

UNIQUE WAVELENGTHS | CO₂ LASERS

Laser Cutting and Engraving of Specific Plastics and Other Materials



Unique Processing Benefits

Select the optimum wavelength for your application.



Faster Cutting Speeds

Maximize your output.



Superior Part Quality

Experience precision and a high resolution.

Alternative Wavelengths

CERAMICORE® Technology Optimizes the Use of Unique Wavelengths

Our patented laser models are engineered and manufactured in a **variety of CO₂ wavelengths**. These are generated by utilizing a combination of:

- CeramiCore® technology
- Laser gas mixture variations
- Proprietary manufacturing methods
- Special internal optics

Why is this important?

All materials possess unique energy absorption characteristics that correspond to specific wavelengths in the electromagnetic spectrum.

By matching the wavelength to the material that best absorbs it, the laser cutting or engraving of materials such as plastics is maximized. Apply this process to achieve faster cutting speeds, improved part quality, and finer resolution on a variety of plastic materials.

Benefits

Largest Selection of Unique Wavelengths in the Industry for Different Materials

In many cases, conventional sealed CO₂ lasers are limited in wavelengths or power level offerings. Our models are available in **most power levels** and in the following wavelengths:

- 10.6 μm → general purpose laser cutting and engraving on plastics and many other materials
- 10.2 μm → kiss cutting of plastics films
- 9.3 μm → engraving on specific plastics
- 11.2 μm → medical and dental applications

By selecting the optimum wavelength and pulsing specifications, the laser processing of your applications will produce superior part quality.

- Iradion lasers are effectively used for laser cutting and laser engraving of the following materials: Plastics and polymers
- Organic substances including wood, paper, skin, and leather
- Glass and ceramics

Applications

Unique Wavelengths for Plastic Laser Cutting and Other Materials

Each wavelength exhibits unique processing benefits depending on the application:

- **10.6 µm:** This is one of the most commonly used wavelengths in the industry. It is absorbed by the widest range of materials. Therefore, it represents a universal laser processing wavelength. It is a perfect wavelength for simple laser cutting and laser engraving of plastics, polymers and organic materials.
- **10.2 µm:** A wavelength that is commonly used for plastic laser cutting like polypropylene (PP), Polyethylene Terephthalate (PET) and other similar plastic films. It is found in the production of labels, packaging and laminations, “**Kiss Cutting**” is a common technique that utilizes 10.2 µm wavelengths for laser cutting of the plastics top layer of a laminate, while preserving the lower material layers.
- **9.3 µm:** A wavelength that is commonly used for process laser marking of plastics or engraving like Polyimide films utilized in packaging as well as optical layers for LED display screens. It is also suitable for Polyethylene Terephthalate (PET) for bottling and containers.
Using the standard wavelength of 10.6 µm may damage these materials and may cause imperfect engravings and marking. A wavelength of 9.3 µm produces shallow and sharp engravings.
- **11.2 µm:** This wavelength is specifically designed for medical and dental applications. The 11.2 µm wavelength allows the use of CO₂ assist gas to stop „wicking“ of fluids into the beam path as well as prevents the CO₂ assist gas from absorbing laser energy and distorting the precision laser beam.

Advantages

Quality, Power and Reliability

Profit from the following advantages of our CO₂ lasers:

- **Perfect cutting or engraving results on specific plastic materials with 9.3 µm and 10.2 µm**
- High stability laser designs available at 10.6, 10.2 and 9.3 µm
- Unique wavelengths are available like 11.2 µm
- Patented CERAMICORE® design ensures longevity and stability
- Inert CERAMICORE® prevents laser gas contamination, power loss
- Low thermal expansion CERAMICORE® for high stability
- Extended power stability from 2% to maximum power
- Short rise and fall times; good pulsing characteristics
- Advanced RF driver electronics: reliable, efficient and state-of-the-art
- 30% fewer laser components; highest reliability

Customizations & Options

An Individual Solution for Your Needs

Tailor our CO₂ lasers specifically to your needs:

- Wavelengths options: 11.2, 10.6, 10.2, 9.3 µm for best applications results on specific materials like plastic laser cutting
- Power levels: 25 to 250 Watts models
- Pulsing options: standard and Fast Pulse
- Cooling options: air-cooled, fan-cooled and water-cooled
- Power supply models and sources
- Beam expansion/collimation: 6x, 5x, 4x, 3x, 2.5x
- Laser controls
- Customized final testing
- Operation and training programs
- Rapid response service program
- Laser gas degradation insurance

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ENDURING EXCELLENCE, PULSE BY PULSE.

