

Laser Marking Machine: The Ultimate Guide to Faqs 2022

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What is a Laser Marking Machine?

A laser marking machine is a device that uses a laser beam to engrave or mark an object. The technique is like laser engraving in that it uses a focused beam of light to draw or etch a thing, but it differs from laser engraving in that the beam does not remove material from the object's surface. Instead, this machine creates long-lasting marks on plastic, metal, and other surfaces.

A laser marking machine is an ideal solution for any business owner looking for a way to create permanent labels for their products. It can be used to keep tools and equipment so customers or employees can quickly identify them and create serial numbers for easy inventory tracking.



What is the Difference Between Laser Marking, Engraving, and Etching?

Laser marking is permanent, like engraving. It doesn't involve cutting through the material or removing any material; it's just a permanent change in the color of the surface. The laser marking can be filled with paint or ink to make the mark more visible, but generally speaking, it's a bit more of an industrial process than engraving.

Laser engraving is different because you cut into the material and remove material to create depth. You can also create a 3D effect by simply removing more material from one area than another. This is called relief carving and can give your image or text a raised look.

Laser etching is similar to laser engraving, except that it removes a thin layer from the surface instead of cutting into the material. This is done by using low-powered lasers — which don't damage the material — while moving very quickly over the etched surface.

I Have a Laser Marking Machine. How Do I Get Started?

Congratulations on your new laser! Now what?

First, let's determine what type of laser you have. There are two main types of lasers used for marking plastics: carbon dioxide (CO₂) lasers and fiber lasers. Both types of laser can be used to engrave and draw on a wide range of materials, including plastics such as polycarbonate (PC), polymethyl methacrylate (PMMA), and acrylic, as well as several other materials such as wood, glass, ceramics, and metals.

A CO₂ laser is better suited for marking organic or non-metal materials. A CO₂ laser can keep plastics without any pretreatment — in most cases; the material does not need to be ablated or vaporized for a high-quality mark. The ideal application for this type of laser is to mark variable data such as serial numbers, batch codes, or 2D codes.

If you have a fiber laser, it will likely be better suited to engraving metal or ablation on plastic parts because of the higher power levels achieved with the fiber laser. If you want to do more than just marking with your machine, this might be your right choice.

If you've just purchased a laser marking machine, we suggest you start with these four steps:

1. Identify the type of laser that works best for your application. (If you're not sure, contact us.)
2. Find out if you'll need any software or additional accessories to make your laser work with your equipment.
3. Make sure you have the right safety equipment and train your staff in proper safety procedures.
4. Get familiar with running the laser and its settings by marking some test materials.

How Does a Laser Marking Machine Work?

A laser marking machine is a kind of equipment that uses a laser beam to engrave graphics or text on the surface of various materials.

Laser marking is a non-contact processing method that uses the laser beam to irradiate the surface of the workpiece, causing local heating and chemical or physical changes to achieve the purpose of marking. Laser marking machines can be used in various fields, such as industrial production and processing, handicraft processing, printing industry, aerospace industry, etc.

The principle of laser marking is: that when the laser beam focuses on the surface of a material if it exceeds its threshold power density, it will destroy its molecular structure and cause local melting, gasification, and other physical changes. The material is removed from the surface layer by evaporation or peeling off at a certain depth. At the same time, the laser energy can also change the color of some materials due to the high-temperature effect.

Do Laser Marking Machines Require a Lot of Power?

Laser marking machines require a relatively large amount of power. A typical laser marking machine will require anywhere from 1 to 5 kilowatts of power. There are a lot of factors that go into how much power the engine requires. Those factors include the type of laser, the material being marked, and how fast the marks are made.

A 1kW laser marking system will require about the same electricity as a standard kitchen oven. These machines need to be able to draw power from an outlet that can handle that much load. The voltage needs to be between 110V and 240V, depending on what is available in your region.

For the machine to operate at peak performance, it needs to be connected directly rather than through an extension cord. This ensures that there is no drop in efficiency over time during operation.

What Accessories for the Laser Marking Machine?

Below we have a classification of the most common accessories:

Fiber laser marking machine with shield,
laser head protection cover,
laser head extension arm,
laser marking on metal or other materials,
metal material clamp and fixture,
rotary device.

How Fast Are Laser Marking Machines?

The marking speed varies from one machine to the other. It depends on the power of the laser, which again depends on several factors, including:

Marking type (engraving or etching)

The material being marked (metals or organic materials)

The thickness of the material being marked

The density of the material being marked

The following are some average speeds:

Etching on anodized aluminum: 1,000 characters/second (cps) at 0.1 seconds per character at 20-watt power.

Typically, it takes 10 to 30 seconds to mark a 1 x 1-inch area.

Fiber lasers offer the best performance in terms of speed and quality. Fiber lasers have a better beam quality than CO2 lasers, allowing them to work at much higher rates. It also means that they can achieve a smaller minimum mark size.



What Are the Typical Applications of a Laser Marking Machine?

Laser marking machines are a part of our daily lives. They are used for numerous purposes in a wide variety of industries. Here are some of the typical applications for laser marking machines:

Barcodes and Serial Numbers

This is the most common use of laser marking technology. The machine can mark logos, barcodes, serial numbers, etc., on a variety of materials with high precision and accuracy. You can also use them to mark different text or symbols on products or components.

Jewelry Industry

Laser marking machines are used to etch names, logos, etc., on jewelry items like rings and necklaces.

Crafts Industry

Laser marking machines are used to carve various patterns and designs into wooden crafts. They can be used to engrave intricate patterns on various materials like wood, glass, acrylics, plastics, etc. They can work with any material that absorbs energy from the laser beam because they use high-power lasers that produce heat quickly.

Medical Devices

Medical devices like syringes and needles need serial numbers or barcodes for identification. These can be etched on these medical devices with the help of laser marking machines.

What Types of Laser Marking Machines Are Available and What Are Their Differences?

Laser marking machines fall into two main categories: fiber laser and CO2 laser. Here are the differences between them:

Fiber Laser Marking

Fiber lasers are suitable for marking a wide range of materials, including metals such as stainless steel, aluminum, titanium, and copper, as well as some plastics. They can be used for high-speed engraving of bar codes, data matrix codes, and logos on products, as well as personalization

applications such as marking names or other information on ID tags. Fiber lasers have a very small beam diameter that allows them to create very high-resolution marks.

CO2 Laser Marking

CO2 laser marking machines are ideal for marking nonmetallic materials such as wood, leather, and rubber. They are also used for engraving glass, crystal, and acrylics to create unique promotional items and personalized gifts. CO2 lasers can mark at higher speeds than standard fiber lasers when working with nonmetallic materials.

How Do I Choose the Right Laser Marking Machine?

There is no single best laser marking system; there are only systems that are well-matched to a particular application.

So you've decided that you need a laser marking machine. But with so many options out there, how do you choose the right one for the job? To narrow down your search, it helps to think about the following factors before you start shopping:

1. The material: Is it metal or plastic?
2. What is the size of your part?
3. How thick is your material?
4. How many do you need to mark per day/month/year?
5. What type of marking do you want to achieve?
6. Do you have any environmental restrictions?

How Long Does It Take to Get a Laser Marking Machine Working Properly?

The answer depends on how long it takes you to get the machine installed and running.

If you are installing a new laser marking machine for the first time, it will take more time to install and start the laser than an existing installation that is being upgraded to a new laser. For example, if you have an old YAG laser marking machine and you are replacing it with a newer fiber laser marking system, the installation time will be less than if this is your first laser system.

It also depends on whether or not you are using the same equipment as before, such as the same mounting position, or whether you need to move your mount or add the amount. If you don't know where to get started with your new laser marking machine, check out this article for some tips on getting up and running quickly: [Laser Marking Machine Set up Tips](#).

If you are working with a professional laser manufacturer or reseller, they can help answer any questions you may have about getting your new laser marking machine up and running quickly. The best way to ensure that your new laser marking machine works properly is to work with a professional who can provide expert advice on how long it should take to get up and running properly.

How is a Laser Marking Machine Set-Up, and How Much Space Does It Require?

Setting up a laser marking machine is relatively easy and doesn't require a large amount of space. The "footprint" of most laser marking machines will be about 2 x 3 feet and will be approximately 4-5 feet high. These machines do not have to be installed on dedicated foundations or floors due to their lightweight and small size. They can generally be set on a table or cabinet and are ready to run within minutes of delivery.

Laser marking machine setup requirements:

1. Indoor use, avoid exposure to direct sunlight or strong lighting;
2. Avoid water or dust; avoid the surrounding temperature change too much; not be next to strong magnetic equipment;
3. To ensure that the ventilation is smooth around the equipment; good grounding system; do not allow nearby flammable materials to avoid fire;
4. Provide a safe work environment for equipment maintenance personnel; provide professional training for personnel who operate.

Are There Any Material Limitations for Laser Marking?

The short answer is yes. There are certain materials that can not be marked by a laser due to the inherent properties of the material itself.

Anodized aluminum, for example, has an oxide layer on its surface that melts at a much higher temperature than aluminum, and so it acts as a shield to the underlying aluminum. This makes it nearly impossible (or at least extremely difficult) to mark such material with a laser.

Other materials that have properties that make them unsuitable for marking include those that are highly reflective (such as stainless steel or chrome) or those that have low melting points (like metals from the alkali group—potassium, sodium, and lithium).

However, there are ways around these limitations when necessary.

For example, anodized aluminum can be marked by removing the oxide layer before marking. And for metals with low melting points, you can simply use a less powerful laser setting to engrave the surface without reaching the melting point of the metal.