Laser cutting

Trotec Speedy 400

institut
FRANÇAIS
de la
MODE

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FabLab safety rules and good practices

- Closed shoes are recommended.
- Wear appropriate clothing for handling machines and tools (no loose clothing, no long jewellery, tie your hair if necessary).
- Never use a machine without first being trained on it.
- Be fully aware of your actions.
  - Do not use machines if you are tired or ill.
  - Do not drink alcohol or take drugs before using the machines and tools.
- Do not distract or surprise other users while using the fablab's machines and tools.
- Never leave a machine running unattended, use only one machine at a time.
- Warn the on-site fabmanager in case of danger.
- Never open a machine, warn the on-site fabmanager for any technical problem related to the machines (malfunction, breakage, etc.).
- Keep the work area clean and tidy after use.
- Store materials and tools in their place.
- Have prepared your files before taking up the machine position.
- Do not force the machines: ask for help, fabmanagers are there for!
- Switch off the machines after use.
- Do not eat in the Fablab.

Security related to laser cutting

The Speedy 400 is a very expensive machine that uses a powerful laser source to cut a variety of materials through a combustion effect.

It is essential to follow the instructions below:

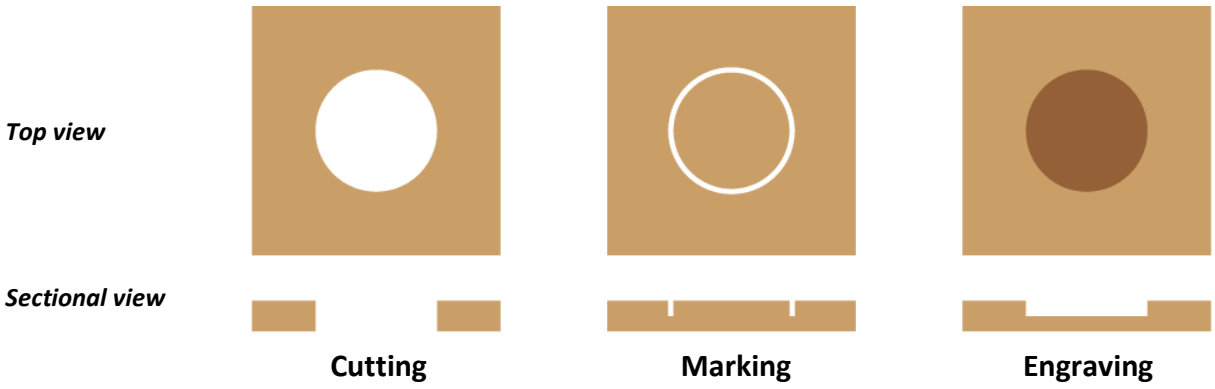
- **Never force or lean on the machine (its axes, plates, bonnet, etc.).**
- **Never leave the Speedy 400 unattended (risk of fire!).**
- **Never operate the Speedy 400 without suction (danger of poisoning!).**
- **Do not look at the laser for too long (risk of burning the cornea and retina).**
- **Only cut out approved materials (see section Description).**
- **Always turn off the machine after use.**

Principle of laser cutting

The Trotec Speedy 400 uses C02 laser technology to cut, engrave, and mark various materials (see Description section) with high precision.

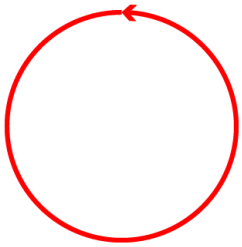
Cutting: cuts the material through its entire thickness.
Marking: gentle cut on the surface of the material that does not cut through the material thickness. Examples of use: accentuating the contours of a typography, creating paper folding lines, etc.
Engraving: Scanning the laser beam over a specific area, which "nibbles" the surface of the material. Engraving can also be carried out using "heat points" of different intensities to reproduce the pixels of an image, thus creating a contrasting image by burn intensity.

Diagram of the 3 techniques: top view and sectional view

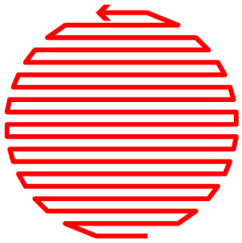


In order to perform its tasks, the laser system will perform the action according to 2 types of movements: interpolated movement or scanning.

Interpolated displacement: The laser moves along the vector path of the design, whether it is a straight line or a curve. It then moves in two dimensions, X and Y at the same time. This movement is used for cutting or marking materials.
When the laser scans, the distance travelled is much greater, so the engraving operation is significantly longer than cutting or marking.

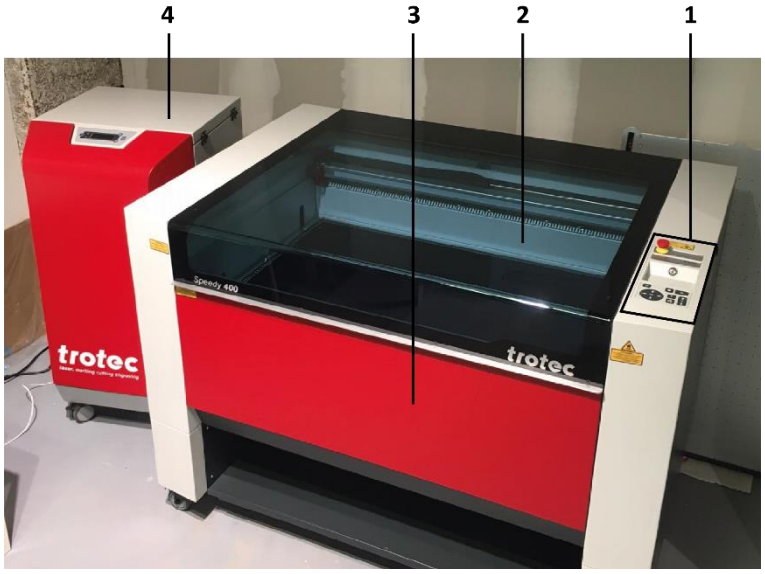


Scanning: In the same way as the inkjet printer, laser cutting scans the surface of the material and deposits "hot spots" in a line. The laser moves in 1 dimension at a time: first in X, then in Y. This movement is used for engraving materials.

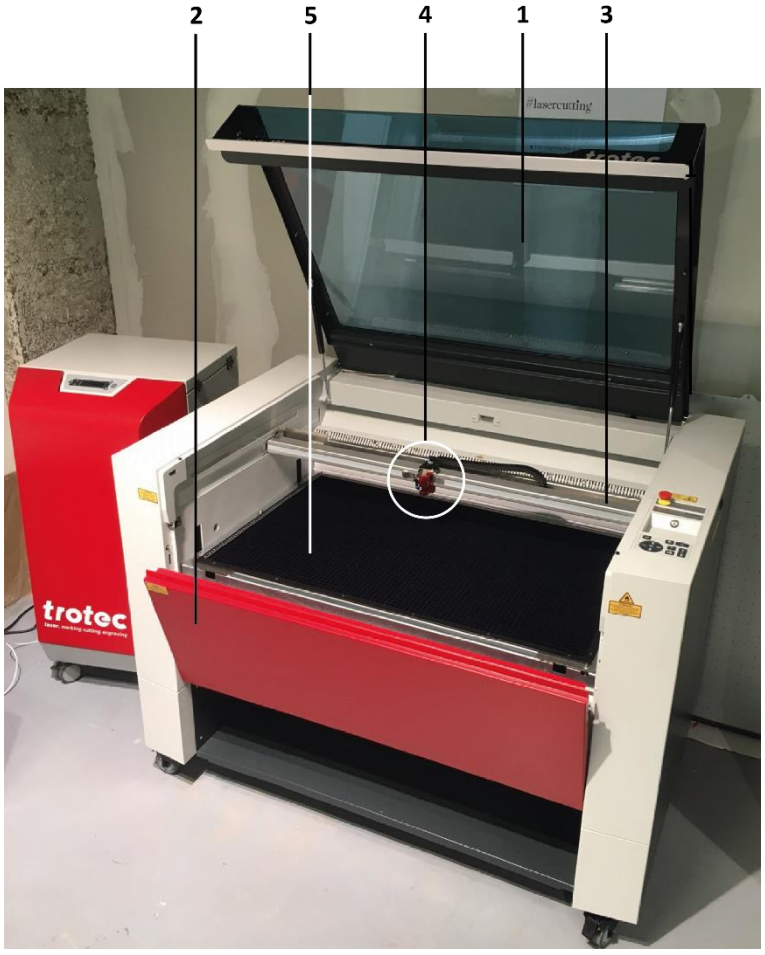


Description of the laser cutting machine

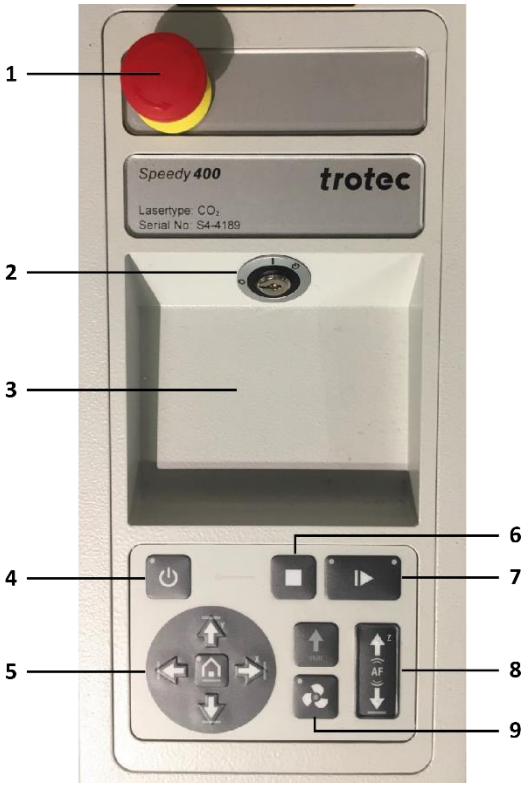
1. Speedy 400 diagrams



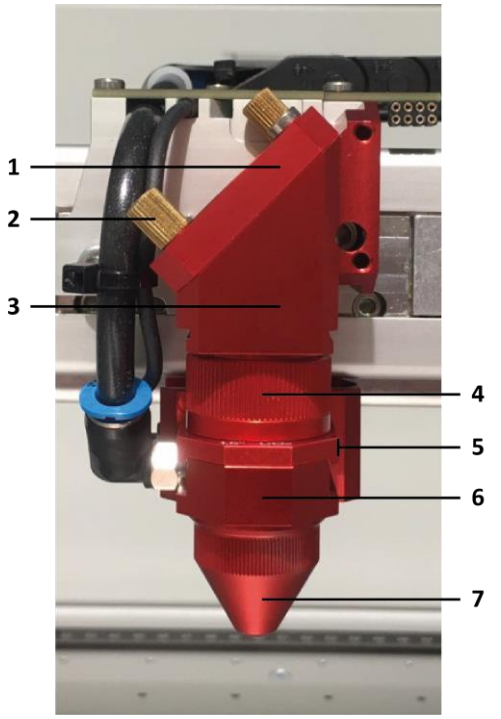
1- Control area
2- Top cover
3- Front door
4- Air extractor



1- Open top cover
2- Front door open
3- x-axis
4- Cutting head
5- Cutting plate



1- Emergency stop button
2- Key switch
3- Accessories area
4- Standby button
5- Buttons for moving the cutting head (x and y axes)
6- Stop button for the current task
7- Play/Pause button for the current task
8- Buttons for moving the cutting table (z-axis)
9- Suction on/off button



1- Mirror
2- Mirror fixing screws
3- Mirror support
4- Lens clamping ring
5- Lens
6- Nozzle holder and lens
7- Nozzle

2. Features

The Speedy 400 is a large format $C0^2$ (80 W) laser cutting machine.

Technical informations :

- Cutting table dimensions: **1016 x 609 mm**
- Parameterisation software: **Ruby**

3. Permitted and prohibited materials (IMPORTANT !)

! All materials must be flat, without relief or level variation!

Permitted materials	Cutting	Marking	Engraving
Anodised aluminium	X	OK	OK
Painted metal	X	OK	OK
ABS	OK	OK	OK
Acrylic / PMMA / Plexiglass	OK	OK	OK
Rubber	OK	OK	OK
Polyamid (PA)	OK	OK	OK
Polybutylene terephthalate (PTB)	OK	OK	OK
Polycarbonate (PC)	OK	OK	OK
Polyethylene (PE)	OK	OK	OK
Polyester (PES)	OK	OK	OK
Polyethylene terephthalate (PET)	OK	OK	OK
Polyimide (PI)	OK	OK	OK
Poloxymethylene (POM)	OK	OK	OK
Polypropylene (PP)	OK	OK	OK
Polyphenylene Sulphide (PPS)	OK	OK	OK
Polystyrene (PS)	OK	OK	OK
Polyurethane (PUR)	OK	OK	OK
Wood (without glue)	OK	OK	OK
Stone	X	OK	OK
Paper	OK	OK	OK
Leather	OK	OK	OK
Cotton	OK	OK	OK
Silk	OK	OK	OK
Ceramics	X	OK	OK
Cardboard	OK	OK	OK
Cork	OK	OK	OK

WARNING
Danger of intoxication!

Strictly forbidden materials :

- Reflective / mirror materials
- Chemical tanned leather and vinyle containing chrome
- Carbon fibres
- PVC (Polyvinyl Chloride)
- PVB (Polyvinyl butyral)
- PTFE, Teflon (Polytetrafluoroethylene)
- Beryllium oxide
- Halogen-containing materials (fluorine, chlorine, bromine, iodine and astatine)
- Epoxy and phenolic based resins

! Check with your supplier to find out the chemical composition of the material before purchasing and using it in the machine.
In case of doubt, do not use the material!

Laser cutting process

1. Step-by-step diagram

FILE PREPARATION

Prepare a vector file (or matrix file for engraving) with the right colour characteristics.

↓

MATERIAL SELECTION

Defining an authorised material and knowing its dimensions and thickness.

↓

PREPARATION OF THE MACHINE

Setting up the machine, Z-axis (platen) setting and cutting head.

↓

SETTING UP YOUR "JOB" PARAMETERS

Test and adjust the settings in the Job Control software according to the desired job on the selected material.

↓

LAUNCH THE JOB

Start your job on the machine.

↓

STORAGE

Store the machine accessories and clean the cutting waste.

2. Preparation of the file

You must create your file on Adobe Illustrator. The laser cutting machine needs specific color and shape informations to understand what you want:

Features:

- Artboard size **W 1000 x H 600 mm** (landscape format)
- **RGB** document
- **Engraving**
  - **Shape** > **RGB BLACK (0,0,0) background**
  - **Stroke** > **RGB BLACK (0,0,0) stroke** // **Thickness you want** (min. 1pt/mm)
- **Marking > RGB Colors stroke (list n°2 to n°16)**
- **Cutting** > **RGB Colors stroke (list n°3 to n°16)**

The Speedy 400 only understand the following specific RGB colours:

Couleur		
1	R:0 V:0 B:0	#000000 ***> ONLY FOR ENGRAVING***
2	R:255 V:0 B:0	#FF0000
3	R:0 V:0 B:255	#0000FF
4	R:51 V:102 B:153	#336699
5	R:0 V:255 B:255	#00FFFF
6	R:0 V:255 B:0	#00FF00
7	R:0 V:153 B:51	#009933
8	R:0 V:102 B:51	#006633
9	R:153 V:153 B:51	#999933
10	R:153 V:102 B:51	#996633
11	R:102 V:51 B:0	#663300
12	R:102 V:0 B:102	#660066
13	R:153 V:0 B:204	#9900CC
14	R:255 V:0 B:255	#FF00FF
15	R:255 V:102 B:0	#FF6600
16	R:255 V:255 B:0	#FFFF00

In the case of **multiple jobs** (engraving + cutting + marking), the machine will move in the order of the colours (from 1 to 16). It will start with engraving (black in 1) and then cutting/marking in the order of colours from 2 to 16 (red, blue, etc).

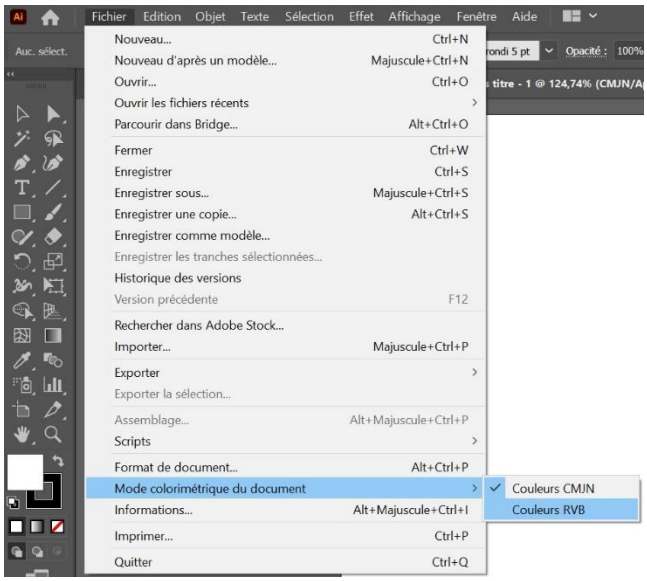
Recommendation: Doing the engraving and marking before cutting will enable quality engraving and marking to be carried out on an uncut surface, which is therefore more stable and flat. In the opposite case, if the marking arrives after cutting, for example, it is possible that the cut piece falls on the grid and is badly positioned to receive the marking.

*! Tip: When you prepare your files, **always choose the same colour code**, red for marking and blue for cutting. This way, your marking will always be done before cutting and you will find your way around more easily. If you make engravings or markings with different settings, use several colours to differentiate them.*

- **Create a NEW FILE** in Adobe Illustrator
  > Artboard **W 1000 x H 600 mm**

  ! Tip: Choose the dimensions of your worktop (or document) according to the size of the material to be cut. In this way, you optimize the different cuts on your material and lose a minimum of material.

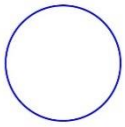
- **Choose the RGB COLORIMETRIC MODE**, otherwise the machine will not be able to read the different actions you wish to set.



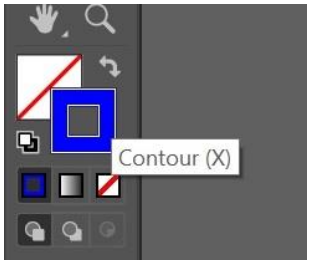
→ **Prepare your file with the correct CODING** (colors, outlines and backgrounds):

Cutting and/or marking:
When you want to cut or mark, you work your file in outline. The contour line must be uniform and have the right colour (***see RGB codes***).

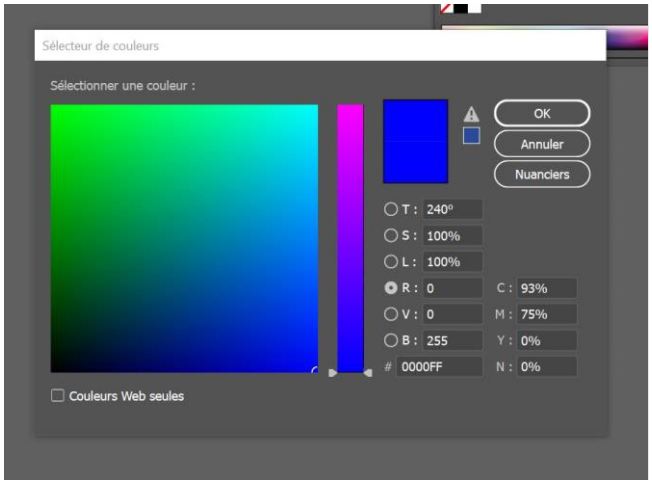
→ Draw the shape you want to cut out, here a circle.



→ Define the RGB colour (here blue for a cut) by **double-clicking** on the contour tool ...



… and enter the **RGB values** in the window that opens.



We have : **R: 0, V: 0, B: 255**

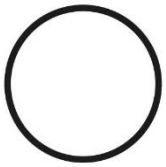
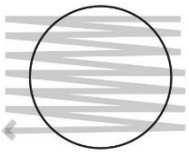
→ Make sure you have a <u>uniform</u> line.

Engraving :

Engraving reacts to the presence of black surfaces. These may be thick lines, simple shapes, or complex images composed of several surfaces.

Option 1 / Engraving from vectorial drawings:

→ **Draw the shape** and apply it...

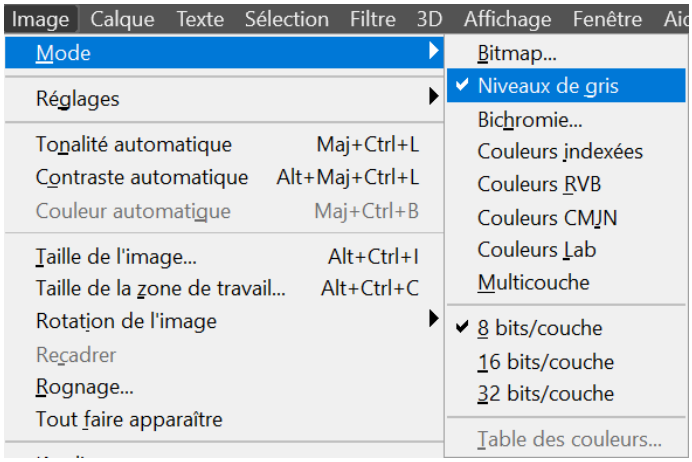
... a black thick line (1 pt or more) (R: 0, V: 0 B: 0)	... or a black background (R: 0, V: 0 B: 0)
	
	
Laser path diagram (gray)	

! Caution: The machine can't engrave lines thinner than 1pt. In that case, use marking.

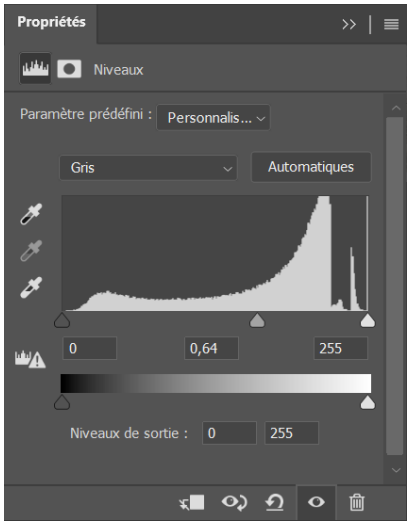
Option 2 / Engraving from raster images (JPEG, GIF, BMP):

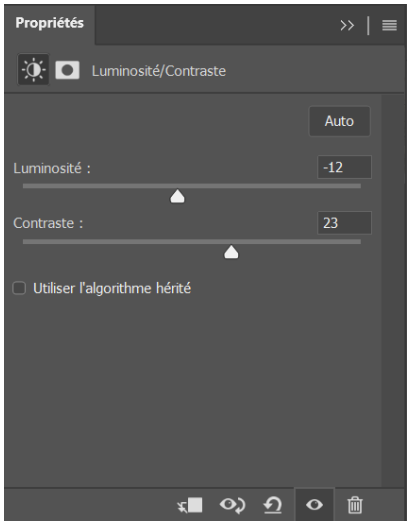
→ Convert your image into grey levels

In Adobe Photoshop, click on ***Image*** and select
Mode > ***Shades of grey.***



→ Work on contrasts: the blacker the image, the more marked the engraving will be. Use the ***Levels*** or ***Brightness/Contrast*** properties to modify the black gaps or intensities.





- **SAVE your file in an editable version** on your USB key**.**

  ! If you do not save your file, you will have to start the different coding steps again the next time. Save time!

3. Setting up the machine

- **CHECK that the emergency stop button** is armed!

☺ X

Emergency stop button armed
> I see the green ring
= you can use the machine

Emergency stop button disarmed
> I don't see the green ring
= you can't use it

To reset the emergency stop button, turn the red knob counter-clockwise and release.
If you see the green ring, the button is reset.
If not, ask for help from the fabmanager.

- **Switch the machine ON** by turning the key to the right.

Do not open the cover right away, the machine will take a few minutes to light up and adjust.

At the first "beep," the machine table will descend (on the Z axis), and then move the cutting head in the X and Y axes to find its origin (point 0 in the upper left corner).

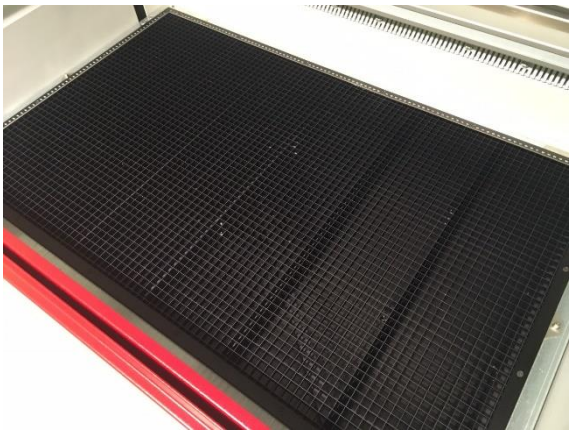
! If you open the topcover too early, this action will not be possible.

Once the machine makes a second "beep" and the green LED is fixed you can open the topcover.

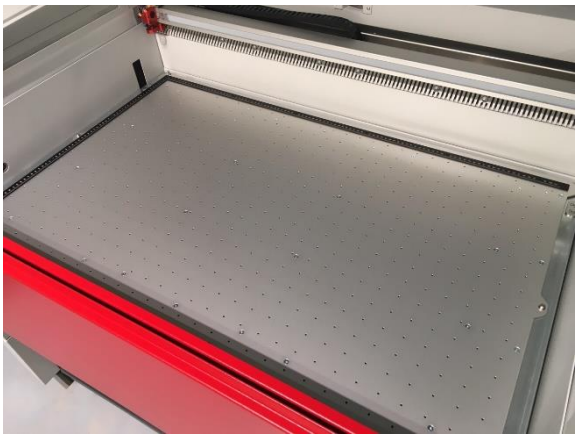
- **CHOOSE THE LENS for an adapted cut**
  The laser is equipped with two lenses. You must choose one or the other according to the thickness of your material:
  - materials thicker than 4 mm: 2.5" lens
  - materials less than 4 mm thick: 1.5" lens

Watch out! For any lens change, call the on-site fabmanager!

- **PLACE the material** on the cutting table.
  ! There are two types of trays depending on the material you want to cut:



Honeycomb tray

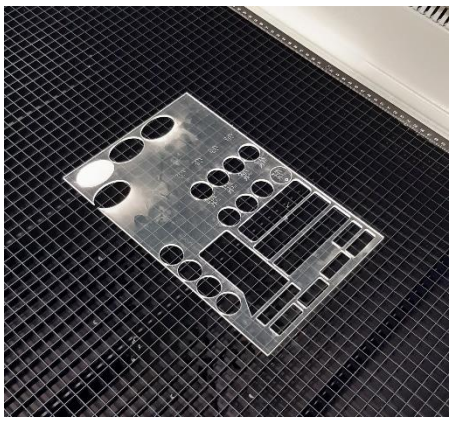


Perforated aluminium tray

  - *a black "honeycomb" tray for **rigid materials and/or thicker than 2 mm** (wood, Plexiglass, cardboard, thick leather, etc).*
  - *a perforated aluminium tray for **soft materials and/or less than 2 mm thick** (textiles, paper, etc.).*

Watch out! For any tray change, call the on-site fabmanager!

- **PLACE the material** on the cutting table.

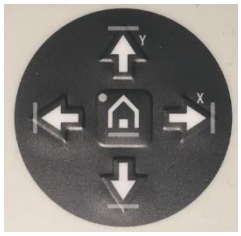


- **ADJUST THE HEIGHT OF THE TRAY according to your material**
  This action allows you to obtain the best focal distance between the cutting head and the surface of your material. Adjusting the focal length is essential for obtaining good cutting, marking or engraving results.

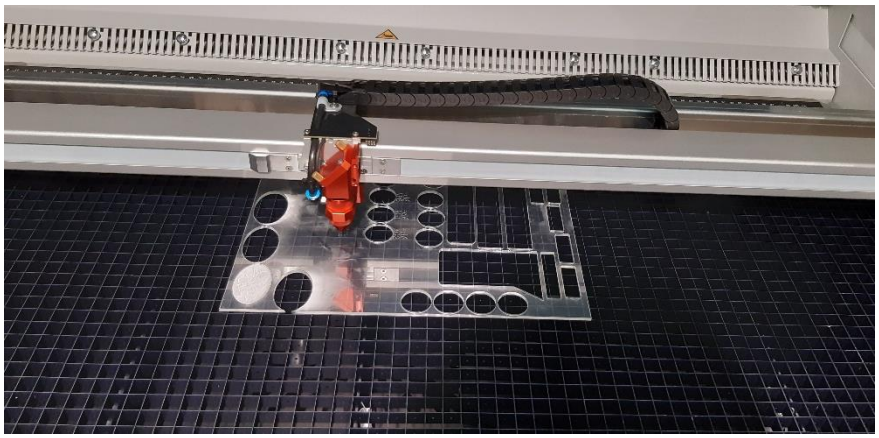
  Please note that only materials with a flat surface are allowed!

  Recommendation: When your material is slightly curled, you must use masking tape to fix it correctly to the cutting table and ensure its flatness.

→ Move the cutting head in the X and Y axes until it is positioned above the material using the arrows on the control panel.

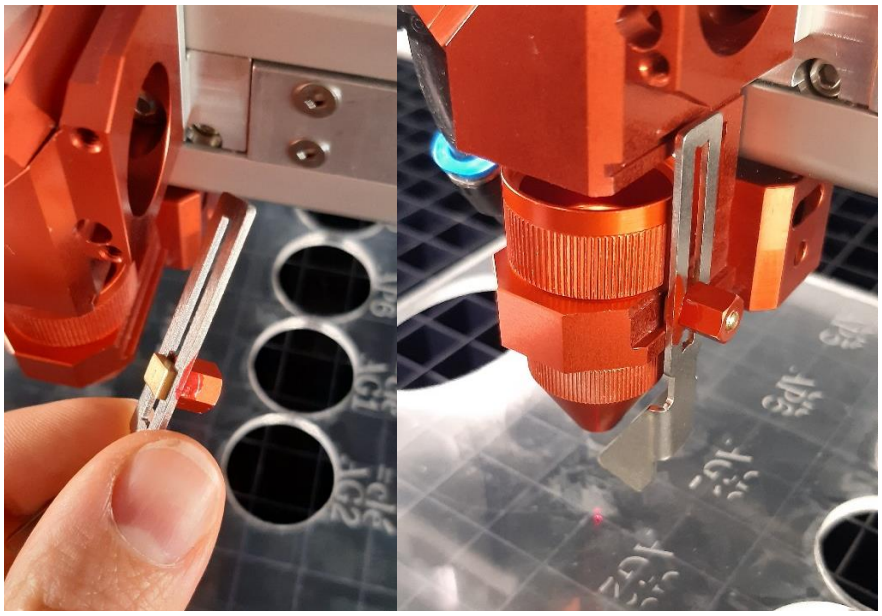


! Tip: You can move the cutting head diagonally by pressing an X-axis arrow and a Y-axis arrow at the same time.



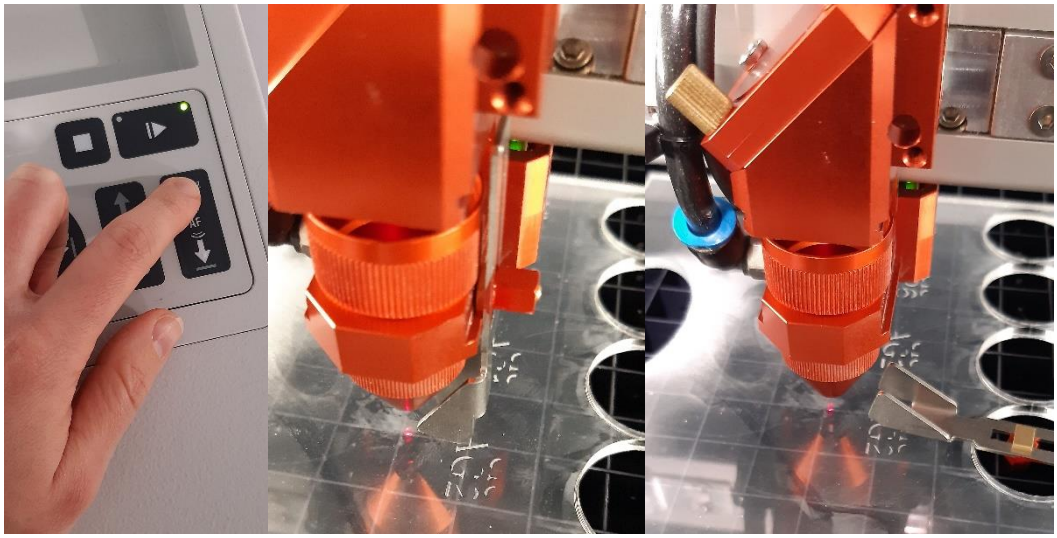
→ Take the pige corresponding to the selected lens (see image above).
The **pin** allows you to set the exact gap between the nozzle and the surface of the material.

→ Place the pin on the edge of the cutting head (on the right side of the nozzle).



→ Show the cutting table using the control panel so that the pin touches the surface of your material until it falls off.

! Do not mount the tray too high and too fast, otherwise the nozzle may collide with the cutting board. ***The plunger must fall carefully****.*



! If you notice that your material is not very flat (material a little warped, crumpled, etc.), repeat the operation with the pigeon on the thickest part of your plate.

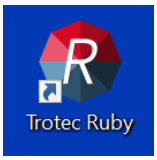
Your material is well positioned and the focal length adjusted, you can now set up your cutting operations!

4. Cutting settings with Ruby

The Ruby software is a software that will allow you to:

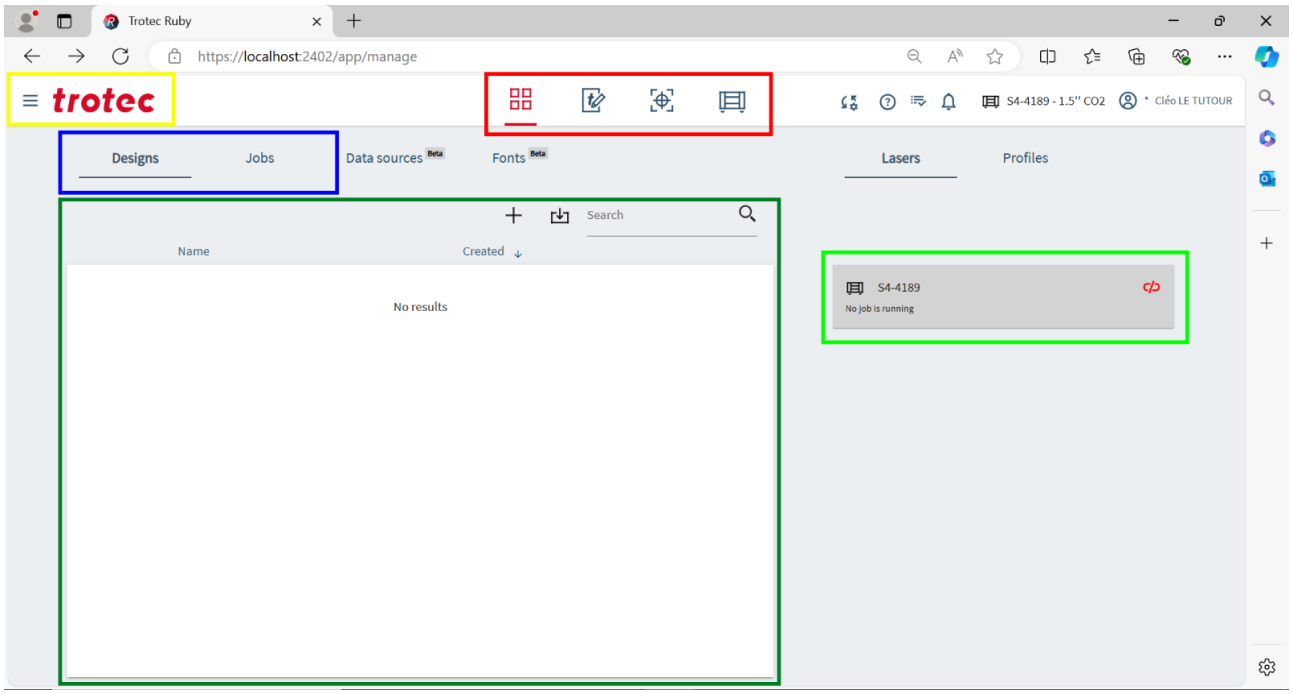
- Position your Job! on your material
- Adjust the settings (materials, speed, power, etc.)
- Transferring information to the laser
- Manage your library of material settings (save settings)

! We name "Job" the file you want to run on the laser, it means “the file previously made on vector software containing all the traces/forms”.

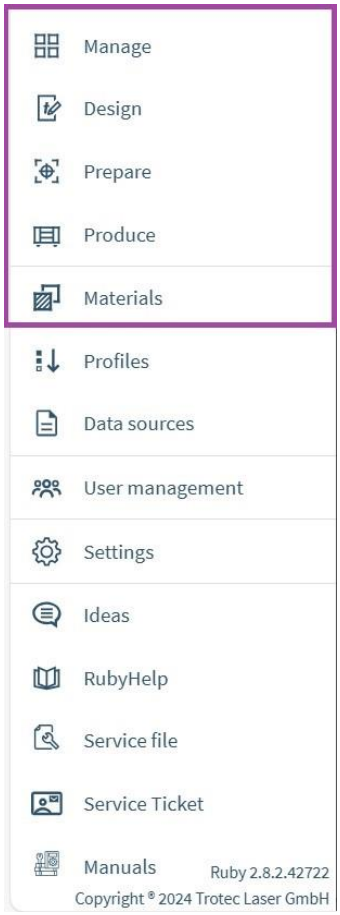
- **OPEN Ruby software** 

- If a login window appears, **REQUEST ACCESS to the fabmanager**

Ruby interface overview



Main menu



Access to the Main menu
Main menu
File tabs
File list
Connection / machine status
Authorised tabs

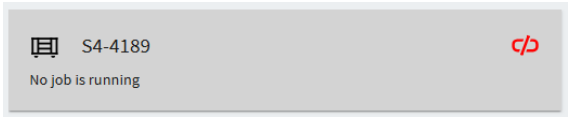
Main menu

Using Ruby

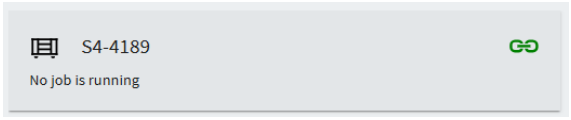
! The process of using Ruby will be shown step by step with a finalised file. ***As a reminder****, before using the machine with a final file, you must first carry out tests with a test file located in the* ***CUTTING TEST*** *folder on the computer.*

Manage tab 

- **CHECK THE CONNECTION STATUS of the machine**



The machine is switched off or disconnected

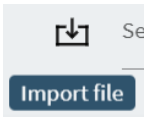


The machine is switched on and connected

- **SWITCH ON THE MACHINE** if you have not already done so.

  When the machine is switched on, you should hear several beeps and the extractor fan.
  ! If you do not hear any sound and the connection light remains red, please notify one of the fabmanagers immediately.

- **IMPORT one or more files from your computer*** by clicking on the 'Import' button



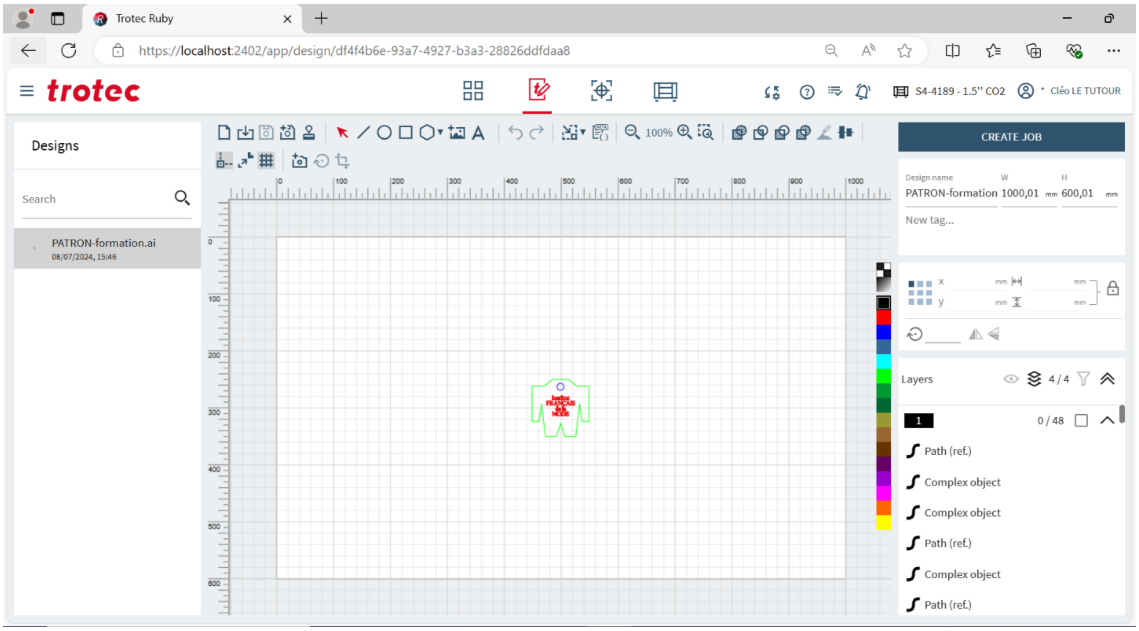
  In the window that opens, retrieve the file from the computer's folder.
  ! Do not use a file that is only stored on the USB key. It is important that the file you import is copied to the computer (STUDENTS FILES folder).

  You should see your file appear in Ruby's list like this:

Design tab 

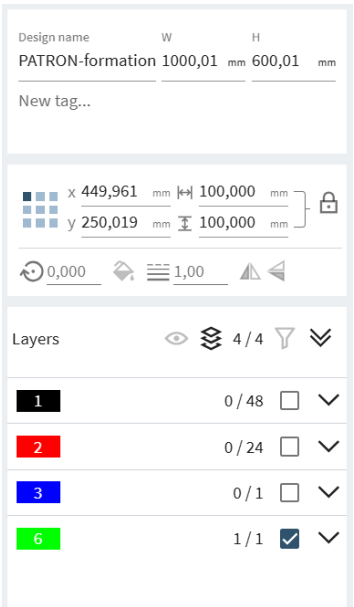
! In this tab, you can make changes to your design (size, colours, adding shapes, etc.), but it is strongly recommended that you set all the characteristics of the file beforehand in **Adobe Illustrator**.

- **SELECT the file** from the list so that it appears on the work surface:



The work surface is set to the dimensions of the machine table, i.e. 1000 x 600 mm.

- **CHECK THE CHARACTERISTICS of your job**

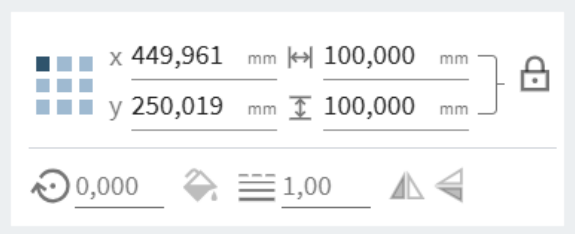


- The name and size of the document
- The size and orientation of the selected object
- The colours used for the different operations.

  Here we see 4 different colours. These will be used to perform 4 different operations.

- If necessary, **CHANGE THE ASPECT of the objects**

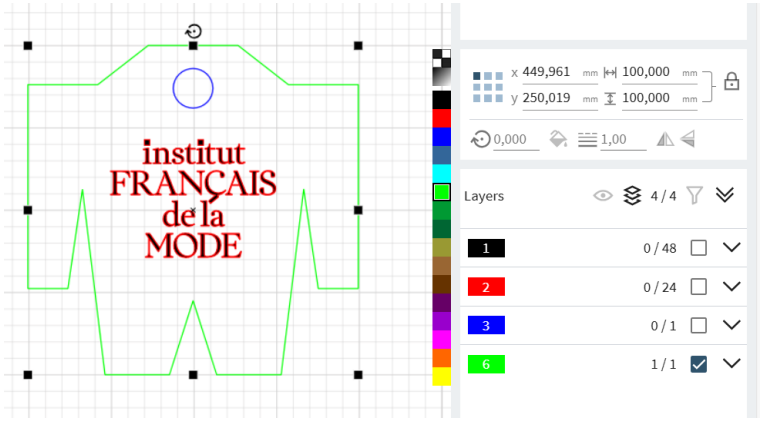
Here you can modify:

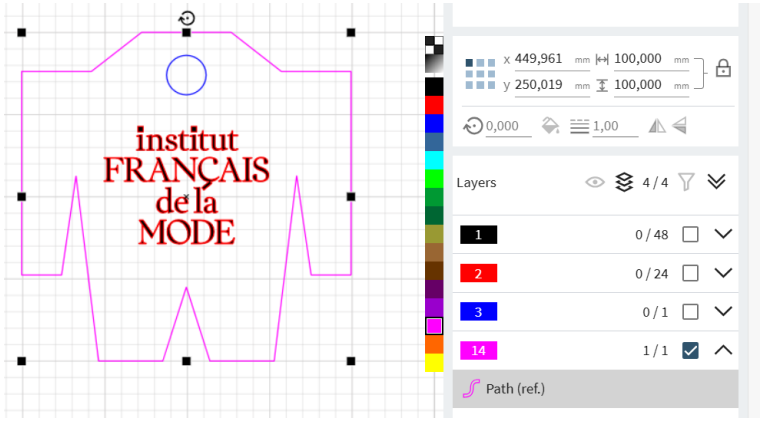


- the position of the object
- object size
- orientation
- the fill
- line thickness
- symmetry

! Please note that the paths are not grouped together and can be modified incorrectly. To affect all the lines in the design, click, drag and drop all the lines.

- If required, **CHANGE the colours of the paths** by selecting the paths concerned and clicking on the desired colour in the colour scale.





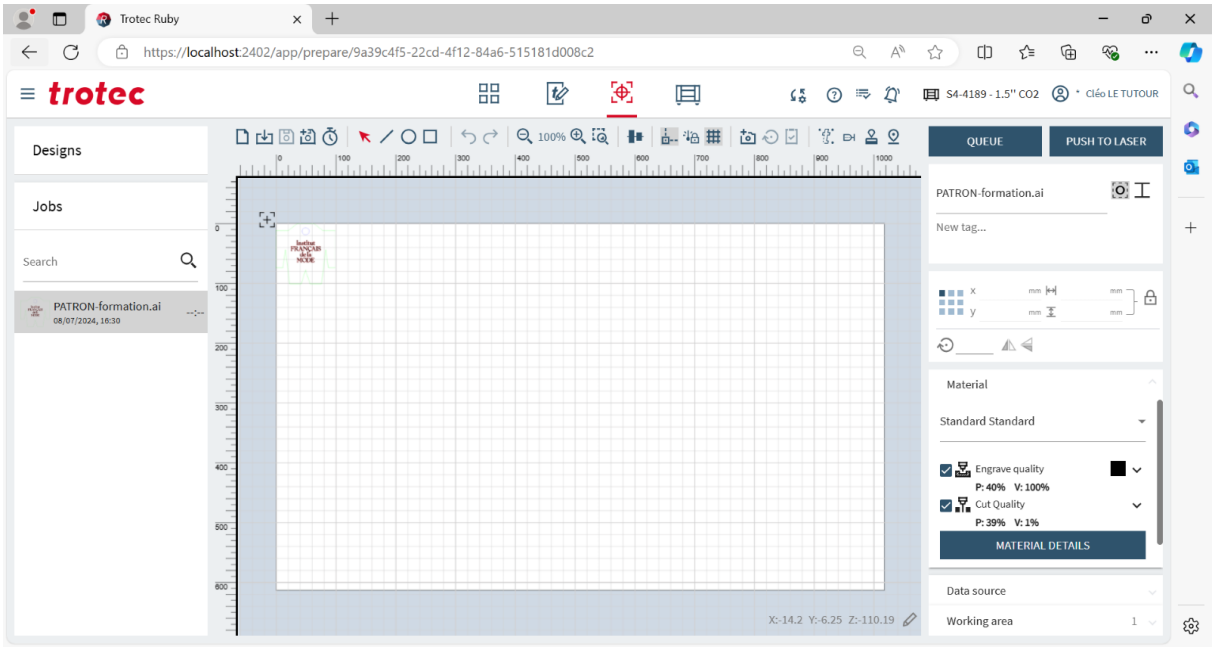
- **ADJUST the work plan** to your design by clicking on 

- If your file is ready, you can **CONVERT IT TO 'JOB' by clicking on the button**

Prepare tab 

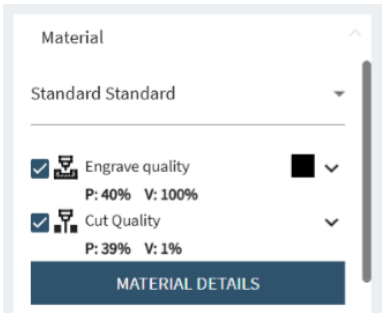
! In this tab, you will need to apply the material parameters to your job. If you have not yet created a material parameter, go directly to the ***Main Menu of RUBY > Materials*** *and follow the instructions in the section* ***Creating a new material in RUBY*** *in the* ***Appendix*** *p.33 and p.34.*

- **SELECT THE JOB to be set up from the list** by clicking on its name

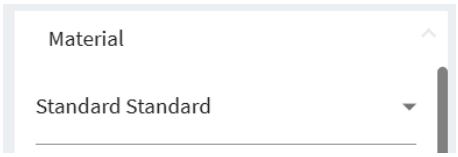


The job appears on the work plan.

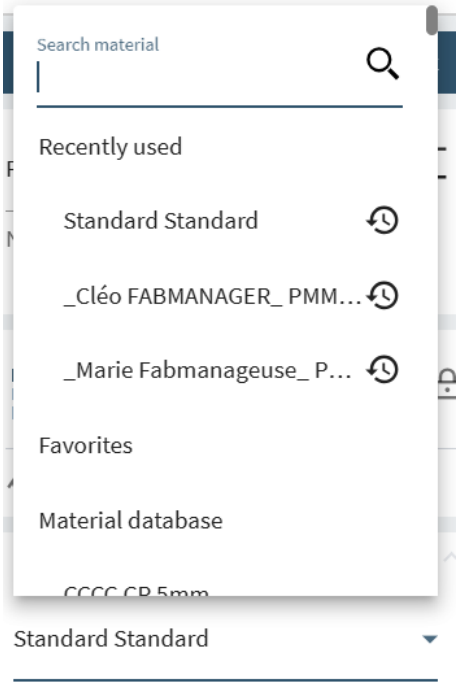
- **ASSIGN MATERIAL to the job** using the ***Material*** menu



- **OPEN THE SCROLL MENU** and **SEARCH FOR YOUR PRE-REGISTERED MATERIAL.**



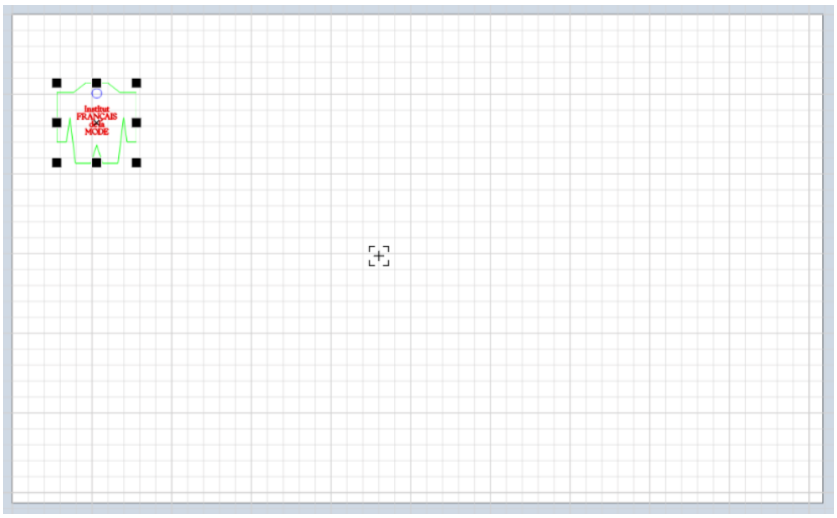
*! If you have not yet created a material parameter, go directly to the **Main Menu of RUBY > Materials** and follow the instructions in the section **Creating a new material in RUBY** in the **Appendix** p.33 and p.34.*



- **CHECK THE DETAILS of the parameters** by clicking on 

! If you have changed them, click on 

- **MANAGING THE PLACEMENT of the job in relation to the laser cursor**
When the machine is switched on, you should see a cursor (small cross) on the work surface:

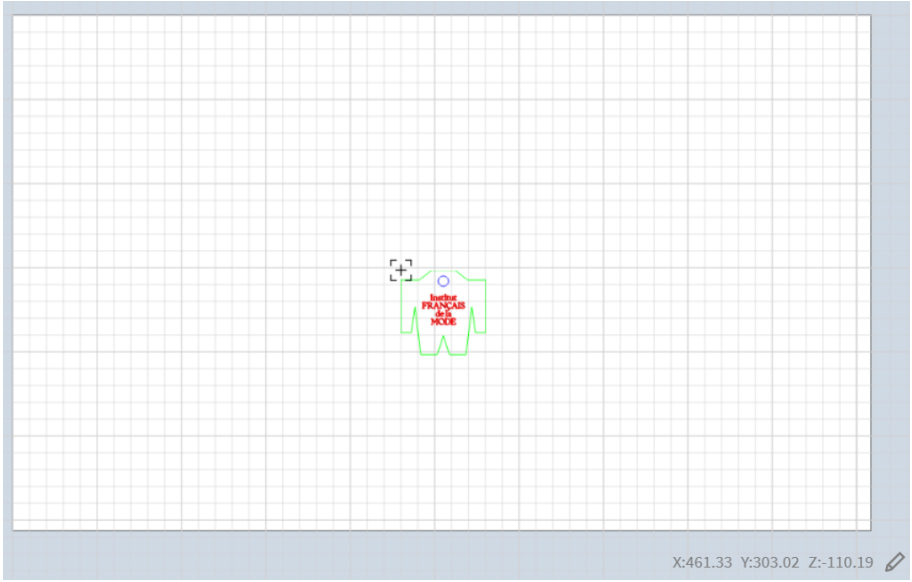


! If you don't see any cursor, check that the machine is switched on and connected to the computer.

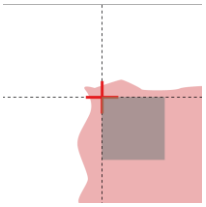
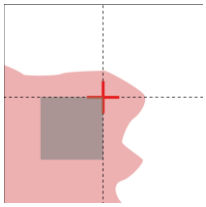
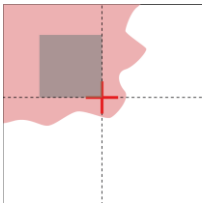
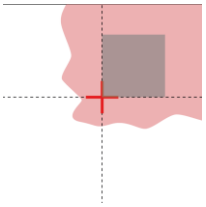
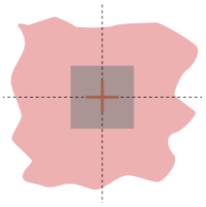
- On the machine, **MOVE THE CUTTING HEAD** to place **THE LIGHTING POINT above the material**. This point will be the **origin of your job**, its reference point.

- On Ruby, **MOVE THE JOB TO THE CURSOR**

*! Make sure that the **SNAPING ON** button*  *is active*



You can position the job in 5 different ways in relation to the cursor, depending on the position of the light pointer chosen on your material:

				
Position by the bottom right-hand corner of the cursor	*Position by bottom left corner of cursor*	*Position by the top left corner of the cursor*	*Position by the top right-hand corner of the job*	*Position by the centre of the cursor*
Job origin: top left-hand corner of the job	*Job origin: top right-hand corner of the job*	*Job origin : bottom right corner of the job*	*Job origin : bottom left corner of the job*	*Job origin : centre of the job*

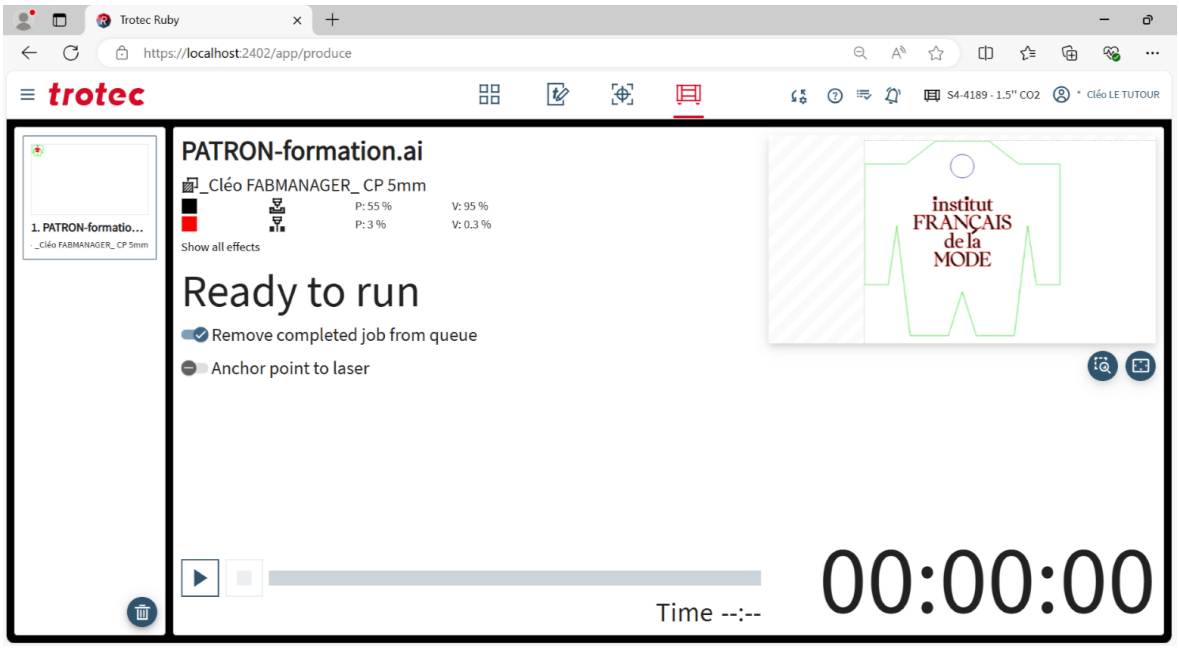
- **<u>Before starting a job</u>, ESTIMATE ITS DURATION** by clicking on 

  ! Some jobs take a very long time (such as engraving or drawings with a lot of detail). It is <u>your responsibility to finish your work before the end of your booking</u> (allow time for cleaning and tidying up) to make room for the next person.
  The fabmanagers may ask you to stop the machine at the end of your booking, <u>even if the job is not finished</u>, so as not to overrun the next person's slot.

- **SEND YOUR JOB in the queue** by clicking on 

  A new page appears.

Produce tab 



- **CHECK the features** on the page :
    - The job appears in the correct colours
    - The selected material is correct

- **RUN THE JOB** by clicking on the **PLAY** button 
  >>> Test the selected settings a first time.

  If necessary, you can use the buttons:

  PAUSE : *This is used to pause the job, to open the machine and carry out checks, for example.*

  STOP : *It is used to stop the job in progress if an error is detected after the job has been launched. ! Warning: this button cancels the job.*

- **ADMIRE the result!**
    - If you're not happy with the result, **change the power and speed settings** and **try again!**
    - If necessary, **ask the fabmanager** for advice!

Cleaning and storage after printing

It is essential that everyone participates in the proper maintenance of the fablab and the machines to ensure quality and comfort for everyone. The machine and its work area must be cleaned and tidied up every time it is used.

1. Cleaning

- **REMOVE THE masking TAPE** used when cutting.
- **SORT YOUR CUTTINGS of material** in the bins at your disposal.
- **THROW THE REMAINING CUTTINGS** into the fablab bins.
- **VACUUM THE SMALL WASTE** with the fablab hoover.
  → Carefully remove the honeycomb cutting tray and vacuum the entire area under the tray.

2. Storage

- **SWITCH OFF the machine** after use!
  → Turn the key counterclockwise to the O and **hand it to the on-site fabmanager**.

- **STORAGE THE ADDITIONAL TRAY** at the rear of the machine.

- **STORAGE THE TOOLS** (pins, tape, hoover, etc.) in their respective places.

- **Be sure to LEAVE THE WORKING AREA <u>as you found it</u>** when you arrived.
  ! Inform the on-site fabmanager if the workspace was not in order, clean and tidy when you arrived at the machine.

APENDIX

Table of contents

General methodology for materials

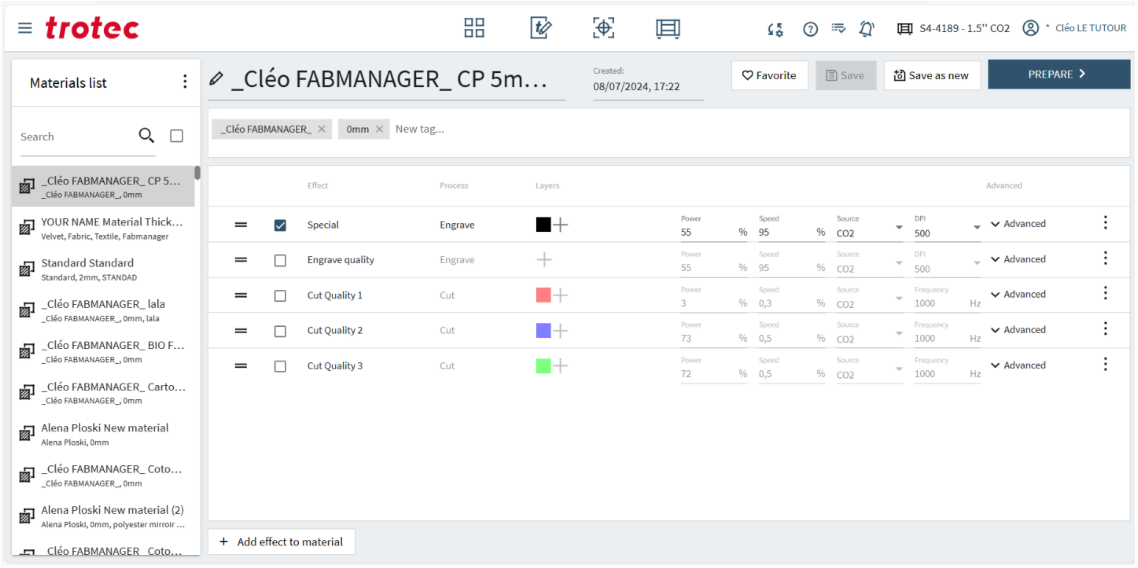
→ Your material may not be allowed to be used with the machine!
If so, **check the list** of prohibited materials or **ask the fabmanager.**

→ You have already worked with this material, **but not in the same thickness**:
- Create a 'new material'
- Use the same parameters as for the same material
<u>but</u> increase them slightly if your material is thicker,
<u>or</u> lower them a little if your material is thinner.

→ Your material is authorised but you don't know which parameters to use:
- Create a 'new material'
- Copy the Power / Speed / PPI/Hz settings from a similar material (rigid/soft, thick/thin, natural/synthetic, etc.)
- Test the settings with a small pattern.
- Readjust them according to the result (cut/not cut, too burnt/not burnt enough, etc.)

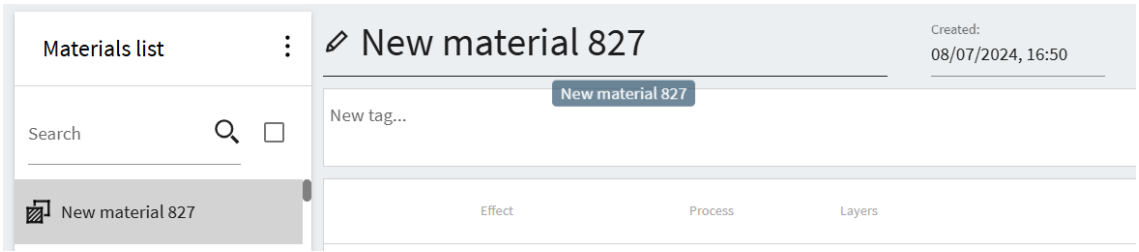
Creating a new material in RUBY

- In the **Main menu** ≡ trotec **CHOOSE the section** Materials



- In the ***Material list*, CLICK on the button** ⋮ and **SELECT** + Add new material

A new material sheet appears:



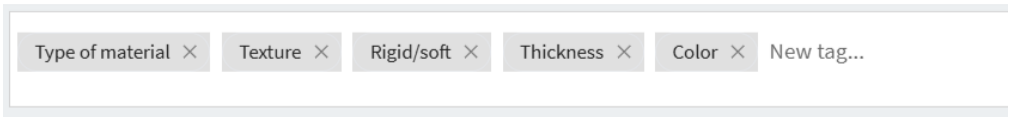
- **RENAME the new material immediately** as:

It is essential that you name a material with **YOUR NAME + NAME OF THE MATERIAL + INFO thickness / rigidity / colour / etc.** for several reasons:

- Two people using the same material will not necessarily want the same result.
- You need to be able to find your settings easily, material by material (this also gives other users inspiration for starting a test phase).

- Settings can be very different depending on thickness / rigidity / colour / etc. For example, soft leather and hard leather will not have the same settings. For example, soft leather and hard leather will not have the same settings, even if they are the same thickness.

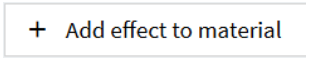
- **ADD tags** to facilitate searches later on:

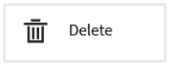


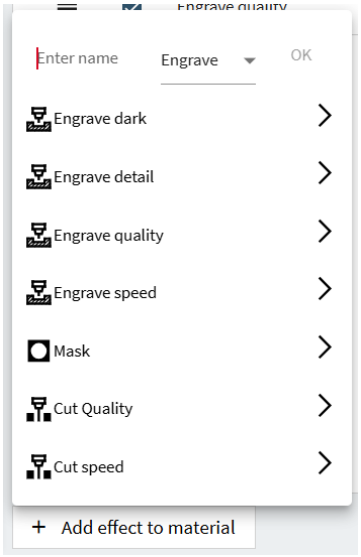
- **ADD operations** to your new material.

When you create a new material, it appears with two machine operations: engraving assigned to the colour black and cutting assigned to the colour red.

You can:

- Add an operation by clicking on the button 

- Delete an operation by clicking on and 

1/ 

2/ 

When you add a new operation, you must choose:

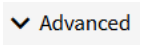
1/ a name
- specific (ex : *Marking*)

or
- picked in the list

2/ the type of operation
- ***Engrave***

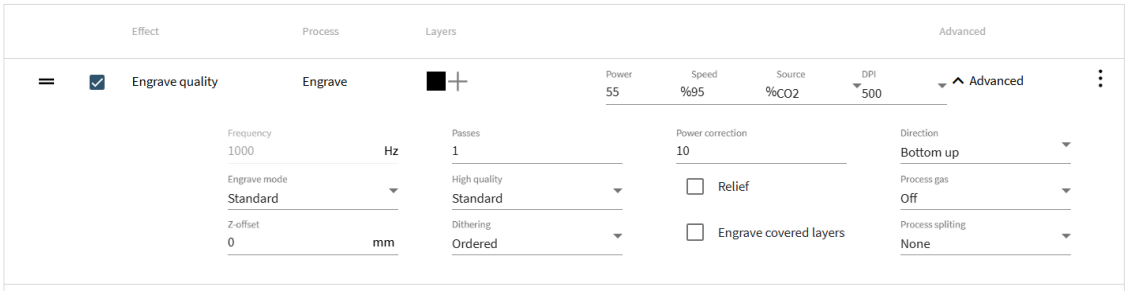
or
- ***Cut*** (marking/cutting)

- **ASSIGN colours to operations** by clicking on  and then on the desired colour from the 16 available (only 1 colour per operation / black only for engraving).

- **CHANGE the operation parameters** by clicking on 

! You can copy someone else's material settings, but <u>NEVER MODIFY THEIR VALUES</u>!

<u>Engraving</u>:

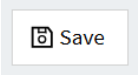


Power : Laser power from 0% to 100%
Speed : Laser movement speed from 0% to 100% *! For engraving, always work between 90% and 100%.*
DPI : Laser pulses during engraving between 125dpi and 1000dpi This parameter is used to vary the engraving resolution. *! For good resolution, choose 1000dpi. Below this value, scans of the laser beam may be visible.*
Passes : Number of passes for one operation
Power correction : This parameter is used to correct the effect of engraving when the cutting head accelerates to reach its maximum speed during large format engraving. *! Carry out tests!*
Direction : Engraving direction in the vertical direction *! Choose "Bottum up".*
Engrave mode : Engraving direction in the horizontal direction. *! Choose "Standard", which is faster*
High quality : Engraving quality *! Choose "High".*
Process gas : Air assistance ON/OFF

This parameter stops the C02 gas assistance during the operation in order to limit dust displacement. *! Set to OFF for engraving.*
Z-offset : Laser defocusing This setting allows darker engraving without digging into the material. *! Test at 1 or 2.*
Process spliting : Job splitting This parameter is used to engrave jobs one by one instead of engraving all the jobs in a single pass. *! Leave unchecked for greater speed.*

Cutting/ Marking:

Power : Laser power from 0% to 100%
Speed : Laser movement speed from 0% to 100% *! For cutting and marking, always use small percentages for greater precision.*
Passes : Number of passes for one operation
Power correction : This parameter is used to correct the effect of the laser at the start of the operation or in the corners of the design. *! Use value 10.*
Z-offset : Laser defocusing This setting allows thicker markings to be made without digging into the material. *! Test at 1 or 2 / DO NOT USE FOR CUTTING.*

- **SAVE your settings** by clicking on 

- **TEST IT!**

  To find out if the settings are right, there's no miracle...you just have to test!!