchez le cordon d'alimentation et contactez immédiatement [glowforge.com/help](https://glowforge.com/help)
- En cas d'urgence ou de dysfonctionnement, débranchez le cordon d'alimentation à l'arrière de l'appareil
- Utilisez uniquement une prise de terre avec au moins 800 watts disponibles
- Le cordon d'alimentation sert de moyen de déconnexion. Assurez-vous que la prise est à proximité de l'imprimante et facilement accessible afin de pouvoir débrancher l'appareil si nécessaire.
- L'ampérage maximal du disjoncteur (ou dispositif de protection contre les surintensités) sur le circuit alimentant la machine doit être de 15 ampères.

## Sécurité incendie

Le laser de l'imprimante Glowforge coupe et grave à l'aide d'un faisceau de lumière infrarouge à haute intensité. Le laser peut générer des températures extrêmement élevées dans le matériau à couper ou à graver. Dans certaines conditions, il est possible que le matériau à l'intérieur de l'appareil Glowforge prenne feu et les flammes se propagent en dehors de la zone à couper ou à graver. En cas d'incendie, les flammes pourraient détruire votre appareil et se propager, mettant ainsi le feu au bâtiment.

### Risque d'incendie

- Ne mettez rien dans l'imprimante Glowforge qui ne soit pas compatible avec le laser, même si vous n'avez pas prévu de couper ou de graver le matériau. Vous en saurez plus sur les matériaux compatibles avec le laser dans le paragraphe suivant.
- N'empilez pas les matériaux, par exemple en essayant de couper deux ou plusieurs feuilles de ce matériau à la fois. Plusieurs feuilles traitées ensemble sont plus susceptibles de prendre feu.
- Nettoyez tous les résidus présents dans l'imprimante Glowforge lorsque ceux-ci s'accumulent. (Voir « Nettoyage »)
- Ne placez pas d'objets sur le dessus de l'imprimante Glowforge. Ne stockez pas d'objets pouvant prendre feu au-dessus de l'imprimante.



- Ne stockez pas de sources de vapeurs inflammables telles que la peinture, l'acétone, l'essence ou l'alcool dans la même pièce que votre imprimante Glowforge. Les vapeurs inflammables peuvent prendre feu pendant le fonctionnement.
- A la fin d'une impression, certains matériaux, tels que les plastiques, peuvent rester chauds. Laissez-les refroidir avant de les toucher.

## Surveillance constante durant l'impression

- Ne laissez jamais l'imprimante Glowforge sans surveillance pendant son fonctionnement - gardez toujours la machine à portée de vue. Vérifiez régulièrement l'intérieur.
- Il est normale qu'une petite flamme en forme de bougie apparaisse là où le faisceau laser touche le matériau. Cette flamme doit se déplacer avec le laser et ne doit pas rester après le passage du laser.
- Si une flamme durable apparaît à l'intérieur de l'imprimante Glowforge et ne s'éteint pas après le passage du laser:
  1. Débranchez la fiche à l'arrière de l'imprimante.
  2. Si possible et s'il n'y a aucun risque, étouffez la flamme avec une serviette humide. Notez que l'utilisation d'eau peut endommager votre Glowforge.
  3. Si l'utilisation d'une serviette humide n'est pas possible, utilisez un extincteur pour éteindre le feu, uniquement si vous pouvez le faire en toute sécurité. Notez que l'utilisation d'un extincteur peut endommager votre Glowforge.
  4. Si l'incendie ne peut pas être éteint en toute sécurité ou s'il se propage à l'extérieur de votre Glowforge,appelez les services d'urgence (par exemple le 112) et évacuez le bâtiment.
  5. N'utilisez plus votre imprimante avant d'avoir contacté Glowforge pour toute information d'entretien à l'adresse [glowforge.com/help](http://glowforge.com/help).

## Sécurité laser pour toutes les imprimantes Glowforge (sauf indication contraire)

### Produits à Laser

L'imprimante laser 3D Glowforge Basic et l'imprimante laser 3D Glowforge Plus sont des produits laser de classe 1 qui sont équipés d'un laser intégré de classe 4. L'imprimante laser 3D Glowforge Pro est un produit laser de classe 4. Le laser de votre Glowforge émet suffisamment de lumière infrarouge pour provoquer des lésions cutanées et oculaires instantanées ou un départ d'incendie. Cette lumière laser infrarouge est invisible. L'imprimante Glowforge dispose d'un boîtier et d'un couvercle en verre qui arrêtent les radiations nocives de lumière infrarouge et ultraviolette pour vous permettre d'utiliser ce laser en toute sécurité.

**AVERTISSEMENT !** L'utilisation de commandes, de réglages ou de procédures autres que ceux spécifiés dans le présent document peut entraîner une exposition à des rayonnements dangereux.



### **Ne pas utiliser l'appareil si le verre ou le boîtier sont endommagés ou ont été modifiés.**

Tout dommage ou modification peut engendrer un contact dangereux avec des pièces en mouvement et/ou électriques, et/ou permettre à la lumière infrarouge et ultraviolette, à la chaleur, à la fumée et aux vapeurs de s'échapper de l'imprimante.

Les interrupteurs de sécurité sur la porte avant désactivent le laser immédiatement en cas d'ouverture de la porte. Ne placez pas d'aimants près du couvercle ou des portes, ceux-ci pourraient interférer avec les interrupteurs. N'essayez pas de court-circuiter les interrupteurs de sécurité.

### **Ne pas modifier ou ne pas procéder à l'entretien**

**AVERTISSEMENT !** Toute modification ou entretien de l'imprimante Glowforge peut entraîner une exposition dangereuse à la lumière laser.

Pour réduire le risque de blessure:

- N'essayez pas de procéder à l'entretien de votre appareil. Tout entretien doit être effectué uniquement par l'usine Glowforge ou par des techniciens agréés par l'usine.
- N'essayez pas de modifier l'imprimante.
- Utilisez uniquement la porte à l'avant ou le couvercle supérieur pour ouvrir le boîtier. N'essayez pas d'ouvrir le boîtier de quelque autre manière, notamment en perçant des trous, en retirant des attaches ou en enlevant des couvercles.
- N'essayez pas de démonter ou d'ouvrir les parties scellées de l'imprimante Glowforge, notamment les revêtements de protection ou les boîtiers.D
- Si vous retirez le plateau de récupération des résidus, faites preuve d'une extrême prudence pour vous assurer que le laser touche uniquement des matériaux qui lui sont compatibles et ne touche pas le fond métallique de l'imprimante, ce qui pourrait réfléchir le faisceau et endommager l'appareil.

### **Glowforge Pro uniquement : Sécurité pour les lasers de classe 4 & Formation d'un Responsable Sécurité Laser (LSO)**

L'imprimante Glowforge Pro dispose de fentes de passage et est donc considérée comme un appareil laser de classe 4. Pour un fonctionnement en toute sécurité, un appareil laser de classe 4 doit être utilisé dans le cadre d'un programme de sécurité laser sous la supervision d'un responsable sécurité laser (LSO). La formation pour les LSO coûte normalement plus d'un millier de dollars, mais Glowforge a travaillé avec des experts de la formation en sécurité laser pour préparer des supports de formation afin que vous puissiez agir en toute sécurité en tant que Responsable sécurité laser (LSO) lors de l'utilisation de votre Glowforge Pro.



**Ces documents vous apprendront à utiliser votre Glowforge Pro dans des conditions de classe 1, qui ne nécessitent pas de précautions particulières supplémentaires.** Si vous devez utiliser votre Glowforge Pro dans des conditions de classe 4, ces supports de formation vous expliqueront ce qu'il faut faire pour le faire fonctionner en toute sécurité. Ils contiennent également un aperçu de la physique du laser, des divers problèmes de sécurité ainsi que des processus à suivre.

Il est important de lire, comprendre et suivre ces supports de formation Glowforge Pro pour utiliser votre imprimante Glowforge Pro.

Les supports de formation Glowforge Pro pour les Responsables Sécurité Laser (LSO) sont envoyés par email à tous les propriétaires de Glowforge Pro sous forme de fichier PDF protégé par mot de passe.

## Sécurité vis à vis des fumées et des émanations

Lorsque vous utilisez votre Glowforge, le laser crée des aérosols, des gaz, des vapeurs et des particules visibles et invisibles (appelés ici « fumées et émanations »). La fumée et les émanations peuvent contenir du monoxyde de carbone et d'autres produits chimiques présentant des risques pour la santé, tout en étant désagréables et nauséabonds. La composition chimique de la fumée et des vapeurs émises dépend du matériau. La fumée et les émanations provenant de matériaux compatibles avec le laser sont contenues grâce à un système d'échappement ou une filtration.

### Évacuations des fumées et émanations

Utilisez uniquement votre imprimante Glowforge si les fumées et émanations sont évacuées vers l'extérieur ou passent par un filtre à air Glowforge. Le manque d'évacuation des fumées et émanations peut entraîner un risque pour la santé ou voire la mort.

Si vous évacuez les fumées et émanations vers l'extérieur, assurez-vous que ce ne soit pas gênant pour les voisins ou les passants, et n'oubliez pas de vérifier la réglementation locale concernant la qualité de l'air qui pourraient s'appliquer à votre activité.

Pour éviter que les fumées et émanations ne s'échappent de l'imprimante, n'ouvrez pas le couvercle avant que les ventilateurs ne se soient arrêtés.

Suivez attentivement toutes les consignes données dans la section « Configuration ».

Il peut y avoir un dégagement d'odeurs lors de l'impression. Toutefois, si vous détectez une odeur forte et âcre qui provoque également une irritation des yeux, du nez ou de la gorge, ou si de la fumée visible s'échappe lorsque le couvercle est fermé, arrêtez immédiatement et vérifiez à nouveau votre système d'évacuation. Si les irritations ou les émissions de fumée ne diminuent pas, arrêtez d'utiliser votre Glowforge et contactez notre assistance.



Utilisateurs professionnels : Il peut y avoir de petites ouvertures sur les bords de la fente de passage. C'est normal. Les puissants ventilateurs de votre Glowforge Pro évacueront la fumée et les émanations par le tuyau d'échappement.

## Équipement de sécurité

Assurez-vous que des détecteurs de monoxyde de carbone ont été installés et testés dans le bâtiment, conformément aux recommandations des codes locaux et du fabricant.

## Sécurité des matériaux

### Matériaux compatibles avec le laser

“Compatible avec le laser” fait référence aux matériaux pouvant être utilisés en toute sécurité avec le laser CO<sub>2</sub> dans l'imprimante Glowforge. Les matériaux qui ne sont pas compatibles avec le laser peuvent prendre feu, émettre des fumées et des émanations toxiques qui ne peuvent pas être contrôlées par une évacuation ou une filtration et qui représentent un danger pour votre imprimante Glowforge ainsi que pour votre santé, celle de vos voisins. Pour cette raison, utilisez uniquement des matériaux compatibles avec le laser dans l'imprimante Glowforge.

### Matériaux Proofgrade™

Glowforge propose une gamme de matériaux Proofgrade compatibles avec le laser et donnant des résultats de très grande qualité avec l'imprimante Glowforge. Pour en savoir plus sur les matériaux Proofgrade, contactez-nous à l'adresse [support.glowforge.com](mailto:support.glowforge.com).

### Matériaux compatibles avec le laser proposés par d'autres fournisseurs

D'autres fournisseurs comme Inventables.com vendent des matériaux qu'ils indiquent être compatibles avec le laser. En cas d'incertitude, demandez au fournisseur si le matériau peut être utilisé en toute sécurité avec un laser au CO<sub>2</sub>.

### Que faire si je ne suis pas certain que mes matériaux soient compatibles avec le laser?

Si vous n'êtes pas certain à 100 % que votre matériau est compatible avec le laser, ne l'utilisez pas dans l'imprimante Glowforge.

- **Certains matériaux ressemblent à des matériaux compatibles avec le laser, mais sont différents.** Par exemple, le vinyle et la fibre de verre peuvent être confondus avec des matériaux compatibles avec le laser mais émettent des fumées et des vapeurs nocives.



- **Les matériaux peuvent contenir des contaminants, des revêtements ou des additifs non compatibles avec le laser.** Par exemple, certaines colles à contreplaqué, encres, adhésifs, colorants et autres peintures peuvent ne pas être compatibles avec le laser.
- **Certains matériaux peuvent réfléchir le laser et endommager votre imprimante Glowforge.** Par exemple, le cuivre et le chrome peuvent réfléchir la lumière laser infrarouge.

## Des matériaux de la bonne dimension

Les matériaux qui ne sont pas de la bonne dimension peuvent entraver le fonctionnement, endommager l'imprimante et augmenter les risques d'incendie.

- Les matériaux ne doivent pas dépasser une largeur de 53 cm (21 po) et ne doivent pas être trop longs (ne pas toucher l'extrémité de l'imprimante Glowforge). Le matériau doit être d'une épaisseur inférieure à 1,2 cm (½ po) si le plateau de récupération des résidus est en place, et inférieure à 5 cm (2 po) si ce dernier est retiré.
- Les matériaux ne doivent pas dépasser le côté du plateau de récupération des résidus (le cas échéant) ou le fond métallique de la zone d'impression (sans plateau de récupération des résidus).
- Ne placez pas de matériau enroulé dans la Glowforge. Il pourrait être trop volumineux ou se dérouler pendant l'impression, ce qui gêne le fonctionnement.

## Les matériaux doivent être plats

- Les matériaux doivent être plats pour qu'ils reposent sur le dessus du plateau de récupération des résidus.
- Un léger renflement est acceptable, par exemple du bois déformé, mais en son point le plus élevé, le matériau ne doit pas dépasser une épaisseur de 1,2 cm (½ po) au-dessus du plateau de récupération des résidus.
- Le matériau ne doit jamais être replié sur lui-même, par exemple en se recourbant.
- Si le matériau se recourbe ou se plie et atteint une épaisseur supérieure à 1,2 cm (½ po) au-dessus du plateau de récupération des résidus pendant une impression, éteignez l'imprimante immédiatement.
- Si le matériau est doté d'un papier protecteur ou un revêtement en plastique, ce revêtement doit être solidement fixé au matériau. S'il commence à se décoller, jetez le matériau et ne l'utilisez pas pour une impression.

## Environnement de fonctionnement

Pour prolonger la durée de vie de votre imprimante Glowforge et réduire le risque d'incendie ou de défaillance mécanique, ne placez pas votre Glowforge dans les conditions suivantes:

- à des températures ou une humidité extrêmes
  - à des températures inférieures à 5°C (40°F) ou supérieures à 48°C (120°F)
  - à des conditions d'humidité extrêmes (inférieures à 10% ou supérieures à 75%)



- en cas d'évacuation vers l'extérieur, assurez-vous que les conditions changeantes ne provoquent pas de températures ou une humidité extrêmes dans l'imprimante Glowforge via le tuyau d'évacuation. Débranchez le tuyau d'évacuation vers l'extérieur lorsque la Glowforge n'est pas en fonctionnement.
- à la lumière directe du soleil
- à la pluie, à l'humidité ou en présence de liquides
- à un excès de particules, de poils ou de poussière
- à des matériaux en vrac tels que du papier ou une nappe qui pourraient être aspirés dans la prise d'air au bas de la Glowforge

Utilisez votre imprimante lorsque la température ambiante est comprise dans les plages suivantes. Si vous utilisez votre imprimante en dehors de ces plages, cela peut entraîner une pause périodique de votre impression ou son échec.

- Basic et Plus : Entre 16°C (60°F) et 24°C (75°F)
- Pro: Entre 16°C (60°F) et 27°C (81°F)

## Arrêtez d'utiliser votre imprimante Glowforge si...

Dans l'un des cas suivants, éteignez immédiatement votre imprimante, débranchez-la et contactez-nous à [glowforge.com/help](https://glowforge.com/help). N'utilisez plus votre imprimante Glowforge tant que le problème n'a pas été résolu par notre service d'assistance.

- Les paramètres par défaut (pour un morceau de matériau Proofgrade™) ne traversent pas le matériau même après avoir nettoyé la lentille et les fenêtres
- Un incendie dans l'imprimante persiste après avoir éteint le laser
- La tête cesse d'avancer mais le laser est allumé
- Le bouton de l'imprimante passe à une couleur autre que blanc, jaune ou bleu
- Vous constatez des dommages ou une décoloration du boîtier
- Vous constatez des fissures ou des éclats au niveau du tube en verre ou du couvercle
- Vous constatez la présence d'humidité à l'intérieur de l'imprimante Glowforge
- Vous constatez des dommages aux composants intérieurs de l'imprimante Glowforge
- Vous remarquez une lumière inhabituelle provenant de l'imprimante qui ne se produisait pas auparavant.
- Vous remarquez un bruit inhabituel provenant de l'imprimante qui ne se produisait pas auparavant