

# Laser Cutter Induction

Dan Cook



# What is a laser cutter?

- Motorised mirror on an X,Y axis
- 100W Carbon Dioxide Laser
- Infrared
- Follows VECTOR line work
- Can cut paper, card, wood, acrylic
- Metal can be etched only
- Wood must be check with the supervisor first.

# Is it dangerous?

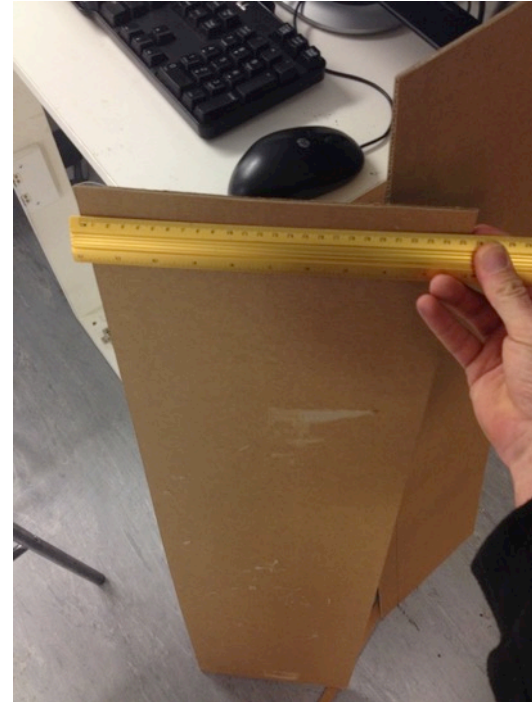
- Yes.
- Fire Danger
- Laser Radiation
  - Burns
  - Blindness
- Safety Interlocks
- No user serviceable parts

# Before you start

- Ask the supervisor to use the laser cutter
- Specify the material you want to cut... And the size.
- You will need to ask the supervisor to get a **HOT WORK PERMIT.**
- No cutting can be done until the hot work permit is in place.
- To stop the machine: Press the pause button or simply lift the lid...



# Measure Twice, Cut Once!



You know the size of your design, yes? You'll need it!

Today we are cutting  $\frac{1}{2}$  A4 size – **148.5mm x 210mm in 4.5mm card**

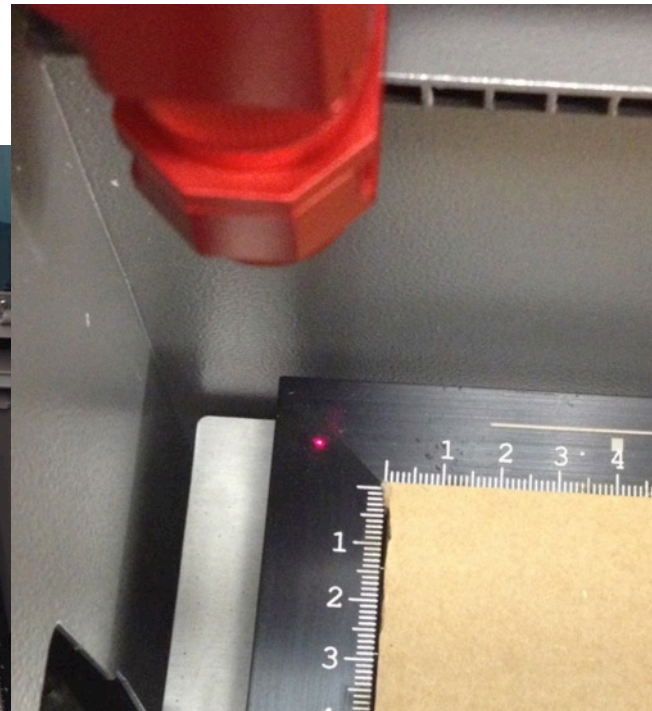
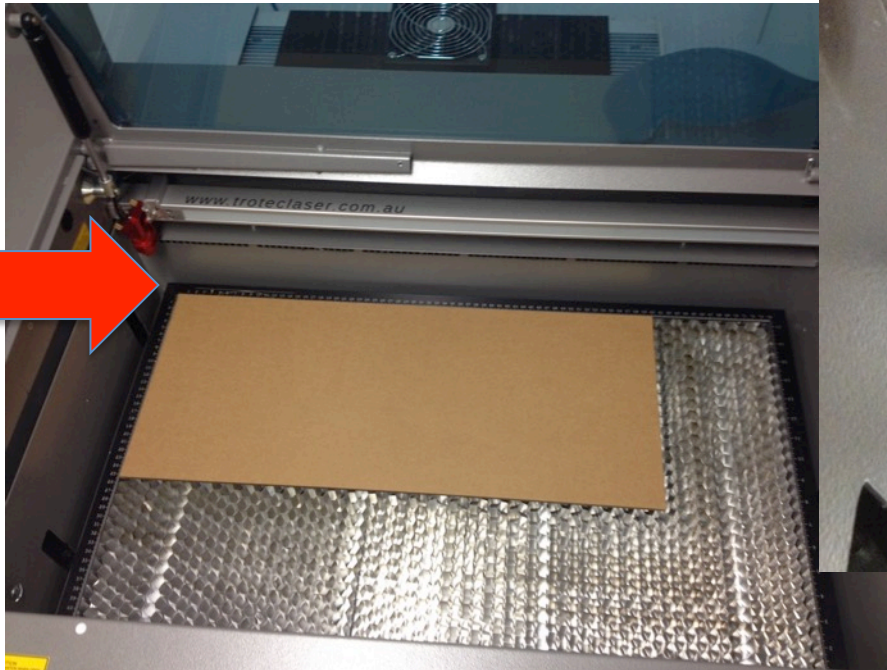
It is critical that you know both the material thickness and the size of your material. Find out. Write it down.

# Inside the machine...



# Let's start!

- Have the supervisor switch on the machine
- Place your material in the top left corner of the honeycomb.



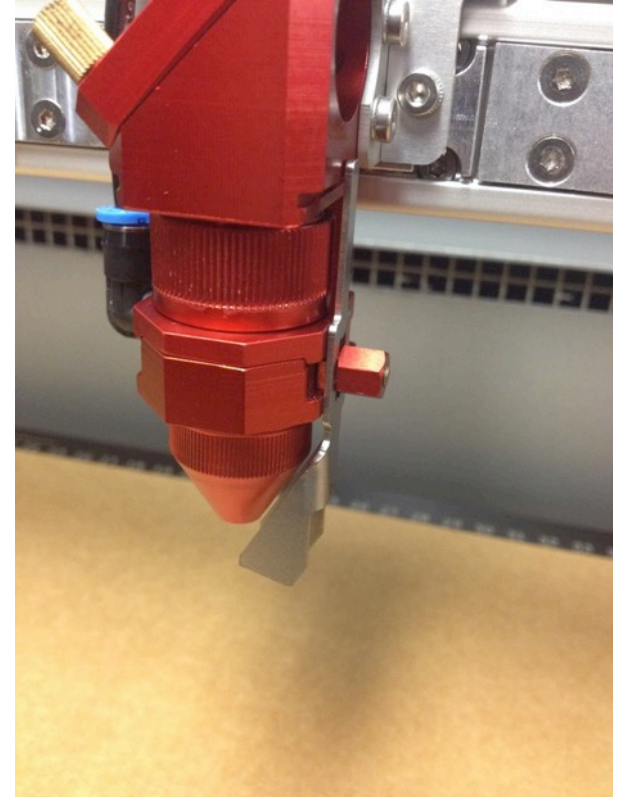
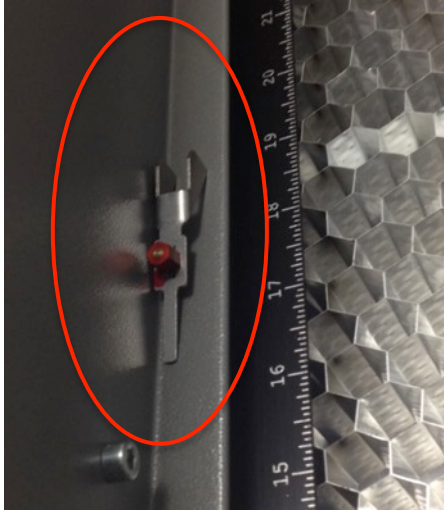


# Position the laser head



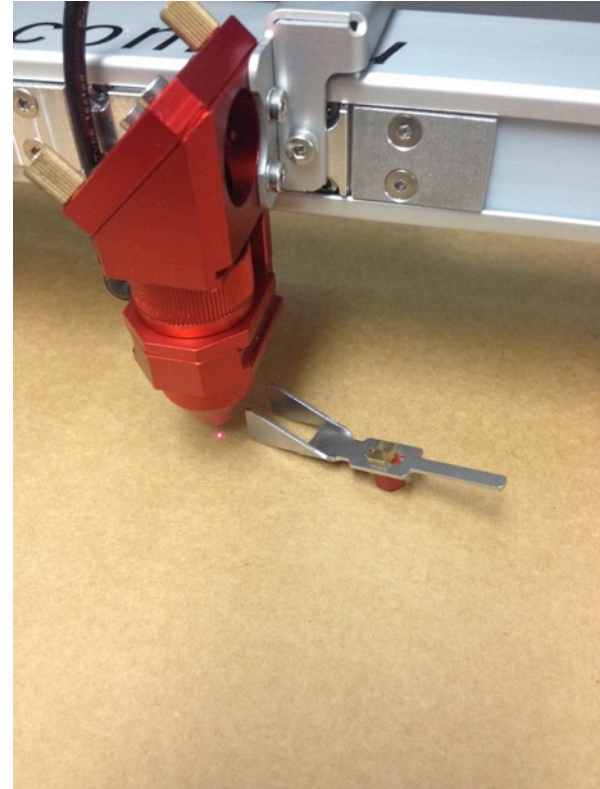
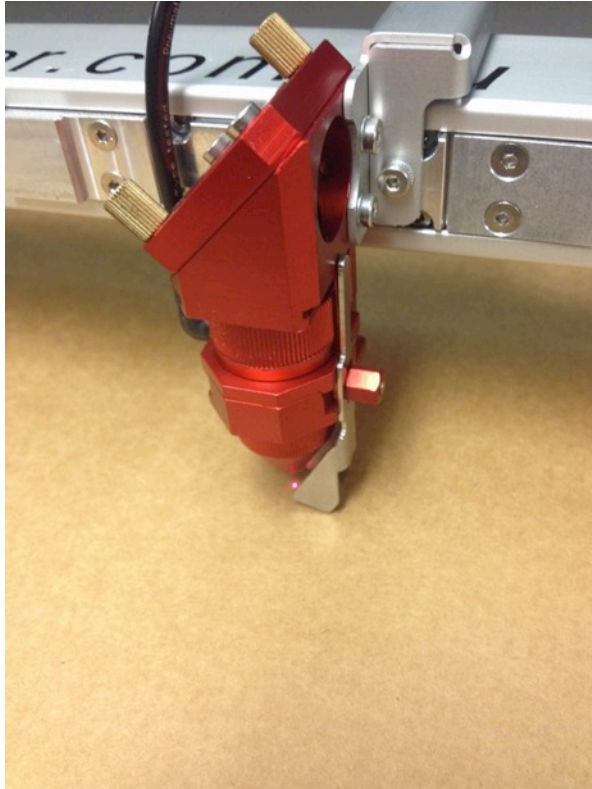


# Check the Focal Distance



Take the focus check device and place carefully into the channel on the side of the laser head... It'll balance there. Don't drop it!

# Raise the bed... Carefully...



As the bed approaches the head, use individual button clicks to move the bed up until it JUST touches the focus device, either knocking it off or causing it to move.



# Put it back where it lives!



Inside the front ledge of the machine!

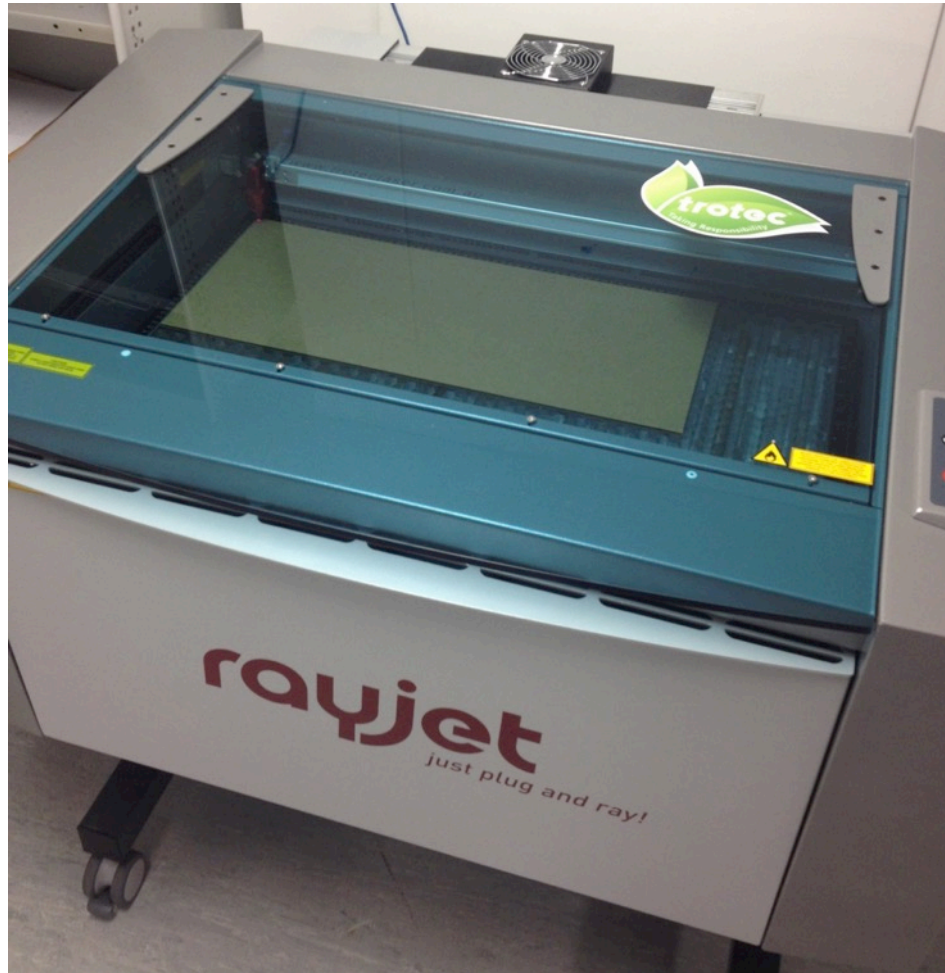
# Position the laser



Position the laser at the top left of the material to be cut.  
Do NOT adjust the height....



# Shut the lid



And move to the PC to setup the software

# Open Corel Draw



# Corel Draw

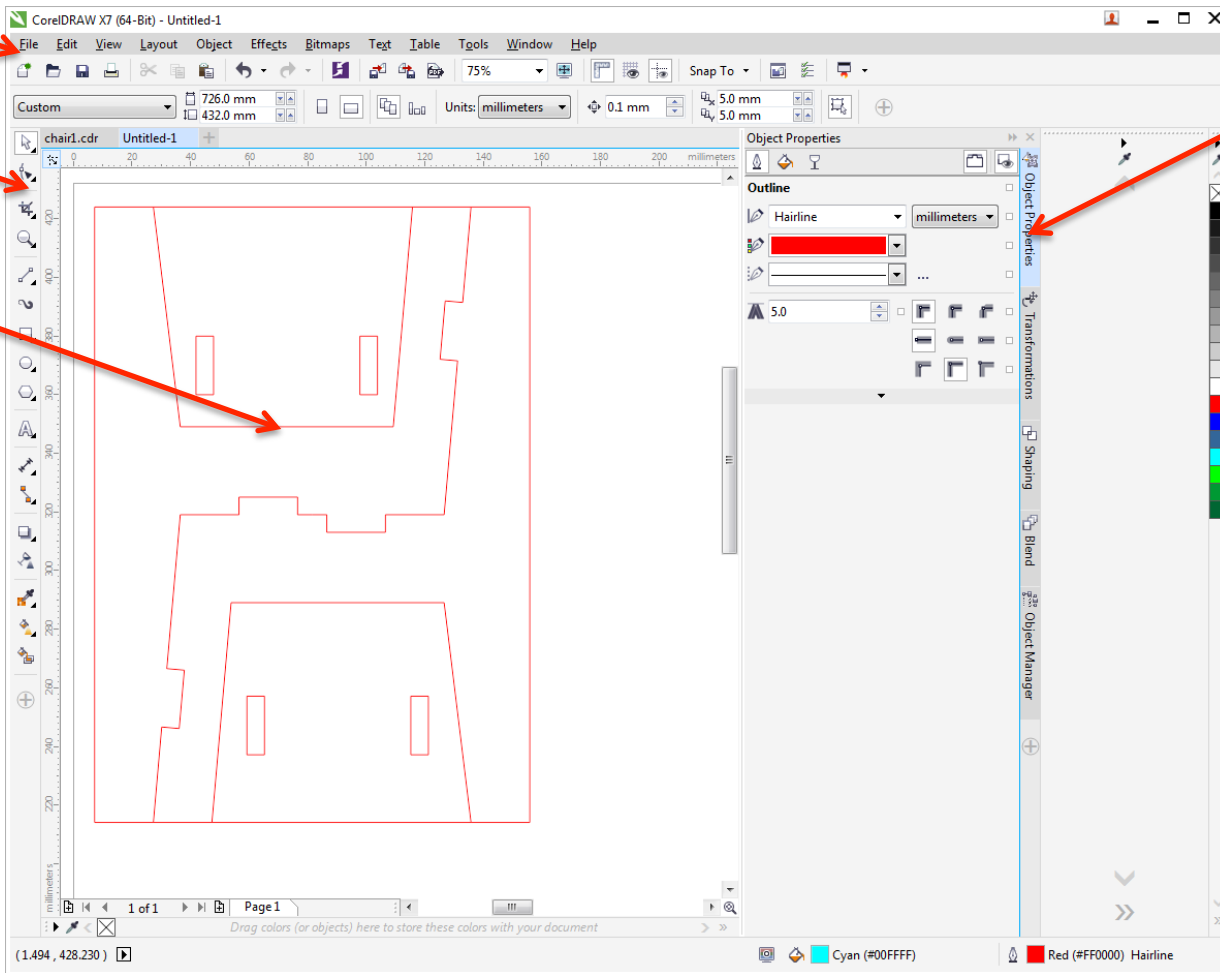
Menu bar

Tool bar

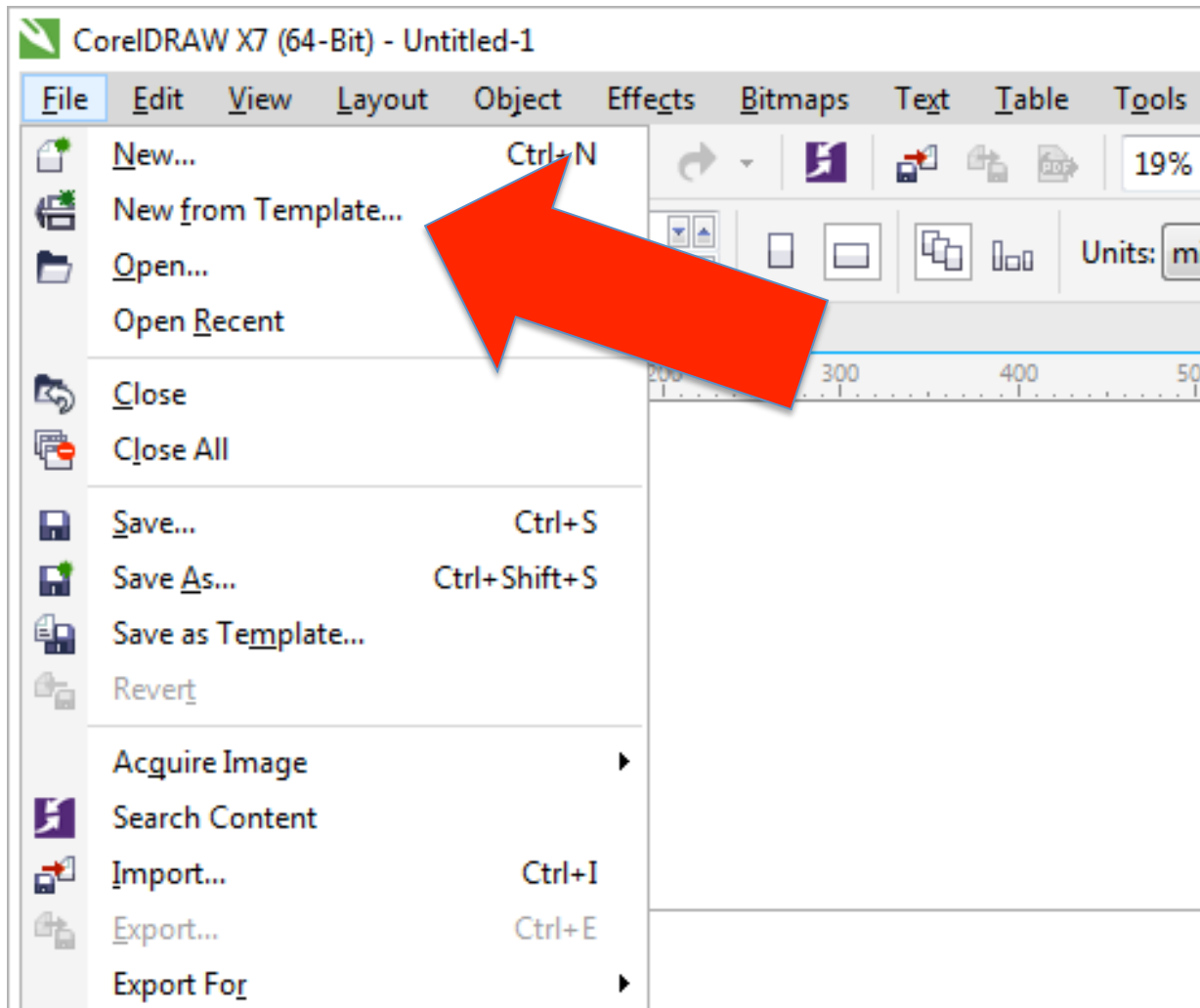
Workspace

Object Properties

Colour Palette

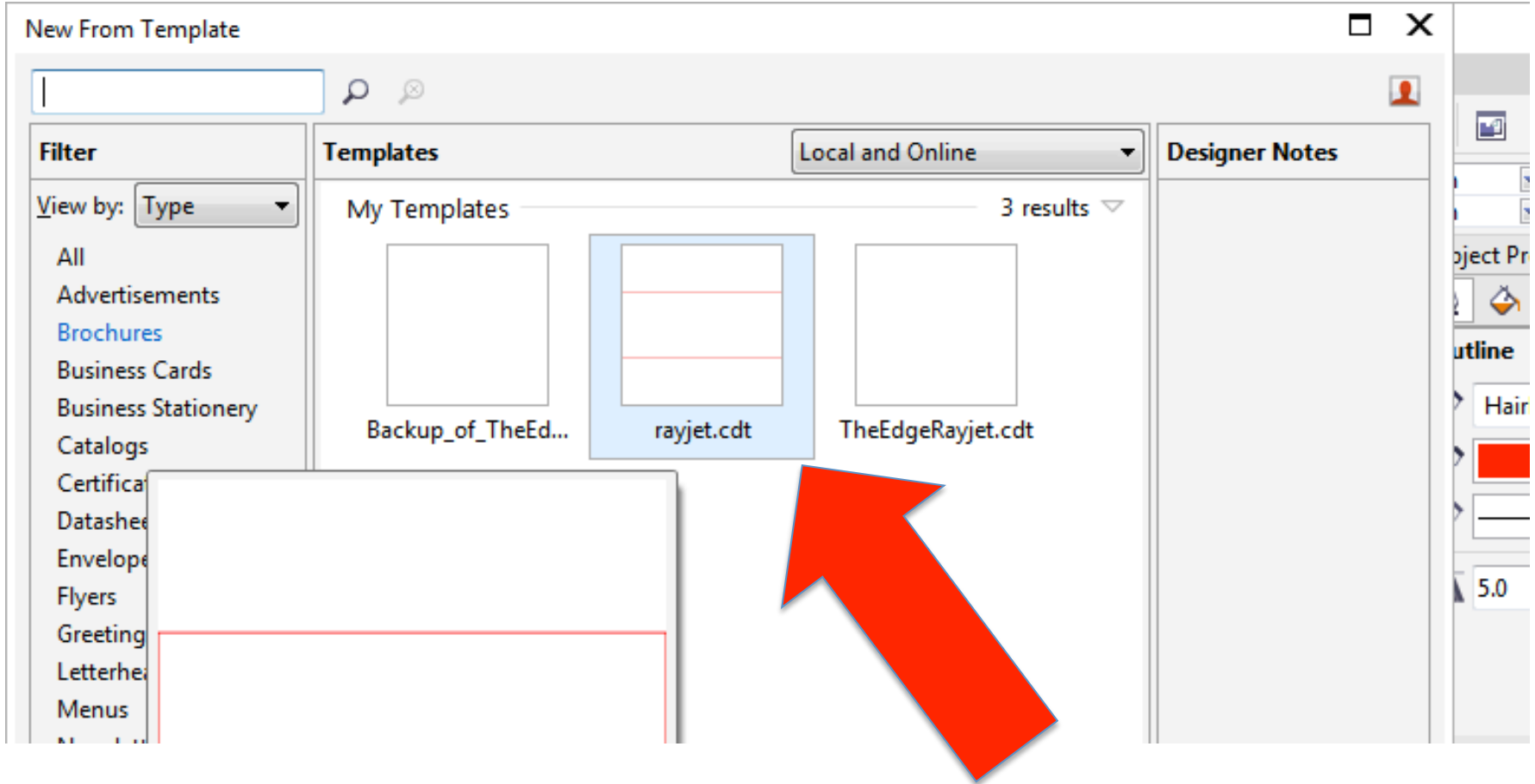


# Select File > 'New From Template'

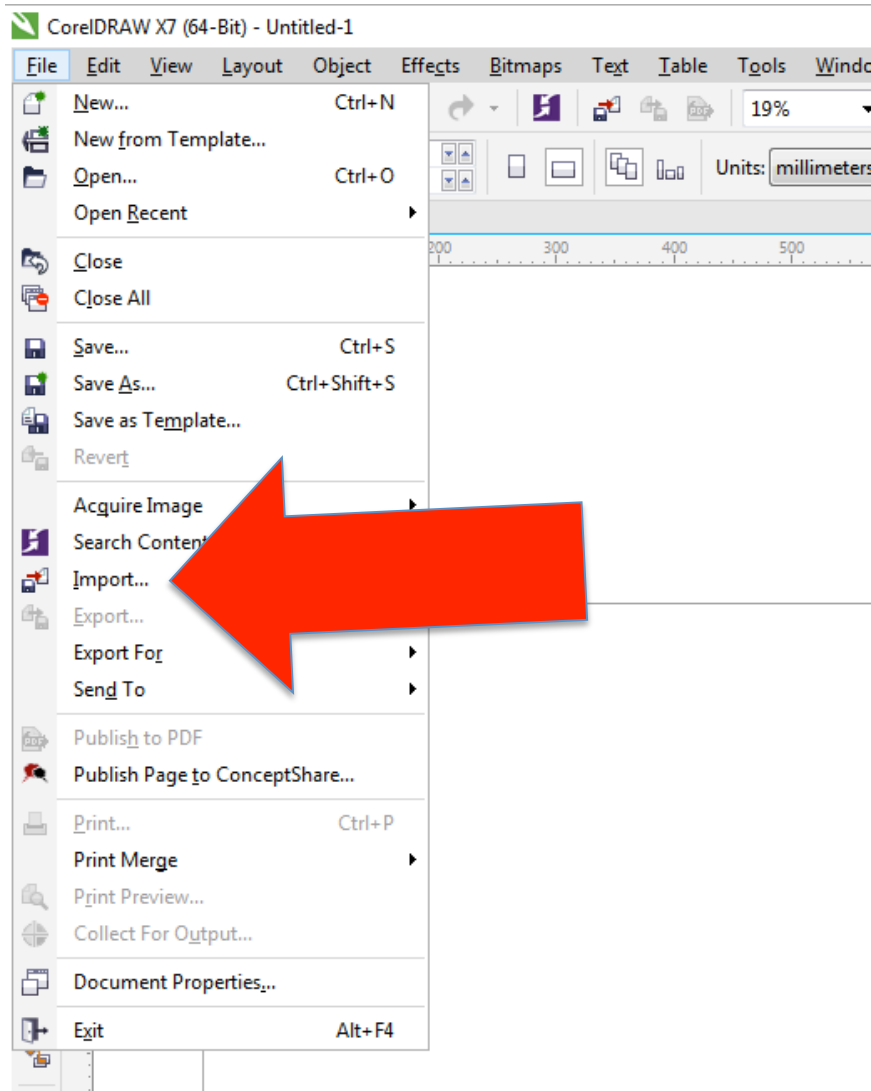




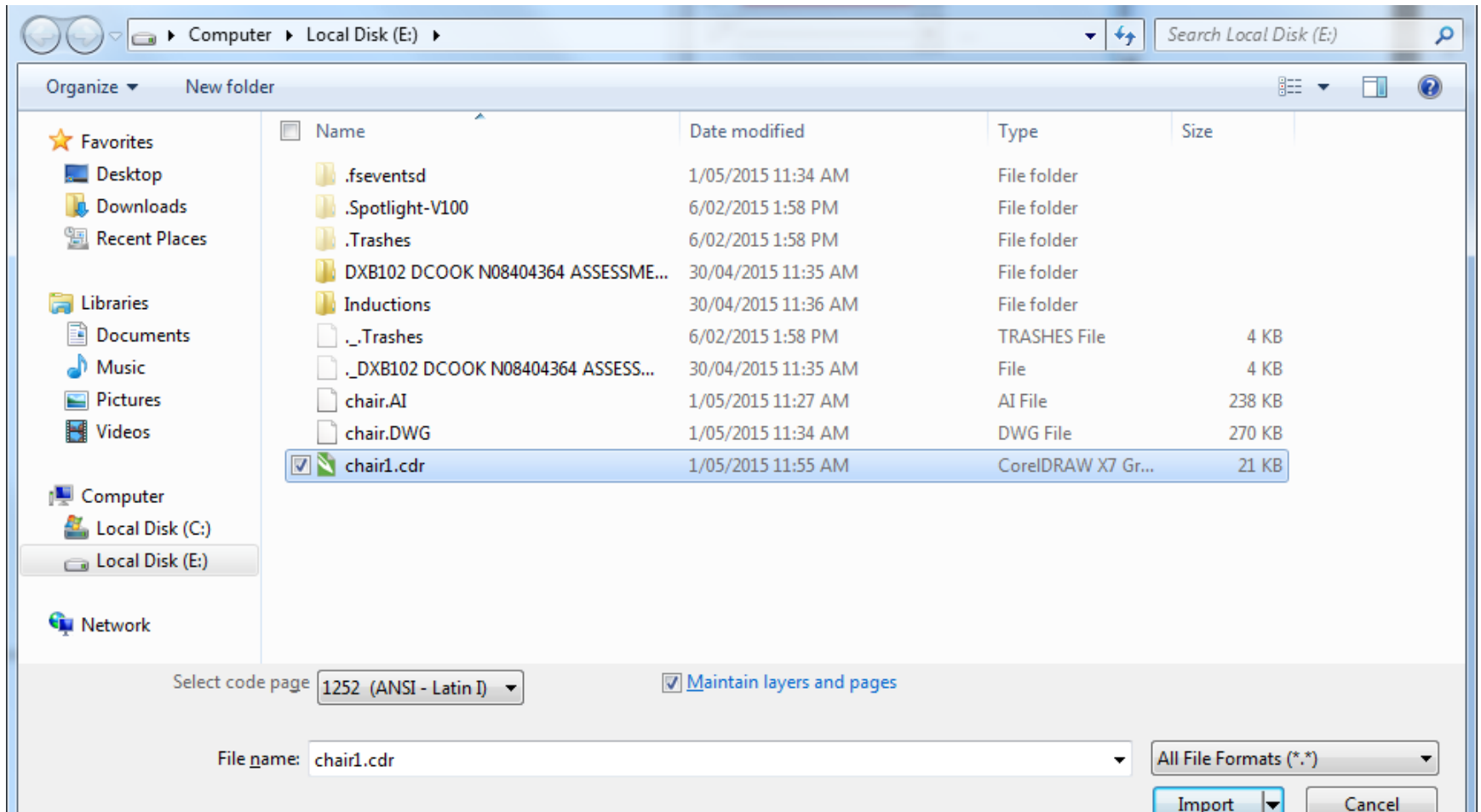
# Choose 'rayjet.cdt' Template



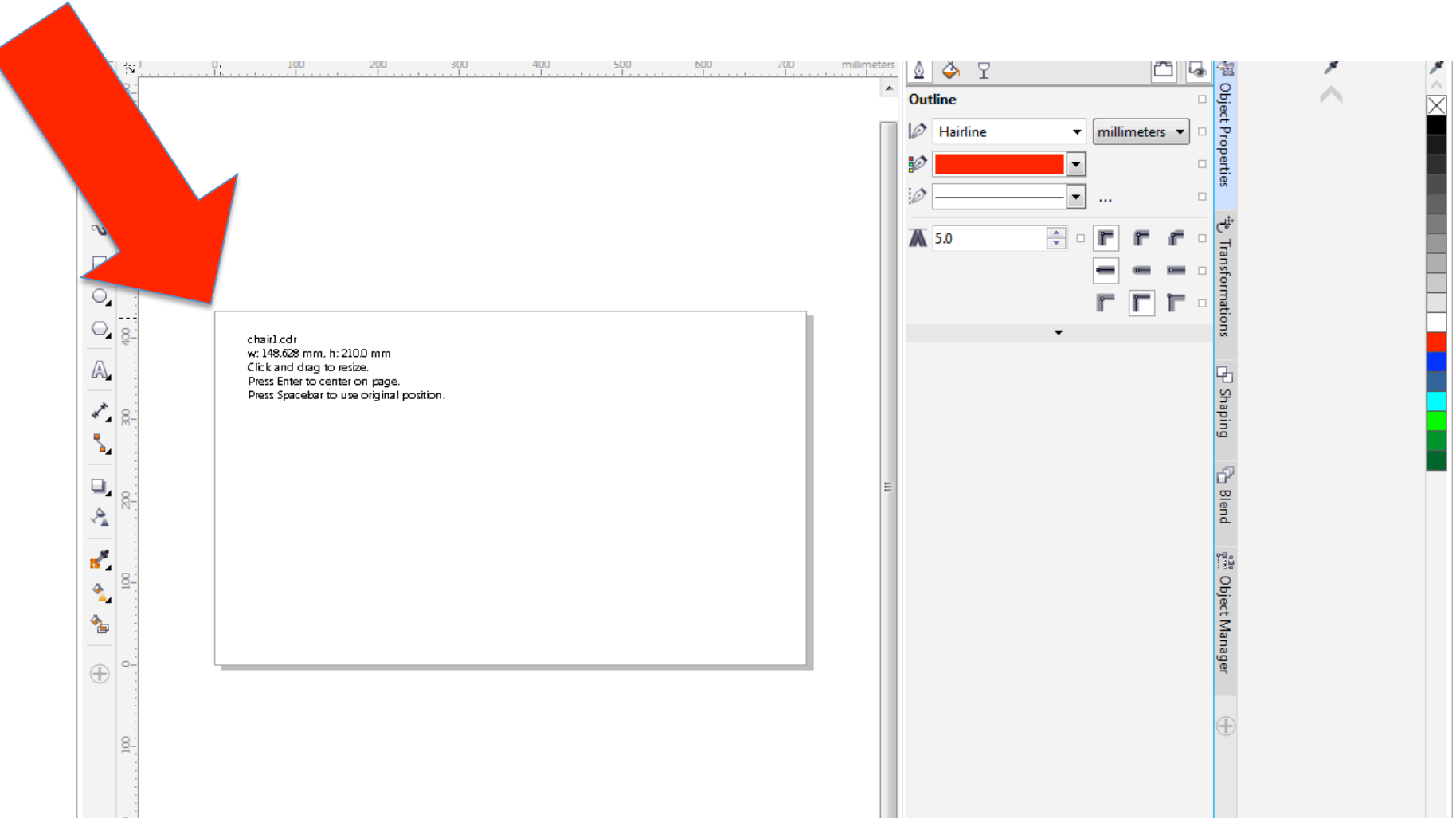
# File > Import



# Select your file...

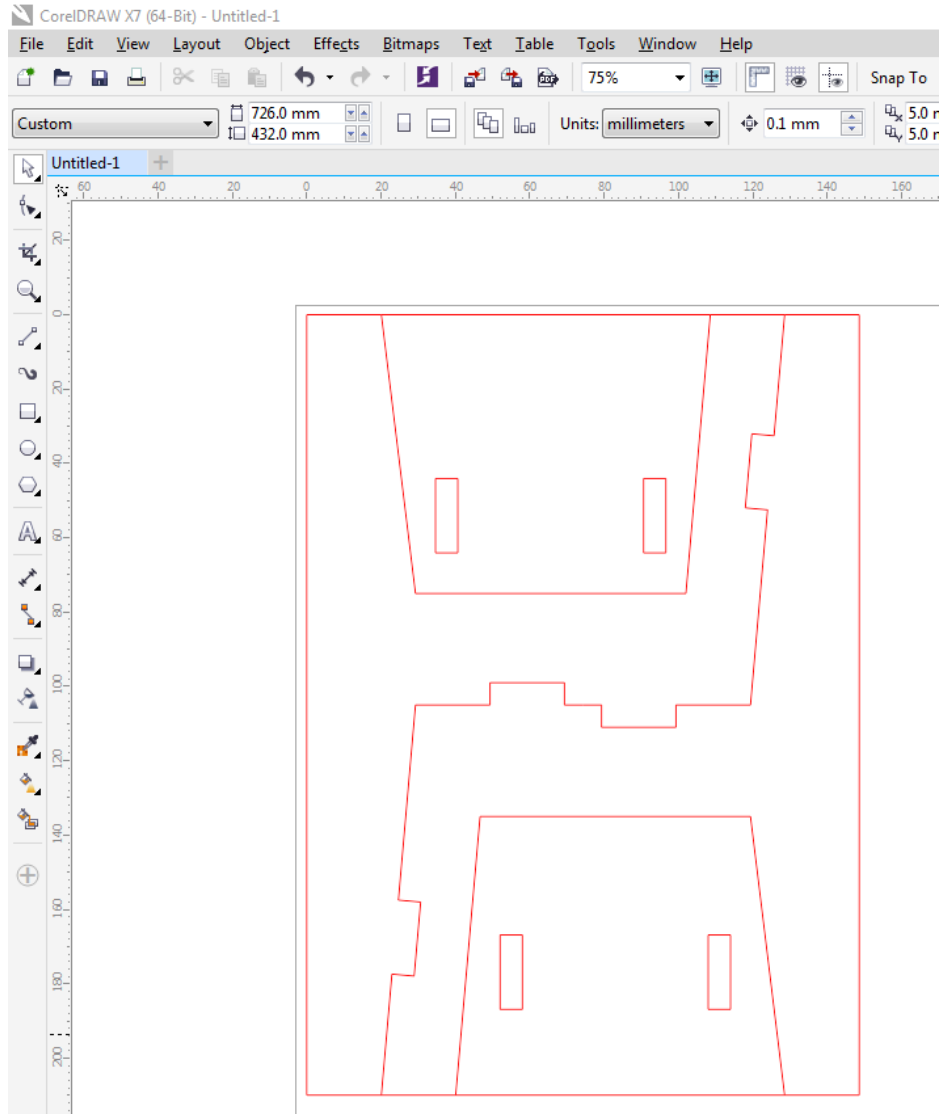


# Place the file in the top left corner

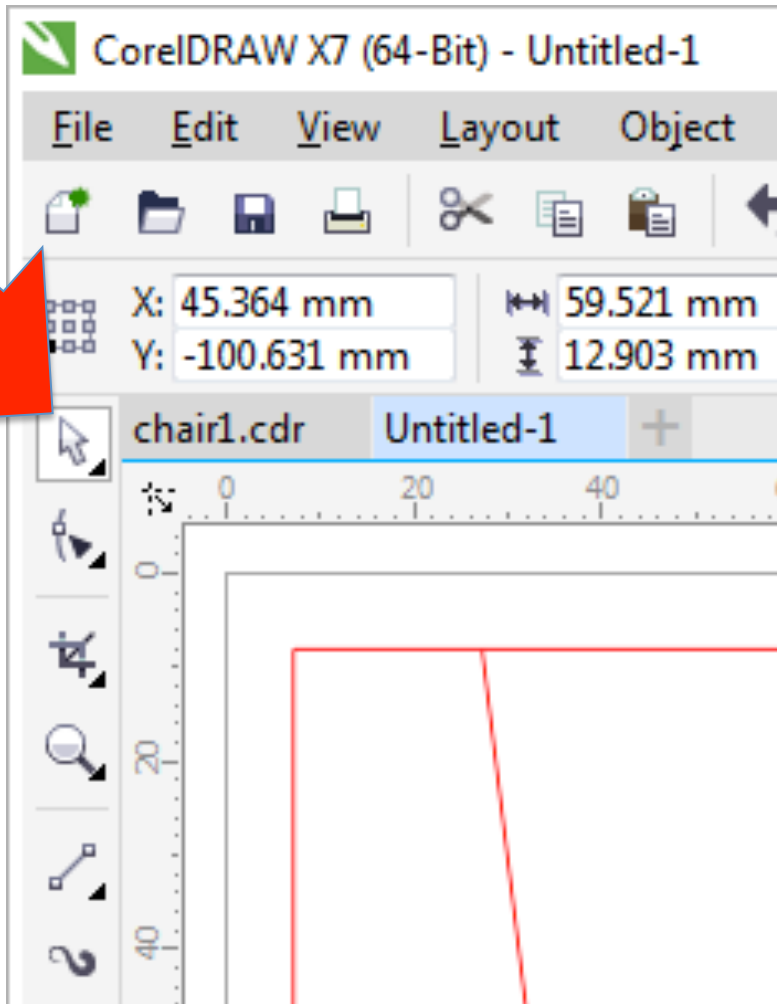




# File is imported



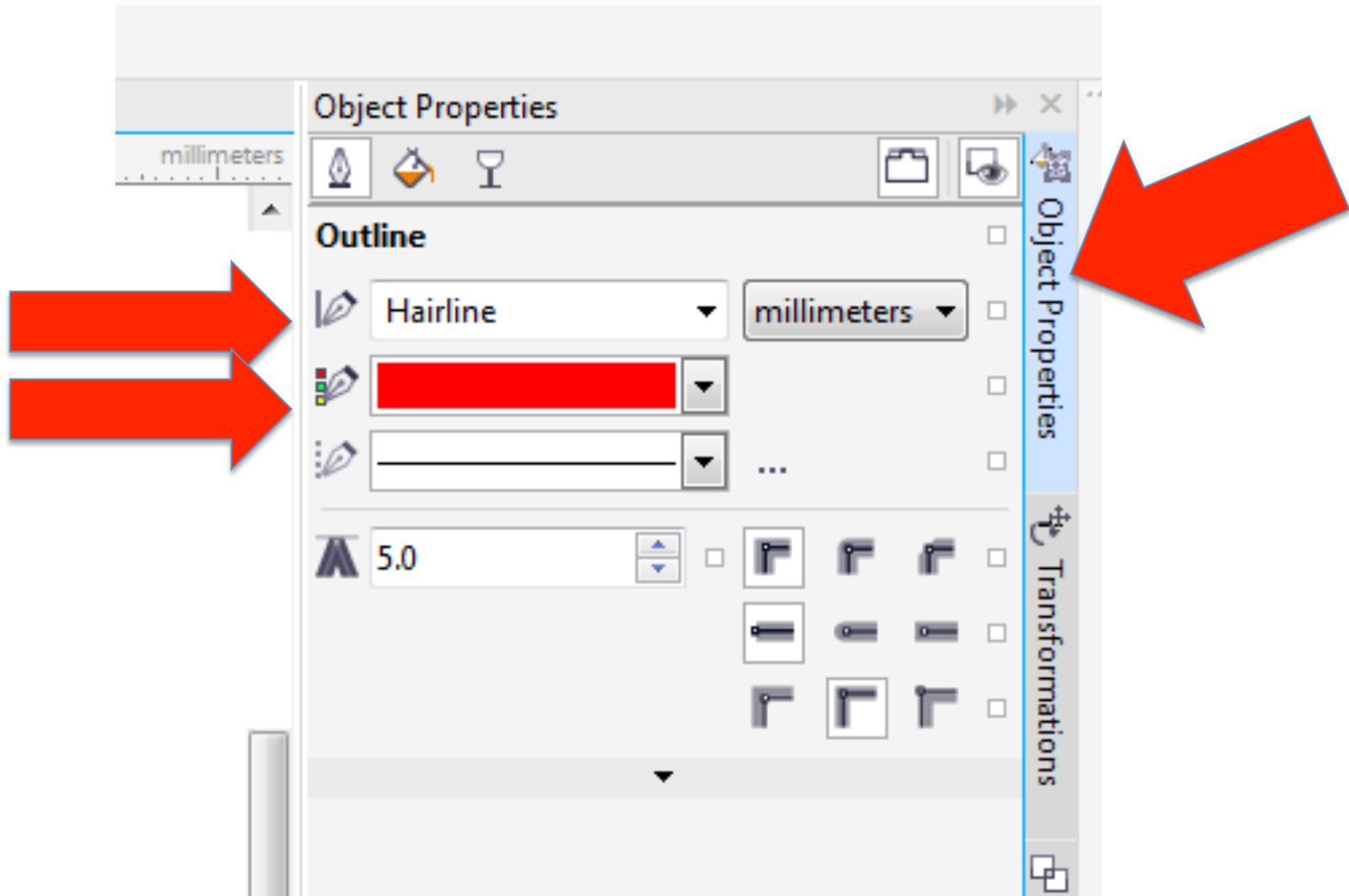
# Use the selection arrow



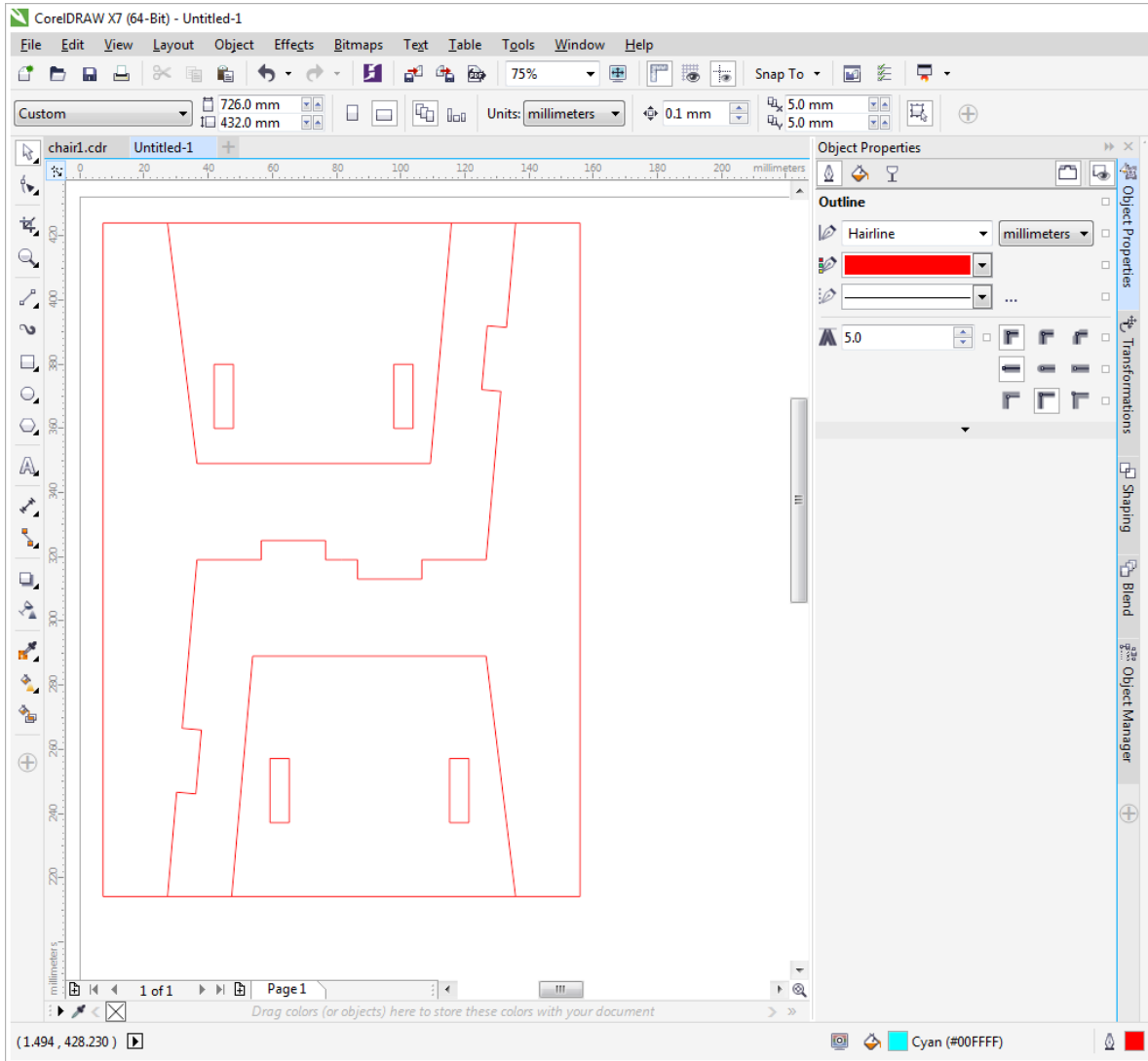
This is used to select items within the program.

Use it to select the entire image by click-dragging a box over it.

# Cut paths MUST have a RED Hairline



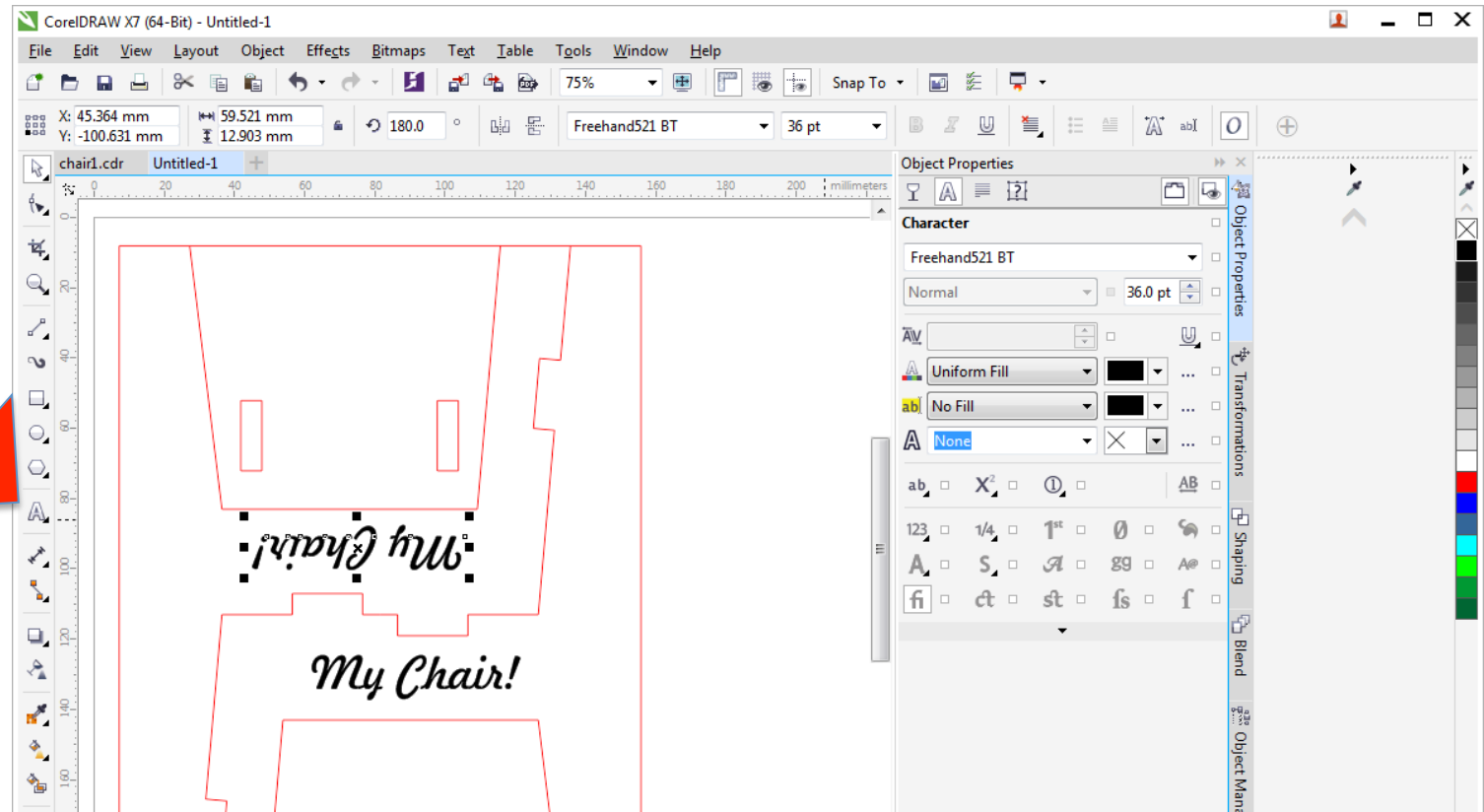
# Check all cut lines are ok



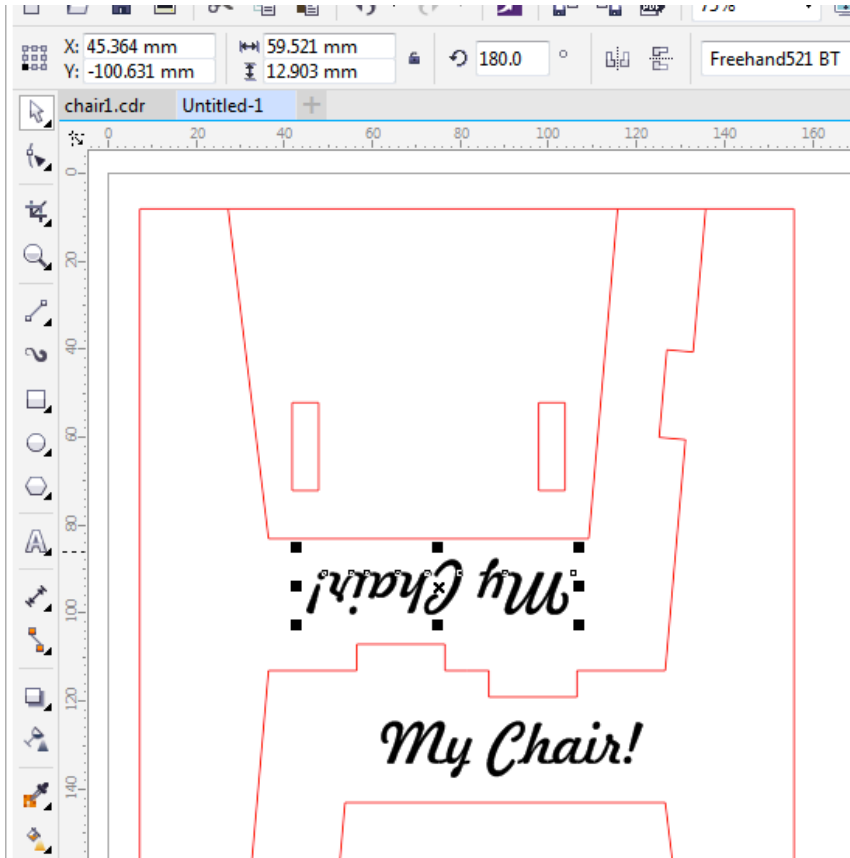
They should be a **RED**  
**HAIRLINE**



# Add some text



# Use your Colours!



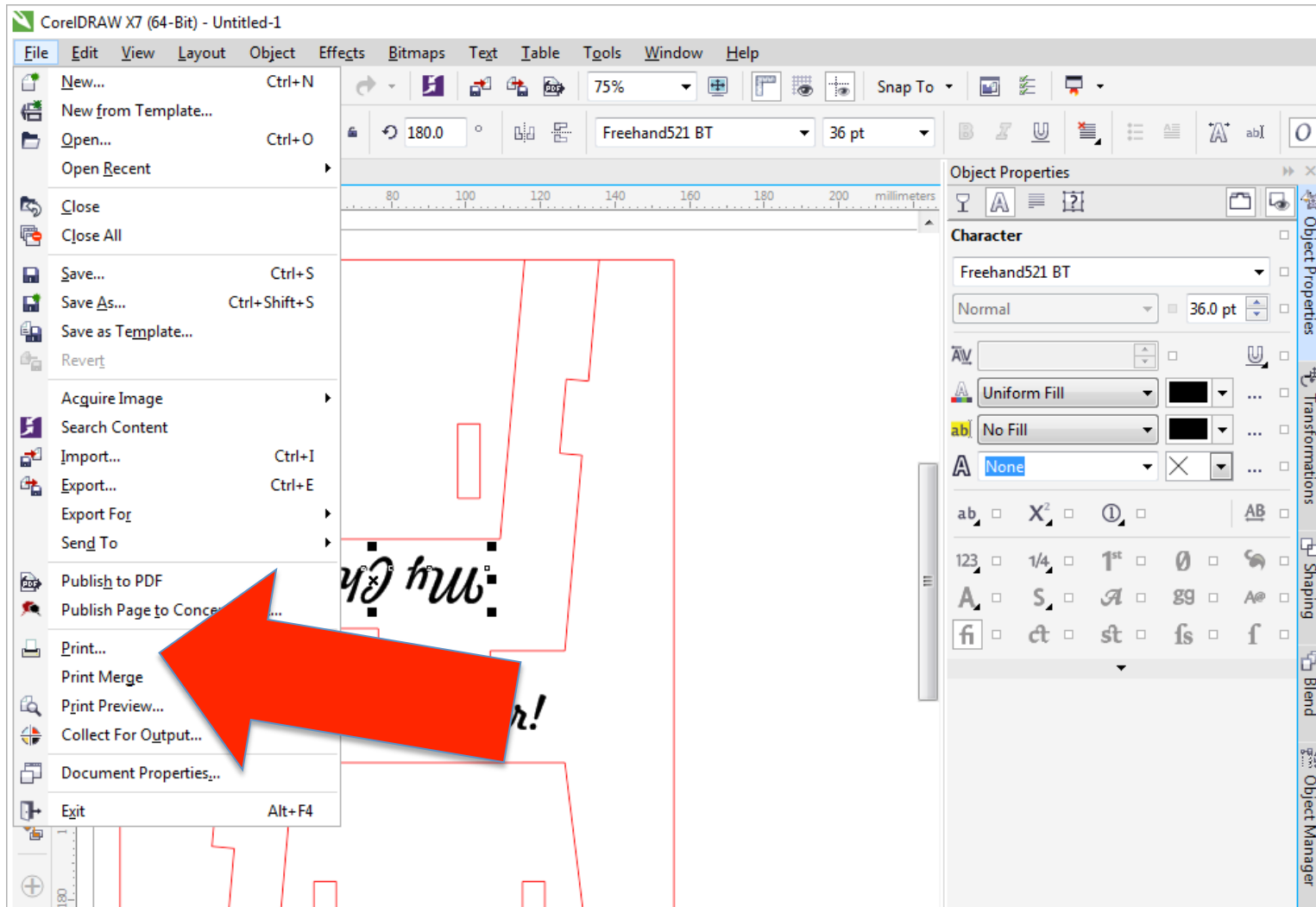
Colours can be used to set cut, engrave or cut orders

Red Hairline – Cut

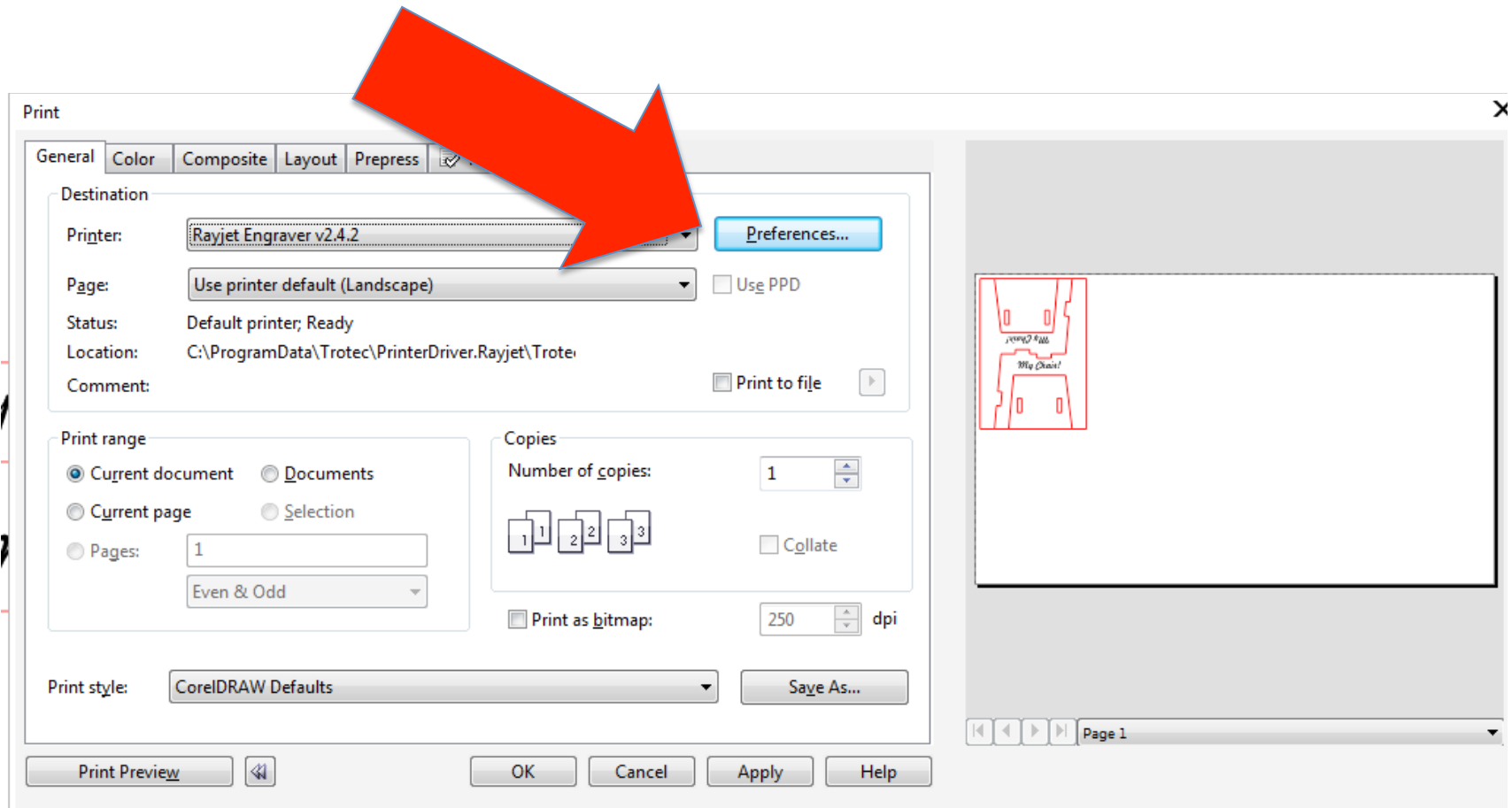
Engrave Power Setting Presets:

Colour	Red	Green	Blue
Red	255	0	0
Black	0	0	0
Blue	0	0	255
Desert Blue	51	102	153
Cyan	0	255	255
Green	0	255	0
Grass Green	0	153	51
Forest Green	0	102	51

# File > Print



# Go to Preferences First



# Setting up the Laser Cutter



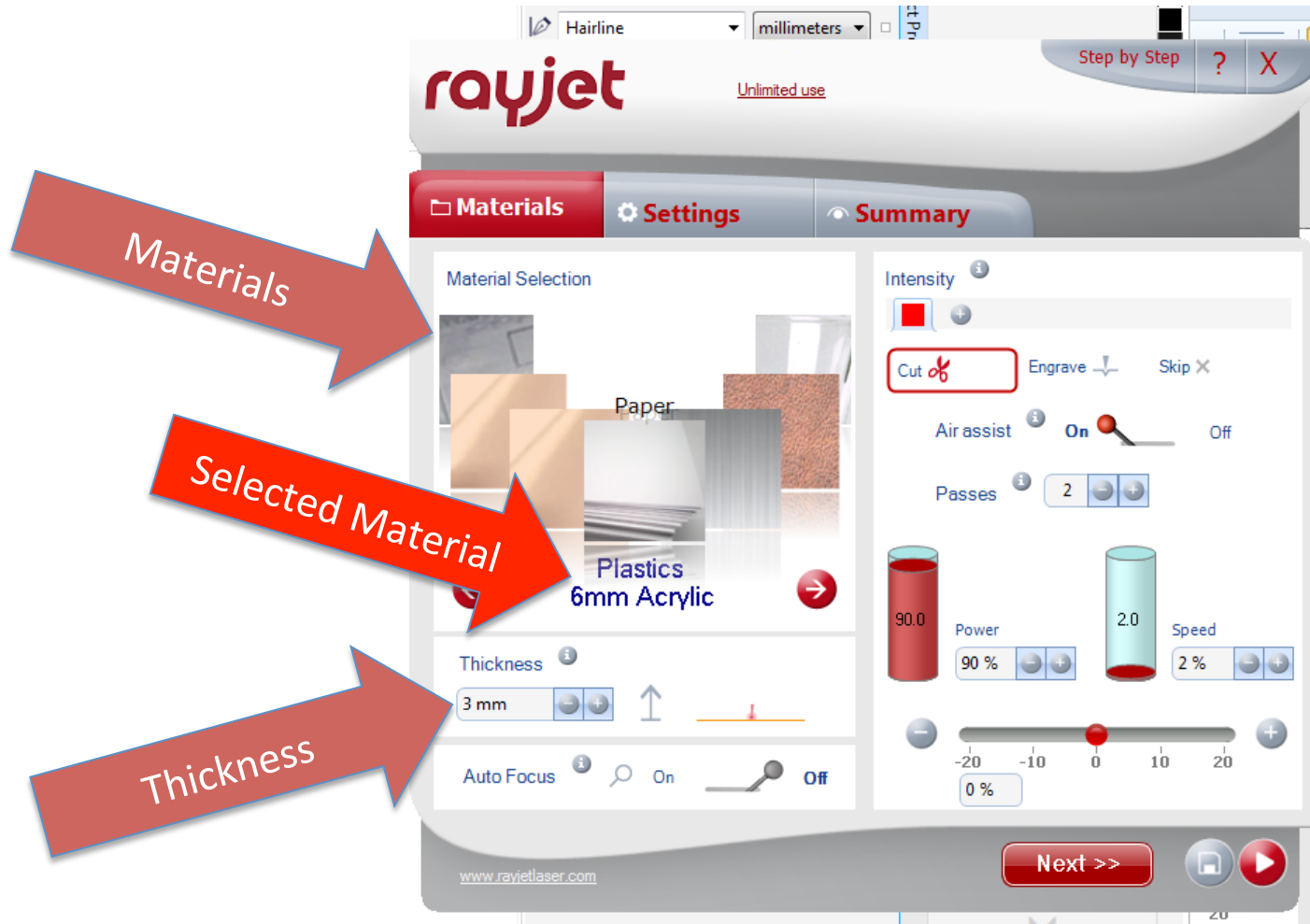
# Fire Or Fail!

- Beware!
- Incorrect settings will cause a fire...
- Or a print fail... And you still pay for the materials.

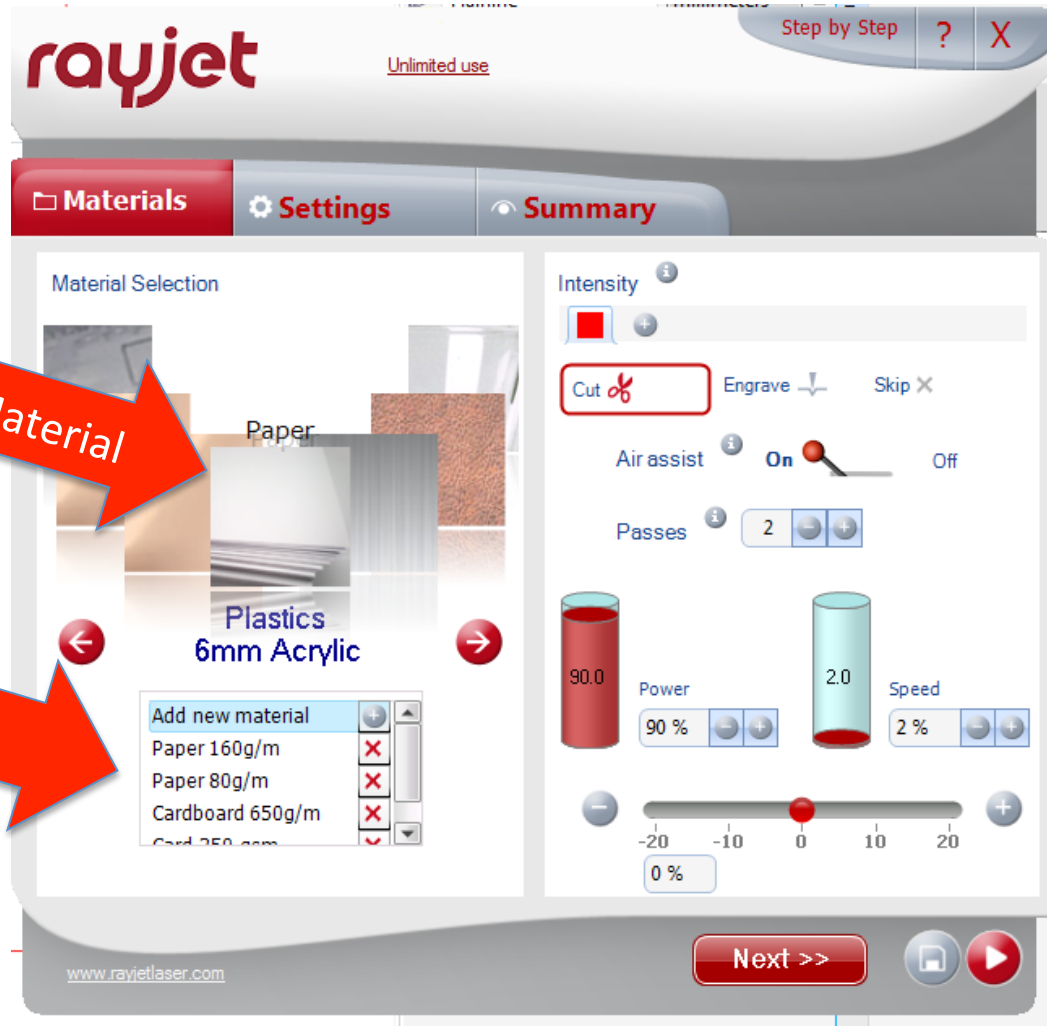




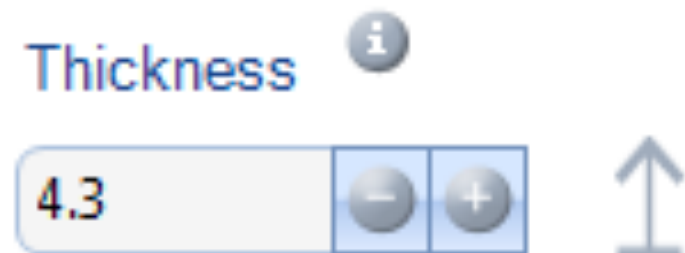
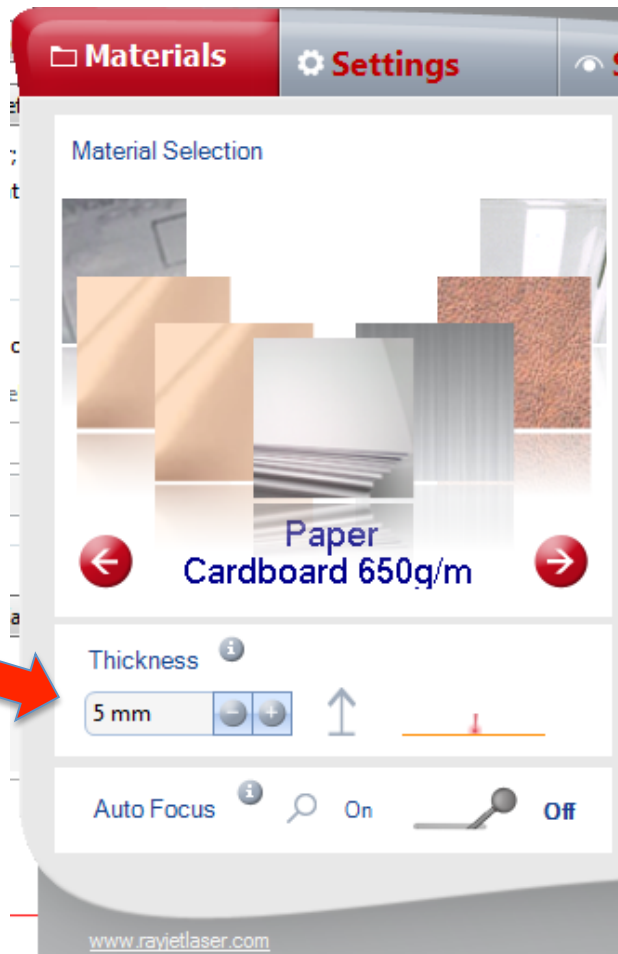
# Setting up the Configuration



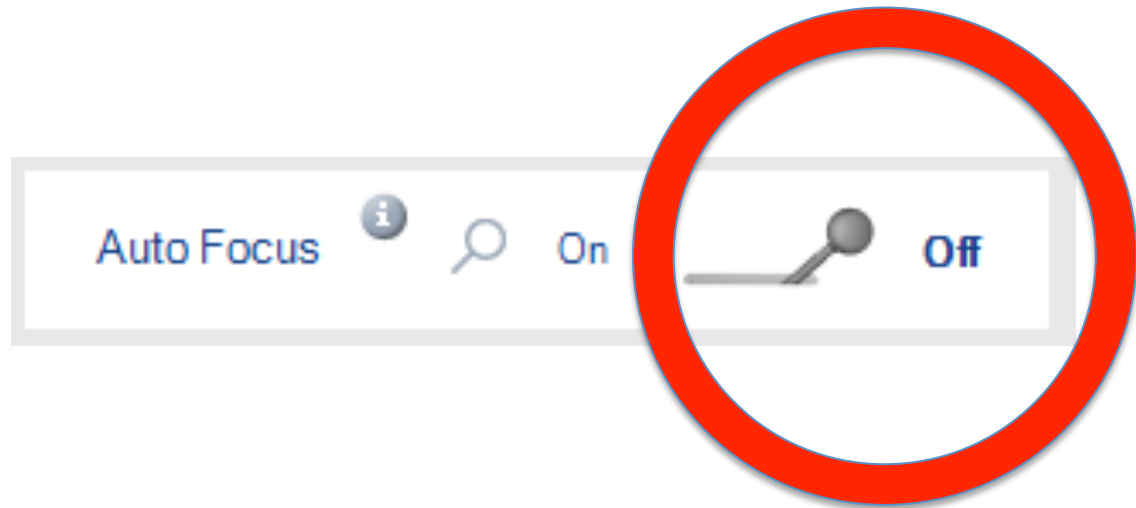
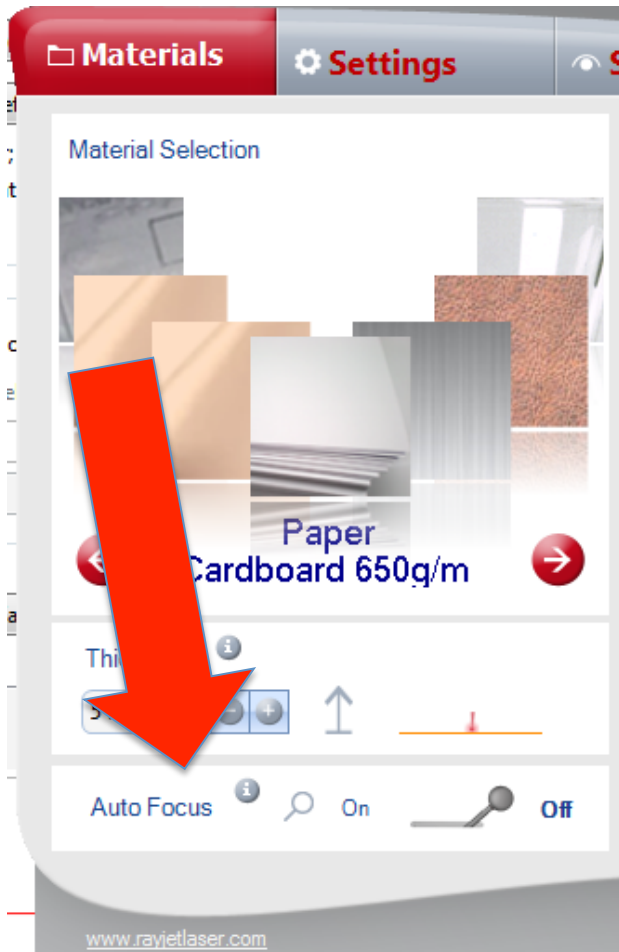
# Set the material



# Set the Thickness



# Auto Focus is **ALWAYS** off



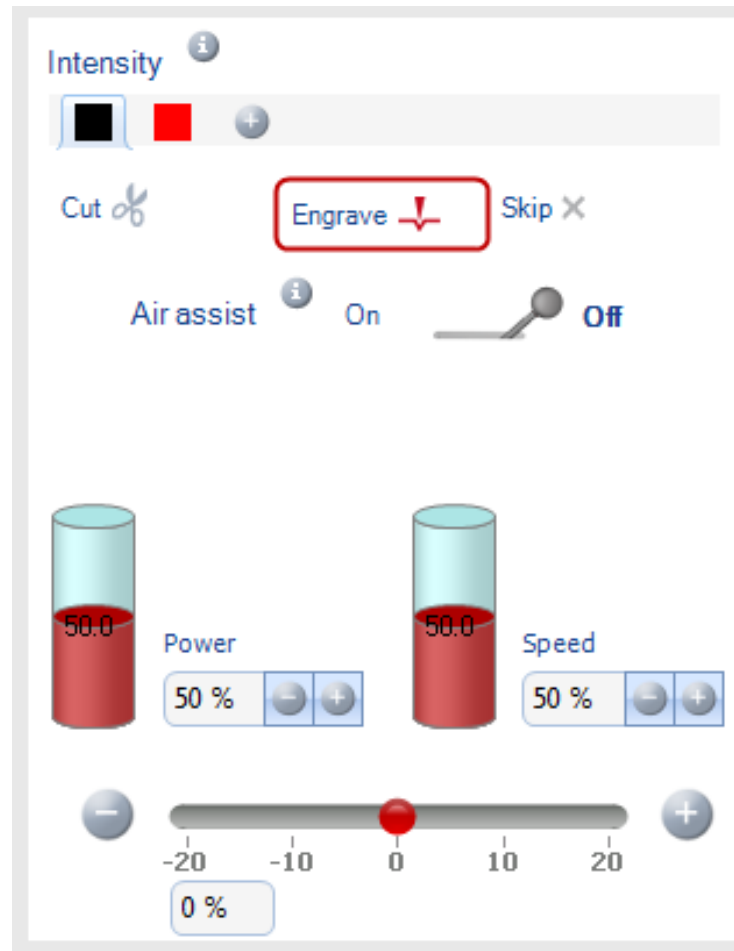
Why? This machine does not have a an auto focus system. Switching on this setting will cause a head crash. This is bad and will require a service technician to rectify.

# Setup the cut...

The image shows a software interface for laser cutting with several settings. Red arrows point to specific controls:

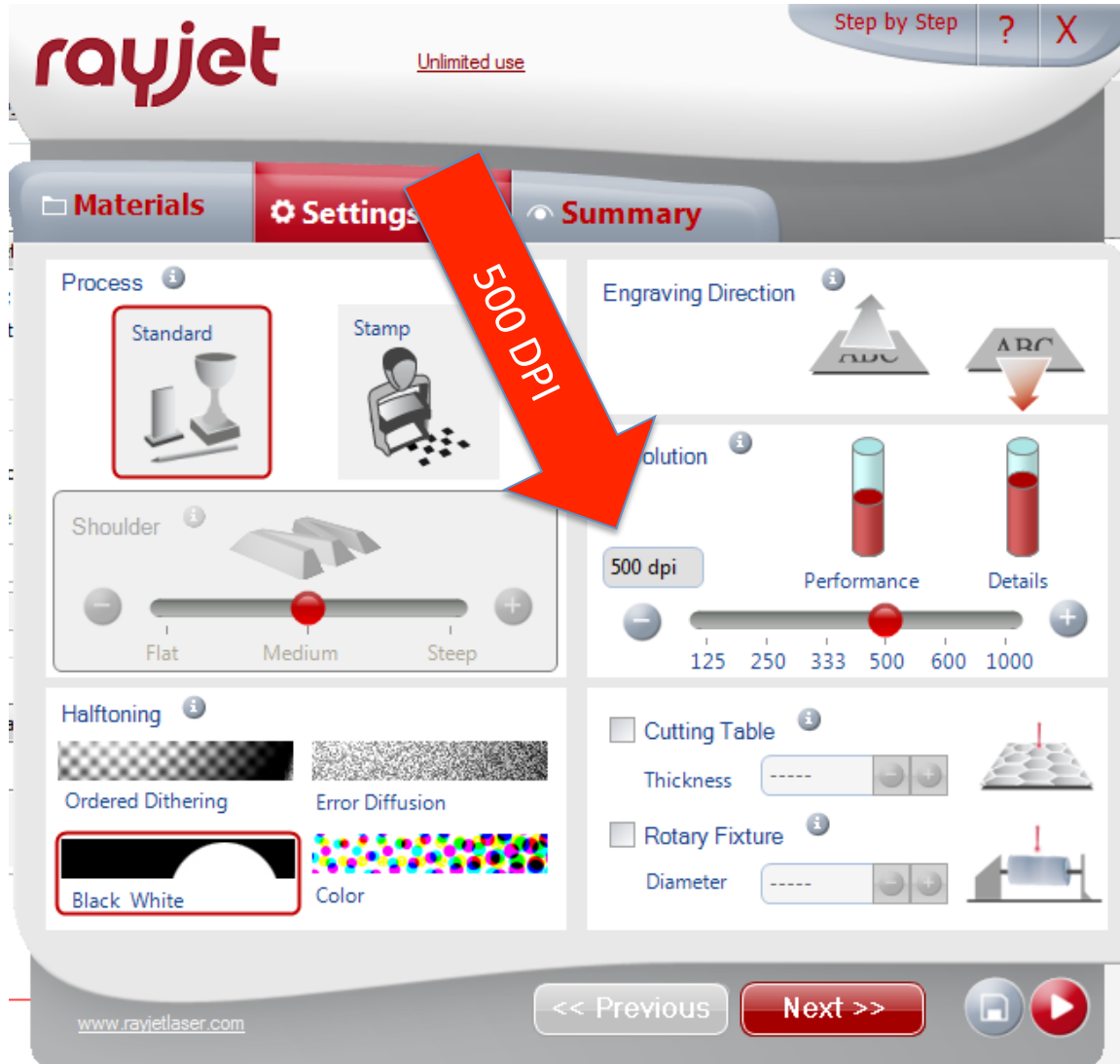
- Colour Select:** Points to the color selection bar at the top, which has black and red squares and a plus button.
- Operation Type:** Points to the 'Cut' button (with a scissors icon), 'Engrave' button (with a downward arrow icon), and 'Skip' button (with an 'X' icon).
- Always ON!:** Points to the 'Air assist' toggle, which is currently set to 'On' (indicated by a red slider).
- Times to repeat:** Points to the 'Passes' field, which is set to '2' with minus and plus buttons.
- Power Setting:** Points to the 'Power' section, which shows a cylinder with '30.0' and a '30 %' setting with minus and plus buttons.
- Speed <> Accuracy:** Points to the 'Speed' section, which shows a cylinder with '2.0' and a '2 %' setting with minus and plus buttons.
- Fine Tune:** Points to a horizontal slider at the bottom, ranging from -20 to 20, with a '0 %' label and minus/plus buttons.

# What's wrong here?





# Check the settings...





# Verify your settings

**rayjet** Unlimited use Step by Step ? X

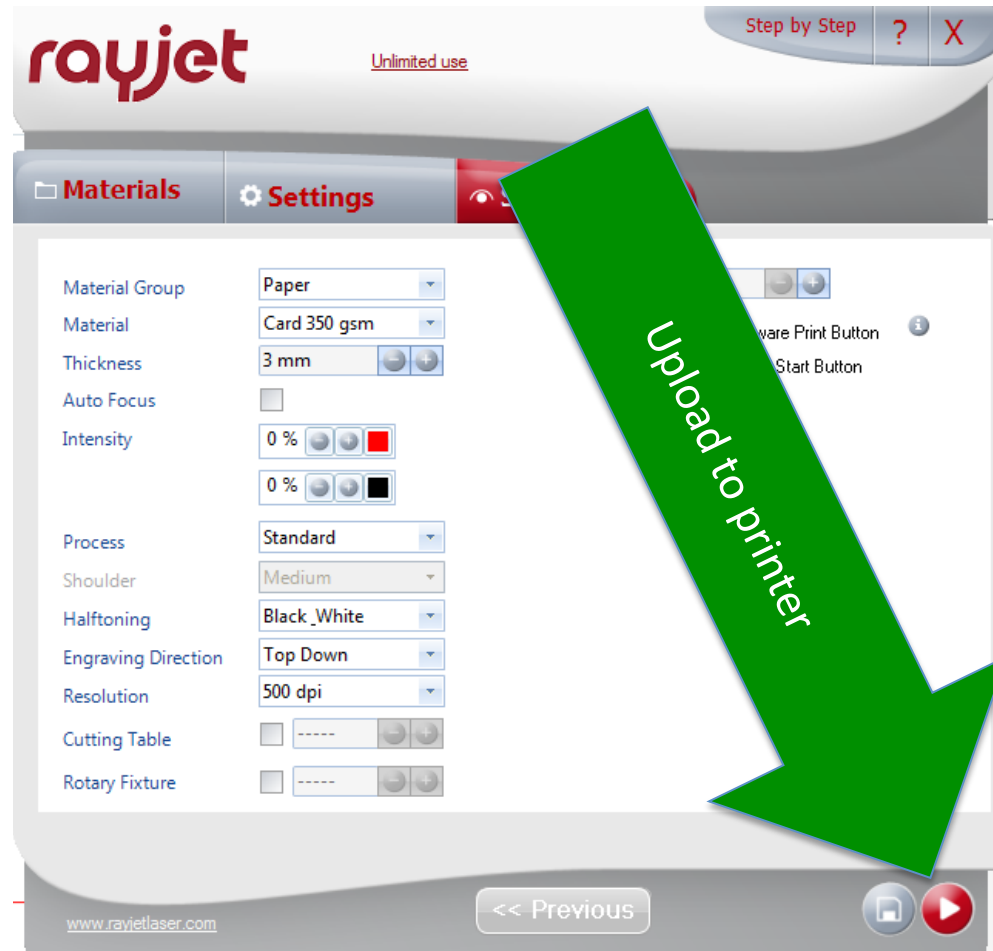
**Materials** **Settings** **Summary**

Material Group	Paper	Quantity	1
Material	Card 350 gsm	Job Start	<input type="radio"/> Software Print Button <span>i</span>
Thickness	3 mm		<input checked="" type="radio"/> Rayjet Start Button
Auto Focus	<input type="checkbox"/>		
Intensity	0 % <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>		
	0 % <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>		
Process	Standard		
Shoulder	Medium		
Halftoning	Black_White		
Engraving Direction	Top Down		
Resolution	500 dpi		
Cutting Table	<input type="checkbox"/> ----- <input type="checkbox"/> <input type="checkbox"/>		
Rotary Fixture	<input type="checkbox"/> ----- <input type="checkbox"/> <input type="checkbox"/>		

[www.rayjetlaser.com](http://www.rayjetlaser.com) << Previous  

Make sure this is checked

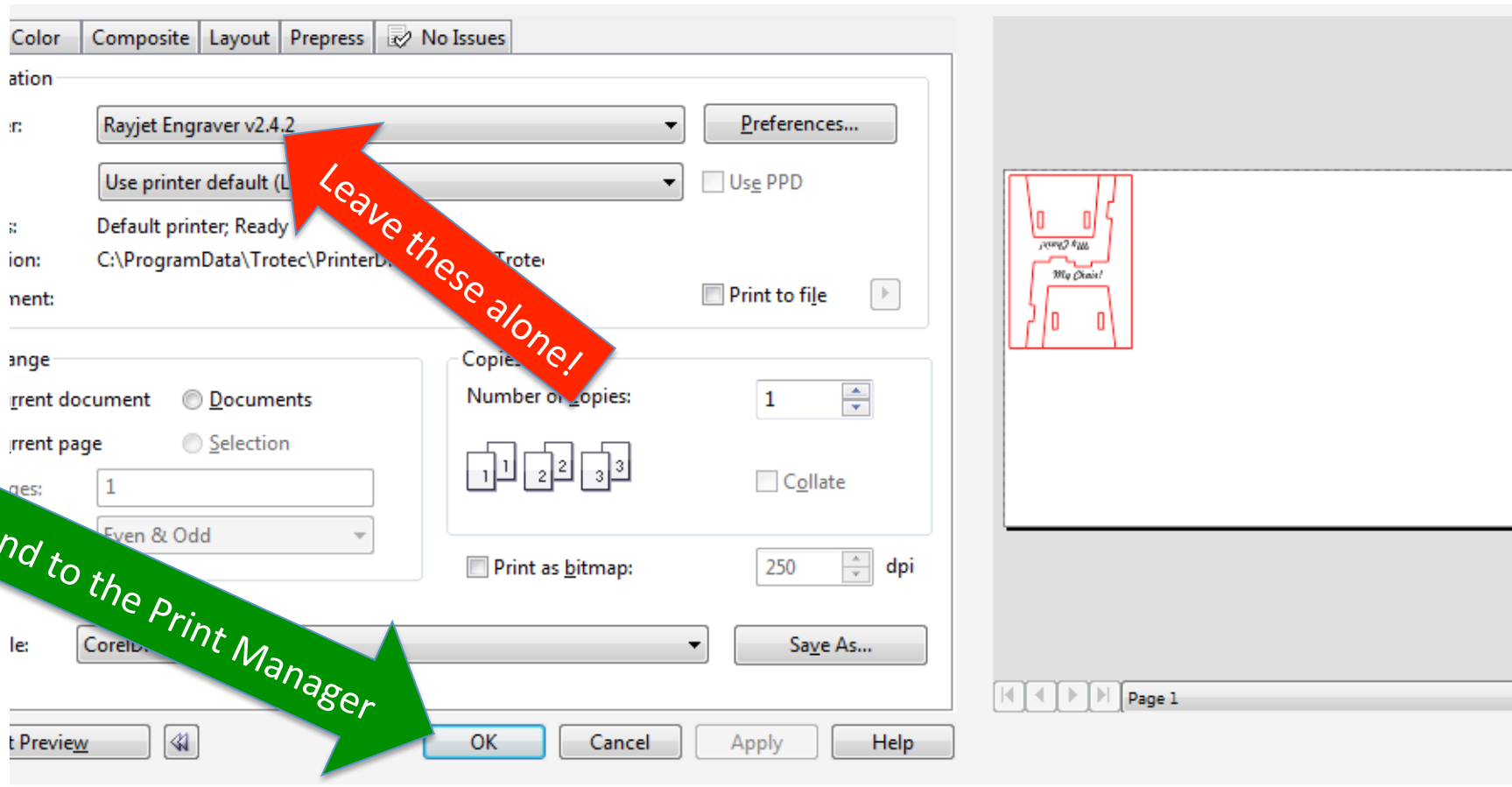
# Upload your settings



# But.....

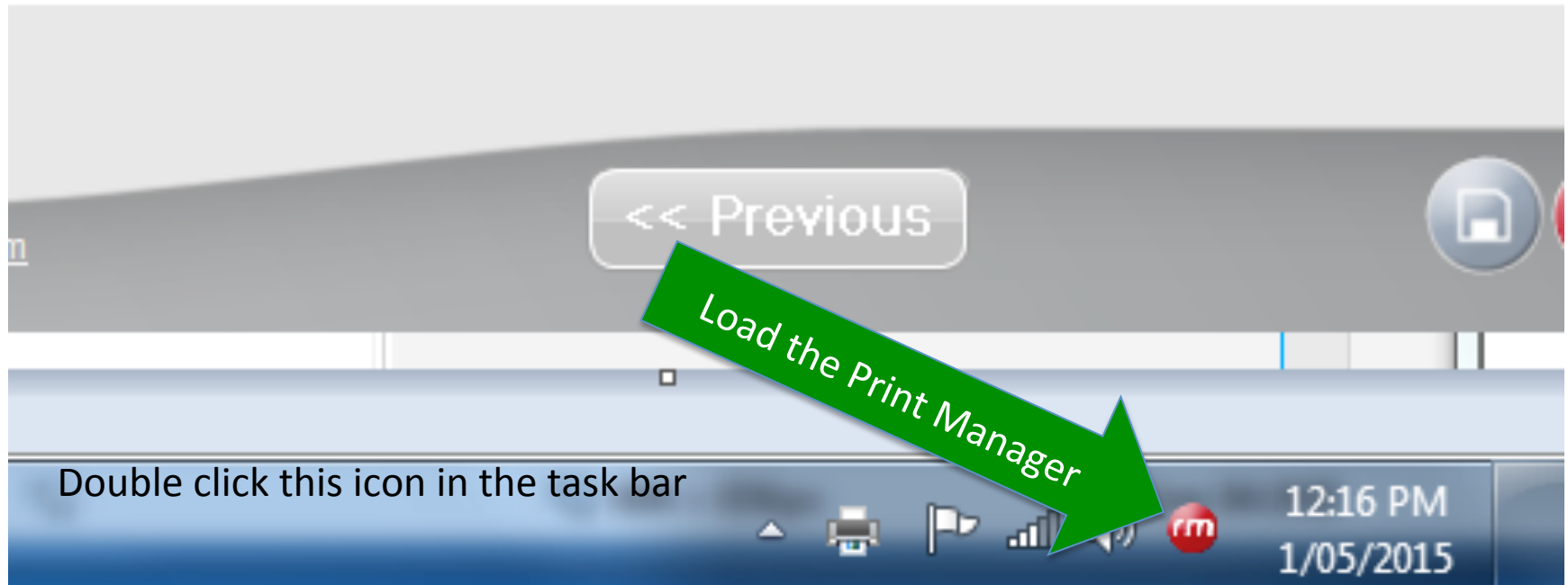


# When Configured, Hit OK!

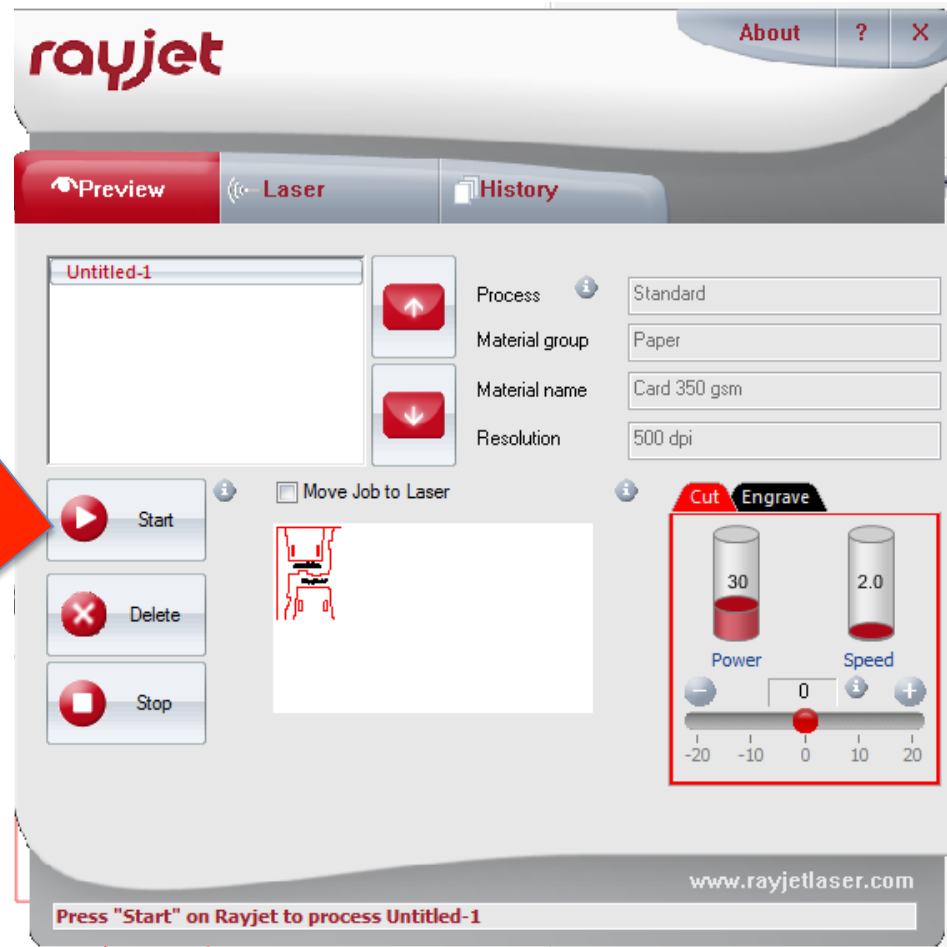




# Now load the print manager

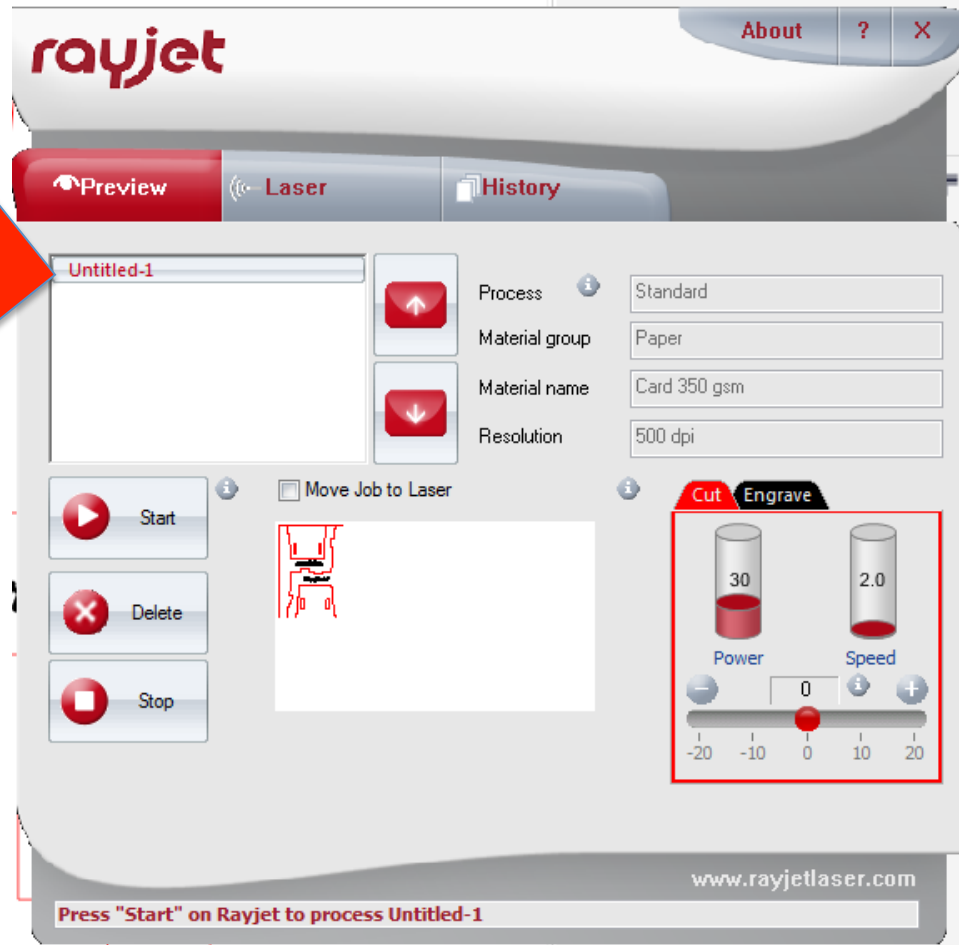


# The print manager...

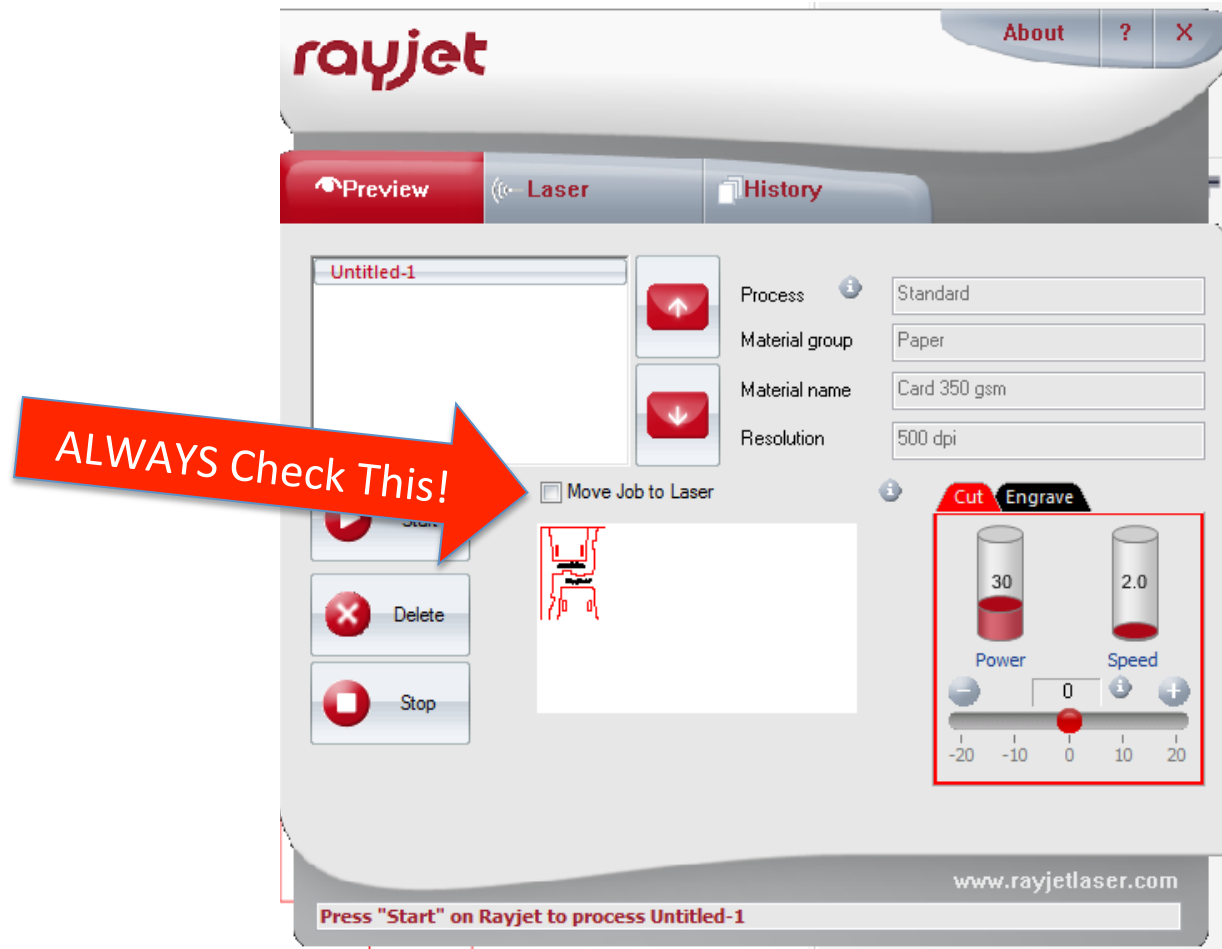


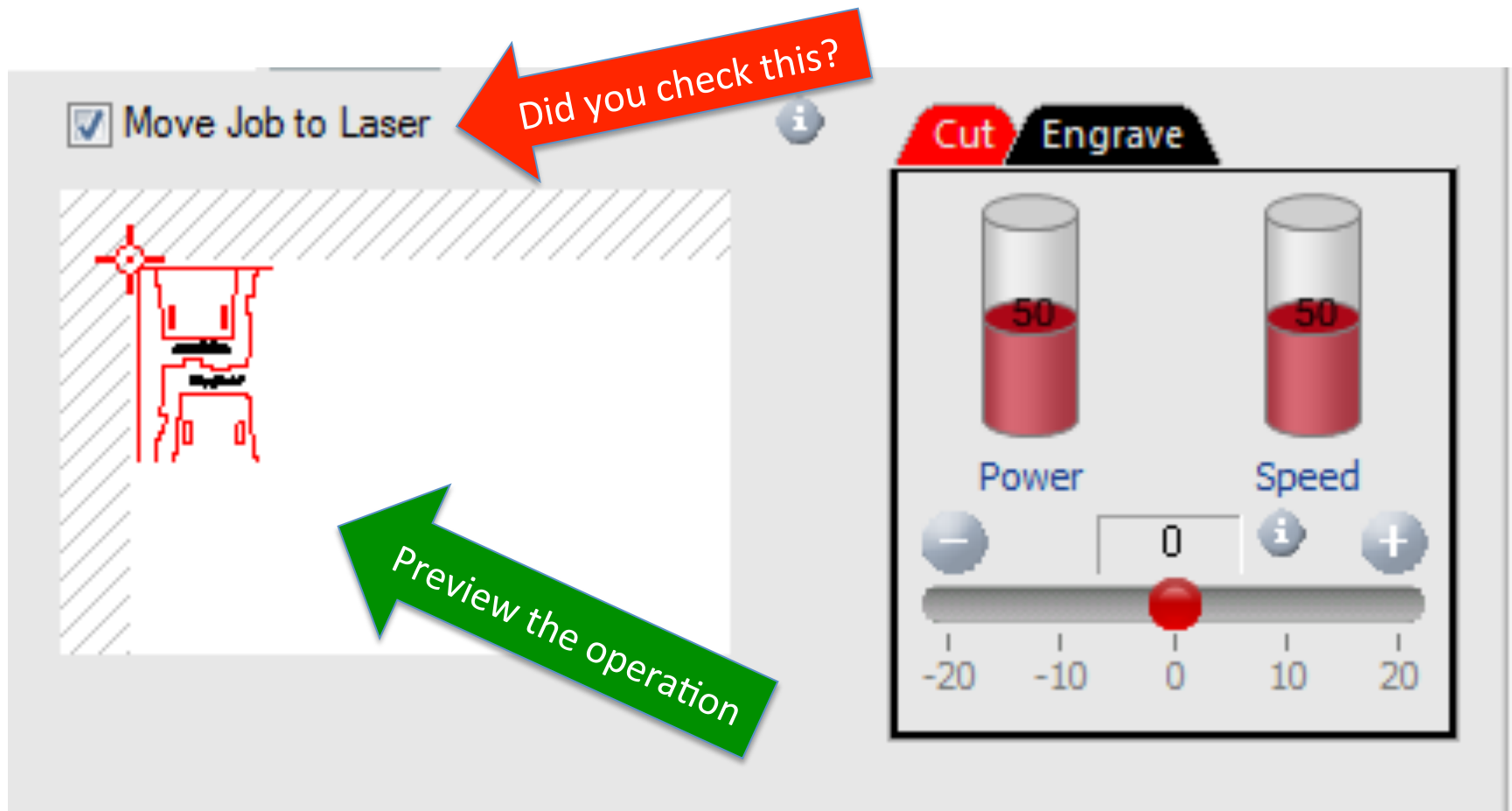
# The print manager...

Select your print



# Always use move job to laser





When previewing you should see the whole image with the colours you selected...



# Press start on the laser cutter!

Press "Start" on Rayjet to process Untitled-1



# The Extractor

The HEPA grade air filter will extract all smoke. Ensure it has automatically come on by looking for this light...



Extractor Indicator



# The print job will start!

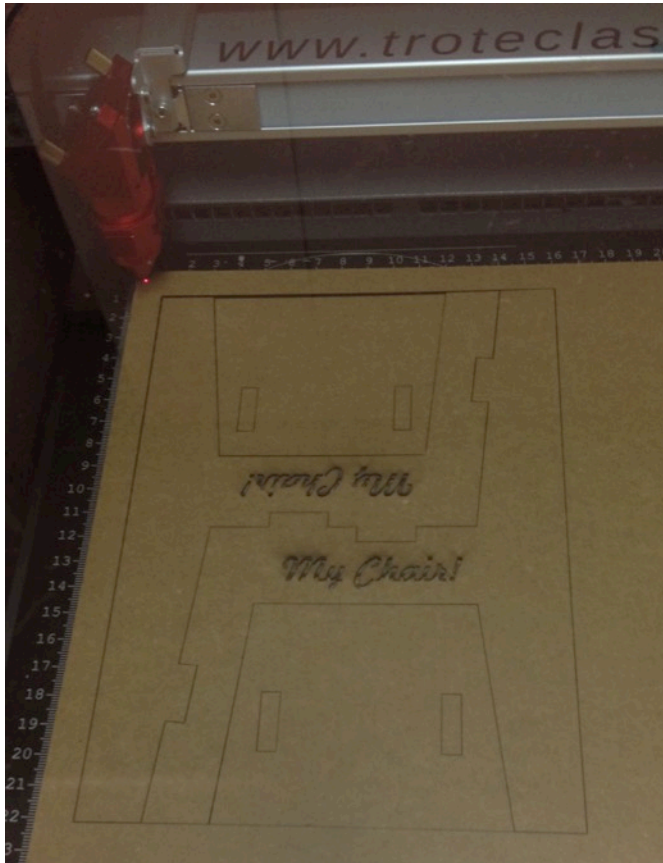


# Keep watch!

- Keep an eye on the cut in case of fire or issues with the print.
- Usually, all engraving starts first, then the cutting.
- In an emergency, lift the lid to stop the cut.



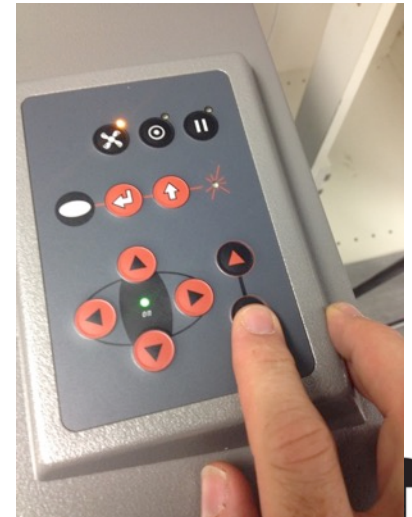
# Complete!



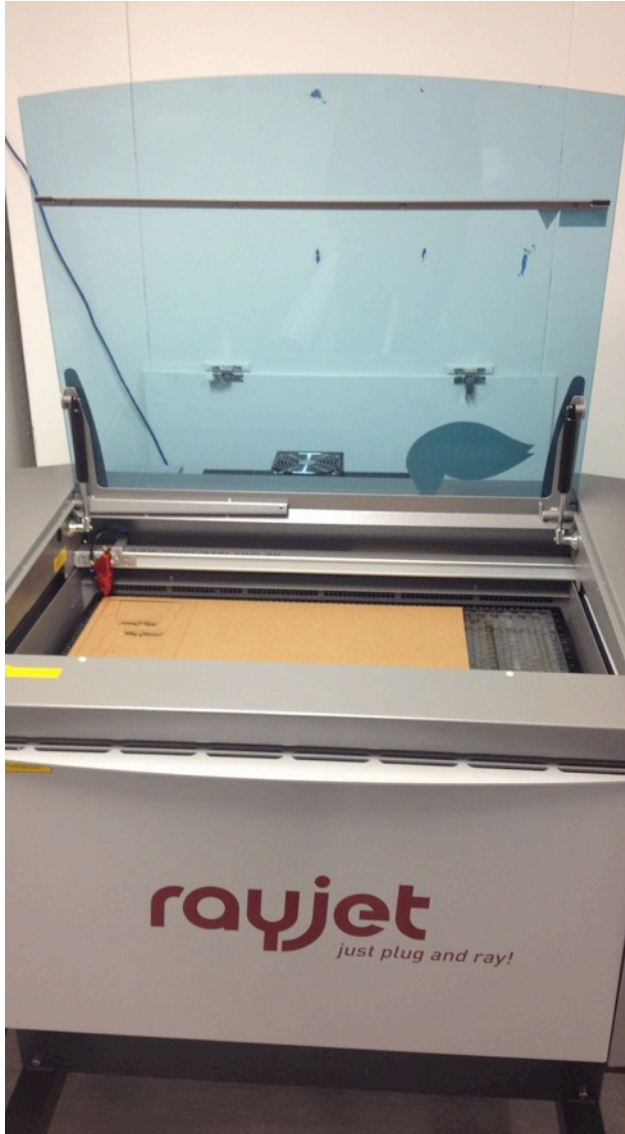
The laser will move back to it's home position.

BEFORE you lift the lid:

- Use the keypad to lower the bed. This prevents damage to the head when removing material.
- Wait... at least 30 seconds for the smoke to clear...



# Carefully remove the work piece



And you're done! Make sure you remove all cut material.

If some material has dropped into the honeycomb, alert the supervisor who will remove it for you.

# Final Questions

- What do you do if the lens is dirty?
- What do you do if the honeycomb is not located properly?
- What do you do if the work piece catches on fire?
- What do you do if the machine makes unusual noises?