

# NEVER CUT THESE MATERIALS

WARNING: Many plastics and synthetics are dangerous to cut, it is important to know what kind you are planning to use.

Material	Danger	Cause/Consequence
PVC (Poly Vinyl Chloride)/vinyl/pleather/artificial leather	Emits chlorine compound gases when cut!	NEVER cut PVC as it will ruin the optics, cause the metal of the machine to corrode, and ruin the motion control system.
Polycarbonate/Lexan	Cut very poorly, discolor, catch fire	Polycarbonate is often found as flat, sheet material. Polycarbonate strongly absorbs infrared radiation, the same frequency of light the laser. Our devices are ineffective at cutting polycarbonate.; it is not allowed at SEA Makerspace.
ABS	Emits cyanide gas and tends to melt	ABS does not cut well in a laser cutter. tending to melt rather than vaporize. Additionally it has a higher chance of catching on fire and leaving deposits on the vector cutting grid. It also DOES NOT engrave well and tends to melt. DO NOT cut ABS on the SEA Makerspace laser etchers.
HDPE/milk bottle plastic	Catches fire and melts	MELTS, DO NOT use it.
PolyStyrene Foam (of any kind including Formular, XPS, StroFoam, or any other)	Catches fire	DO NOT use it. It catches fire, it melts. This is the #1 material that causes laser fires!!!
PolyPropylene Foam	Catches fire	DO NOT use this. Like PolyStyrene, it melts, catches fire, and the melted drops continue to burn and turn into rock-hard drips and pebbles.
Fiberglass	Emits fumes	NEVER CUT Fiberglass is a mix of two materials that can't 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 <b>NEVER</b> when coated. Until the ventilation is improved we will not cut.
Gator Foam	Poor results	Foam core gets burned and eaten away compared to the top and bottom hard paper shell on top and bottom.
Coroplast (Corrugated Plastic)	Difficult material to get clean results.	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.
Carbon Fiber mats/weave that has NOT had epoxy applied	FSL doesn't recommend.	Emits fumes, takes a high wattage laser than SEA Makerspace equipment.

## GENERALLY SAFE MATERIALS TO CUT

The laser can cut or etch. The materials that the laser can cut materials like wood, paper, cork, and some kinds of plastics. These are safer alternatives, but common sense and caution should guide your work. If it doesn't look, sound, or smell correct, ask for guidance. Etching can be done on almost anything, wood, cardboard, aluminum, stainless steel, plastic, marble, stone, tile, and glass.

Material	MAX Thickness	Notes	WARNINGS
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. Consult with Shop Supervisor if in doubt.
Plywood/Composite Woods	1/4"	These contain glue, and may not laser cut as well as solid wood.	Test your materials before committing. Consult with Shop Supervisor
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	thicker	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"	Beware materials that look like acrylic but are not actually PMMA. We will work with this on a case-by-case basis. This material is generally acceptable, but we have had fume issues. The Makerspace is working on better ventilation.	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.
Cloth/Felt/Hemp/Cotton		They all cut well. Wool smells like burnt hair (go figure).	<b>NO plastic coated or impregnated cloth!</b>
Leather/Suede	1/8"	Leather is very hard to cut, but can be if it's thinner than a belt (call it 1/8").	Real leather only! NOT 'pleather' or other imitations!
Magnetic Sheet		Other makerspaces report good results	
NON-CHLORINE-containing Rubber		Fine for cutting.	<b>Beware chlorine-containing rubber! Material documentation will be required.</b>
Teflon (PTFE)	thin	Cuts OK in thin sheets	

# GENERALLY SAFE MATERIALS TO ETCH

This is a guide to the GENERALLY SAFE materials to be etched at SEA Makerspace. Ask when you have any questions. On case-by-case basis some jobs will not be approved or allowed to continue if the tech or supervisor has concerns about any particular material.

All the previously listed "cuttable" materials can be etched, in some cases very deeply. In addition, you can etch the following.

## ETCHING

Material	Notes	WARNINGS
Glass	Green seems to work best... looks sandblasted.	FLAT GLASS can be engraved in the Makerspace at this time.* No round or cylindrical items.
Ceramic Tile	Details to come	None known yet.
Anodized aluminum	Vaporizes the anodization away. Etching grade business cards are a favorite on the market currently.	None known yet.
Painted/Coated metals	Vaporizes the paint away.	None known yet.
Stone, Marble, Granite, Soapstone, Onyx	Gets a white "textured" look when etched. 100% power, 50% speed or less works well for etching.	None known yet.