Laser Engraving Equipment – *Features, Accessories and other Must-haves*
By Mike Dean, director of sales and marketing, Epilog Laser

Laser engraving systems have come a long way since their inception. Today's systems are faster, more powerful, have more features, and best of all, are more affordable than ever. If you're in the market for laser engraving equipment – regardless of the manufacturer – the following features, listed in no particular order of importance, were designed to make your cutting and engraving experience as convenient as possible. We encourage you to keep them in mind in your search for the right equipment to meet your needs.

Auto Focus: To achieve optimum image and edge quality, the laser beam must be focused to its smallest spot size at the point where it contacts your material. Auto-focusing the laser beam is simply a matter of using a motorized table lift and a sensor to move the table up or down until the top of the work surface is the correct distance from the focus lens. Manufacturers use different methods to achieve automatic focusing, so you should determine if one method works better for you than another. Some things to look for are whether or not the system can auto-focus on glass, whether it can auto-focus when using a rotary device, whether it can auto-focus at any location on the table, and whether or not you can custom-control the distance between the focus lens and the material with which you ar workingl.

Air Assist: Air assist is designed to remove heat and combustible gasses from the work surface. Air assist is most commonly used when vector cutting, but there are some raster engraving applications, like rubber stamp engraving, that also benefit from using air assist. Air assist directs a constant stream of compressed air across the work surface to reduce the amount of flaming, scorching and charring that can occur. Air assist is a standard feature in many CO2 systems; however, some manufacturers offer it as an optional accessory.

Safety Note - Because of the large number of laser systems in use, many manufactures are reiterating the need to operate lasers as safely as possible. Air assist is both a useful tool as well as an important safety feature. One of the most common materials to cut with a laser is acrylic, but unfortunately, acrylic is also one of the most flammable materials that can be laser-cut. Using air assist is absolutely essential when laser cutting acrylic and acrylic should never be cut without it. Additionally, many of today's engraveable plastics are acrylic-based. Always use your air assist feature when cutting, and never allow your laser system to run unattended.

Beam Enhancing Optics – Some manufacturers offer an optics package that will enhance the characteristics of the laser beam. Epilog calls this our Radiance™ optics. This feature varies from manufacturer to manufacturer, but using enhancing optics to expand and straighten the laser beam helps produce a smaller, more consistently shaped beam over the entire table. The need for enhanced optics becomes more and more important as the size of your work area grows. On a large table that does not have beam enhancing optics the beam will be a different shape and

size at opposite corners of the table. This difference in beam shape and size can produce a noticeable effect on the output quality of your system, especially when you compare the work produced at opposite corners of the table.

Advanced Driver: An advanced driver is an indispensable tool for helping not only with complete control over the laser system, but it can also be a great tool for helping keep your laser activities organized. An advanced driver provides features like a materials and job file database that you can use to create and save virtually any number of machine and material configurations you want. It also provides other features like Color Mapping that allows you to define and save how individual laser functions will operate based on their color in your artwork. And, the advanced driver should be just as easy to use whether you are just beginning or you are an advanced user with the most demanding needs.

Integrated Vacuum Table: Epilog offers an integrated vacuum hold-down table that uses air from the exhaust to pull from beneath the work to hold thin materials flat, thus keeping them in proper focus while cutting or engraving. Sheet stock like plastic, anodized aluminum, wood, etc. that is slightly warped can be held flat without t the need for double-sided tape or other mechanical means.

Integrated Vector Grid: The vector grid is a must-have with applications that involve cutting. Epilog offers an integrated vector grid as a standard feature in all of our systems. The grid is used to lift the material you're cutting off of the flat work table, allowing the laser beam to pass cleanly through the material. This dramatically reduces underside reflections and removes smoke, not only from the top side of the material, but also from the underside. This revolutionary feature is a huge time saver and offers user convenience that is indispensible for many of the most commonly used laser materials.

Moveable Home Position: Not every object you engrave or cut will fit nicely in the upper left hand corner of your engraving machine. That's why most manufacturers offer a moveable "home position" on their systems. This feature makes it possible to engrave irregularly-shaped pieces by allowing you to create a temporary "home" position anywhere on the table. This temporary home position helps eliminate the frustration that engraving or cutting in exactly the right location on oddly shaped items can create. It is also a great time saver for simple jobs where you don't want to spend time determining the X and Y coordinates of where you want to start engraving.

Center-Center Engraving: A center-center engraving option allows you to define the center of your artwork as the primary reference point (home position) of your engraving or cutting. Used in conjunction with a moveable home position, this feature provides an added level of flexibility to simplify many jobs.

Servo Motors
Servo motors set the highest standard within the industry. While other motor systems are appropriate for more entry-level machinery, servo motors are the best choice for higher-end, professional equipment. Servo motors are renowned for their incredibly fast acceleration and deceleration times as well as their ability to operate without the cogging that is sometimes seen in other types of motors. Motor choices vary by manufacturer and machine.

Red Dot Pointer - Since the CO2 laser beam is invisible, a red dot pointer is added to the system that allows you to have a visual reference for locating where the laser will fire. Unlike the CO2 laser, the red dot pointer stays on when the door is open so you can run and preview where a job will engrave or cut without actually firing laser. Some manufacturers also display a

numerical read-out of the X and Y coordinates that provide an exact position of where an object is on the table. This is a very handy visual tool!

There are many factors to take into consideration before purchasing the right CO2 laser engraving system to meet your needs. Depending upon your needs and budget, some of the features above may be more or less important to you. We encourage you to research various providers – both online and in person. And remember, in the world of laser engraving, ***seeing is believing*** – evaluate different systems by engraving and/or cutting your artwork on your materials to see if you're going to get the results you're looking for when shopping for the best laser system for your business.