

**LP SOP-29 Latent Print Unit Laser System****Purpose:**

The Division of Scientific Services utilizes a laser system as a method of developing and documenting latent friction ridge skin impressions. The device is a Laser Light Solutions BrightBeam DUAL High Power Blue/Green Forensic Laser System. The guidelines below will be followed to safely and properly operate this system.

**1. Safety**

- 1.1. Lasers pose unique hazards in the laboratory, and those hazards must be identified, understood, and controlled before using these systems. Lasers can operate across a broad spectrum, from the ultraviolet (UV) to the infrared (IR). Not all wavelengths present the same hazards. Additionally, hazards may vary depending on the specific nature of the lasers.
- 1.2. The most notable hazard is ocular. The lens and cornea of the human eye focus optical wavelengths between 400 nm and 1400 nm directly onto the retina. However, the human eye is only sensitive to wavelengths between 400 nm and 700 nm. The near-IR range (700 nm to 1400 nm) can present an increased hazard—in this range, light is still focused on the retina but is not visible. As a result, the blink reflex (or aversion response) is not present at these wavelengths. Retinal burns are the most common significant injuries that occur with lasers in the ocular wavelength range (400 nm to 1400 nm), higher power lasers in this range can cause thermal burns to the skin as well. The Latent Print Unit's dual beam laser emits radiation in the following wavelengths:

445nm	(blue)	InGaN diode based semiconductor
532nm	(green)	Nd: YAG solid-state based

- 1.3. No persons shall be allowed to operate the Latent Print Unit's dual beam laser until they have received proper safety training pertaining to the use of class 4 lasers. The training shall be in compliance with OSHA guidelines and LP SOP-28 Latent Print Unit Laser Safety Program.

*Approved by Director: Dr. Guy Vallaro*

1.4. No persons shall be allowed to operate the Latent Print Unit's dual beam laser until they have been trained in its proper use. The Latent Print Unit Supervisor/Lead or his/her designee shall be responsible for training Latent Print Unit Examiners.

1.5. The area where the laser is being utilized shall be designated a "Controlled Area". A controlled area shall display proper warning and danger signs as designated below:

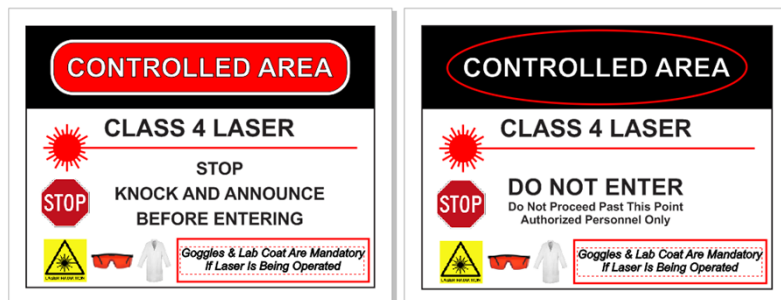
1.5.1. **Danger Laser In Use** sign shall be displayed on the exterior and interior doorway to the specific laboratory giving access to a Controlled Area where the Latent Print Unit's dual beam laser is in use. It shall also be displayed at Temporary Controlled Areas. This sign shall also indicate the laser wavelength and power output.



1.5.2. **Controlled Area** sign shall be posted on the exterior Controlled Area door of the Latent Print Unit. The sign shall display "Controlled Area" and instruct reader to stop, knock and announce before entering. It shall also indicate that goggles and a lab coat are mandatory if the laser is being operated. An illuminating warning sign adjacent to the entrance door to the laser room (Controlled Area) is currently present and shall be turned on (illuminated) when the laser is in use in order to alert employees who may wish to enter the Controlled Area. For a **Temporary Controlled Area** a printed sign shall be posted and display "Controlled Area" and instruct the reader not to enter and that goggles and lab coat are mandatory if laser is

*Approved by Director: Dr. Guy Vallaro*

being operated.



- 1.5.3. **Danger Class 4 Laser Safety Check** sign shall be displayed over the laser warning sign which will be illuminated when the laser is in use. The warning sign shall be on the exterior wall of the Controlled Area entrance way.



- 1.6. **Laser Glasses/Goggles** shall be available in both the “Controlled Area” and “Temporary Controlled Area” in a clearly visible location adjacent to such area’s entrance way. Glasses/goggles for the BrightBeam Blue/Green Laser shall meet or exceed the following specifications as recommended by the manufacturer:

OD Specs (ANSI Z136)	L-Rating Specs (EN 207) <sup>a</sup>	Optical Density vs. Wavelength
180 to 532 nm, OD = 7+	180 to 315 nm (D LB7 + IR LB4) >315 to 532 nm (DIRM LB6)	

Manufacturer recommended suppliers are:

Thorlabs ([www.thorlabs.com](http://www.thorlabs.com))

NOIR ([www.noirlaser.com](http://www.noirlaser.com))

- 1.7. **Direct Skin or Eye Exposure:** Direct skin or eye exposures are to be avoided and are not authorized. Under no circumstances should the laser beam be

intentionally pointed or aimed at any individual. Appropriate eye protection and a lab coat (or other outer skin covering) will be worn while operating a class 4 laser. The laser will be immediately turned off if anyone without proper protection enters the Controlled Area.

- 1.8. **Medication, Drugs & Alcohol:** Under no circumstances is the laser to be operated by any individual who is under the influence of medications that may affect balance, perception, and decision making processes, illicit drugs or alcoholic substances.
- 1.9. **Incidents or Injury:** Any incidents or injury involving the Latent Print Unit's dual beam laser are to be immediately reported to the Latent Print Unit Supervisor/Lead, the Deputy Directory of Identification Services and the Identification Section's Safety Officer. Immediate medical attention will be provided to the injured person.
- 1.10. **Entrance Way Interlock Device:** The Latent Print Unit Controlled Area entrance has an interlock device installed to terminate the laser beam in the event an accidental entrance occurs. Temporary controlled areas will either incorporate an entrance way interlock device or other physical security measure to assure that unauthorized and unprotected persons do not enter the Temporary Controlled Area.

## **2. BrightBeam Operation**

- 2.1. Prior to Start Up:** Make sure laser safety precautions are in place.
  - 2.1.1. Make Sure Evidence Viewing Area is Clean and Prepared
  - 2.1.2. Check that Laser Unit Power is set to OFF
  - 2.1.3. Check that Laser Unit Enable key switch is set to OFF
  - 2.1.4. Set Up Camera Equipment (if needed)
  - 2.1.5. Place Barrier Filter on Camera Lens (if needed)
  - 2.1.6. Make Sure Evidence is Dry of any Flammable Liquids or Solutions
  - 2.1.7. Place Evidence in Controlled Area
  - 2.1.8. Make Sure Personal Protective Equipment is in Place (Goggles & Lab Coat)

## **2.2. Laser Start Up**

- 2.2.1. Make sure at least one pair of laser goggles are hanging on the exterior wall adjacent to the control area door
- 2.2.2. Power on the illuminating warning sign to alert lab personnel that the laser is in use
- 2.2.3. Make sure entrance door to controlled area is closed
- 2.2.4. Press Power rocker switch to on position to enable power to laser
- 2.2.5. The Power LED will illuminate
- 2.2.6. The fan will momentarily go to maximum speed
- 2.2.7. The Enable LED will flash during power up and then go off
- 2.2.8. The Interlock and Temp LED will be green
- 2.2.9. The LCD will display: Disabled Key On to Enable
- 2.2.10. Turn enable key switch to on position (this allows the lasers to be turned on and enables the hand controls)
- 2.2.11. The Enable LED will illuminate (Both Lasers will still of OFF)
- 2.2.12. The LCD will display: Blue Off 000 GRN Off
- 2.2.13. Select appropriate laser (blue/green) on hand piece and gradually increase power setting to achieve proper illumination.
- 2.2.14. Once the proper illumination has been achieved, use this light source to locate any latent prints and document findings on the appropriate quality record.

## **2.3. Laser Shut Down**

- 2.3.1. Turn enable key to off position
- 2.3.2. Press Power rocker switch to Off position
- 2.3.3. Turn off illuminating warning sign to alert lab personnel that laser is no longer in use

## **3. References**

- 3.1. Laser Light Solutions BrightBeam DUAL High Power Blue/Green Forensic Laser System Users Manual
- 3.2. OSHA Section III: Chapter 6 Laser Hazards  
[https://www.osha.gov/dts/osta/otm/otm\\_iii/otm\\_iii\\_6.html](https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_6.html)