

Revision history

Date	Version	Content
2020-04-03	V1.0	The first version of the instructions
2020-04-24	V1.1	Added Sharpness and Grayscale under Engraving Parameters and Array Tools under Add Layer . The features are available in Laserbox v1.0.7 and later version.
2021-8-3	V1.2	Remove the device selection interface, laserbox software will automatically identify the device type

Disclaimer

Welcome! We're glad you use Makeblock products.

Before installing and using the product for the first time, please carefully read all the accompanying documents to make the most out of Laserbox. If you fail to use the product according to the instructions and requirements of the Manual, or mis-operate the product due to misunderstanding, etc., Makeblock Co., Ltd. (Shenzhen) bears no responsibility for any loss resulting therefrom, except for losses due to improper installation or operation by Makeblock professional maintenance personnel.

Makeblock Co., Ltd. (Shenzhen) has carefully collated the Manual rigorously and carefully, but we cannot guarantee that the Manual is completely free of error or omission.

Makeblock Co., Ltd. (Shenzhen) is committed to continuously improving product functionality and service quality, and therefore reserves the right to change any product or software program described in the Manual and the contents of the Manual at any time without prior notice.

The Manual is intended to help you use the product correctly and does not include any description of the product hardware and software configuration. For product configuration, please refer to the relevant

contract (if any) and packing list, or consult your distributor. Pictures in the Manual are for reference only and the actual product may vary. Protected by copyright laws and regulations, the Manual shall not be reproduced or transcribed in any way, or be transmitted on any wired or wireless network in any manner, or be translated into any language without the prior written authorization of Makeblock Co., Ltd. (Shenzhen).

Video tutorials

We provide video tutorials to help you quickly get started with Laserbox. For video tutorials, see

<https://www.makeblock.com/maker-tools/laserbox-video>

Safety first

General safety

Read and get familiar with all safety protocols and procedures before operating the Laserbox. Users shall strictly follow all safety precautions and ensure that the Laserbox is properly assembled and in working order.

Please observe the following operating principles:

- Always check the Laserbox for damage every time before use. Do not operate any damaged or defective Laserbox in any way.
- Please keep the workspace clean and flat. Please note that the laser tube is made of glass and is very fragile. If it is broken, the Laserbox will fail to work.
- Without authorization, please do not disassemble or convert Laserbox in any other way; and please do not modify or decompile the operating system of Laserbox.
- Never leave Laserbox running unattended.

- Please keep the inside of Laserbox clean. Residues and chippings accumulated during cutting and engraving are dangerous and may cause a fire. Clean the chippings and residues in the honeycomb panel and tray on a regular basis.
- The working temperature of laser is between 5 ° C and 25 ° C. It is strictly prohibited to operate below 0 ° C.

Laser safety

Under normal circumstances, the CO2 laser tube is completely enclosed in a casing during operation. The Laserbox has a safety interlock switch. If the lid is lifted during operation, the Laserbox will stop working to prevent harming people. No special precautions are required to ensure laser safety.

Please observe the following safety guidelines:

- Never operate Laserbox with any parts removed, such as tray. Please note that the absence of any part of the Laserbox may expose the laser system and increase the risk of equipment damage. Remember that the CO2 laser beam is invisible.
- Do not engrave or cut any material that contains PVC or vinyl (plastics are not recommended). These materials (and other materials containing chlorine/chloride) can generate corrosive vapor that is extremely harmful to the human body and can cause damage to Laserbox. Any damage caused by engraving or cutting any material containing PVC or vinyl is not covered by Makeblock' s warranty.
- Do not engrave or cut any unknown material. Vaporization/melting of many materials, including but not limited to, PVC and polycarbonate, will release harmful smoke.
- Laser operation is prohibited when the lid/tray is lifted. Make sure that the lid/tray is closed while running and do not tamper with the safety mechanism of the lid.

- Do not operate Laserbox before properly connecting the smoke purifier. Most materials produce irritating smoke when being processed. These include, but are not limited to, paints, varnishes, composite boards, and plastics that can produce hazardous compounds during processing.

The reference standard for laser safety is American National Standard for Safe Use of Lasers (Z136.1-2000), which is provided by the American National Standards Institute (ANSI). This reference is the basis for federal regulations and laser system manufacturers, as well as the laser safety guidelines of Occupational Safety and Health Administration (OSHA). It contains details on the proper installation and use of laser systems.

Fire safety

A high-density laser beam is used by Laserbox to irradiate the material to be cut or engraved to heat up the material surface and vaporize the material without burning. But most materials are inherently flammable and may be ignited to form a naked flame that can burn Laserbox (even if it is made of flame-retardant materials) and its surroundings. Experience shows that vector cutting with a laser is most likely to produce a naked flame. Particularly acrylic has proven to be extremely flammable in vector cutting.

Please read the following warnings and suggestions carefully:

- Please note that stacked materials (especially organic materials such as paper) may spread flames or increase the risk of ignition.
- Never leave Laserbox unattended during operation. There is a risk of fire if Laserbox is started due to incorrect settings and left unattended for a long period of time, or if Laserbox is mechanically or electrically malfunctioning during operation.
- Clean Laserbox on a regular basis. Excessive accumulation of residues and chippings from cutting and engraving would increase the risk of fire.

Honeycomb panel and tray should be removed and cleaned periodically to ensure that there is no residue or chipping inside Laserbox.

- Keep the area around Laserbox clean and free of cluttered flammable materials, explosives or volatile solvents such as acetone, alcohol or gasoline. Get fire extinguishers ready beforehand, and perform regular maintenance and inspection.

Electrical safety

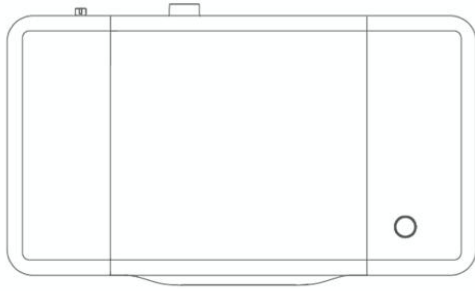
Laser tube of the Laserbox has a silicone rubber casing, which can effectively shield the internal power cord. If you find the cover is loose and the power cord is exposed, stop running Laserbox and contact customer service personnel.

Please carefully read and strictly observe the following warnings and suggestions:

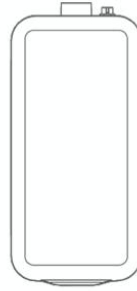
- When Laserbox is connected to the power supply, do not open any access panel on Laserbox to avoid harm from accidental contact with the power supply.
- When Laserbox is connected to the power supply, do not touch the electronic area with your hands or other tools.
- "The power button is on the back of Laserbox. Press "-" down to power it ON and press "o" down to power it OFF."

Preparation

List of items



Laserbox × 1



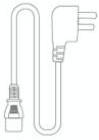
Smart Smoke Purifier × 1



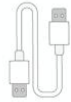
3mm Basswood × 56



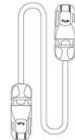
3.5mm Cardboard × 45



Power Cord × 1



USB Cable × 1



Aviation Connector × 1



User Manual × 1



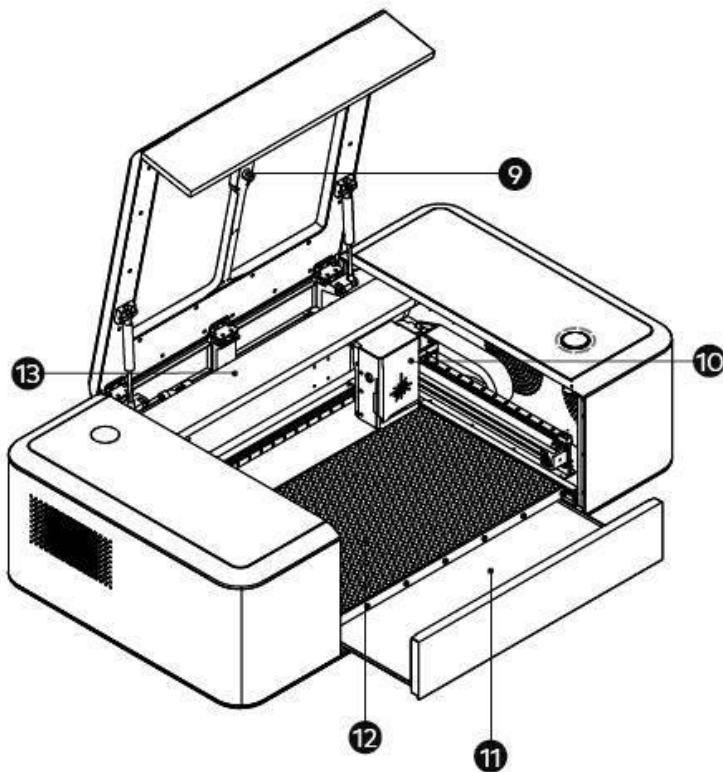
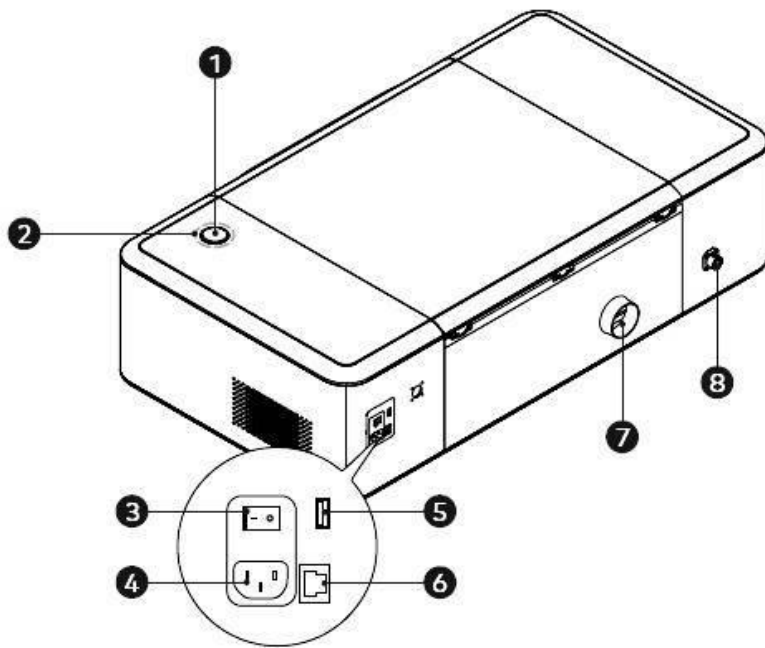
Smoke Exhaust Pipe × 2



Pipe Clamp × 3

Meet your Laserbox

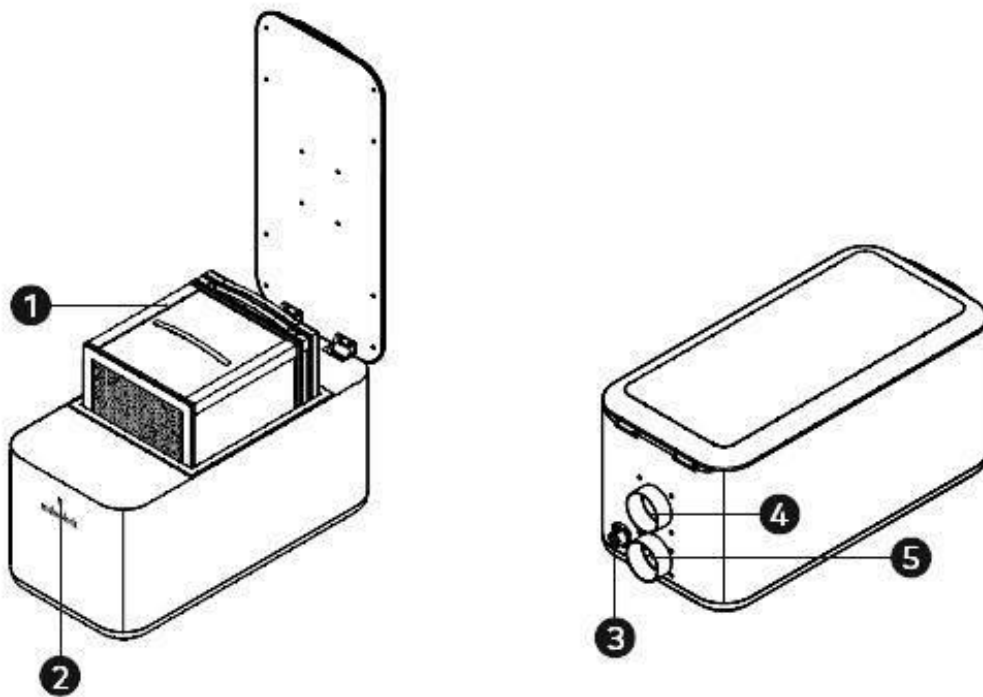
Laserbox



1	Button	2	Annular indicator	3	Power button	4	Power interface	5	USB interface
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6	Ethernet cable interface	7	Smoke outlet	8	Aviation interface	9	Camera	10	Laser head
11	Tray	12	Honeycomb panel	13	Laser tube				

Smart smoke purifier



1	Filter	2	Indicator	3	Aviation interface	4	Smoke inlet	5	Smoke outlet
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Annular indicator status

Indicator status	Description
Flashing white	The system gets started.
Solid white	Waiting to connect
Flashing blue	It is ready and the image has been sent successfully

Solid blue	It is in the standby mode and the Laserbox has been connected to the computer
Six indicators light up gradually	It is in the working status, and the number of indicators that are ON indicates the current progress
Solid green	Complete
Green breathing indicator	Sleep mode. It goes into the sleep mode from the standby mode after 10 minutes idle.
Solid red	Abnormal
Solid purple	The Laserbox firmware is being upgraded

Download and install software

Download Laserbox

Laserbox is the laser engraving software designed by Makeblock.

The software features many capabilities that let you make the most out of Laserbox. It also provides essential design tools that you can depend on to create different shapes and add filters to your design. Download

Laserbox at: <https://www.makeblock.com/maker-tools/laserbox-2#Software>

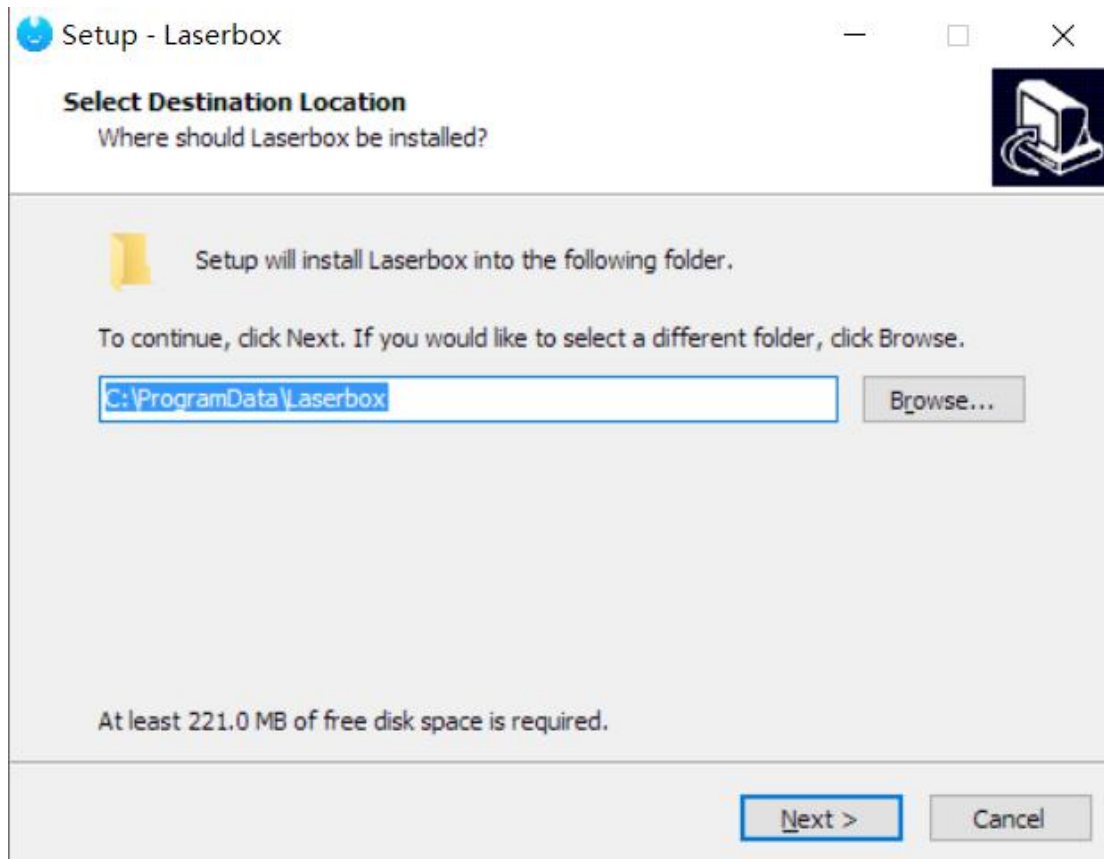
Install Laserbox

1. Run installer

Run the Laserbox installer you just downloaded.

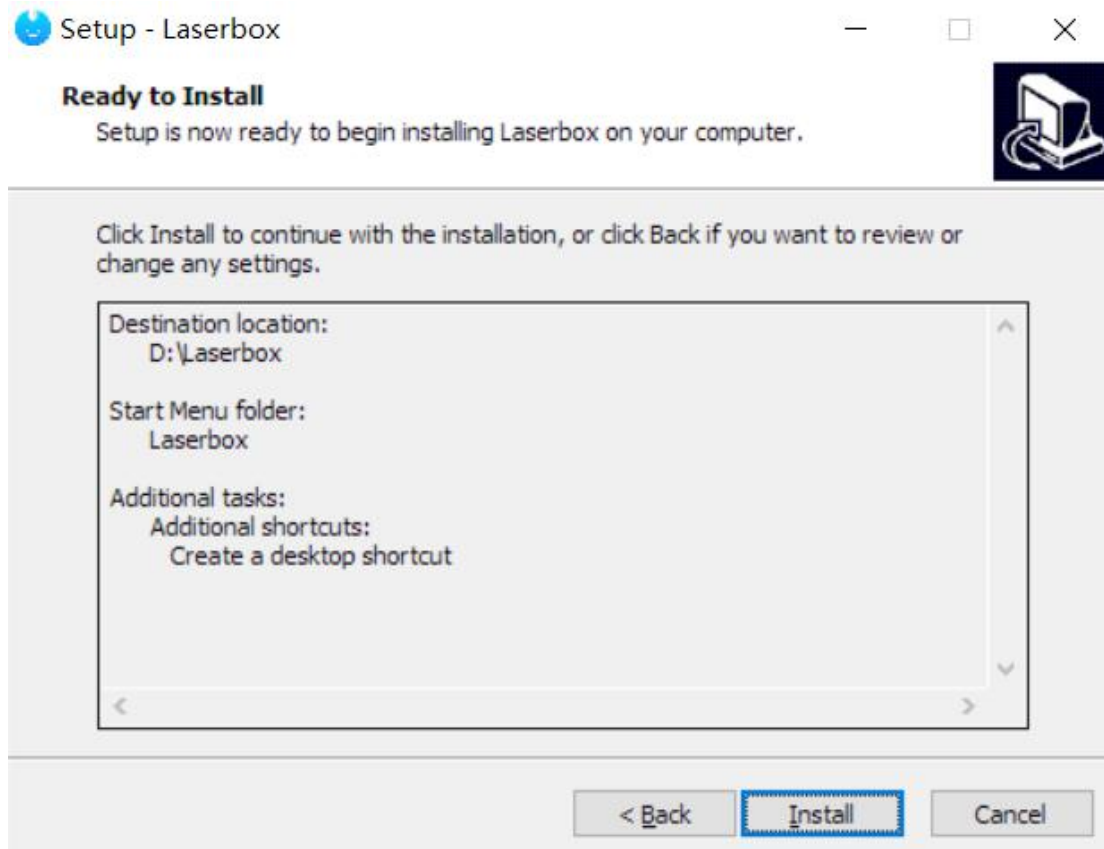
2. Choose destination location

Choose the folder into which you're going to install Laserbox. Click Next to continue.



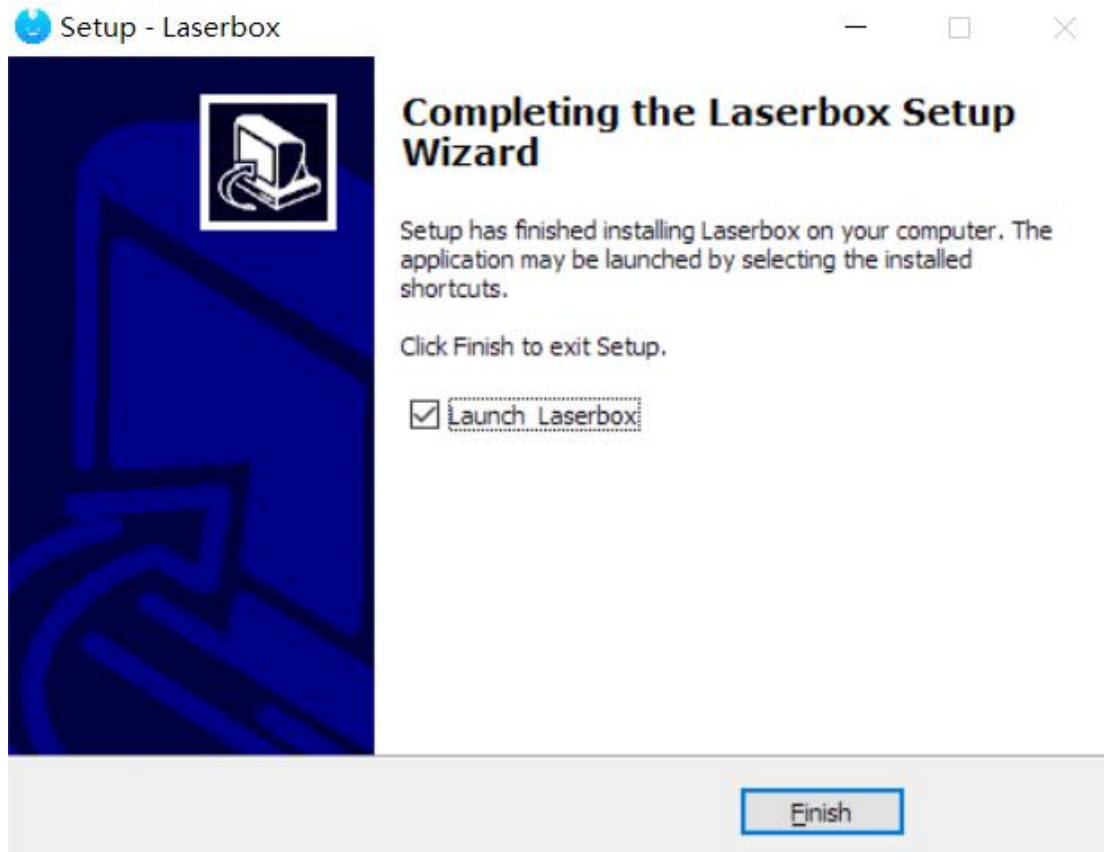
3. Select additional tasks

Follow the on-screen prompts to select any of the additional tasks you want to perform, including adding a folder to the Start menu or creating a desktop shortcut. Click **Install** to start the installation.



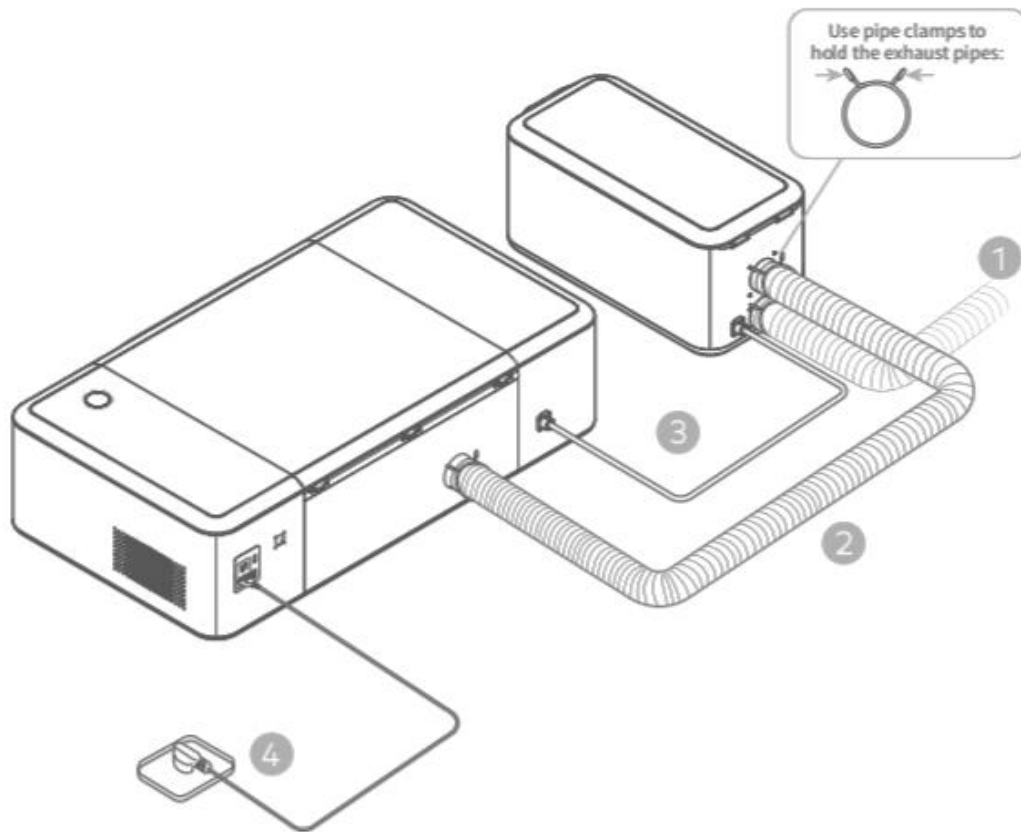
4. Finish

After the installation is complete, click **Finish** to exit the installer.



Connect devices

Connect the smart smoke purifier to Laserbox.



1. Plug the 2m exhaust pipe into the purifier and lead the pipe to the window.
2. Connect Laserbox and the purifier with the 1.5m exhaust pipe.
3. Connect Laserbox and the purifier with the aviation connector.
4. Connect to a power supply.

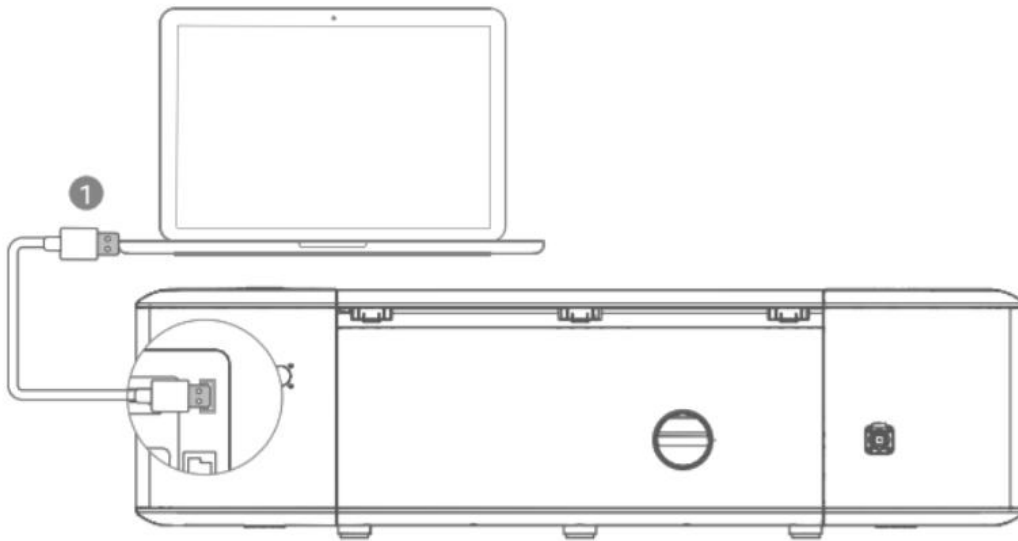
Start Laserbox for the first time

The laser head automatically resets and calibrates after you press the power button. When the first startup is complete, the annular indicator will turn solid white. The startup process takes a while, so please be patient.

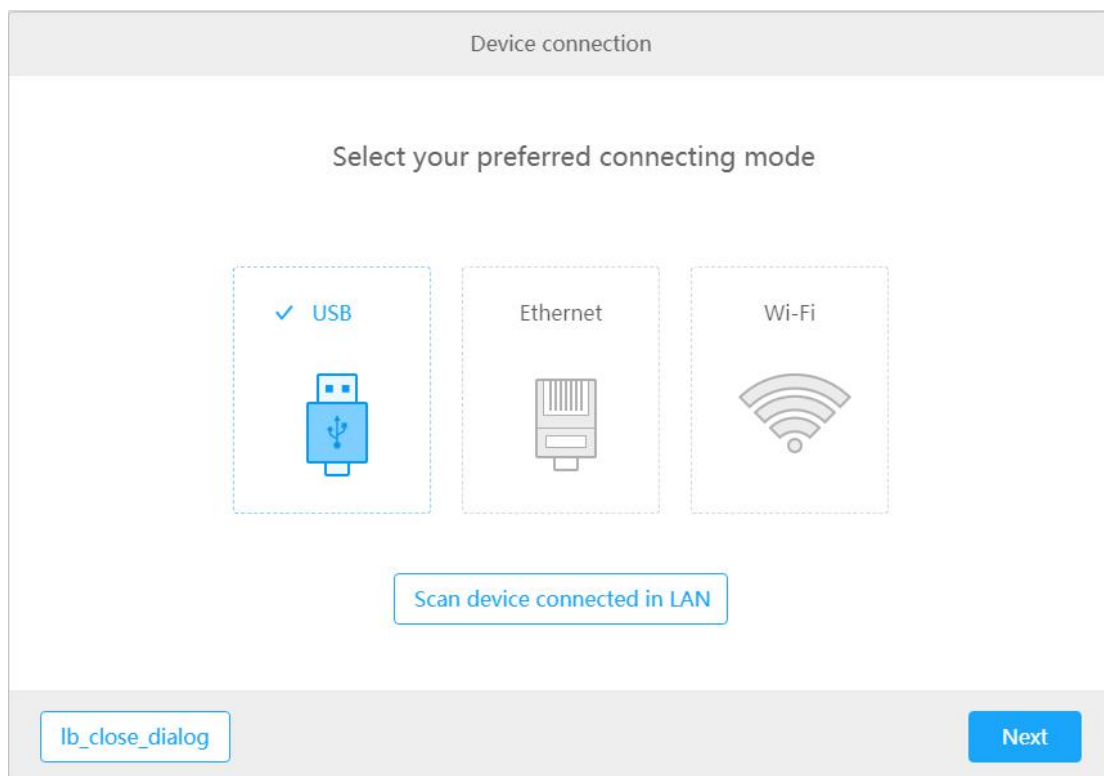
Connect laserbox to a computer

Connect via a USB cable

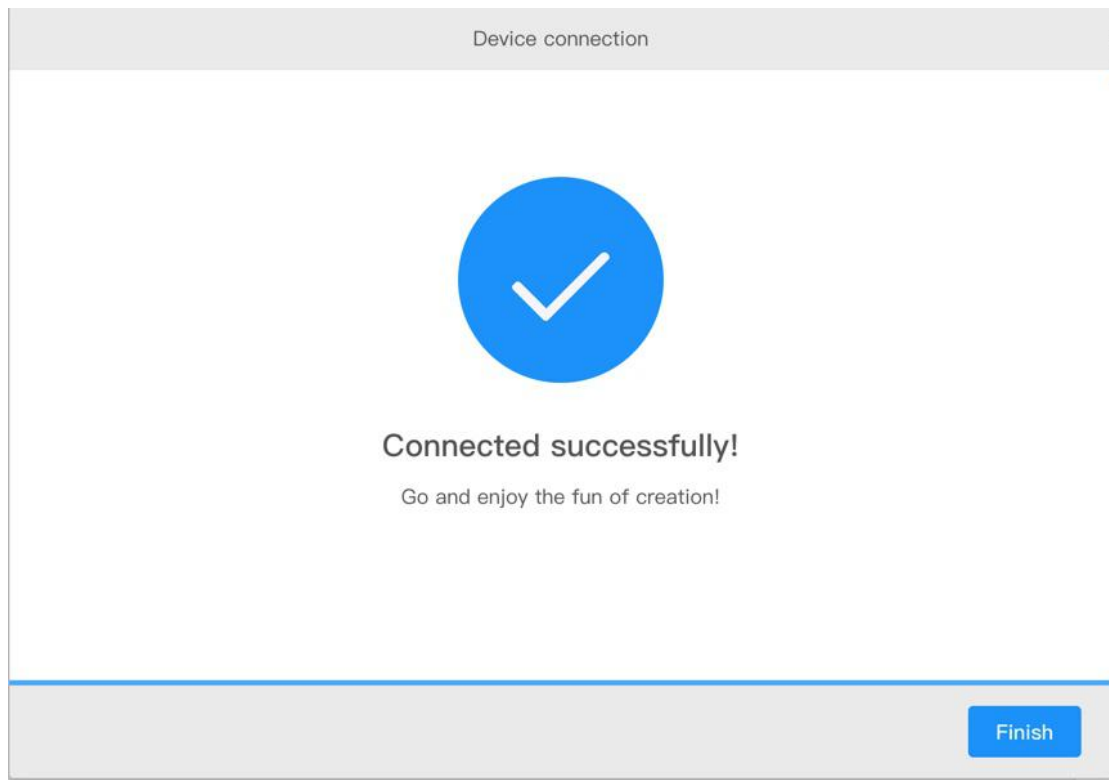
1. Use a USB cable to connect Laserbox to your computer.



2. Open the software Laserbox, Select **USB**, then click **Next** to connect Laserbox to the computer.

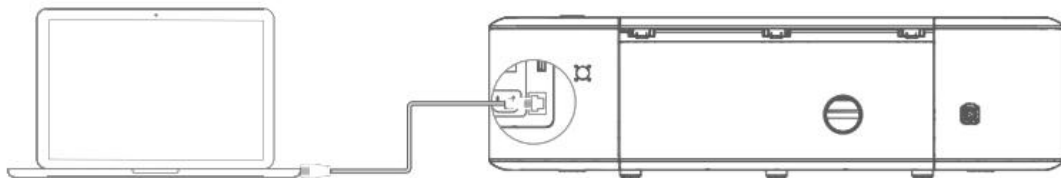


3. Connected successfully.

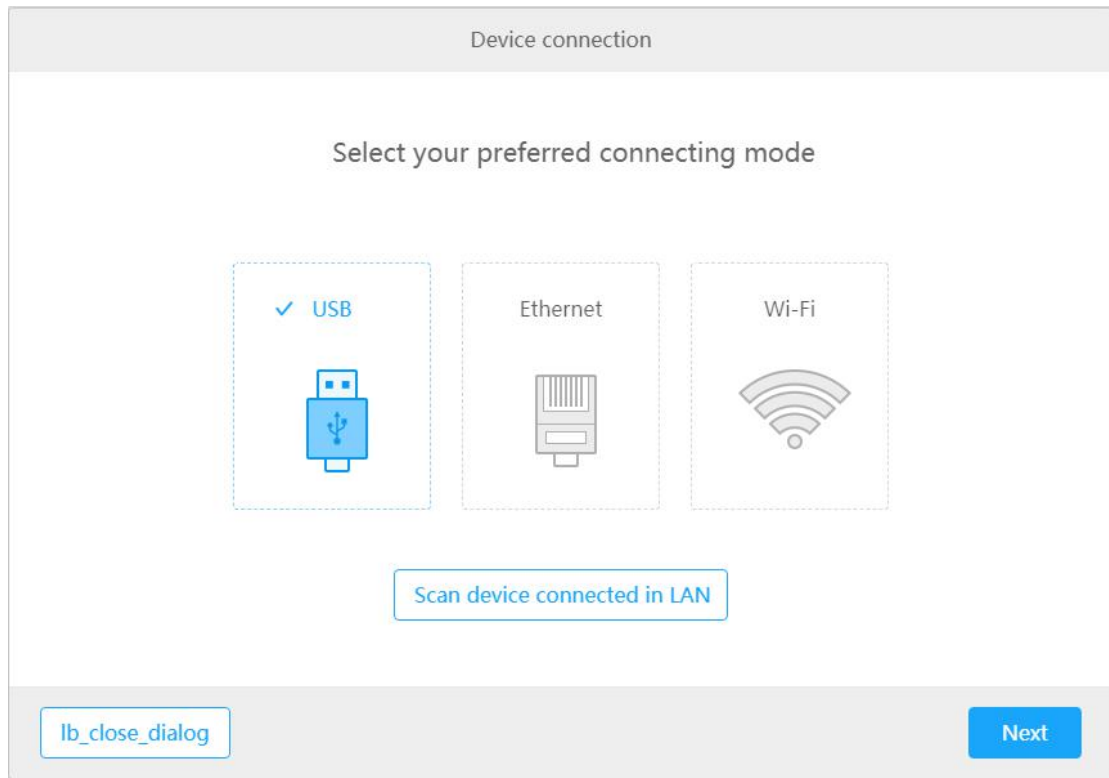


Connect via an Ethernet cable (not included in the package)

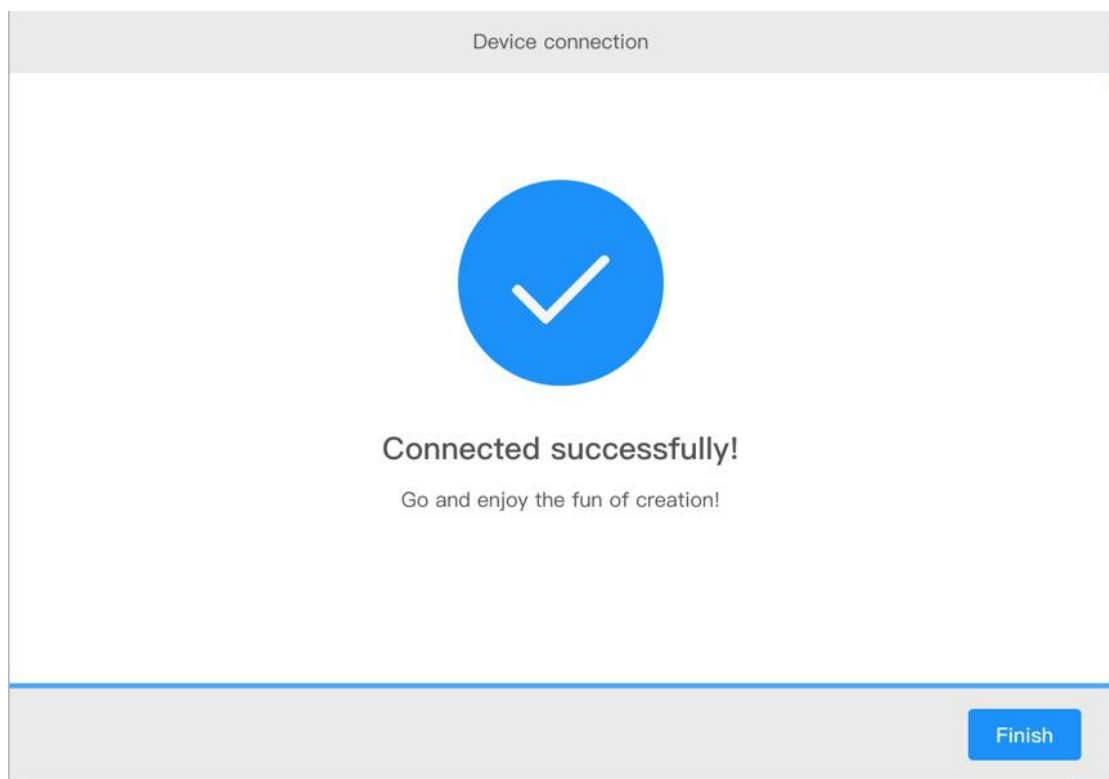
1. Use an Ethernet cable to connect Laserbox to your computer.



2. Open the software Laserbox, Select **Ethernet**, then click **Next** to connect Laserbox to the computer.

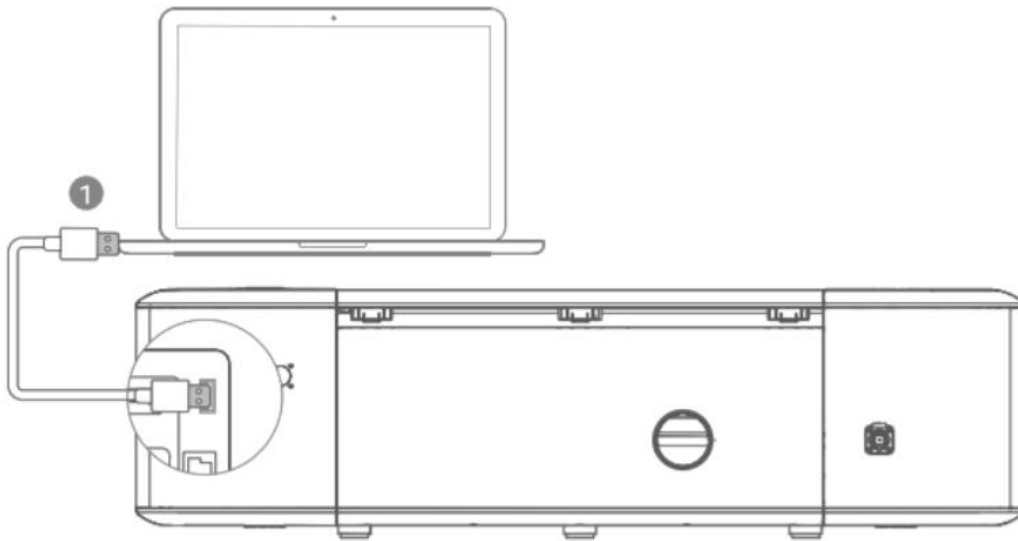


3. Connected successfully.

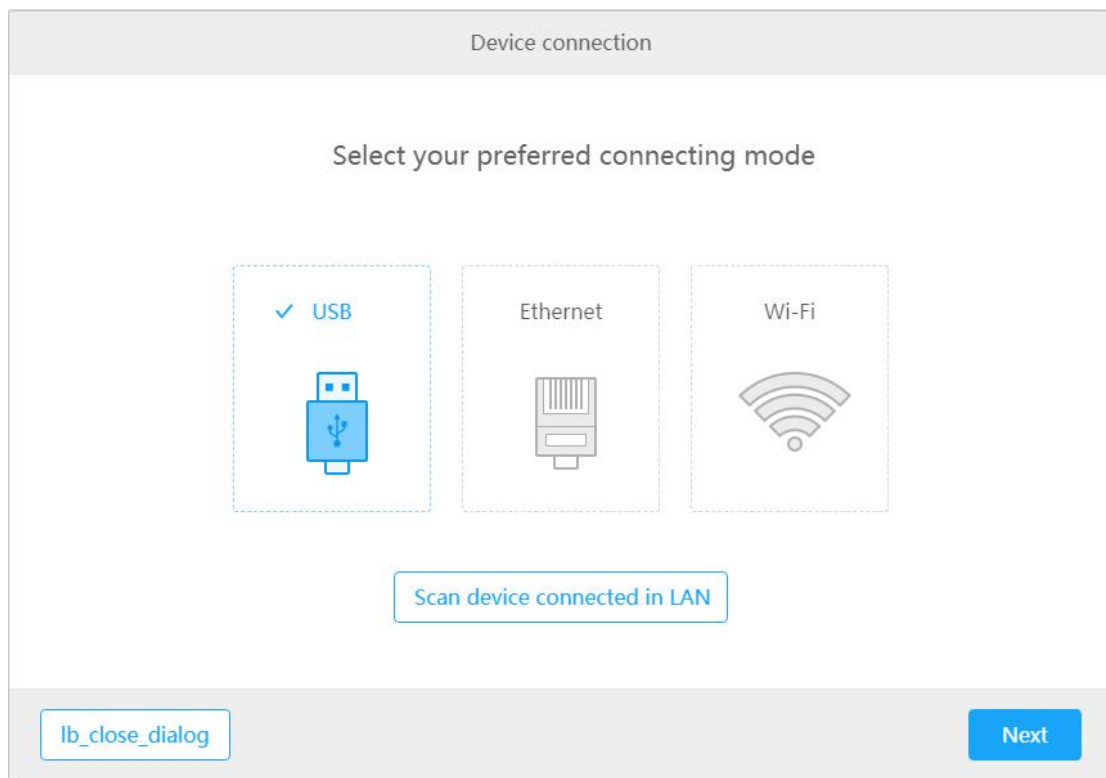


Connect via Wi-Fi.

1. Use a USB cable to connect Laserbox to your computer.



2. Open the software Laserbox, Select Wi-Fi, then click **Next** to connect Laserbox to the computer.



3. Connect to an available Wi-Fi network.

Device connection

Select the Wi-Fi network to which your device connects.

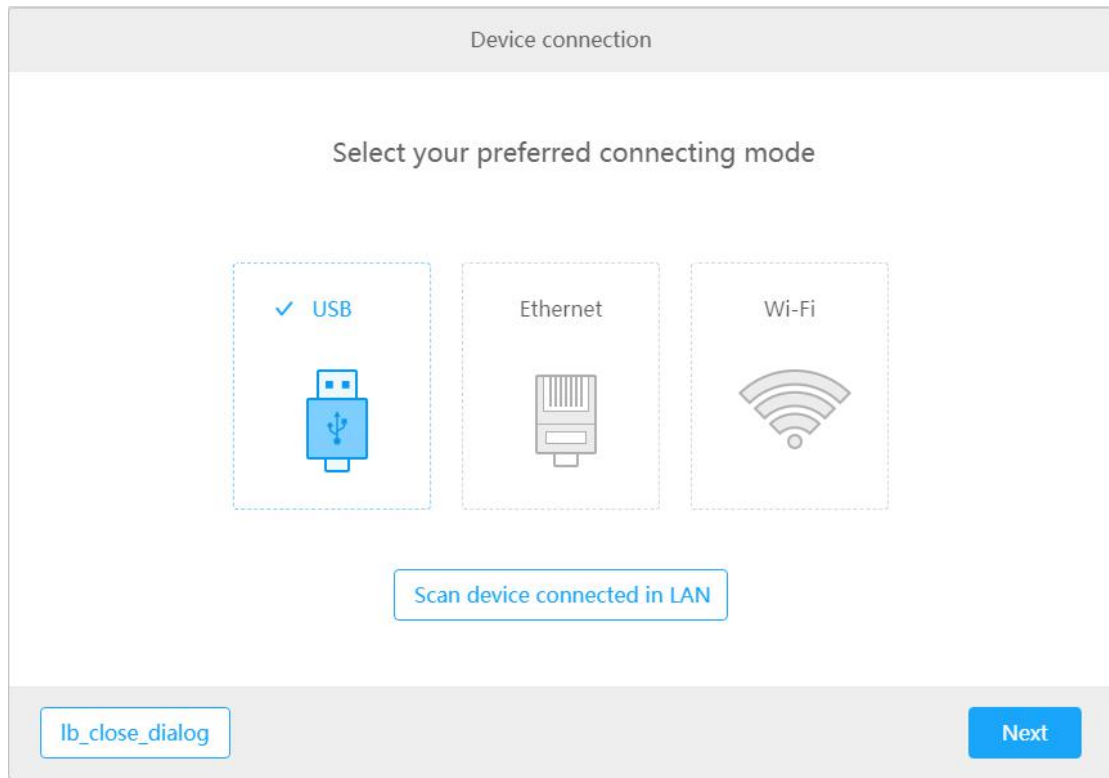
Wi-Fi Name

Password

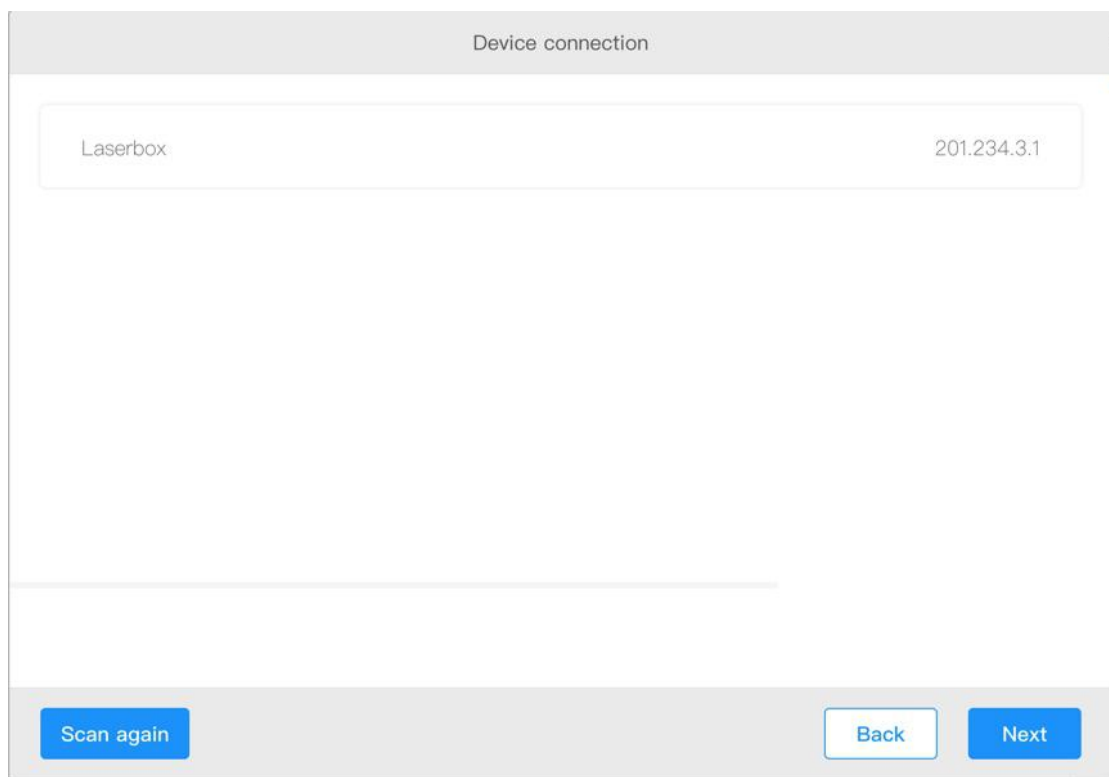
4. Remove the USB cable when successfully connected to a Wi-Fi network. When the computer and the laser cutter are on the same Wi-Fi network, you can wirelessly control the laser cutter using the software Laserbox.

Connect to a networked Laserbox.

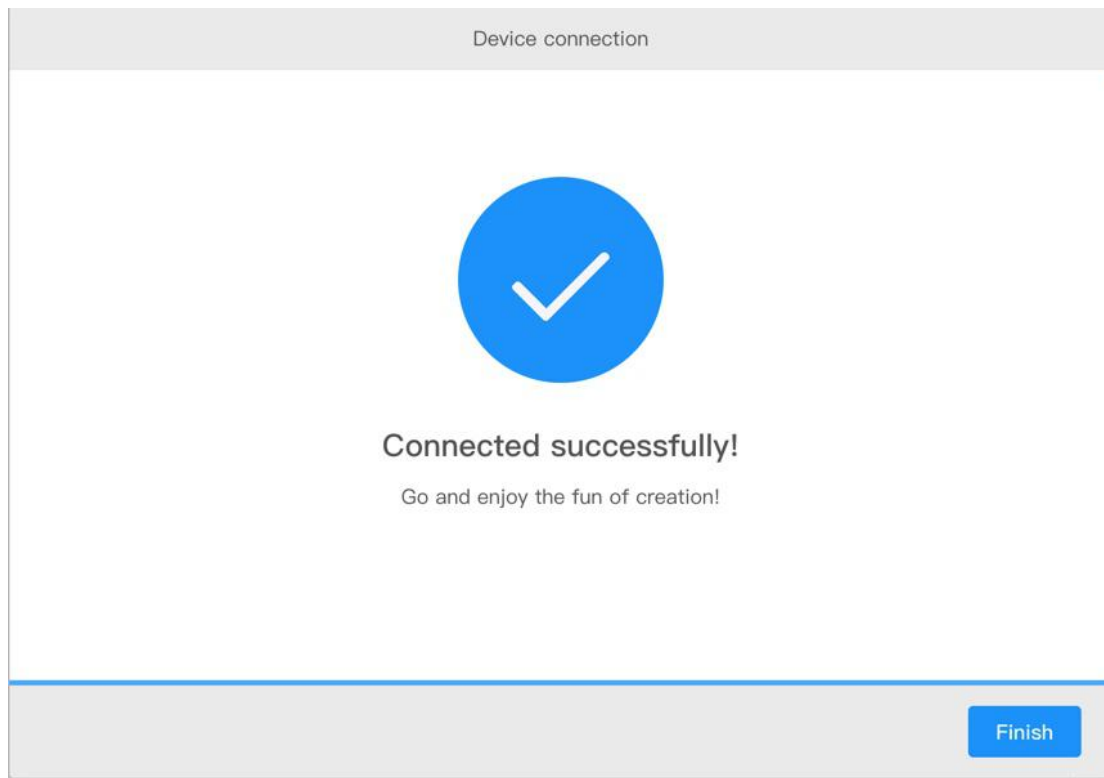
1. Ensure your computer and the laser cutter are on the same Wi-Fi network.
2. Open the software Laserbox, select **Scan device connected in LAN**.



3. Select the device you'd like to connect from the list. Click **Next**.



4. Connected successfully.



Features

Cut/Engrave

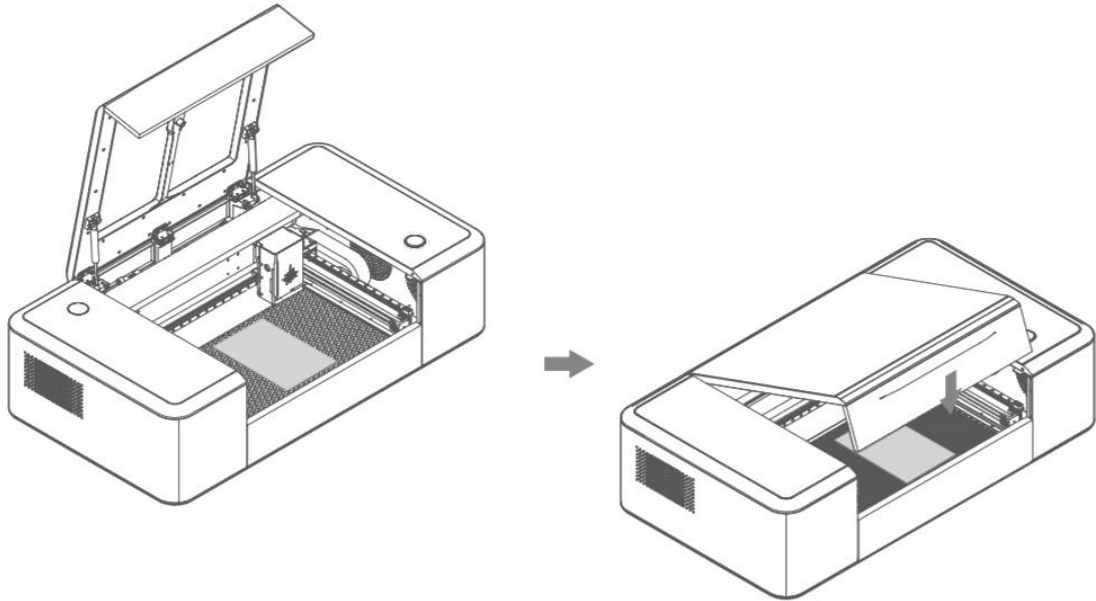
What can it do?

Laserbox can engrave or cut every single layer in the canvas, and finish processing them in one task.

How to use it?

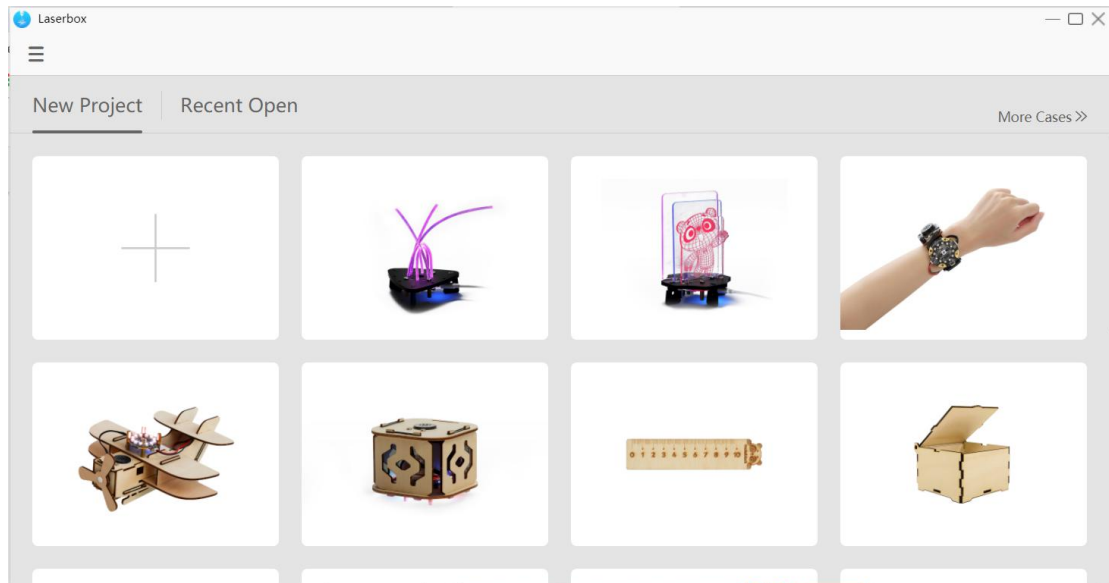
1. **Place materials.**

Open the lid. Place a Makeblock material in the working area. Ensure the ring code side faces up.



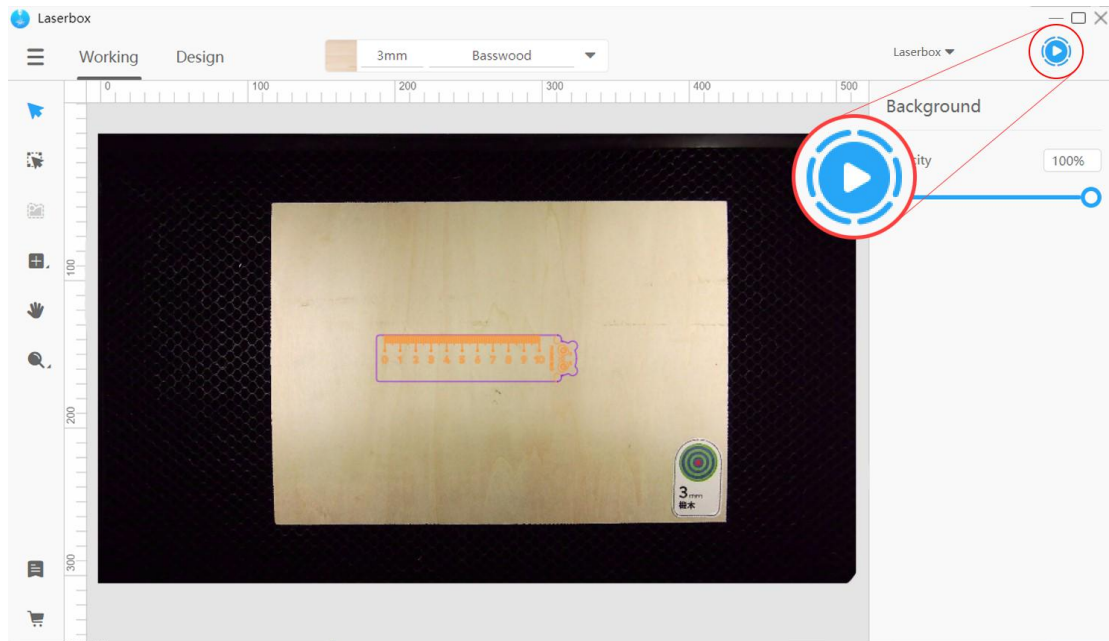
2. Import the file.

Open the software Laserbox. Select a sample project, or import an image file.



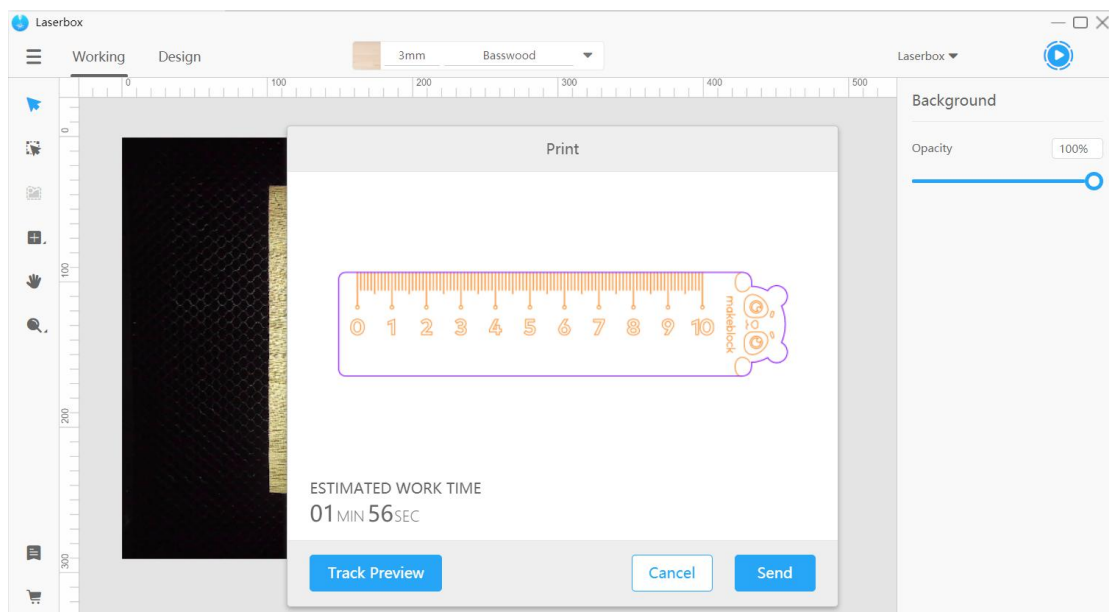
3. Click the start button.

Click the start button at the upper right corner.



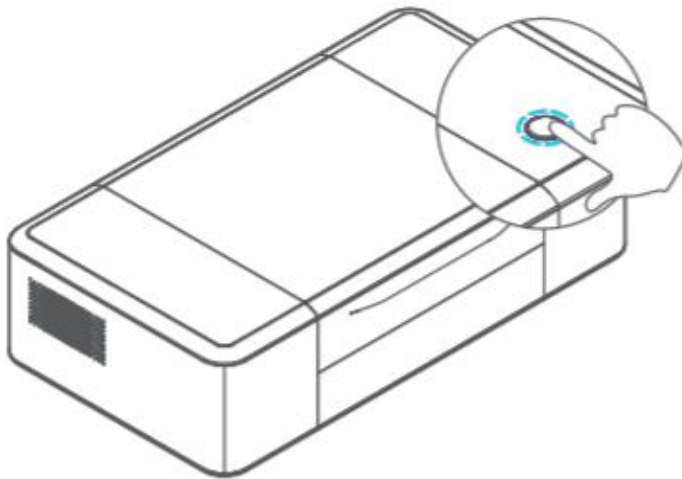
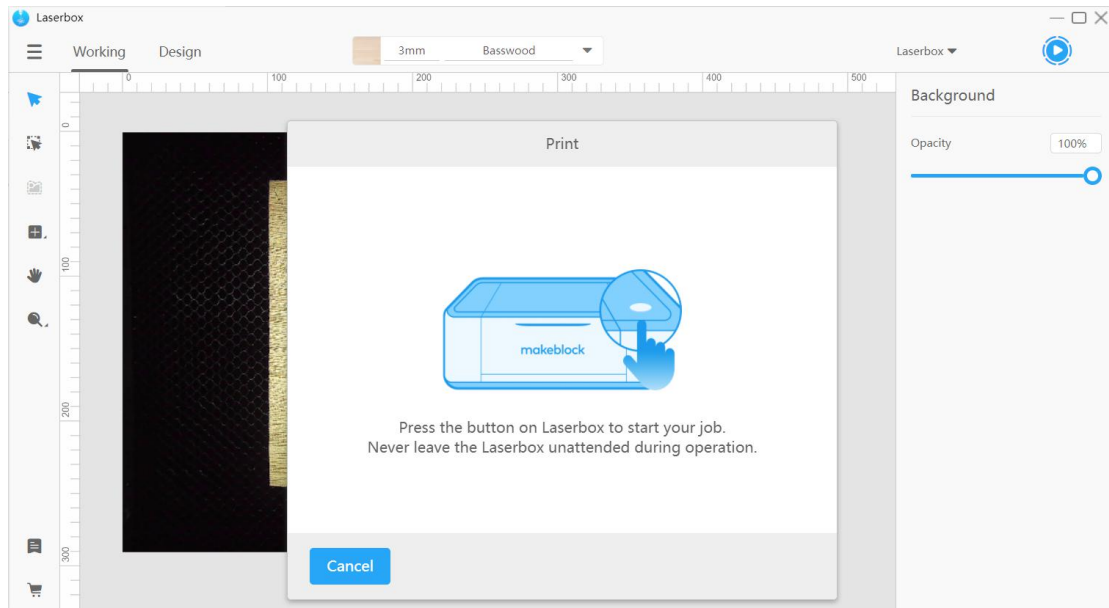
4. Click the send button.

In the pop-up, click **Send** to send the file to the laser cutter.



5. Press the button.

After the file is sent to the laser cutter, follow the on-screen prompts to press the button on the laser cutter. The laser cutter starts working.



6. Task finished.

When seeing a prompt or the annular indicator turn green, you know the task is complete. Then you can open the lid to take out the result.

Identify materials

What can it do?

Laserbox features a high-definition camera with an ultra-wide-angle lens. It automatically recognizes Makeblock materials based on ring codes, making necessary settings adjustments, including focus, speed and power,

to ensure a best cut or engraving. No more manual focus or parameters setting. No more hassle over running tests on the chosen materials.

NOTE

- DO NOT pile up several materials; otherwise, it may cause damage to the laser head.
- DO NOT stick ring codes to any of non-Makeblock materials. Laserbox relies on the ring codes to identify materials and make settings adjustments. These adjustments only apply to Makeblock materials so Laserbox could fail to give you what you expect if you're using a non-Makeblock material.

How to use it?

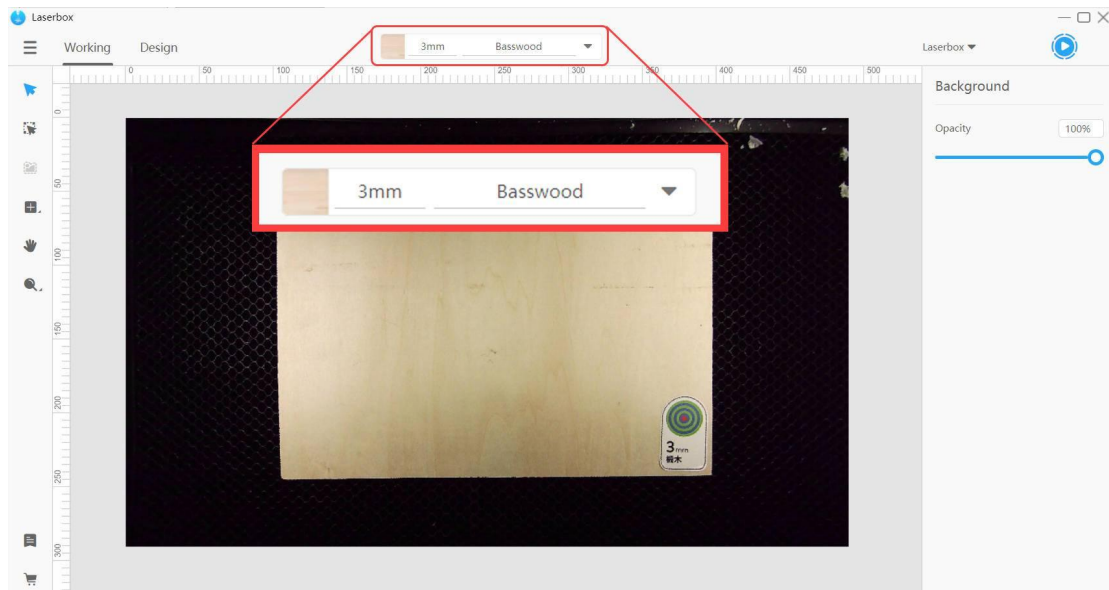
1. Place materials.

Open the lid. Place a Makeblock material in the working area. Ensure the ring code side faces up.



2. Auto recognition

Close the lid. Laserbox automatically recognizes the material, and sets up the parameters accordingly.



Auto measure

What can it do?

Laserbox features a high-definition camera with an ultra-wide-angle lens enabling it to automatically measure the thickness of the material. Based on the measurements, Laserbox automatically adjusts the focus before it starts laser cutting or engraving. No manual measurement or manual focus is required. You can save much trouble.

NOTE

- DO NOT place materials that are over the maximum thickness. Laserbox could process up to 22mm thickness, or up to 52mm thickness if the honeycomb panel is removed. Exceeding the limit could lead to a failed focus setting and even damage the laser cutter.
- Please go to our website to check the supported materials. But we can't recommend parameters settings for non-Makeblock materials, and can't promise you superior cutting/engraving experience if you're using

non-Makeblock materials. Our official website: <https://www.makeblock.com/maker-tools/laserbox/>

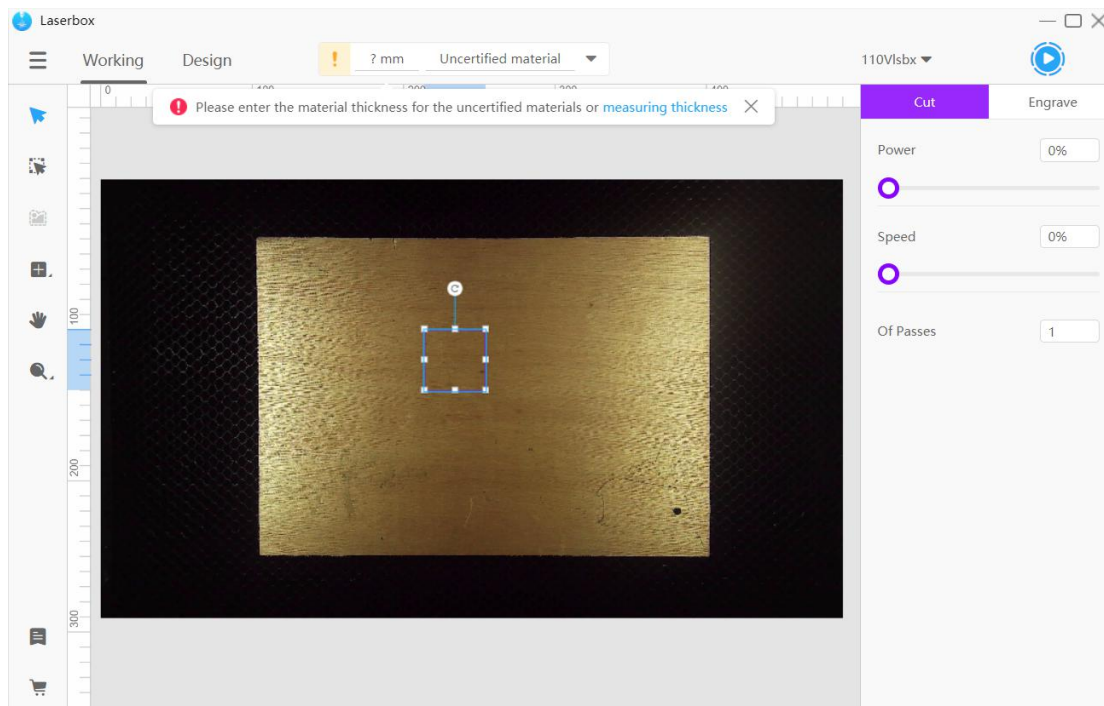
How to use it?

1. Place materials.

Open the lid. Place the material in the working area.

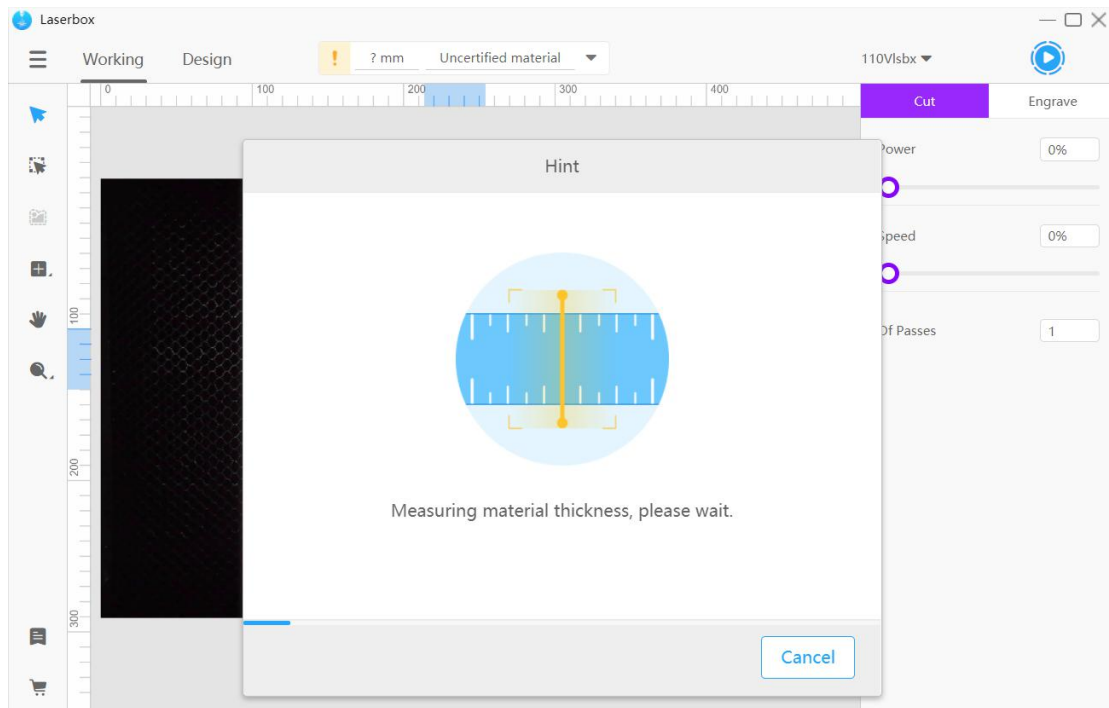
2. Determine the location to measure.

Import an image or insert a shape in the software. Drag the image or shape to the location where you'd like Laserbox to process. Then, above the canvas appears an auto measurement prompt.



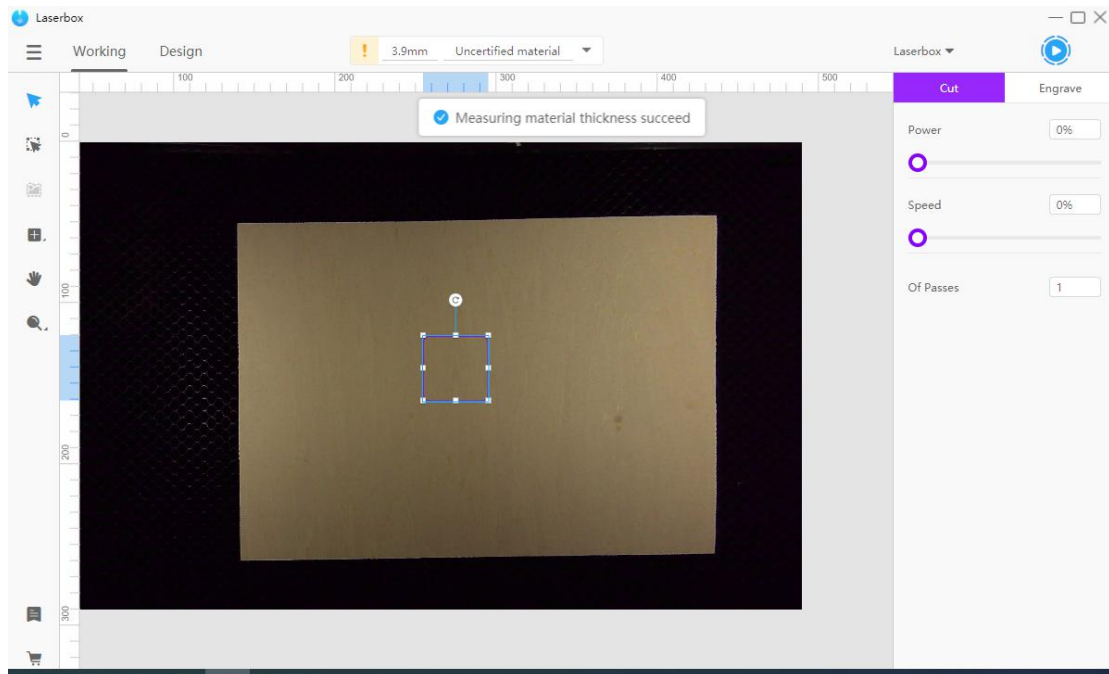
3. Start measuring.

Click **Measuring thickness** in the prompt. The laser head will start measuring the thickness of the location where the image or shape is processed.



4. Finish measuring.

A prompt pops up after measurement is complete, and the measurement result is displayed at the top of the interface.



Extract images

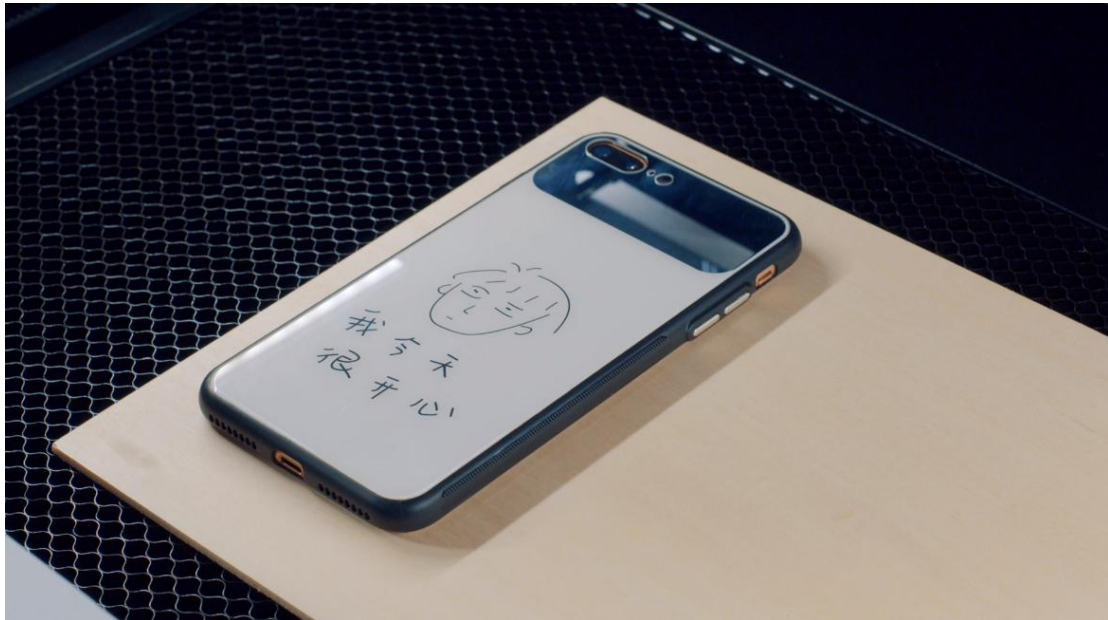
What can it do?

Laserbox features a high-definition camera with an ultra-wide-angle lens. It uses an image-processing algorithm which lets you extract images with a click away. You can directly use the image extracted from the surface of an item to create your own project. It could improve the efficiency a lot.

How to use it?

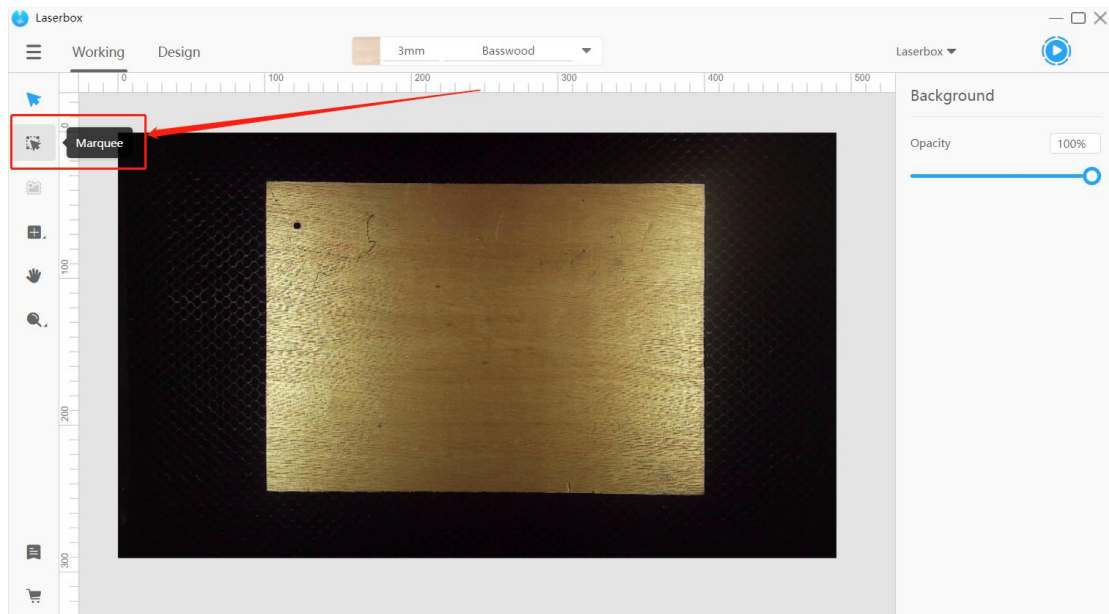
1. Place an item.

Open the lid. Put the item you'd like to extract in the working area.



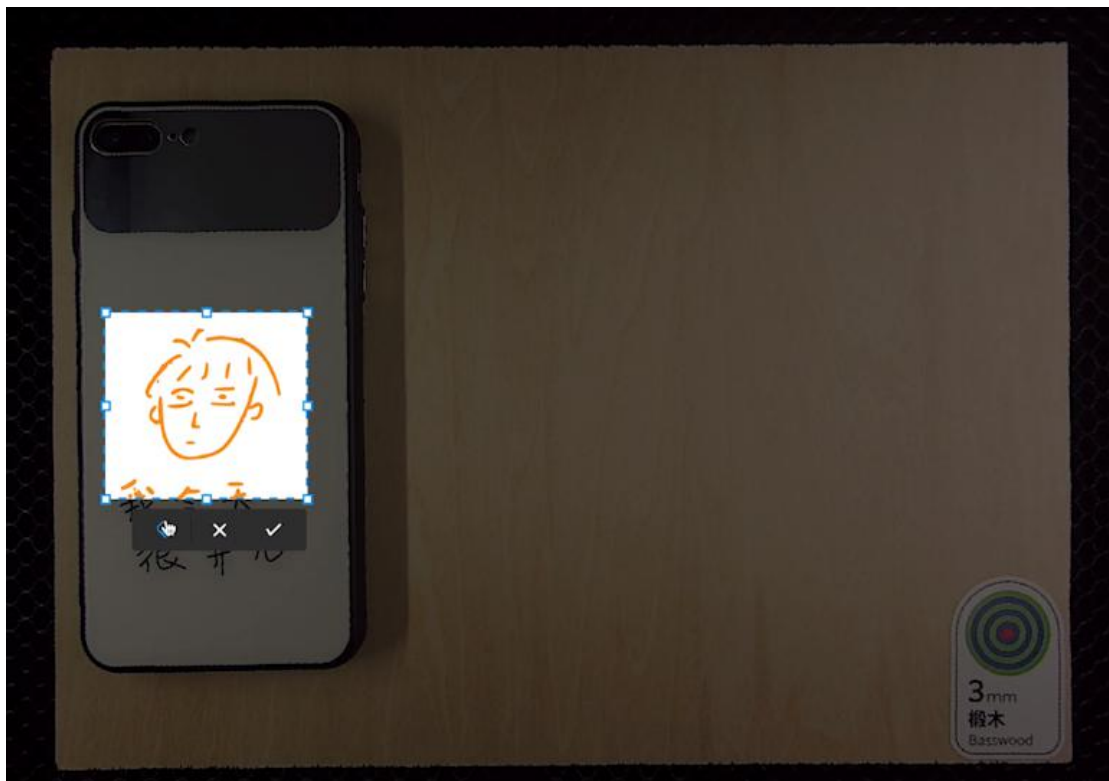
2. Click Marquee.

In the **Working** interface, click Marquee on the left toolbar.



3. Frame the image.

Drag your mouse to frame the image you'd like to extract. Use the eraser tool to remove what you don't need in the frame.



4. Finish

Click ✓ to confirm.



Extract outlines

What can it do?

The software Laserbox is able to quickly extract an image by its outline for later cutting or engraving, ensuring much more superior results.

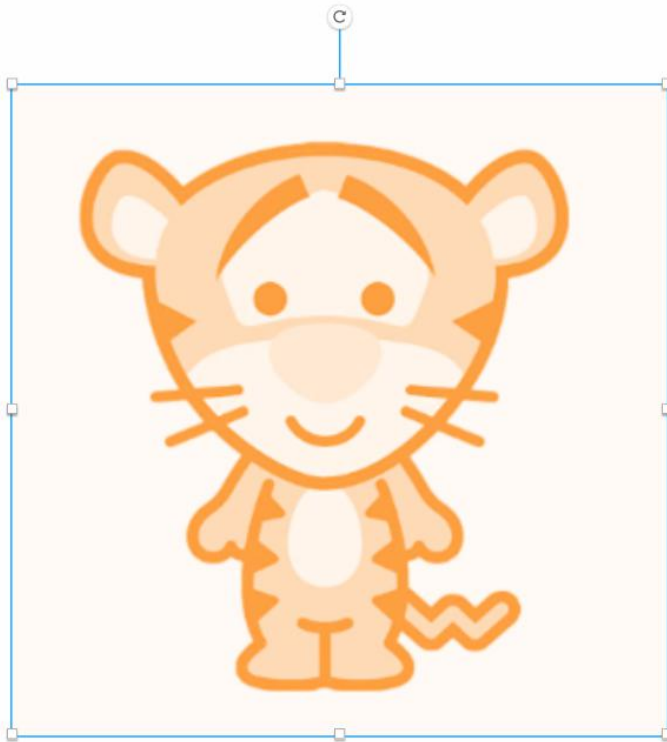
NOTE

- Select images with enclosed outlines. Images made of broken lines may lead to failure in outline extraction.
- Select images made with a pure-colored background. Adding images made of complex textures could lead to failure in outline extraction.

How to use it?

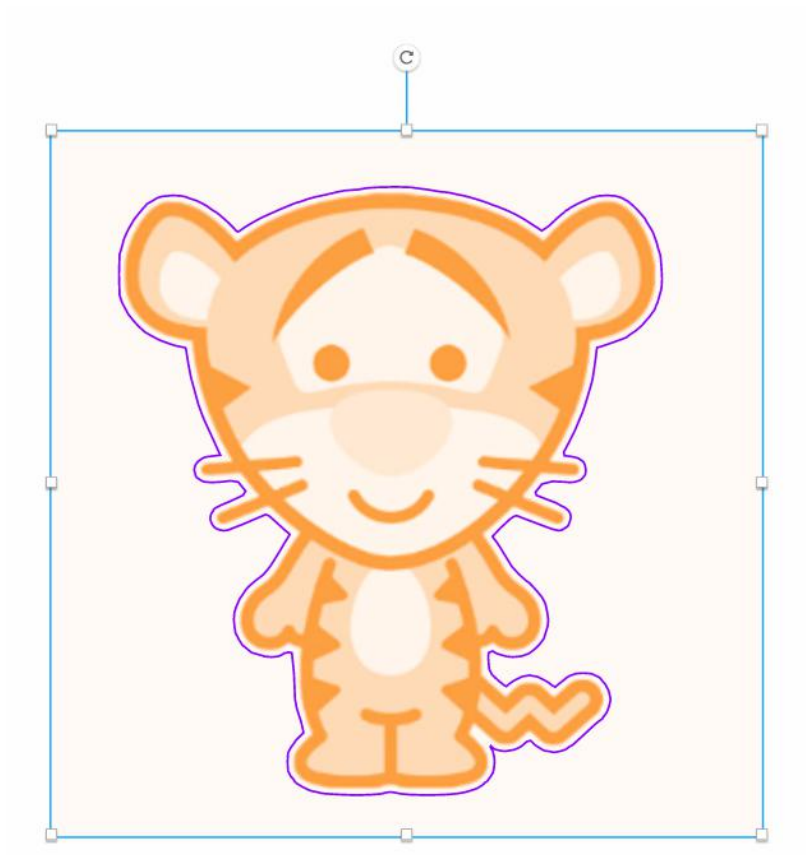
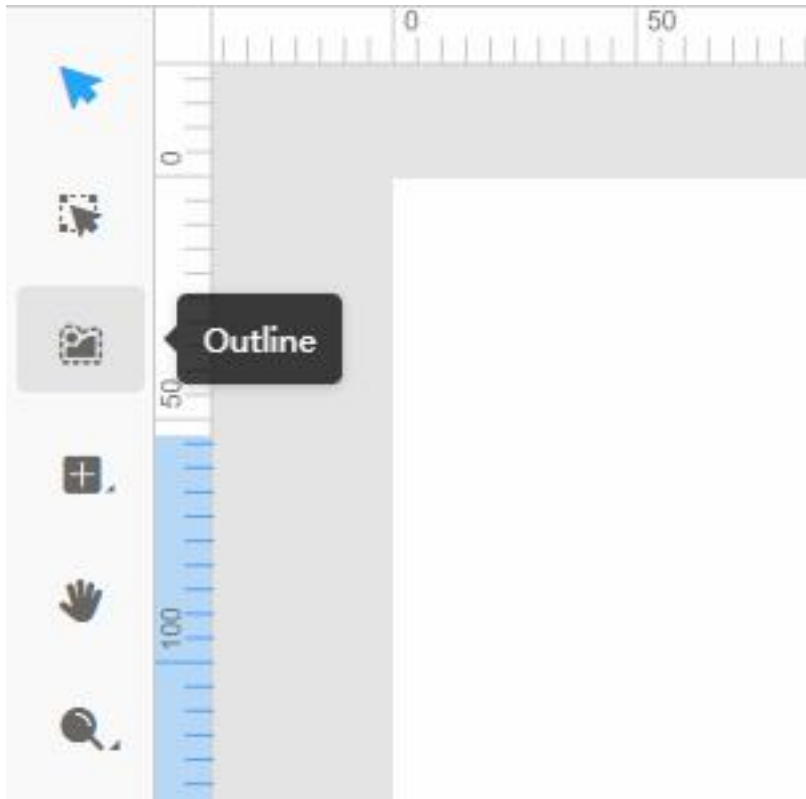
1. Import an image.

Import an image made of enclosed outlines and pure color..



2. Click Outline.

Select the image you'd like to extract. On the left toolbar, click **Outline**. Wait for a while, then the image is automatically extracted by its outline.



3. Start processing.

Click on the start button on the upper right corner to send the image to the laser cutter. Press the start button on the laser cutter, letting Laserbox engrave the image and cut it out.



Laser what you draw

What can it do?

Laserbox can identify images drawn on Makeblock materials and A4 copy paper. Based on its identification results, Laserbox can cut/engrave those images.

By default, Laserbox engraves lines drawn in black, and cut lines drawn in red.

Go to Settings, and select the Cut outline option. Then, the laser cutter will start engraving the outlines drawn in black.

NOTE

- Use Makeblock materials. Reflective materials or materials too dark will make it much harder for Laserbox to identify images.

- Use Makeblock-recommended markers. Images printed out or too thin (<2mm) will make it much harder for Laserbox to identify. Deli s550 marker pens are recommended.
- Avoid drawing small images. Images smaller than a size of 4mm*4mm could be regarded as distractions and thus be deleted.
- Draw images at the center of materials. Images close to the edges may lead to the failure of Laserbox to accurately position the material scope. Images near the ring code could be regarded as distractions and deleted.
- Keep black lines at a distance with red lines when drawing an image. Make sure the distance is more than 2mm.

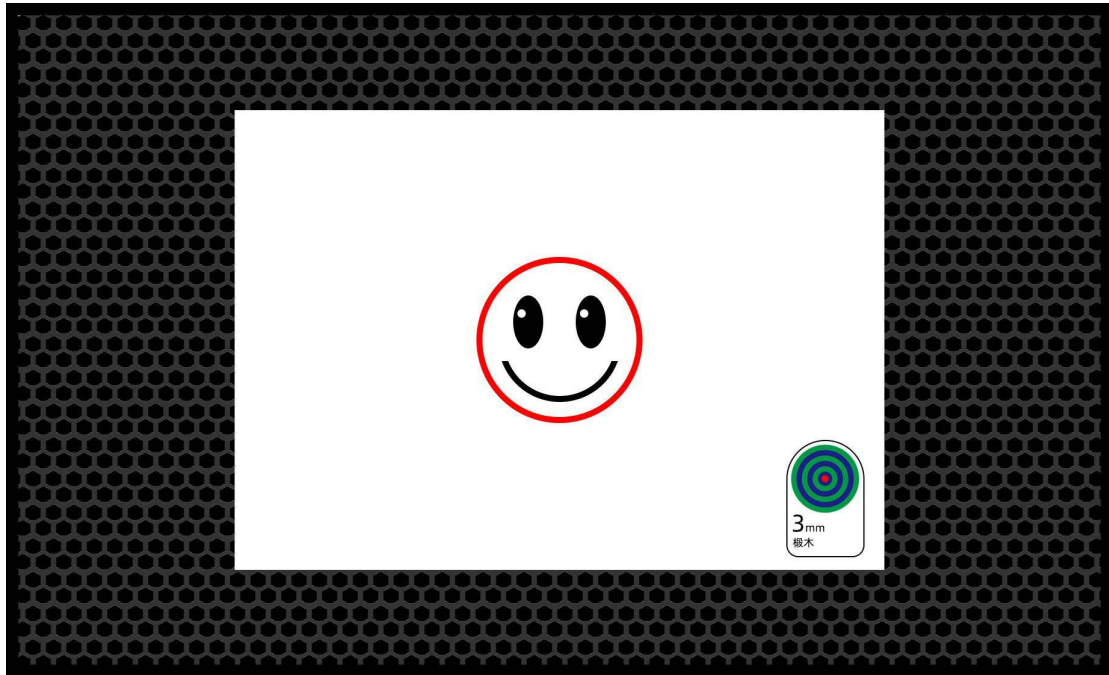
How to use it?

1. Draw images.

On a Makeblock material or a piece of white A4 paper, use a black or red marker to draw images.

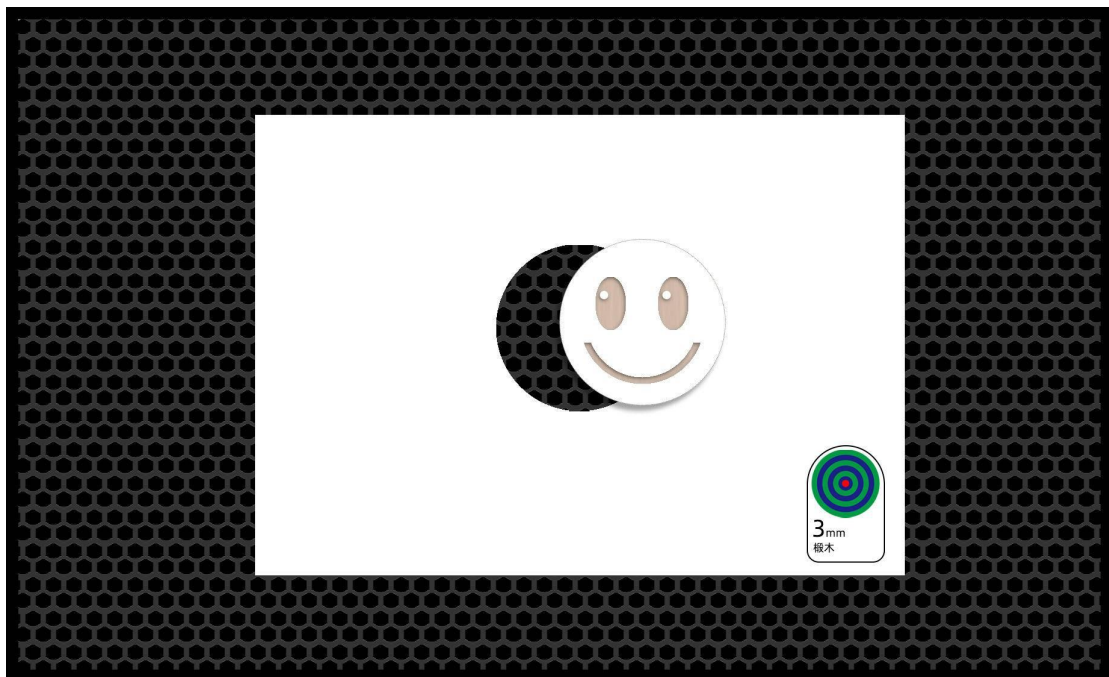
2. Put it into Laserbox.

Open the lid. Put the material horizontally at the center of the working area.



3. Start processing.

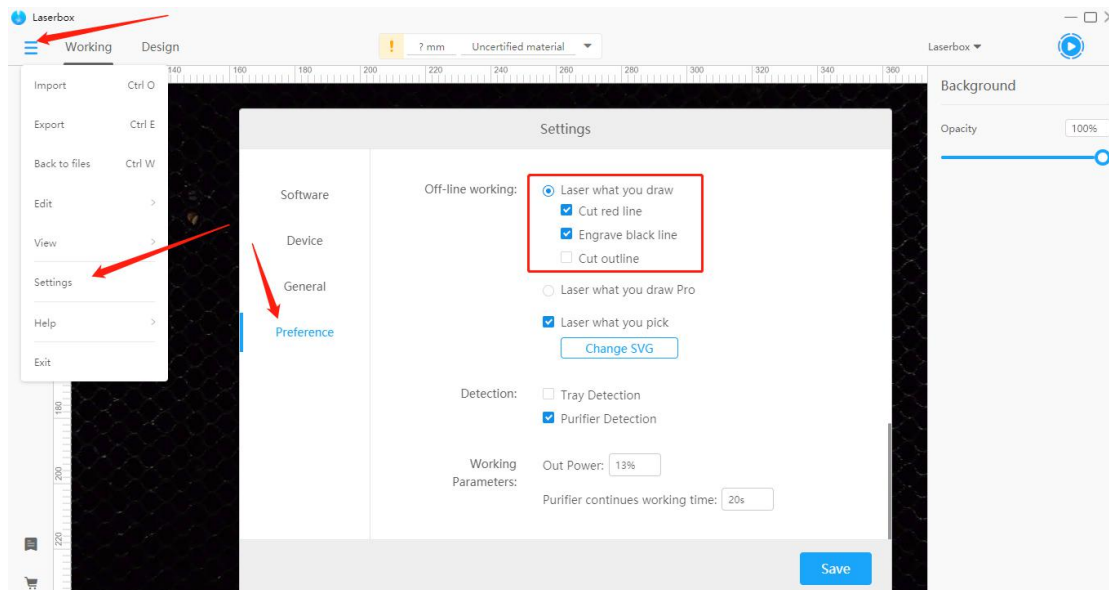
Close the lid. Press the button on the laser cutter to let it automatically identify the image and start processing it.



Settings

In the software, you can go to **Settings** to define processing methods for Laser what you draw.

Go to **Menu >Settings >Preference**, then make sure you select the Laser what you draw feature. You can select the options below to define how images are processed.



Laser what you draw Pro

What can it do?

Laserbox can automatically identify images drawn on white A4 paper, and cut/engrave them. The first image will be cut or engraved on the upper left corner of Makeblock materials. The materials can be repeatedly processed using the remaining areas. Laserbox can identify which areas of the Makeblock materials have been processed and quickly decide where to process the next image.

By default, Laserbox engraves black lines and cut red lines.

In **Settings**, you can check the **Cut outline** option if you'd like Laserbox to cut black outlines.

NOTE

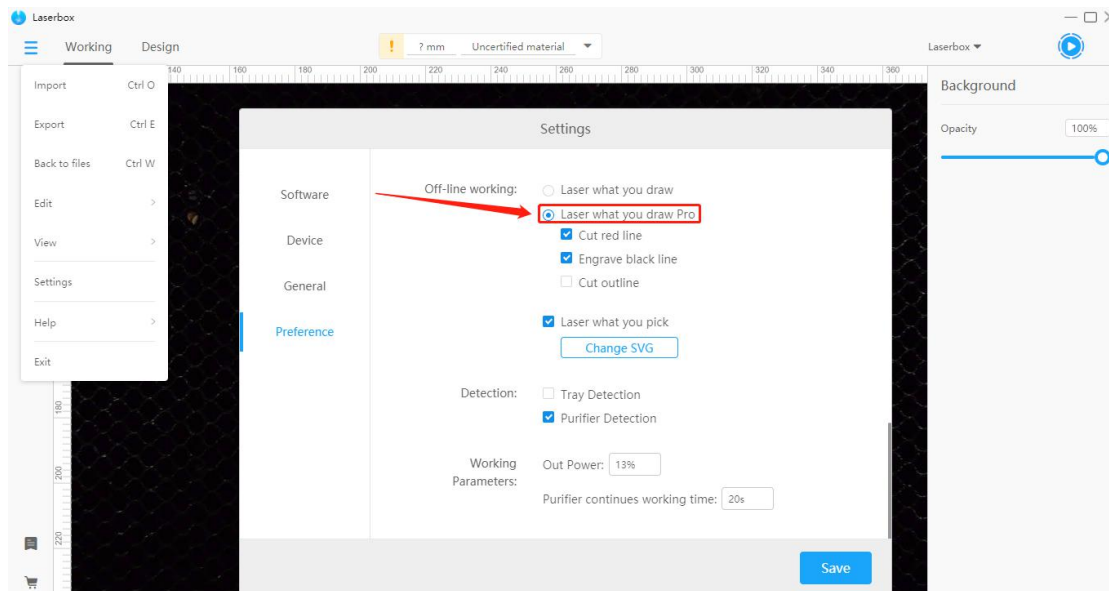
- Use Makeblock-recommended materials. Reflective materials or materials too dark will make it much harder for Laserbox to identify images.

- Use Makeblock-recommended markers. Images printed out or too thin (<2mm) will make it much harder for Laserbox to identify. Deli s550 marker pens are recommended.
- Avoid drawing images that are too small. Images smaller than a size of 4mm*4mm could be regarded as distractions and thus be deleted.
- Keep black lines at a distance with red lines when drawing an image. Make sure the distance is more than 2mm.
- Remove the finished engravings once they're done. Remove the finished engravings so that Laserbox can quickly identify which areas are already processed, avoiding repetitive processing.

How to use it?

1. Switch to Laser what you draw Pro .

Connect Laserbox to your computer. Go **Menu > Settings > Preference**, then select the Laser what you draw Pro option.

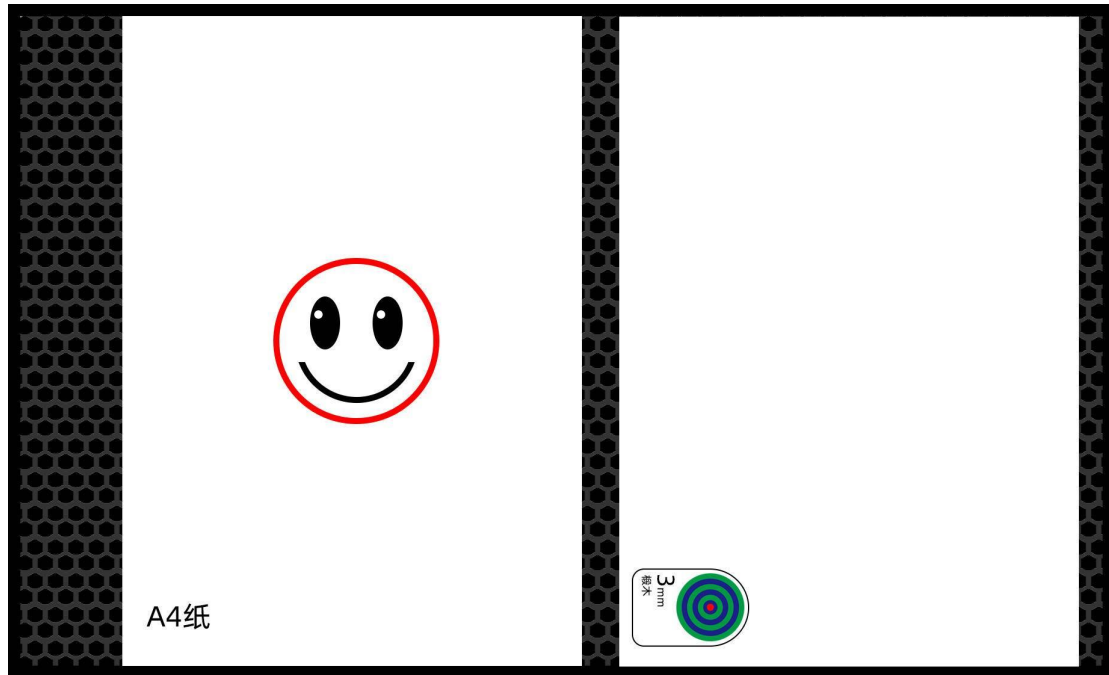


2. Draw an image.

Prepare a piece of white A4 paper. Use red or black markers to draw images.

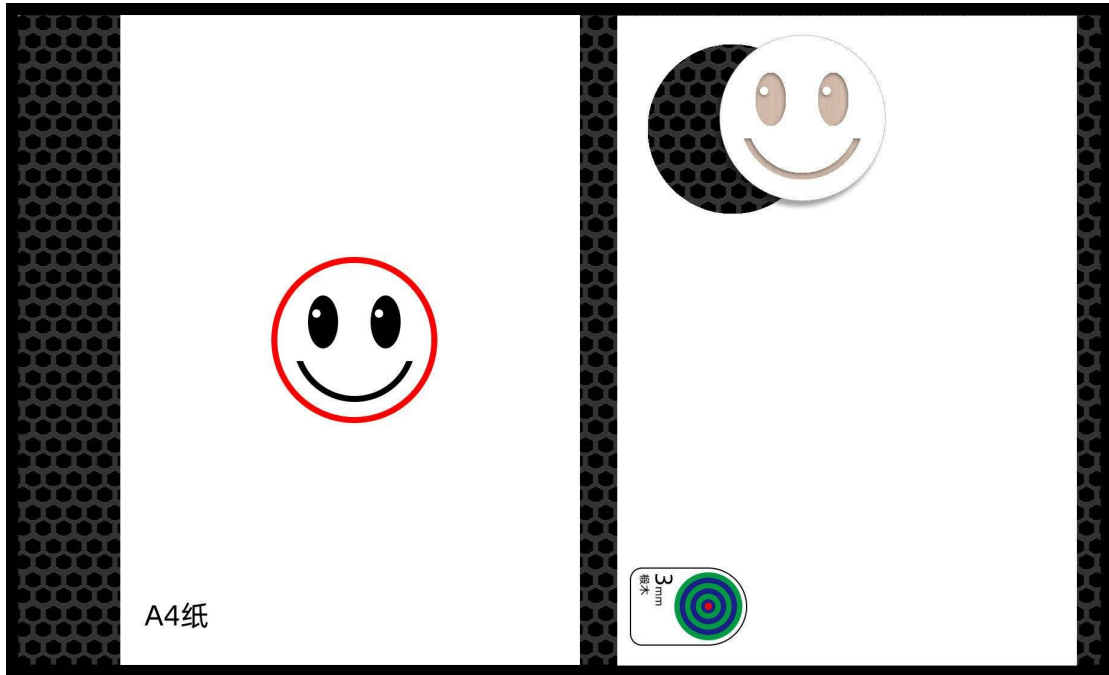
3. Put it into Laserbox.

Open the lid. Put the A4 paper and Makeblock material vertically in the working area as shown. A4 paper on the left, Makeblock material on the right. Please note that the upper edges of the paper and material should align with the upper edge of the honeycomb panel. And make sure the A4 paper is about 1cm distant from the material.



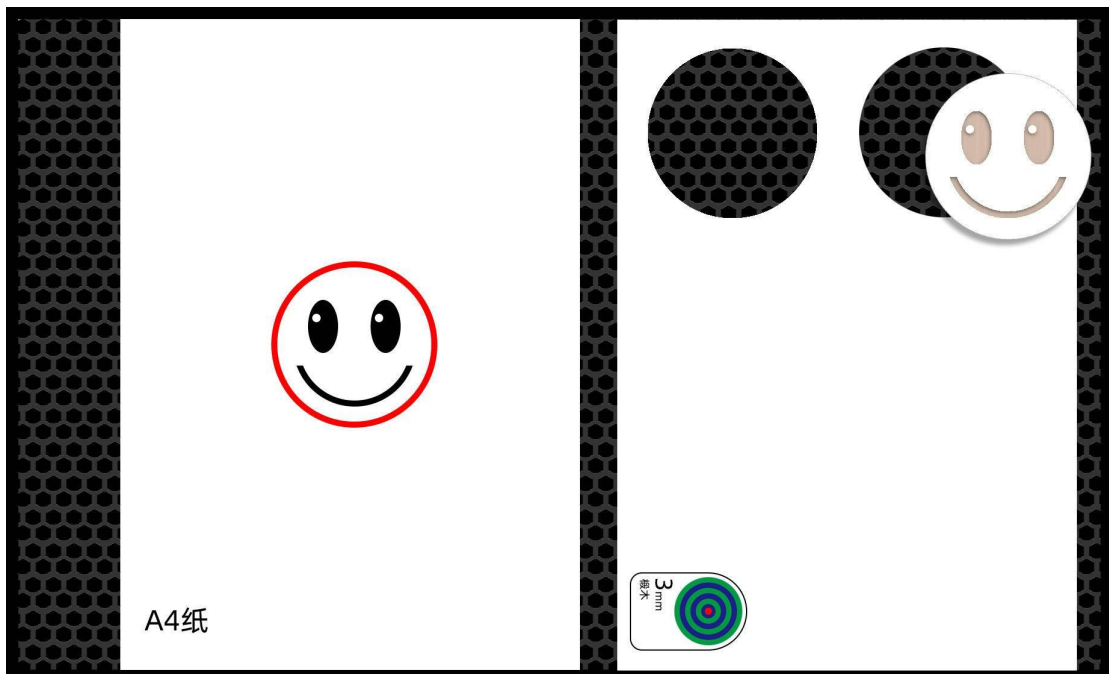
4. Start processing.

Close the lid. Press the button on the laser cutter to let it automatically identify the image and start processing it.



5. Reuse the material.

Laserbox can automatically identify which areas are already processed, and decide where to process next. So a piece of Makeblock materials is reusable for multiple times.



Laser what you pick

What can it do?

Laserbox automatically identifies the images printed on the paper, engraves the selected image on wood board, and cuts it out. You can also leave your signature or custom images on the printed sheet, having them engraved in the result as well.

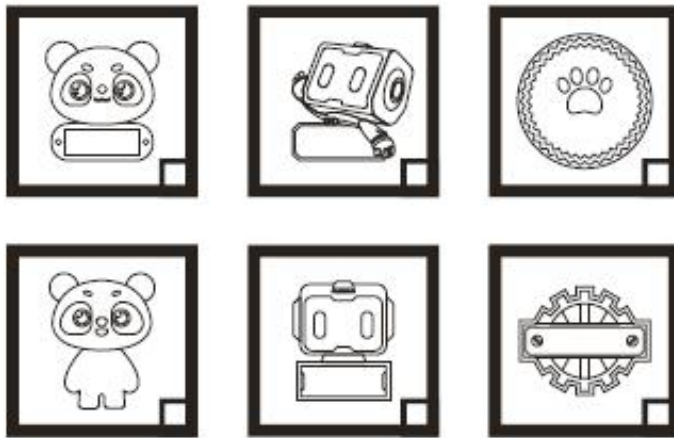
How to use it?

1. Print out the sheet.

Print out the sheet on a piece of A4 paper.

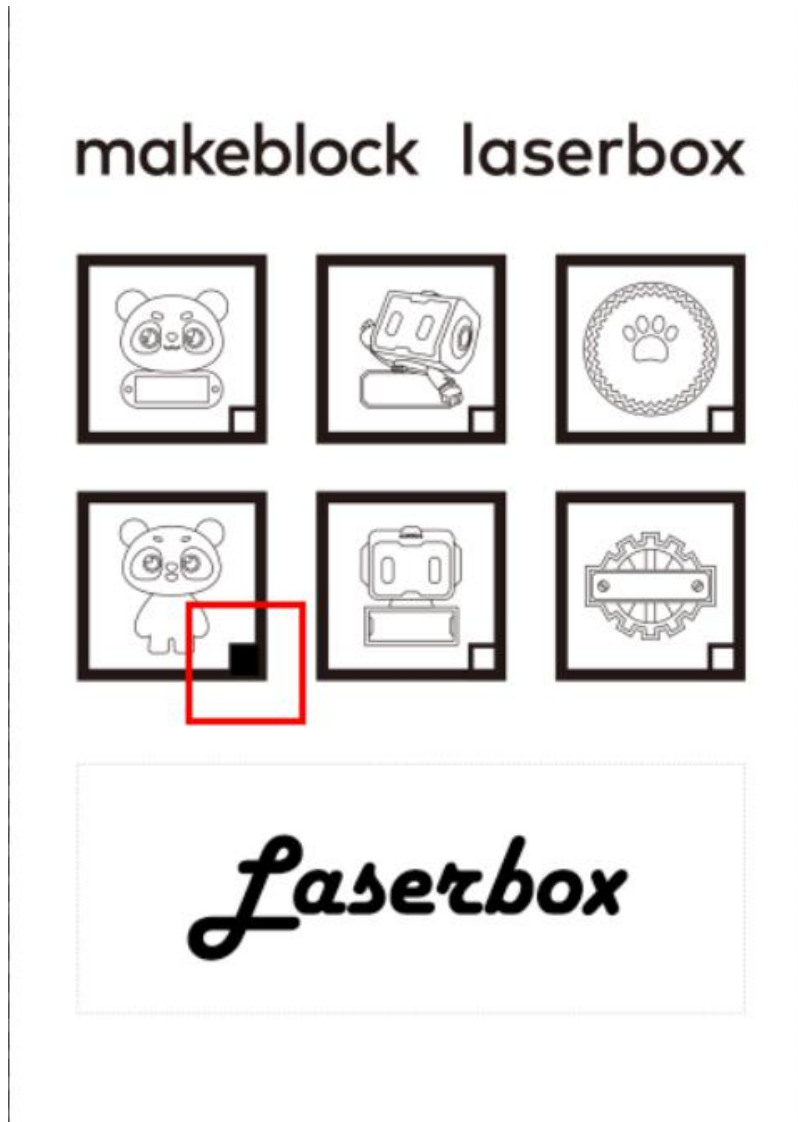
Download the sheet at: <https://www.makeblock.com/support/ps-laserbox>

makeblock laserbox



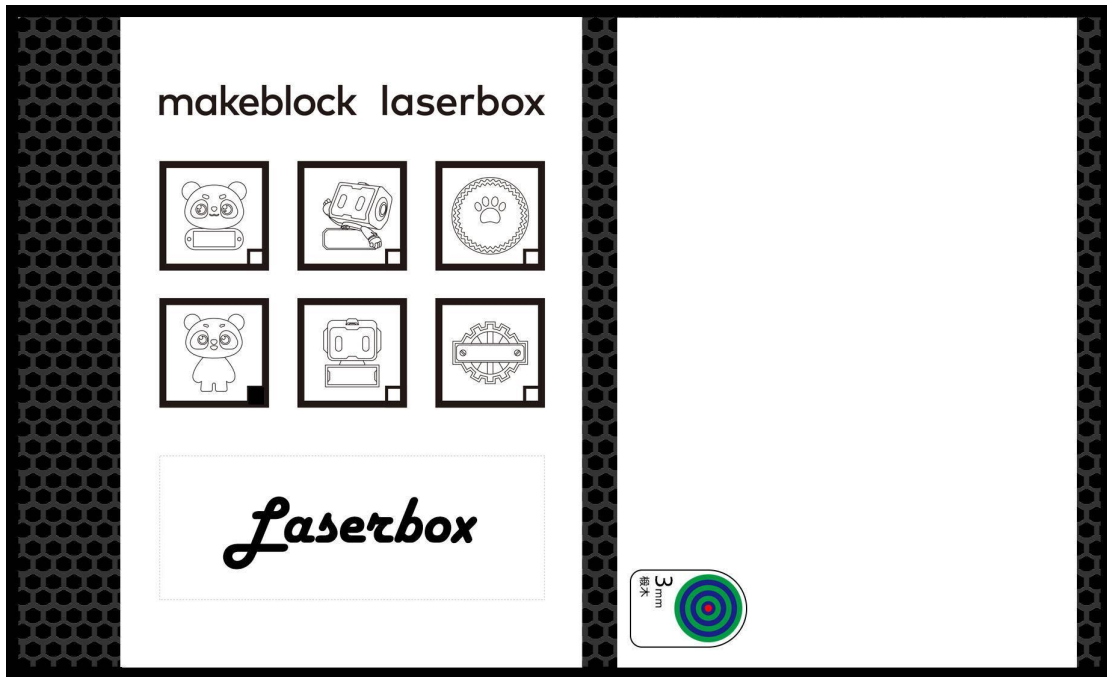
2. Select an image.

Select an image you like. Use a black marker to fill the box at the bottom right corner of the image. Draw images or leave a signature in the dashed box below. Laserbox will engrave your drawings/signature into the image you just select.



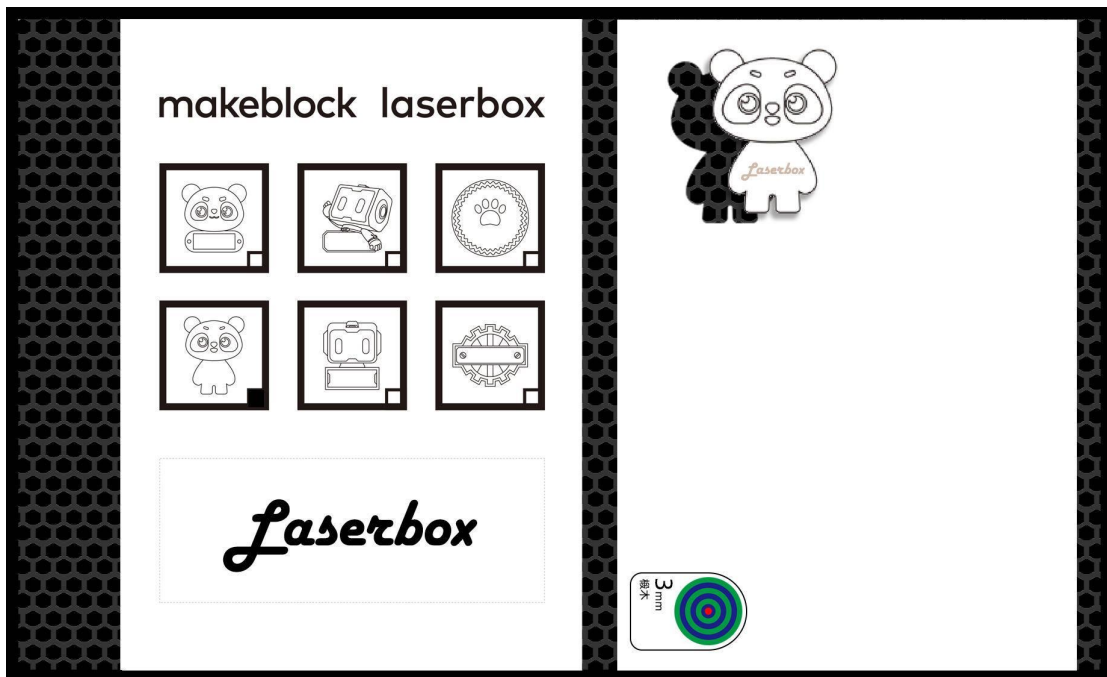
3. Put it into Laserbox.

Open the lid. Put the A4 paper and 3mm basswood vertically as shown in the working area. A4 paper on the left, 3mm basswood on the right. Please note that the upper edges of A4 paper and 3mm basswood should align with the upper edge of the honeycomb panel. And make sure the A4 paper is about 1cm distant from the basswood.



4. Start processing.

Close the lid. Press the button on the laser cutter to let it automatically identify images and start processing. The image you select will be engraved on the material and cut out. The content in the dashed box will be engraved in the blank area of the image.



5. Reuse the material.

Laserbox can automatically identify which areas are already processed, and decide where to process next. So a piece of 3mm basswood is reusable for multiple times.

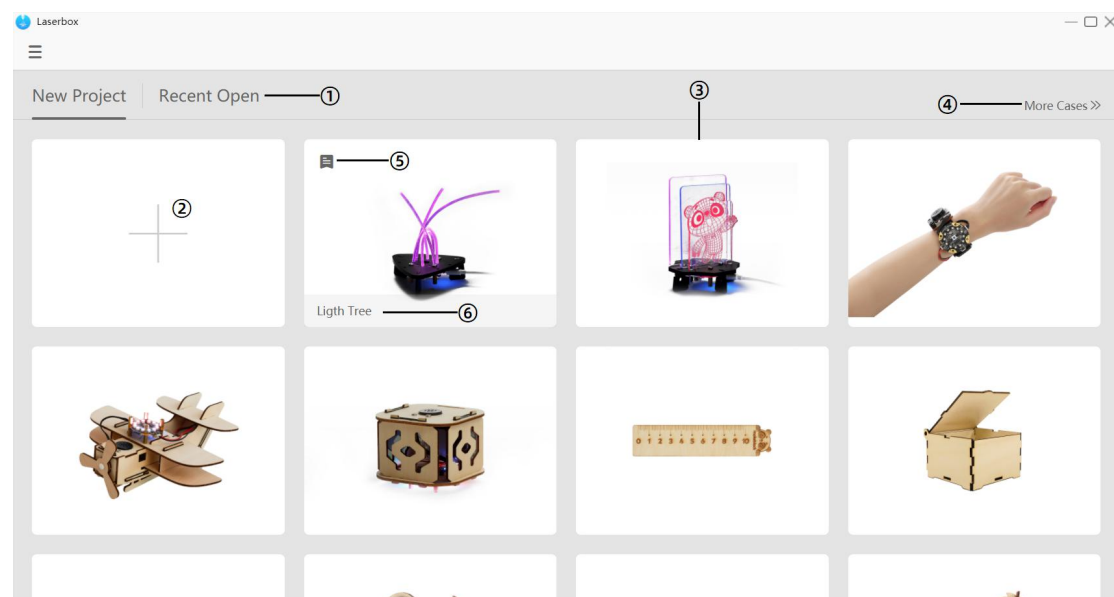
Use software Laserbox

Project management

The software Laserbox manages files in the form of projects. Project management includes creating **New Project** and opening **Recent Open**.

New project

New Project is the first interface that you'll see after you opened the software. You can create a brand-new project or directly import a project offered by Makeblock.

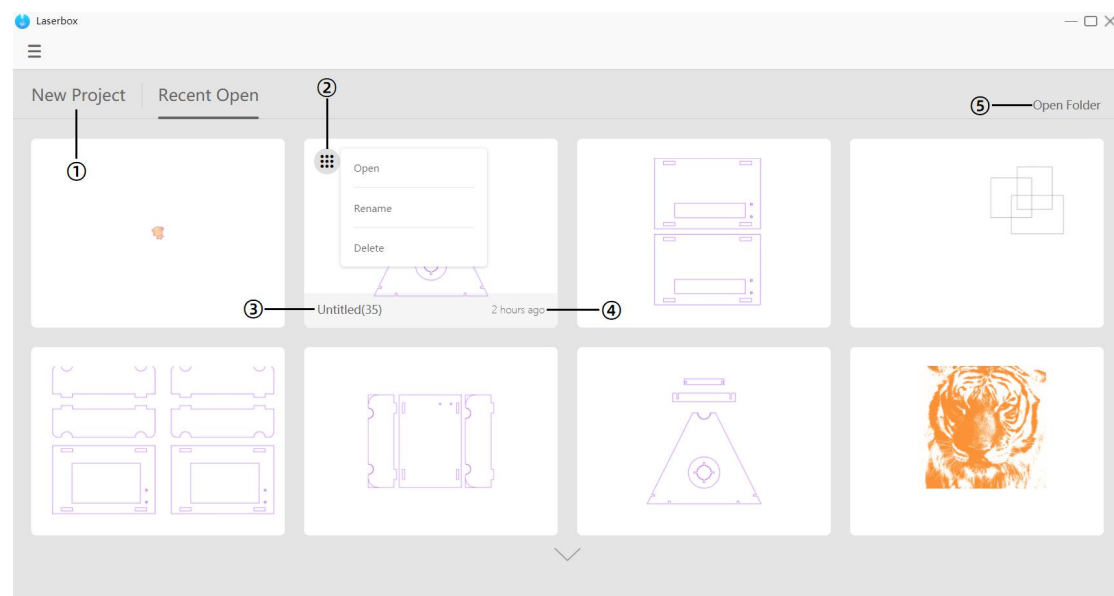


1. **Recent Open** Click on it to switch to the interface you can find the projects you recently opened.
2. **Add a new project** Click it to create a brand-new project.
3. **Sample projects** Click sample projects to see in-built examples.
4. **More Cases** Click it to redirect to Makeblock Education where you could find more Laserbox projects.

5. **Details** Click this button to redirect to Makeblock Education where you can access project-related descriptions, assembling video and more resources.
6. **Project name** Here displays the project name.

Recent open

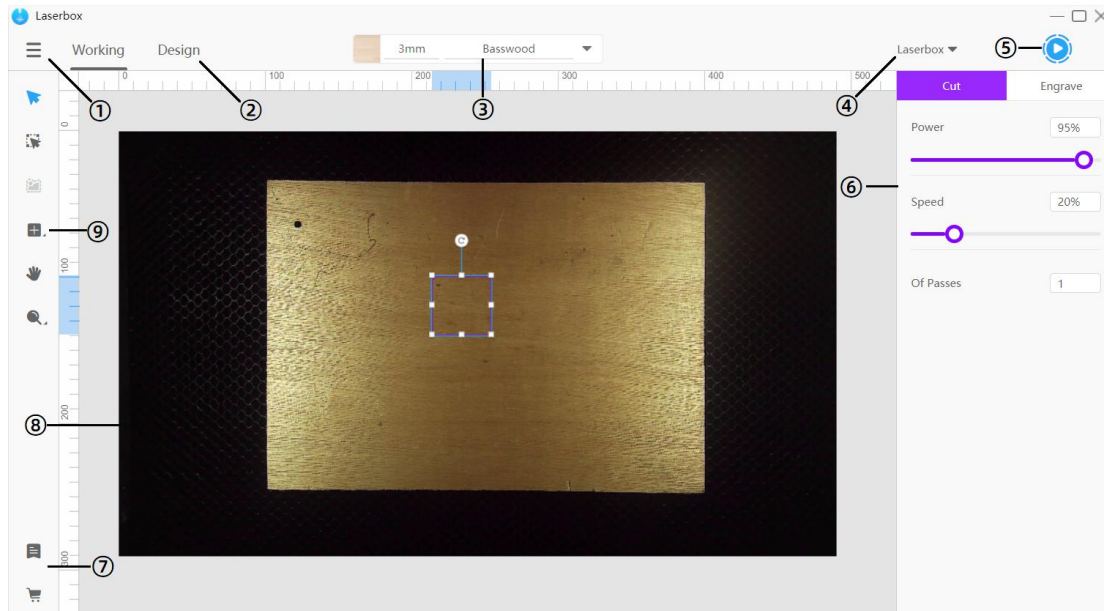
In this interface, you can find the projects you recently opened or edited in Laserbox. Laserbox automatically saves your project when you exit the project.



1. **New Project** Click it to switch to the New Project interface.
2. **Operate** Click it to open, rename or delete the project.
3. **Project Name** Here displays the project name.
4. **Project Time** Here displays the time when the recent project was saved.
5. **Open Folder** Open the folder into which Laserbox automatically saves projects.

Interface tour

Working interface



1. **Menu** In Menu, you can import/export files, or change settings.
2. **Working/Design** Click it to switch between interfaces.
3. **Material management** Here displays the material already identified or set up. Click to select a material for processing, add a new material or change the processing parameters.
4. **Device management** Here displays the connected device. Click it to manage all the devices that were once connected.
5. **Start button** Click the start button to start a cutting or engraving procedure.
6. **Parameter settings panel** Use this panel to change cutting or engraving parameters. Parameters are displayed only when there's a layer on the canvas. If you enable Show Color Block in Settings, then the panel will display custom parameters.
7. **Other links** Visit Makeblock official website or online store to access more courses or buy consumables.

8. **Canvas** The canvas is the area where you create images for processing. It's the same as the working area in the laser cutter. So when the software is connected to the laser cutter, the canvas will display the picture from the camera in real time.
9. **Toolbar** The toolbar includes many tools and options that are frequently used.

Design interface



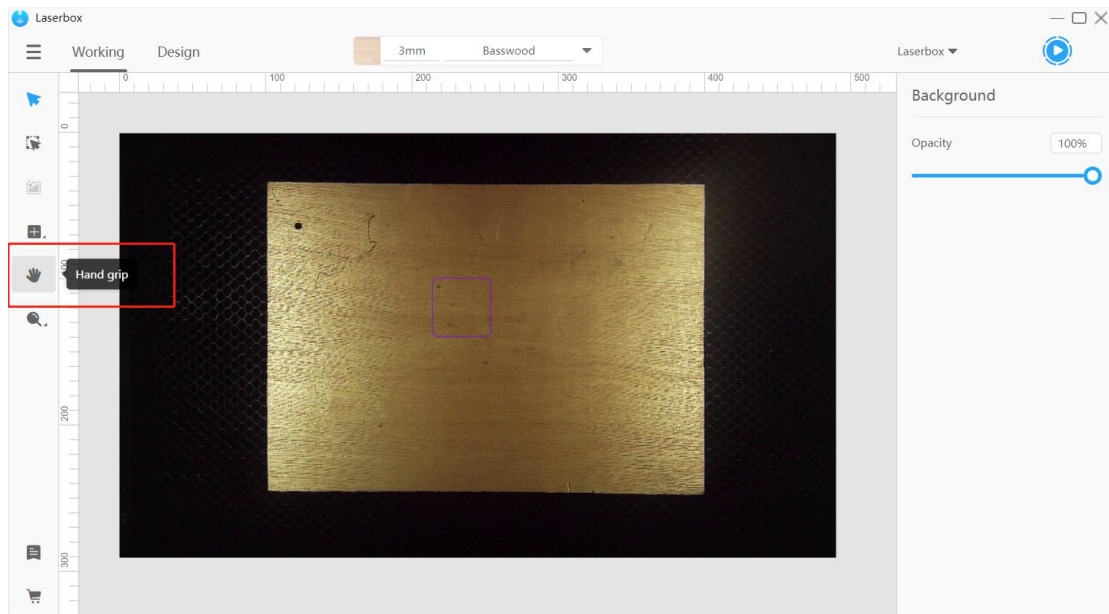
1. **Menu** In Menu, you can import/export files, or change settings.
2. **Working/Design** Click to switch between interfaces.
3. **Styles panel** This panel includes lots of tools allowing you to combine and change shapes to create more complex images.
4. **Canvas** The canvas is the area where you design and edit images for processing.
5. **Toolbar** The toolbar includes many tools and options that are frequently used.

Canvas

Both the working interface and design interface have a canvas. They have the same features, except that you can set up the canvas in the working interface to display images from the camera in real time.

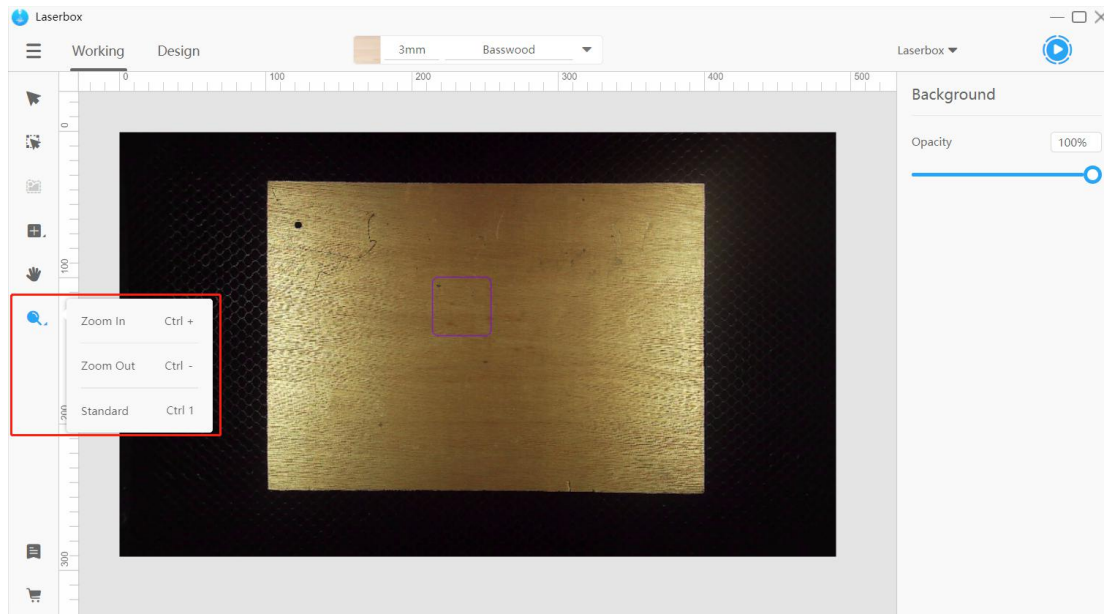
Drag canvas

On the left toolbar, click on Hand grip. Then, hold down the left mouse button to drag the canvas. Or, you can hold down the space key and left click the mouse to drag the canvas.



Zoom in/out

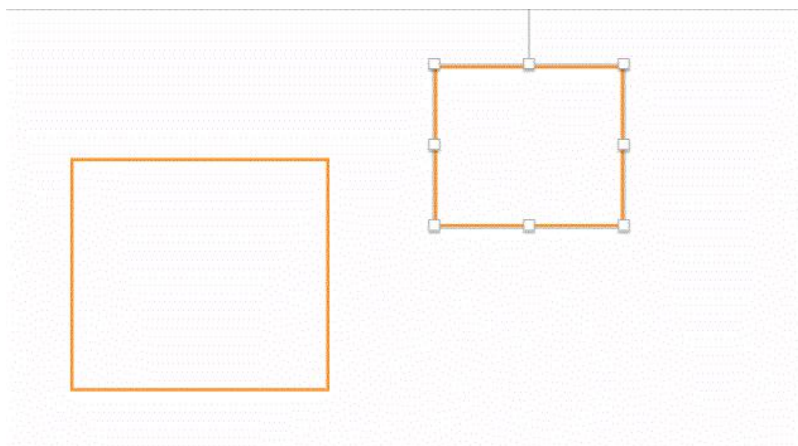
In the left toolbar, click the **Zoom** button – the magnifier icon, then you can change the canvas size on the pop-up list. You can also scroll the mouse wheel to adjust the canvas size.



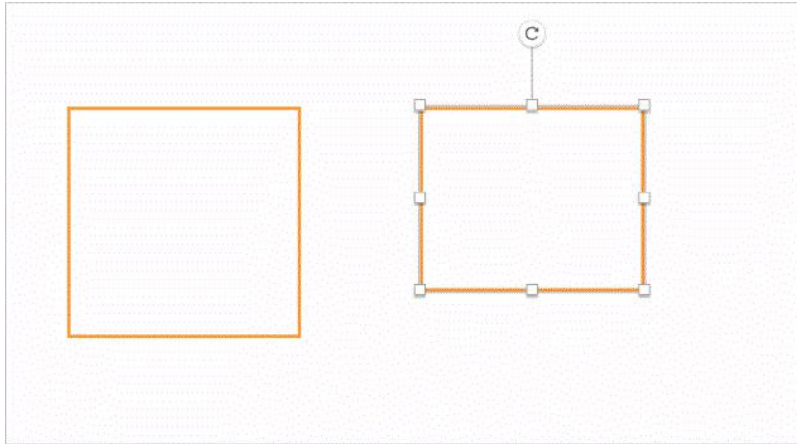
- **Zoom in** Make the canvas appear bigger.
- **Zoom out** Make the canvas appear smaller.
- **Standard** Make the canvas fit the current window size.

Auto align and distance measurement

When you drag one of the layers, alignment lines will be generated so that you can easily align this layer with the edges or center of another layer. Meanwhile, the distance between two layers will be displayed.



This feature also applies to the situation where you drag the corners of a layer to resize it. It helps you keep two layers at the same height or width.



Menu

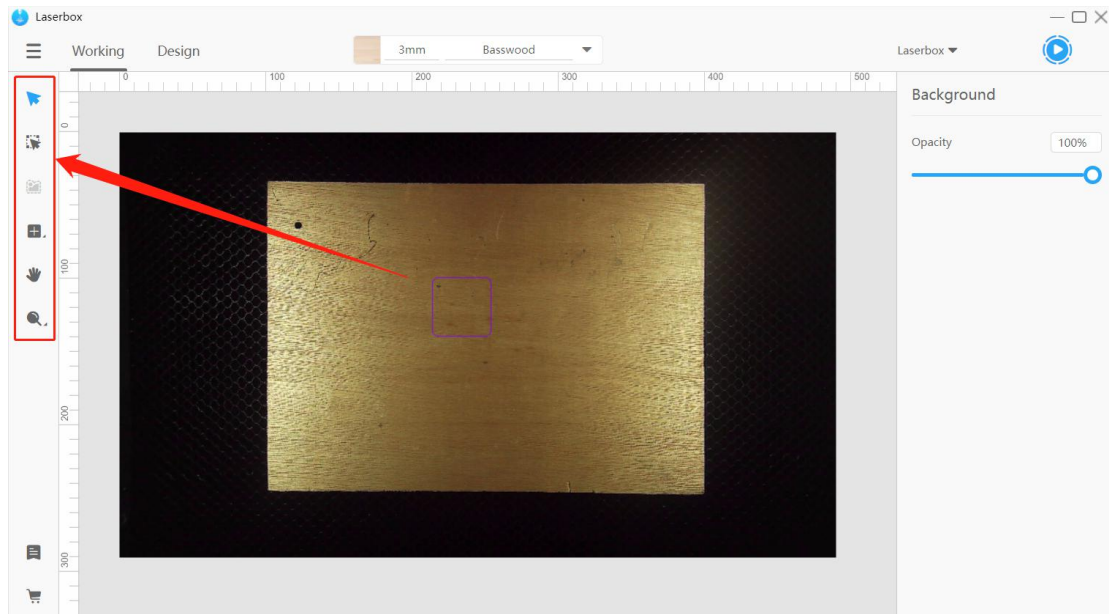
In Menu, you can do plenty of things. The working interface and design interface have the same menu list.

- **Import** Import projects or image files into the canvas. The shortcut is [Ctrl] + [O]. Or you can directly drag a file into the canvas.
- **Export** Save the file as lq format specific to Laserbox. The shortcut is [Ctrl] + [E].
- **Back to files** Back to the project management interface.
- **Edit** Edit layers.
- **View** Zoom in /out or drag the canvas.
- **Settings** Change the settings for the software and laser cutter that's connected.
- **Help** Redirect to websites where you can see help documents.
- **Exit** Close the software.

Toolbar

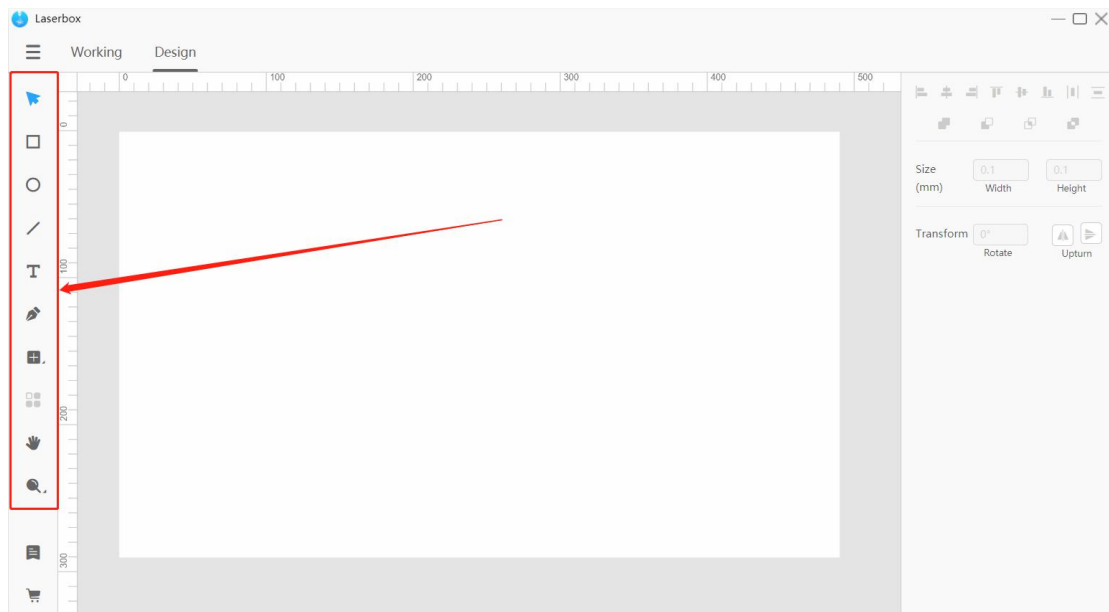
The working interface and design interface have different toolbars.

3.1 Toolbar in working interface



- **Select** Left click or frame a layer to select it.
- **Marquee** Extract images from the camera on the laser cutter. [Learn more about Extract Images.](#)
- **Outline** Extract outlines from the images on the canvas. [Learn more about Extract Outlines.](#)
- **Insert** Insert in-built graphs or components. [Learn more about Insert Elements.](#)
- **Hand grip** Drag the canvas to see different parts of the canvas.
- **Zoom** Make the canvas appear larger or smaller.

3.2 Toolbar in design interface



- **Select** Left click or frame a layer to select it.
- **Rectangle** Create rectangle layers in the canvas.
- **Oval** Create oval layers in the canvas.
- **Line** Create line layers in the canvas.
- **Text** Create texts in the canvas.
- **Pen** Create vector paths in the canvas.
- **Insert** Insert in-built graphs or components. [Learn more about Insert Elements.](#)
- **Array** Quickly duplicate layers and arrange them in the way you set up.
- **Hand grip** Drag the canvas to see different parts of the canvas.
- **Zoom** Make the canvas appear larger or smaller.

Add layers

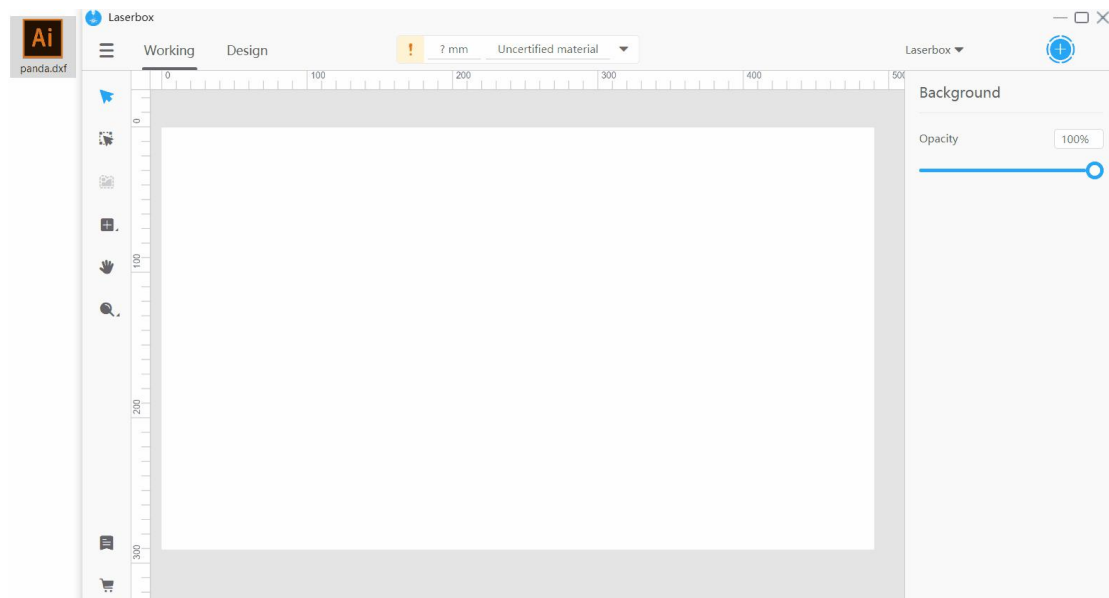
Layers are a collection of elements such as vectors, bitmaps, texts, lines and more. Laserbox allows users to make adjustments on every single layer

so you can change the engraving power and speed for each layer in order to create different effects. In the software Laserbox, the first layer you create is at the bottom, and the final layer you create is at the top. Laserbox supports importing vectors and bitmaps. You can engrave or cut vectors, but you can only engrave bitmaps.

Add layers in the working interface

Import images

Go to **Menu > Import**, then select the image file you'd like to import. Or, you can directly drag an image into the canvas. The shortcut is **[Ctrl] + [O]**.



Extract images

The Marquee tool enables you to extract images from the camera on the laser cutter. Click on **Marquee** in the toolbar to frame any portion you'd like to extract. [Learn more about Extract Images.](#)

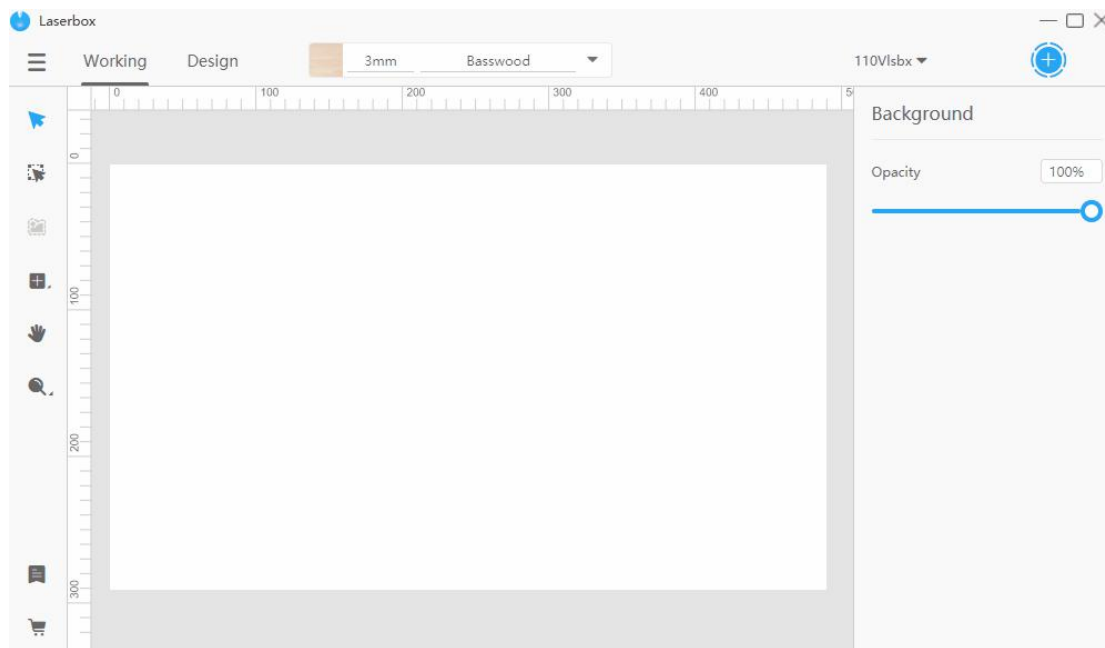
Extract outlines

The Outline tool automatically outlines a bitmap. The result can be used for the laser cutter to cut the image by its outline. Select a bitmap layer made of enclosed outlines, then click on **Outline** in the toolbar, and wait until a vector path layer of the outline is generated. Set up in the

software to cut the enclosed outline. [Learn more about Extract Outlines.](#)

Insert

The **Insert** tool contains the options you can use to draw shapes on the canvas. Click **Insert** on the toolbar on the left, and select graphs or components on the panel. Click and drag the shape or part into the canvas to insert it.

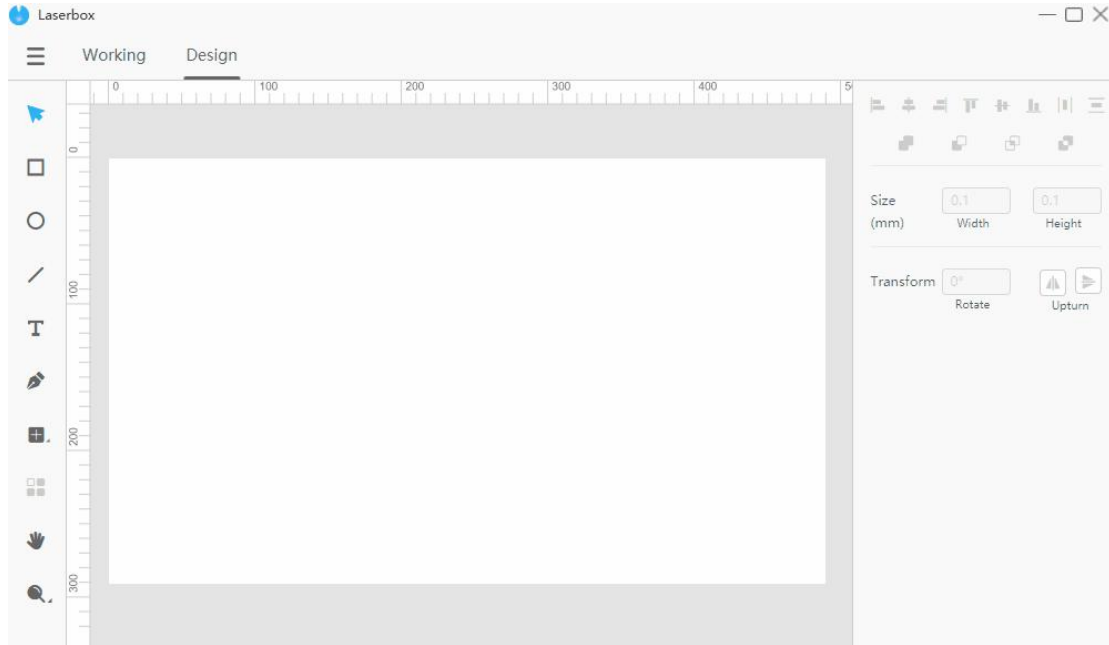


Add layers in the **Design** interface.

Rectangle

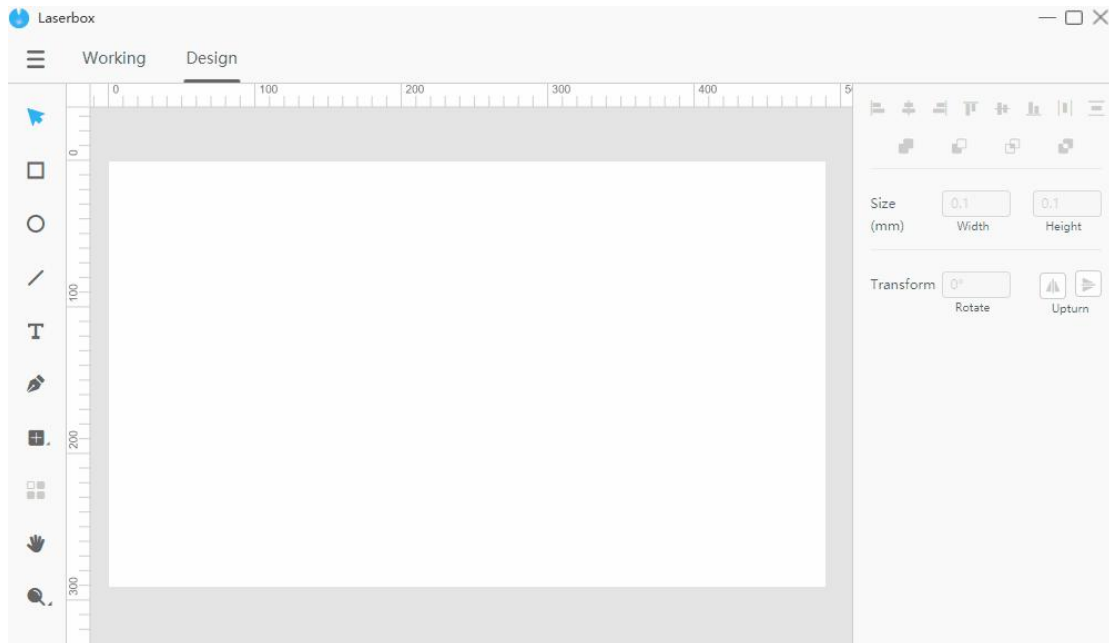
For making rectangles. In the **Design** interface, select **Rectangle** on the toolbar on the left, and then drag on the canvas to create a rectangle. If you hold down **Shift** while dragging the mouse, you lock the width-height ratio to 1:1, which means you're drawing a square. The keyboard shortcut to draw a rectangle is **[R]**.

When you draw a rectangle, its width and height appear at the bottom right corner of the mouse-pointer.



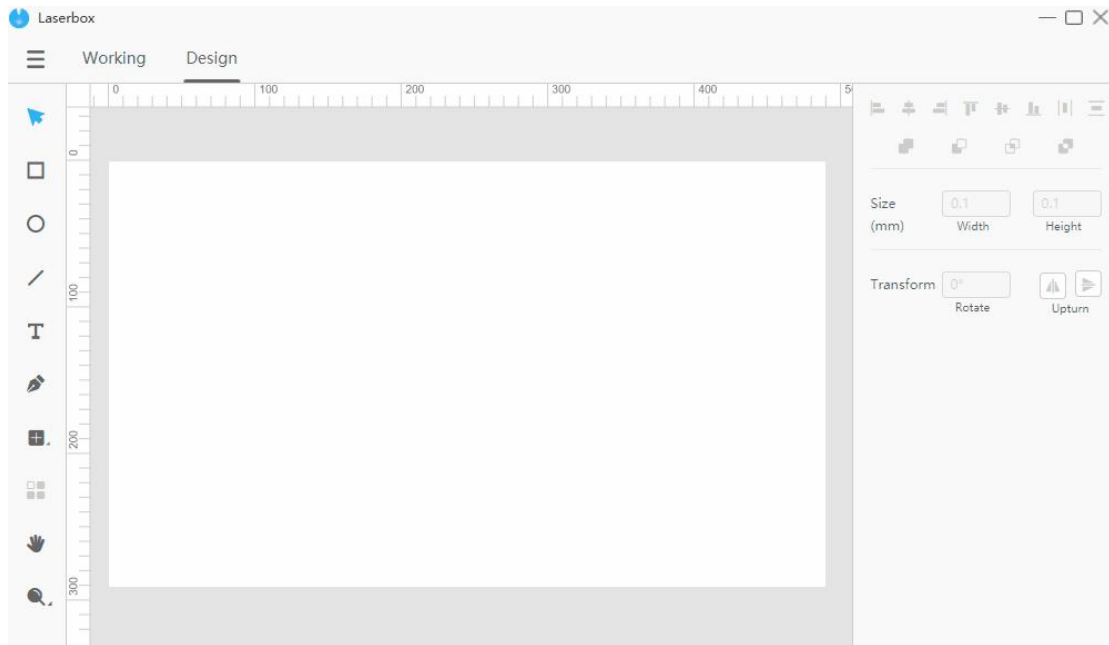
Oval

Used to draw an ellipse. In the **Design** interface, select **Oval** on the toolbar, and then drag on the canvas to make an ellipse. You can draw a perfect circle by holding down **Shift** when you drag the mouse. Doing this will lock the aspect ratio to 1:1. The keyboard shortcut to create an ellipse is [0].



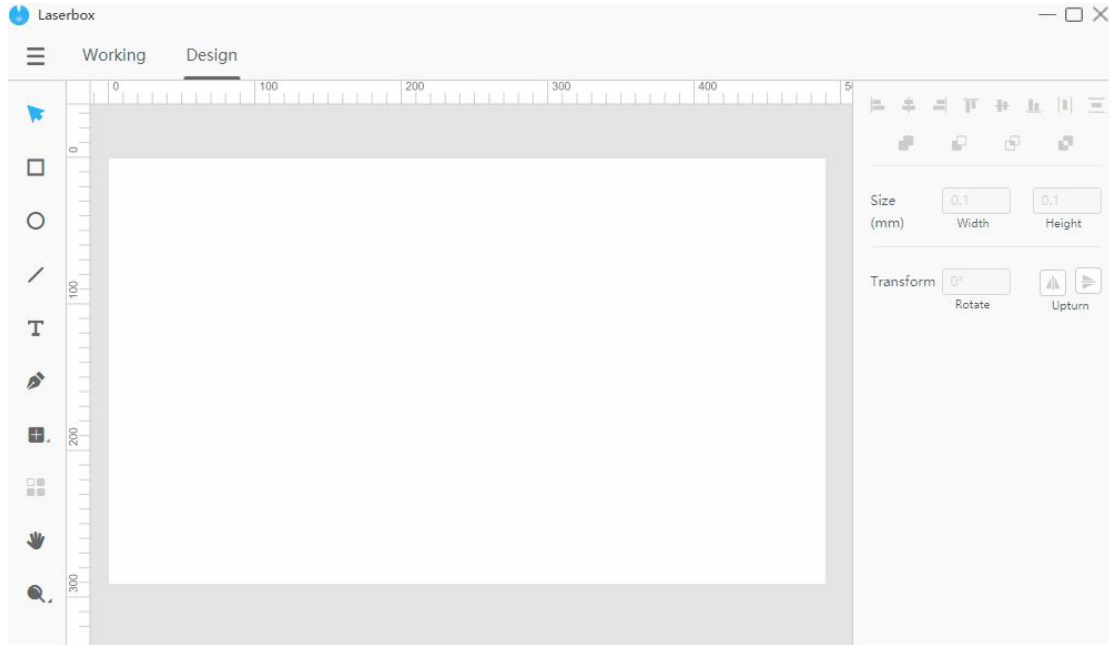
Line

For drawing lines. In the **Design** interface, select **Line** on the toolbar and drag on the canvas. Then a line will be created between the location where you click the mouse and where you release the mouse button. The keyboard shortcut to insert a line is **[L]**.



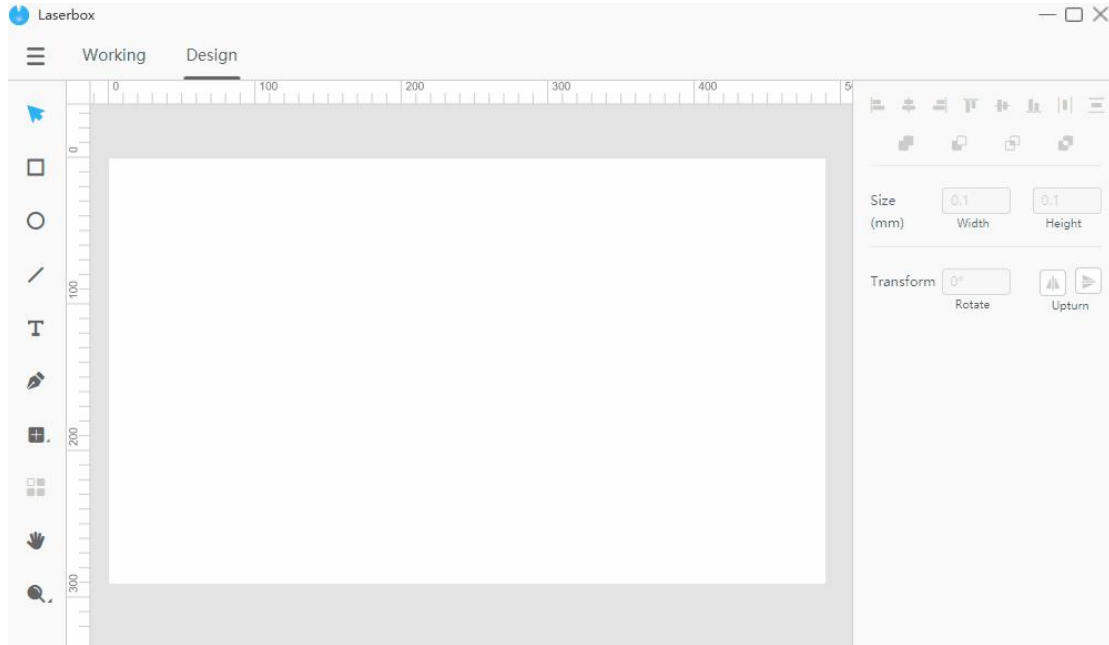
Text

Used to insert text. In the **Design** interface, click **Text** on the toolbar, and then drag on any blank space on the canvas to insert a text box. When the insertion point appears inside the text box, it means you can type to create text. Click on any blank space to exit text editing. The keyboard shortcut to insert text is **[T]**.



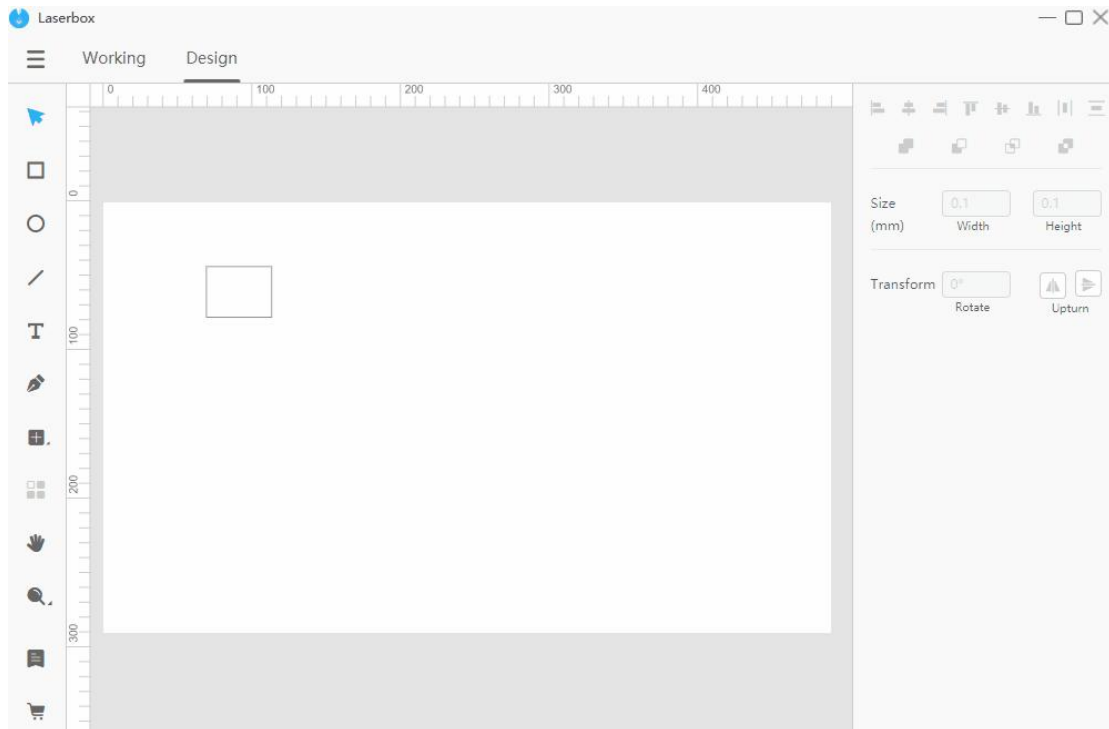
Pen

For creating paths on the canvas as you like. In the **Design** interface, click **Pen** on the toolbar, and click on the blank space on the canvas to insert an anchor point. The tool creates vector paths between anchor points. To ensure a smooth curve at an anchor point, drag your mouse when inserting the anchor point. Move your mouse to control the direction of the path. To close the path, click on the first anchor point you set down. Press Esc on your keyboard to exit pen drawing and create an open path. The keyboard shortcut to insert text is [P].



Array

For creating copies of layers and arranging them. Select a layer on the canvas, click **Array** on the toolbar in the **Design** interface, and specify how many rows and columns you want and the spacing between the copies.



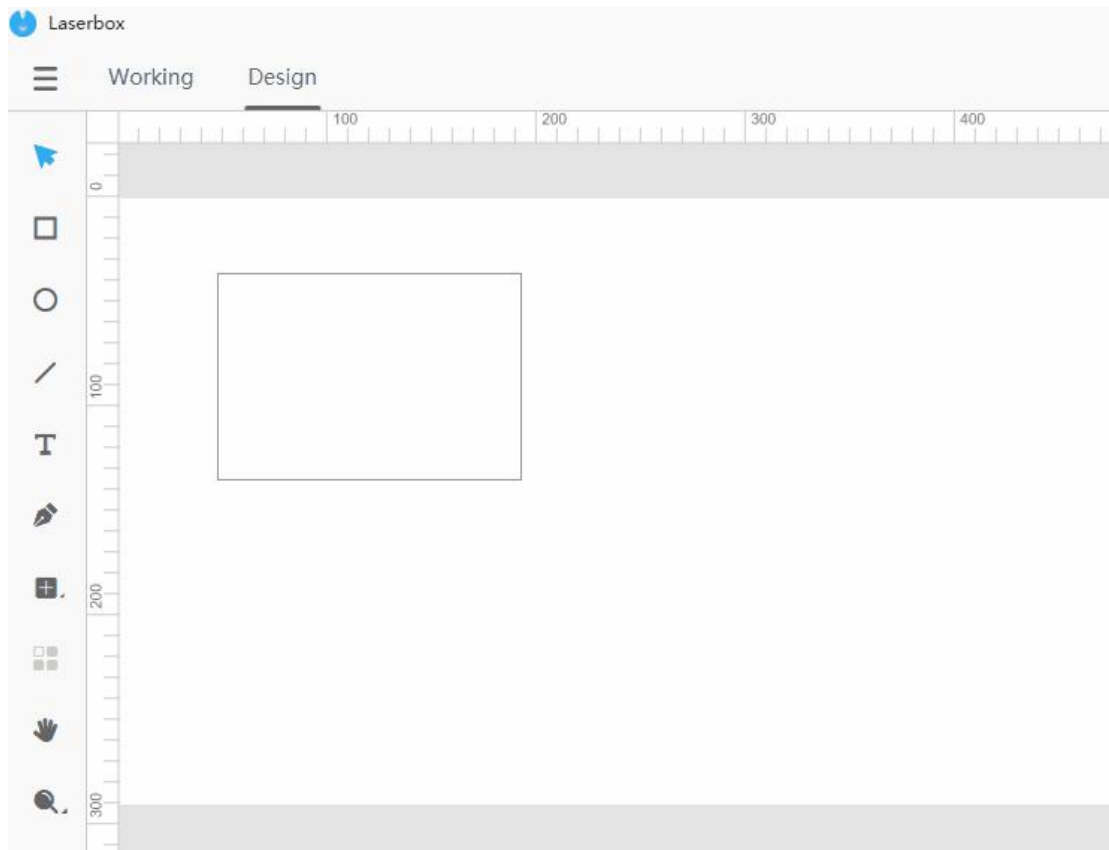
Basic tools

Edit

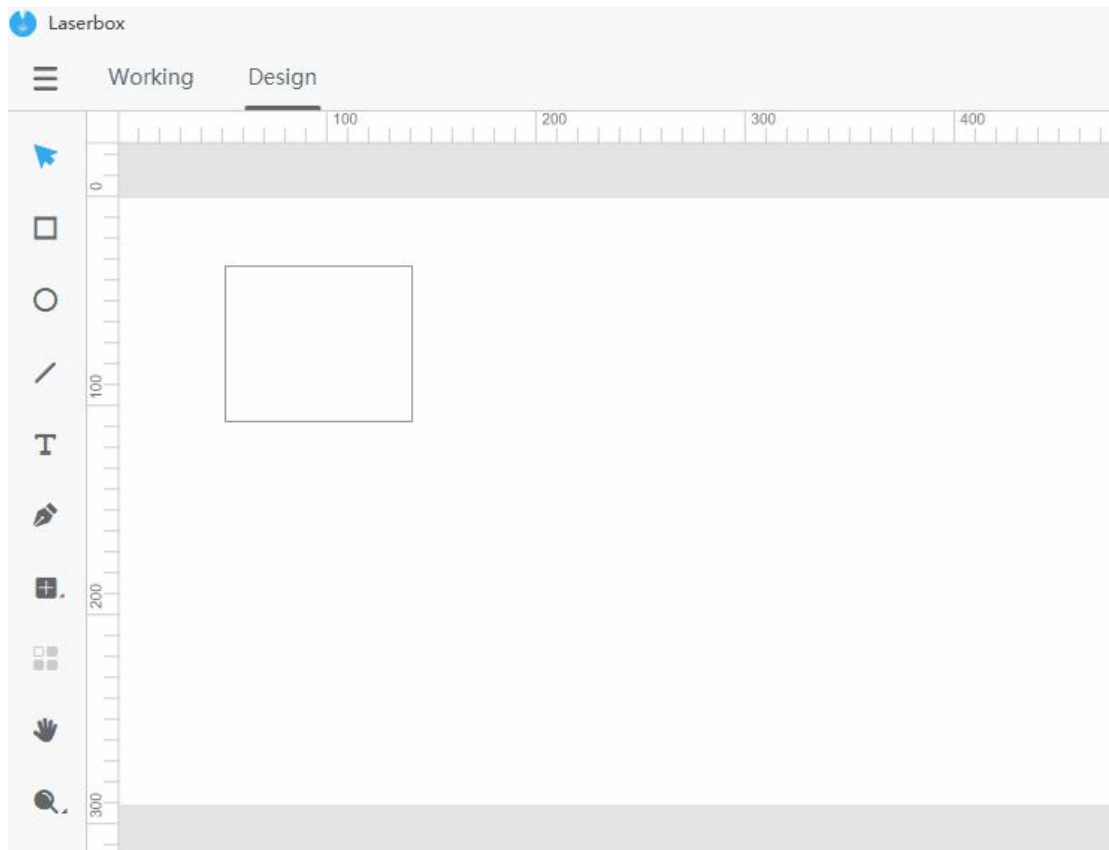
Go to **Menu > Edit**. Keyboard shortcuts:

Action	Keyboard shortcuts
Select ALL	[Ctrl] + [A]
Undo	[Ctrl] + [Z]
Redo	[Ctrl] + [Y]
Cut	[Ctrl] + [X]
Copy	[Ctrl] + [C]
Paste	[Ctrl] + [V]
Delete	[Delete]

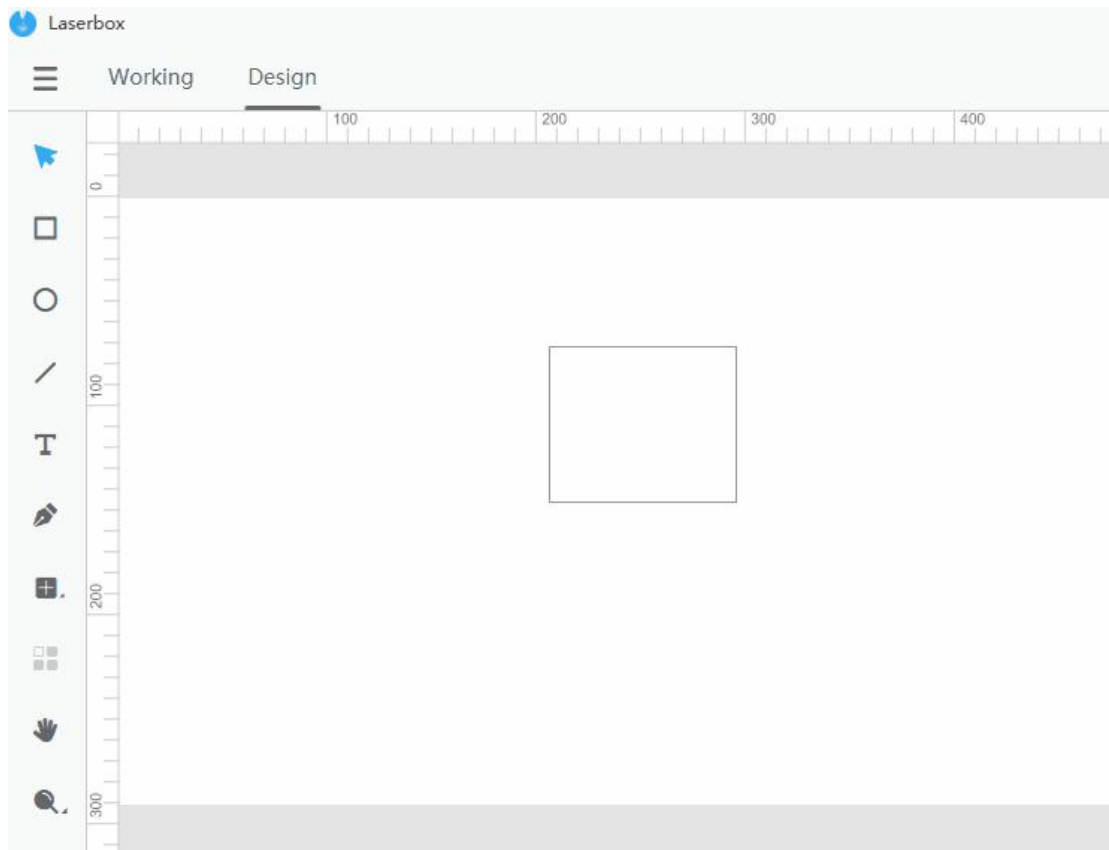
1. **Undo** Reverses your last action. Go to **Menu > Edit > Undo** to remove the last change you've done to the canvas. You can also press [Ctrl] + [Z] on your keyboard to undo actions.
2. **Redo** Reverses something you've undone. To redo your last undo, go to **Menu > Edit > Redo**. The Redo button is grey and unavailable until you undo an action. The keyboard shortcut to redo something is [Ctrl] + [Y].



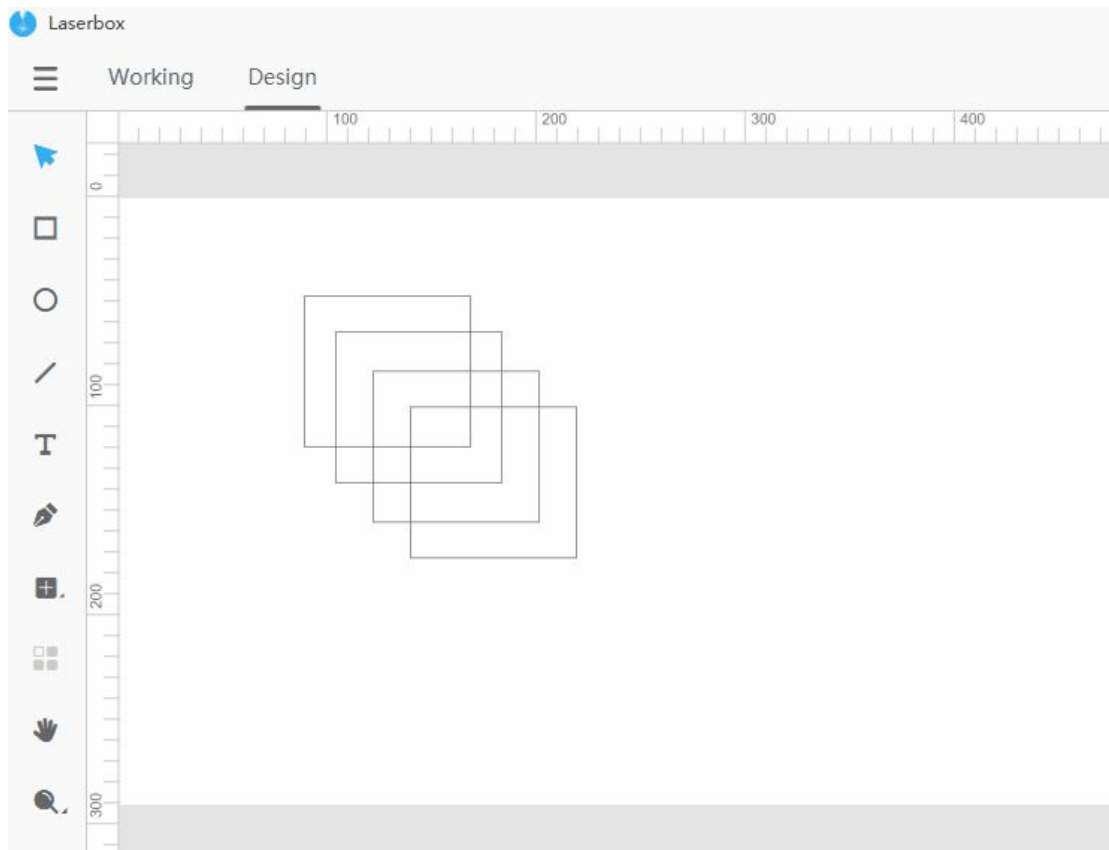
3. **Cut** Right-click a layer and select **Cut** to add it to the clipboard. The layer then disappears on the canvas. The keyboard shortcut to cut a layer is **[Ctrl] + [X]**.
4. **Copy** Right-click a layer and select **Copy** to add it to the clipboard. The layer remains on the canvas when you do this. You can also press **[Ctrl] + [C]** to quickly copy a layer.
5. **Paste** Right-click anywhere on the canvas and select **Paste** to insert the copied layer from the clipboard. The keyboard shortcut to paste a copied layer is **[Ctrl] + [V]**.



6. **Delete** Right-click a layer and select **Delete** to remove it from the canvas. The keyboard shortcut for this action is **[Delete]**.



7. **Select All** Right-click any blank space and click **Select All** to select all contents on the canvas. The keyboard shortcut is **[Ctrl] + [A]**.



Style tools

Size

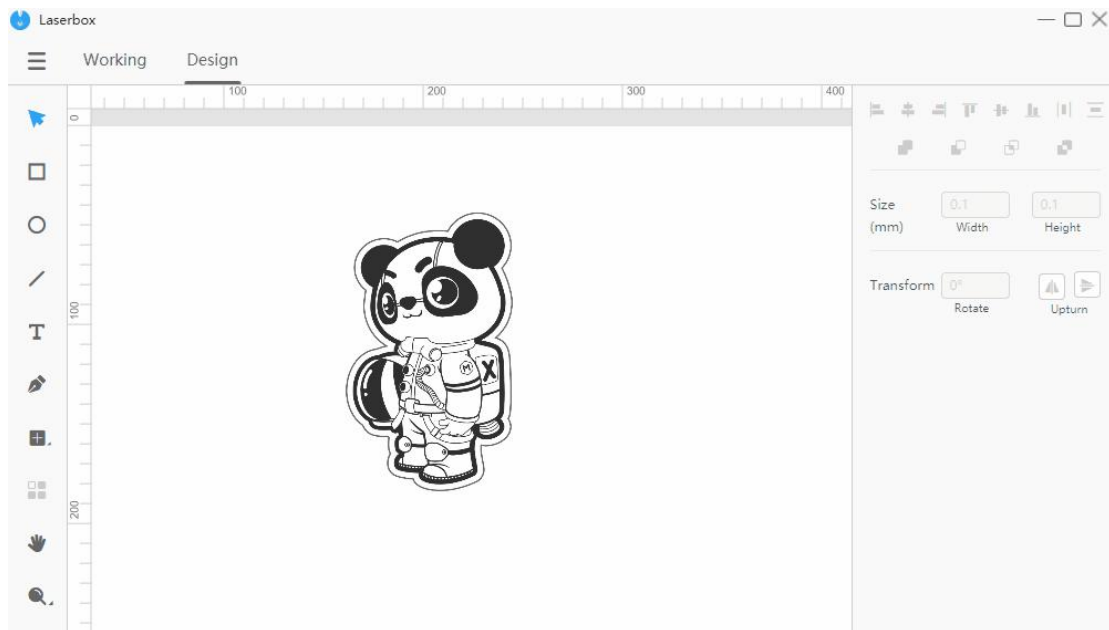
When you select a layer, anchor points appear on its borders. Drag the anchor points to resize the layer. Or, you can specify the width and height in the style panel on the right for more accurate size control.

Click the lock icon between the size parameters to lock/unlock the aspect ratio. If the aspect ratio is locked, it won't change even when you drag the anchor points of the layer or adjust the size parameters. If the ratio isn't locked, you can adjust the width or height without changing the other. To quickly lock the aspect ratio, hold down Shift when dragging the anchor points of a layer.



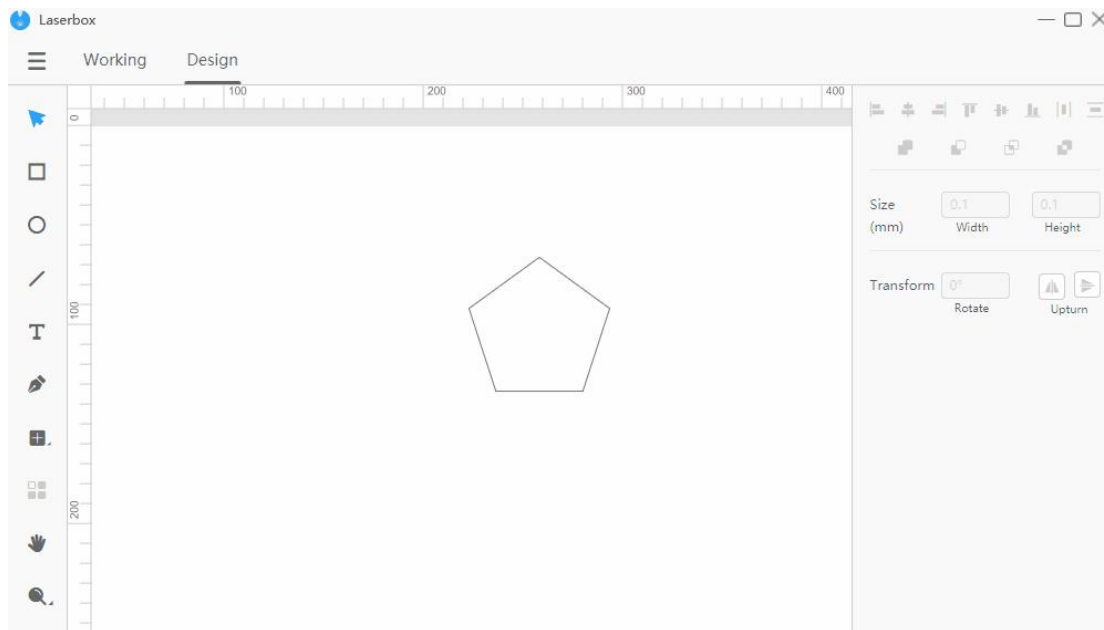
Transform

- **Rotate** When you select a layer, a rotation handle appears at the top of it. Drag the handle to rotate the layer or specify the rotation angle in the style panel.
- **Upturn** Click **Upturn** to flip the layer horizontally or vertically.



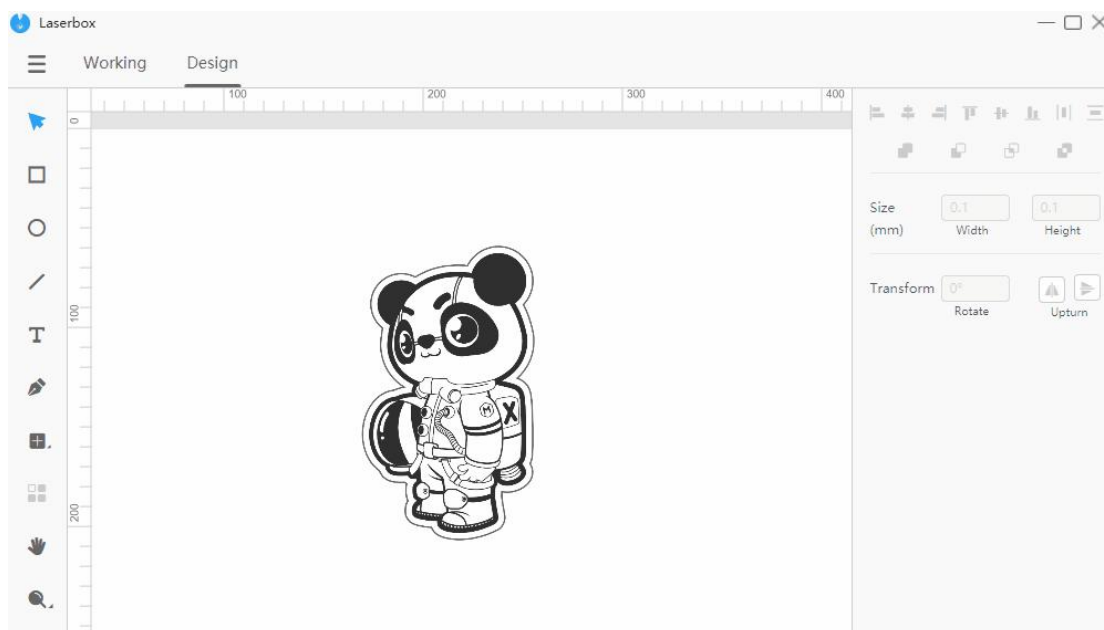
Fills

When you select a closed vector image or text, the **Fills** option appears on the style panel. Tick **Fills** to color the closed shape or text.



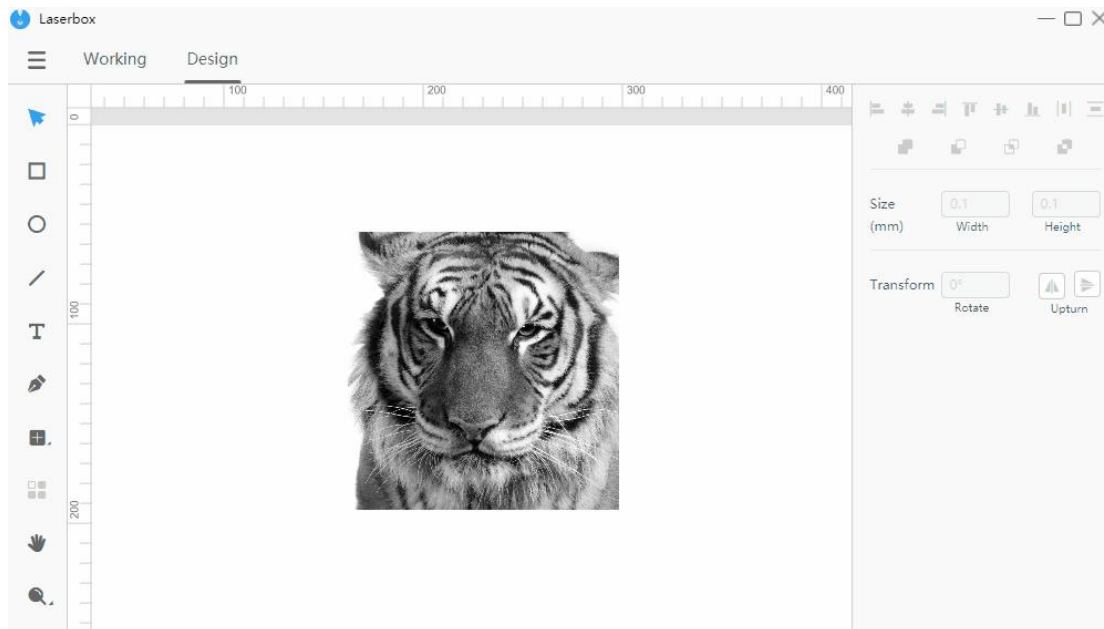
Crop

When you select an image, you can crop it. Right-click on the image, select **Crop**, and adjust the crop box. Then click on blank space. The part in the crop box remains on the canvas and the part outside the box will be removed. You can also double-click on the image to crop it quickly.



Filter setting

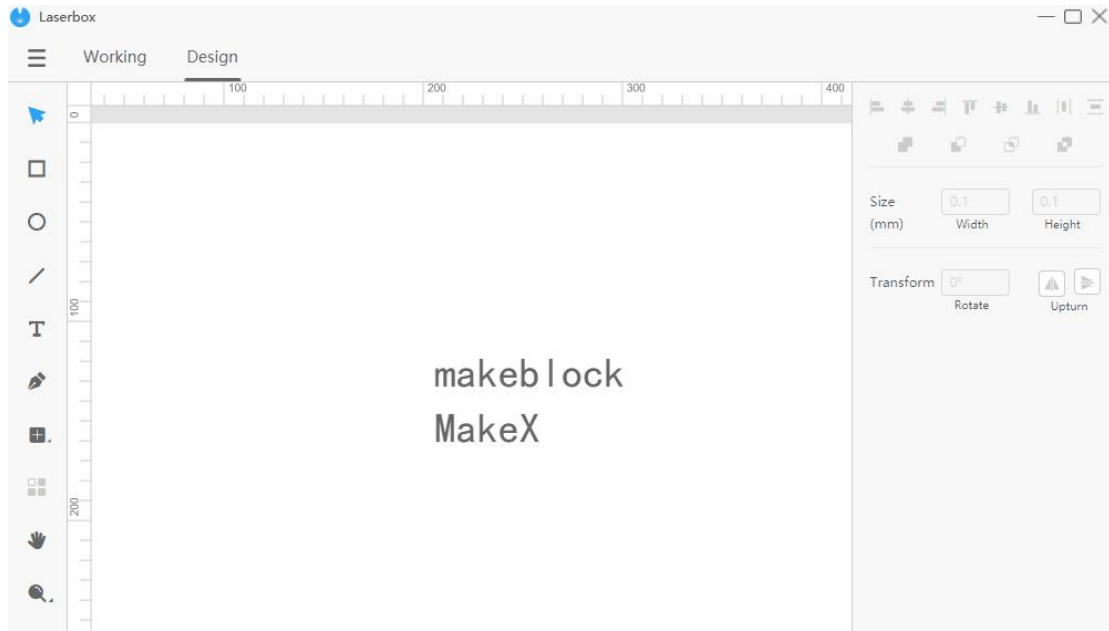
When you select an image, the **Filter Setting** appears in the style panel. Click the options to apply different filters to your image. To remove an applied filter, click the filter again.



Edit text

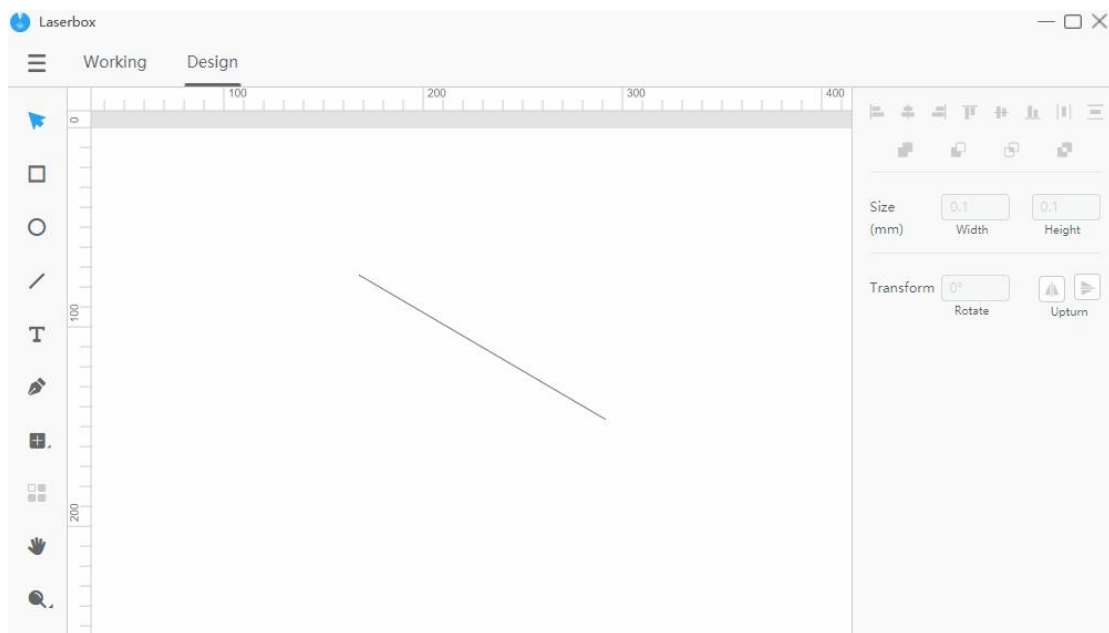
When you select a text, the text editing options appear in the style panel. Click the text again to start editing it.

- **Typeface** Changes the font of your text.
- **Space** Changes the spacing between words and lines.



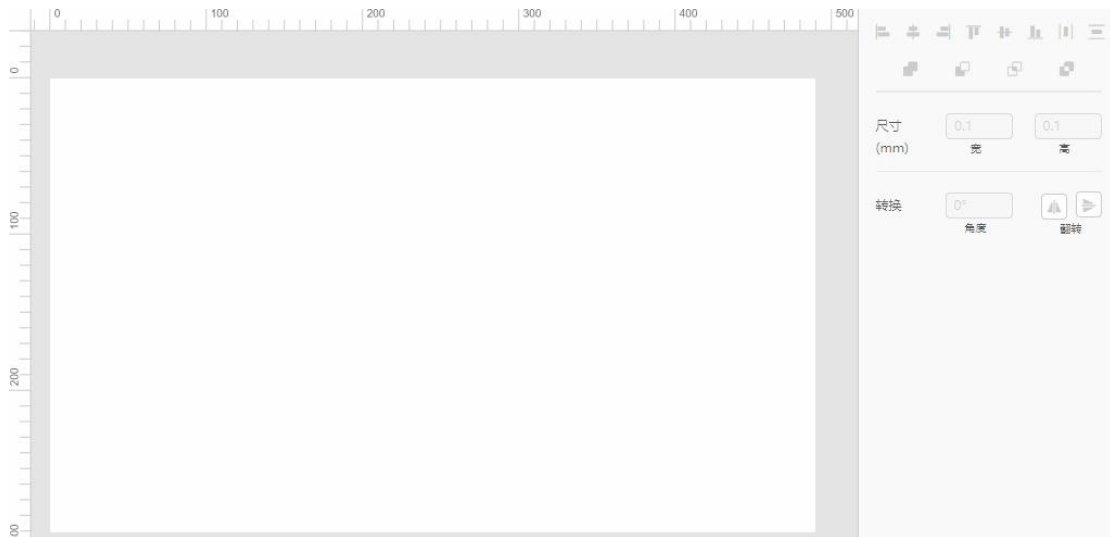
Line style

When you select a line, the line style options appear in the panel. Click the drop-down list to change styles.



Pen tool anchor points

When you select a vector path that is created with the pen tool, you can double-click the layer to edit the anchor points. Select an anchor point and define it as a **Corner Point** or **Smooth Point** in the style panel on the right.

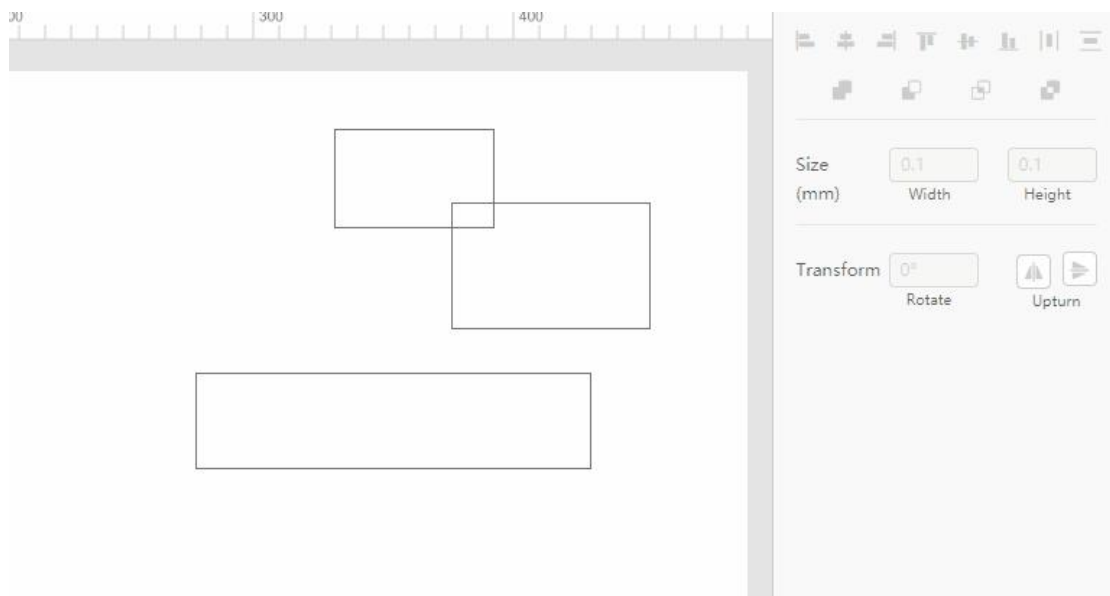


Alignment tools

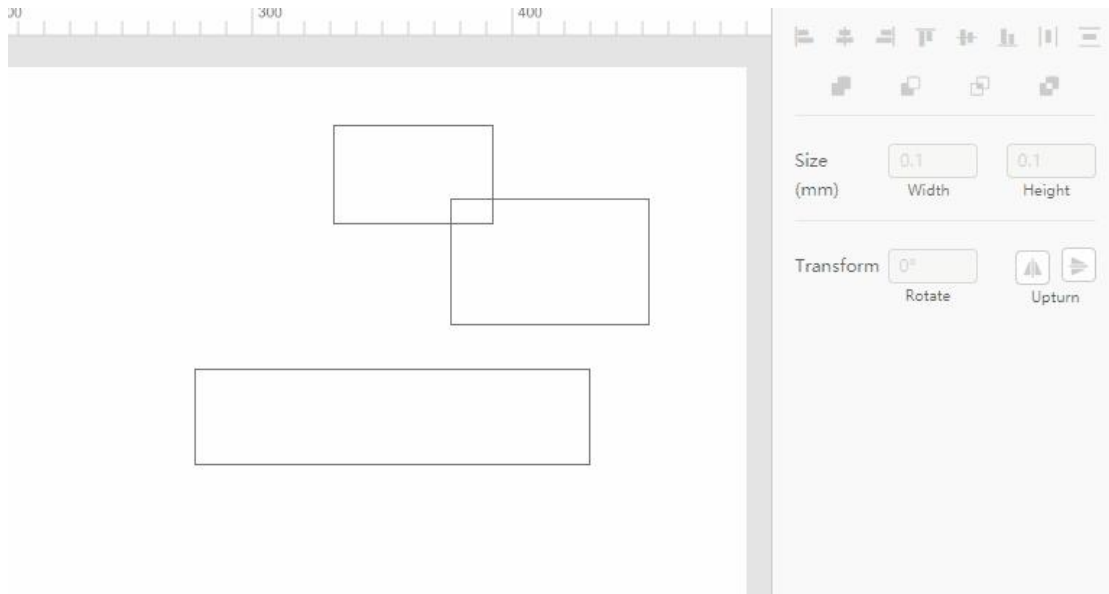
When you select more than one layer, you can align them with the alignment tools. The alignment options include:

NOTE: Distribute Horizontally and Distribute Vertically are only available when you select three or more layers.

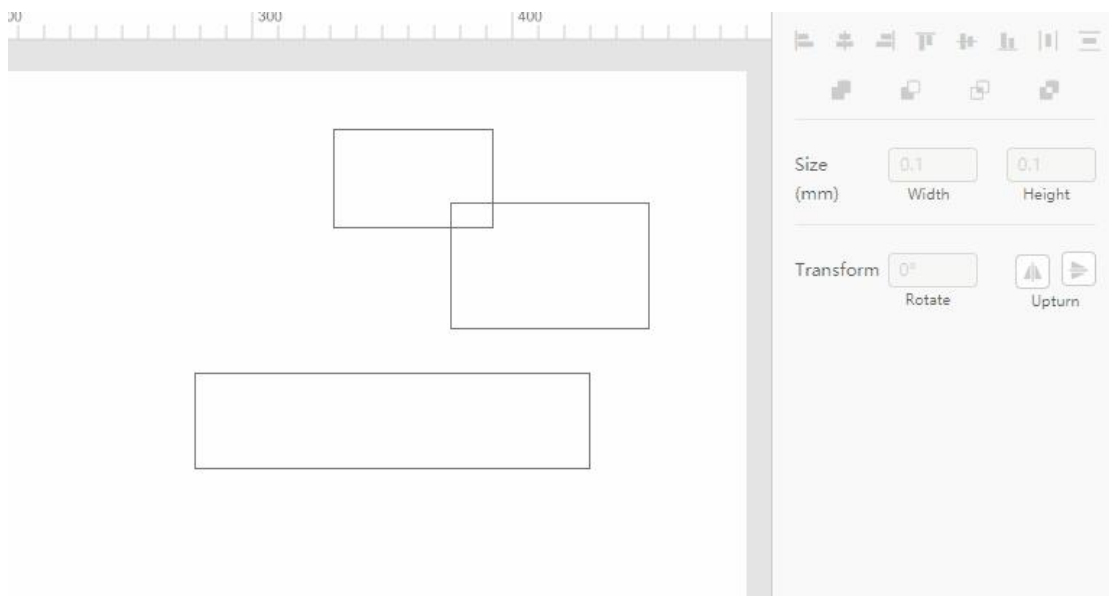
- **Align Left** Aligns the left edges of the selected layers to the left edge of the leftmost layer, or to the left edge of the selection box.



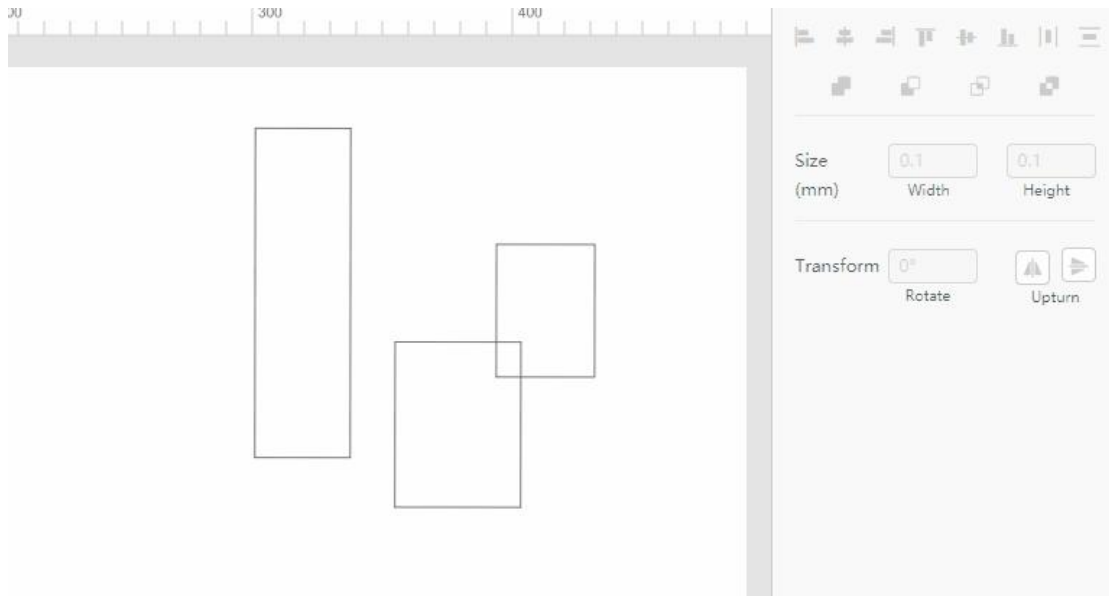
- **Align Center** Aligns the vertical center of each selected layer to the vertical center of the selection box.



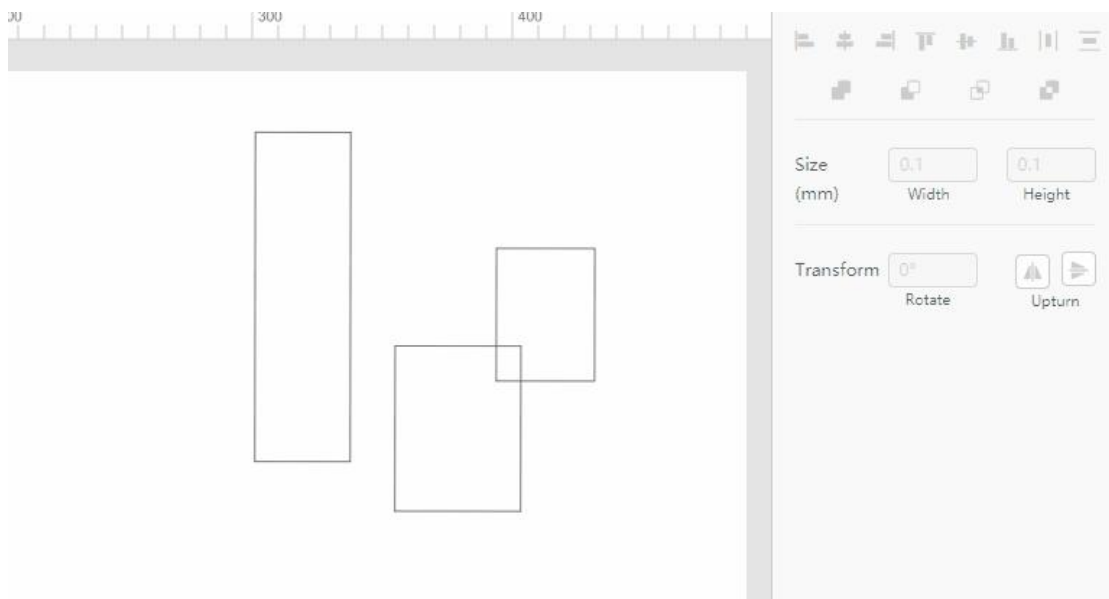
- **Align Right** Aligns the right edges of the selected layers to the right edge of the rightmost layer, or to the right edge of the selection box.



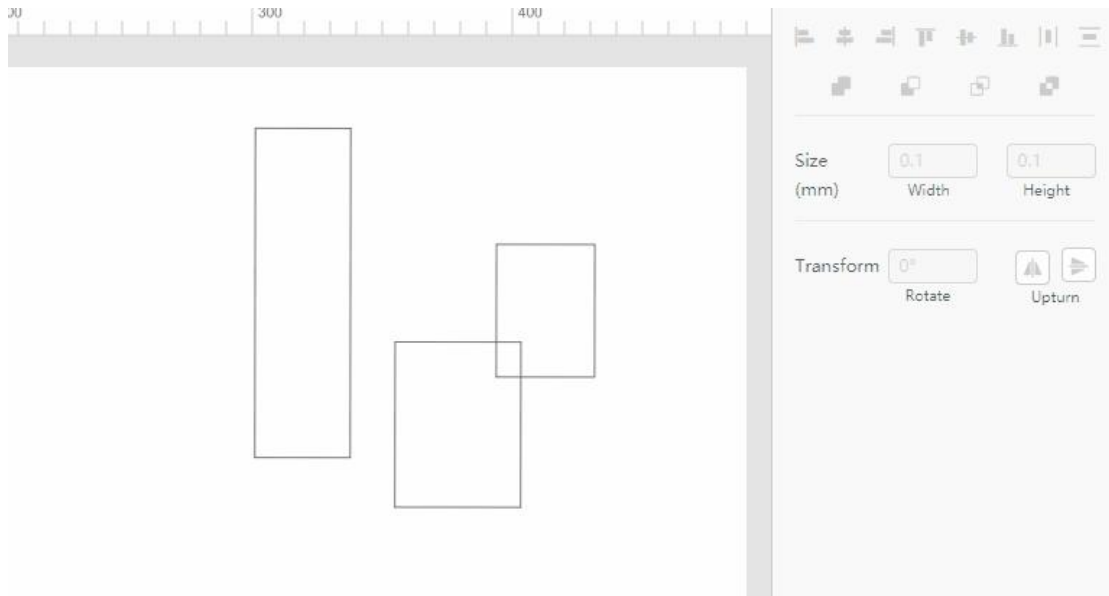
- **Align Top** Aligns the top edges of the selected layers to the topmost edge of all selected layers, or to the top edge of the selection box.



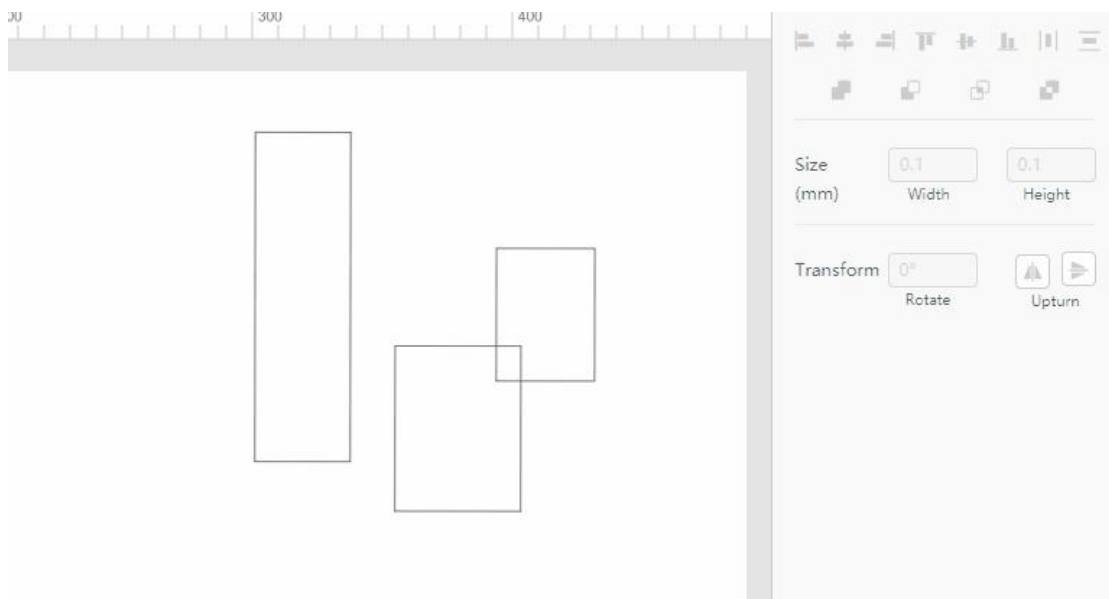
- **Align Middle** Aligns the horizontal center of each selected layer to the horizontal center of the selection box.



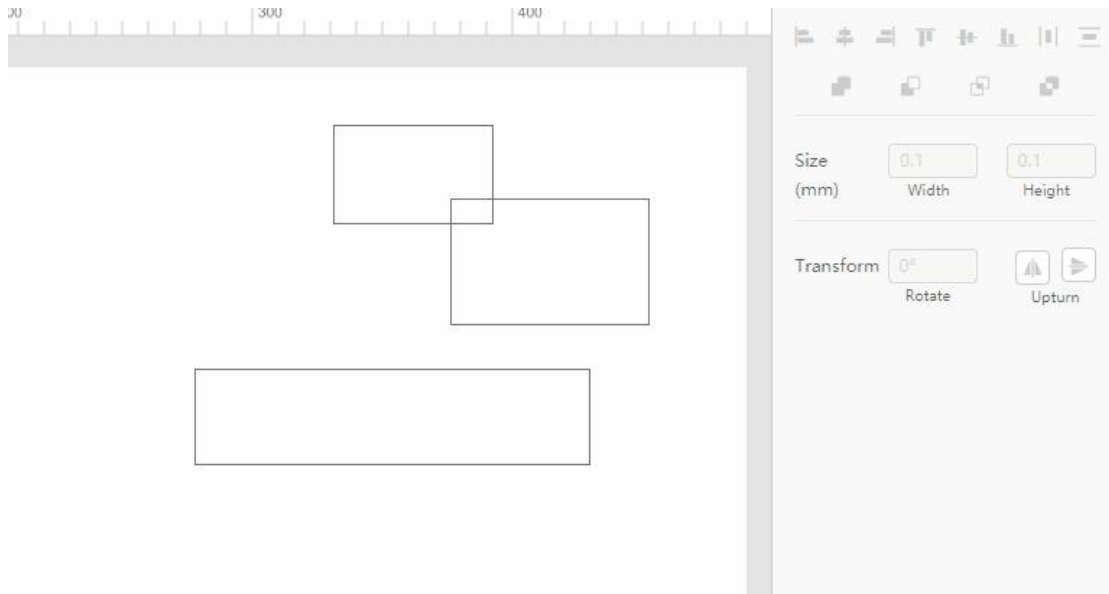
- **Align Bottom** Aligns the bottom edges of the selected layers to the bottommost edge of all layers, or to the bottom edge of the selection box.



- **Distribute Horizontally** Distributes the horizontal spacing between the selected layers evenly.



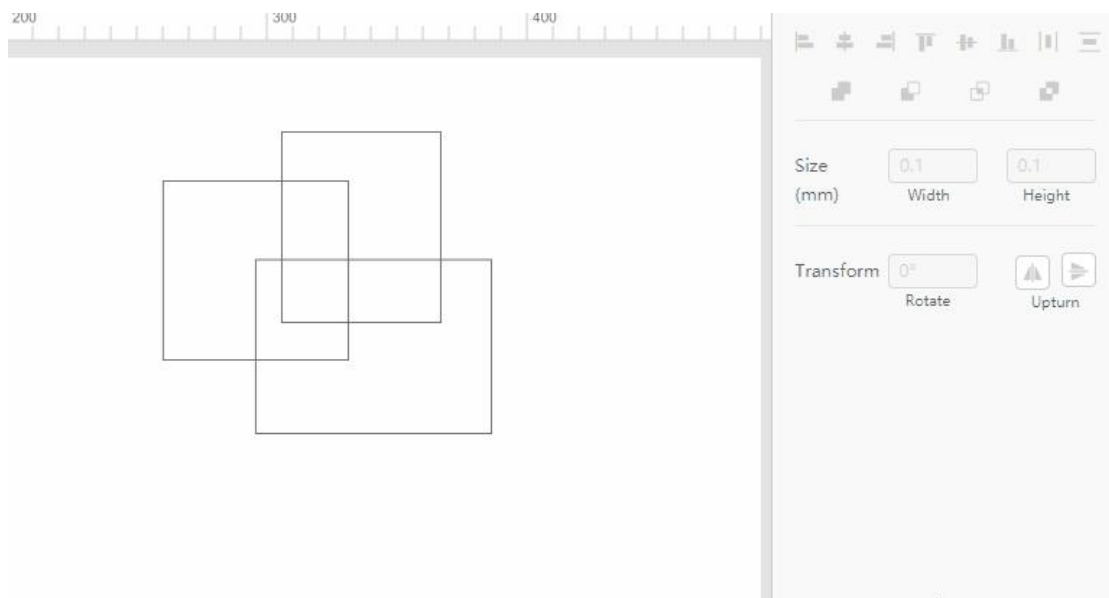
- **Distribute Vertically** Distributes the vertical spacing between the selected layers evenly.



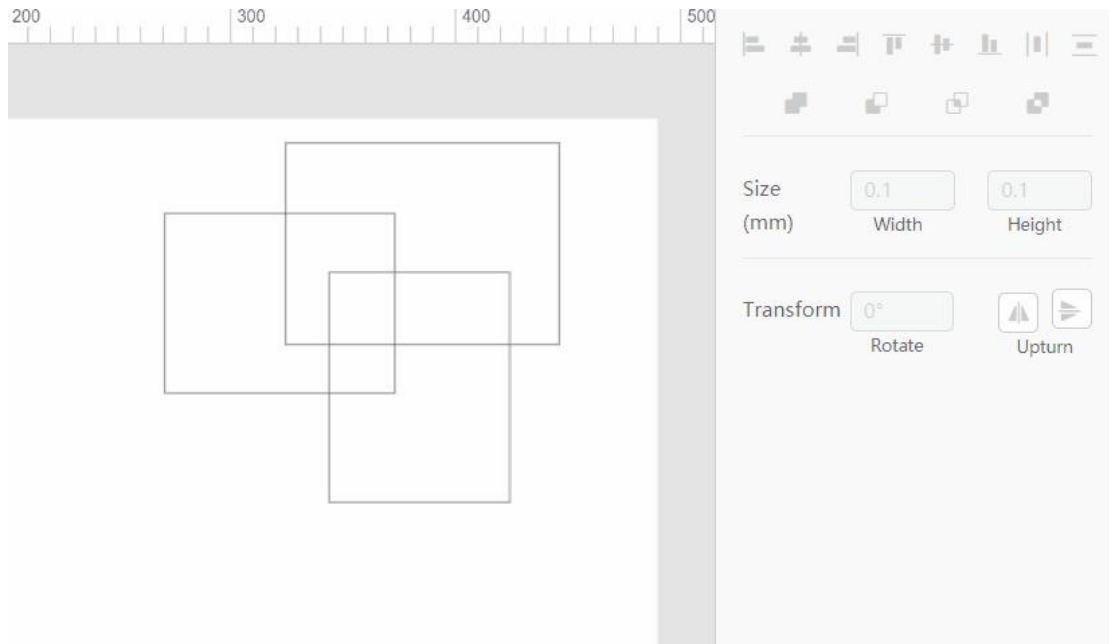
Boolean operations

Use Boolean operations to transform two or more shapes into one. Four types of operations are available:

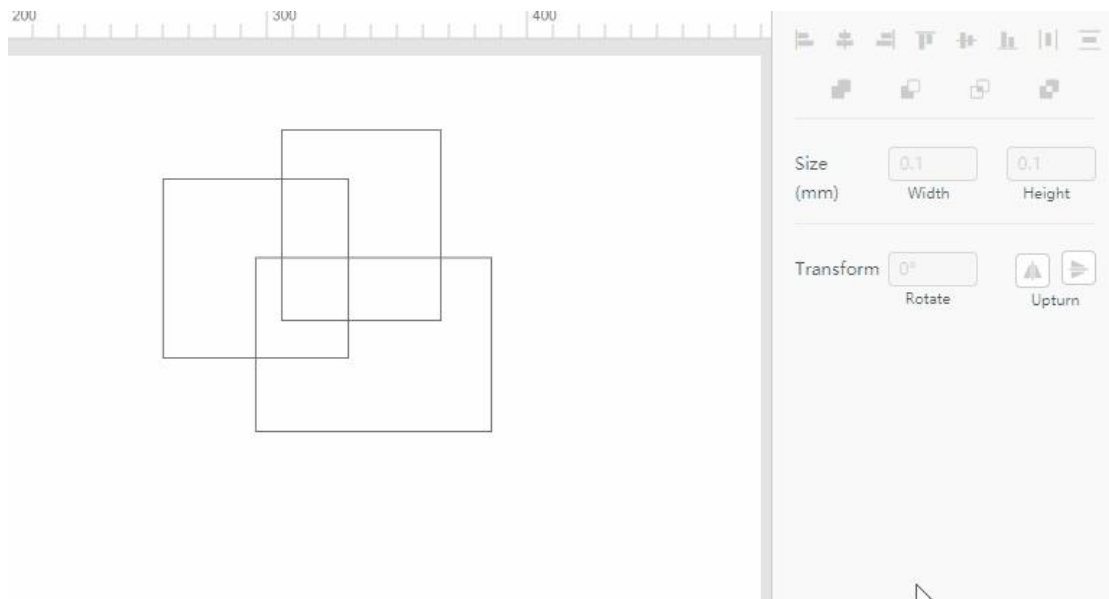
- **Union** Merges multiple shapes into one.



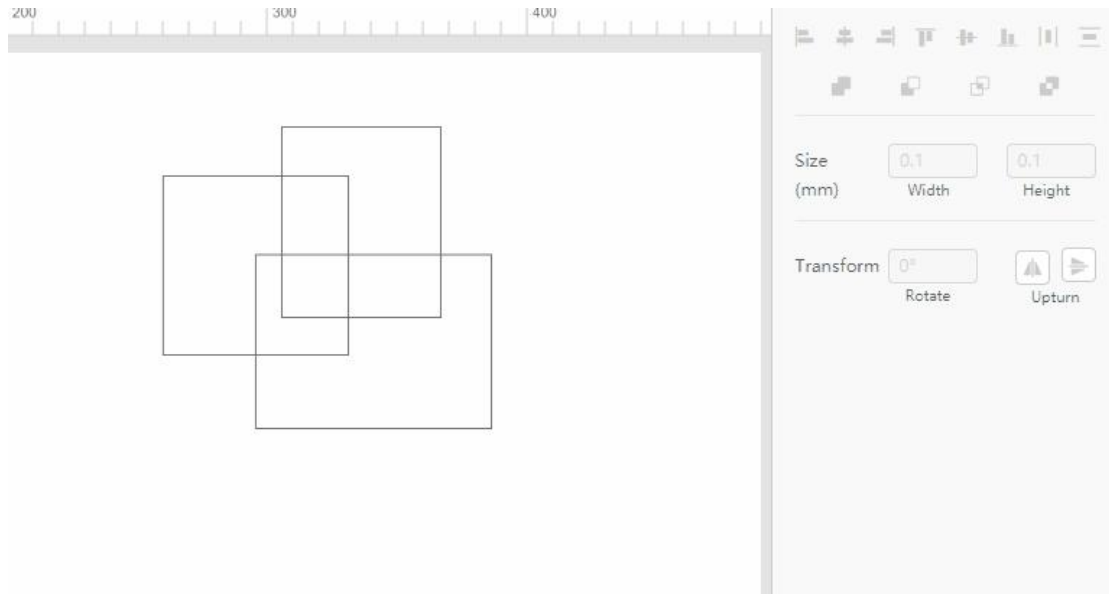
- **Subtraction** Removes the region of the bottom shape that is covered by the top shape and keeps the uncovered region of the bottom shape.



- **Intersection** Keeps the overlapping region and deletes the rest of the shapes. If the shapes aren't overlapping at all, then all shapes will be removed.



- **Differentiation** Removes the overlapping region of the shapes and leaves the rest on the canvas. Opposite to Intersection.



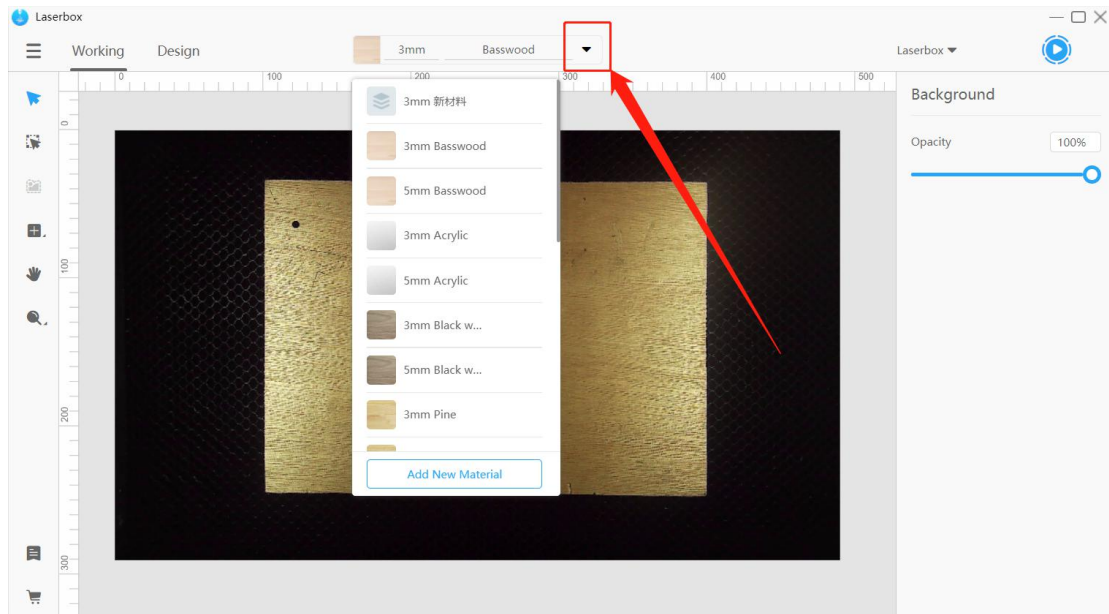
Materials management

Select a material

Laserbox is equipped with a high-resolution ultra-wide-angle camera. The Laserbox software relies on the camera to read the ring codes on Makeblock materials and identify the materials. If you want to process a material that is the same as a Makeblock material but without a ring code on it, you can select the material manually with the materials management tool in the software.

1. View the materials list

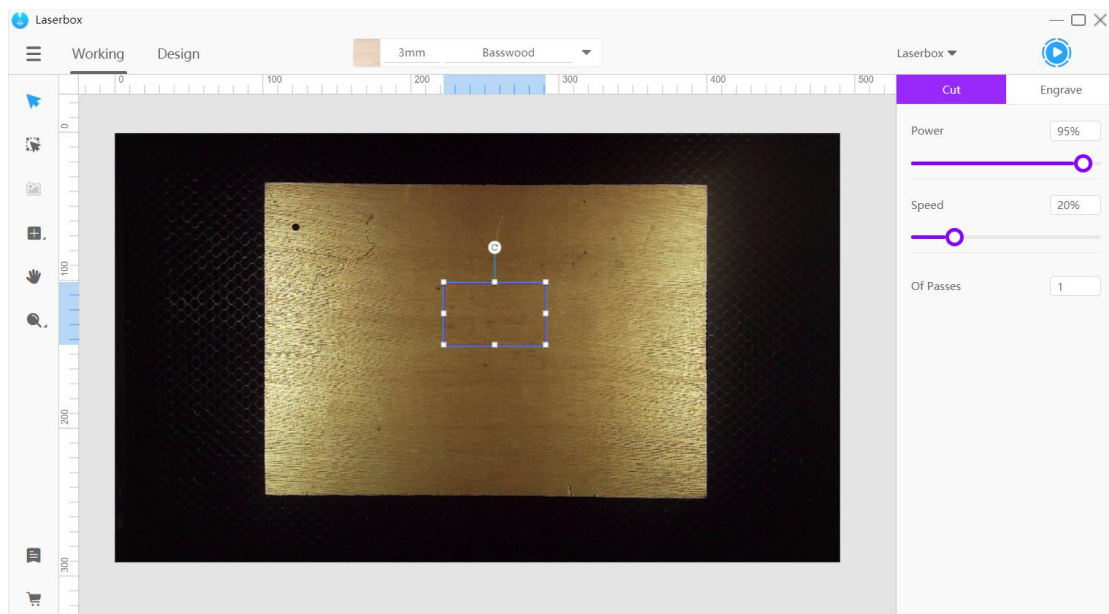
Click the triangle icon on the right of the materials management tool to display the materials list.



2. Select a material

On the drop-down list, select the material you want to process. Laserbox will then configure the parameters accordingly.

NOTE: The processing parameters will be shown on the right side of the **Working** interface only when you select at least one layer on the canvas.

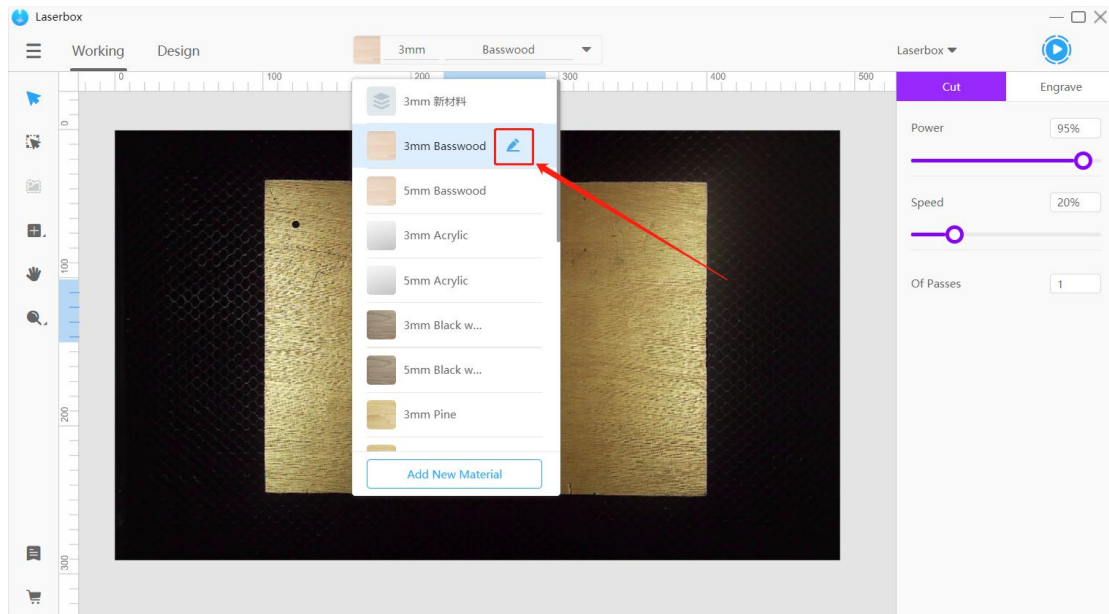


Edit material parameters

If you're not happy with the default processing parameters and effects, change them with the materials management tool.

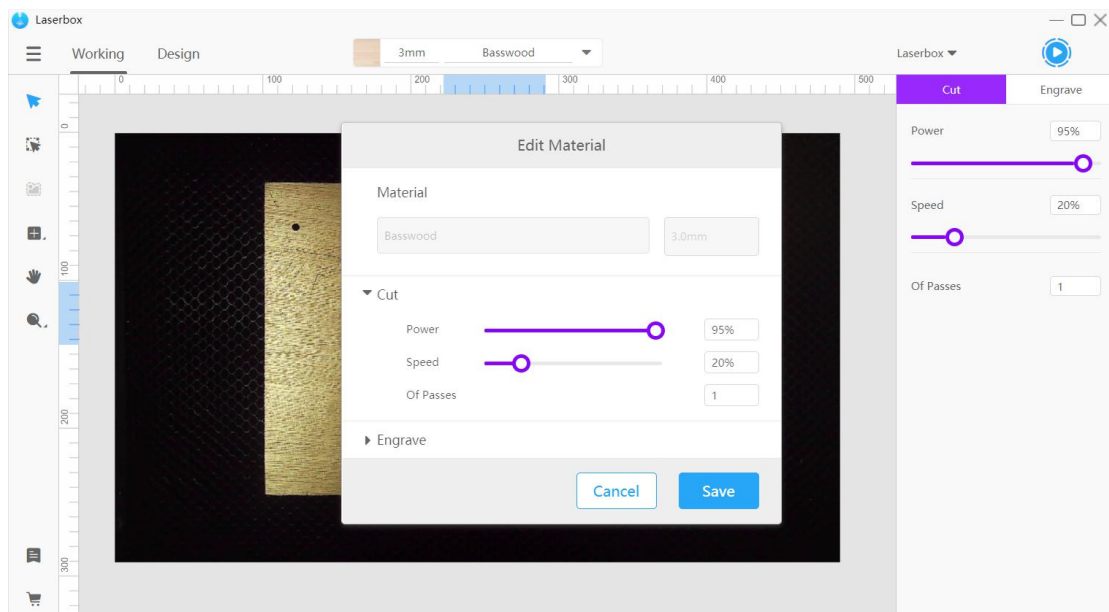
1. Edit material

When the mouse pointer stops at a material name on the materials list, an edit button appears on the right side. Click the button to open the material editing window.



2. Adjust parameters

In the **Edit Material** window, you can configure the laser cutting or engraving parameters for any Makeblock material.



3. Save parameters

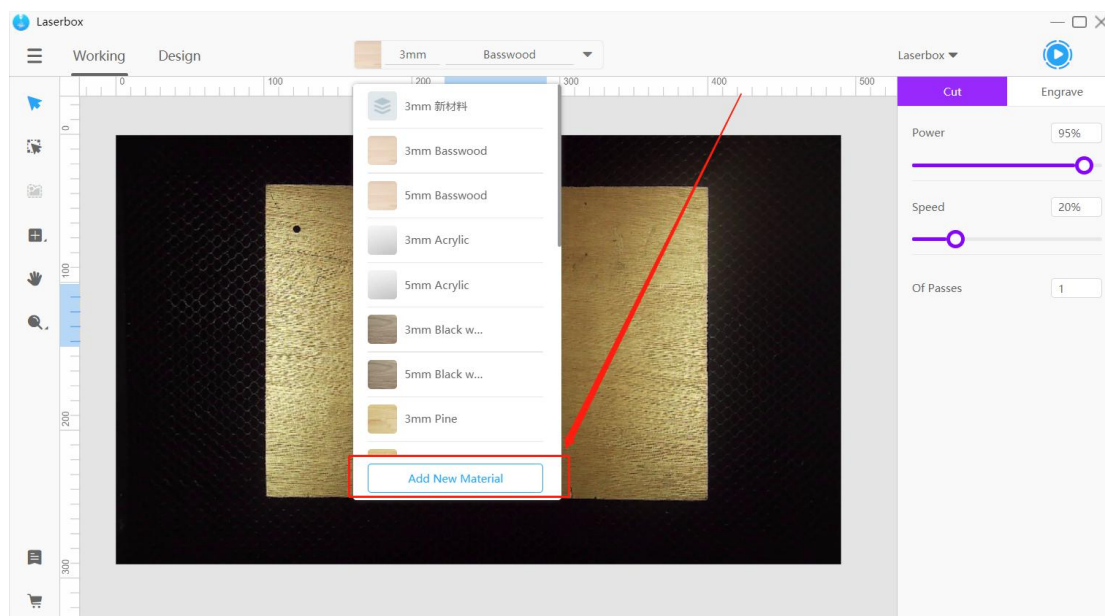
Click **Save** at the bottom right corner of the window to apply the new parameter configuration in the software. After that, the new parameters will be applied to the same materials that are identified through the ring codes.

Add a new material

Non-Makeblock materials that have gone through processing parameter tests can be added to the materials list in the software. This offers quick access to parameter settings for later use.

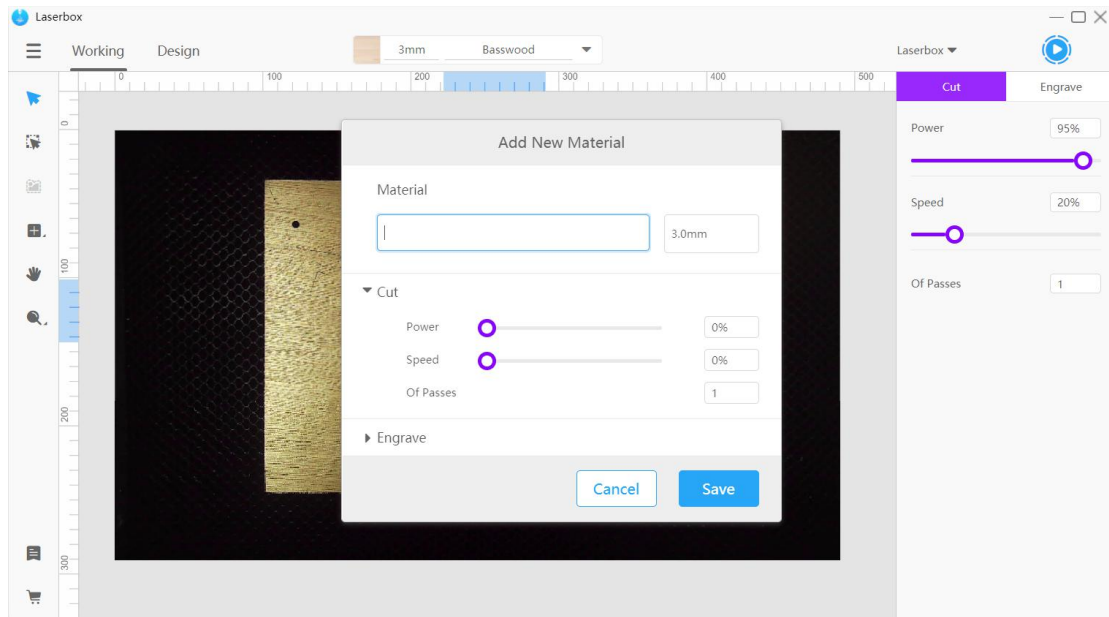
1. Add a new material

Click **Add New Material** at the bottom of the materials list.



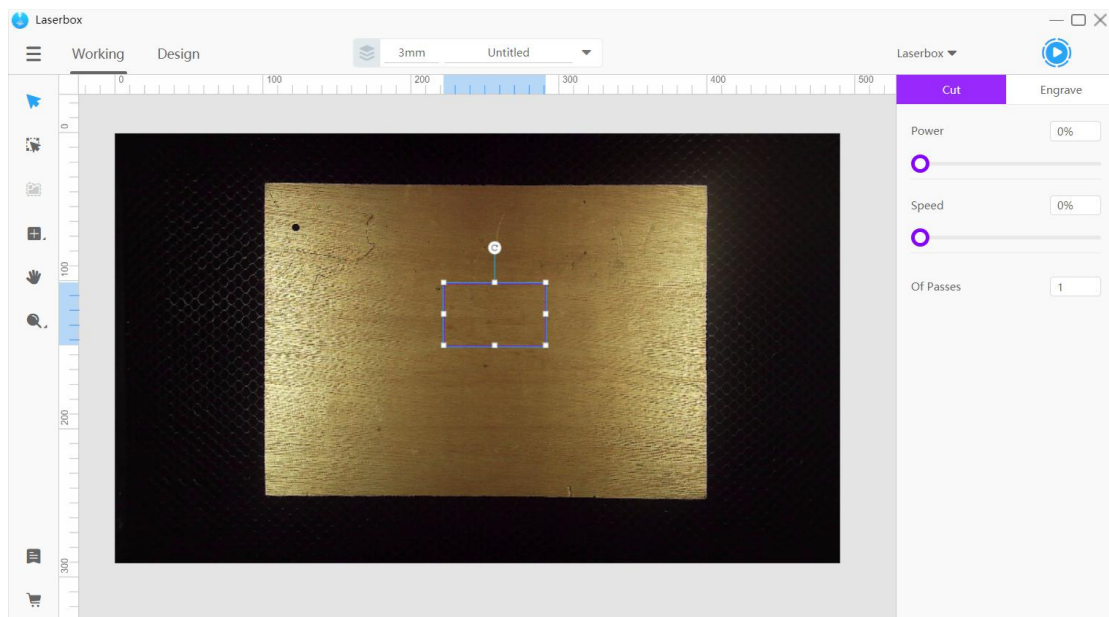
2. Enter material information

In the pop-up window, type in the material information, including name, thickness, engraving parameters, and cutting parameters.



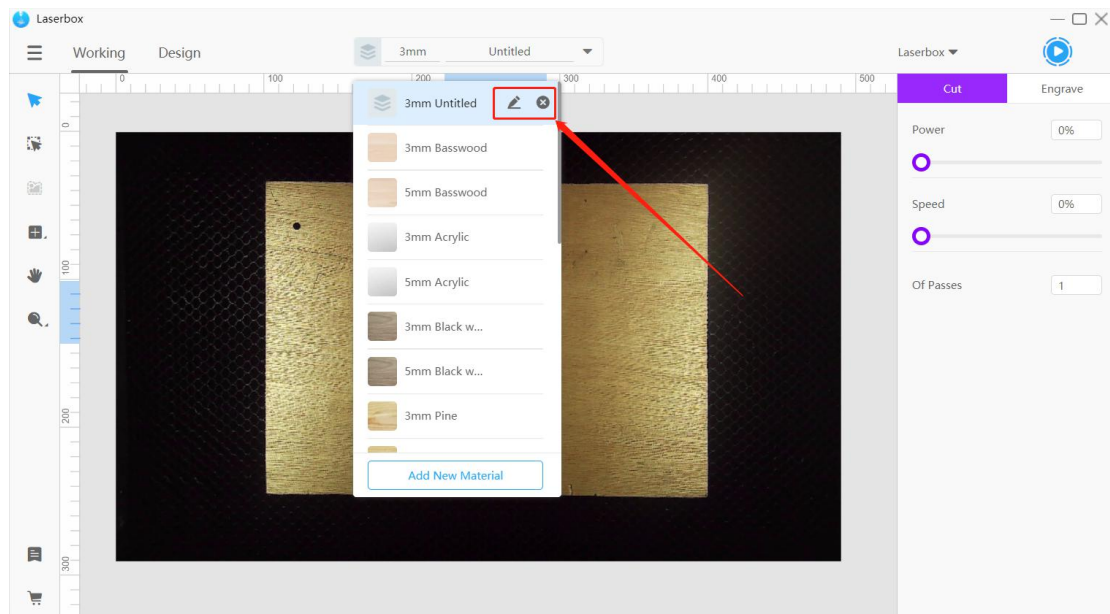
3. Save material information

Click **Save** at the bottom right of the window. And the window automatically closes when you do this, and the materials management tool will select the new material.



4. Select the material to save

The newly-added material is displayed at the top of the materials list. Click x on the right of the material name to remove the material from the list.



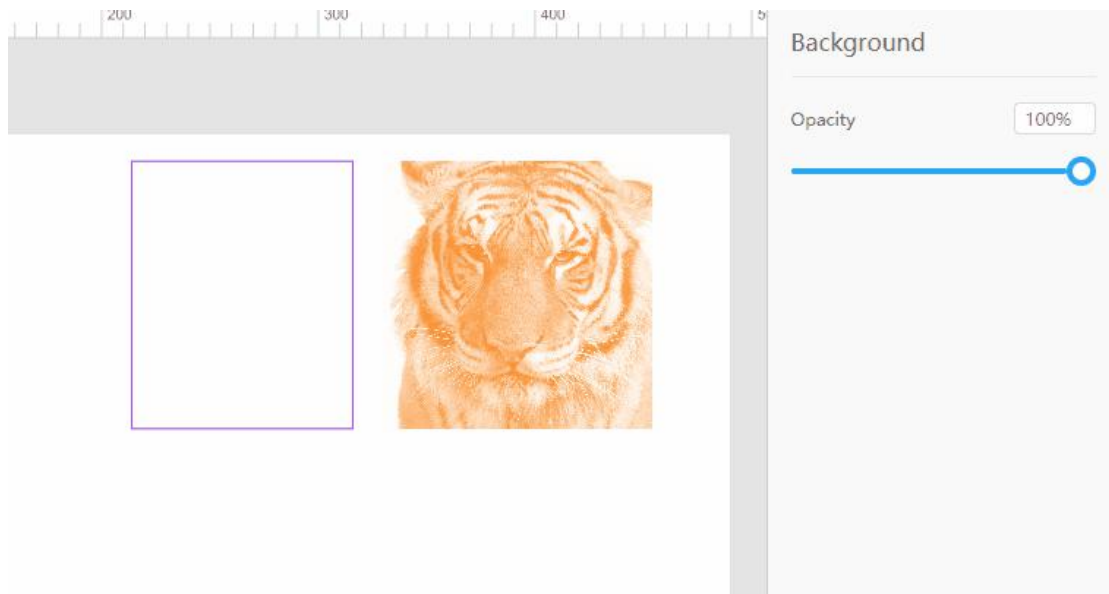
Parameter settings

Processing parameters include three types: engraving parameters, cutting parameters, and custom parameters. By default, engraving or cutting parameters will appear on the right of the **Working** interface after you select a layer.

Bitmap images can't be cut, so you can only tune the engraving parameters if you select a bitmap layer.

If you select a vector layer, you can adjust both cutting and engraving parameters for it

Orange means engraving and blue for cutting.



Engraving parameters

1. Engrave mode

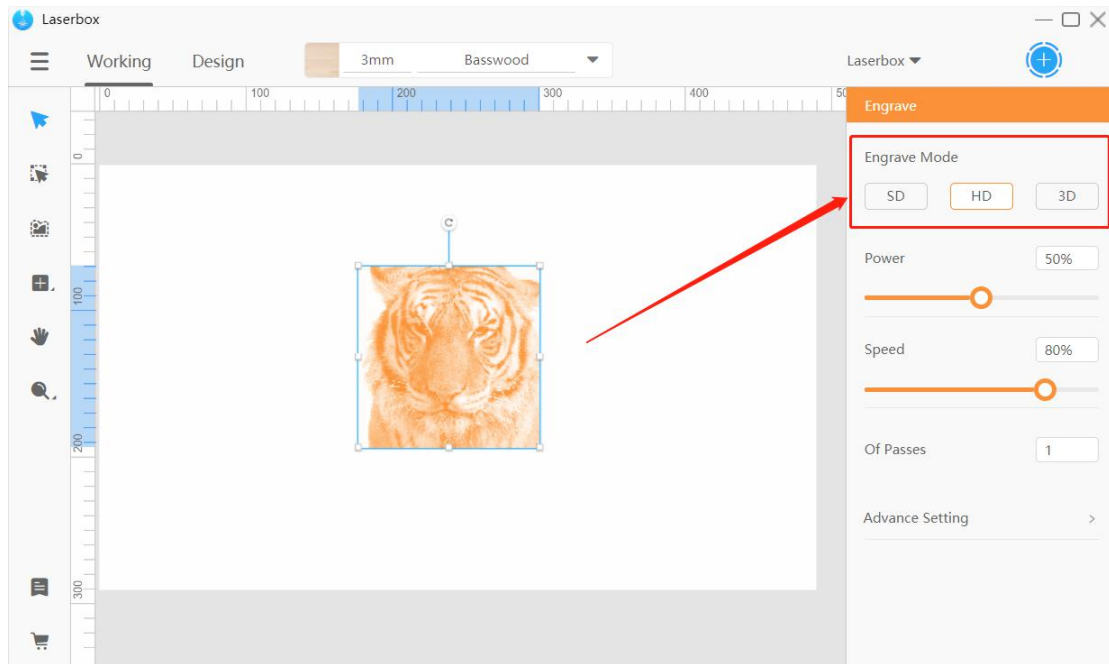
What can it do?

Engrave mode options are only available when you select a bitmap. There are three modes:

1. **SD** Muddier engraving but shorter engraving time.
2. **HD** Fine-carved but longer engraving time.
3. **3D** Generates a 3D profile based on the gray level of a bitmap. The darker the color is, the deeper the engraving will be, producing a relief effect.

How to use it?

Select a bitmap image and choose the engraving mode you want in the style panel on the right.



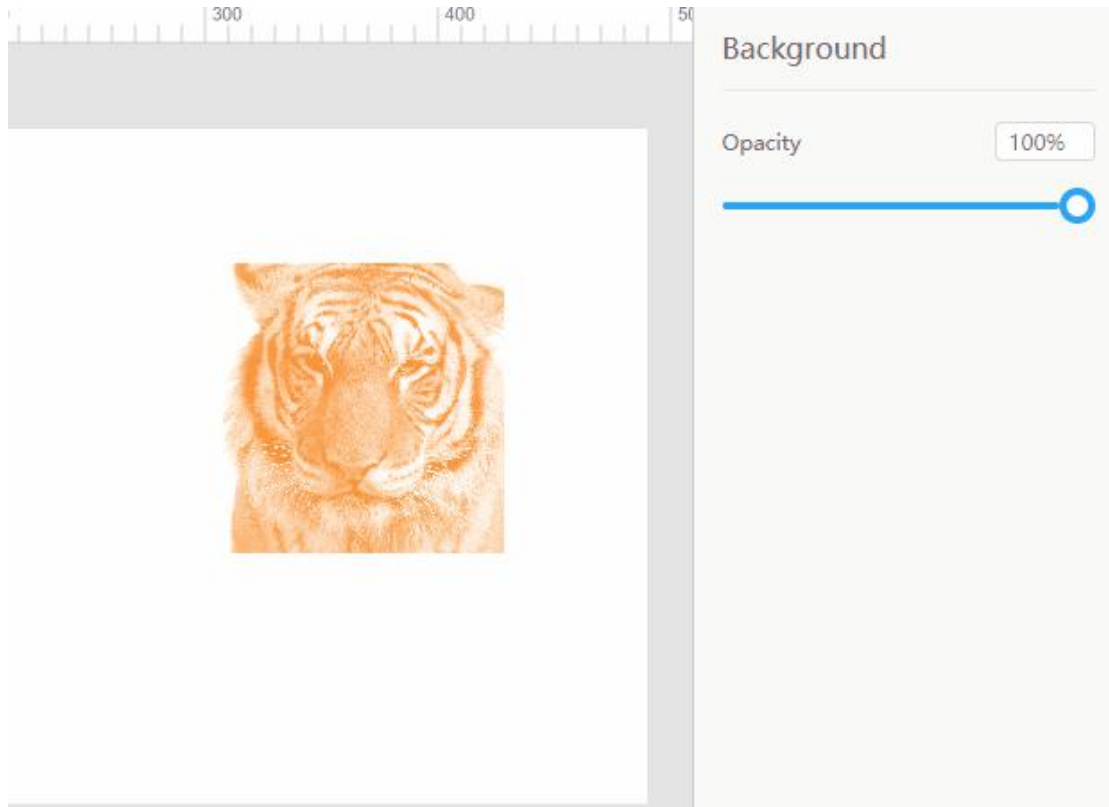
2. Engraving power

What can it do?

Power affects engraving quality. Higher power leads to deeper engravings, and lower power means shallower engravings.

How to use it?

Select a layer and drag the slider under **Power** on the right side. Alternatively, type in a value to specify the power.



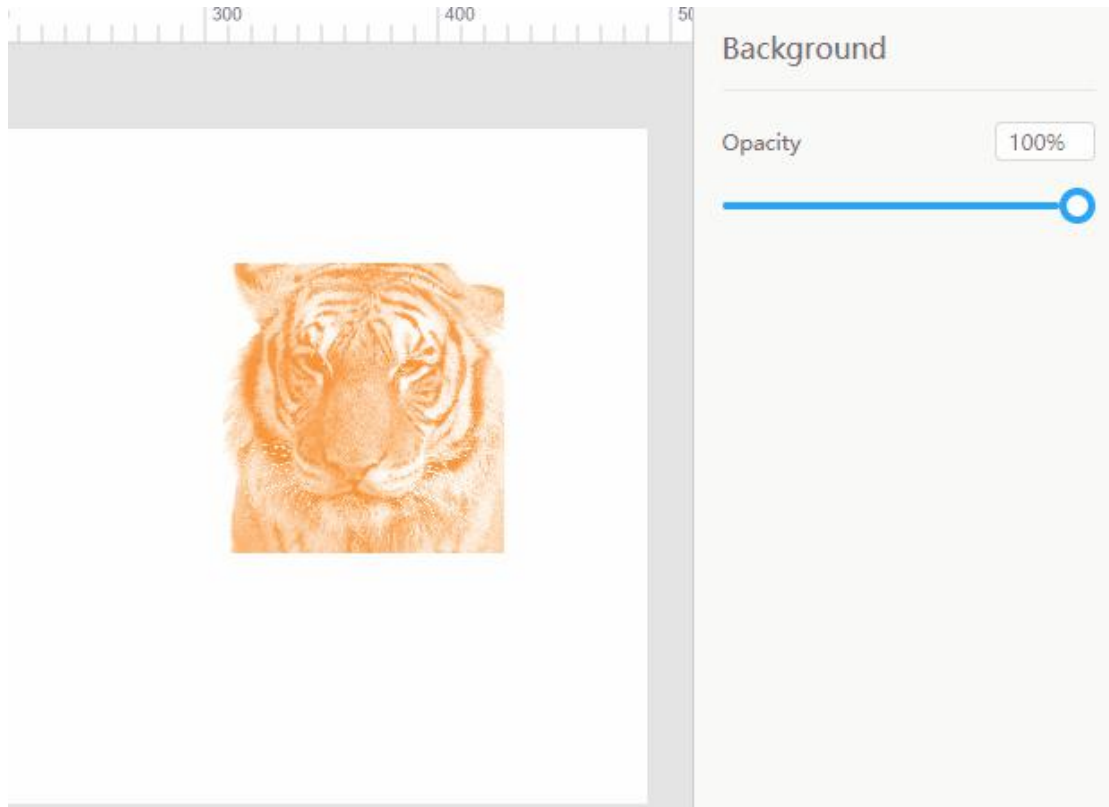
3. Engraving speed

What can it do?

Speed also affects engraving quality. Lower speed leaves deeper engravings, and higher speed shallower engravings.

How to use it?

Select a layer and drag the slider under the speed setting on the right side. Or, enter a value in the input box to define the speed.



4. Of passes

What can it do?

Of passes determines how many times a selected layer will be engraved. Multiple passes can make deeper engravings but take more time.

How to use it?

Select a layer and enter a value in the parameters panel on the right to define the number of passes. For equipment safety, the maximum number of passes supported by the software is 10.

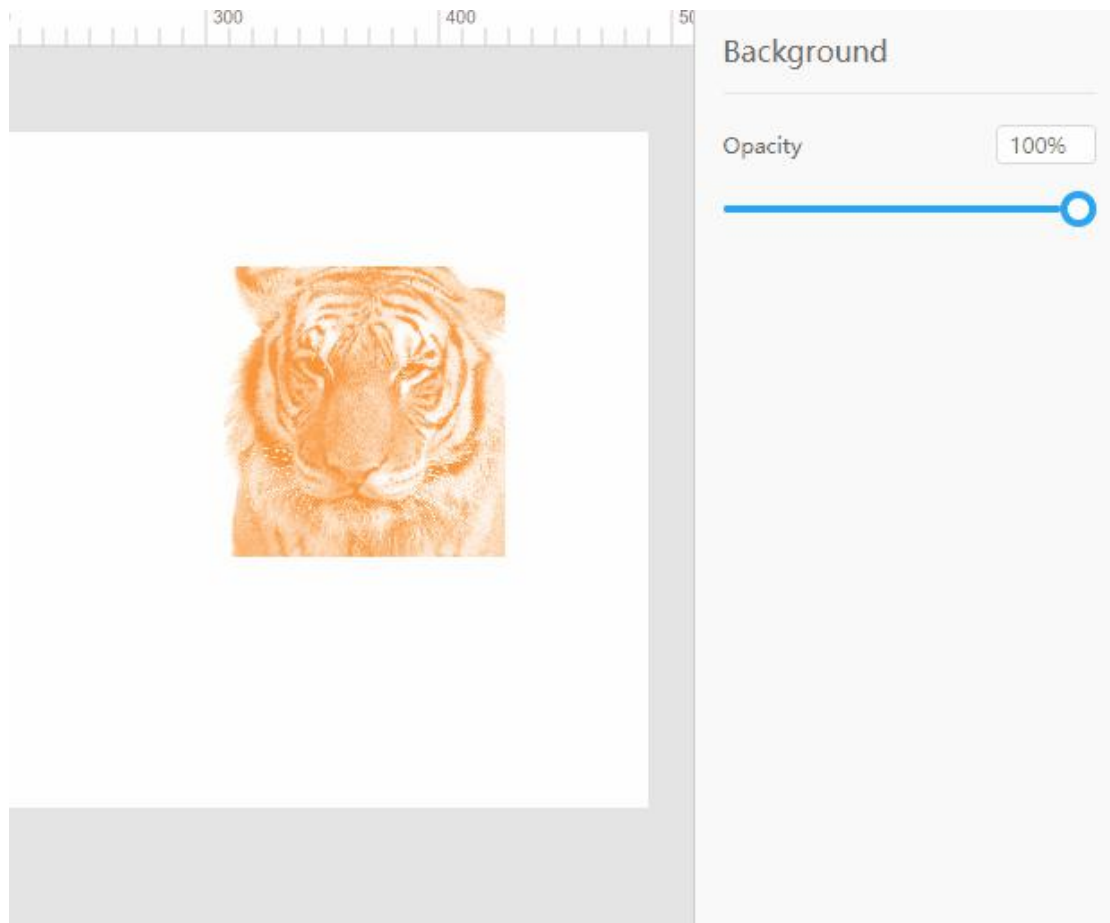
5. Lines per cm

What can it do?

Lines Per CM is only applicable to bitmap images. This parameter defines how many horizontal passes are made in one centimeter. More lines per cm can result in a finer result, but it takes longer to complete the engraving. And fewer lines per cm helps save time.

How to use it?

Select a bitmap image and go to **Advance Setting** in the parameters panel. Then click **Lines Per CM** and select a value in the drop-down menu. Optionally, drag the slider to tune the parameter.

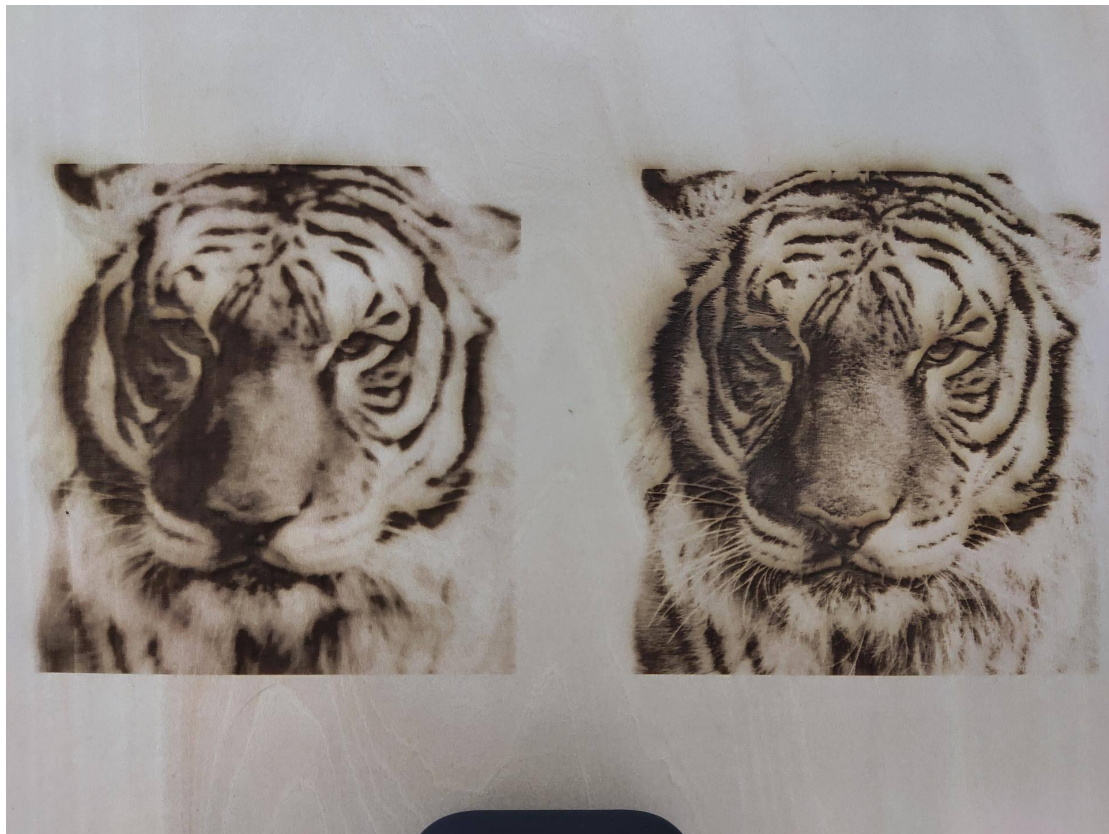
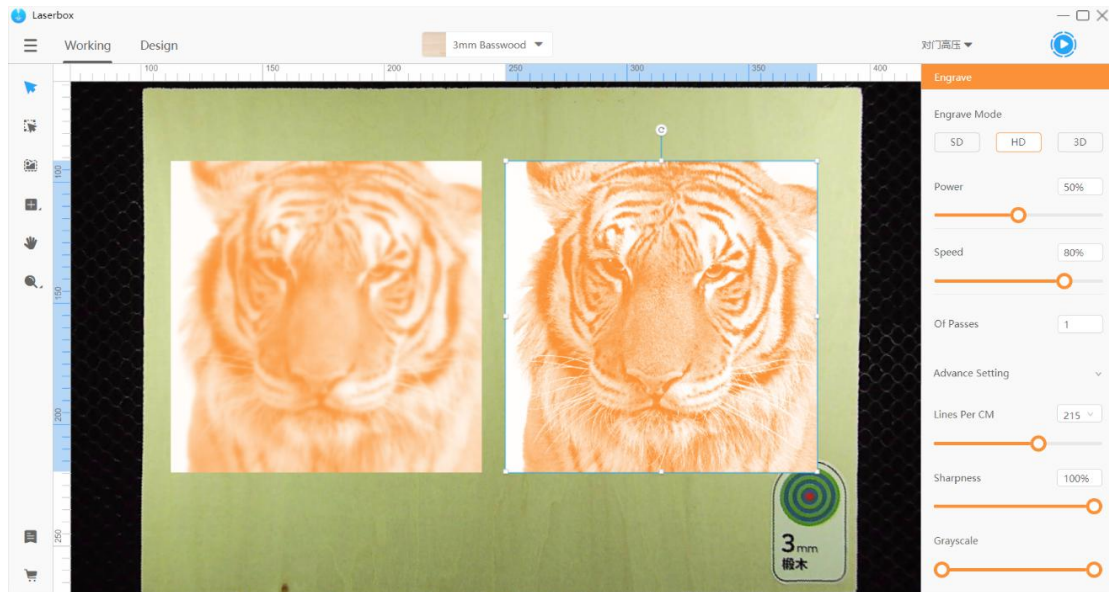


6. Sharpness

What can it do?

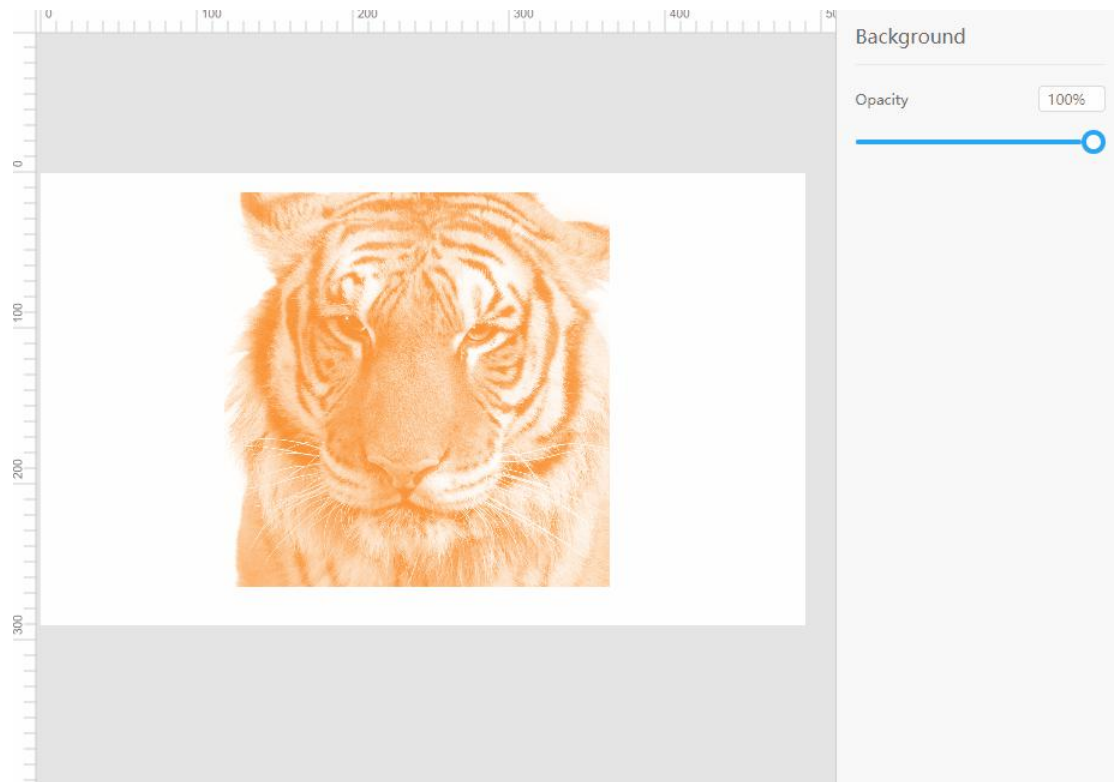
Sharpness is only applicable to bitmap images. An image with higher sharpness has sharper edges and details, and one with lower sharpness has smoother edges and details.

The sharpness of the image on the left is 0, while the sharpness of the one on the right is 100.



How to use it?

Select a bitmap image and go to Advance Setting in the parameters panel. Then drag the slider under Sharpness or enter a value to define the parameter.



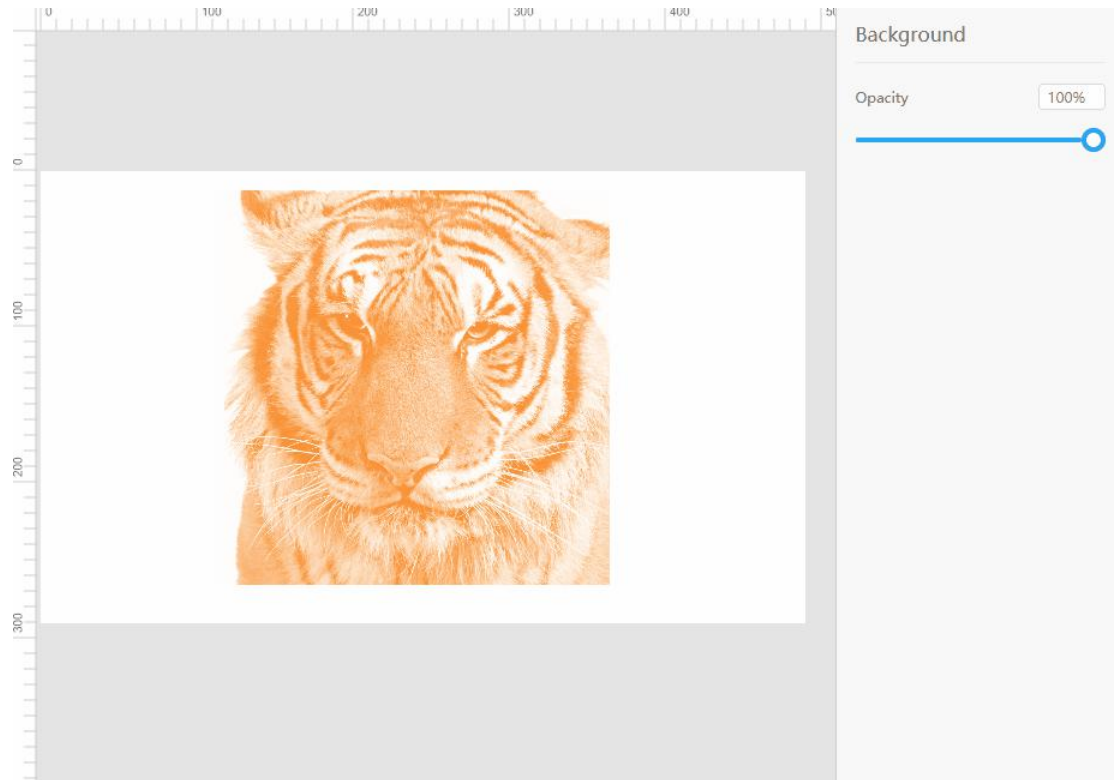
7. Grayscale

What can it do?

Grayscale is only applicable to bitmap images. The grayscale option is available in the Laserbox software, allowing you to produce different engraving effects. Lower grayscale gives higher contrast but causes loss in detail.

How to use it?

To change the grayscale, select a bitmap image, then go to **Advance Setting** in the parameters panel, and drag the slider under **Grayscale**.



Cutting parameters

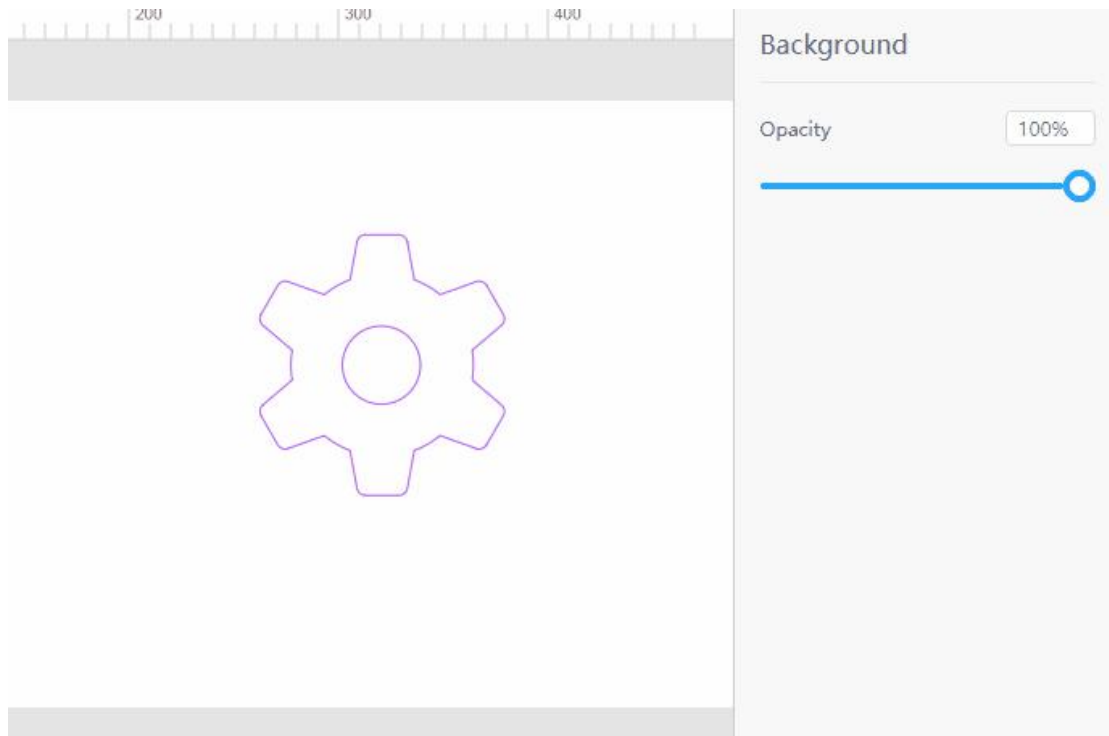
1. Cutting power

What can it do?

Power affects cutting quality. Higher power leaves deeper cuts and lower power shallower ones.

How to use it?

In the Working interface, select a layer to cut and drag the slider under Power in the parameters panel on the right. Or, just type in a value to adjust the power.



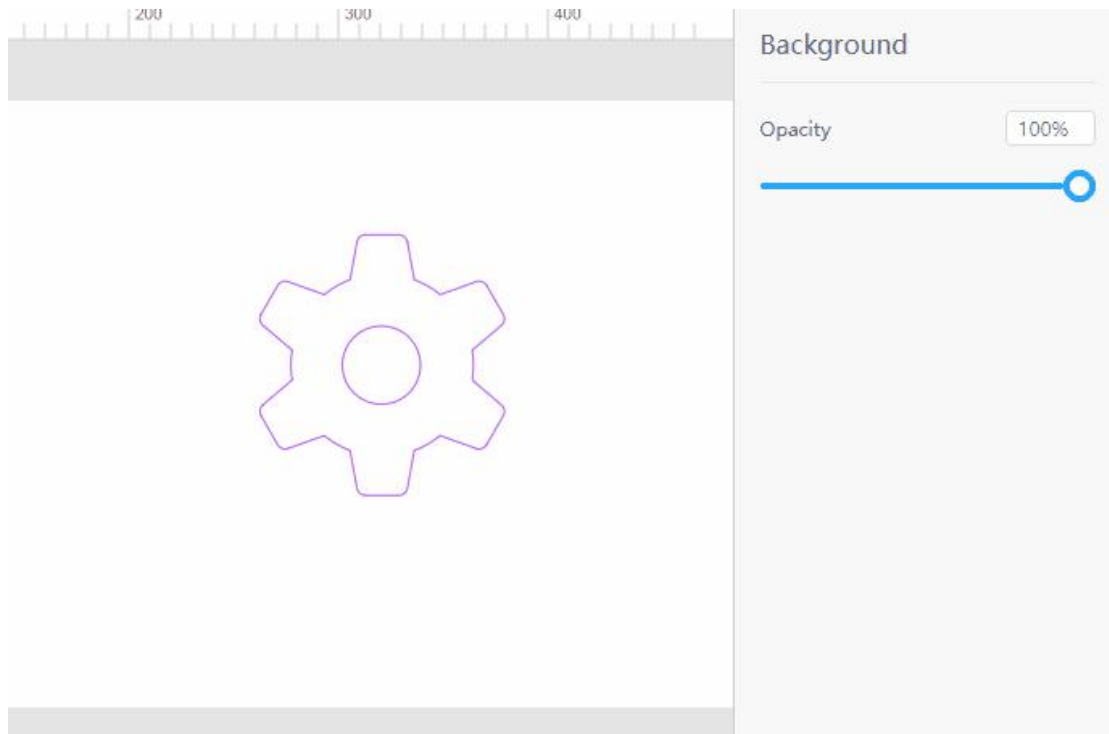
2. Cutting speed

What can it do?

Speed also affects cutting quality. Higher speed leads to narrower cuts, while lower speed causes wider cuts.

How to use it?

In the Working interface, select a layer to cut and drag the slider under Speed. Or, just type in a value to adjust the speed.



3. Of passes

What can it do?

Of passes controls how many times a layer will be cut during the process. Multiple passes can produce deeper cuts and ensure the material is cut through. However, multiple passes also make the cuts wider and take more time to complete the process.

How to use it?

In the **Working** interface, select a layer to cut and enter a value in the parameters panel on the right. For equipment safety, the maximum number of passes supported by the software is 10.

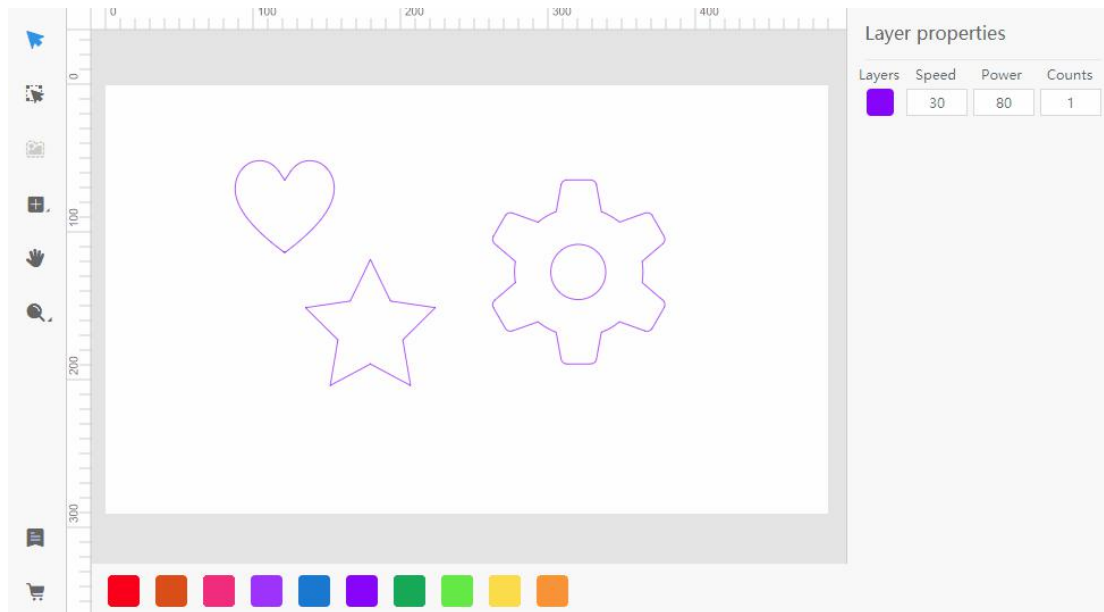
Color block mode

What can it do?

In the Laserbox software, you can sort the layers based on their colors and apply different processing parameters to layers of different colors. Tick **Show Color Block** in **Settings** to activate the mode. In the color block mode, you can configure power, speed, and number of passes without considering whether they're for cutting or engraving.

How to use it?

Go to **Menu > Settings > Software**, tick **Show Color Block**, and click **Save**. To set color groups for layers, select a layer and click a color on the color block list at the bottom. A color used in the canvas will appear in the **Layer properties** on the right side. In the **Layer properties**, you can set the parameters based on colors.



Device management

Add/Switch Devices

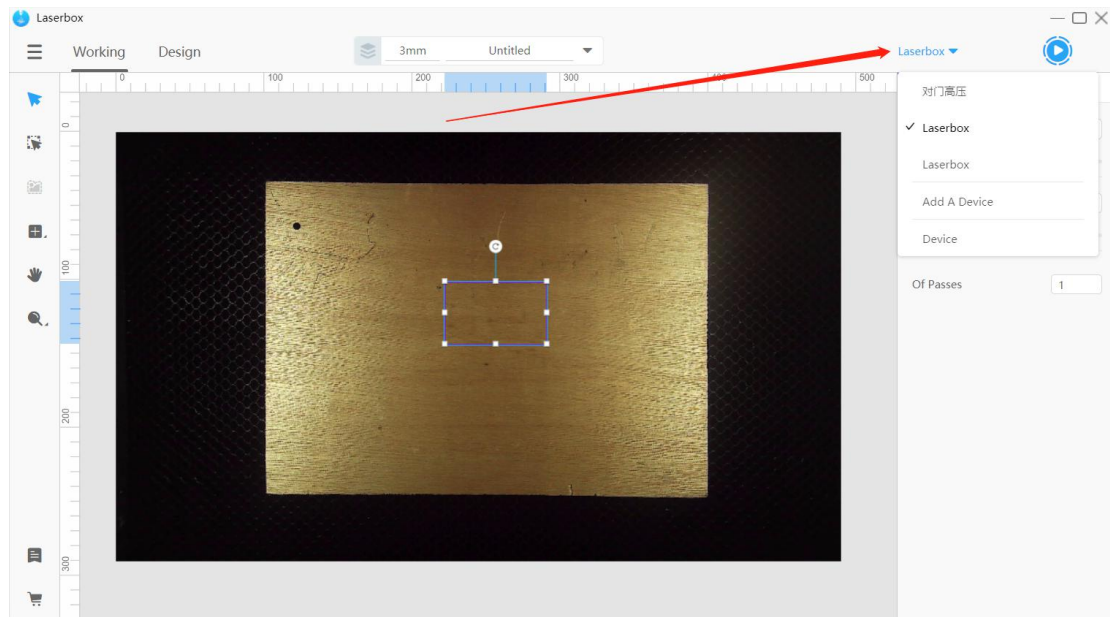
What can it do?

The Laserbox software allows connections to multiple Laserboxes at a time and saves the connected devices to the device list. So, you can easily switch between devices.

How to use it?

At the upper right corner of the window, find the device name and click the drop-down icon on the right of the name to show the device list. Click on the device name to connect to the device. To remove a device from the list, put the mouse pointer on the name of an unconnected device and click **×** on the right.

Click **Add A Device** and select **Connect to a new Laserbox** or **Connect to a networked Laserbox** in the pop-up device connection window. [Learn more about Connect Devices.](#)



Software settings

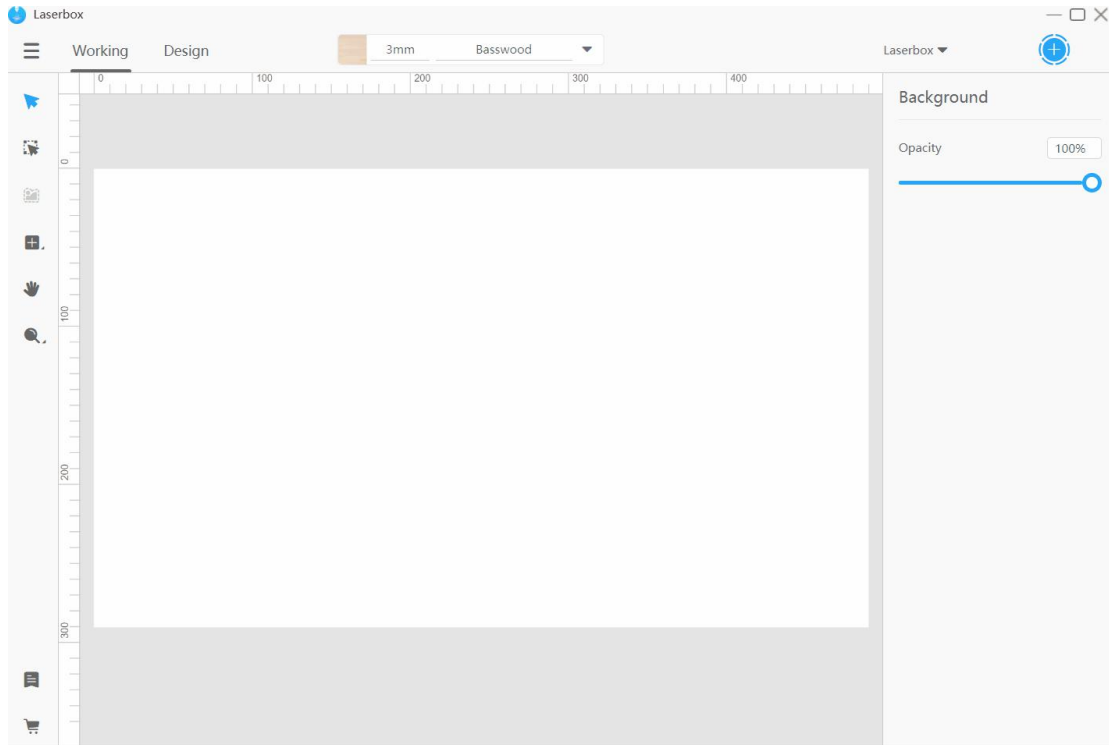
Language settings

What can it do?

The Laserbox software has multiple display languages.

How to use it?

Go to **Menu > Settings**. The language option appears at the top of the pop-up window. Select a language on the drop-down list, then click **Save** to confirm your option. The display language will change immediately.



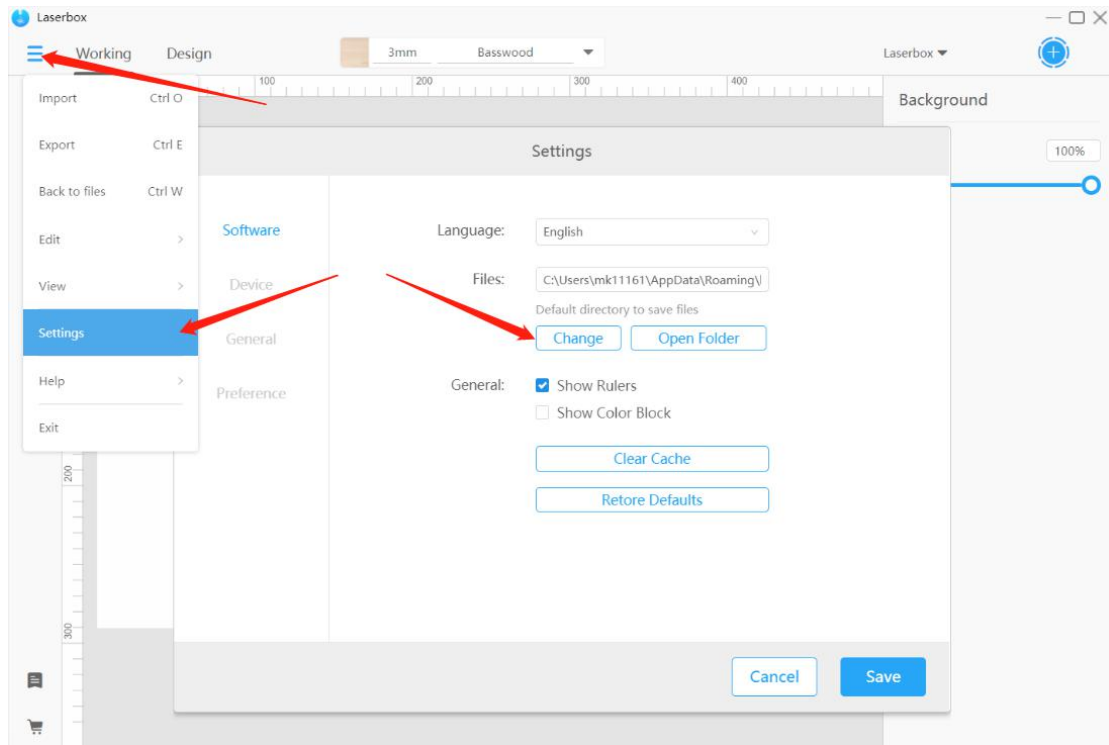
View/Change file locations

What can it do?

The software saves a processing file as a project. It automatically saves your file as you work. You can find your work in the recent files. So, don't panic if you accidentally close the program before completing your work. You can view and change the default file location in Settings.

How to use it?

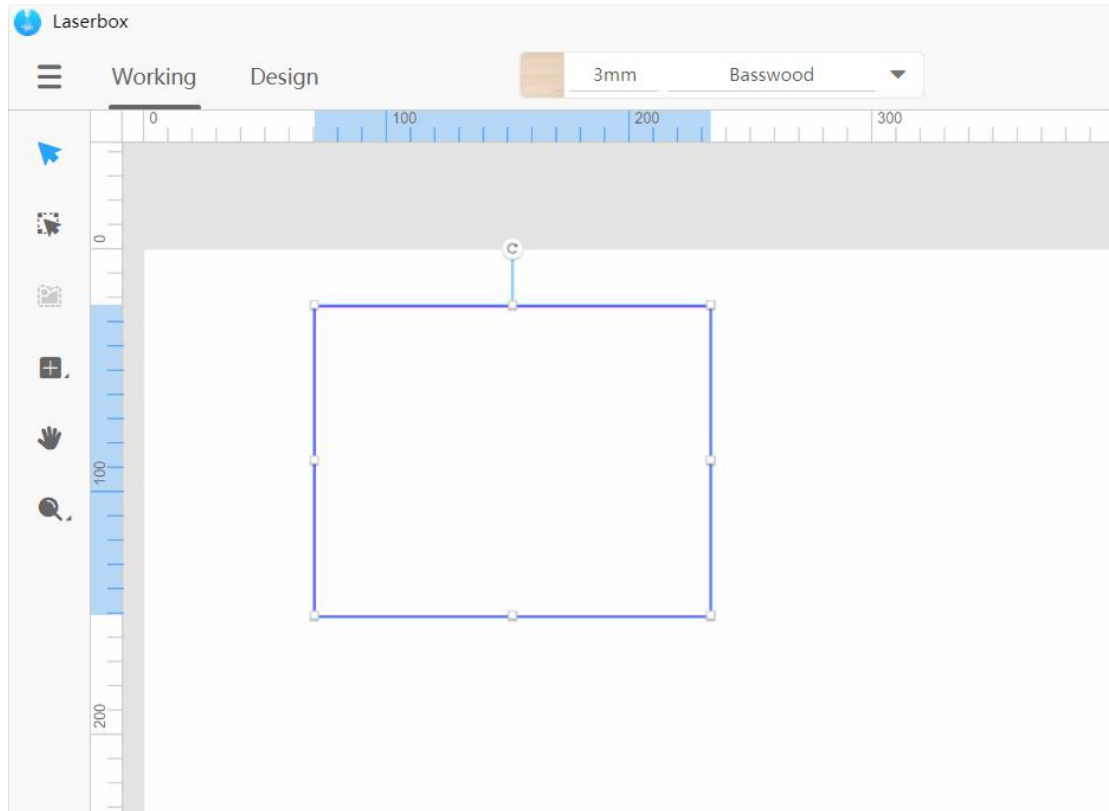
Go to **Menu > Settings > Software** and find Files. Click **Change** to choose a new location to save your files. Click **Open Folder** to view the saved files in the file manager and click **Save** to confirm the settings.



Show/Hide rulers

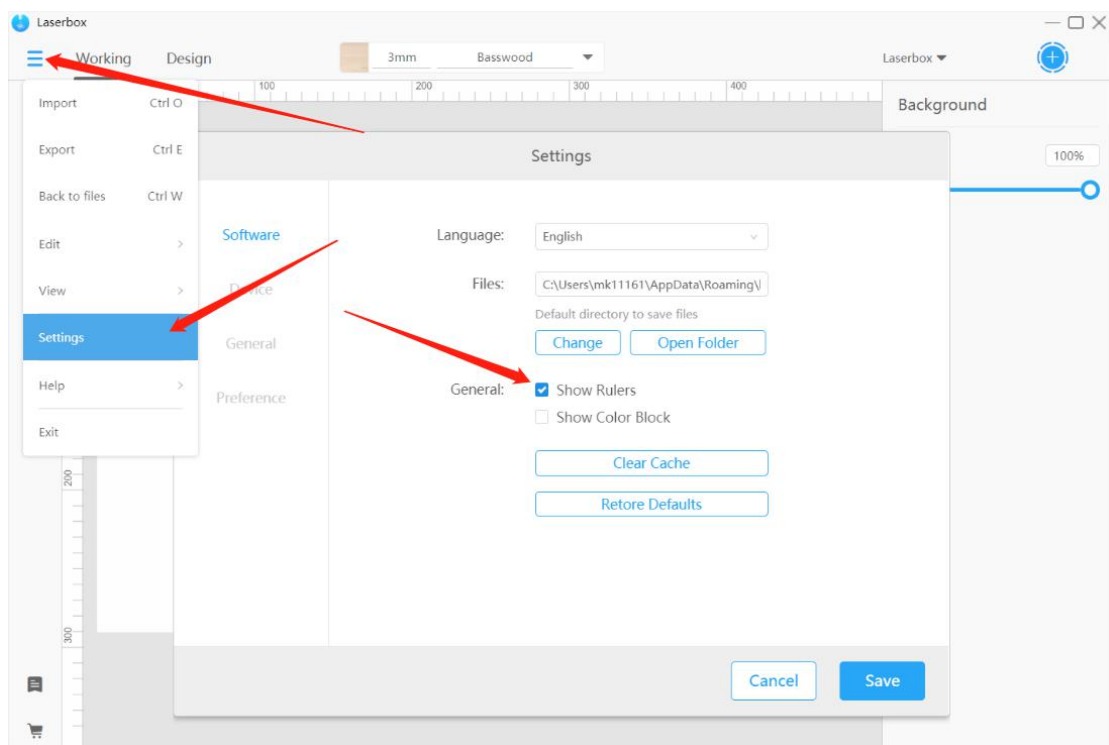
What can it do?

The canvas has two rulers on its edges, one horizontal and the other vertical. When you select a layer, you can see its width and height from the highlights on the rulers. The rulers tell the size and location of a layer.



How to use it?

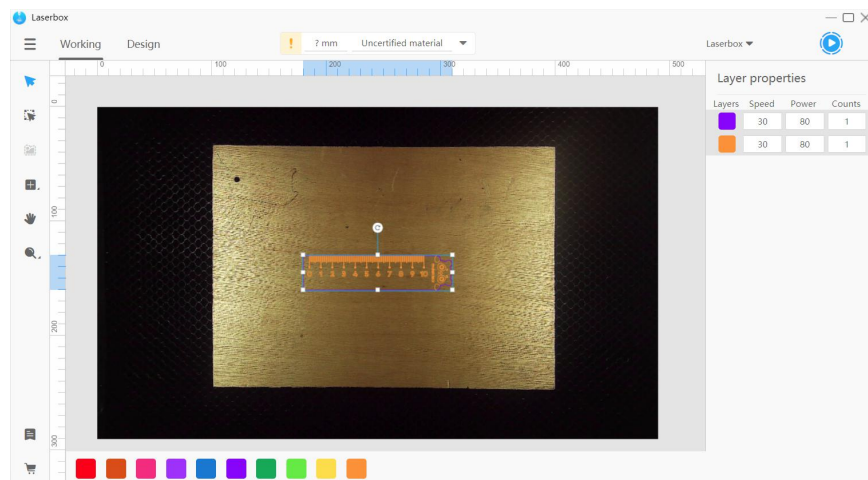
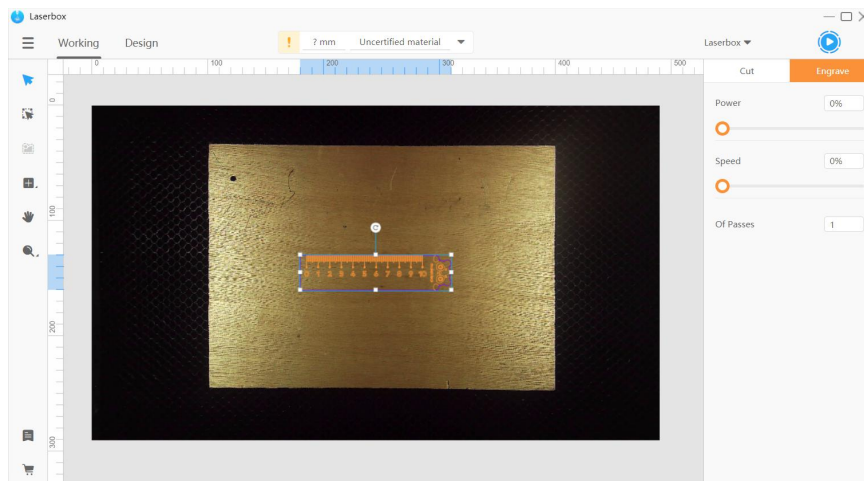
Go to **Menu > Settings > Software** and check **Show Rulers**. Check the box to display the rulers on the canvas and uncheck the box to hide the rulers. Click **Save** to confirm your option.



Show color block

What can it do?

The software supports grouping layers by colors and setting processing parameters for layers based on different colors. When this feature is on, you can directly set up the power and speed for your project without considering whether they're for cutting or engraving.



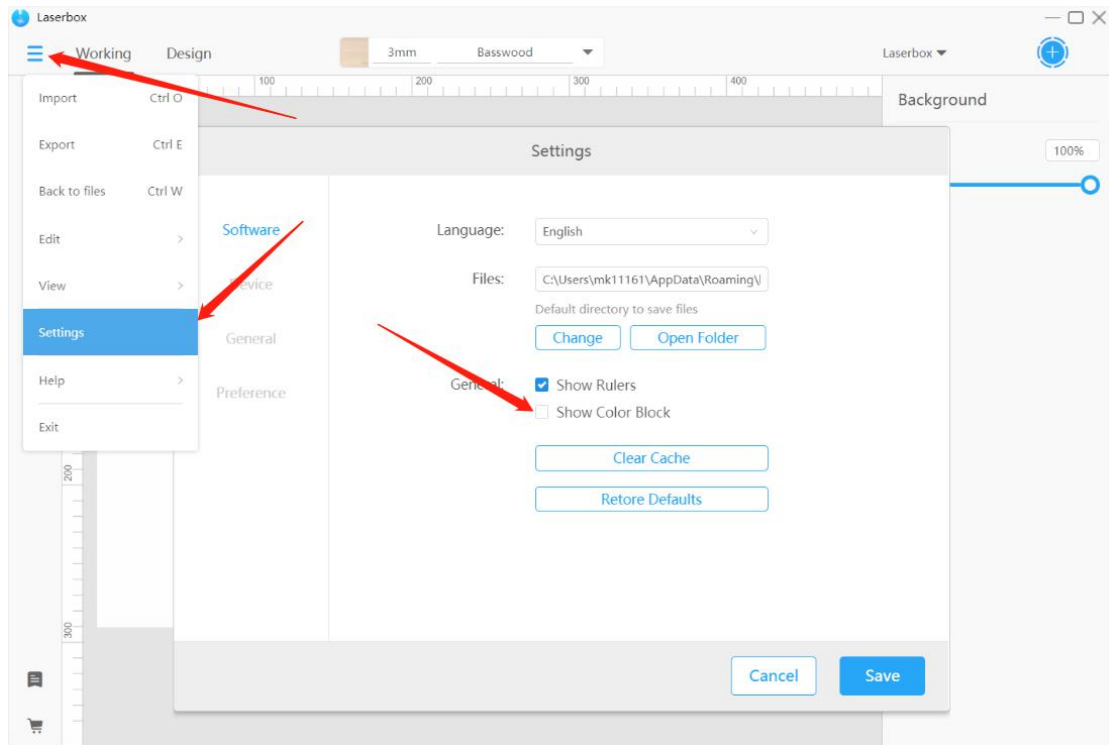
默认模

式

色块模式

How to use it?

Go to Menu > Settings > Software and check Show Color Block. Check the box to turn on color block mode and uncheck the box to turn it off. Click Save to confirm your settings.



Clear cache

What can it do?

The software creates some cache when in use. The cache helps enable the program to serve faster but would take up drive space. Click Clear Cache to free up space.

How to use it?

Go to **Menu > Settings > Software** and click **Clear Cache**. The software will then start clearing the cache and restart.

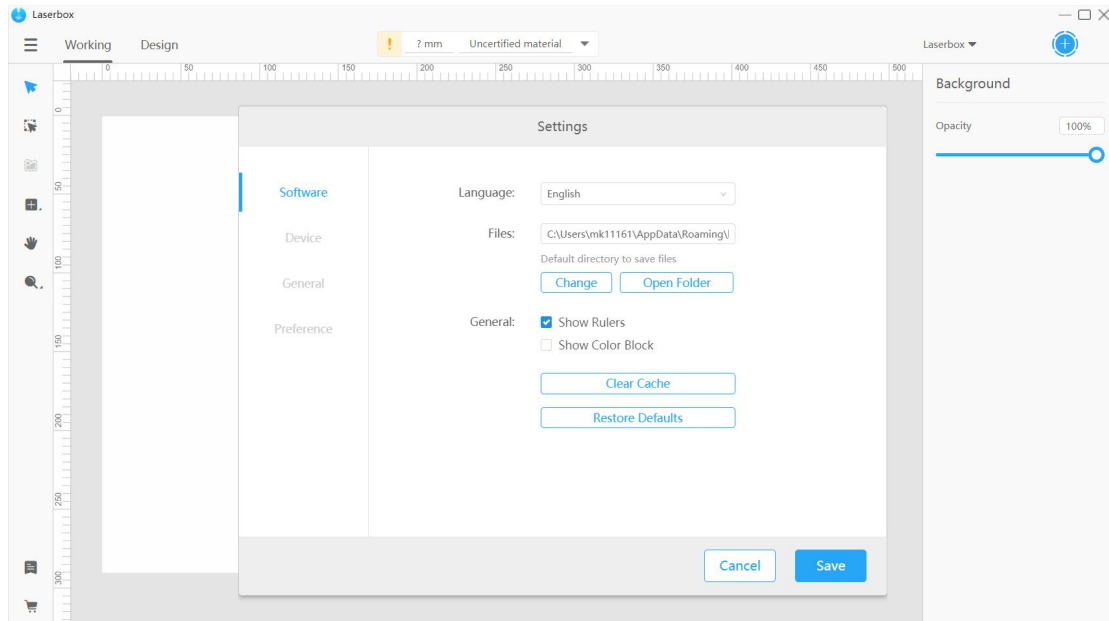
Restore defaults

What can it do?

This option restores the software to its default settings. If you need to reset the software after you change some settings, use this option.

How to use it?

Go to **Menu > Settings > Software**, click **Restore Defaults**, and then click **Save**. The software will return to the default settings.



Device settings

View device information

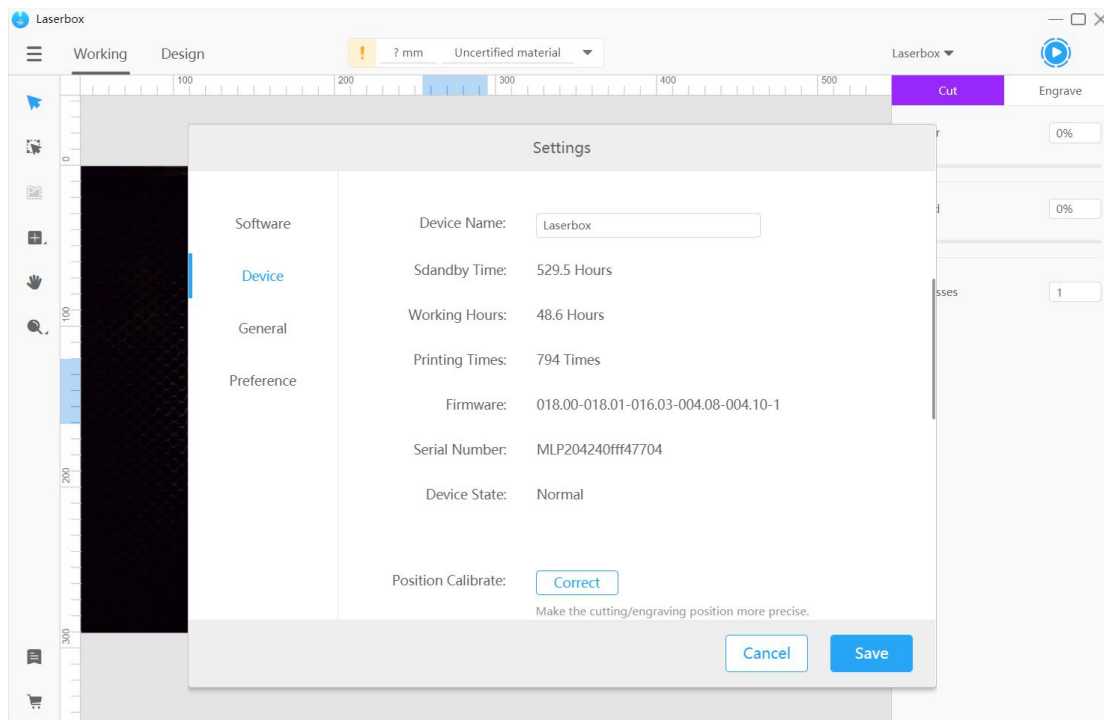
What can it do?

You can view the information about the Laserbox that is currently connected. Device information includes:

- **Device Name** Name of the connected device, which also appears on the left of the start button in the software interface. You can change the device name in Settings.
- **Standby Time** Total time that a device takes to turn on.
- **Working Hours** Maximum length of time that a cutting/engraving task requires.
- **Printing Times** Number of times that a cutting/engraving task will be carried out.
- **Firmware** Current firmware version.
- **Serial Number** Factory-applied serial number of a device.
- **Device State** Operation status of a device.

How to use it?

Go to **Menu > Settings > Device** to view device information. The **Device**, **General**, and **Preference** tabs are only available when a device is connected.



Position calibrate

What can it do?

The camera enables Laserbox to position design drawings and materials. When a deviation occurs, you can use **Position Calibrate** to reduce deviation from the visual position.

NOTE

When the laser cutter is calibrating, the A4 paper **MUST** be clean and flat, that is, no stains or curls, because these may hinder the camera from identifying the paper.

When the laser cutter is calibrating, **DO NOT** place any heavy objects on it because they may cause a positional deviation of the camera.

How to use it?

1. Clean the camera

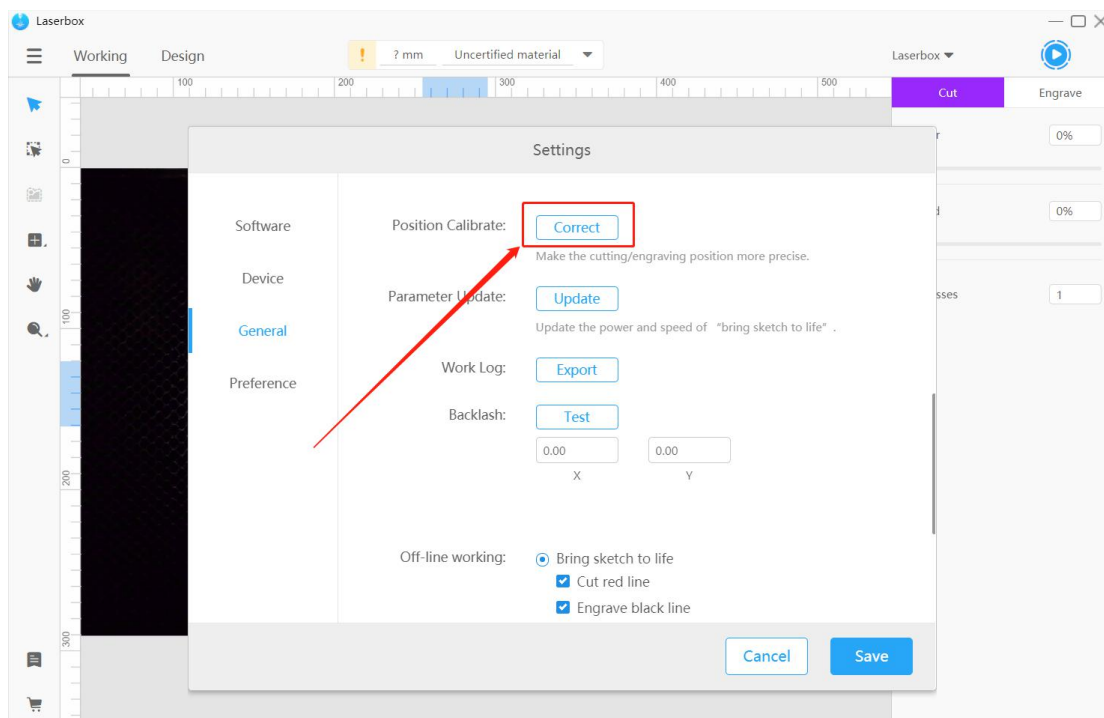
Lift Laserbox's lid, spray some alcohol on a cleanroom wipe, and clean the camera with the wipe. Next, check whether the camera comes loose. If it comes loose, glue it to hold it in place before letting the laser cutter start calibrating.

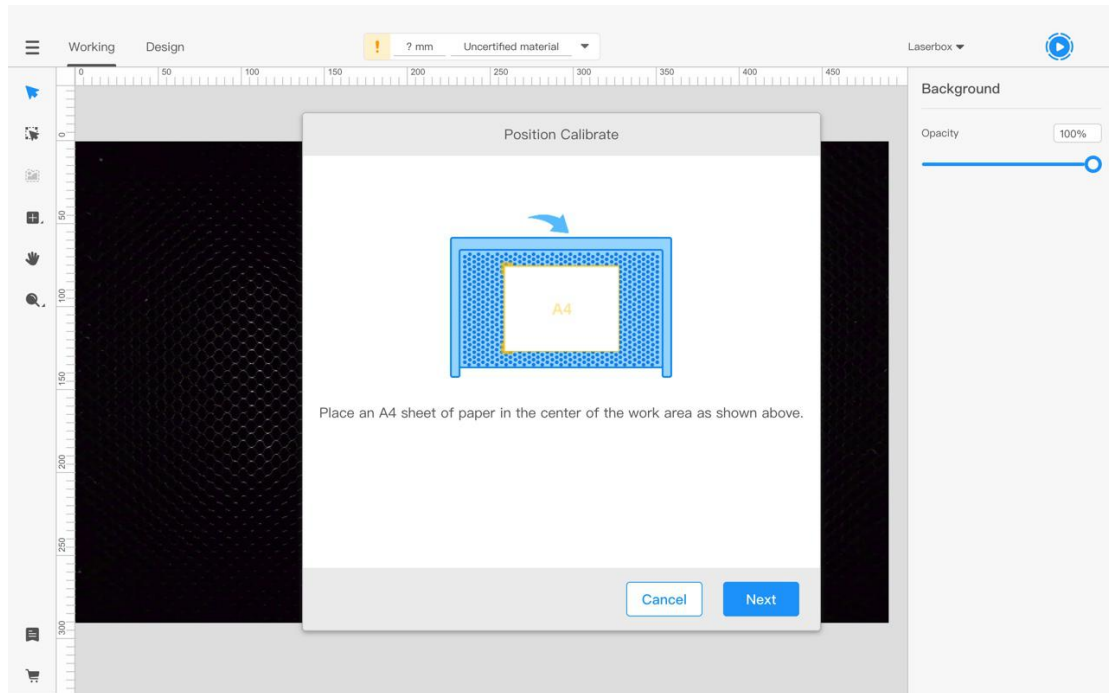
2. Connect Laserbox to your computer

Connect Laserbox to your computer and run the Laserbox software.

3. Click position calibrate

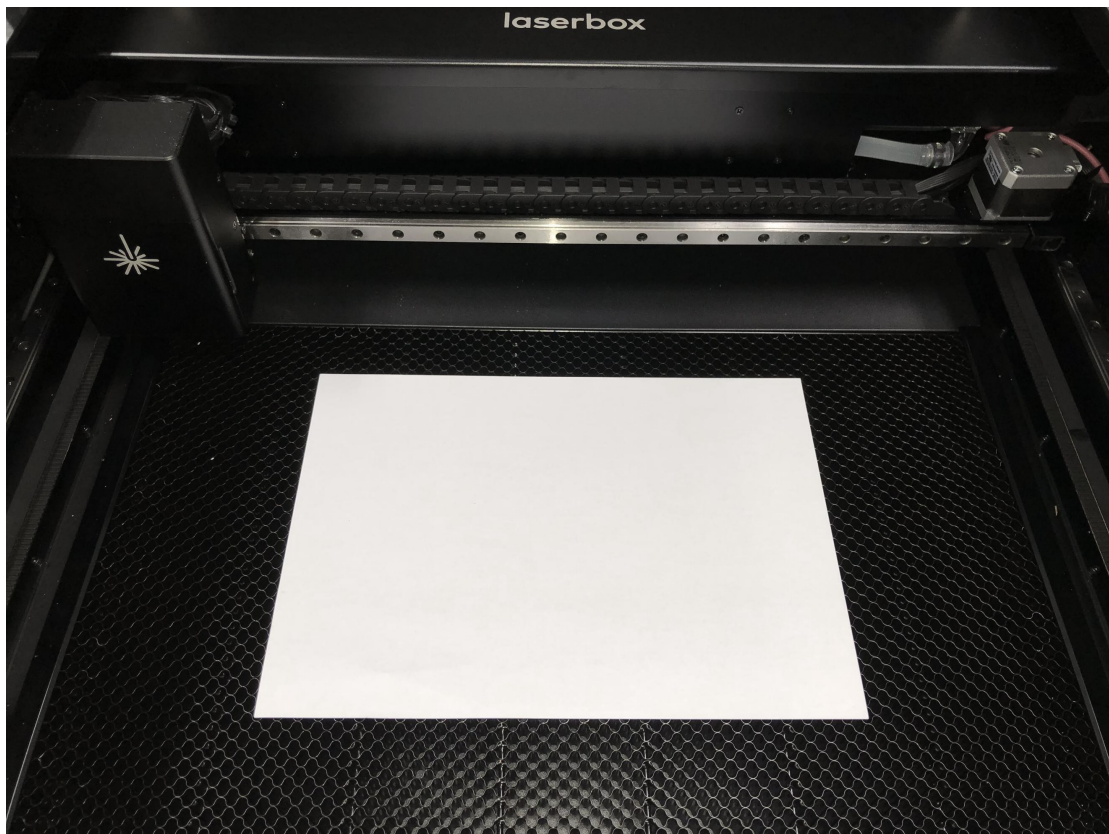
Go to **Menu > Settings > General** and click **Correct** after **Position Calibrate**. Then you will see a pop-up window as follows.





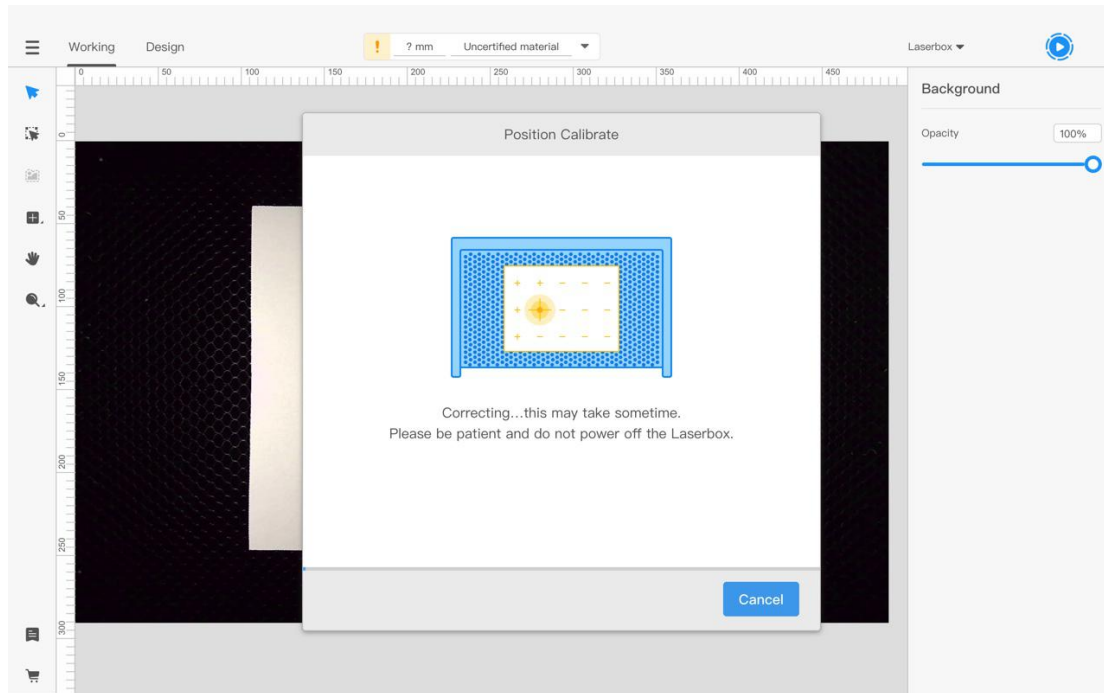
4. Put in A4 paper

Follow the software prompts to place the A4 paper. Use a glue stick or double-sided tape to avoid curls on the paper edges.



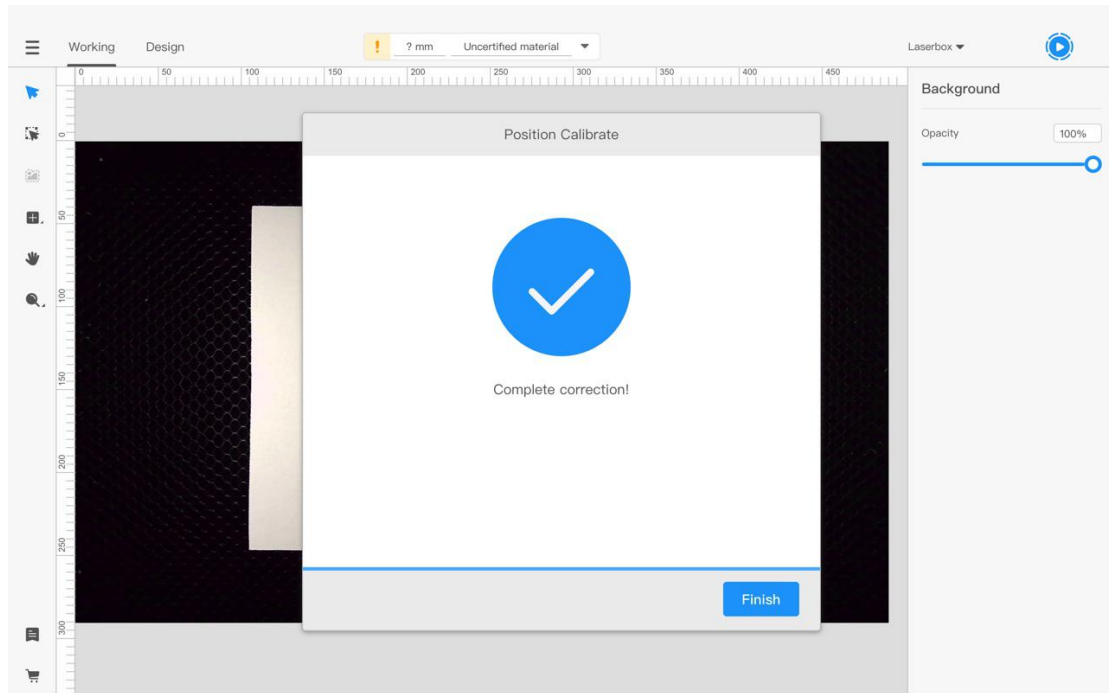
5. Start calibrating

Click Next in the prompt pop-up window and press the button on the laser cutter to start the calibration. It takes about three minutes to complete the calibration.



6. Calibration completes

A window below pops up when the calibration is done.



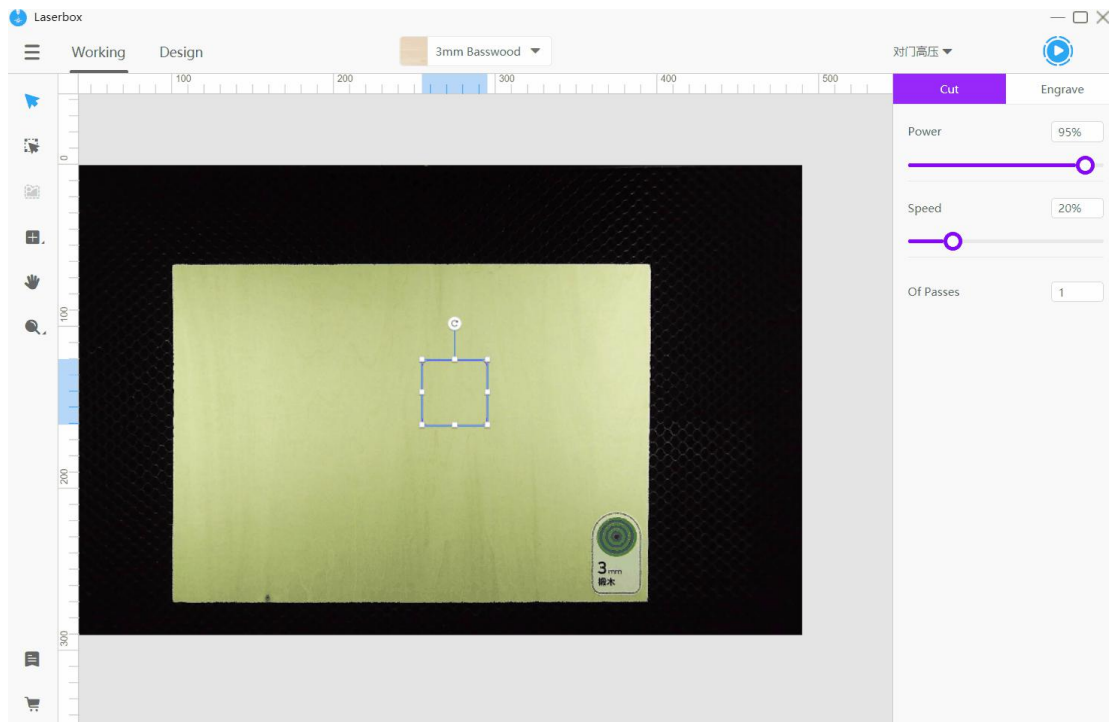
Parameter update

What can it do?

Laserbox boasts multiple offline features, which empower it to identify Makeblock materials and set parameters when the laser cutter is offline. Parameter Update synchronizes the material list and processing parameters in the software into Laserbox, allowing the laser cutter to apply new parameter settings when used offline. [Learn more about Materials Management.](#)

How to use it?

Connect Laserbox to your computer. To sync the parameter settings to the laser cutter, in the software, go to **Menu > Settings > General**, and click **Update** after **Parameter Update**.



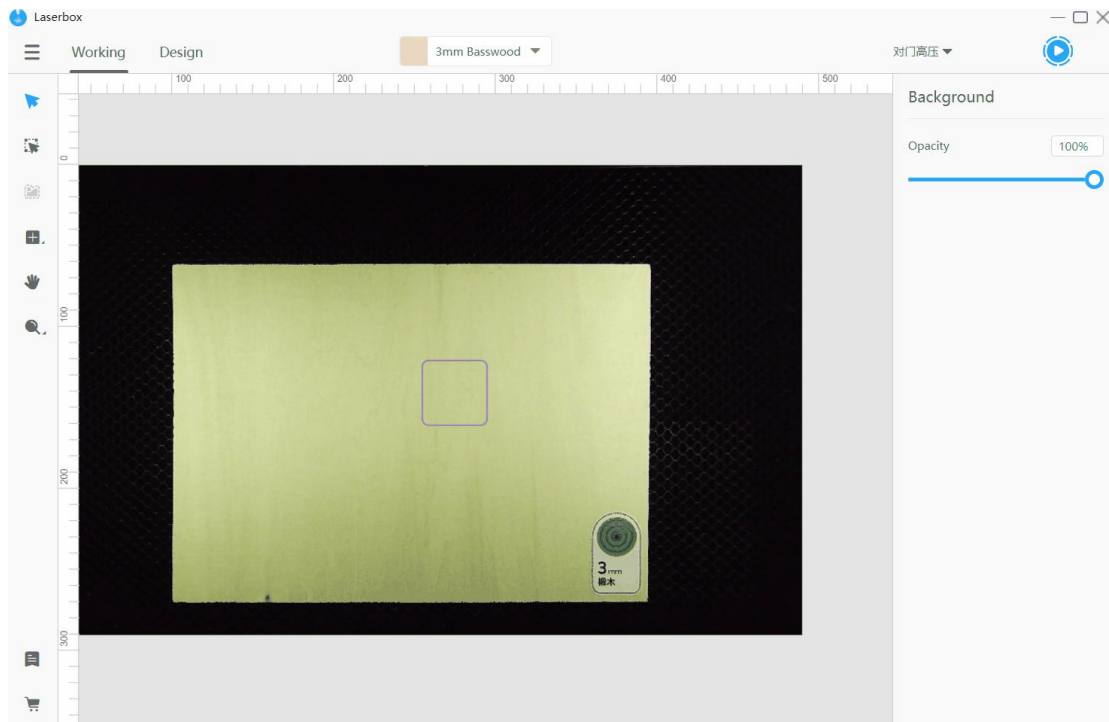
Export work logs

What can it do?

When errors occur to Laserbox, they will be recorded in the work log. Exporting the work log and sending it to our after-sales engineers help us analyze the problem quickly.

How to use it?

Go to **Menu > Settings > General** and click **Export after Work Log**. Wait for a few seconds to let the computer save the work log.



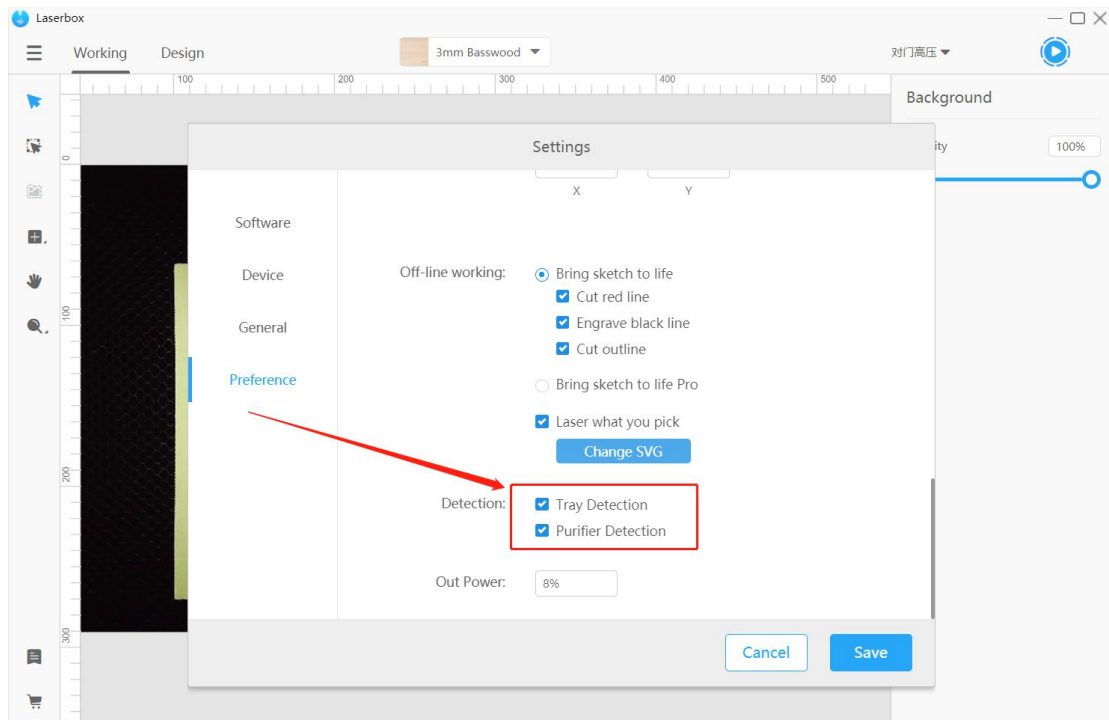
Detection settings

What can it do?

Laserbox can perform device detection, checking whether the tray or purifier is correctly installed. By default, Tray Detection is off and Purifier Detection is on. When Tray Detection is on, the software will display a prompt if the tray isn't properly installed. Likewise, when Purifier Detection is on, a prompt pops up in the software if the purifier isn't properly installed or the filter cartridge is clogged.

How to use it?

Go to **Menu > Settings > Preference** and check the options under **Detection** to turn on the features. If you want to turn off the detection, uncheck the options.



Out power

What can it do?

Out power refers to the minimum duty cycle of laser emission. The laser isn't emitted continuously but at intervals in a specific cycle. The fraction of time of laser emission during a cycle is duty cycle. When the duty cycle is lower than a certain value, the lasers fail to come out. Out Power allows you to set the minimum duty cycle to ensure the normal laser emission. After Laserbox operates for a long time, a certain level of power loss occurs. In this case, increase Out Power to offset the loss.

NOTE: Adjust Out Power only when the laser emission goes wrong.

How to use it?

Go to **Menu > Settings > Preference**, enter a value in the input box to adjust the minimum Out Power.

Firmware/Software updates

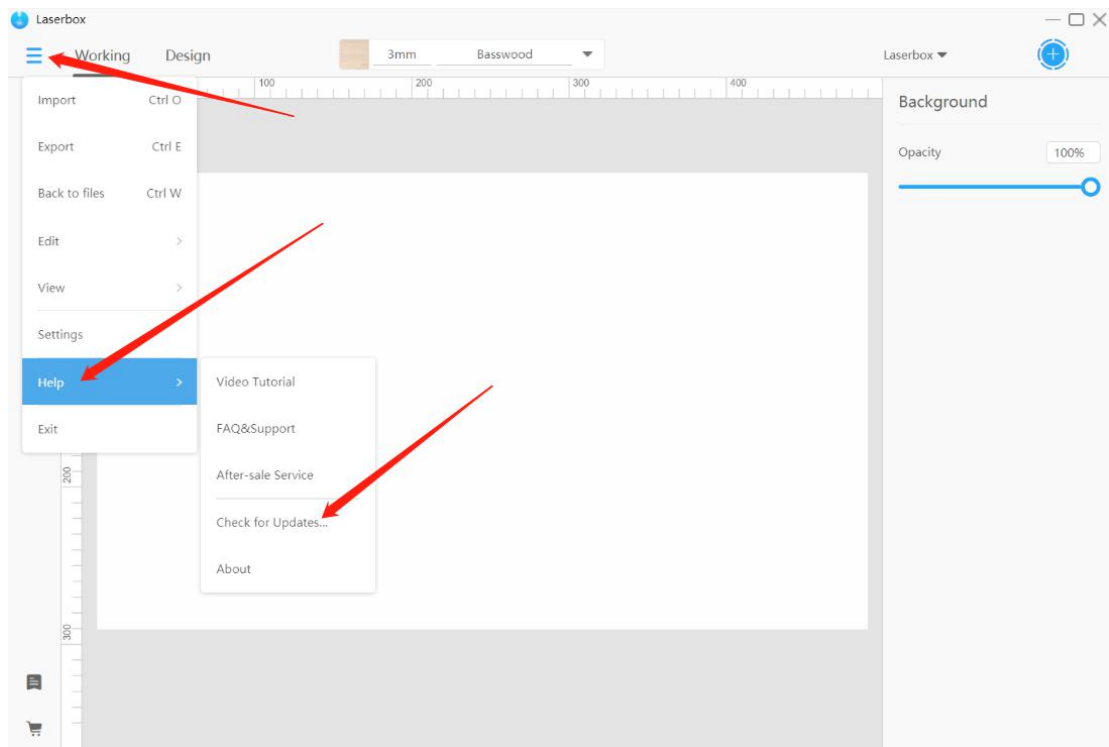
What can it do?

The Laserbox software and firmware will be updated on an irregular basis to provide you with more features and better user experience. Check for updates in the software, and update the software and firmware to the latest version.

How to use it?

1. Check for updates

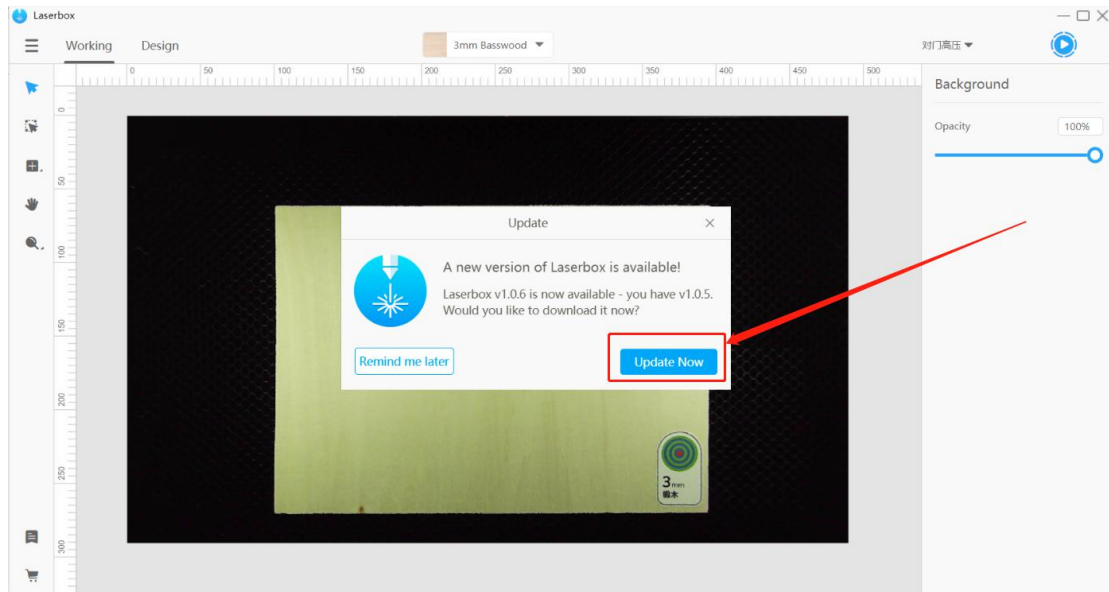
Go to **Menu > Help > Check For Updates...** to see whether the software and firmware are in the latest version.



2. Update software

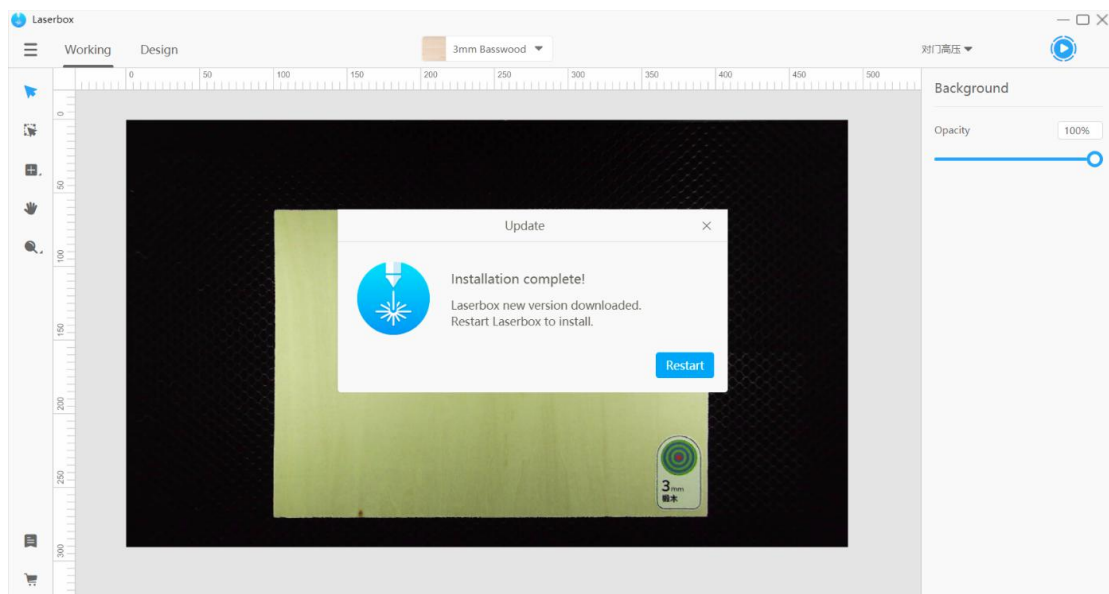
2.1 Click to update

When a new version of the software is released, a prompt below will pop up. Click **Update Now** to download the latest version.



2.2 Restart the software

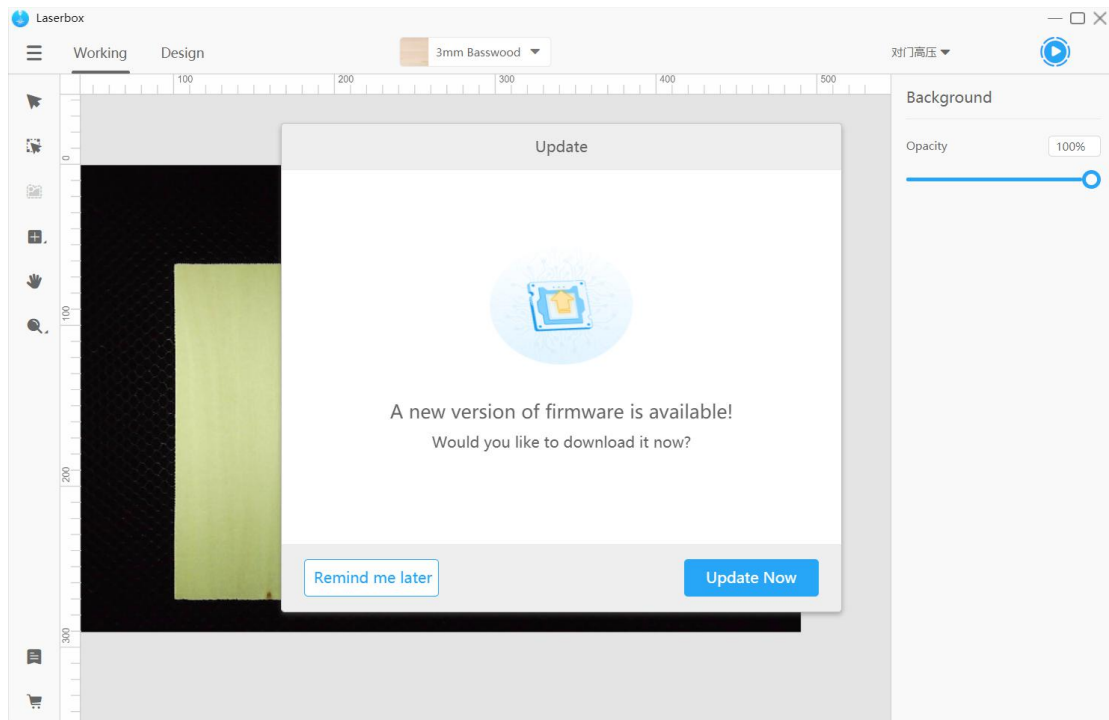
When the installation is complete, click **Restart** to complete the software update and open the latest version.



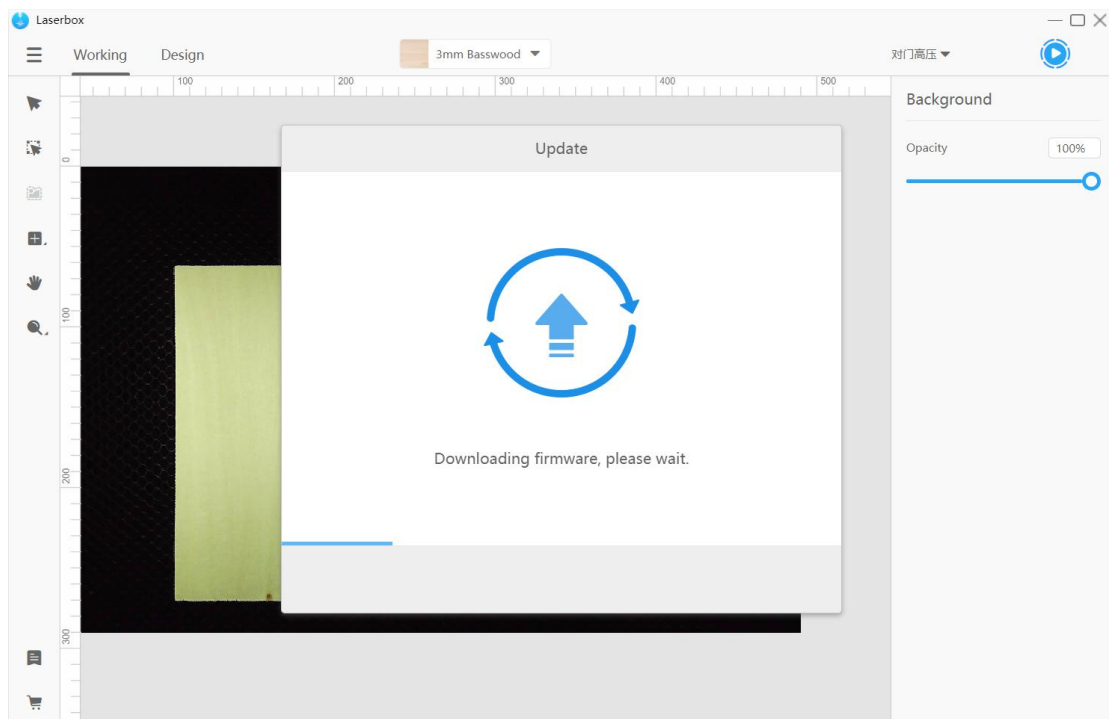
3. Update firmware

3.1 Click to update

When a new version of firmware is available, a prompt below will pop up. Click **Update Now** to download and install the latest version.

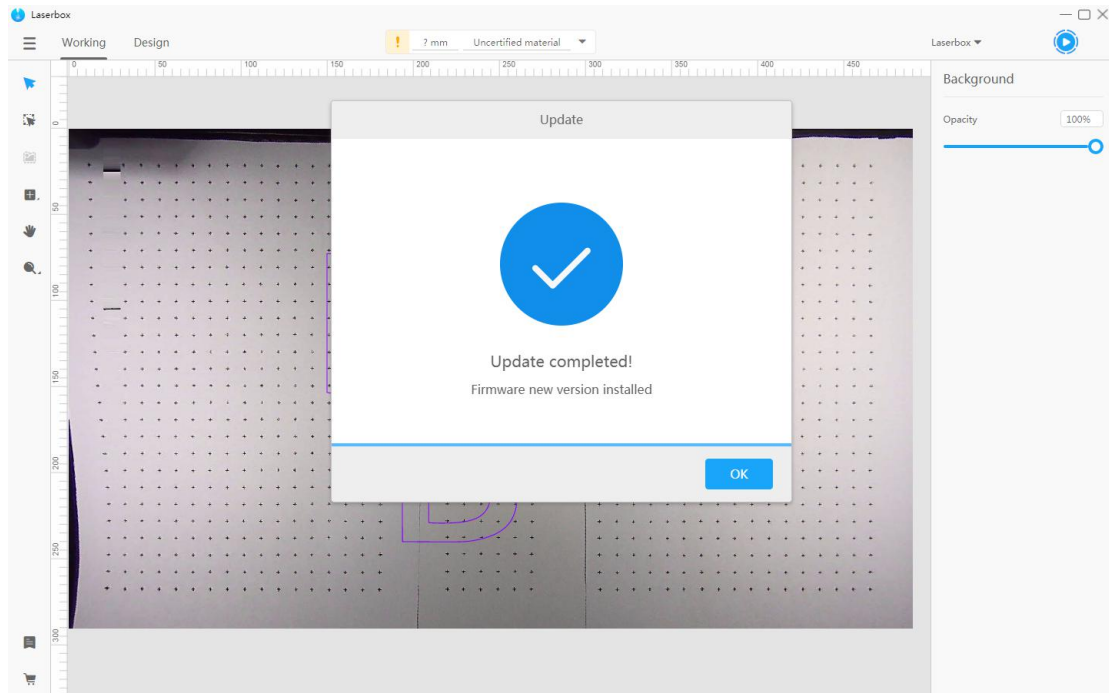


Closing the software or turning off the laser cutter in the middle of the update installation may cause a failed update or Laserbox unable to operate. So, wait for the firmware update to complete.



3.2 Finish

When the update is complete, a window below pops up.



Device maintenance

Video tutorials about maintaining Laserbox are available at <https://www.makeblock.com/support/ps-laserbox#maintenance-videos>.

Makeblock support

Please contact us if you find any inconsistency between the actual product and the description in the document during operation, want to get the latest information, or have any questions or suggestions.

Technical support: support@makeblock.com

NOTE: The above information may be subject to changes due to objective factors. Please refer to the latest release of Makeblock. If you use the internet or phone call to get our support, additional fees may apply.