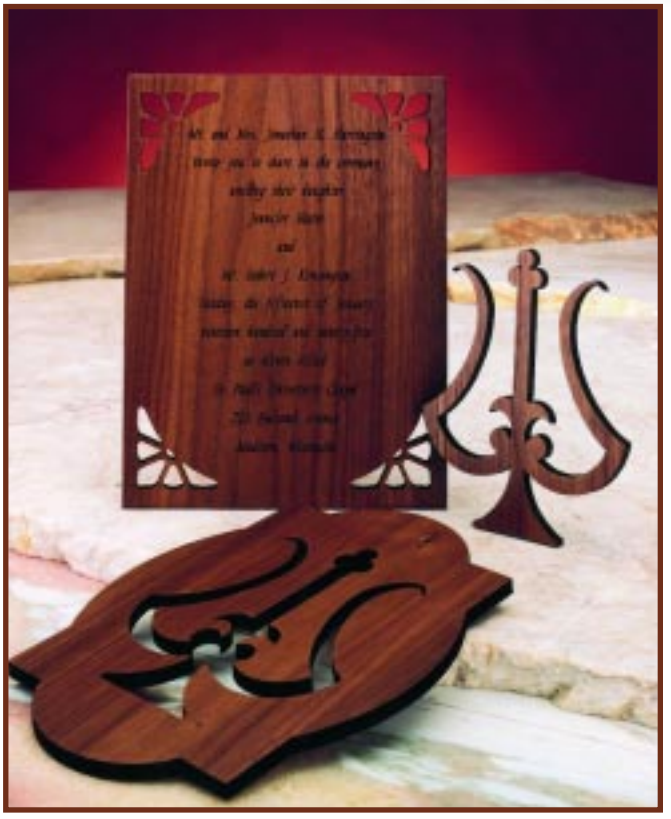
LASER ENGRAVING WOOD

Cutting Wood



Truly ornate items can be created using the laser as a cutting device. This is best done with the more-powerful lasers, but those of us with 25-30 watt lasers aren't left out. There are a lot of things we can do as well. (Photo provided courtesy of Universal Laser Systems, Inc.)

A wide variety of inlays are made possible with materials currently on the market. Shell, wood, mother of pearl, plastics and metal can all be inlaid using a laser.

PART THREE

By J. Stephen Spence

THE FINAL CHAPTER in our look at laser engraving wood deals with cutting. Those of us who own low-power lasers will find their options for cutting materials such as wood and acrylic somewhat limited, but still, there are a lot of things we can do. Those who have more-powerful lasers can, of course, do everything we can, but they can just do it faster, cleaner, and most important of all, the more powerful the laser, the thicker the material it can cut.

If you have not discovered the world of laser-cut wood yet (it seems very few people actually use their lasers for cutting anything), you are in for a neat experience. Although wood can be a challenge when used with a laser, it can also produce some truly beautiful products. Everything from name badges to ornate inlaid designs can be created with a laser. Best of all, both engraving and cutting can often be done in the same process, making for extremely accurate results.

Anyone who has attended a tradeshow and checked out a laser-engraving booth has probably seen salespeople cutting and engraving things like rulers and similar trinkets intended to wow you into laying down some hard-earned cash. These little demonstrations should not be taken too lightly since a host of neat products can be made in this way.

For a moment, allow me to have a time of confession. I have, from early in my youth, been fascinated with trains. I have owned, built, collected and run model railroads and have traveled over most of the Eastern US chasing trains and can chatter like a mockingbird about the various engine numbers, the wheel arrangements, their top speeds and the like.

Because of this, I am well aware that some of the finest models of both rail cars and buildings are actually made using a laser engraver. Not only are the tiny shingles, clapboard sidings, window sills and other details engraved into the very thin wood slats, but those details such as window and door openings are also cut out with the laser to such precision these tiny parts will fit together so tightly that glue isn't necessary to hold them together.

As a result of the laser's cutting ability, an entire industry has been created using a low-power laser. Best yet, model railroaders are not the only ones to capitalize on the laser's ability. People who build and collect miniature doll houses or fly model airplanes often purchase laser-cut products, and I am confident that these are only a few of a great many similar such industries.

So what does this have to do with you? Just this: You too can make

Fantastic inlays can be created with lasers. Here, a guitar has been engraved and inlaid with seashell material. The process is fast, simple and demands a big return.

To make a true inlay, two things must be accomplished. First, the entire area to be inlaid must be cut away to a depth equal to the thickness of the inlay. Although this is a simple process with a laser, finding exactly the right settings can take some experimentation. The objective is to end up with the inlay being perfectly level with the original surface of the wood. This is helped somewhat by a natural tendency of the shell to roll-off on the cut edges, but some care should be taken to make this full cut into the wood.

Cutting too deep will allow the fingers to feel the ridge of the wood where the shell drops into the cutout. If the cutout isn't deep enough, the edge of the shell will be felt and the exposure of the raw edge of this fragile material could lead to its chipping.

Since every laser is different and the woods all vary as well, it is impossible to give settings for this process but since the cut is so shallow, smoke damage should be very minimal even if a second pass is required. It is far better to run two shallow passes than a single pass that might be too deep. With a little experimentation, a suitable setting should be found to accomplish this process in a single step.

It should be noted that, because this is a truly natural material, it will vary somewhat in thickness. This may cause some concern at first, but it shouldn't. When the cut is made too shallow, just run a second pass to deepen it up a little. When the cut is too deep, it can be compensated for with additional tape or adhesive.

There are two ways to adhere all inlaid materials into wood: tape and adhesives. The advantage of tape over other adhesives is that it is clean and neat. It also has a very precise thickness that can be figured into the formula. Tape can be applied to the back of the inlay before cutting and actually cut at the same time. This is helpful for those very tiny, intricate details that would otherwise be very difficult to adhere.

The disadvantage of tape on lasered wood is that, in some cases, it may not stick as tightly as needed for a lifetime of use. When cutting out an inlay in wood, it is not uncommon for the resulting surface to have tiny ridges, dust and even some charcoal residue if it was cut too hot. Tape may not adhere very well if these traits are present. Still, tape is a viable option. Be sure to use a quality tape that can be expected to withstand temperature changes and even some moisture and still last a lifetime.

When working with larger inlays, I much prefer to use adhesives. They are sometimes a bit messy but I feel better about their ability to hold the inlay forever. My adhesive of choice is pure silicone adhesive. Available in a variety of sizes, this clear, super tacky material is fairly easy to use and allows for cleanup both during and after application.

The thing I like best about silicone is that a tiny bit of silicone can be placed in the cutout just before pressing the inlay in place. The soft silicone can be moved easily throughout the cutout to cover the entire area of the inlay. Excess silicone will seep out around the edges and can be immediately wiped off with a damp towel. Dried silicone can also be removed using mineral spirits (be careful, some wood finishes will not tolerate mineral spirits).

A great many other adhesives might be used, although I fail to see one that is easier than silicone unless it might be a dual application rubber cement. This type adhesive is often used for mounting counter tops and is usually sold in pint, quart or gallon cans. Like silicone, it is thick, so some allowance must be made for the depth of cut in the wood. With this product, a coat is painted on the back of the inlay prior to cutting. A coat must also be applied to the cutout in the wood where the inlay will be placed.

Once each has dried, they can be handled, cut and worked with, and neither will tend to attract dust or stick to other surfaces. Once they come in contact with each other, however, they will bond instantly and permanently. Unlike silicone, there is little or no opportunity to move or adjust the inlay. Once it touches, it is there forever.

Inlays are by no means the only things you can make by cutting wood on a laser. Fancy ornamental wood pieces like those used in the making of fine furniture are simple projects with a laser. Cutting ornate Christmas ornaments or other keepsakes are fast and simple with even a low-power laser.

Power is really the dividing point in wood cutting. Although a low-power laser (25 to30 watts) can cut wood up to 1/4″ thick, it isn't as easy as it sounds. More-powerful lasers (50 to 100 watts) can make quick work of 1/4″ plywood or alder, while smaller lasers may find such materials hard going. It really isn't so much a problem with the thickness of the wood; the low-power lasers can chew through thicker materials just by running multiple passes. It is slower, to be sure, but it works.

What it also does is produce a great deal more smoke and char. To try to cut a pre-finished piece of walnut on a 25 to 30 watt laser might very well destroy the finish while hacking its way through. A higher-powered laser can vaporize a much thicker piece of wood in a single pass than can a low-powered machine. When wood is being vaporized, it produces very little smoke and no char. Therefore, the more powerful lasers are clearly the ideal for cutting wood and most other materials as well. Still, so long as there is a major difference in price, most of us will just have to make do with the lower-powered lasers.

Those who use low-power lasers will find the most success when cutting wood that is not more than 3/32″ thick. This usually cuts in a single pass and allows for easy control of heat and smoke damage. I cut a lot of 1/8″ material, and it always cuts clean in a single pass.

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