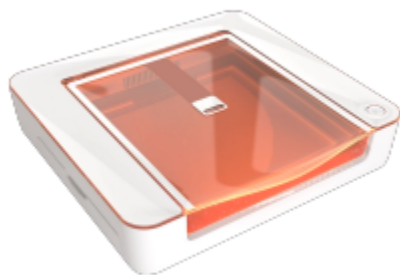




Glowforge GFD 200 User Manual

FOR CERTIFICATIONS SUBMITTAL
- WORKING DRAFT
SUBJECT TO CHANGE

April 19, 2023



Safety

First, 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 unit, 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 unit 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 unit may become hot during printing. Use caution before touching surfaces inside the printer.

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 sealed portion of the Glowforge unit.
- If the Glowforge unit is damaged, unplug the power cord and contact support@glowforge.com 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 300 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 5 amps.

Fire Safety

The Glowforge unit's laser cuts and engraves with a beam of high-intensity visible 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 unit 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 anything 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 support@glowforge.com

Laser Safety for all Glowforge Printers (except where noted)

Laser Products

The Glowforge GFD 200 3D Laser Printer is certified as a Class 1 laser product containing an embedded Class 4 laser. The embedded laser emits enough visible light energy to cause instant injury to the skin and eye if directly exposed, or start a fire when exposed to flammable materials. The Glowforge GFD 200 provides an engineered protective housing which block

harmful levels of laser light, allowing you to safely utilize this versatile tool.

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 case is damaged or modified.

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

Safety interlock switches on the lid turn off the laser immediately if the lid is 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 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.

Additional Laser Safety Information

The Glowforge Aura (Model Number GFD200) is a Class 1 laser product as defined in International Standard IEC 60825-1.

The Aura contains a Class 4 embedded laser source, known as the Laser Head, which is fully enclosed by the product safety enclosure with safety interlock that reduces the product to a Class 1 laser product.

In the image below the Laser Head is indicated, all operators should be aware that the Laser Head is a class 4 laser source with the laser beam path exiting from the bottom of the head towards the base plate of the product.

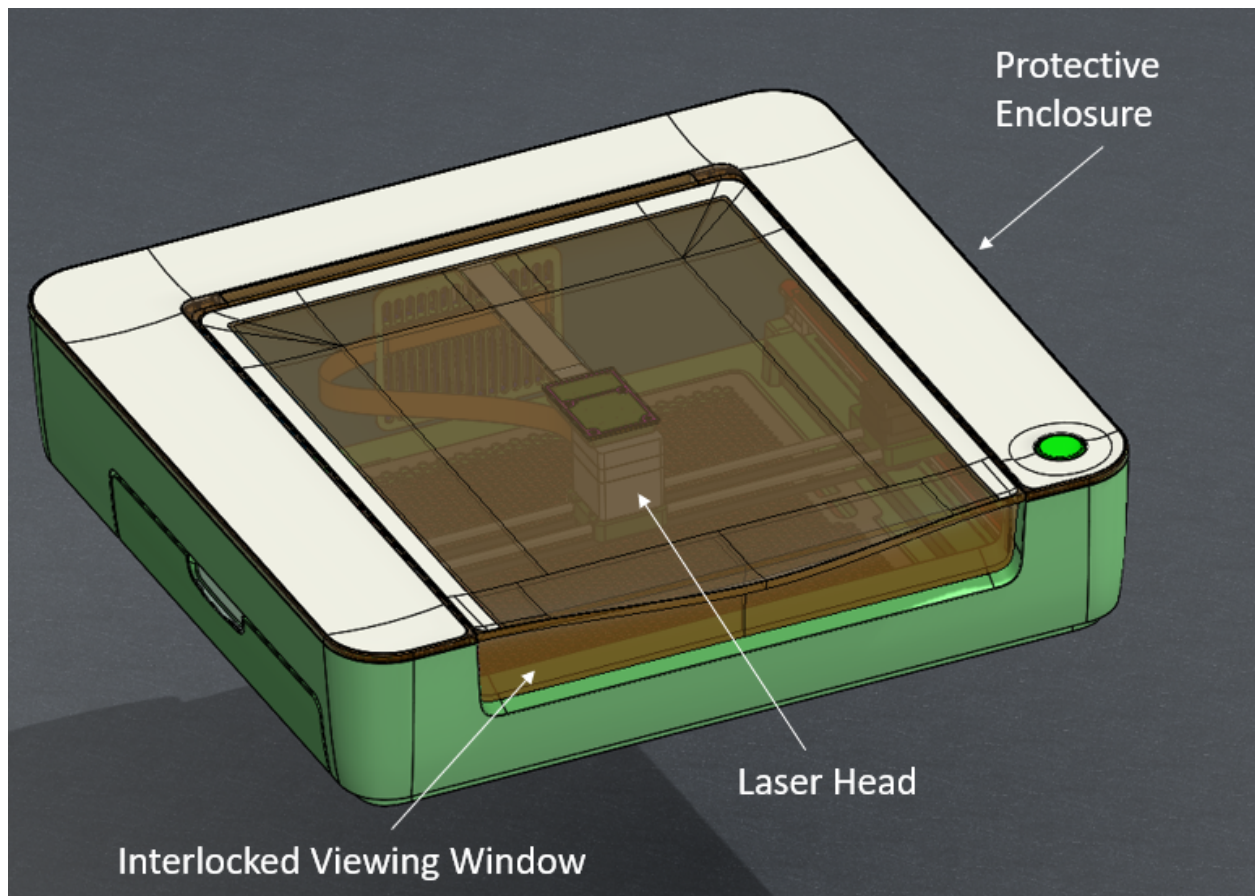


Figure 1: Glowforge Aura with Laser Head location shown.

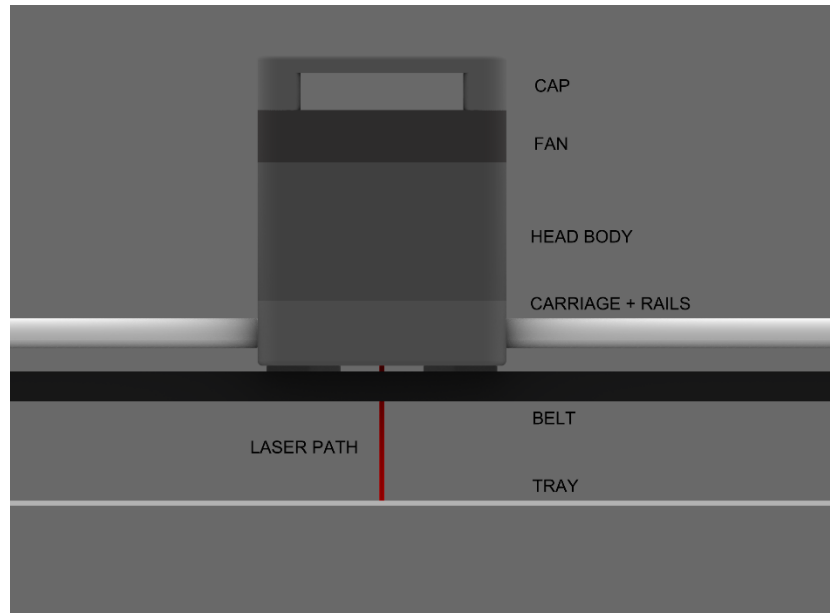


Figure 2: Laser Beam path as viewed from the from on the unit inside the safety enclosure.



Exposure to Hazardous laser light (Class 4) may result if misuse occurs.

CAUTION ! Do not modify or tamper with the safety enclosure, viewing window or interlocks of your Glowforge.

CAUTION ! Do not attempt to use a Glowforge unit that has suffered physical damage to the safety enclosure, viewing window or interlocks.

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Smoke and Fume Safety

When you use your Glowforge unit, 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 unit and contact support.

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

Safety Equipment

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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 diode 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 unit. 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 your Glowforge GFD 200 printer. To learn more about Proofgrade materials, go to 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 diode 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 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 12 in (30.4 cm) wide and must not be so long as to touch the end of the Glowforge unit. Material must be less than ¼ in (6.75 mm) tall if the crumb tray is in, or less than ¾ in (21 mm) 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 ¼ in (6.75 mm) 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 ¼ in (6.75 mm) 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 55 degrees Fahrenheit (13 Celsius) or over 110 degrees Fahrenheit (43 Celsius)
 - Extreme humidity conditions (below 20% or more than 80%)
 - 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.

- Between 60 degrees Fahrenheit (16 Celsius) and 75 degrees Fahrenheit (23 Celsius).

Stop Using Your Glowforge Unit If....

If any of the following occur, immediately turn off the power switch, unplug the unit, and contact support@glowforge.com. 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 in the case, lid, or trim
- 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 Model Details

	Glowforge GFD 200
Glowforge Model No.	GFD 200
Product Classification	Class 1
Warranty	12 months
Laser power rating	6W
Upgraded hardware for improved speed	✓
Cooling for all day use	✓

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Giant sized prints with Passthrough slot See <i>"Using Your Glowforge GFD 200"</i>	✓
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 GFD 200 unit has an overall Class 1 laser equipment classification.

The included laser diode has the following characteristics:

- Wavelength: 450nm CW
- Internal laser power: less than 6000 milliwatts peak
- Beam diameter: 0.1mm
- Beam divergence: 9mRad

The Glowforge unit is manufactured by:

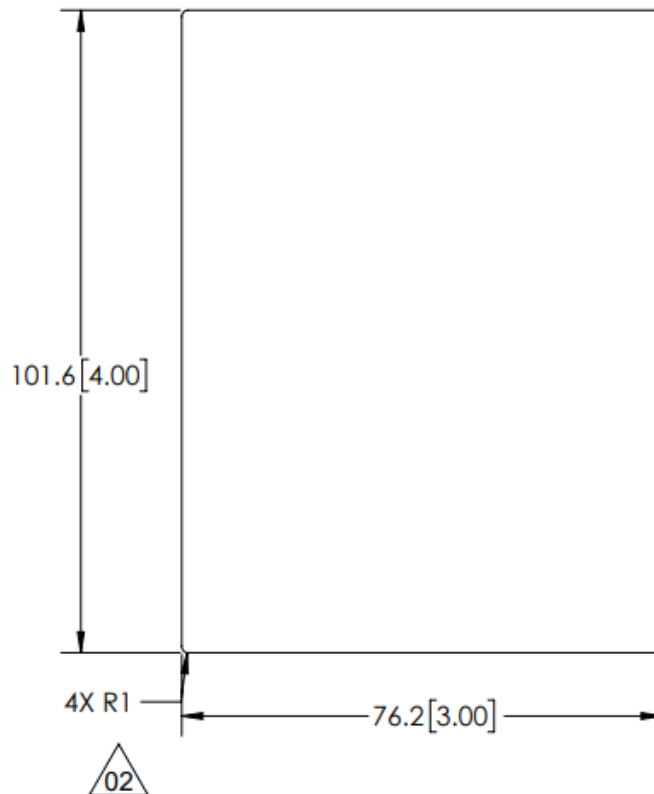
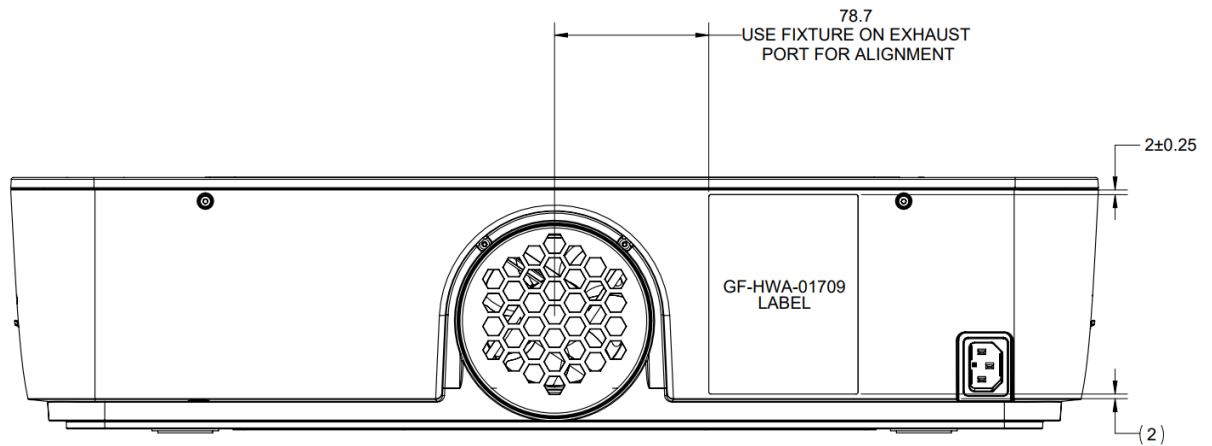
Glowforge Inc.
1938 Occidental Ave S, Suite C
Seattle, WA 98134

For more information or support, contact support@glowforge.com.

The following label information applies to the Glowforge GFD 200

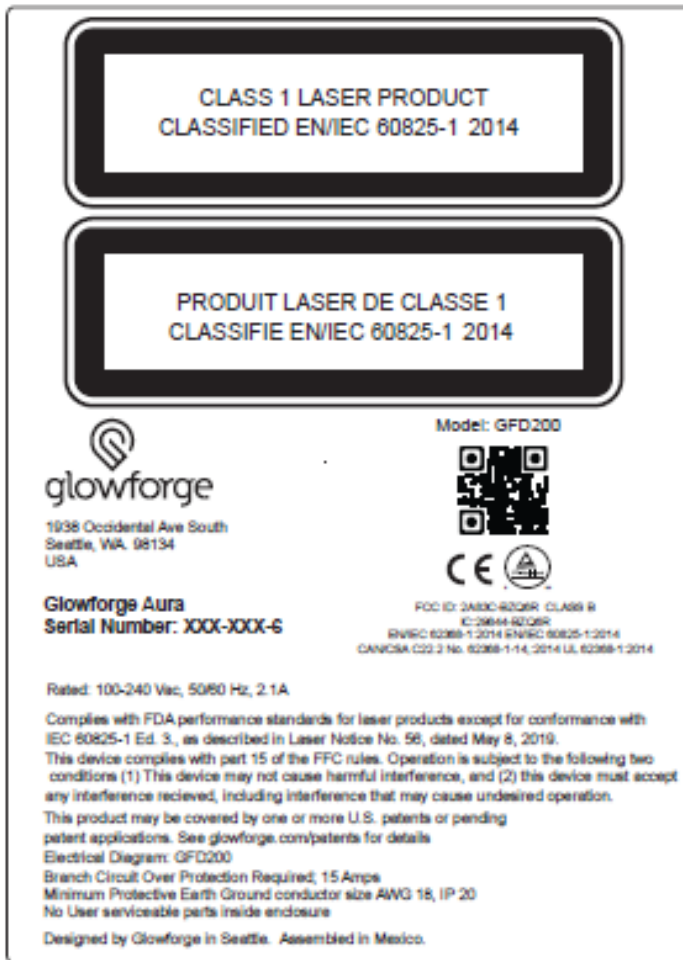
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The Manufacturer's Label will appear on the back of every Glowforge GFD 200, with an appropriate serial number, in the positions indicated. (Please see next page.)



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Preliminary Label Design (NOT final):



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Glowforge GFD 200 FCC Warning Statements

FCC ID 2A83C-BZQ6R

The Glowforge GFD 200 complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to the equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To satisfy RF exposure requirements, this device and its antenna must operate with a separation distance of at least 20 cm from all persons.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Glowforge GFD 200 Innovation, Science and Economic Development Canada (ISED) User Notification

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device. (Per RSS-Gen, Section 8.4.)

Unboxing & Setting Up

Let's Get Started

If you've read about Safety, you now know everything you need to operate your GFD 200 printer 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, our Customer Success team can be reached at support@glowforge.com

Before you start, be sure you have a stable surface on which to place your GFD 200 printer where you'll have nearby access to an electrical outlet and exhaust vent.

Let's get started, shall we?

Any damage?

If any part of your GFD 200 printer is visibly damaged out of the box, we want to make it right as soon as possible! Send photos of the damage to support@glowforge.com and wait

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until you hear back from us. If the printer itself is visibly damaged, do not plug it in or attempt to operate it; contact us immediately.

Setup

1. Place the box flat on the floor or a large flat surface, and open it.
2. Using two hands, remove the top foam piece by pulling straight up to reveal your GFD 200 printer.

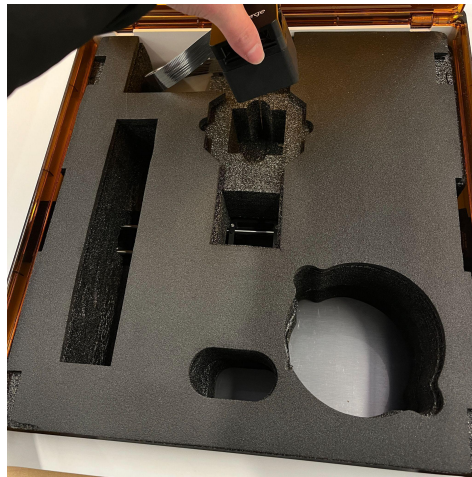


3. Lift your GFD 200 printer out of the box and place it on a flat, stable surface.
4. Remove the plastic bag from your GFD 200 printer, and peel away the blue tape holding the lid shut.

5. Open the lid. Remove the power cord and exhaust hose, and set them aside.



6. Lift the small foam piece to reveal the printer head. With one hand, carefully remove the printer head (with cable attached) from the larger foam insert. With your other hand, remove the foam insert from your GFD 200 printer.



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7. Place the printer head on the carriage plate with the Glowforge logo reading left to right, as pictured. The four magnets will help it click into place.



8. Pull away the foam pieces holding the laser arm in place on either side of the printer bed.

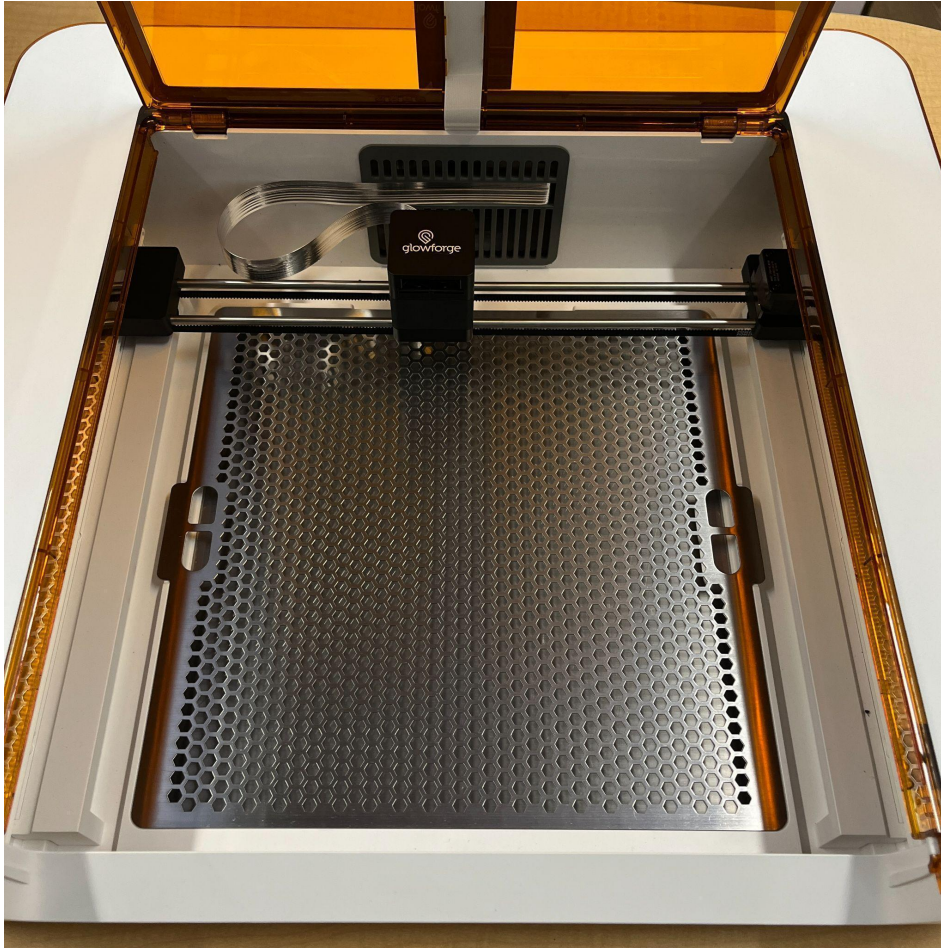


9. Push the laser arm to the back of the printer.



10. Remove the cardboard sleeve from the box and remove the cutting tray.
11. Place the cutting tray in your printer. The handles of the cutting tray will fit into the notches on the sides of the bed. When properly installed, the tray should sit fully

within the tray slot.



12. Close the lid.

13. Use the power cord to connect your printer to power.

Connect to Wi-Fi and Sign In

1. Using a web browser, navigate to setup.glowforge.com and sign in to your Glowforge account.
2. Depending on your computer, you may be prompted to download the Glowforge Setup app. If prompted, download and install it (this should take less than a minute). Open the Glowforge Wifi Setup app and log in with your Glowforge account email address and password. You'll see the "Let's Get Started!" page first. Scroll to the bottom of this page and click on "7. Connect to Wi-Fi". From here, the steps are the same whether you're using the app, or glowforge.com for setup.

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3. Once you're on the "You're ready to get connected!" page, check the button on your GFD 200 printer - it should be glowing teal. If not, press the button on top of your printer, and keep it pressed for at least 10 seconds. When the button begins to glow teal, let go, and click Continue when prompted on your device.
4. Your GFD 200 is now broadcasting a temporary Wi-Fi signal. With the computer you're using for setup, find the signal in your list of available Wi-Fi networks, connect to it, then return to setup. Please note it can take up to 30 seconds for the network to show up on your computer.
5. Once setup recognizes that you're connected to the temporary Wi-Fi signal, you'll see a list of available Wi-Fi networks.
6. Choose the network you'd like your GFD 200 printer to use (note: 2.4GHz Wi-Fi networks only), and enter the password if needed.
7. You're connected! You can close the setup App. It's time to start printing!

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!

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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](mailto:help@glowforge.com) 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