

Thunder Nova 24 and 51 Laser Cutters

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Equipment

Thunder Nova 24	<ul style="list-style-type: none">• Uses one 60 watt sealed glass CO2 cartridges• Cutting area is 23.6" x 15.7" - with a max thickness of 6.1"• Pass through closed: 27.6" x 20.9" x 6.1"• Pass through open: 27.6" x " x .8"	 A compact, white and blue laser cutter with a hinged lid. The lid is open, revealing the cutting bed. The machine has a control panel on the right side with a red emergency stop button. The brand name 'THUNDER LASER' is visible on the front panel.
Thunder Nova 51	<ul style="list-style-type: none">• Uses one 100 watt sealed glass CO2 cartridges• Cutting area is 51.2" x 35.4" - with a max thickness of 9.1"• Pass through closed: 55.1" x 40.6" x 9.1"• Pass through open: 55.1" x " x .8"	 A larger, white and blue laser cutter with a hinged lid. The lid is open, revealing the cutting bed. The machine has a control panel on the right side with a red emergency stop button. The brand name 'THUNDER LASER' is visible on the front panel. It has a more industrial design with a larger base and wheels.

Class Slides:

Intro Class - Version at 2024-2-10



Laser Intro - Thu...vised 2_10_24.pdf

Advanced Class - Version at 2023-12-27



Laser Advanced - ...- 2023-12-27.pdf



Laser Camera - T...ised 2_12_24.pdf

Recommended Videos:

Computer Creationz	https://www.youtube.com/channel/UCB3-k4fmkVqTTjAhb0Cdd_g
LightBurn Official YouTube Channel	https://www.youtube.com/@lightburnsoftware7189
The Louisiana Hobby Guy	https://www.youtube.com/@TheLouisianaHobbyGuy

Default Settings

Files should be on each Desktop in a folder named "Thunder Laser Default Preferences"

Laser	Design Software	
NOVA 24 Purcellville	Inkscape	NOVA24-DefaultPrefs-Inkscape-2023-11-27.lbprefs
NOVA 24 Purcellville	Adobe Illustrator	NOVA24-DefaultPrefs-AdobeIllustrator-2023-11-27.lbprefs
NOVA 51 Leesburg	Inkscape	NOVA51-DefaultPrefs-Inkscape-2023-11-27.lbprefs
NOVA 51 Leesburg	Adobe Illustrator	NOVA51-DefaultPrefs-Illustrator-2023-11-27.lbprefs

Laser Calendar

Book by logging into [Makersmiths.org](https://makersmiths.org) and selecting Members Only Content and then [Laser Calendar Reservations](#). If you have any issues just email us at lasercutter@makersmiths.org

Best Places to Buy Acrylic:

<https://www.canalplastic.com/>

<https://www.tapplastics.com>

<https://www.inventables.com/categories/materials>

NEVER CUT THESE MATERIALS

WARNING: Because many plastics are dangerous to cut, it is important to know what kind you are planning to use. Make has a How-To for identifying unknown plastics with [a simple process](#).

PVC (Poly Vinyl Chloride)/vinyl /pleather/artificial leather	Emits pure chlorine gas when cut!	Don't ever cut this material as it will ruin the optics, cause the metal of the machine to corrode, and ruin the motion control system.
Thick (>1mm) Polycarbonate /Lexan	Cut very poorly, discolor, catch fire	Polycarbonate is often found as flat, sheet material. The window of the laser cutter is made of Polycarbonate because polycarbonate <i>strongly absorbs infrared radiation!</i> This is the frequency of light the laser cutter uses to cut materials, so it is very ineffective at cutting polycarbonate. Polycarbonate is a poor choice for laser cutting.
ABS	Emits cyanide gas and tends to melt	ABS does not cut well in a laser cutter. It tends to melt rather than vaporize and has a higher chance of catching on fire and leaving behind melted gooey deposits on the vector cutting grid. It also does not engrave well (again, tends to melt).
HDPE/milk bottle plastic	Catches fire and melts	It melts. It gets gooey. Don't use it.
PolyStyrene Foam	Catches fire	It catches fire, it melts, and only thin pieces cut. This is the #1 material that causes laser fires!!!

Polypropylene Foam	Catches fire	Like PolyStyrene, it melts, catches fire, and the melted drops continue to burn and turn into rock-hard drips and pebbles.
Fiberglass	Emits fumes	It's a mix of two materials that cant' be cut. Glass (etch, no cut) and epoxy resin (fumes)
Coated Carbon Fiber	Emits noxious fumes	A mix of two materials. Thin carbon fiber mat can be cut, with some fraying - but not when coated.

Safe Materials

The laser can cut or etch. The materials that the laser can cut materials like wood, paper, cork, and some kinds of plastics. Etching can be done on almost anything, wood, cardboard, aluminum, stainless steel, plastic, marble, stone, tile, and glass.

Cutting

Many woods	1 /4"	Avoid oily/resinous woods	Be very careful about cutting oily woods, or very resinous woods as they also may catch fire.
Plywood /Composite woods	1 /4"	These contain glue, and may not laser cut as well as solid wood.	
MDF /Engineered woods	1 /4"	These are okay to use but may experience a higher amount of charring when cut.	
Paper, card stock	thin	Cuts very well on the laser cutter, and also very quickly.	
Cardboard, carton	thick	Cuts well but may catch fire.	Watch for fire.
Cork	1 /4"	Cuts nicely, but the quality of the cut depends on the thickness and quality of the cork. Engineered cork has a lot of glue in it, and may not cut as well.	Avoid thicker cork.
Acrylic/Lucite /Plexiglas /PMMA	1 /2"	Cuts extremely well leaving a beautifully polished edge.	
Thin Polycarbonate Sheeting (<1mm)	< 1 mm	Very thin polycarbonate can be cut but tends to discolor badly. Extremely thin sheets (0.5mm and less) may cut with yellowed/discolored edges. Polycarbonate absorbs IR strongly and is a poor material to use in the laser cutter.	Watch for smoking/burning
Delrin (POM)	thin	Delrin comes in a number of shore strengths (hardness) and the harder Delrin tends to work better. Great for gears!	
Kapton tape (Polyimide)	1 /16"	Works well, in thin sheets and strips like tape.	
Mylar	1 /16"	Works well if it's thin. Thick mylar has a tendency to warp, bubble, and curl	Gold-coated mylar will not work.
Solid Styrene	1 /16"	Smokes a lot when cut, but can be cut.	Keep it thin.
Depron foam	1 /4"	Used a lot for a hobby, RC aircraft, architectural models, and toys. 1/4" cuts nicely, with a smooth edge.	Must be constantly monitored.
Gator foam		Foam core gets burned and eaten away compared to the top and bottom hard paper shell.	Not a fantastic thing to cut, but it can be cut if watched.
Cloth/felt/hemp /cotton		They all cut well. Our "advanced" laser training class teaches lace-making.	Not plastic coated or impregnated cloth!
Leather/Suede	1 /8"	Leather is very hard to cut, but can be if it's thinner than a belt (call it 1/8"). Our "Advanced" laser training class covers this.	Real leather only! Not 'pleather' or other imitations!
Magnetic Sheet		Cuts beautifully	
NON-CHLORINE-containing rubber		Fine for cutting.	Beware chlorine-containing rubber!

Teflon (PTFE)	th in	Cuts OK in thin sheets	
Carbon fiber mats/weave that has not had epoxy applied		Can be cut, very slowly.	You must not cut carbon fiber that has been coated!!
Coroplast ('corrugated plastic')	1 /4"	Difficult because of the vertical strips. Three passes at 80% power, 7% speed, and it will be slightly connected still at the bottom from the vertical strips.	

Etching

All the above "cuttable" materials can be etched, in some cases very deeply.

In addition, you can etch:

Glass	Green seems to work best...looks sandblasted.	You can do flat glass on the etching table. Take the rotary advanced class for round objects like wine glasses.
Ceramic tile		
Anodized aluminum	Vaporizes the anodization away.	
Painted/coated metals	Vaporizes the paint away.	
Stone, Marble, Granite, Soapstone, Onyx.	Gets a white "textured" look when etched.	100% power, 50% speed or less works well for etching.

Frequently Asked Questions

Question	Response
The Thunder Laser screen is showing Frame Slop Error	<p>Frame Slop means that you are trying to engrave/cut too close to the laser's X or Y limits. The honeycomb bed is larger than the actual cutting area in the Y direction (front to back). You can't run the laser on the back 1.5 inches of the honeycomb in the Y direction.</p> <p>In the X direction (left to right) the machine overshoots the edges of your design so it can slow down before coming back on the next pass. To do this, it needs at least 1cm of space between the edge of your design and the machine's X limit to slow down.</p>