FABLAB - riidl Somaiya Vidyavihar | Standard Operating Procedures

CO_2 Laser Cutter - SIL

Step 1: Book the Laser Cutter through the RIIDL Fab Lab machine booking portal at
https://riidl.org/fablab/machine_book.

Step 2: File format settings

- Step 2a: If you are experienced, prepare your file in .dxf format and save it to a pendrive or your laptop.
- Step 2b: Access the PC located next to the laser cutter, and open your file using the RDWorks software.
- Step 2c: If you encounter issues with .dxf files or need assistance, provide a 3D CAD or 2D vector file format and contact Pranav Gawde for help.

Step 3: Turn on all power units of the laser cutter machine, including the machine itself, laser generator, exhaust, air compressor, and PC.

Step 4: RDWorks software

- Step 4a: Use the RDWorks software to transfer files to the laser cutter. Note: The laser cutter is connected to the PC via a network cable.
- Step 4b: Refer to the provided image for basic RDWorks usage. Seek assistance from Sachin or Pranav for any settings clarification.
- Step 4c: Set speed and power settings for cutting/scanning according to the chart attached to the machine.

Step 5: Bring your own material. The laser cutter can process materials like acrylic up to 10mm, MDF up to 4mm, thin plywoods, cardboards, paper, and leather only.

Consult with Pranav before using any other materials such as Sunboard, canvas, plastic, etc. Ensure you provide your file and material details for approval.

Step 6: Before initiating the job, ensure all five buttons on the bottom right of the machine are turned on, ensure air is flowing from the hose next to the laser nozzle, and home the laser nozzle.

Step 7: Place your material flat on the bed. The official bed size is 3x4ft. Seek assistance if you are using a different-sized sheet.

Step 8: Once the file is loaded, set the Z-axis (5mm above the material), set the origin, perform a frame check, and then start the cut/scan.

Step 9: Close the door while the cut/scan is in progress.

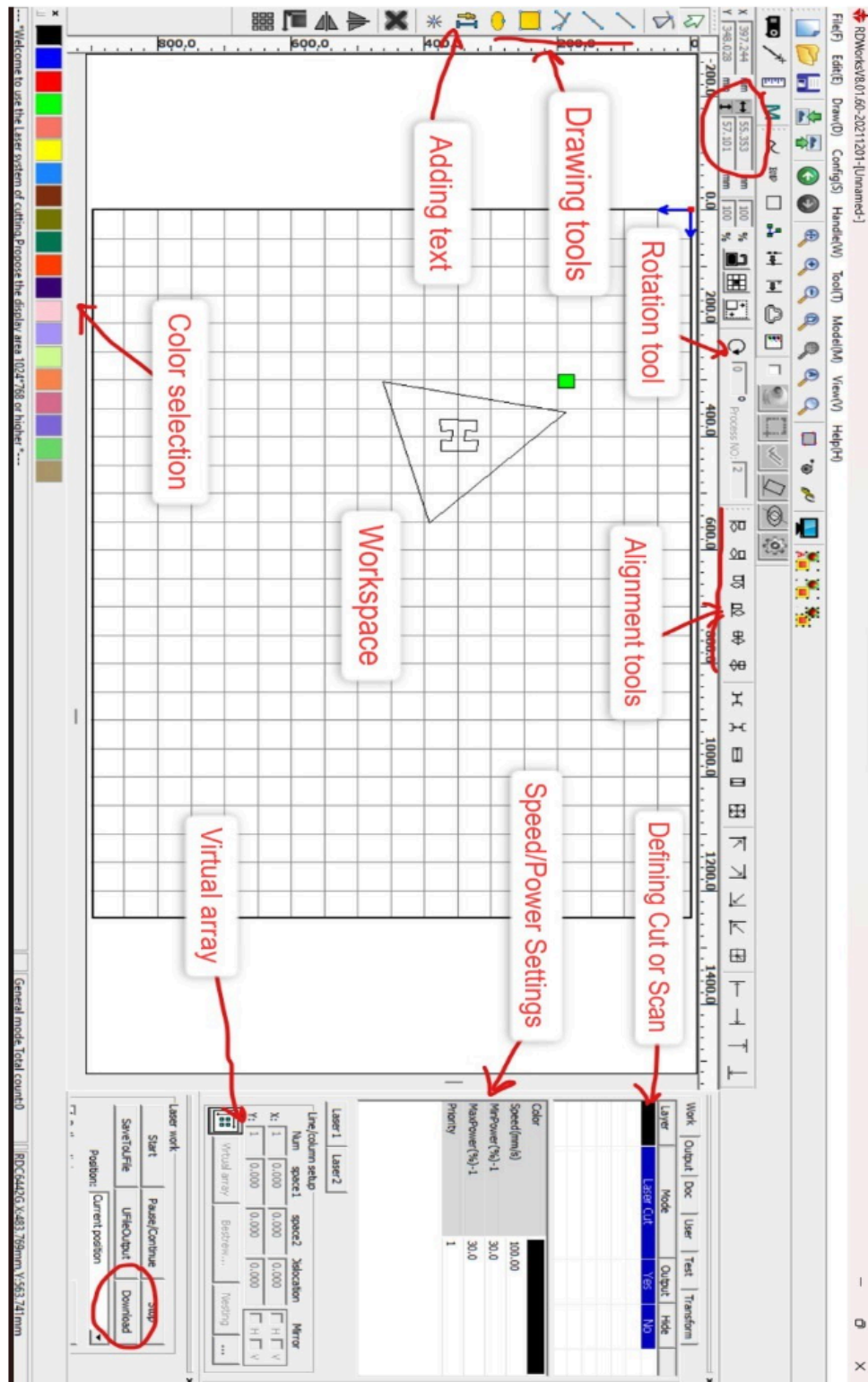**Step 10:** After the job is completed, turn off the laser, as well as all other components.

Step 11: Clean the workspace and take any leftover material with you.

Note:

- **Follow all safety protocols and guidelines provided by RIIDL Fab Lab staff.**
- **Ensure the SIL Laser Cutter is operated in accordance with manufacturer instructions.**
- **Clean up your workspace after use and adhere to any additional guidelines provided by RIIDL Fab Lab staff.**

These additional notes are crucial for maintaining printing quality, safety, and efficient usage of the 3D printer at RIIDL.

Labels shown on the interface screenshot:
- Adding text
- Drawing tools
- Rotation tool
- Color selection
- Workspace
- Alignment tools
- Virtual array
- Speed/Power Settings
- Defining Cut or Scan

CO$_2$ Laser Cutter - SIL

Speed & Power Settings

	Material	Thickness (mm)	Speed	Power
Cut	Acrylic	1	25	40
	Acrylic	2	22	45
	Acrylic	3	15	60
	Acrylic	4	10-11	65
	Acrylic	5	9-10	75
	Acrylic	6	8-9	82
	Acrylic	8	6	82-85
	Acrylic	10	5	85-88
	Acrylic	12	3	90-92
	Acrylic	15	2	95
	MDF	1	25	35
	MDF	2	22	45
	MDF	3	15	60
	MDF	4	8	75
	MDF	5	4	80-82
	Leather	1	40	16-18
	Leather	2	25	22-25
	Paper	60-120 GSM	40	13-15

	Material	Thickness (mm)	Speed	Power
Scan	Acrylic		350/300	9-12
	MDF		350	9-12
	Glass		300	18
	Marble		200	60
	Leather		300	21.5
	Aluminium		200	60-65