# Laser User Manual

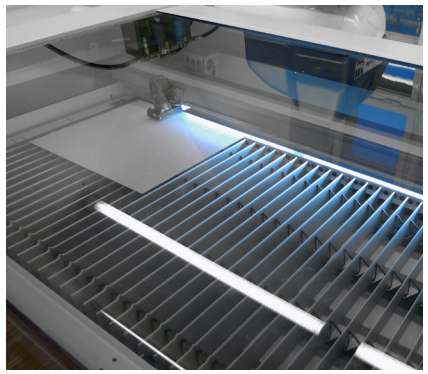
1. Basic info
2. Reservation and payment
3. Drawing preparation
4. Prefab Lab Login
5. Creating a Job in Ruby
6. Switch on and prepare
7. Behavior in case of
   smoke, fire, and accidents




TU Wien / E2642 / Institut für Kunst und Gestaltung / Abteilung Modellbau  Karlsplatz 13 A-1040 Wien

http://kunst2.tuwien.ac.at/

# 1. Basic info



Work area of the laser table

## Prefab Lab

1245 x 708mm

## Workshop

729 x 433mm

## Data format

## PDF

*Please email us in advance for any laser cutting requests involving other materials: werkstatt264.2@tuwien.ac.at*




## Materials

### cardboard

| | | |
|---|---|---|
| Grey cardboard | Graukarton | 0,5 - 3mm |
| Finn cardboard | Finnpappe | 0,5 - 4mm |
| Brown cardboard | Braunpappe | 1mm |
| Bristol cardboard | Bristolkarton | 0,3 - 2mm |
| Graphic cardboard | Graphikkarton | 1mm |
| Screen printing plate | Siebdruckkarton | 1 - 2mm |
| Photo cardboard | Fotokarton | 0,3mm |
| Single-wall corrugated cardboard | Wellkarton | 1,5mm |
| Double-wall corrugated cardboard | Wellpappe | 1,5 - 6mm |

### plastics

| | | |
|---|---|---|
| Acrylic glass GS | Acrylglas gegossen | 1 - 12mm |
| Sandwich panels | Sandwichplatte | 3 - 5mm |
| Polystyrene | Polystyrol | 0,3 - 1mm |
| Polyester sheets (Vivak) | PETG (Vivak) | 0,5 - 1,5mm |

### wood and woodbased materials

| | | |
|---|---|---|
| Poplar plywood | Pappelsperrholz | 3 - 6mm |
| Aircraft plywood (birch) | Flugzeugsperrholz (Birke) | 0,6 - 1,5mm |
| Linden wood | Lindenholz | 0,5 - 4mm |
| Balsa wood | Balsaholz | 0,8 - 2mm |
| MDF | MDF | engraving only |

*Caution, toxic:*

leather and artificial leather that contains chrome; carbon, PVC, PVB, PTFE, Beryllium oxide, materials with halogene, epoxy resins or phenolic resins.

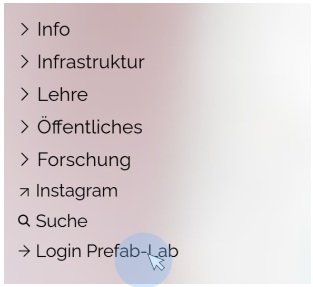
*The following materials CANNOT be used:*

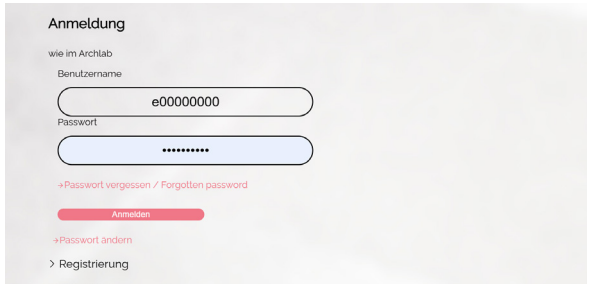
Metal, stone, mirrorglass, glass, ceramics

# 2. Reservation and payment

## Login via Kunst 2 homepage

*https://kunst2.tuwien.ac.at*




Use the login-data from your Archlab-account.

If you don‘t have an account, register at *https://www.archlab.tuwien.ac.at* and link your TU-Card to your account following the instructions on the orange payment machine in the hallway of the Archlab.

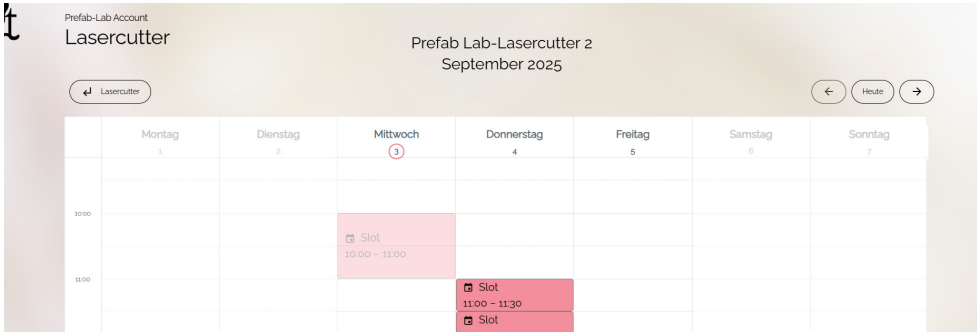
Booking a slot and entering the Prefab-Lab is only possible if you meet the following requirements:

1. you have positively completed the course 264.252
2. you have enough credit on your account
3. you have enough time credit
4. your current TU Card is linked to your archlab-account (If you lost your card, your new card must be linked again. Go to the Archlab or Workshop to do so.)
5. your TU Card is activated for this semester

Otherwise you cannot enter the Prefab Lab. The card must be activated 24h before entering (valid for one semester). If your card is not activated and you cannot enter the Prefab Lab, your money for the booked slot will not be refunded!
*See the archlab homepage for instructions on how to add money to your account.*

## Booking, editing and deleting a slot

Laser cutters for which the requirements are not met will appear transparent. By clicking on the transparent machine you‘ll see which requirements are missing.

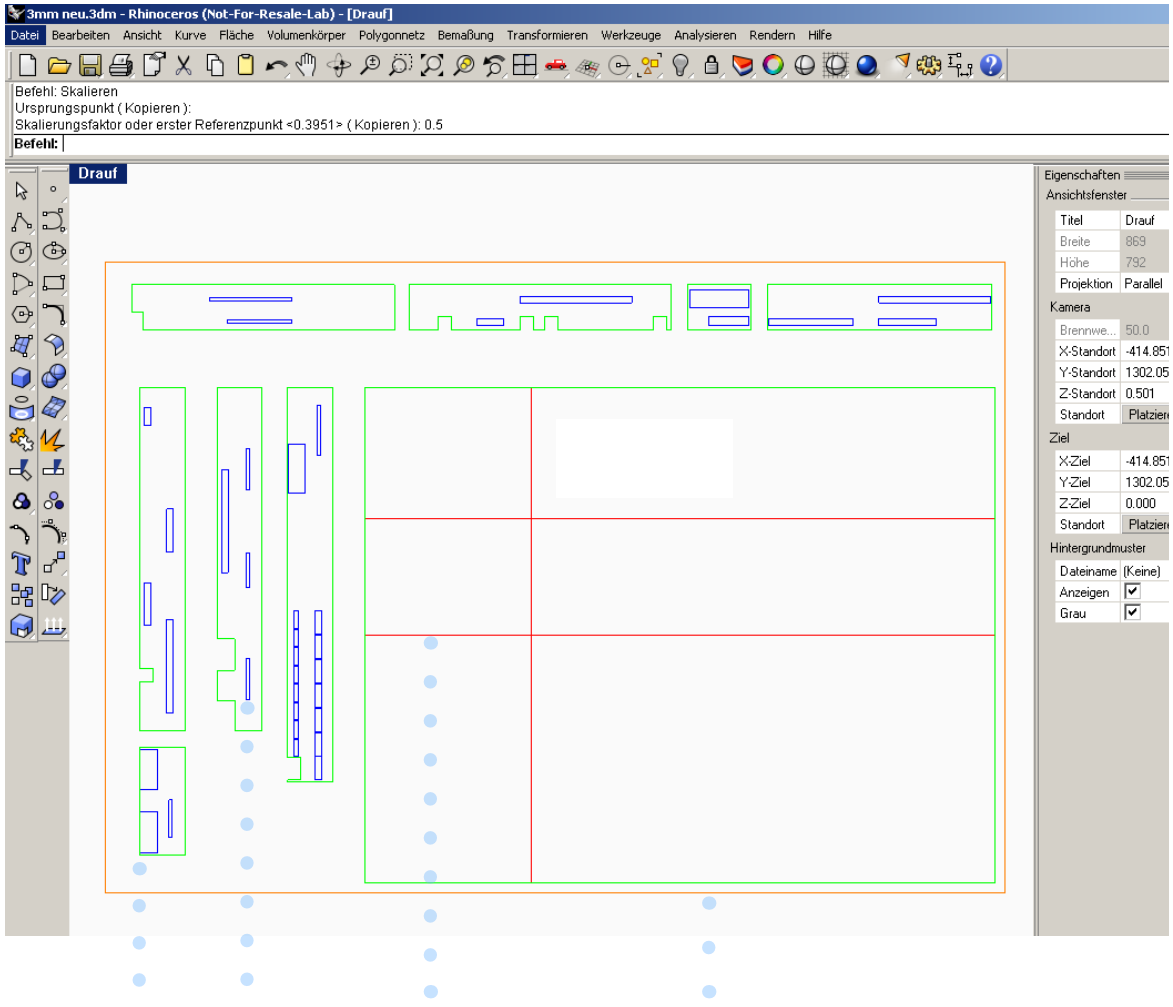



*Calendar displays the upcoming two weeks. Every Sunday at midnight, the past week is removed & a new week is added. The maximum booking time per week is shared between all lasers in the Prefab Lab!*

- minimum booking time is 30min
- booking is possible up until the start time of the slot, e.g. a 9:00–9:30 slot can be booked until 8:59
- a time slot can be deleted up until 2 hours before the beginning

- ***extension beyond timelimit:*** An extension beyond the weekly timelimit is only possible in exceptional cases (e.g. diploma projects and surrounding models for the whole group) or if the Prefab-lab is not busy. These extended slots can only be booked by staff members (werkstatt264.2@tuwien.ac.at).

# 3. Drawing preparation




1. Carving (Red)
2. Cutting inner contours (Blue)
3. Cutting outer contours (Green)

Frame: gold (R255 |G200 |B0)

## Prepare the drawing (e.g. RHINO)

- keep the max. work area in mind
- draw in millimeters
- save in the right scale
- export only the lines you want to cut

- Layer structure of the drawing:

  - Carving: red (R255 | G0 | B0)
  - Cutting inner contours: blue (R0 | G0 | B255)
  - Cutting outer contours: green (R0 | G255 | B0)
  - frame of the drawing: gold (R255 | G200 | B0)

## Format: PDF

For each job (each cardboard piece), generate a single-page PDF that fits within the laser cutter‘s maximum work area ->
Prefab Lab: 1245 x 708mm
Workshop: 729 x 433mm

# 4. Prefab Lab Login

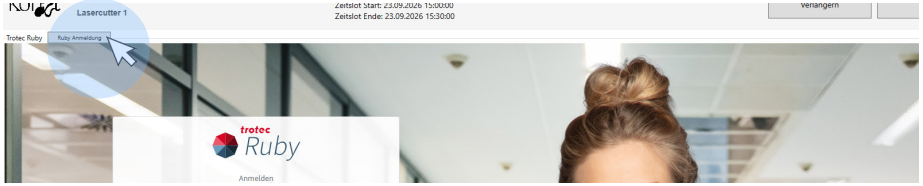
## Using your booked slot at the laser cutter:

- To start your booked slot, touch your TU card to the sensor at the laser cutter. This will activate the countdown and open the Ruby software on the screen. WAIT FOR THE AUTOLOGIN IN RUBY.





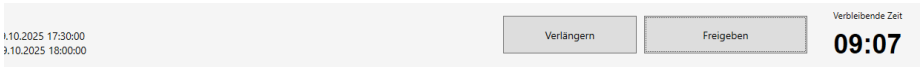
- If the AutoLogin doesn‘t work, click „Ruby Anmeldung“ in the upper left corner of the screen.




- You can then turn on the laser cutter to begin the homing process. The lid must remain closed during homing.

*You will receive a warning signal three minutes before your time slot ends. It will repeat two minutes and one minute before the countdown finishes.*

- if you are done, click „FREIGEBEN“ so that no one can extend with your account
- ***„freigeben“:*** If the last 30 or 60 minutes of your booking have not yet started and you are logged in at the laser cutter, you may shorten your booking (payment for the returned time slots will be refunded) E.g. booking from 9:00 to 10:30. The person is logged in and finishes lasering at 9:50. In this case, they can return the last 30 minutes of their booking in the calendar by 9:59:00 at the latest.
- ***„verlängern“:*** is possible when you haven‘t reached the time limit for the week, you have enough credit and the slot after your booked slot is free.







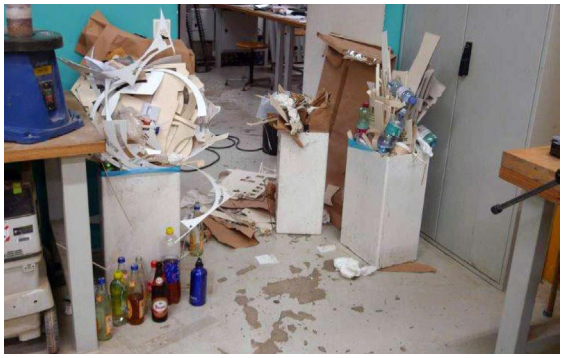
To turn on the **laser 1** and initiate the homing sequence, turn the rotary switch past ‚I‘ to the ‚⏻‘ symbol. Turning it only as far as ‚I‘ will only switch on the laser display.

## Misbehaviour

If the team‘s instructions are not followed, accessto the Prefab Lab will be blocked indefinitely.

If the Prefab Lab was already left in disarray before your visit, you must send a photo documenting the situation (with visible date and time) to werkstatt264.2@tuwien.ac.at by 11:00 AM the next day.This helps us hold the previous users accountable.

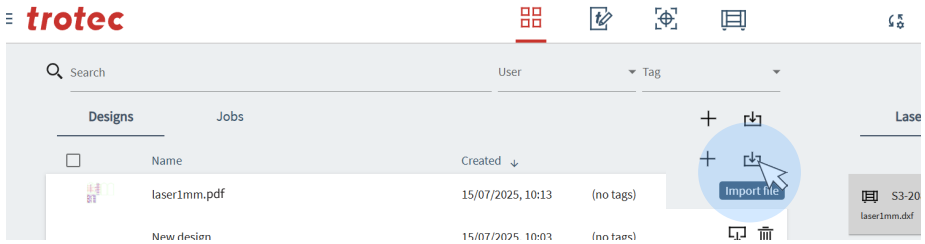
Lending your TU card to others or ignoring instructions from the workshop staff will result in permanent exclusion from the workshop.

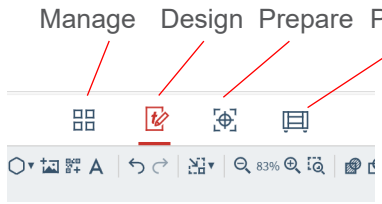


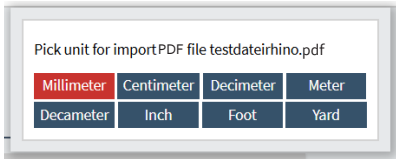
# 5. Creating a Job in Ruby

## Import file

Open Ruby, and import your drawing in the „manage“ menu via „Import file“.

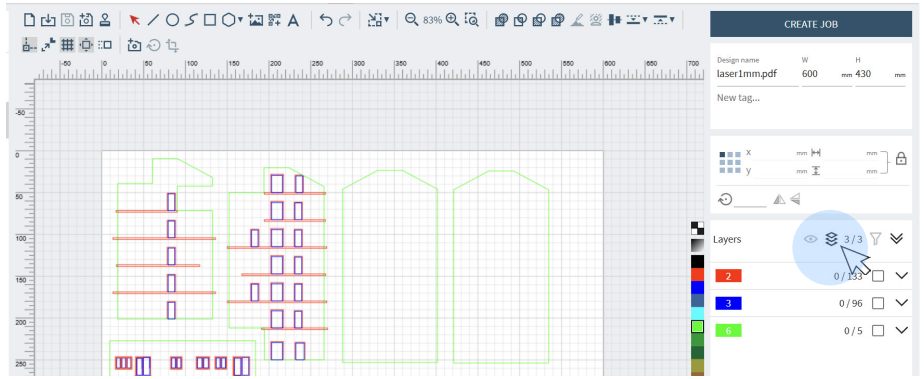


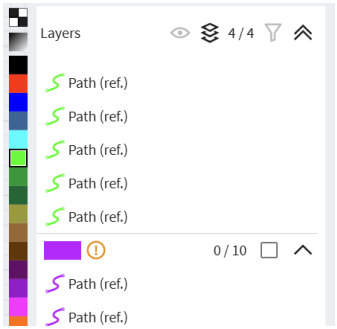

click on your job and pick millimeter in the pop up window (upper right corner) the drawing will open up in the *Design* menu

make sure that the layer symbol is activated for an easier depiction




Check if the scaling and the color selection is right, the size of the frame will be shown in the upper right corner.

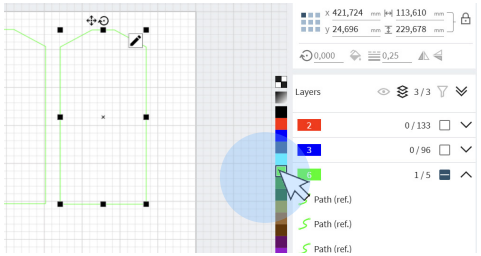
## Adjust the drawing

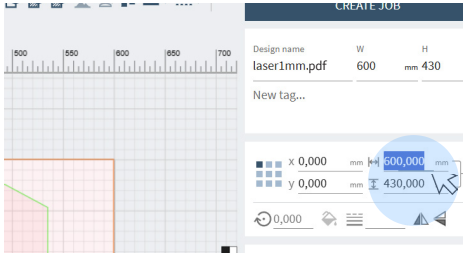



There will be an exclamation mark, when you used a color in your drawing, that Ruby is not working with.

To change the color, select the paths or the whole layer and choose the right color in the color scale.

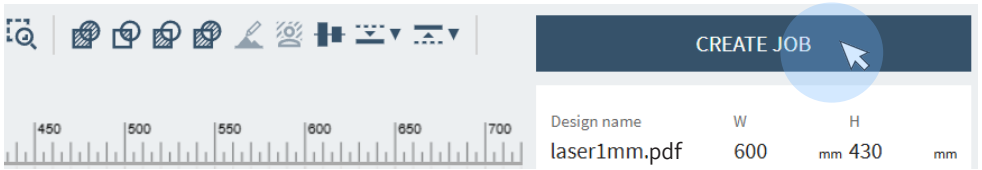
To change the size of the drawing, select all objects and fill in the right size in the upper right corner.



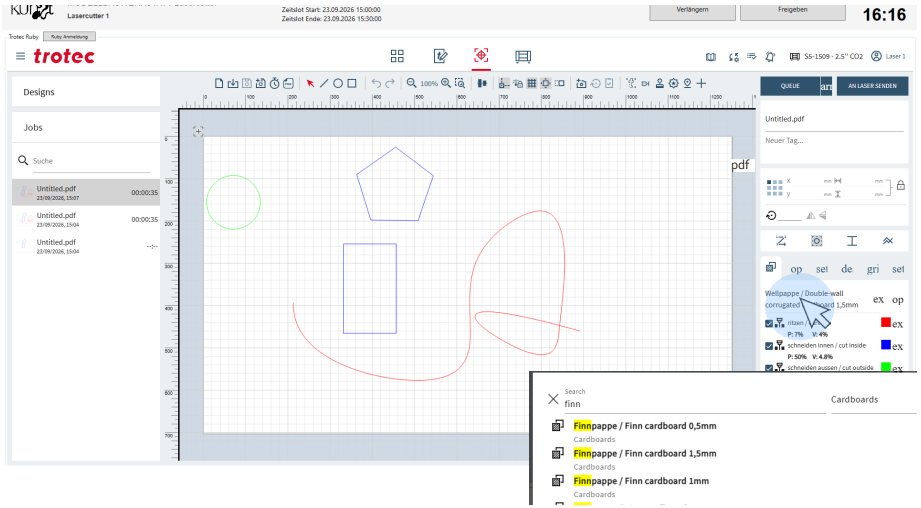

## Create job

Once your drawing is finished, click *Create Job* above the size information.



# 5. Creating a Job in Ruby

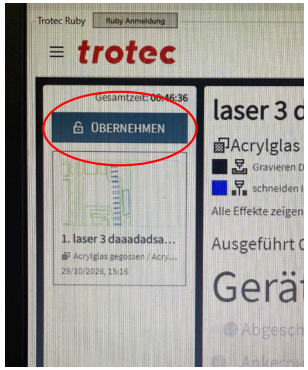
The job will be opened in the prepare menu.
Pick the right material in the drop down menu on the right side of the drawing.
You can also search for the material.



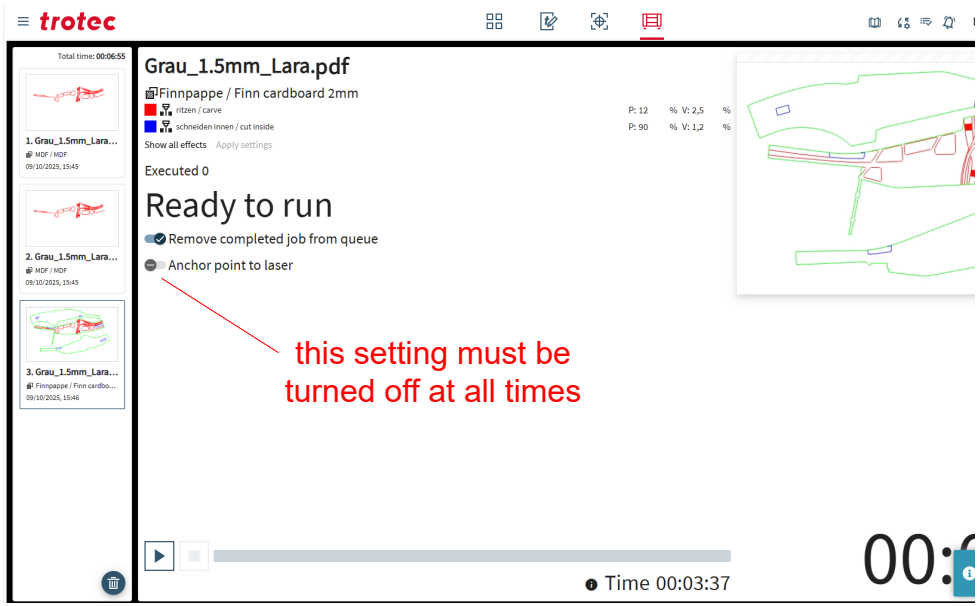

On the left side you can choose between different prepared jobs and assign them to the right material. When you are done, click either *queue* or *push to laser*. In the *produce* menu you can switch the order of your different jobs and start the lasercutter.




On **Laser Cutter 1**, the print cannot be started, paused, or canceled via the PC - only directly from the laser‘s control panel. To do this, select the job on the laser‘s touch display and use the buttons to start/ pause, or cancel.




„Once modifications have been made on the Laser 1 touch display, the ‚takeover‘ message on the PC must be confirmed to make the queue editable.“

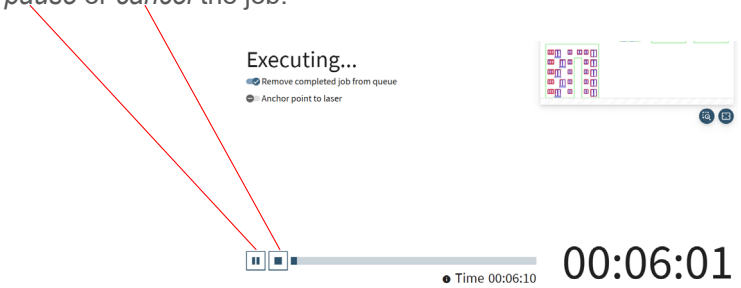



The queue is on the left side of the *produce* menu, to switch the order you can click on one job and move it to another spot. For each job the calculated cutting time is shown in the lower right corner.

If you can‘t see all jobs and want to check, click on *show all effects*.

BEFORE STARTING THE JOB
ADJUST THE Z - AXIS
(see next page)

To start the lasercutter, push the play button. If needed you can either *pause* or *cancel* the job.



# 6. Switch on and prepare

## Prefab Lab

CLOSE THE LID +
SWITCH IT ON




1 turn key for power

2 Table height:
Up - Down

3 Forward - Back
Left - Right

4 Pause

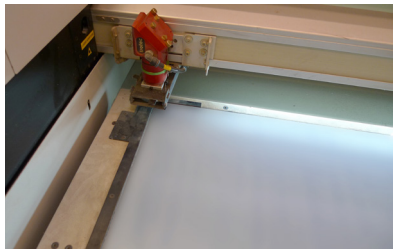


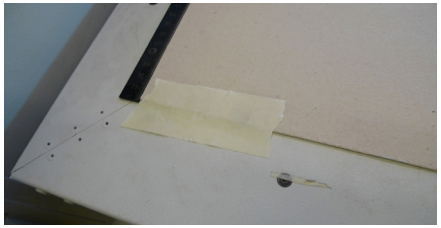

To turn on the **laser 1** and initiate the homing sequence, turn the rotary switch past ‚I' to the ‚⏻' symbol. Turning it only as far as ‚I' will only switch on the laser display.

### Wait until the homing is done
### (every axis will move to its starting point)

when the homing is done, position your material in the upper left corner. Use masking tape to attach it to the laser table only if it's bent!







To ensure the focal point of the laser beam is correct, the distance from the lens to the material must be adjusted (using a focusing foot). If the material thickness changes, this distance must be re-adjusted.

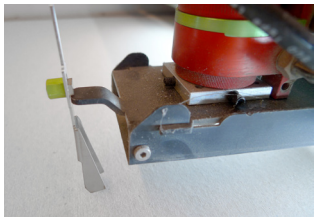
Using the control panel, position the laser head centrally over the material

The focusing foot must be hung on the projection of the carriage as shown in the image. Then the table should be carefully moved upwards in small steps until the focusing foot touches the material and drops.

### Prefab Lab



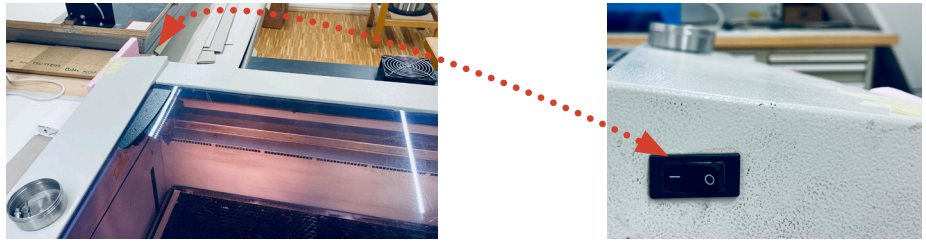




WARNING!
Raising the table too high will cause the machine to alarm and require a restart. Turn the key to start the machine again and wait for it to finish the homing.

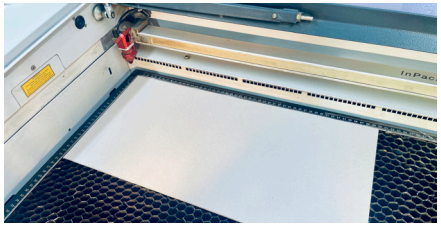
# Workshop

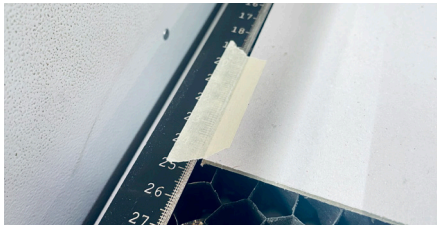
CLOSE THE LID +
SWITCH IT ON



## Wait until the homing is done
## (every axis will move to its starting point)

when the homing is done, position your material in the upper left corner. Use masking tape to attach it to the laser table only if it‘s bent!





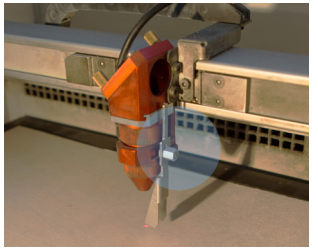
To ensure the focal point of the laser beam is correct, the distance from the lens to the material must be adjusted (using a focusing foot). If the material thickness changes, this distance must be re-adjusted.

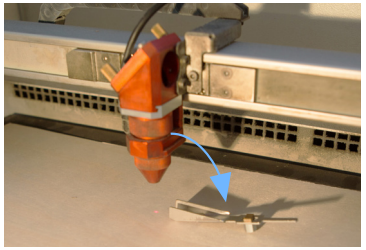
Using the control panel, position the laser head centrally over the material

The focusing foot must be hung on the projection of the carriage as shown in the image. Then the table should be carefully moved upwards in small steps until the focusing foot touches the material and drops.

## Workshop gallery







WARNING!
Raising the table too high will cause the machine to alarm and require a restart. Turn the key to start the machine again and wait for it to finish the homing.

# 7. Behavior in case of smoke, fire, and accidents



















## Smoke incident

1. Pause the laser
2. Do not open the lid
3. Call the workshop

## Fire

candle flame
1. Pause
2. Open the lid
3. Blow out the flame

material is on fire
1. Emergency stop
2. Manually push the entire axis with the laser head backwards
3. Drop the material onto the floor
4. Throw the fire blanket over the material
5. Call the workshop

machine is on fire
1. Emergency stop
2. Activate the fire alarm and call the fire department at 122
3. Use the fire extinguisher to put out the fire
4. Exit the prefablab
5. Call the workshop

## First Aid

1. First-aid kit and bandages can be found next to the front door
2. For serious injuries, call the emergency services at 144 and also dial the internal emergency number of the university