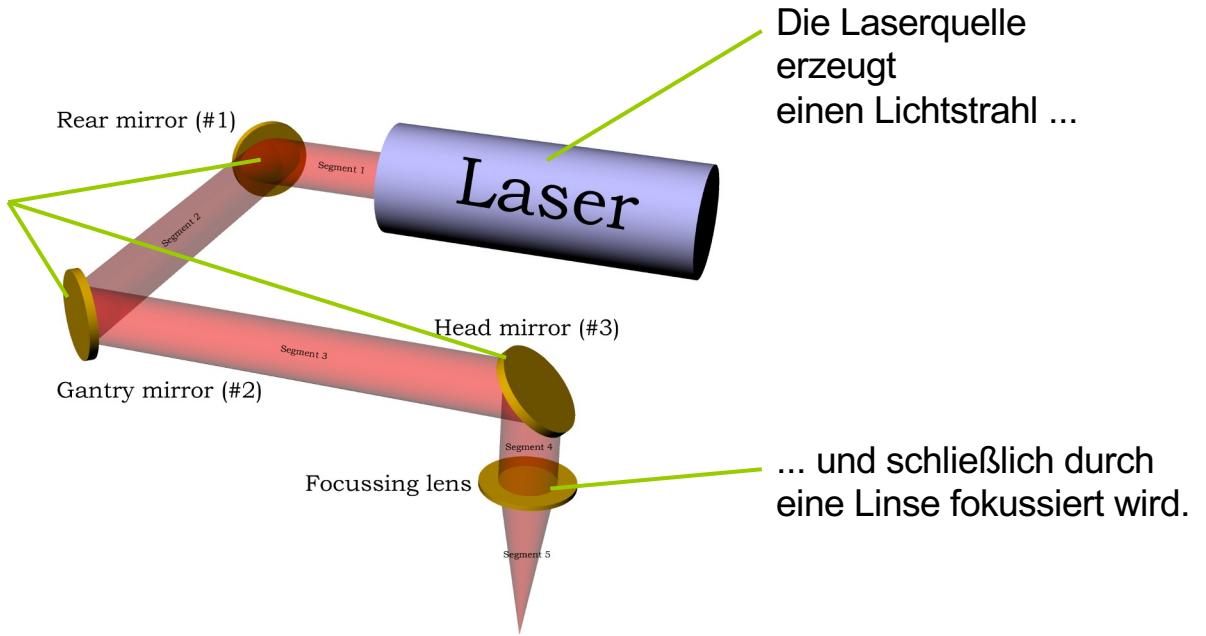
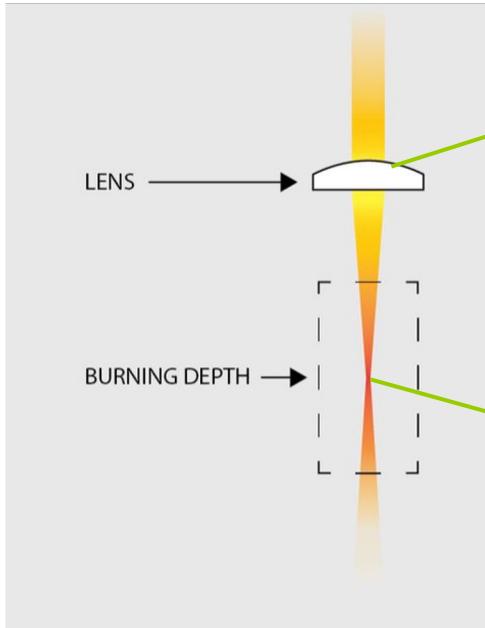


Lasercutting workshop

..., der durch Spiegel auf den Schneidkopf geleitet ...





Fokus-Linse ...

... fokussiert den Laser nach unten ...

... zu einem dünnen und konzentrierten Strahl

schneiden



gravieren

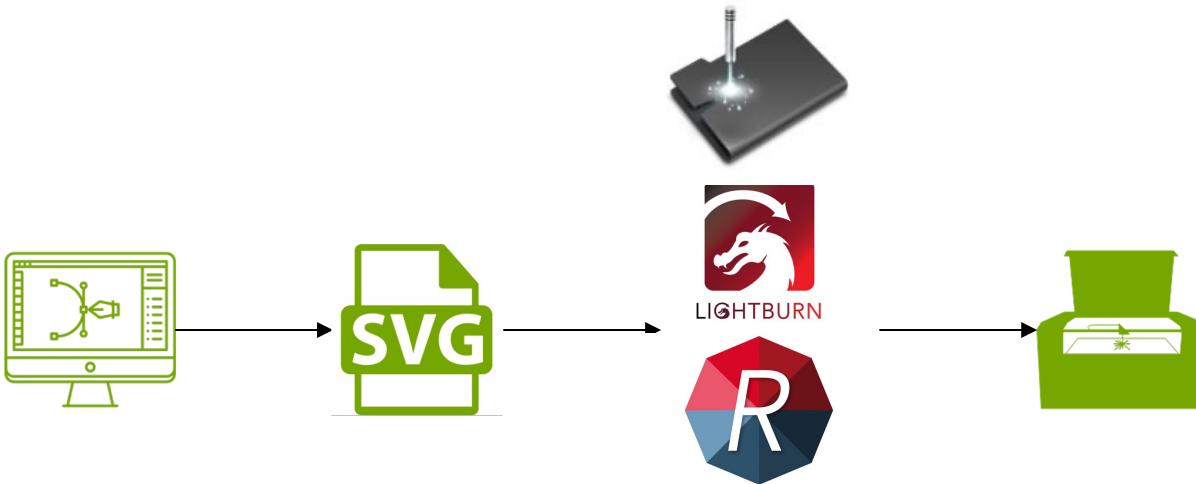


gravieren & markieren



markieren





Erstellen einer
Vektordatei
+ .ai .pdf .dxf

Exportformat
.svg

Einrichten mit
CNC-Software

Schnitt- und
Gravur-Prozess

Luftunterstützung und Vacuair müssen immer eingeschaltet sein.

Bleibe während des Schnitt- und Gravurvorgangs bei der Maschine und überprüfe regelmäßig, ob alles in Ordnung ist.

STOPP bei konstanter Flammenbildung



Im Falle eines Vorfalls wende dich bitte an einen Werkstattleiter.



CAUTIO

NI

Lasse den gesamten Rauch aus dem Schneideraum absaugen bevor du den Deckel öffnest.

Power: **0,1–100 %**



Geschwindigkeit: **0,1–100 %**



Frequenz **0-5000hz**

Laser folgt Vektoren mit **hoher Leistung** und
mittlerer Geschwindigkeit

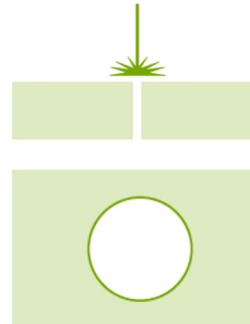
→ Durchtrennen des Materials



High Power



Medium Speed



Laser folgt Vektoren mit mittlerer Leistung
und hoher Geschwindigkeit

→ Anschnitt der Oberfläche



Medium Power High Speed



Geschwindigkeit verringern und/oder
die Leistung erhöhen.



Anzahl der Laserpulse pro Sekunde von 1 bis 5 000 Hz

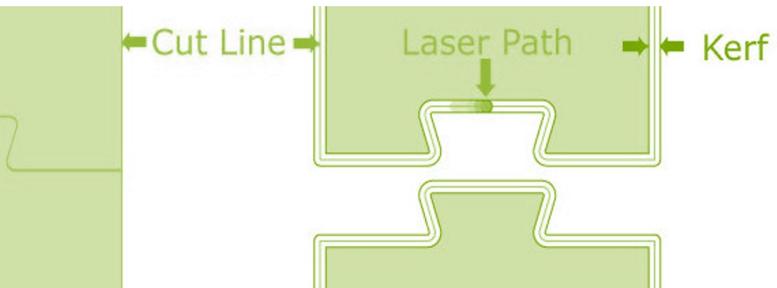
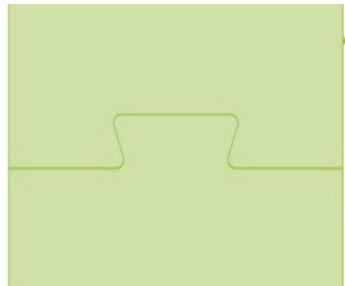
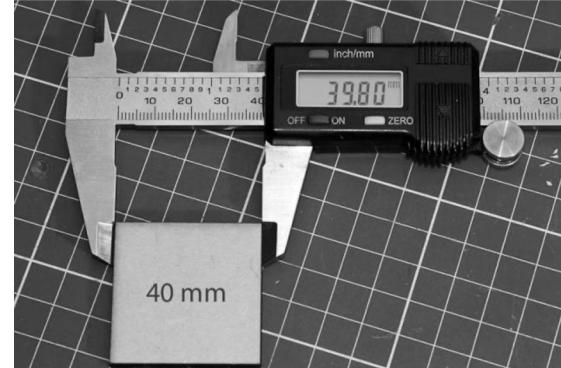


Verbrennende Materialien (Holz, Papier):
Niedrige Frequenz, 500 Hz



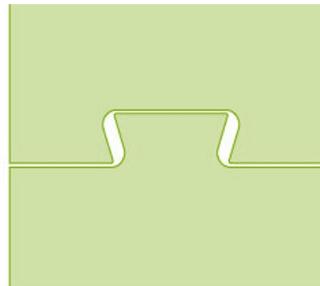
Schmelzende Materialien (Kunststoffe):
Hohe Frequenz, 5000 Hz

Abhängig von Materialeigenschaften
ca. 0,10–0,30 mm

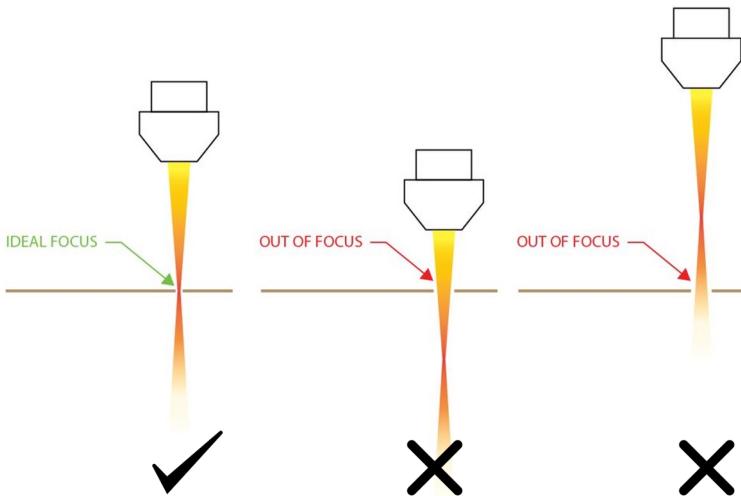


Designed Fit

Laser Cutting Route



Actual Fit



Idealer Fokus

dünner Laserstrahlauschnitt
auf der Oberfläche des Materials

Defokussiert

Schneidet nicht durchs Material
dicke Schnittlinien



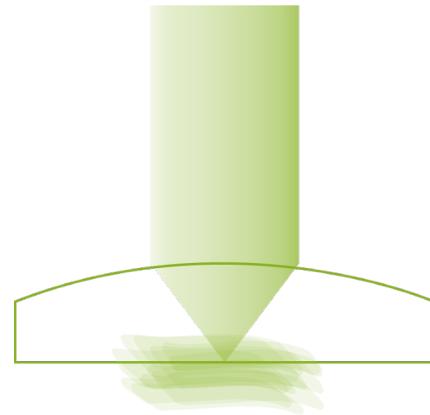
Guter Fokus



Schlechter Fokus

Beim Laserschneiden entstehen Rauch und Staub und die Linse wird **verschmutzt**.

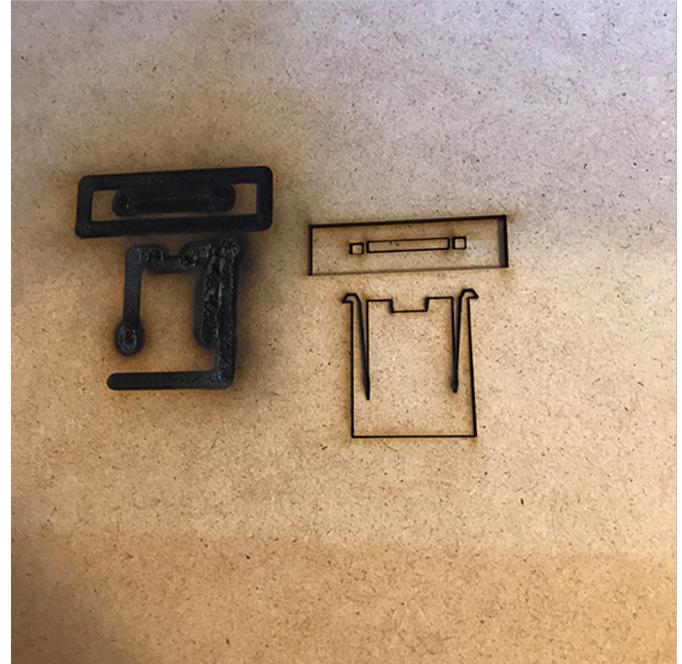
Bei zu starker Verschmutzung fokussiert der Laserstrahl auf die Linse und verbrennt sie.



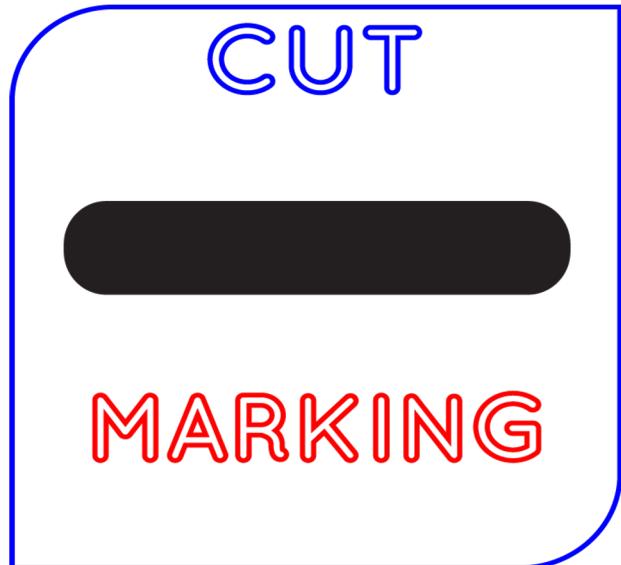
- Sieht schlecht fokussiert aus
- Flammen und Rauch
- Schneidet nicht durch
- Dicke und verschmutzte Schnittlinien

Sofort anhalten

Frage die Werkstattleitung nach
einer Linsenreinigung.



Beginne immer mit einem Test in der Ecke deines Materials,
um die richtigen Einstellungen zu finden.



Zu dunkel oder verbrannt:

Leistung verringern
Geschwindigkeit erhöhen

Schneidet Material nicht vollständig durch:

Leistung erhöhen
Geschwindigkeit verringern

Erzeugen toxische Gase



Beschädigen die Maschine



Entflammungsgefahr



Verbotene Materialien

brennbare Stoffe,
z.B. Schaumstoffe fangen leicht Feuer
und sind i.d.R. verboten.

Metalle

Reflektierende Oberflächen

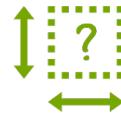
Materialien, deren Bestandsstoffe nicht zu ermitteln
sind

Vinyl
Polyvinyl Chloride (PVC)
Polyvinyl Butyral (PVB)
Polytetrafluorethylene PTFE (Teflon)
Neoprene (CR)
Kevlar, Nomex (PPTA, PMPI)
Polystyrene/ Polystyrol (PS)
Polycarbonate (PC)
Polycarbonate (PC)
Polyurethane (PUR)
Polyethylene (PE)
FPM / FKM (Viton®, Tecnoflon®, Fluorel®, Daiel®)
Bakelite
Synthetic leather
Acrylonitrile butadiene styrene (ABS) Styrene

Caoutchouc
Latex

Beryllium oxide
Glass Fiber
Carbon or Carbon Fiber
Printed Circuit Board (PCB)

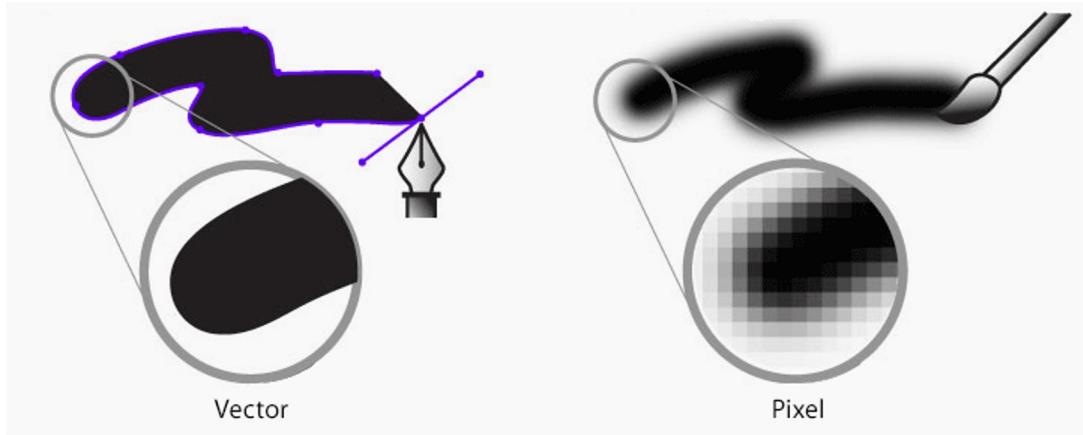
Farbmodus
RGB



Abmessungen

Illustrator
Corel Draw
Autocad
Inkscape (free)
GravitDesigner (free)



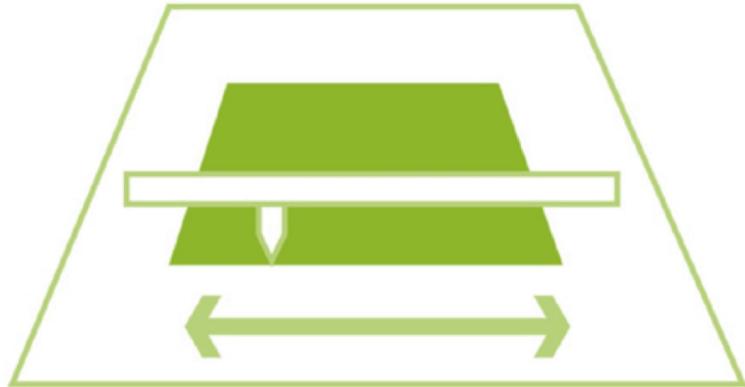


Schneiden, Markieren und
Gravieren möglich

Nur Gravieren möglich

Graviert **jeden einzelnen Punkt** einer Fläche

→ Flächiges Abtragen des Materials



Medium Power High Speed

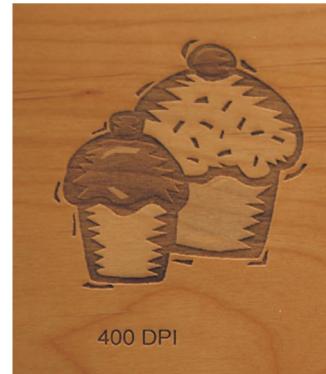




150 DPI



300 DPI



400 DPI



600 DPI

→ höhere Auflösung

längere Gravurzeit

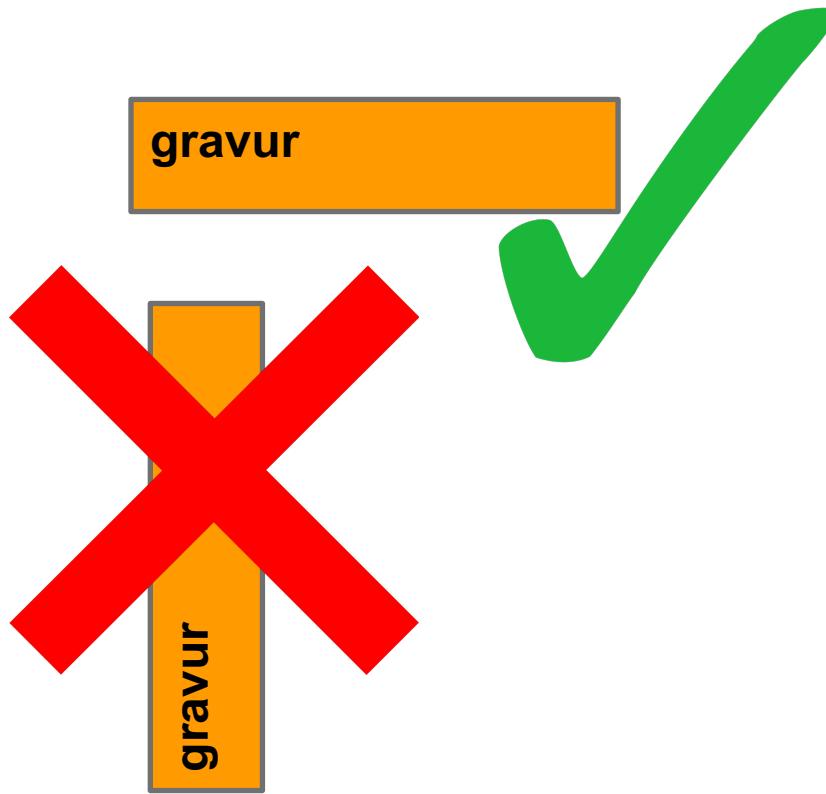
höherer Detailgrad

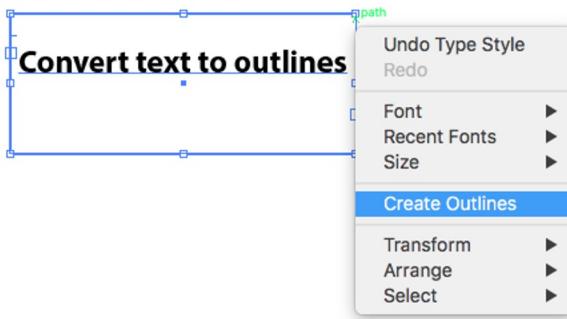
Reducing DPI can speed up jobs significantly.

full speed + full power allows to reduce DPI to 125 for light engraving and 250 for darker engraving. DPI has a linear relation to cutting time. Half the DPI half the time.



- Gravuren entlang X-Achse anordnen





Convert text to outlines

Convert text to outlines

R **R**

Bridges
recommended for
text cutting out

metroplex laser

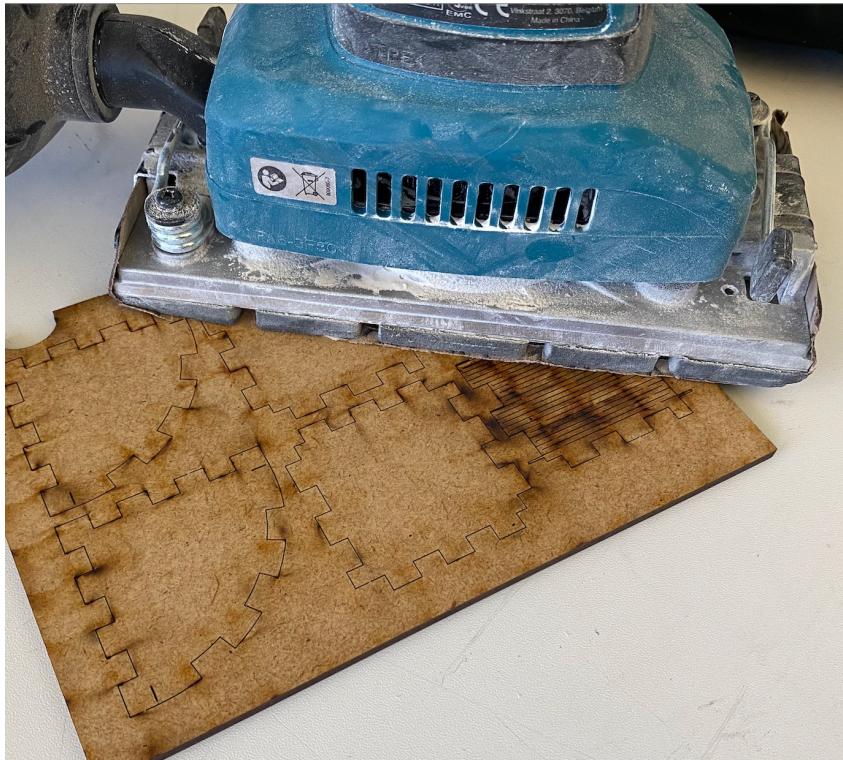
or use laser cutting
fonts

preventing
burning
(David)

Prevent burning:

- Clean lens
- Focus correctly
- Make sure Air Assist is on
- Choose a setting that cuts through the material but is not overpowered.
- To prevent burnmarks from the metal grid, lifting the pieces is an option
- Potentially tape the material prior to cutting
- Apply water prior to cutting

Remove burn



Sand the whole plate while pieces are still in place.
It's quick and allows to remove heavy burn.

Sanding burn at
any later stage is harder.

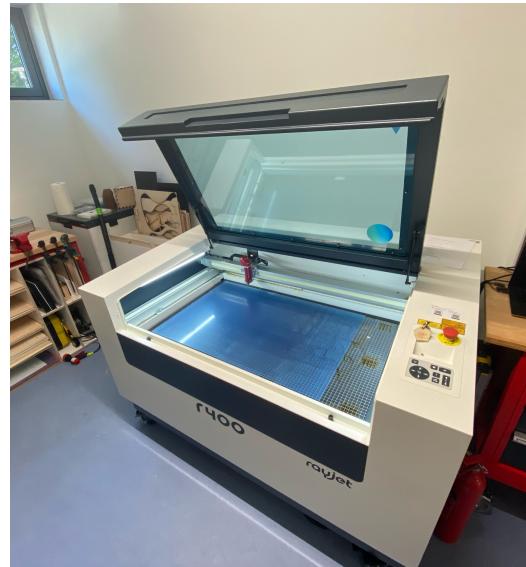
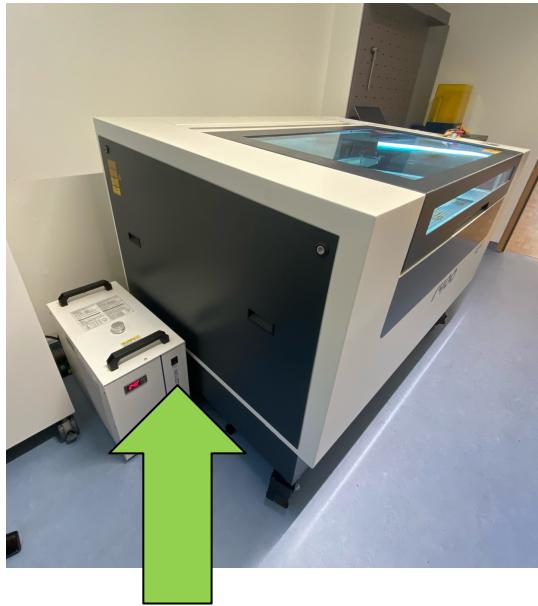
Remove burn on engravings



Use a soft wire brush to carefully remove burn on engravings

Starting
the laser

Starting the laser



- 1) Switch on water cooling
- 2) Turn on laser with key
- 3) Open & Close lid and wait for homing
(laser will approach endstops on all axis)

Manual focus:

Attach focus gauge



Move Z-axis up until gauge falls down



Using ruby

software

Working with Ruby

Import files on first tab

A screenshot of a web-based application interface for managing files. The interface includes a header bar with various icons and a search bar. Below the header is a navigation menu with 'trotec' and tabs for 'Designs' and 'Jobs'. The main area displays a list of items with columns for Name, Created, and actions. A modal window titled 'Lasers' is open, showing a preview of a file named 'X36-0356' and a message 'New job 4291'. A large green arrow points from the top left towards the '+' button in the toolbar. Another green arrow points from the top right towards the 'Lasers' tab. A curved orange arrow points from the bottom left towards the 'New design' row.

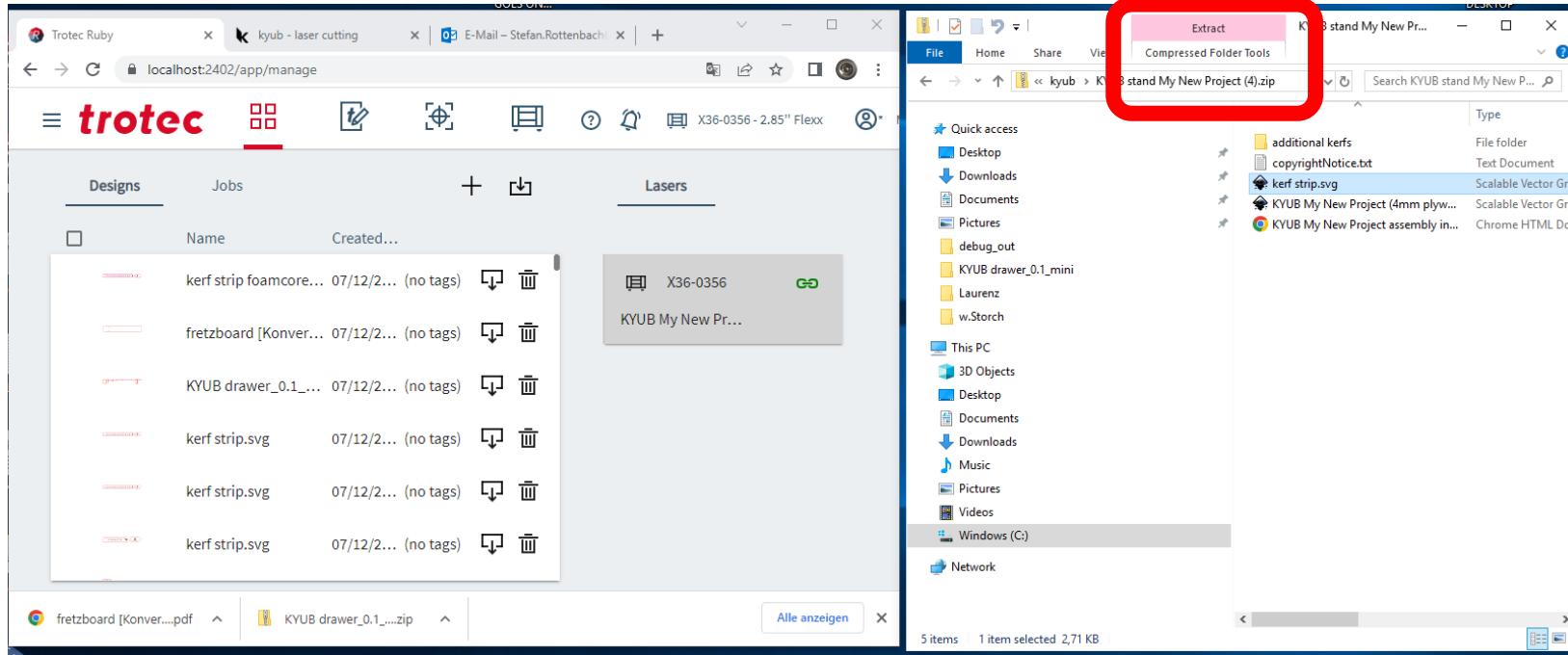
Name	Created	Actions
kerf strip.svg	07/12/20...	[Download] [Delete]
KYUB My New Project (...	07/12/20...	[Download] [Delete]
KYUB My New Project ...	07/12/20...	[Download] [Delete]
kerf strip.svg	07/12/20...	[Download] [Delete]
KYUB My New Project (...	07/12/20...	[Download] [Delete]
KYUB My New Project (...	07/12/20...	[Download] [Delete]
KYUB My New Project (...	07/12/20...	[Download] [Delete]
KYUB My New Project (...	07/12/20...	[Download] [Delete]
New design 4110	07/12/20...	[Download] [Delete]

By file dialog, or



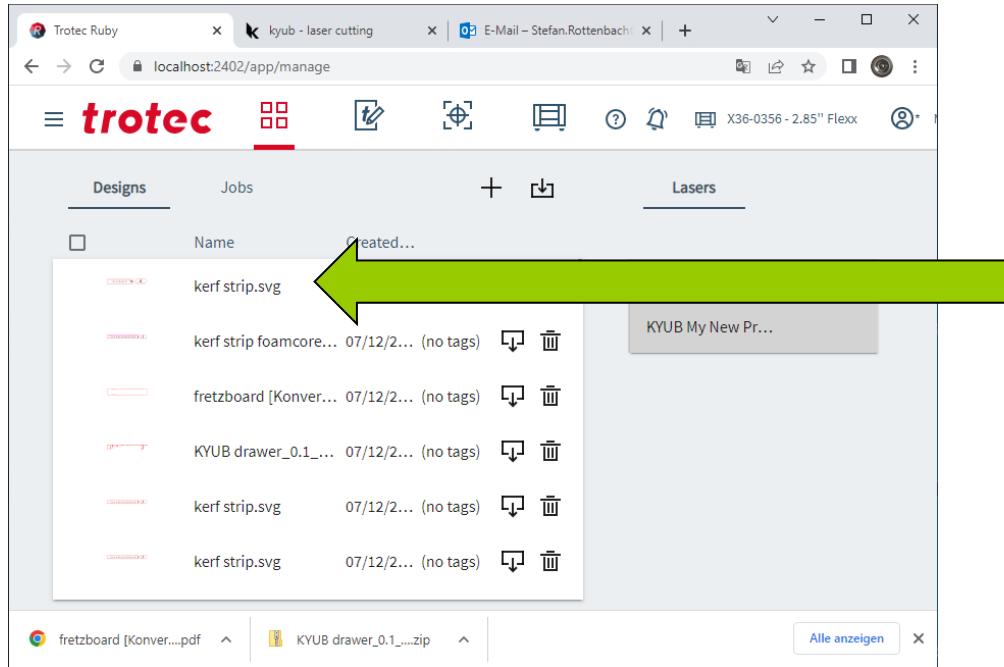
Drag and drop

Working with Ruby



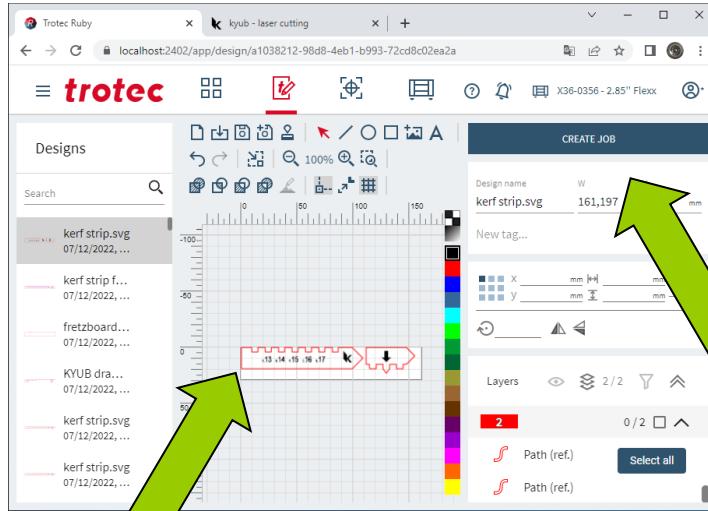
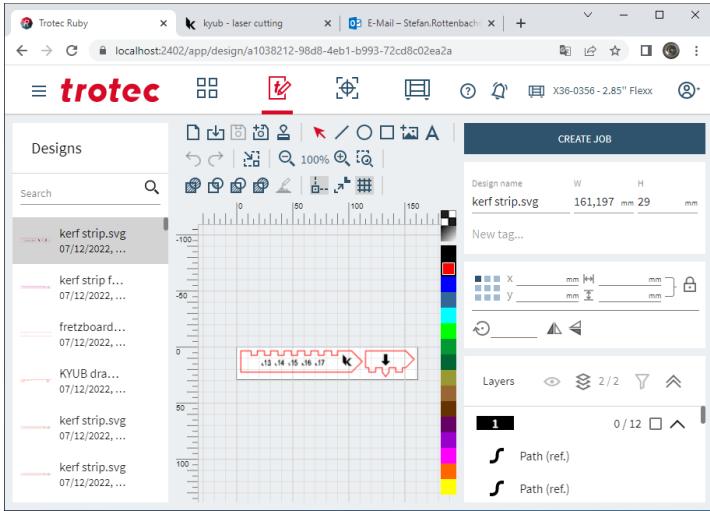
Dragging from a doubleclicked KYUB export zip file wont work.
Extract files first in order to drag them.

Working with Ruby



Doubleclick file to move
to the next tab

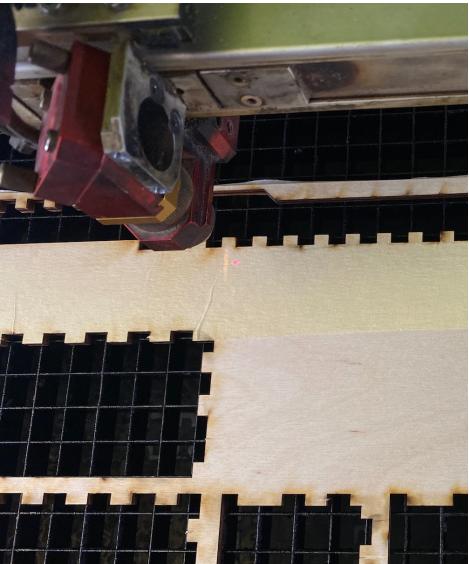
Working with Ruby



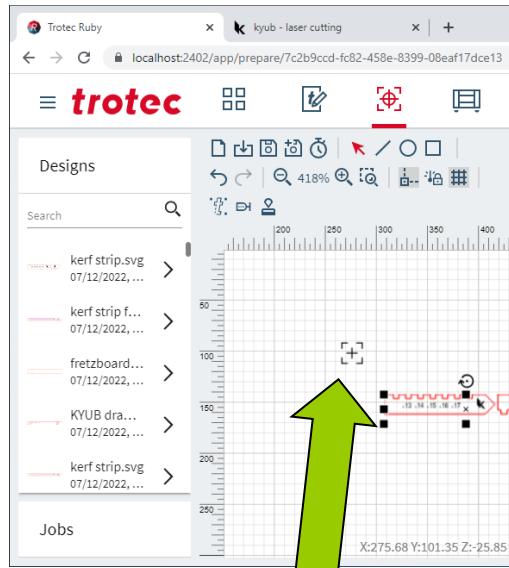
For precise alignment it's usefull
to move the file to the artboard boundary

After arranging press
„create job“

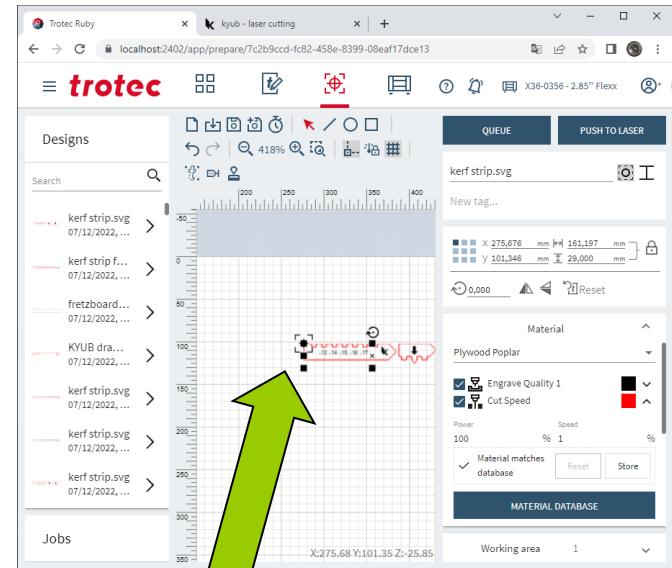
Working with Ruby



Move laser (red dot) to desired cutting area

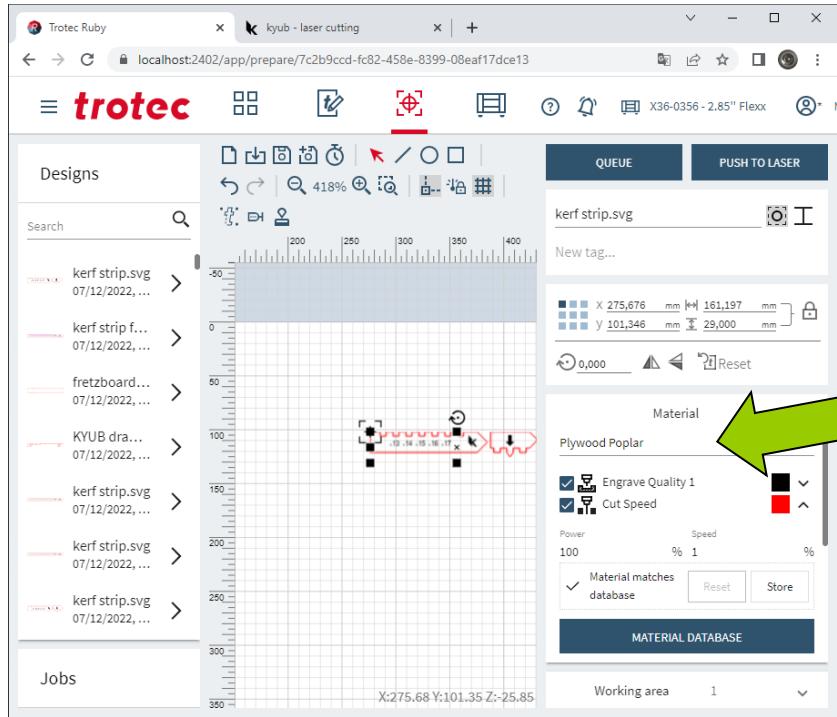


Crosshair represents
position of laser



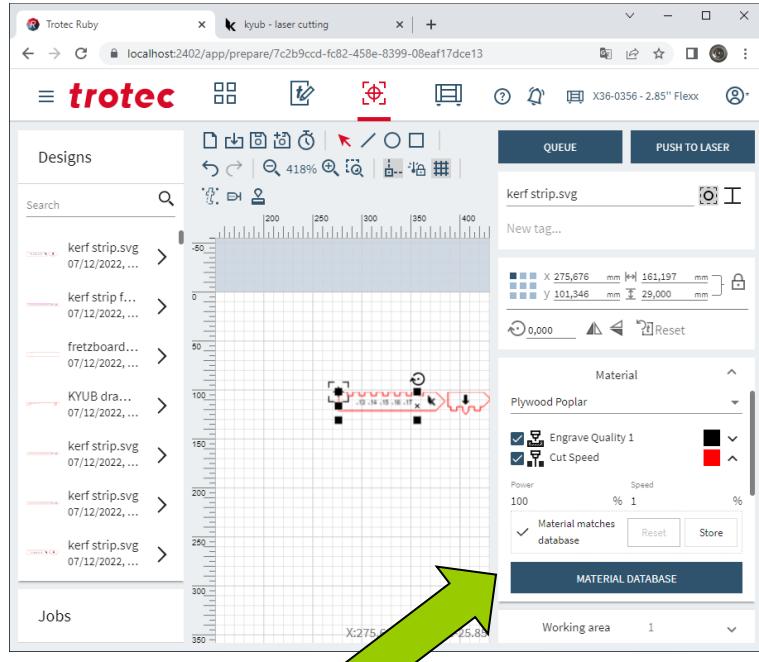
Align file with crosshair
(magnetic snap)

Working with Ruby

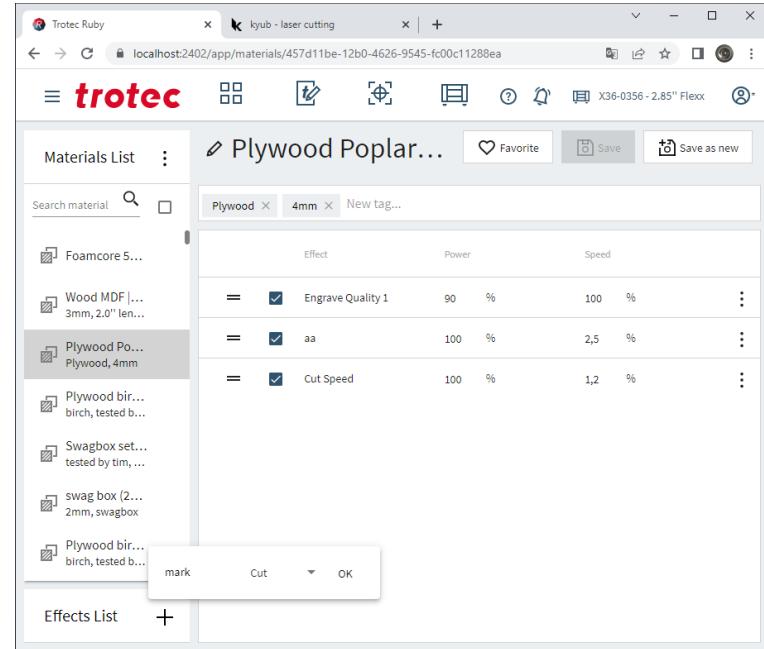


Select material here,
edit settings if needed

Working with Ruby

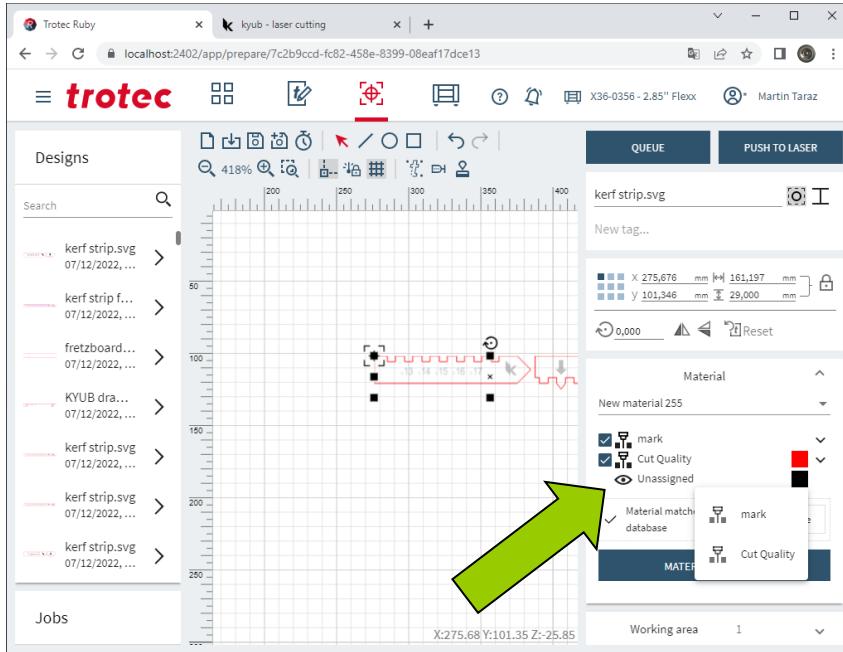


For all editing options jump to „material database“

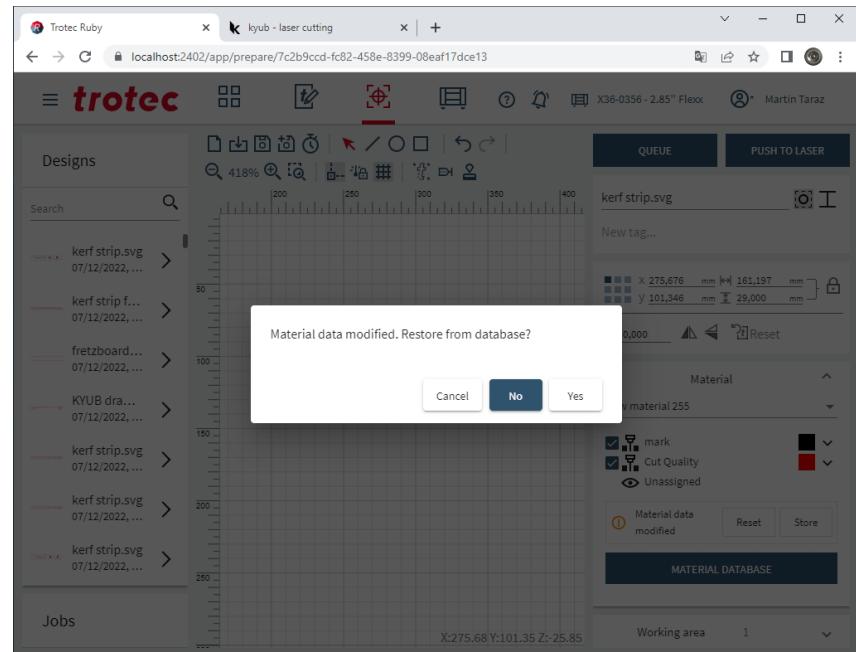


Here you can save new materials and rename them

Working with Ruby

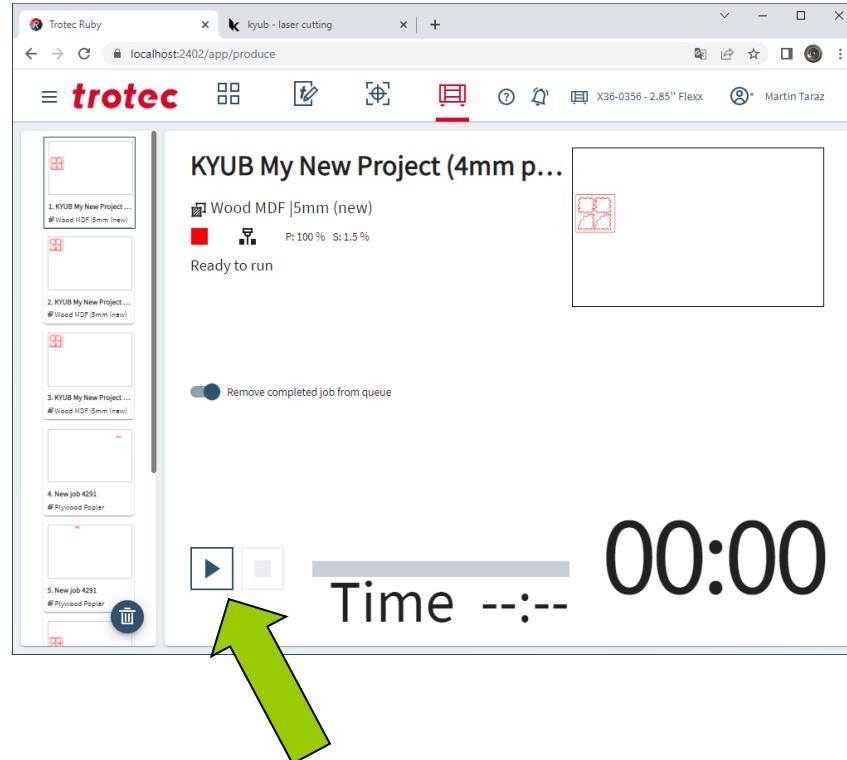


Assign colors to the predefined process here (right click on color)



If you made changes do not restore the defaults from database

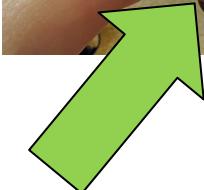
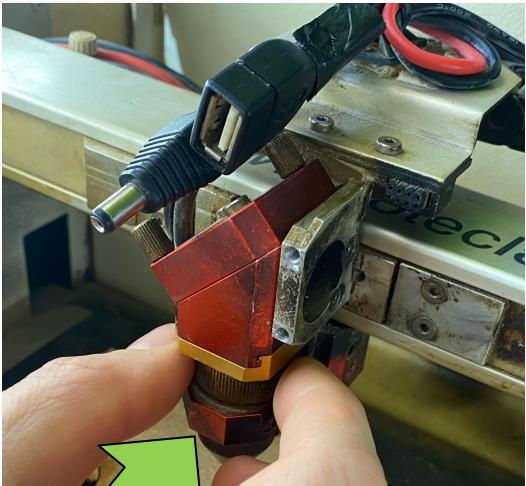
Working with Ruby



You reached the final tab,
Hit play to cut!

Laser
maintenance

Before cutting: Check lens & clean if required



- 1) Unscrew below lens,
- 2) Remove lens and check



3) it's dirty



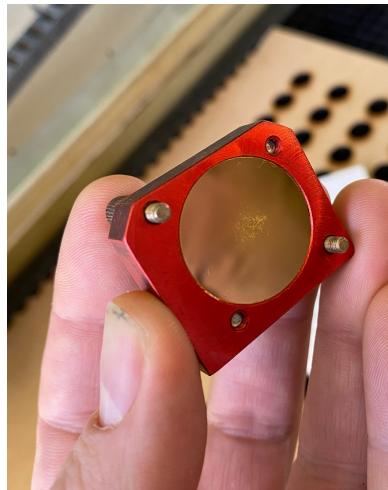
- 4) Apply 1 drop of cleaning fluid
- 5) Gently wipe with lens cleaning paper
- 6) insert lens and screw **tightly**



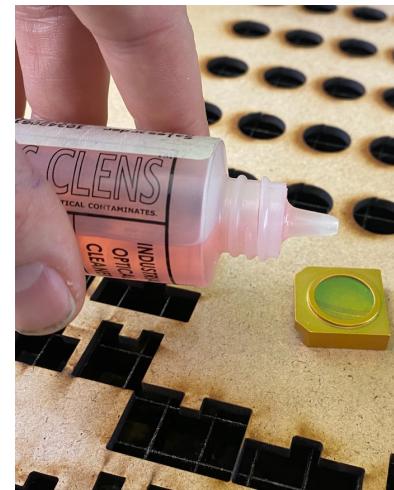
Before cutting: Check mirror & clean if required



- 1) Unscrew mirror
- 2) Remove mirror and check



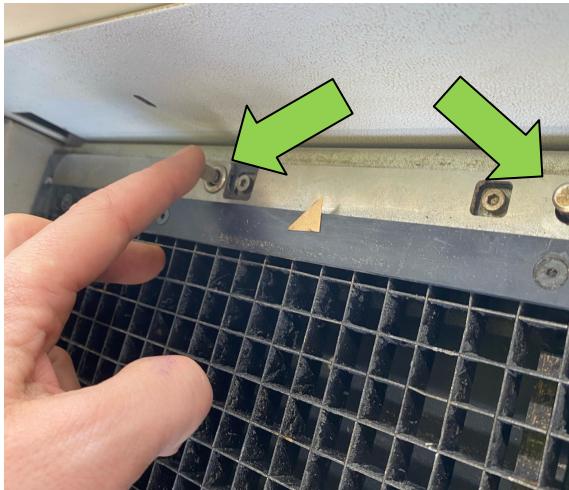
3) it's dirty



- 4) Apply 1 drop of cleaning fluid
- 5) Gently wipe with lens cleaning paper



Clean work table / remove grid



- 1) Move x-carriage to top
- 2) Click locking bolts to open
- 3) Remove **carefully**,
do **not** hit the lens unit



- 4) Clean table with handbrush or vacuum.
It's important to do it regularly because leftovers can easily burn.