Laser Engraving - Answers to Commonly Asked Questions

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I spend a fair amount of my day talking about lasers and answering questions largely from first-time laser users. The same questions are asked time and again, so I thought I would to take this opportunity to share the most common ones.

How does a laser work?
The easiest way to think about a laser is to think of it as a light source, like a light bulb. However, a light bulb will emit energy all around it. A laser, on the other hand, emits energy from a tube and has a very small spot-size diameter. The process is similar to using a magnifying glass to focus the sun. The energy is collected from a larger area and focused into a tiny spot size, where the energy is the most concentrated. Move the magnifying glass up and down and you lose concentration of the energy to burn or vaporise materials.

Lasers were first created in laboratories where scientists discovered that by making a light source (through a variety of methods) and focusing the energy, one could produce a medium powerful enough to affect certain materials. They named these first light sources Light Amplification by Stimulated Emission of Radiation or LASER.

It didn't take long for industry to begin to notice the importance of this discovery. Early laser pioneers moved the techonology out of the labs and experimented with several types of methods of generating the light source, thus creating several types of lasers. For many engraving options, CO2 lasers, named for the gases used to create the light source, are the tool of choice.

Like light bulbs, lasers are rated by wattage. Simply put, the higher the wattage, the more powerful the tool. Engraving lasers generally range in power from 10-100 watts.

Using a laser to engrave is a fairly simple process. The laser emits the beam of light. The beam goes though a corner bock and is turned by a mirror to a focusing assembly that focuses the beam down to the material, where it actually vaporises the material. Features such as power, speed, resolution, and pulse frequency are easily controlled by the operator via the machine or the computer.

If I buy a laser machine, what else do I need?
In addition to the laser machine, you will need the following items:

A computer - Any model purchased within the last few years should work adequately.

A graphic arts software package - Most users like CorelDRAW products, but there are others as well. Check with the manufacturer for their recommendation and also make sure your version is compatible with your computer system's version of Windows and the drivers that come with the laser machine.

A good working exhaust system - This will help to remove all vaporised materials to the outside. What you get will vary depending on how you will be using your system and the materials you are processing. Manufacturers typically recommend an exhaust system that will move a minimum of 235 CFM (cubic feet per minute) at 6 inches of static pressure. For top efficiency, make sure the duct work is adequate to support the type of blower and materials you will be using, and make sure that all vents and ducts remain open and free of debris.

How much laser power do I really need?
With today's seemingly endless options for power, it can be quite confusing for a consumer. Before you make any purchase, consider the following: Because power is mainly a function of speed and versatility, make sure that you are buying a machine with enough power to do your specific jobs at speeds that are profitable. Again, before you

make any purchase make sure the system can do what you need it to do. In addition, you might want to factor in future needs and consider buying the most power you can afford. This will allow you to not only perform needed tasks profitably, but to grow into further capabilities as well.

What options should I invest in?
Many of the options available today will come standard with your system. If you are going to be engraving curved surfaces, you will want to invest in a rotary fixture. This is an option that turns the piece you wish to engrave beneath the laser beam so that it is able to stay in focus during the engraving process. A rotary fixture can be purchased from your system manufacturer and can be added at any time.

Another useful option is a vector cutting table, which is an option that allows for the material to remain off the table top and to be cut through without the laser beam reflecting directly off the table top of the machine into the underside of the material. These can be added at any time, come in a variety of designs, and can be purchased from the equipment manufacturer or aftermarket suppliers.

In addition there are special lenses that work for specific applications, air assist packages, which can be useful for vector cutting purposes, and beam splitters which allow you to run more than one part at a time. These are options that, depending on the system, may need to be included at the time of purchase or may be added at a later date. The equipment manufacturer is usually the best source for equipment options, but there may be others as well.

What kind of maintenance do these systems require?
To keep your system in peak operating condition will require some maintenance. The OEM will advise you as to what this entails and how often you should perform such tasks. Remember to always use materials supplied by or recommended by the manufacturer.

What can I charge my customers?
What you will be able to charge your customers for laser-processing services will depend on many factors, including the location of shop, specific job(s), and the market segment. Most engravers will charge either a price per square inch of engraving or an hourly rate. In addition, extra charges may include the cost of material, set up, artwork, finishing, packaging and shipping charges.

Where can I learn more about laser engraving?
Talk to manufacturers and distributors of new equipment. They can be found in industry directories or online searches. Read articles published in trade magazines and online. There are also several excellent forums where you can discuss the topic with other users and experts in the field. Attend trade shows where manufacturers are exhibiting. This will give you an opportunity to see the equipment firsthand. Whenever possible, ask to see a demo of the equipment processing your part(s). Ask questions so you know exactly what you are getting for your investment. In addition to the equipment, you will also want to know about warranties and service issues. Knowing upfront who to contact for help will go a long way in preventing problems later. Ask for references and use a job shop initially to help you determine if a laser-engraving system is right for you.

Diane Bosworth owns and operates Access Business Solutions, Inc., a company that specialises in the sale of quality used laser-engraving equipment and laser consultation services. For more information e-mail Diane at dianec@usedlasers.com.

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