Section I - Subsection 1 Argon-Ion Laser Page 1

Name of Procedure:

Argon-Ion Laser

Suggested Uses:

The Argon-Ion Laser is used to examine items of evidence for the presence of latent fingerprints, palmprints, footprints, footwear and other impressions. The laser will often be a useful tool in discovering latent impressions which have compounds or residues which will fluoresce under the influence of a laser beam. The use of laser dyes and other processing techniques in conjunction with the laser is one of the most successful means of developing latent impressions on items of evidence. The laser will also detect serological and trace evidence which may not visible to the naked eye.

Equipment Needed to Perform Procedures:

A - Argon-Ion Laser

B- Camera Equipment

Chemicals Needed For Preparation of Chemical Solution(s):

Not Applicable

Formula/Directions for Preparation of Chemical Solution(s):

Not Applicable

Processing Procedures for Application to Item(s) of Evidence:

Items of evidence should be subjected to this beam prior to applying processing techniques in an attempt to detect these latent impressions. Numerous other processing techniques should be utilized and the laser used where applicable to develop and photograph any latent impressions. The use of florescent dyes has been found to be one of the most effective ways of developing latent impressions and should be utilized to develop latent impressions as often as possible.

Start Up Procedures:

1. Turn on the water.

2. After a few seconds, turn on the Laser Pure 60 system.

3. Turn on Main Power Switch.

4. Turn on Laser Key Lock.

5. Push the System Power Button to the "On" position.

6. The laser system will take approximately forty-five (45) seconds to begin lasing.

Note: To change wavelengths accurately the power must be set at the maximum of fifty-five (55) amps.

Note: It is normal for the "Change Filter" indicator light to come on after the Laser Pure 60 system is turned on.

Note: If a warning system activates on the Laser Pure 60 system, the entire laser unit should be shut down. Contact the Key Operator immediately.

Shut Down Procedures:

1. Turn down the power to approximately two (2) to three (3) watts.

2. Push off the System Power Button.

3. After eight (8) to ten (10) minutes, turn off the Laser Pure 60 System.

4. Turn off the water.

5. Turn off the Laser Key Lock.

6. Turn off the Main Power Switch.

Note: Check for condensation build-up in the front panel of the power unit after shutting down the system. If a build-up is noted contact the Key Operator As soon as possible.

Examination of Evidence:

1. Wearing safety goggles with the appropriate filters, scan the item of evidence with the laser beam (a strong hand held magnifier may be utilized to enhance visualization of the latent impressions).

2. If a latent impression is noted, immediately note the location and direct the beam

away from the area.

3. Place the area noted under the appropriate camera and place the laser filter over the lens of the camera.

4. Direct the laser beam over the area to be photographed and begin photography (a number of photographs may be taken at various times and F-stops to record the latent impression).

5. After each photograph is taken it is advisable to direct the beam away from the impression to avoid destruction of the area or surface (Prolonged exposure to the beam will cause the latent impression to photo degenerate over a short period of time until eventually the impression will disappear.)

Steps to Preserve Developed Impressions:

The most appropriate methods of preserving developed impressions is through photography, utilizing the appropriate techniques, (See Photographic Equipment/Procedures) and electronic recording (See Image Processing). The utilization of a 35 mm, 2 1/4, MP-4, or CU5 camera will suffice for developed impressions prints; however, all laser prints must be photographed using a laser filter to be recorded on the film.

Negatives produced from Polaroid film are the most effective manner to accurately reproduce the developed impressions (See Photographs/Negatives Preservation).

Safety Concerns:

Never look directly into the laser beam as this will cause eye damage.

Do not expose the laser beam to the skin as it will not immediately cause harm, but may have long term effects with prolonged exposure.

Eye protection should be worn at all times while operating the laser, this includes other individual who may also be in the same room or area. This is particularly important when examining reflective surfaces as the beam may be reflected and result in eye damage.

Storage and Location of Chemicals and Solutions:

Not Applicable

Shelf Life:

Not Applicable

Other Information:

The laser should always be used as one of the first steps in analyzing items of evidence. This will serve to detect any inherent latent impressions and to show the color and the intensity of the surface's background. This will allow the analyst to determine which florescent dye will be appropriate to use in the sequence of processing evidence.