

!?! What materials can I cut/engrave?

What you can, probably shouldn't, and cannot under any circumstances put in the laser

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☐ Materials that are safe to laser

These materials are 'safe' to laser, but are still to be considered a fire risk.

Please follow individual guidance for the material to reduce this risk.



Wood-based materials

Cutting these items will leave a sooty edge in most cases, which will wipe off with a dry cloth. The air assist can also blow this soot onto the top surface leaving a smudge, particularly with MDF (due to the vaporised glue). This can sometimes be removed by wiping over with IPA (rubbing alcohol) or sanding back to clean wood. If you need to use masking tape, make sure it is the *paper* version and is very well stuck down.

Paper and card

Consider using a sacrificial MDF board with tacky surface to hold down your paper or card to stop it blowing around. You may also consider designing your cuts with uncut tabs to hold any cut-outs in place.

MDF

Ensure your MDF is 'laser safe' - it will have less formaldehyde and glue and cut cleaner than the variety at hardware stores

Plywood

Ensure your plywood is 'laser safe' - it will generally be of a finer quality with smaller glue pockets. Glue pockets are notorious for not cutting through, potentially ruining an otherwise ok cut.

Fabric

Most fabrics are ok to cut in the laser. Organic fibres (e.g cotton) will take more power to cut through compared to man-made (e.g. polyester) - testing is crucial to get a clean cut with minimal charring or melting. Consider using a sacrificial board with a tacky surface to stop fabric pieces blowing away and keep them flat. IMPORTANT: you should not layer up fabric in an effort to save time, as this significantly increases the fire risk due to air pockets between layers and in creases.

Plastics

Not all plastics are safe, or appropriate, to laser. If you are unsure of the composition of the plastic, DO NOT LASER and ask for advice. Check out the ['never laser these materials'](#) list as well.

Acrylic

IMPORTANT: remove any protective plastic sheets from the acrylic before you cut. If you need to mask, use a laser-safe *paper* masking tape that is stuck down and well-burnished to ensure adhesion. The commonest cause of fires when cutting acrylic is masking that lifts and catches alight.

IMPORTANT: vaporised acrylic fumes will catch light underneath the sheet. You must ensure that the bed is clean and without debris, as these flameouts can easily set fire to any leftovers on the bed.

EVA

Ethyl-vinyl acetate foam is ok to cut on the laser, typically used for cosplay

Mylar

Very useful to make stencils and masks from

Stone & Rock

Generally speaking, stone materials are fine to engrave. They will not cut. Be aware that the stone will become warm during engraving and will be a burn hazard.

Slate

Slate is great to etch in the laser, resulting in a white(ish) mark. Invert your image, particularly if engraving a photo (i.e. black lines will be the ones that engrave, resulting in a white marking). For extra contrast, use a polyurethane spray varnish to coat the slate at least 48 hours before lasering.

☐☐ Materials that probably shouldn't be used

There are some materials that, whilst not on the banned list, are problematic in other ways and should be avoided:



Oily or resinous wood

Pine, cedar, eucalyptus or teak woods have a high resin or oil content and will char excessively. They may ignite easily. Use untreated hardwoods such as maple or birch instead.

Reflective metals (not mirror-finished)

Aluminium, brass and copper may reflect the laser back along the optical path and cause damage to the machine. Metals will not cut using a CO₂ laser. If engraving, use a laser safe coating and lowest effective power.

Corrugated cardboard

Air pockets within the corrugations increase fire risk. Monitor the cut or engraving carefully and continuously.

Foam board (paper-foam-paper laminate)

Foamboard will cut nicely on the laser, but... The paper coating will scorch, and the foam layer will shrink away from the cut leaving unsupported edges. There is a greater risk of fire due to the lamination and melting plastic.

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❗ NEVER LASER THESE MATERIALS

These materials should never be used in the laser.

This is not an exhaustive list. If you are not sure, don't use it and find out.



PVC, vinyl, neoprene, pleather, PTFE (Teflon)

When heated, these materials release chlorine or similar gases. This is a respiratory hazard, but also combines with moisture in the air to create acids which will seriously damage the laser through corrosion.

Polypropylene sheet and foam

Highly flammable and likely to catch fire whilst cutting

Coated carbon fibre

The resin coating can give off toxic fumes and is a significant fire risk

Mirror-finish metals

The mirror finish is likely to reflect the laser straight back along the laser path and damage the optics. A CO₂ laser will not cut or mark metals anyway.

ABS plastic

Emits cyanide fumes when lasered and is likely to melt and burn rather than cut cleanly

HDPE plastic (e.g. milk bottles)

Likely to melt and burn rather than cut cleanly

Chromium tanned leather

Releases toxic chromium oxide fumes during laser cutting

Use vegetable tanned leather instead

Fibreglass

Both glass dust and resin fumes will damage the machine and cause respiratory problems

Expanded polystyrene/polystyrene foam

Very high fire risk, with toxic smoke

There are some foams, e.g. EVA, that are laser safe alternatives

Cured epoxy resins

High fire risk, with toxic smoke including cyanide and chlorine

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Recommended suppliers

These suppliers have been recommended by members:

laserply.co.uk

kitronik.co.uk

hobarts.co.uk