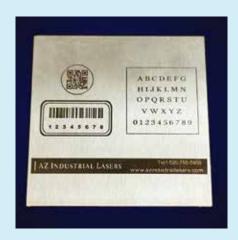
# High Performance Laser Marking Machines









# AZ INDUSTRIAL LASERS

We will be glad to answer any questions that you may have, and it is our pleasure to help you find the right marking solution for you application.

We truly value our customers and strive to serve as a long-term partner to help our customers achieve their success.

Please contact us for further discussion of your material and marking requirements. We will be happy to help you choose the machine that is most suitable for your application.

520-790-5808
sales@azindustriallasers.com
AZIndustrialLasers.com

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### Introduction

AZ Industrial Lasers is proud to provide high quality and cost competitive **LasePen®** series of laser marking machines to meet the marking needs from various industrials.

Our **LasePen®** laser marking machines can well mark on a variety of materials: Metals, Plastics, Glasses, Crystals, Ceramics and more. With in-depth application know-how, our team can help you find the optimized marking solutions for your industry and application.

Our **LasePen®** laser marking machines allow you to mark with all the common laser marking technique:

- Laser Etching: creates high contrast and permanent marks on material surface at high speed.
- Laser Engraving: creates deep and permanent marks that withstand abrasion
- Laser Annealing: generates marks under the surface without affecting the base material or its protective coating.
- Laser Ablation: removes only the coating on a given material.
- Laser Carbonization/Foaming: oxidize the carbon in a given material to produce CO2, which results in high contrast mark.

Our **LasePen®** laser marking machines are easy to use, efficient to mark and deliver superior marking results. Our machines require no consumables during operation, which helps you keep low operation cost in the long run.

**LasePen®** laser marking machines can be great value-added tools to you and your business. Embedded into your process, they can bring many benefits to your operation such as:

- **Traceability:** Adding unique product info, lot number, QR code, barcode etc. onto your parts to ensure their traceability in the entire supply chain. It makes your inventory management and aftersales service highly efficient and convenient.
- **Branding:** Adding your logo and contact info onto your parts to help you standout out from competitors and create a memorable impression to your customers.
- **Regulation Compliance:** Marking on packaging to help you meet the increasingly strict and expanding industry labeling regulation and requirements.
- **Anti-Counterfeiting:** Marking unique code on your products to provide identification and protect you against counterfeiting.

## **Laser Marking Machines**

Product Modules	
LasePen® F-1:	Portable Fiber Laser Marking Machine
LasePen® F-2:	Desktop Fiber Laser Marking Machine
LasePen® F-3:	Standalone Fiber Laser Marking Machine
LasePen® U-3:	Standalone UV Laser Marking Machine
LasePen® F-OEM:	Custom Fiber Laser Marking System
LasePen® U-OEM:	Custom UV Laser Marking System







## LasePen® F-1: Portable Fiber Laser Marking Machine

**LasePen®** F-1 Portable fiber laser unit is an extremely versatile tool for marking metals and many other non-metal materials. Equipped with a high-quality fiber laser and highly stable Galvanometer, **LasePen®** F-1 Portable features excellent marking quality, fast marking speed and low maintenance costs. Its compact design, light weight and full transportability add great convenience to operation. **LasePen®** F-1 Portable is the ideal choice for marking on large parts, vertical surface or applications where mobility is critical.



### Highlights of the full portability of LasePen® F-1:

- Powered by both Lithium Battery and a Standard 110V Plug
- No need for an external computer thanks to the on-board touch screen interface
- Class I laser protection shied to ensure laser safety

Machine Technical Parameters: LasePen® F-1 Portable		
Laser source	Fiber Laser 30W	
Laser wavelength	1064nm	
Pulse repetition rate	30-200kHz	
Laser beam control	Galvo scanning marking style	
User control interface	Linux	
Working area	$100 \times 100 \text{ mm}^2$	
Marking speed	Max 7000mm/s @ F = 163mm	
Minimum line width	0.06mm @ F = 163mm (per material)	
Minimum character height	0.2mm @ F = 163mm	
Machine box dimensions	W315mm x H291mm x D215mm (W12.4" × H11.5" × D8.5")	
Machine weight	~8 kg (~17.6lbs)	
Machine handle weight	<0.9kg (2lbs)	
Power supply	110V or 220V	
Total power consumption	200W	
Cooling system	Air cooling	

<sup>\*</sup>All specs might be subject to change without notice due to continuous improvement

#### **Benefits of Portable Fiber Laser Marking Machine**

- Small size, light weight, fully portable.
- Permanent marking
- No corrosion, wearing, damaging or contamination of the parts
- Suitable for all kinds of metals such as stainless steel, aluminum, anodized aluminum, copper & brass, titanium, etc. and many non-metal materials.
- Supports variety of marking formats such as texts, numbers, logos, images, bar codes, QR codes, etc.
- Extremely fast
- Requires no consumables or post machining
- High marking precision and accuracy
- Can easily mark any shape and content on any kind of surfaces or areas difficult for access
- Free of maintenance Ultra-low running cost





### **Graphic Format Supported:**

Vector files: DXF/PLT/SVG

Image files: .bmp, .jpg, .png, etc.

### **Working Environment Required**

Environment Temperature: 0°C-40°C, Humidity: <70%

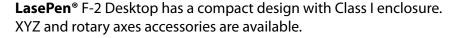
Must Not Have: No dust, No fumes, No corrosive gas, No flammable, explosive or volatile solvents.

- Videos on Laser Marking: www.azindustriallasers.com/applications/video/
- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

# LasePen® F-2: Desktop Fiber Laser Marking Machine

**LasePen®** F-2 Desktop is an easy and affordable desktop marking workstation that utilizes Fiber laser source. With high quality fiber laser and highly stable Galvanometer, **LasePen®** F-2 Desktop can provide excellent marking quality and low maintenance cost. It has wide applications on metals and some non-metal materials.

Compared to conventional machining process, laser machining doesn't wear down any tooling and has highly-consistent repeatability. Arbitrary features can be easily designed by CAD files and proceed directly.





Machine Technical Parameters: LasePen® F-2 Desktop		
Laser source	Fiber Laser 30W/50W	
Laser wavelength	1064nm	
Pulse repetition rate	30-200kHz/50-200kHz	
Laser beam control	Galvo scanning marking style	
User control interface	EZCAD2 (Compatible with Lightburn)	
Working area	$100 \times 100 \mathrm{mm^2}$ (customizable)	
Max load	~ 30 kg (~66lbs)	
X/Y platform	Adjustable precision platform, manual	
Z axis	Motorized, programmable	
Safety enclosure	Class I safety enclosure with safety interlock switch	
Marking speed	Max 7000mm/s @ F = 163mm	
Minimum line width	0.06mm @ F = 163mm (per material)	
Minimum character height	0.2mm @ F = 163mm	
Machine dimensions	W480mm x H732mm x D735mm (W18.9" × H28.5" × D28.9mm)	
Machine weight	~70 kg (~154bs)	
Power supply	110V or 220V	
Total power consumption	≤1.5 KW	
Cooling system	Air cooling	

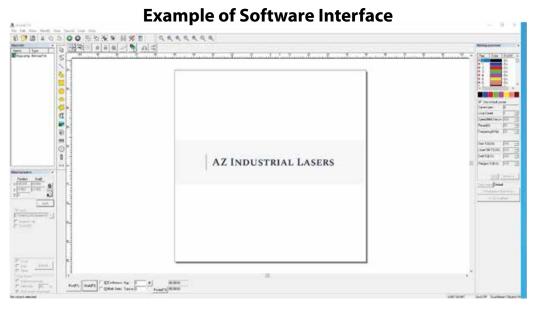
<sup>\*</sup>All specs might be subject to change without notice due to continuous improvement

#### **Options & Accessories**

- Exhaust systems
- Rotation axis

#### **Benefits of Desktop Fiber Laser Marking Machine**

- Permanent marking
- No corrosion, wearing, damaging or contamination of the parts
- Suitable for a wide variety of materials such as aluminum, copper, stainless steel, plastics, ceramics, etc.
- Suitable for all kinds of metals such as stainless steel, aluminum, anodized aluminum, copper & brass, titanium, etc. and many non-metal materials.
- Extremely fast
- Requires no consumables or post machining
- High marking precision and accuracy
- Can easily mark any shape and content on any kind of surfaces or areas difficult for access
- Free of maintenance Ultra-low running cost
- Compact design to save space



### **Graphic Format Supported:**

Vector files: .dxf, .ai, .dst, .plt, etc.

Image files: .bmp, .jpg, .gif, .tga, .png, .tif, etc.

#### **Working Environment Required**

Environment Temperature: 0°C-40°C, Humidity: <70%

Must Not Have: No dust, No fumes, No corrosive gas, No flammable, explosive or volatile solvents.

- Videos on Laser Marking: www.azindustriallasers.com/applications/video/
- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

# LasePen® F-3: Standalone Fiber Laser Marking Machine

**LasePen®** F-3 is a top-of-the-line Standalone Fiber Laser marking machine that is highly powerful and efficient. Equipped with a high-quality fiber laser and highly stable Galvanometer,

**LasePen®** F-3 features excellent marking quality, fast marking speed and has low maintenance cost. It has a wide range of applications on metal and some non-metal materials.

Compared to conventional marking process, laser marking is faster and less labor-intensive, no tooling wear or need for waste disposal, and delivering highly consistent repeatability.

**LasePen®** F-3 features ample inner working space, longer Z-axis travel distance and Class I safety enclosure. The machine, complete with the computer and display is ready to use after being plugged in. Rotary axes and other accessories are available.



Machine Technical Pa	rameters: LasePen® F-3
Laser source	Fiber Laser 30W/50W
Laser wavelength	1064nm
Pulse repetition rate	30-200kHz/50-200kHz
Laser beam control	Galvo scanning marking style
User control interface	EZCAD2 (Compatible with Lightburn)
Working area	100 × 100 mm² (customizable)
Max load	~ 50 kg (~110lbs)
X/Y platform	Adjustable precision platform, manual
Zaxis	Motorized, programmable
Safety enclosure	Class I safety enclosure with safety interlock switch
Marking speed	Max 7000mm/s @ F = 163mm
Minimum line width	0.06mm @ F = 163mm (per material)
Minimum character height	0.2mm @ F = 163mm
Machine dimensions	W700mm x H1563mm x D800mm (W27.5" x H61.5" x D31.5")
Machine weight	~185kg (~408lbs)
Power supply	110V or 220V
Total power consumption	1000W
Cooling system	Air cooling
Laser Module Life	>100,000 hours

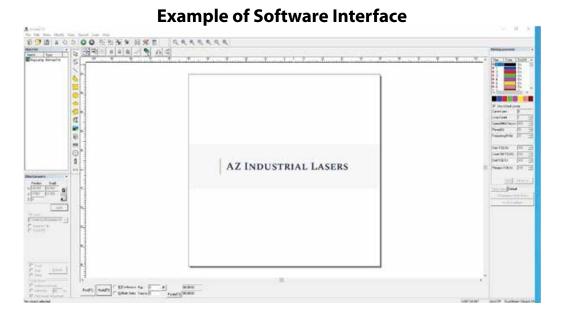
<sup>&</sup>quot;All year might he subject to change without autics durin continues impressented

#### **Options & Accessories**

- Exhaust systems
- Rotary Fixture

#### **Benefits of Standalone Fiber Laser Marking Machine**

- Permanent marking
- · No corrosion, wearing, damaging or contamination of the parts
- Suitable for a wide variety of materials such as aluminum, copper, stainless steel, plastics, ceramics, etc.
- Supports variety of marking formats such as texts, numbers, logos, images, bar codes, QR codes, etc.
- Extremely fast
- Requires no consumables or post machining
- High marking precision and accuracy
- Can easily mark any shape and content on any kind of surfaces or areas difficult for access
- Free of maintenance Ultra-low running cost



### **Graphic Format Supported:**

DXF, PLT, AI, JPG, BMP, DST, JPC, SVG, BOT, DST, NC

### **Working Environment Required**

Environment Temperature: 0°C-40°C, Humidity: <70%

Must Not Have: No dust, No fumes, No corrosive gas, No flammable, explosive or volatile solvents.

- Videos on Laser Marking: www.azindustriallasers.com/applications/video/
- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

# LasePen® U-3: Standalone UV Laser Marking Machine

**LasePen®** U-3 is a highly efficient stand-alone marking machine that utilizes UV laser source. UV laser marker has its unique advantages due to the small beam size and high beam quality. It will largely reduce the mechanical deformation of material and minimize heat affect zone. It is an excellent choice for ultra-precision marking and engraving. LasePen® U-3 works on a variety of materials such as glass, ceramics, crystals, plastics, semiconductor silicon wafer, metal, rubber, wood, etc.

Compared to conventional machining process, laser machining doesn't wear down any tooling and has highly-consistent repeatability. Arbitrary features can be easily designed by CAD files and proceed directly.



**LasePen®** U-3 Standard is a classic design with Class I enclosure. The machine, complete with computer, display and water chiller, is ready to use after being plugged in. XYZ and rotary axes accessories are available.

Machine Technical Parameters: LasePen® U-3		
Laser source	UV Laser 3W/5W	
Laser wavelength	355nm	
Pulse repetition rate	20-100kHz	
Laser beam control	Galvo scanning marking style	
User control interface	EZCAD2 (Compatible with Lightburn)	
Working area	$100 \times 100$ mm <sup>2</sup> (customizable)	
Max load	~ 50 kg (~110lbs)	
X/Y platform	Adjustable precision platform, manual	
Z axis	Motorized, programmable	
Safety enclosure	Class I safety enclosure with safety interlock switch	
Marking speed	Max 7000mm/s @ F = 163mm	
Minimum line width	0.01mm @ F = 163mm (per material)	
Minimum character height	0.03mm @ F = 163mm	
Machine dimensions	W700mm x H1563mm x D800mm (W27.5" x H61.5" x D31.5")	
Machine weight	~210kg (~463lbs)	
Power supply	110V or 220V	
Total power consumption	≤1.5 KW	
Cooling system	Water cooling	

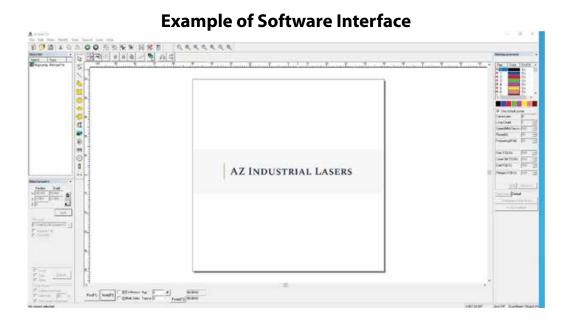
<sup>\*</sup>All specs might be subject to change without notice due to continuous improvement

#### **Options & Accessories**

- Exhaust systems
- Rotation axis

#### **Benefits of Standalone UV Laser Marking Machine**

- Permanent, Ultra-high precision and accuracy marking
- No corrosion, wearing, damaging or contamination of the parts
- Minimize heat affect zone
- Suitable for a wide variety of materials such as glass, ceramics, crystals, plastics, silicon wafer, metal, rubber, etc.
- Support variety of marking format such as texts, numbers, logos, images, bar codes, QR codes, etc.
- Extremely fast
- Requires no consumables or post machining
- Can easily mark any shape and content on any kind of surfaces or areas difficult for access.



### **Graphic Format Supported:**

Vector files: .dxf, .ai, .dst, .plt, etc.

Image files: .bmp, .jpg, .gif, .tga, .png, .tif, etc.

### **Working Environment Required**

Environment Temperature: 0°C - 40°C, Humidity: <70%

Must Not Have: No dust, No fumes, No corrosive gas, No flammable, explosive or volatile solvents.

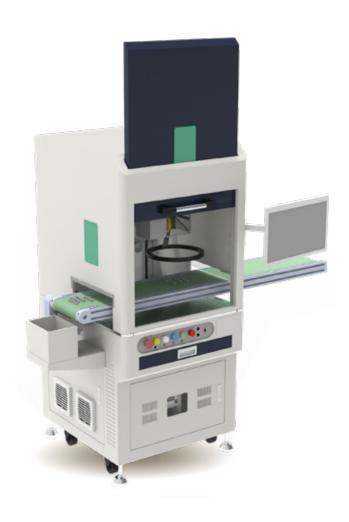
- Videos on Laser Marking: www.azindustriallasers.com/applications/video/
- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

# LasePen® F-OEM: Custom Fiber Laser Marking System LasePen® U-OEM: Custom UV Laser Marking System

Industrial customers often have unique needs for marking so that the marking procedure can fit into their current workflow, speed requirement and setup. AZ Industrial Lasers can help you analyze your process, identify your marking needs and provide a laser marking solution that is well integrated into your existing manufacturing process.

Enabled with our powerful fiber laser source or UV fiber laser source, our highly customized **LasePen®** in-line laser marking systems can mark or engrave onto various materials, including metals, plastics, glasses, ceramics, semiconductor wafers, and more.

Please feel free to contact us for discussion of your potential marking needs. We will be happy to hear your application details and what you would like to achieve, and help you design the marking system that can enhance your current process.



### **Laser Marking Services**

# Creative, Passionate, and Dedicated to Excellence



With a deep understanding of laser marking machines and a wealth of experience across diverse materials and applications, AZ Industrial Lasers sets the standard for top-notch laser marking services and takes immense pride in each piece delivered to our valued customers.

Our expertise extends across a wide range of industries and applications, including:

**Industrial Parts Laser Marking:** Whether it is serial numbers, logos, QR codes or barcodes, we provide clear and durable markings essential for effective identification.

**Firearm & Knife Laser Engraving:** From NAF marking to personalized names, images and intricate designs, we bring precision and artistry to every project.

**Jewelry Laser Engraving:** Elevate your jewelry pieces with custom art designs and elegant hallmarks, adding a touch of sophistication to every piece.

**Promotional Merchandise Laser Maring:** Enhance your brand visibility and appeal with custom markings on pens, tumblers and various promotional items, reflecting your brand identity with style.

**Awards & Gifts Laser Marking:** Transform name plaques, awards and personalized gifts into cherished keepsakes with detailed engraving that captures the essence of the occasion.







We work with a wide spectrum of materials, including metals, plastics, glasses, crystals, ceramics, wood, leather, and stones, ensuring versatility and quality across all projects.

Whether you provide your own files, use our ready-to-use artwork, or seek fully personalized design services, our team is committed to fulfilling your unique needs. From initial consultation to final delivery, we prioritize open communication. We attentively listen to your needs, present you with options, and provide support and guidance throughout the entire process. Your satisfaction and success are our top priorities, and we are here to ensure that every aspect of your experience with us is truly exceptional.

Contact us at Tel: 520-790-5808 or Email: sales@azindustriallasers.com to begin the conversation.

Follow us on Instagram: AZIL (@azil\_lasers) • Instagram photos and videos for updates of our laser marking examples.

### **Laser Marking and Engraving on Metals**

Marking and engraving on metals have very long history with mechanical means such as stampers. Laser provides the metal-related community a powerful new tool to achieve their goals practically and aesthetically.

Compared with traditional marking tools on metals, our **LasePen**® laser marking machines shows many unique advantages:

- No material deformation caused by external stress. The non-contact feature of laser makes it possible to offer precise marking/engraving without introducing any force on the metal parts. External stress, which usually causes material deformation, will not be present during the laser marking process.
- Highly efficient marking process. Laser marking on metals is very fast in speed. It largely reduces the time
  and labor compared with traditional metal marking. In addition, Multiple parts can be marked at the same
  time. There is no post-processing or additional finishing process needed after laser marking. The overall
  metal marking process is highly efficient.
- Durable, high contrast and high precision marking results. Laser marking is permanent and can withstand the impact from weather and harsh working environment over the time. The marking result also has much higher quality compared to markings made by mechanical ways such as stamping. Laser marking looks much more professional, appealing and consistent.
- High flexibility. Laser marking can be conducted on nearly any position on metal parts, including areas difficult to reach by traditional tools. The marking size, color contrast, depth control etc. are all easily adjustable. Numbers, texts, images, QR codes and bar codes can be simply marked to meet diverse needs. Marking can be made on both flat and round surface. Laser marking works well on all types of metal materials. For example, stainless steel, aluminum, anodized aluminum, copper, brass, titanium, and various alloys.

Black-annealed marking, white etching marking and deep engraving marking are all possible with our **LasePen®** laser marking machines.









- Videos on Laser Marking: www.azindustriallasers.com/applications/video/
- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

### **Laser Marking on Plastics**

Laser marking on plastics offers incomparable labelling qualities with permanent, high precision and flexible features. Our **LasePen®** laser marking machines are the ideal solutions for marking and etching on plastic materials.

Unlike conventional ink printing, the laser-marked texts and images are permanent. Laser markings are not able to be easily removed by wearing or solvents.

Very small feature size can be realized even at areas difficult to access by conventional methods.

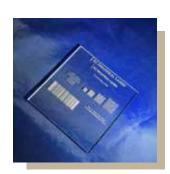
Our **LasePen®** laser marking machines support different types of laser marking processes on plastics, which enables various marking capabilities that can meet a variety of desired application requirements. For example, laser ablation and paint removal can remove the painting layer on plastic parts or plastic itself. Laser foaming creates visible making on dark color materials. Laser carbonization produces beautiful high contrast marking. Color change is another important photochemical process that provides high contrast and long-lasting marking on plastics.

Our **LasePen®** laser marking machines can mark on most type of commonly used plastics such as PET, PMMA, PI, PTFE, Polycarbonate, ABS, etc. Markings can be added on white, transparent, black and color plastics.









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### **Laser Marking on Glasses**

Glass, as a transparent material, had always been a challenge to provide good marking. Conventional mechanical or chemical marking/etching methods often delivers less-desired marking quality, and the processes are not easy.

Our **LasePen®** U series of laser marking machines are the ideal solutions for marking and etching on glass materials. Here are some key advantages:

- Superior marking quality. Due to the machine's small laser beam size and high beam quality, the heat
  affect zone of marking is minimized. The marking edge has superior quality compared to markings made
  by other methods.
- Small size and intricated details are achievable. The machine can mark with line width as thin as 0.01mm depending on the material. As a result, we can mark very fine lines and extremely small character. It is especially helpful for applications where space is a premium, such as LED packaging, micro marking, etc.
- High flexibility. Our marking machine can mark on flat surface, round surface and even inside of the glass materials. The marking size, position, fonts etc. are all adjustable. Numbers, texts, images, QR codes and bar codes can be easily marked to meet diverse needs.

Our **LasePen**® U series of laser marking machines are excellent to mark on all types of glasses. For example, soda lime, borosilicate, BK7, fused silica, glass panel with thin film coating, glass panel with ITO layer, etc.

Traceability of glass and glassware is increasingly important for manufacturers and end users. The label or barcode marked by our laser marking machines help people easily track and identify the corresponding data of the glass, and ensures the traceability of medical products and glass wafers in electronics industry.









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### **Laser Marking on Crystal Materials**

Crystal materials, such as sapphire and silicon, are widely used in consumer electronics applications. For example, sapphire is increasingly popular to be used in consumer electronics (e.g. cover window for watches and camera windows, substrate for LED and sensors, etc.).

As one of the hardest materials as known, sapphire is extremely difficult to be machined. Our **LasePen®** U series of laser marking machines are the ideal solutions for marking and etching on such crystal materials.

Compared to conventional diamond tools, lasers are more affordable, accurate and flexible. There is no tooling wear, and the yield is much higher.

Selective material ablation is also able to be employed during the marking/engraving process without introducing cracks or weakness into the substrates.

The picture below is an example of laser marking on a sapphire wafer with our **LasePen®** U-3 model. Texts, numbers, QR codes, bar codes and images can all be easily marked on the wafer with high accuracy and superior quality.



- Videos on Laser Marking: www.azindustriallasers.com/applications/video/
- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

### **Laser Marking on Ceramics**

Ceramic materials, like Al2O3, AlN and ZrO4, are widely used in industry and academic areas due to their advanced properties such as electrical insulation and wear resistance. However, the brittleness and hardness of ceramics make them difficult materials to be marked on. There is almost no easy tool available except lasers.

Our **LasePen®** laser marking machines are the ideal solutions for marking and etching on ceramic products. For example, ceramic substrates, ceramic components, ceramic light bulb sockets, ceramic crafts, ceramic cups, and more.

Unlike traditional ink painting method, our laser marking doesn't require extra consumables, which saves users extra cost. There is no involvement of additional material, which can avoid the problem of potential contamination.

Texts, numbers, QR codes, bar codes and images can all be easily marked on ceramic parts with high accuracy and superior quality.



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- Pictures on Laser Marking Samples: www.azindustriallasers.com/applications/gallery

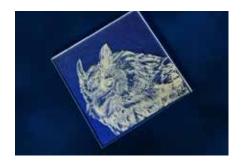
### **Laser Marking for Fun**

Laser marking is a great and easy way to personalize many items for your everyday life. You can add images or a message on such items as tumblers, pet tags, bracelets, cutting boards, etc. Whether it's for yourself or for a gift, let your creativity take over. The possibilities are endless!



















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AZ Industrial Lasers, LLC 3470 S. Dodge Blvd, Tucson, AZ 85712, USA Tel: 1-520-790-5808, Fax: 1-520-747-4024

www.azindustriallasers.com

