Maintaining your laser system: regular cleaning makes for a long laser life

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As with most pieces of equipment, preventive maintenance is an important part of owning any CO2 laser engraving system. This month we'll discuss common maintenance techniques that will keep your laser system performing at its peak. ***Please keep in mind that every laser manufacturer is a little different, so the following tips are more general in nature.*** You should reference the laser engraving guide/manual supplied by your provider for complete instructions.

It's actually very easy to keep your laser system running its best if you always keep it clean. That includes ensuring the area around the laser is free of clutter, combustible materials, explosives, or volatile solvents such as acetone, alcohol, or gasoline.

Below are the common materials that will be used to remove the smoke and vapor from the table, X-beam and anywhere else that collects dirt and debris.

Materials for regular system cleaning:

- Soft cloth
- Mild household solvent like Isopropyl alcohol
- Cotton swabs

The top six maintenance techniques we're about to cover will give your laser and long, happy and productive life. Most manufacturers include some cleaning instructions in their manual, and you should refer to your specific manual for the best instructions.

Cleaning Optics

The optics in your system includes all lenses and mirrors. We recommend inspecting them weekly, and cleaning as necessary for optimum performance. Keep in mind that your exhaust flow may affect your cleaning schedule. If you have low exhaust flow, you may not be getting rid of all of smoke and debris, and you may need to modify your cleaning schedule. Luckily, a simple visual inspection is all that's needed to determine if your optics need cleaning.
The two optical components most likely to require cleaning are the focus lens and the mirror directly above it.

Look at your optics to determine if they are dirty. Normally, most optics are a clear gold color and are bright and shiny. If the optics are cloudy, or have smudges or debris on them, they need to be cleaned. If there is a cover over your optics, remove the cover to inspect the optics. Don't let

the cover fool you! Dirt and debris are still is able to get into most lens chambers and if you don't clean your optics, they can degrade your engraving and can even crack the lens.

To clean the focus lens and the mirror that is directly above it, use a cotton swab that is soaked with optics cleaning fluid. Gently swab the optics to remove dust and debris. Wet the cotton swab thoroughly with the solvent, and then blot it against a piece of cotton so that it is no longer soaking-wet. Then dab the optic gently, rotating the swab after each dab to expose clean cotton to the surface, until the optic is free of visible contamination. At that point, prepare a fresh swab and clean the surface with a gentle zigzag motion across it. Avoid any hard "scrubbing" of the surface, especially while there are visible particles on it. When you are done, be careful to remove any cotton threads that may have snagged on the mountings. Allow the optics to dry before you operate your engraver.

It might sound odd, but if you should run out of the optics cleaning fluid supplied by your laser manufacturer, pure ethyl (grain) alcohol is a highly recommended substitute because of its pure nature and because it is readily available.

With an easily accessible lens assembly, you can quickly clean your optics as needed. If your optics are covered, remove the cover to check for the dirt and debris that are still is able to get into the lens chamber. Dirty optics will degrade your engraving and can even crack the lens.

Cleaning your Vector Grid/Table

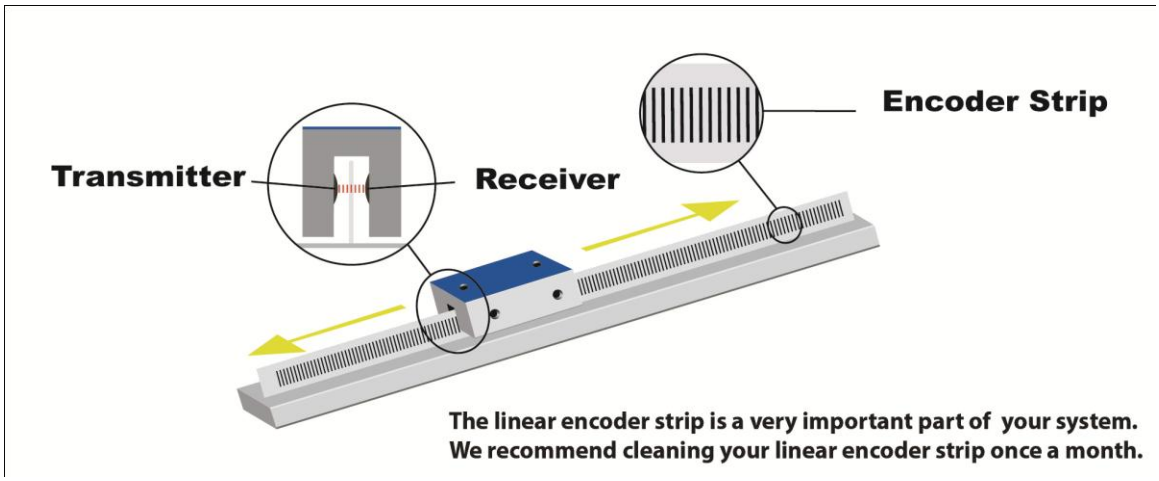
Whenever you are vector cutting there is the potential for small pieces to fall through the vector grid and collect in the table tray. These small pieces present a very dangerous fire hazard, especially if they are allowed to collect over time. Since most users cut wood and acrylic, these small pieces that fall into the table tray act just like kindling and can ignite and start a fire. To clean your tray, remove the vector grid and clean out the table tray using a small brush or vacuum cleaner. Completely remove the debris in the bottom of the tray on a regular basis.

Cleaning and the Bearing Rails
The bearing system in your laser system should be inspected on a regular basis and cleaned as necessary. Use a soft cloth or cotton swab with isopropyl alcohol or similar mild solvent to clean all of the bearing tracks. For many systems cleaning the bearings is not a necessary part of a frequent maintenance schedule, but they should occasionally be inspected and cleaned per the manufacturers instructions.

Cleaning the Auto Focus Feature
The auto focus mechanism is typically mounted at the back of the carriage that holds the focus lens. It is usually about a quarter inch in diameter, and about two inches long. If you work with materials that leave a greater amount of debris and/or residue (such as wood) the auto focus feature should be periodically cleaned for accurate focusing.

Use a soft cotton cloth and some mild household cleaner or isopropyl alcohol to gently wipe the auto focus plunger until it is clean.

Cleaning Optical Strip and Linear Encoder
With laser systems that use linear encoders, you occasionally may need to clean the optical strip and encoder in your machine. The optical strip and encoder are likely located under the protective cover of the X-beam assembly. The optical encoder provides precise positioning for the x-axis carriage. To clean the optical strip remove the protective X-beam cover and wipe off the optical strip using isopropyl alcohol and a soft cotton cloth or swab.



Cleaning the Exhaust

Make sure the exhaust blower you are using receives proper maintenance. Periodically clean the exhaust blower and duct system to remove built-up debris. If you detect odor while engraving, or if the smoke in the cabinet is visible in the area of the lens carriage, inspect the exhaust system for leaks and obstructions. Ensure all connections are properly secured. Also check for loose or broken duct connections.

Inspect and clean the exhaust ports in your machine to ensure there are no obstructions within the machine itself. Use a wire brush to clean the plenum and exhaust port of your machine.

As you can see, all of the maintenance techniques are simple and easy to perform. Spending just a few minutes on a regular basis inspecting and cleaning your machine will add life and productivity to your equipment and in turn, to your business.