



TIPS & TRICKS

Another helpful idea that will simplify and improve your laser projects.

LASER ENGRAVING & CUTTING TIPS

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Applications

Topic	Comment
OK to cut on worktable. CO ₂ “stops” at metal, does not penetrate or cut into metal surface	<ul style="list-style-type: none"> • Typical engraver CO₂ beam does not cut into metal • Metal cutting lasers re in the 150-500 watt range • Exception: HPDFO marking with 25 watts, cutting very thin foils (.005” steel for example)
Importance of focus	<ul style="list-style-type: none"> • Out of focus: Flaming and wide kearf, burned or melted edges
Use red dot & Relocatable View to set center point of job	<ul style="list-style-type: none"> • Use to verify job location on the worktable • Can also draw outline box or run the job with the door open and observe “fit”
Test for correct power on cuts	<ul style="list-style-type: none"> • Use minimum power plus about 10% for material variations • Correct power gives clean edge, minimum melting/burning
Taper and melting on cuts – what to expect	<ul style="list-style-type: none"> • Will get edge effects on any material • Wood taper. Use to your advantage on inlay • Plastics, acrylic – taper and slight melting (rolled edge) • Fabric – Benefit!! Get sealed edge on polyester material
When to use cutting table	<ul style="list-style-type: none"> • Keeps machine cleaner during cutting for most materials • Exhaust underneath carries debris away from bottom surface • Cleaner cuts on wood, paper, cloth, plastics (EXCEPT acrylic) • Can close upper fume port on some machines to get max suction from under cutting table (helps hold films in place) • Requires good fume extraction

LASER ENGRAVING & CUTTING TIPS (Cont.)

Applications (Cont.)

Topic	Comment
Technique for cutting acrylic	<ul style="list-style-type: none"> • 1000 ppi or high frequency • Focus into the surface slightly (e.g. 0.020" on ¼" acrylic) • Leave protective paper on back only • Coat with dish detergent on top surface • No cutting table • Elevate 1-2" and use black anodized plate on worktable
Plastic laminates – engraving light-over-dark colors such as yellow over black	<ul style="list-style-type: none"> • Light color over dark can require more power to penetrate • Light color “cap layer” may be thicker to assure opaque cover on top of dark base color
Plastic laminates – engraving blue and red materials	<ul style="list-style-type: none"> • May need two passes to remove tint on some colors
Fumes, smell, “out gassing”	<ul style="list-style-type: none"> • Plastics release fumes for several hours • Keep finished pieces in the laser enclosure with exhaust on
Do not process PVC	<ul style="list-style-type: none"> • Highly corrosive and toxic
Glass	<ul style="list-style-type: none"> • Engrave with 70% gray instead of black – gives cleaner image, reduces chipping • HPDFO engraves deeper, works on more types of glass
Anodized aluminum: brightness and clarity can vary depending on coating	<ul style="list-style-type: none"> • Some colors leave a slight tint (blue, red) • Some anodized coatings are better than others
Diagonal striping on anodized aluminum	<ul style="list-style-type: none"> • Run most anodized aluminum out of focus .010”
Painted metal – use products designed for CO ₂ : Pens, gifts, plates, etc.	<ul style="list-style-type: none"> • Select items made for use with CO₂ lasers • Two-layer paint coatings: Clear coat first layer, color top layer • Laser penetrates top color layer but not the clear coat • Clear coat stops tarnish, gives bright finish that lasts

LASER ENGRAVING & CUTTING TIPS (Cont.)

Applications (Cont.)

Topic	Comment
Metal marking with CerMark or TherMark	<ul style="list-style-type: none"> • Metals to use: Steel, stainless, chrome plate, titanium • Copper and brass require very high power • Must have no coating, no paint or varnish on metal • Not for large grayscale areas – will see banding
Lines per inch in Y direction for engraving (with Manual Control driver using Image Density)	<ul style="list-style-type: none"> • 250-350 with wood, large block text • 500 for normal level of detail • 1000 for precision • Affects run time
How much power do I need?	<ul style="list-style-type: none"> • One high power machine or multiple low power machines? • Two low power machines produce more than one high power machine on many engraving jobs • High power cuts thicker material, engraves deeper
Plaque layout techniques	<ul style="list-style-type: none"> • Draw a box (size of the plaque) and center items in the box • Make page size equal to plaque size
Concept of rotary	<ul style="list-style-type: none"> • Print driver “wraps” page into a cylinder. Must measure diameter so system can properly calculate distance around • Test for taper and curvature tolerance

Managing Your Workflow

Topic	Comment
Set up your “library”	<ul style="list-style-type: none"> • Back it up!! • Organize jobs and parameter sets like a “Recipe File”
Keep parameters & settings	<ul style="list-style-type: none"> • Can use Materials Driver or... • Keep a folder of parameters by material – process name
Keep templates (job layouts) in folders	<ul style="list-style-type: none"> • By customer name (ABC company) • By item number, description, or part name (logo Key Ring)

LASER ENGRAVING & CUTTING TIPS (Cont.)

Keeping Your Machine in Top Condition

Topic	Comment
Good fume and exhaust flow	<ul style="list-style-type: none"> • Keeps machine and optics much cleaner
Lens and mirror cleaning	<ul style="list-style-type: none"> • Prevents burned optics
Keep Machine clean	<ul style="list-style-type: none"> • Motion system performance
Clean debris from cutting table	<ul style="list-style-type: none"> • Can be “fuel,” and unfocused beam can ignite material