

# I. INTRODUCTION

## Principles of CO<sub>2</sub> Laser

**LASER** is a **L**ight **A**mplification by **S**timulated **E**mission of **R**adiation.

A CO<sub>2</sub> laser works by exciting the molecules of a carbon dioxide gas mixture.

To engrave, the beam is focused through a lens. The intensive beam can vaporize the surface of the material leaving an engraved image or, in some cases, cutting through the material.

## Safety

The safety rating of Class 1 by CDRH means that the laser beam is enclosed in a cabinet and has safety interlock mechanisms to protect the operator from injury. While when a class 1 laser system equipped with a red dot pointer which allows you to position laser beam, the safety rating turns into Class 3a due to the red beam is laser light. A few extra safety precautions; namely, **avoid placing your eyes in the red beam path**, is required.


### • Precaution

1. Do not attempt to modify or disassemble the laser system at any time.
2. Wear appropriate safety goggles especially when engraving with mirrors or coated metals such as enameled brass and anodized aluminum..
3. Good ventilation is required to remove odors and vaporized materials to the outside of the building or structure. An exhausted system is recommended.
4. Invisible intensive laser radiation may cause physical burns or severe eye damage. Always read the manual and caution labels carefully before operation.
5. Do not work with reflective metals, heat sensitive surfaces or other materials that may produce toxic substances, such as PVC and Teflon.
6. A fire extinguisher should be available on hand at any time.
7. Never leave the machine unattended during operation.
8. Follow the recommendations for maintaining and cleaning your system. Not only will this enable you to engrave efficiently, it will ensure that your machine runs safely as well.

- **Warning Label**

**DANGER**  
Invisible laser radiation when  
open and interlock defeated.  
**AVOID EYE OR SKIN EXPOSURE  
TO DIRECT OR SCATTERED  
RADIATION**

**On the right of the top door and the upper center of the front door.**

 **WARNING!!**  
Do not use reflective metals, heat sensitive  
surfaces or other materials that may produce  
toxic substances, such as PVC and Teflon.

**On the front center of the top area.**

**CAUTION**  
**AVOID PLACING YOUR EYES IN  
THE RED BEAM PATH**

**On the front center of the top door.**

**DANGER**  
Invisible laser radiation when open.  
**AVOID EYE OR SKIN EXPOSURE  
TO DIRECT OR SCATTERED  
RADIATION**

**On the back panel (non-interlocked panel with screws) and outside of the  
first mirror cover.**

## Frequently Asked Questions

### 1. What materials can be processed by CO<sub>2</sub> laser?

Virtually any materials such as acrylic, wood, fabrics, glass, leather, marble, stone, rubber stamps, paper products, coated metals, plastics (especially micro plastic developed by IPI, Spectrum and Rowmark etc.) other hard-surface materials blended with polyester and fibers ( Corian™, Fountainhead™, and Avonite™ etc.) or laserable simulated products of stone, wood and metal etc.

Bare metals can not get a good engraving result by using CO<sub>2</sub> laser. However, *special kind of spray* has been developed that allows CO<sub>2</sub> laser to mark on the bare metals such as stainless steel, aluminum etc. Heat sensitive materials or any other toxic substances that can be produced by laser treatment such as *PVC and Teflon coating should be avoided.*

### 2. What is the life cycle of the laser source?

The life cycle of laser source are around 20,000 hours, however it can be re-filled and should be done by your dealer.

### 3. Is LaserPro Y2K compliant?

Yes, because LaserPro is not equipped with a real time clock for timing purpose.

### 4. What is the main purpose of air assist system?

The air assist system can provide a much better engraving & cutting effect, as it will blow away vaporized particles and prevent fire due to overheating.

### 5. What does cutting table do?

The cutting table, also known as honeycomb table, is especially useful for vector cutting application. The space between materials and working table, gapped by cutting table, allows heat and smoke to be disbursed and vented out which may otherwise cause bad cutting effect.

### 6. What is the maximum engraving speed of LaserPro?

The maximum engraving speed of LaserPro is 1016 mm/sec (42 inch/sec). When engraving an A4 (18 x 28 cm) size square with 250dpi at full speed, it takes LaserPro 18 minutes to complete.

### **7. Can LaserPro be used under Windows 3.x?**

Yes, please download driver for Windows 3.x from GCC's home page ([www.gcc.com.tw](http://www.gcc.com.tw)).

### **8. How to engrave an extremely long working piece?**

The back door (or panel) of LaserPro can be removed by taking away the screws. For a better ventilation and safe purpose, this special design is to prevent the back door being opened without notice during operating. However, you have to use magnetic devices to short the connector of the magnetic switches on both side of the front door while opening for engraving extremely long work-piece. When doing so, make sure that you wear safety goggles to operate the machine.