ISPFS
Latent Fingerprint Section
SOP Manual

History Page

The original version of the Latent Fingerprint Section SOP Manual is dated August 30, 2000.

Revision 1, revised from revision 0 is effective

Approval _____ Date 7-13-01

Approval _____ Date 7-13-01

The revised Latent Section SOP Manual is being passed around in sections. We will start with sections 1-15. Please read and make comments (suggestions, re-wording, typos, etc.). After you have had a chance to review each portion, please initial below, and return to me.

Thank You,

Tina

I have read the following:

	Ray	Gary	Tina	Randy	
Section 1-15	RP			RP	
Section 16				RP	04/16/01
Section 17				RP	
Sections 18-20				RP	
Appendixes A-G				RP	

STANDARD OPERATING PROCEDURES

OF THE

IDAHO STATE POLICE FORENSIC SERVICES

LATENT FINGERPRINT SECTION

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GOALS OF THE LATENT FINGERPRINT SECTION:

1. To properly receive, record, and return physical evidence submitted to the laboratory.

2. To conduct examinations for latent prints on physical evidence, to maintain records, and to prepare a report on the results of the analysis.

3. To give expert court testimony.

4. To instruct or inform members of the criminal justice system on aspects of latent print processing and analysis.

1.0.0. REFERENCES

1.1.0. ISPFS Procedure Manual.

1.2.0. ISPFS Health and Safety Manual

1.3.0. American Society of Crime Laboratory Directors (ASCLD) Manual.

1.4.0. U.S. Army Criminal Investigation Laboratory Technical Manual.

1.5.0. Manual of Fingerprint Development Techniques (Home Office).

2.0.0. PURPOSE

This document defines standard procedures for processing the majority of evidence encountered by the Latent Section.

3.0.0. RESPONSIBILITIES

3.1.0. The Latent Section Supervisor is responsible for ensuring that personnel adhere to established standard operating procedures and safety practices.

3.2.0. Individual examiners are responsible for adherence to established operating procedures and safety guidelines.

3.3.0. The Latent Section Equipment Officer is responsible for ordering, maintaining, and inventory of all equipment used in the section.

3.4.0. The Latent Section Chemical Officer shall be responsible for ordering, receiving, labeling, logging and dating all chemicals used in the processing of latent print evidence and maintaining the Material Safety Data Sheets (MSDS) for all chemicals maintained in the section.

3.5.0. The Latent Section staff consists of 1) Supervisor, and 3) Latent Fingerprint Examiners.

3.6.0. Access to the Latent Section laboratory areas will be limited to staff and authorized visitors.

4.0.0. STANDARDS AND CONTROLS

4.1.0. Standards and controls required for a specific type of processing will be addressed in this manual as required. It should be noted, however, that exact measurements and proportions when preparing chemical solutions are desirable for consistent quality, but successful results in developing latent fingerprints are not dependent upon unequivocal accuracy. There is a considerable margin for error in preparing chemical solutions for latent fingerprint techniques without adversely affecting the successful development of latent prints.

4.2.0. Equipment necessary for latent print processing (Omniprint 1000, Gallenkamp humidity chamber, Coleman Vacu-Print, eye washes/shower, and chemical vent hoods) will be maintained in accordance with manufacturers specifications and records kept. Annual inspections will be conducted and records kept. The section supervisor will maintain these procedures and records.

4.3.0. All chemical reagents and solvents should be of an appropriate grade for their intended use.

4.4.0. Standard working solutions prepared in the laboratory will be properly labeled with identity, the date prepared, expiration date if applicable, and the initials of the person who prepared them. Each solution will be tested when prepared and this test documented in the reagent log along with the date made, carrier used, and initials of the individual making the solution. Concentrations, normality's, etc. should be expressed in correct numbers of significant figures. Stock solutions, which are retained for use over a period of time, should be labeled with a scheduled shelf life if applicable.

5.0.0 SAFETY

5.1.0. All Latent Section personnel are advised to utilize appropriate work practices when handling the chemicals and solvents used in latent print procedures.

5.2.0. Safe work practices include:

5.2.1. Wearing personal protective equipment such as gloves, laboratory coats, eye protection, etc., when handling any chemicals.

5.2.2. Making sure that all engineering controls such as ventilation hoods, etc., are used properly.

5.2.3. Utilizing clean work habits such as washing hands after the preparation of chemical solutions (even though gloved), and no eating or drinking in the labs

5.3.0. Specific safety practices regarding personal protective equipment and work practice controls are outlined within each processing technique described in this manual.

5.4.0. Safety practices regarding engineering controls, biohazards, the disposal of chemicals, etc., are outlined in the ISPFS Health and Safety Manual.

5.5.0. Hazards and safety procedures associated with all chemicals used are contained in the MSDS file stored in the chemical laboratory. Employees have the responsibility to read the MSDS prior to handling unfamiliar materials or if they have any questions about how the chemicals is being used in the laboratory.

6.0.0. METHODS AND PROCEDURES USED IN PROCESSING EVIDENCE

6.1.0. Written technical procedures are available describing examination protocols for each category of evidence which is routinely examined.

6.2.0. These procedures will describe the methods, procedures, and techniques which are routinely used in the examination of evidence. The procedures cannot be expected to address each and every situation or type of evidence encountered. The individual examiner must exercise sound judgment in selecting the methods which will best suit the requirements of the evidence submitted for a specific case; therefore, the procedures will be designed to accommodate the majority of evidence encountered.

6.3.0. Visible ridge detail suitable for comparison should generally be photographed upon initial examination, as additional detail develops, after a specific technique, and/or prior to a subsequent technique.

6.4.0. As specific chemical solutions are used to enhance or develop latent prints, these solutions should be tested prior to use. All chemical solutions will be tested after they are mixed and before use and results will be noted.

6.5.0. The physical, chemical, or electronic techniques which are used to locate, develop or enhance prints are found in the section on protocols.

7.0.0. LATENT PRINT QUALITY GUIDELINES

7.1.0. Friction ridge examinations are based on the following premises:

7.1.1. The fundamentals of the science of friction ridge identification are permanence and individuality. The comparison and identification of two areas of friction ridge skin impressions are based on the examination of ridge structure, individual ridge appearance, pores, minutiae, and spatial relationships.

7.1.2. There is no scientific basis for requiring that a minimum number of corresponding friction ridge features be present in two impressions in order to effect an identification.

7.2.0. Fundamental Principles of Quality Assurance in Friction Ridge Analysis.

7.2.1. Latent print examiners must be successfully trained to competency before effecting an identification.

7.2.2. All identifications must be verified by a qualified latent print examiner.

7.3.0. Friction Ridge Analysis.

7.3.1. Definitions and Conclusions:

7.3.1.1. Print evaluation:

Prints are of value for comparison or they are not. "Of value" for comparison means that sufficient ridge detail is present to warrant a comparison in the opinion of the examiner.

7.3.1.2. Identification:

An identification is the determination that two corresponding areas of friction skin impressions originated from the same person.

7.3.1.3. Non-identification:

A Non-identification is the determination that two corresponding areas of friction ridge skin did not originate from the same person.

7.3.1.4 Incomplete or Unclear Known Impressions:

Incomplete or unclear known impressions may result in the inability to reach either an identification or non-identification decision.

7.3.1.5. Qualified Identifications:

Friction ridge identification are absolute conclusions. Probable, possible, or likely identification conclusions are outside of the acceptable limits of the science of friction ridge identification.

7.3.2. ASCLD/LAB Discrepancy:

7.3.2.1. Class I

7.3.2.1.1. Erroneous Identification:

An erroneous identification is the incorrect determination that two areas of friction ridge impressions originated from the same person. An erroneous identification is the most serious error an examiner can make in technical case work.

7.3.2.1.2. Erroneous Verifications:

Verification of an erroneous identification is equal to having effected the original erroneous identification.

7.3.2.2. Class II

7.3.2.2.1. Missing Identifications:

A missed identification is the failure to make an identification when in fact both friction ridge impressions are from the same origin. This is not an erroneous identification.

7.3.2.3. Class III

7.3.2.3.1. Clerical and Administrative Discrepancy:

Clerical and administrative errors are not erroneous identifications. Examples include, but are not limited to, writing the wrong finger number or name.

7.3.2.4. Conflict Resolution:

When conflict develops in making an identification, a principle examiner or IAI certified examiner will review the latent in question. If an identification is made, it should be verified by another IAI Certified examiner if possible, or the Latent Section Supervisor.

7.3.2.5. Corrective Action:

When erroneous latent print identifications occur, the primary consideration is the prevention of further discrepancies, personnel retention, and salvage of the latent print examiner's training investment following ISP Forensic Services guidelines when at all possible.

Also in accordance with practices of the Latent Print Certification Program of the International Association for Identification, and barring extenuating circumstances, the Latent Print Section Supervisor may recommend the Laboratory Manager consider the following actions in a Class I Discrepancy:

1. Revocation of latent print examiner's certification and one year retraining for **one** erroneous latent print identification.

2. Permanent revocation of latent print examiner's certification and a transfer to other duties or dismissal for more than one erroneous identification during a latent print examiner's entire career.

8.0.0. TRAINING AND QUALIFICATION RECORDS

8.1.0. Training Records:

The Latent Section will maintain training records on each examiner and they will be on file in the section.

8.2.0. Curriculum Vitae:

The Latent Section will maintain a copy of each examiners Curriculum Vitae on file in the Latent Section.

9.0.0. LATENT PRINT LIFTS AND PHOTOGRAPHS/IMAGES

9.1.0. Latent print lifts shall have the following:

9.1.1. Unique case identifier

9.1.2. Date and initials or date and personal marking

9.1.3. Impression source (description or source identifier)

9.2.0. Latent print lifts or case notes shall include the following:

9.2.1. Scene location or address

9.2.2. Significant information about the orientation and/or position of the latent print on the object through description and/or diagram(s).

9.3.0. Latent print photographs/images or case notes shall include the following:

9.3.1. Unique case identifier

9.3.2. Date and initials or date and personal marking

9.3.3. Impression source description or source identifier.

9.3.4. Scene location or address.

9.3.5. Significant information about the orientation and/or position of the latent prints on the object through description and/or diagram(s).

9.3.6. Scale information.

10.0.0. EVIDENCE HANDLING PROCEDURES

10.1.0. Evidence must be collected, received, and stored so as to preserve the identity, integrity, condition, and security of the item.

10.2.0. Chain of Custody:

A clear, well-documented chain of custody must be maintained from the time that the evidence is collected or received until it is released.

10.3.0. Each examiner will have an area of short-term storage that is equipped with a proper lock. Keys to these locks will be limited to the individual examiner and a record of their distribution will be kept by the Latent Section Supervisor.

10.4.0. Evidence Handling and Storage:

Evidence will be handled according to ISPFS Procedure Manual, Chapter 3. Evidence Handling.

11.0.0. CASE WORK DOCUMENTATION AND REPORT WRITING

11.1.0. Case work documentation and report writing will be according to ISPFS Procedure Manual, Chapter 5. Handling Casework.

11.2.0. Documentation must be sufficient to ensure that any qualified latent print examiner could evaluate what was done and replicate any comparison.

11.3.0. Verification of all identifications must be documented.

11.4.0. Reports must contain the following:

11.4.1. Case identifier

11.4.2. Identity of the examiner

11.4.3. Date of report

11.4.4. Description of evidence

11.4.5. Results of latent print examination

12.0.0. PROFICIENCY TEST

12.1.0. Proficiency testing will be according to ISPFS Procedure Manual Chapter 8. Quality Control 8.1. and ASCLD/LAB 1.4.3.

13.0.0. CONTINUING EDUCATION

13.1.0. Examiner's skills must be maintained by activities such as:

13.1.1. Receiving specialized training

13.1.2. Attending educational seminars

13.1.3. Reading professional publications

13.1.4. Conducting and publishing research

13.1.5. Completing self-study programs

13.1.6. Instructing specialized classes or seminars

13.1.7. Continuing formal education.

14.0.0. TESTIMONY REVIEW

14.1.0. Testimony review will be according to ISPFS Procedure Manual Chapter 7. Subpoena and Testimony Policy, Evaluation of Testimony 7.2

15.0.0. QUICK REFERENCE PROCESSING GUIDE

GENERAL EVIDENCE:

NOTE: As each technique is completed, the evidence is visually examined for the presence of identifiable ridge detail. When identifiable ridge detail is visible, the evidence should be photographed prior to any additional processing. The exact steps and procedures are dependent on the examiner's experience and discretion.

POROUS:

1. Visual: White light and possible / Alternate Light Source (ALS)
2. Iodine Fuming (if used)
3. Visual: White light examination
4. DFO (if used)
5. Visual: ALS examination
6. Ninhydrin
7. Visual: White light
8. Physical Developer
9. Visual: White light

NOTE: See FORMULARY, Appendix A for additional instructions.

NON-POROUS:

1. Visual: White light
2. Cyanoacrylate Fuming
3. Visual: White light / ALS
4. Dye Stain
5. Visual: ALS / or Ultraviolet light (UV) as required
6. Powders: Luminescent or non-luminescent
7. Visual: White light / ALS

SPECIFIC EVIDENCE:

BLOOD EVIDENCE:

Non-porous:

1. Visual: White light
2. Cyanoacrylate Fuming
3. Visual: White light
4. Amido Black
5. Visual: White light / ALS
6. De-stain / Rinse solution

7. Visual: ALS
8. Powders: Luminescent or non-luminescent
9. Visual: White light / ALS

Porous:
1. Visual: White light / UV (fabric-background luminescence)
2. Amido Black or Ninhydrin
3. Visual: White light

CARDBOARD:

1. Visual: White light and possible / ALS
2. Ninhydrin (Iodine Fuming and DFO can be used prior to Ninhydrin)
3. Visual: White light and UV (background luminescence)
4. Physical Developer
5. Visual: White light

CARTRIDGE CASES:

1. Visual: White light
2. Cyanoacrylate Fuming
3. Visual: White light / ALS
4. Dye Stain
5. Visual: ALS

GLOSSY PAPER:

1. Visual: White light
2. Cyanoacrylate Fuming
3. Visual: White light / ALS
4. Powders: Luminescent or non-luminescent
5. Visual: White light / ALS
6. Ninhydrin
7. Visual: White light
8. Physical Developer
9. Visual: White light

HUMAN SKIN:

Macerated Fingers (water soaked)
1. Photography (when possible)
2. Take record prints, if skin flexibility permits.
3. Send to FBI if necessary

Mummified Fingers (dried)

1. Photography (when possible)
2. Take record prints, if skin flexibility permits.
3. Send to FBI if necessary

LEATHER:

1. Visual: White light
2. Visual: ALS
3. Cyanoacrylate Fuming: ALS
4. Powders: Luminescent or non-luminescent
5. Visual: White light / ALS

PAINTED SURFACES:

Latex Paint: process as for porous evidence
Semi-gloss/enamel paint: process as for non-porous evidence

PHOTOGRAPHS:

Emulsion side:

1. Visual: White light
2. Cyanoacrylate fuming
3. Visual: White light / ALS
4. Powders: luminescent or non-luminescent
5. Visual: White light / ALS

Paper (reverse side): Process as for porous evidence

PLASTIC BAGS:

1. Visual: White light
2. Cyanoacrylate fuming
3. Visual: White light / ALS
4. Dye Stain
5. Visual: White light / ALS
6. Powders: Luminescent or non-luminescent
7. Visual: White light / ALS

RUBBER GLOVES:

1. Visual: White light
2. Cyanoacrylate fuming
3. Visual: White light / ALS

4. Dye Stain
5. Visual: ALS
6. Powders: Luminescent or non-luminescent
7. Visual: White light / ALS

TAPE:

Adhesive side:

1. Visual: White light **OR**
2. Gentian Violet (crystal violet)
3. Visual: White light
4. Physical Developer
5. Visual: White light

1. Visual: White light
2. Cyanoacrylate Fuming
3. Visual: White light / ALS
4. Dye Stain
5. Visual: ALS

OR

1. Visual: White light
2. Sticky side powder
3. Visual: White light

Non-adhesive side:

1. Visual: White light
2. Cyanoacrylate Fuming
3. Visual: White light / ALS
4. Dye Stain
5. Visual: ALS
6. Powders: Luminescent or non-luminescent
7. Visual: White light / ALS

VARNISHED WOOD:

1. Visual: White light
2. Cyanoacrylate fuming
3. Visual: White light / ALS
4. Dye Stain (ex. Rhodamine 6G in water solution)
5. Visual: ALS
6. Powders: Luminescent or non-luminescent
7. Visual: White light / ALS

WET SURFACES:

1. Visual: White light **OR**
2. Small Particle Reagent
3. Visual: White light / ALS
4. Lift

1. Visual: White light
2. Dry to room temperature
3. Visual: White light/ ALS
4. Physical developer

16.0.0 METHODS (MLP)

MLP 16.1.0. PACKAGING OF PAPER ITEMS

REFERENCES:

ISPFS Procedure Manual. Chapter 3.

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978). Page 134.

Fingerprint Techniques, Andre Moenssens (1971). Page 136.

The Science of Fingerprints, F.B.I., (1963). Page 174.

INTRODUCTION:

Proper packaging of paper items is necessary to assure the integrity of the evidence as well as to preserve possible latent print evidence. Proper packaging is required in the laboratory as well as at crime scenes.

PROCEDURE:

When paper items are received in the laboratory or recovered at a crime scene, the paper items are evaluated as to the examinations and handling that will be required. Precautions need to be taken so that additional contamination/deposition of prints does not occur. If additional examinations are needed the paper items are packaged in an appropriately-sized envelope or box and the container is sealed. The exterior of the container is then marked with the analyst's initials, the case number, item number and any other information deemed necessary. The materials are then placed in the evidence vault.

If there is a chance that a document examination will be done to look for indented writing on the evidence, it is important that the analyst not mark the outside of an envelope while the document is inside. The analyst may be adding indented writing to the document.

Wet items can be handled in the above manner after the evidence is air-dried, or can be submitted in the same water that the documents were found in. Paper items being submitted wet need to be kept in a water-tight container or kept frozen.

MLP 16.2.0. PACKAGING OF NON-POROUS ITEMS

REFERENCES:

ISPFS Procedure Manual. Chapter 3.

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978). Pages 133-134.

Fingerprint Techniques, Andre Moenssens, (1971), Page 136.

The Science of Fingerprints, FBI, (1963). Page 174.

Manual of Fingerprint Development Techniques, Home Office Police Scientific Development Branch (1998).

INTRODUCTION:

Proper packaging of non-porous items is necessary to assure the integrity of the evidence as well as to preserve any possible latent print evidence. Proper packaging is required in the laboratory as well as at crime scenes.

PROCEDURE:

When non-porous items are received in the laboratory or recovered at a crime scene, the non-porous items are evaluated as to the examinations and handling that will be required. Precautions need to be taken so that additional contamination/deposition of prints does not occur. If additional examinations are needed, the non-porous items are packaged in sturdy containers (such as boxes or metal cans) in a manner in which the suspected latent print bearing surfaces do not contact any other surfaces. Fingerprints on smooth non-porous surfaces are easily damaged. If possible, items should be held by areas where fingerprint detection is least likely. The container is then sealed and the exterior is marked with the examiner's initials, the laboratory case number, item number, and any other information deemed necessary. The material is then turned in to the Technical Records Specialists to be placed in the evidence vault.

MLP 16.3.0. SUBMISSION OF HUMAN HANDS, FINGERS, AND FEET

REFERENCES:

ISPFS Health and Safety Manual

The Science of Fingerprints, FBI, (1997). Pages 134-162.

INTRODUCTION:

Normally, hands, fingers, or feet are only submitted to the Latent Section when normal printing procedures fail or cannot be applied due to the decomposed state of the hands, fingers, or feet.

Every attempt at obtaining deceased prints in the field should be exhausted prior to any consideration of having the hands or fingers severed and submitted to the Latent Section. It is our responsibility to assist law enforcement officers, when called upon to do so, to determine when the hands should or should not be severed and submitted.

When the printing has been done, the hands, fingers, or feet will be returned to the submitting agency.

PROCEDURE:

1. All body parts received at the lab should already be sealed and then placed in the refrigerator or freezer.

2. Any body part that involves a person infected with or possessing antibodies for the HTLV-III - LAV (AIDS Virus) will not be accepted for processing.

3. Submitting hands or fingers of deceased persons:
   - When possible, it is most desirable to have both of the hands, severed at the wrist, and forwarded in their entirety. This eliminates the possibility of getting the fingers mixed up or incorrectly labeled.

   - If it is not possible to send the hands for some reason, the fingers should be cut off and forwarded. The fingers should be severed at the palm. As soon as each finger is cut off, it should be placed in an

individual container and immediately labeled as to which particular finger it is.

- It is preferred by the Latent Section that hands be submitted in the same condition as found and as soon as possible. If the hands were immersed in water, transport in water. If found dried out and hard, place in an airtight container and send without using any preservative. If hands cannot be delivered to the Latent Section within 24 hours after being discovered, preserve them by refrigeration. **Do not use a formaldehyde solution** to preserve the hands. This causes the hands to become brittle and hard, making the task of obtaining identifiable prints very difficult.

- Hands, fingers, or feet should only be severed and removed by the attending medical examiner or under their authority and supervision.

ADDITIONAL INFORMATION:

Safety: Rubber gloves, lab coat, and/or a protective disposable apron will be worn at all times when working with any body parts. All utensils used and any area that the body parts come in contact with will be washed down with the disinfectant foam cleaner.

MLP 16.4.0 RECORDING INKED IMPRESSIONS

REFERENCES:

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978). Pages 70-75.

Fingerprint Techniques, Andre A. Moenssens, (1971). Pages 144-145.

Friction Ridge Skin, James F. Cowger, (1983). Pages 14-19.

The Science of Fingerprints, FBI (12-84). Pages 116-162.

MATERIALS:

- Printer's ink, ink rollers/palmprint roller
- Fingerprint cards/quality bond paper
- Adhesive materials (tape and Kinderprint)
- Clear latent print lift backing
- Hypodermic needles, tissue builder, casting materials (Mikrosil),
- Lab coats, rubber gloves, face shields,
- Cleaning materials (spray soaps, paper towels, etc.).

INTRODUCTION:

Recording inked fingerprints/palmprints is necessary to secure known samples for comparison with visualized latents friction ridge skin impressions. Recording inked fingerprints/palmprints for comparison with latent prints is most commonly done by officers of the submitting agencies. However, there are times when the examiner may need to secure the known inked fingerprints/palmprints.

PROCEDURE:

The method, number, and types of fingerprints/palmprint impressions taken are to be determined by the examiner's experience and discretion.

ADDITIONAL INFORMATION:

Safety issues when securing inked impressions include, but are not limited to:

Personal Safety - when taking inked finger and palmprints, precautions need to be taken should the person become violent. This often requires the presence of an officer to provide security.

Biological Contamination - when taking the inked impressions of a subject or cadaver, care must be taken to minimize the chance of contact with diseased and/or putrefied materials. Lab coats, rubber gloves, and face shields should be worn at the discretion of the examiner.

Notes and documentation:

The content of case notes is largely up to the examiner's discretion but should be in accordance with laboratory protocol. Photocopies should be made of all fingerprint/palm print cards related to a case. These copies should be retained in the ISP/FS case file. If an Ident has been made from a particular card, and the card is being returned to the agency, it is strongly recommended that the card be scanned into the More Hits system prior to being returned.

MLP 16.5.0. RECORDING MAJOR CASE INKED IMPRESSIONS

REFERENCES:

The FBI Advanced Latent Fingerprint School Manual. Pages 167-172.

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978). Pages 70-72.

Friction Ridge Skin, James F. Cowger, (1983). Pages 22-25.

MATERIALS:

- Printer's ink, ink rollers/palmprint roller
- Fingerprint cards/quality bond paper
- Adhesive materials (tape and Kinderprint)
- Clear latent print lift backing
- Hypodermic needles, tissue builder, casting materials (Mikrosil),
- Lab coats, rubber gloves, face shields,
- Cleaning materials (spray soaps, paper towels, etc.).

INTRODUCTION:

Recording major case impressions is often necessary to secure known samples for comparison with visualized latent friction ridge skin impressions. Major case impressions consist of rolled fingerprints, palmprints, finger-joint impression, and the tips and sides of the fingers/palms. Recording inked major case prints for comparison with latent prints is most often done by officers of the submitting agencies. Occasionally, the examiner is requested to record the impressions at or in relation to a crime scene investigation.

PROCEDURE:

The mechanics for the taking of inked major case prints can be found in the section on major case inked impressions in the FBI Advanced Latent Fingerprint Manual. The examiner's training and experience will determine the number and types of impressions to be secured.

ADDITIONAL INFORMATION:

Safety issues when securing inked impressions include, but are not limited to:

Personal Safety - when taking inked finger and palmprints, precautions need to be taken should the person become violent. This often requires the presence of an officer to provide security.

Biological Contamination - when taking the inked impressions of a subject or cadaver, care must be taken to minimize the chance of contact with diseased and/or putrefied materials. Lab coats, rubber gloves, and face shields should be worn at the discretion of the examiner.

Notes and documentation:

The content of case notes is largely up to the examiner's discretion but should be in accordance with laboratory protocol. Photocopies should be made of all fingerprint/palm print cards related to a case. These copies should be retained in the ISP/FS case file. If an Ident has been made from a particular card, and the card is being returned to the agency, it is strongly recommended that the card be scanned into the More Hits system prior to being returned.

MLP 16.6.0. LIFTING LATENT PRINTS

REFERENCES:

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978). Pages 369-387.

Fingerprint Techniques, Andre, A. Moenssens, (1971). Pages 109-112.

Friction Ridge Skin, James F. Cowger, (1983). Pages 85-88.

Manual of Fingerprint Development Techniques Home Office Police Scientific Development Branch (1998).

MATERIALS:

- Lifting materials-tape, hinge lifts, rubber lifts, Mikrosil, and gelatin lifts.
- Camera and accessories.

INTRODUCTION:

Lifting powder or flame-processed latent prints is an effective technique for the preservation of the latent print impressions. This technique works because the adhesive on the lifting medium is stickier than the surface on which the latent print deposit resides. Lifting should be done after any necessary photography.

PROCEDURE:

Lifting latent print deposits that have been developed with the flame technique or have been powder processed is often an effective technique for the preservation of the latent print image. It is a good idea to have a variety of lifting mediums as they vary in clarity, adhesion, and flexibility. Caution should be exercised in using general purpose tapes as they may cause migration of some latent print ridge detail or may have striations or other imperfections making it hard to do comparisons. Lifting latent prints is often used in conjunction with photography of the latent print image. The examiner's training and experience will determine the use and/or sequence of the lifting and photographic processes. Finally, it is important that the back of the latent lift cards be filled out to the best of the examiner's ability. One should be able to pin point the area and orientation of a latent print on the object.

ADDITIONAL INFORMATION:

Advantages to the lifting of latent prints are:

- Lifting latent prints is an inexpensive, easy, and quick method of preserving developed latent print images.
- Lifting latent prints is an effective method of preserving the latent print images at a crime scene.

Disadvantages to the lifting of latent prints are:

- Lifting latent print images may not always be the most effective method of preserving the latent print image.
- Lifting sometimes destroys the latent print image left on the surface and makes repeat lifting impossible.

MLP 16.7.0. BLACK AND WHITE FILM DEVELOPMENT GUIDELINES

Kodak T-MAX 100

Handle undeveloped film in total darkness. Do not use a safe light. Wind film onto reels and place in the developing tank. Make sure that the lid is securely fastened.

PROCESSING:

1) Fill tank with 68°-70° F. running water. Firmly tap the tank on the top of the work surface to dislodge any air bubbles. Allow film to sit in water for one (1) minute, then empty water down the drain.

2) Fill tank with pre-mixed Kodak D-76 Developer. Firmly tap the tank on the top of the work surface to dislodge any air bubbles. Provide initial agitation of 5 to 7 inversion cycles in 5 seconds, i.e., extend your arm and vigorously twist your wrist 180 degrees. Repeat this agitation procedure at 30-second intervals for the rest of the development time. Develop film for fifteen to twenty (15-20) minutes. Return used D-76 developer to jug using proper funnel.

3) Rinse film with 68°-70° F. running water for two (2) minutes, then drain.

4) Fill tank with pre-mixed Kodak Fixer. Firmly tap the tank on the top of the work surface to dislodge any air bubbles. Agitate film frequently during fixing. Fix film for fifteen to twenty (15-20) minutes. Return used fixer to jug using proper funnel.

5) Rinse film with 68°-70° F. running water for a minimum of two (2) minutes, (20-30 minutes if time allows) then drain. Film may be removed from tank at this point and examined.

6) Fill tank with Perma Wash, agitate and let stand for two (2) minutes. Pour Perma Wash Down the drain.

7) Rinse film with 68°-70° F. running water for two (2) minutes, then drain.

8) Fill tank with 68°-70° F. water, add two or three squirts of Photo Flo and agitate. Photo Flo minimizes water/drying marks.

9) Remove excess water from film with two fingers or with Chamois. Hang and dry film in a dust-free place.

NOTES- Pre-mixed chemicals should all be room temperature (68°-70° F.) when used.

Fixer will be exhausted more rapidly with KODAK T-MAX Professional Films than with other films. If negatives show a pink stain after fixing, the fixer may be near exhaustion or the fixing time was too short. If the stain is slight, it will not affect image stability, negative contrast, or printing times. However, if the stain is pronounced and irregular over the film surface, refix the film in fresh fixer.

MLP 16.8.0. LATENT FINGERPRINT/IMAGE SUBMISSIONS TO BCI/AFIS

LATENT EVIDENCE RECEIVED:

Latents lift cards accompanied by elimination or suspect prints:

All latent cards accompanied by elimination or suspect prints need to be examined for quality and compared to the submitted elimination and suspect prints prior to being sent to BCI. Any remaining quality latents not identified will then be forward to BCI/AFIS if warranted.

Latents prints received without elimination or suspect prints:

Any latent prints received without accompanying elimination or suspect prints, and not associated with other evidence awaiting latent processing should be submitted, with proper documentation, directly to BCI/AFIS.

Latents prints addressed to BCI/AFIS, but received by FS:

Latent prints addressed to BCI/AFIS, but received by FS should be submitted along with proper documentation directly to BCI/AFIS.

LATENT EVIDENCE GENERATED:

Latents developed by ISP/FS latent examiners that need to go to BCI/AFIS:

Each FS latent examiner, who develops latent lift cards will place them in a small evidence envelope with FS lab number in the proper place on the envelope (upper right corner). The examiner will start the chain of custody by signing the first entry at the bottom of the envelope. A BCI/AFIS form WILL be filled out by the case latent examiner, attached to the envelope and submitted to the TRS. The TRS will then attach a bar-code for IETS and scan it into IETS. The TRS will then forward the envelope with documentation (BCI/AFIS form) to BCI.

NOTE- File jackets should also be given to the TRS at this time. They will be placed in the filing cabinet at the front of the office and returned to the examiner when the evidence is returned from BCI. This will allow the chain of custody to be maintained on the Evidence Receipt.

Latents to be retained by ISP/FS:

The Latent Section filing cabinet in the evidence vault is bar-coded and latent lift cards developed by the Latent Section examiners will be retained in this cabinet. Latent lifts are to be logged into IETS and tracked like all other evidence.

NOTE-All latents lift cards will be handled as evidence, this means that proper chain of custody and security measures need to be followed.

DIGITAL IMAGES GENERATED (LATENT)

Latent image prints to be sent to BCI/AFIS:

Images need to be placed in a 9x9 inch fingerprint card envelope which has the lab number, examiner's name, and a note to return the latent images to the examiner. All digital image prints need to be the best possible quality, black and white, and 1:1 (the fact that the images are 1:1 should be noted somewhere on the image, or you may use a scale).

A BCI/AFIS form needs to be filled out by the examiner and attached to the envelope. The envelope, with form attached, will then be placed in a special outgoing bin. This bin is located next to the evidence vault door on the old Latent Section side where it will be picked up by the BCI/AFIS staff.

The returning BCI/AFIS results will be dropped off in an incoming BCI/AFIS bin next to the before mentioned outgoing bin. The images/results can then be picked up by the case examiner.

Upon conclusion of the case, the photographs/images envelope and contents and the BCI/AFIS form will be retained in the ISP/FS case file.

17.0.0. PROTOCOLS (PLP)

PLP 17.1.0. DETECTION OF LATENT PRINTS WITH POWDER

REFERENCES:

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978), pages 209-235.

Fingerprint Techniques, Andre A. Moenssens, (1971), pages 106-109 and 112-114.

Friction Ridge Skin, James F. Cowger, (1983), pages 85-88.

Manual of Fingerprint Development Techniques Home Office Police Scientific Development Branch (1998).

MATERIALS:

- Powders-traditional, magnetic, and fluorescent powders
- Applicator- magnetic wand, feather brush, fiber glass, animal hair etc.
- Alternate light source

INTRODUCTION:

Latent friction ridge skin residue can be detected on smooth, non-porous objects by the application of commercial fingerprint powders. This coloring of the fingerprint residue occurs because the latent print residue has greater adhesion properties than the substrate. The powder particles adhere to the latent print residue allowing the latent print to be visualized. The use of cyanoacrylate esters often increase the adhesion of latent print residue.

PROCEDURE:

When making an examination for the presence of latent print impressions on smooth, non-porous surfaces, powder processing is often the method of choice. The type of powder that is selected is dependent upon:

- contrast to the surface bearing the latent print
- characteristics of the powder
- the nature of the surface to be processed

The type of applicator that is selected is dependent upon:

- the size of area to be dusted

- the type of powder to be used
- the type of surface to be dusted

Test impressions-when there is doubt as to the suitability of a powder for processing a particular surface a test impression should be made on a similar surface if available. If a similar surface is not available, then an area of the suspected surface may be explored "blindly" (i.e. wiped clean and used for testing).

ADDITIONAL INFORMATION:

Safety concerns when using commercial fingerprint powders are minimal.
Examiners are required to use the exhaust vents positioned at each workstation when doing powdering and lifting in the lab. When fingerprint powders are to be used for an extended period of time, a dust mask or half face respirator with dust filters should be worn to minimize the inhalation of the fingerprint powder particles. Persons using fingerprint powders should monitor reactions (if any) to the fingerprint powders.

Advantages to using fingerprint powders are:

- Processing with fingerprint powders is fairly rapid and inexpensive.
- Powder processing is most often the method of choice in the laboratory or at crime scenes where a large quantity of materials are to be examined.

Disadvantages to using powders are:

- If fingerprint powders are used as the first technique, the process may prohibit other types of latent print examinations.
- Success using fingerprint powders is dependent on proper lighting and the examiner's experience and care in using the process.

PLP 17.2.0. POWDER PROCESSING OF ADHESIVES

REFERENCES:

Journal of Forensic Sciences, Vol. 44, No. 2, "Sticky-Side Powder: The Japanese Solution", Darren S. Burns, pages 133-138.

"Sticky-Side Powder", Technical Note, Lightning Powder Co., (April, 1994).

MATERIALS:

- Sticky-Side powder
- Photo-Flo
- Small glass beaker
- Stir rod
- Camel hair fingerprint brush or a small paint brush
- Glass tray
- Tap or distilled water

INTRODUCTION:

Processing the adhesives on the sticky sides of tape and other items, such as labels, present problems in processing. Traditional powders will not work (unless modified) because the adhesive properties of the tapes cause the powder to obscure the latent print deposits. Sticky-Side powder is a liquid fingerprint detection technique that produces gray-developed latent prints when applied to adhesive surfaces. Sticky-Side powder may be more appropriate for certain types of tapes than for others (ex. masking tape vs. electrical tape). Surfaces that require other forensic examinations, such as trace or serology, should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

Adhesive surfaces that need to be examined for latent prints can be examined by using Gentian Violet or Sticky-Side powder at the examiner's discretion.
Sticky-Side powder detects the fatty/oily and/or epithelial cells often left when handling the adhesive surface on items such as tape or labels.

Sticky-Side powder can be used in two ways, the powder solution can be painted on, or the surface can be immersed in an aqueous solution containing the powder solution.

Sticky-Side powder solution is prepared as follows when using the paint on method:

1. Mix a solution of water and Photo-Flo in a glass beaker in a 1:1 ratio.

2. Mix a quantity of Sticky-Side powder (as needed) in a beaker with the water/Photo-Flo solution to make a liquid that has a consistency of paint.

The above solution is painted onto the adhesive surface with the brush and allowed to remain on the surface for 10 to 20 seconds after which the surface is rinsed with water. If left on the surface for too long, it may become difficult to rinse off. The adhesive surface is then evaluated for latent prints and dried thoroughly. Any suitable latent prints are photographed or covered with a protective cover such as lifting tape or clear plastic. The surface can be reprocessed to improve contrast and/or make the latent print(s) darker.

To use the submersion method, the glass tray is filled to an appropriate depth with water and the prepared solution of powder and Photo-Flo is added to the water. The examiner's experience determines the proper amount of the powder solution to be added. Some of the powder will suspend in the water and the water should be agitated or stirred to cause the maximum amount of the powder to remain suspended. After inserting the adhesive surface (adhesive side up) in the tray, the particles of powder will settle onto the surface being examined. The surface is removed from the water after twenty seconds (or longer, at the examiner's discretion) and rinsed with water if necessary. This procedure can be repeated if desired. Latent prints that are developed can be preserved as previously described.

It is not necessary to have commercially-prepared Sticky-Side powder to use this type of processing. An alternate method of using **a liquid fingerprint powder solution** is as follows:

1. Measure out .5g of fingerprint powder.

2. Add 1 ml of water to the fingerprint powder.

3. Add 1 ml of Liqui-Nox or other liquid detergent.

4. Thoroughly mix the liquid and fingerprint powder.

5. Apply the solution to the adhesive surface in the same manner as for using Sticky-Side powder.

ADDITIONAL INFORMATION:

Safety: when using the Sticky-Side powder in the previously described manner, there does not appear to be a significant health hazard. When using the powder in the dry form, precautions should be taken to prevent the powder from becoming airborne and possibly inhaled. Laboratory safety protocol should be followed when using the powder. Small amounts of Sticky-Side powder can be safely washed down the drain, while larger amounts should be collected in a suitable container for disposal.

Control tests are easily accomplished by placing one's own fingerprints on a piece of tape and following the processing guidelines. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of using the Sticky-Side powder are as follows:

- Sticky-Side powder is an inexpensive method of processing the adhesive surfaces of tapes and labels.
- Sticky-Side powder does not require the use of much equipment and can easily be used at crime scenes if necessary.
- The latent prints detected with the powder are stable and dark in color.

Disadvantages of using the Sticky-Side powder are as follows:

- The powder solution tends to be rather messy.
- A source of water is needed for rinsing the processed surfaces.

PLP 17.3.0. IODINE FUMING

REFERENCES:

Friction Ridge Skin, James F. Cowger, (1983), pages 93-96.

Fingerprint Techniques, Andre A. Moenssens, (1971), pages 114-120.

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978), pages 247-256.

Manual of Fingerprint Development Techniques, British Home Office, (1998), Chapter 4.

Peavey Product Guide, (1999).

MATERIALS:

- Iodine crystals
- Fume hood
- Container such as a small chamber or a plastic bag
- Iodine fuming "gun," glass wool, calcium chloride
- Iodine fuming stix

INTRODUCTION:

Iodine fuming is one of the oldest latent print techniques currently employed in the examination processes for the visualization of latent prints. The iodine vapors are absorbed by the fatty portion of a latent print deposit and turn the latent print a brownish color. Iodine is toxic in any form, and as a result, is only used in such instances as when the desired latent is suspected to have more fatty deposits than normal. An example could be when the contaminant forming the latent print deposit is suspected to be something such as kitchen grease or butter.

PROCEDURE:

In a fume hood, break open a glass ampoule of iodine crystals to reveal the iodine crystals. Place the crystals in an airtight chamber (that has adequate venting available to evacuate the chamber after use) with the questioned surface and a similar control surface which bears a quality latent print. The iodine crystals will

start to sublimate, go from a solid to a gas, resulting in purplish fumes with the application of heat (approximately 100° F). If desired, an electric heater can be wired into the chamber that is being used for iodine fuming. The latent prints will start to turn a yellowish-brown color. The process needs to be carefully monitored so that over-development does not occur.

If the questioned surface is too large to fit in a chamber, the surface can be processed by using a commercially available fuming gun. The fuming "gun" consists of a length of rubber tubing (that acts as a mouthpiece) with a length of glass tubing (about 6") attached. The glass tubing contains glass wool and calcium chloride crystals to absorb the moisture that is introduced into the tube when the apparatus is blown into. Attached to the rubber-stoppered glass tube is a thistle tube into which the iodine crystals are inserted. The "gun" is used by inserting iodine crystals into the open end of the thistle tube and wrapping one's hand around the tube. The warmth from the hand is sufficient to cause the iodine to change from a solid to a gas. The formation of purple fumes is indicative of the change.

When sublimation is noticed, the open end of the tube is directed toward the suspected latent print bearing surface and the mouthpiece is blown into to direct the purple fumes onto the surface. This processing with a "gun" is to be done in a fume hood or in an area with generous ventilation (preferably outdoors).

Another technique using iodine is called the "cold" method. This technique uses a heavy plastic bag to contain the exhibit, the atmosphere, and the iodine crystals. The exhibit is placed into the plastic bag with a quantity of iodine crystals (the equivalent of a standard iodine ampoule). The open end of the bag is then folded two or three times to make a temporary seal to contain the soon-to-be iodine rich atmosphere. The iodine crystals are then moved to one location in the bag. That portion of the bag is cradled in the hand and the body heat causes the change from solid to gas. The exhibit is monitored by viewing through the bag to determine when the processing is complete.

For small items, the iodine fuming stix, or "Fumette," available from Sirchie Fingerprint Laboratories Inc., make it possible to process prints on wood, paper, or cardboard surfaces on either vertical or horizontal surfaces. The heat from your hands combined with the moisture of your breath causes a chemical reaction that works well.

ADDITIONAL INFORMATION:

The resulting yellowish-brown latent prints that are characteristic of iodine processing can vanish and must be preserved. The finger marks are evaluated to determine which are suitable for comparison. Those fingerprints deemed to be of value are photographed as soon as possible, and notes are taken. Iodine prints that have faded, or are completely gone, can sometimes be redeveloped by reprocessing. This is only possible if no other techniques have been used nor too long of a time span has elapsed. Other latent print techniques such as DFO or ninhydrin tend to dissolve the fats that the iodine reacts with. Therefore, if iodine fuming is to be used, it must be used prior to other latent print development processes.

Iodine reacts to fresh prints better than old ones because the fats tend to change and become less receptive to this process with time.

Safety is a major concern when using the iodine technique. **Iodine is toxic in any form. ALWAYS AVOID INHALING IODINE FUMES AND NEVER BREATHE IN WHEN USING THE FUMING "GUN" APPARATUS!!** Iodine fumes may irritate the skin and damage the respiratory tract. Headaches that can last for several days may result from exposure to iodine. Long-term effects to the thyroid gland may result from exposure. Adequate ventilation when using the technique is mandatory as the fumes are very corrosive to metals and may discolor other surfaces that they come in contact with. Iodine also degrades the quality of the fuming "gun" by hardening and cracking the rubber stoppers and the rubber hose mouthpiece. The "gun" should be inspected before each use.

Iodine routinely comes sealed in glass ampoules or in bulk in glass jars. The sealed ampoules must stay sealed until use for safety purposes. The jars need to have the lids kept screwed tightly and the container kept in a chemical supply room until needed. As some leakage of the iodine vapors can occur after the lid on a jar is loosened for the first time, the ampoules are the recommended containers.

Control tests: Testing the iodine crystals is done upon each use. This test involves the making of quality latent prints on a test surface similar to the one being examined. The test print is exposed to the fumes in the same manner as the questioned surface. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of the iodine technique are as follows:

- Iodine is a quick, simple and inexpensive technique.
- If iodine fuming is used, it must be used prior to other latent print processes.
- Iodine developed latent prints will fade and disappear on documents leaving the surface undamaged unless there are metal items such as staples present. These will show signs of corrosion.

Disadvantages of the iodine technique are as follows:

- Iodine is toxic in any form.
- Iodine can interfere with subsequent examinations for body fluids.
- Iodine is not suitable for application on dark colored surfaces.

PLP 17.4.0. NINHYDRIN PROCESSING

REFERENCES:

Scott's Fingerprint Mechanics, Robert D. Olsen, (1978), pages 285-288.

Fingerprint Techniques, Andre A. Moenssens, (1971), pages 122-126.

Friction Ridge Skin, James F. Cowger, (1983), pages 96-98.

MATERIALS:

- N-Hexane, acetic acid, 2-propanol, ninhydrin crystals
- Glass trays/beakers/graduated cylinders
- Brushes/tongs
- Balance/magnetic stirrer, stirring bar
- Lab coats/rubber gloves
- Face shields
- Steam iron/lab oven

INTRODUCTION:

Ninhydrin is the latent print processing technique that is most commonly used on porous objects, such as paper. Ninhydrin reacts with the amino acids and proteins present in the latent print deposit to produce a purple color. Ninhydrin processing should be done after iodine and DFO (1,8-Diazafluoren-9-ONE) processing but before processing with silver nitrate or physical developer. Surfaces that need other forensic examinations such as questioned document examinations should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

Ninhydrin stock solution is mixed by obtaining a one-liter beaker and placing it on the magnetic stirrer. 300 ml of 2-propanol is then added to the beaker, followed by 100 ml of acetic acid. The stirring bar is placed in the beaker and the stirrer is turned to a slow stir while 50g of ninhydrin crystals are added to the solution. It may take up to two hours for all of the ninhydrin to dissolve.

Ninhydrin working solution is mixed by adding 30ml of the ninhydrin stock solution to a one-liter beaker. The beaker is then filled to the 1-liter mark with N-Hexane, and clarified with 2-propanol if needed. The working solution can be doubled or quadrupled if need.

Application the exhibits to be processed with ninhydrin are saturated with the ninhydrin solution in a fume hood or other well-ventilated area. The saturation of the item can be done by dipping in the solution, brushing the solution on the item, or by spraying the surface with the solution. Spraying is the least desirable of the application options as this allows the solution to become airborne.

NOTE: Upon standing in its storage container, some of the ninhydrin will "fall out of solution" causing a visible yellow layer at the bottom. Do not dip, brush, or spray items with this yellow layer.

After the exhibit is dry, the item is exposed to an atmosphere that is warm and humid. This can be accomplished in a lab oven or by passing a steam iron over the surface without touching the item. The combination of heat and humidity accelerates the reaction of the amino acids and ninhydrin to form the characteristic purple deposits (Rhuemann's Purple) which allow visualization of latent prints with the naked eye.

Any suitable latent prints are photographed because the latent prints will fade with time and may not be retrievable with reprocessing. It may be possible to increase the contrast between the ninhydrin developed latent and the substrate by using a yellow filter on the camera.

Latent prints that were made with blood can often be successfully darkened with an application of the ninhydrin solution. The ninhydrin reagent will cause the protein portion of the stain to turn purple and be darker and often will visualize parts of the latent print not readily seen with the naked eye. Prints in blood need to be fixed in some manner prior to processing with ninhydrin. Heat or methanol can be used as a fixative. Methanol is often the preferred method as it can be pipetted over the surface and limited to the stain so that the remainder of the surface is unaffected. Also, when using methanol the size of the object does not make as much of a difference as when using heat. Three or four applications of methanol are needed to fix the stain. When using heat as a fixative, the object is put in an oven for one hour at 100° centigrade. This heat fixing often ruins latent prints that are composed of normal latent print constituents. Failure to fix the stain does not always render a poorer quality latent print.

The ninhydrin solution is applied to the stain and allowed to remain at room temperature for approximately 48 hours. The ninhydrin will turn the protein component of the blood/serum stain a dark purple. This may often be the stain of choice on bloodstains because of the apparent increased sensitivity of the reagent over other techniques such as Amido Black. This may be used on porous items as well as non-porous surfaces. Non-porous surfaces should be processed with cyanoacrylate esters prior to the application of the ninhydrin reagent. This allows for further processing of the item with other conventional techniques.

ADDITIONAL INFORMATION:

Safety is a concern when using or mixing ninhydrin solution. Rubber gloves and a lab coat should be worn when using or mixing ninhydrin. A face shield should be worn if there is a chance of the solution splashing into the face or eyes. The examiner needs to be aware of the fact that the skin will stain if it is allowed to come in contact with the ninhydrin solution. Precautions should also be taken to avoid inhalation of the fumes.

The solvent used in the ninhydrin working solution, Hexane, is *extremely flammable* and the solution is to be used or mixed in a fume hood or in another well-ventilated area.

Glacial Acetic Acid is *corrosive* and extremely irritating to the eyes and respiratory system. Avoid breathing the vapors and use in a fume hood or with adequate ventilation. Glacial Acetic Acid will cause burns if it comes in contact with skin.

2-Propenol, also known as Isopropyl Alcohol, is *flammable*. It is an irritant, and can be harmful if inhaled. Avoid breathing the vapors and use in a fume hood or with adequate ventilation.

Small amounts of excess reagent can be evaporated off in the fume hood while larger quantities should be collected for disposal.

Control tests are easily accomplished by placing one's own fingerprints on a piece of paper and following the processing guidelines. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of the ninhydrin solution are:

- Ninhydrin is simple to use, inexpensive, and very effective.
- Ninhydrin will detect latent prints that are months or years old.

Disadvantages of the ninhydrin solution are:

- Ninhydrin will not detect latent prints deposited by all donors.
- Ninhydrin will not detect latent prints on items that have gotten wet.

PLP 17.5.0. DFO PROCESSING

REFERENCES:

Manual of Fingerprint Development Techniques, British Home Office, Chapter 4, (1998).

Technical Notes #1-0038, Lightning Powder Co., 1,8-Diazafluoren-9-One (DFO)

MATERIALS:

- DFO, methanol, ethyl acetate, acetic acid, petroleum ether
- Balance/magnetic stirrer, stirring bar
- Alternate light source
- Lab coats/rubber gloves
- Face shields
- Lab oven
- Glass ware/graduated cylinder

INTRODUCTION:

DFO (1,8 Diazfluoren-9-ONE) is an analogue of the ninhydrin molecule that luminesces when illuminated with monochromatic light in the 485 nm to 510 nm range. The use of the DFO reagent when processing porous surfaces provides greater sensitivity than previously offered by the ninhydrin reagent. DFO does not replace the ninhydrin reagent but is used before and in addition to the ninhydrin reagent. Surfaces that need other forensic examinations such as trace or questioned document examinations should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

DFO stock solution: measure and mix solvents in a fume hood. While a magnetic stirrer is not necessary, it does make the mixing process go faster. Dissolve 0.5 gram of DFO powder in 100 ml of methanol. When the powder is dissolved, add 100 ml of ethyl acetate. When it is thoroughly mixed, add 20 ml of acetic acid. Store this solution in a dark brown glass or polypropylene bottle.

DFO working solution: measure and mix these solvents in a fume hood. Do not mix this solution until you are ready to use it. For best results, the manufacturer recommends not using any working solution which is older than two to three weeks. If one liter (1000 ml) of working solution is needed, take the entire 220 ml of stock solution and add 780 ml of petroleum ether, mixing thoroughly. If less working solution is desired, halve or quarter the solutions accordingly.

Application: the paper specimen should be dipped into the solution for ten seconds and allowed to dry for about three minutes (DFO may also be swabbed on). This step should be repeated, as two dippings and dryings seem to be better than one application. Although it is possible to spray this solution, it is **not recommended** due to the health hazards involved and its inability to soak the specimen adequately.

Heat is then applied in an oven. While expensive chemical ovens can be used, a regular household toaster oven will work. The specimen should be heated for ten minutes at 100° C (212° F). View the paper item under a forensic light source or laser.

As an alternative to an oven, a hair dryer or dry iron will work. If using one of these alternative heat sources, place a thick towel or other protective material on the counter first, followed by the evidence. Then, place a few paper towels on top of that. Apply dry heat to the surface for several minutes. A dry iron can be placed directly on top of the paper towels and used the same as when ironing clothes. It is possible to stop ironing to check the progress with a forensic light and, if the latent prints are not very bright, continue to iron for a few minutes longer. Sometimes, this added heating time will improve resulting print development. The DFO-developed latent prints may or may not be visible to the naked eye, but should be viewed under a forensic light source or laser. Any suitable latent prints on the item are photographed using the ALS and a filter on the camera (orange or red). Faint latent prints may be made to luminesce brighter with a second or third application of DFO. The second and third applications of DFO (if necessary) are done in the same manner as the first.

DFO is not intended to replace ninhydrin, but should be used in conjunction with ninhydrin. DFO will detect latent prints on porous surfaces that ninhydrin will not and the reverse is also true.

ADDITIONAL INFORMATION:

Safety in the laboratory is always a concern and standard laboratory protocol is followed when handling solvents. DFO has not been fully tested for potential health hazards but is thought to be similar to the ninhydrin molecule, which may act as an irritant. Rubber gloves, lab coats, and face shields (if there is a chance of the DFO becoming airborne) should be worn when mixing and using DFO. The application of the DFO working solution should be done in a fume hood or in a well-ventilated area, or while wearing an air-purifying respirator equipped with an organic vapor cartridge.

Glacial Acetic Acid is *corrosive* and extremely irritating to the eyes and respiratory system. Avoid breathing the vapors and use in a fume hood or with adequate ventilation. Glacial Acetic Acid will cause burns if it comes in contact with skin.

Methanol needs to be handled carefully and non-permeable gloves worn during mixing and use. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor consulted. Inhalation of methanol vapors should be kept at a minimum and the DFO should be used in a well-ventilated area.

Control tests are easily accomplished by placing one's own fingerprints on a piece of paper or cardboard similar to the evidence, and following the processing guidelines. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of DFO are:

- It is relatively simple to use, and very effective.
- DFO will detect latent prints that are months or years old.

Disadvantages of the DFO are:

- You must use an alternate light source to visualize and photograph any developed prints.
- DFO may cause diffusion or running of some inks.
- Fingerprints may develop if items are handled after treatment.

PLP 17.6.0. USING PHYSICAL DEVELOPER

REFERENCES:

Manual of Fingerprint Development Techniques, British Home Office, (1999), Chapter 4.

Advances in Fingerprint Technology, Henry C. Lee, R.E. Gaensslen, (1994), pages 79, 80, 81, 95, 112.

Technical Note #1-2730, Lightning Powder Co., (1993).

MATERIALS:

- Physical Developer Kit (parts A & B)
- 2 glass trays/graduated cylinders
- Plastic tongs

INTRODUCTION:

Physical developer is a technique for processing porous items to allow the detection of latent fingerprints. Physical developer reacts with lipids, fats, oils, and waxes present in the fingerprint residue to form a silver-gray deposit. This technique is the final step in the sequential processing of porous items. The physical developer technique replaces the silver nitrate technique most of the time. Physical developer is the only technique to show adequate results on paper items that have gotten wet, and has shown good results on paper currency. Physical developer can also be used to detect shoe prints on paper items. The ability to detect shoe prints on paper is limited by the composition and contamination of the sole. Surfaces that need other forensic examinations such as body fluid, trace, or questioned document examinations should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

The processing of porous items with physical developer uses two solutions: Solution A (20% silver nitrate) and Solution B (reductant solution).

Application: the step-by-step procedure for using physical developer is as follows:

1) The actual processing should be done in the stainless steel sink in the chemical lab. The physical developer solution will cause dark stains on any surface with which it comes in contact with.

2) Wash and rinse glass trays. Any contaminants on the glass trays will ruin the physical developer. To avoid any cross contamination, always use clean glassware rinsed with tap water, then with distilled water.

3) Arrange the glass trays in the sink so that the paper items can be moved easily from tray to tray in the proper sequence.

4) Add 5 ml of solution A (20% silver nitrate solution) to 90 ml of solution B (reductant solution) in a beaker. Stir the working solution for approximately one minute with a clean glass/plastic stirring rod. Do not mix the working solution until you are ready to use it as it does not have a very long shelf life.

5) Add the physical developer working solution to its dedicated glass tray.

6) Wash and rinse the beaker that is used to mix the physical developer solution.

7) Use plastic photographic tongs or plastic forceps without serrated edges to remove articles from PD solutions. Do not use metal tools.

8) Conduct a control test.

9) Place the item to be processed into the physical developer using the tongs. Immerse the item and gently rock the tray for approximately 5 to 15 minutes (examiner's discretion). The item is then removed and placed into another clean tray with running tap water until the excess stains are gone. The water should run clear from the tray.

10) The processed item needs to completely dry prior to final examination and any developed latents need to be photographed.

ADDITIONAL INFORMATION:

Cleanliness is important in the physical developer technique. A good deal of the instability in the earlier solutions was a result of laboratory equipment that was

not spotless. Some contaminants, especially salts, will cause the silver nitrate in the solution to come out of suspension thus spoiling the physical developer solution and perhaps ruining the item being examined, therefore, it is important to keep the glassware spotless and rinsed with distilled or deionized water prior to use. When washing glassware, use detergent, not abrasive cleaners.

Physical developer will cause dark stains on many surfaces. Therefore, care must be taken to avoid spills in the laboratory. Full strength chlorine bleach will usually remove any stains from counter tops and floors, but the bleach may cause damage to fabrics stained with physical developer.

Safety: the standard protection of rubber gloves, laboratory coats, and face shields (if there is a chance of the solution splashing into the face or eyes), is sufficient. Physical developer should only be used in well-ventilated areas, as it is irritating to the respiratory tract. Standard laboratory protocol is followed for chemical handling. Excess physical developer should be collected in a container for proper disposal.

Control tests are easily accomplished by placing one's own fingerprints on a piece of paper or cardboard similar to the evidence, and following the processing guidelines. When making test prints, keep in mind that physical developer reacts to the fats, and oils present in fingerprint residue. An examiner can not proceed with evidence processing until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of Physical Developer are:

- Physical developer will find latent prints on dry paper that ninhydrin and DFO will not detect.
- Physical developer will detect latent prints on papers that have gotten wet.

Disadvantages of Physical Developer are:

- Instructions for making and use must be carefully followed.
- The use of the physical developer technique requires some experience to achieve the best results.
- It is more time and labor intensive than the other techniques for processing porous items.

PLP 17.7.0. CYANOACRYLATE PROCESSING

REFERENCES:

"Methods of Latent Print Development", Henry C. Lee and R. E. Gaensslen, 1987 Proceedings of the International Symposium on Latent Prints, pages 15-23.

Advances in Fingerprint Technology, Henry C. Lee and R. E. Gaensslen, (1991).

Journal of Forensic Identification, Vol.46, No. 4 July/August, 1996; Vol. 46, No. 1 January/February, 1996.

Coleman Vacu-Print Instructions and Notes, Lightning Powder, (1995).

Manual of Fingerprint Development Techniques, British Home Office, Chapter 4, (1998).

MATERIALS:

- Airtight container such as a tank or sealed plastic bag
- Cyanoacrylate such as "Hard Evidence" or super-glue
- Cups/warm water (optional)
- Low temperature heating element (optional)
- Sodium hydroxide treated cotton balls (optional)
- Coleman Vacu-Print apparatus

INTRODUCTION:

Fuming with cyanoacrylate esters (CAE/super-glue) is a process that is used to visualize latent print deposits on non-porous objects. It also serves to fuse the latent print to the surface, making it more stable and less easily damaged. The cyanoacrylate goes through a process known as polymerization where a white deposit is lain down upon the latent print residue. The process is temperature, humidity, and pressure sensitive. CAE processing prepares the surface for the acceptance of powders and dye-stains that may enable further visualization of the latent prints. Objects that need additional forensic examinations such as trace or questioned document examinations should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

A smooth, non-porous surface that is to be processed with CAE needs to be exposed to an atmosphere rich in CAE fumes. This procedure requires the use of an airtight container (to trap the fumes to enable them to adhere to the surface) and a source of CAE fumes. The container can take many forms such as tanks or plastic bags, but it needs to have a transparent surface or have a readily assessable interior in order to check the progress of the procedure. The surface to be examined is placed in the container and then the CAE source is added.

One of the most common sources of CAE is a commercial preparation known as "Hard Evidence," which is available from Lightning Powder Inc. This is a sealed foil package containing a small amount of CAE in a gel form. The package is designed to be opened and used without additional preparation. Once the gel is exposed to the air, the CAE in the gel begins to vaporize at a controlled rate. The "Hard Evidence" packets may be stored at room temperature and have a shelf life of six months to a year.

Another CAE processing method is the use of CAE fumes in a vacuum chamber. The "Coleman Vacu-Print Instructions and Notes" list a step-by-step procedure for the processing of evidence in the vacuum chamber. Vacuum processing may be the preferred method when processing a large quantity of plastic bags because there does not have to be large spaces separating the bags and/or the bags do not have to be unfolded.

Other techniques that use heat or a sodium hydroxide treated pad to accelerate the vaporization of the super-glue are described in the previously mentioned references.

ADDITIONAL INFORMATION:

Safety: when used in the above-described manner, CAE are not believed to pose a health hazard. Super glue fuming should only be conducted in well-ventilated areas. Precautions should be taken to avoid inhaling or allowing the vapors to contact the eyes, as the vapors can be irritating to the eyes, nose, and mouth. Persons wearing contact lenses should not open CAE chambers without taking proper precautions. Non-vented goggles should be worn. Other precautions include using sealed CAE chambers and evacuating the air from the chambers prior to removal of the questioned and test surfaces.

Gloves should be worn to prevent the cyanoacrylate from contacting the skin. If liquid glue is allowed to contact the skin, adhesion may result. If the skin sticks together, immerse affected areas in warm water. This will loosen the skin so that it can be gently pulled apart.

Control tests: testing of the CAE packets is done by observing the results of the CAE on a test sample that is included in the chamber. Placing one's own fingerprints on a black latent lift card works well for this purpose. Processing and quality control are done at the same time. A quality test print is applied to a surface and put into the tank with the questioned surface in an easily-monitored position. When the development of the test print is complete, the questioned surface is also finished.

Advantages of using the CAE process are as follows:

- CAE is a simple, quick, and inexpensive technique.
- Use of CAE prepares the surfaces for the application of powders, stains, and alternate light sources.
- The exposure of surfaces to CAE fumes hardens and plasticizes the latent print residue and makes the latent prints more durable.

Disadvantages to using the CAE process are as follows:

- The liquid glue option tends to be messy.
- The polymerized CAE coats the interior surfaces of the chambers with a whitish layer that can be difficult to remove.
- CAE are not effective on porous surfaces.
- CAE may affect further examinations such as firearms (if used heavily) and the serological examinations of body fluids and tissues.

PLP 17.8.0. ~~MIXING~~ RHODAMINE 6G DYESTAIN Processing

REFERENCES:

An Introduction to Lasers, Forensic Lights and Fluorescent Fingerprint Detection Techniques, E. Roland Menzel, (1991), pages 42-44.

Manual of Fingerprint Development Techniques, British Home Office, (1998), chapter 4

Chemical Formulas and Processing Guide for Developing Latent Prints, U.S. Department of Justice, F.B.I. Laboratory Division, (1994), pages 55-56.

Technical Notes #1-0041, Lightning Powder Co. Inc., pages 1-4.

MATERIALS:

- Rhodamine 6G powder
- Methanol or distilled water
- Balance
- Spatula, one-liter beaker, glass tray
- Spray or rinse bottles
- Alternate light source
- Photographic equipment

INTRODUCTION:

Rhodamine 6G is a dye-stain used primarily to aid in the luminescence of latent prints that have been treated with cyanoacrylate esters (CAE). It is used in the examination of smooth or semi-smooth non-porous items. Rhodamine 6G is a very important stain because it has light absorption properties that lend themselves to being used with Argon lasers, Copper Vapor lasers, and alternate light sources. Surfaces that need other forensic examinations such as body fluid or trace examinations should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

Rhodamine 6G working solution: a spray or rinse bottle (approximately one liter) is filled with methanol or distilled water. Approximately 0.1 gram Rhodamine 6G (about the size of a BB) is added to the methanol or distilled water and the bottle is sealed. The bottle is then gently agitated to mix the Rhodamine with the water or methanol. The resulting solution is a light pink color. This working solution is irrigated over the item being processed and then rinsed off with methanol or water contained in another bottle. The Rhodamine 6G bottle should be labeled with the date and the contents (whether the solvent is distilled water or methanol). The solution can be stored at room temperature with an indefinite shelf life.

ADDITIONAL INFORMATION:

The amount and strength of the dye-stain used is left to the examiner's discretion. Rhodamine 6G luminesces when exposed to light in the 450 - 525 nm range, and viewed through an orange filter. Slight color variations may be noted. These variations may be due to the mixing of the stain or the substrate. The variations do not affect the quality of the examination.

The use of distilled water in lieu of methanol is useful when methanol may damage the item being processed, as may be the case with some lacquers, plastics, or tapes.

It is recommended that Rhodamine 6G be used prior to powdering, not after.

Control tests: the working solution of Rhodamine 6G will fluoresce when illuminated with an alternate light source or a laser. Control tests should be documented in the laboratory case notes and on the control tests work sheet.

Safety: Rhodamine 6G is thought to be a relatively safe compound when exposures are at low levels. Rhodamine 6G should never be inhaled or allowed to get into the eyes or mouth, as it is an irritant. If this should occur, the eyes or mouth should be flushed with a generous amount of water and a doctor consulted.

Methanol is highly *flammable*. It needs to be handled carefully and non-permeable gloves worn during mixing and use of the stain. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor consulted. Inhalation of methanol

vapors should be kept at a minimum and the stain should be used in a well-ventilated area.

Rhodamine 6G dye-stain can be disposed of in the following manner:

- Methanol-based stains can be allowed to evaporate in a fume hood.
- Water-based stains can be disposed of in a waste bottle with an absorbent material to soak up the liquid (see ISPFS Health and Safety Manual).

Advantages of Rhodamine 6G are:

- The Rhodamine 6G process may develop older latents more effectively thus rendering more useful latents.
- It can be utilized on a large range of textures and surfaces.

Disadvantages of Rhodamine 6G are:

- Rhodamine 6G must be viewed in a darkened environment utilizing an alternate light source.
- The carrier (methanol or water) may damage some surfaces.
- It is more time and labor intensive than the other techniques for processing non-porous items.

PLP 17.9.0. AMIDO BLACK BLOOD PRINT PROCESSING

REFERENCES:

Manual of Fingerprint Development Techniques, British Home Office, (1998).

Journal of Forensic Identification, Vol. 45, No. 5 Sept/Oct 1995, "Superglue of Latent Shoe Prints in Blood Prior to Processing", pages 498-50.

Proceedings of the International Forensic Symposium on Latent Prints, "Enhance Latent Prints in Blood With New Staining Techniques", Paul Norkus and Kevin Noppinger, page 147.

MATERIALS:

- Amido Black
- Glacial acetic acid, methanol
- Distilled water
- Balance, magnetic stirrer/stirring bar
- Pipettes
- 2 liter beaker, graduated cylinder
- Appropriately sized storage bottles, squirt bottles

INTRODUCTION:

Processing surfaces that have been contaminated with blood and other body fluids posses problems in the detection of friction ridge skin impressions because these prints consist of different constituents than normal latent print deposits which consist of sweat, fats, and oils. Prints in blood, on non-porous surfaces, can be processed with Amido Black to detect faint deposits of friction ridge skin impressions. Amido Black is a dye that stains the protein portion of blood (or other body fluids) a blue-black or bright blue color. The reagent will not detect the normal constituents of latent fingerprints and therefore must be used in the proper sequence with other latent processing techniques when blood-contaminated latent prints are examined. Amido Black is also known as Amido Black 10B, Amido Black 12B, Napthol Blue Black, or Napthalene Black.

PROCEDURE:

Smooth, non-porous surfaces, suspected of bearing blood-contaminated friction ridge impressions, require special consideration. Any samples to be used for the serological examination of blood deposits or trace analysis need to be collected before the examination and enhancement of the surface for blood-contaminated latents.

Blood-contaminated friction ridge impressions need to be fixed before the processing for latent prints can begin. This is because the liquid solutions used in the Amido Black process may wash away some or all of the blood deposits. Fixing can be done using heat, methanol, or super-glue. Blood can be fixed to an object by heating in a 100° centigrade oven for thirty minutes (restricted to non-heat sensitive objects). When using methanol, it may be sprayed or pipetted over the item. Super-glue is the most effective as it will fix all possible latent prints not just those contaminated with blood.

The Amido Black process utilizes a working solution, a rinse solution, and another wash solution (distilled water). The solutions needed for Amido Black processing have an indefinite shelf life. Storage of the solutions should be in glass bottles that are labeled appropriately. A step-by-step procedure for mixing the solutions is provided below.

Amido Black working solution:

1. Weigh out 3-5 grams of Amido Black and place it in a clean, dry one-liter beaker.
2. Measure out 100 ml of acetic acid and add it to the Amido Black.
3. Measure out 900 ml of methanol and add it to the beaker containing the Amido Black and acetic acid. Stir the solution with a magnetic stirrer for thirty minutes and transfer the solution to a clean storage bottle.

Amido Black rinse solution (de-stain):

4. Measure out 100 ml of acetic acid and pour it into a clean, dry, two-liter glass beaker.
5. Measure the 900 ml of methanol and add it to the beaker. Stir the solution for two to three minutes and transfer the solution to a clean, dry storage bottle.

Water rinse:

6. Rinse with water after the rinse solution.

Application: use of the Amido Black reagent requires the item to be immersed in the working solution for two to three minutes. Alternatively, the item may be sprayed or irrigated with the Amido Black working solution. The resulting latent prints are a dark blue-black.

Immerse or irrigate the item with the De-Stain Rinse Solution to remove the excess dye. Then immerse or irrigate the surface with the Water Rinse Solution. Allow the item to dry at room temperature and photograph any latent prints suitable for comparison.

ADDITIONAL INFORMATION:

Safety in the laboratory is a concern and proper laboratory protocol is followed when using any acids or methanol. Rubber gloves, lab coats, respirators, and face shields or goggles (if there is a chance of the reagents becoming airborne) are worn when mixing or using Amido Black.

Glacial acetic acid is corrosive and extremely irritating to the eyes and respiratory system. Avoid breathing the vapors and use in a fume hood or with adequate ventilation. Glacial Acetic Acid will cause burns if it comes in contact with skin.

Methanol is *flammable*. It needs to be handled carefully and non-permeable gloves worn during the mixing and use of Amido Black. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor consulted. Inhalation of methanol vapors should be kept at a minimum and the solution should be used in a well-ventilated area.

In addition, examiners must be aware of the biological hazards associated with blood and other body fluids and take extra precautions to protect themselves.

Excess reagent should be collected in a container for proper disposal.

Control tests:

After mixing, the reagents should be tested by application of the reagent to a slide prepared with blood or a blood portion. For safety reasons, examiners *will not* prepare test prints made with blood. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet. After testing, the reagents can be stored until needed.

Advantages of Amido Black are:

- Amido Black is a simple inexpensive process.
- Amido Black may be the best process for detecting faint, blood-contaminated friction ridge skin impressions on non-porous surfaces.

Disadvantages of Amido Black are:

- Amido black will interfere with forensic examinations for body fluids, fibers, hairs, paint, and most other examinations.
- Amido black will only stain traces of blood, and will not detect the friction ridge skin impressions composed of normal latent print constituents.
- Methanol may damage some surfaces.

PLP 17.10.0. GENTIAN VIOLET PROCESSING

REFERENCES:

Chemical Formulas and Processing Guide for Developing Latent Prints, FBI, (1994).

Lightning Powder Technical Notes, "Crystal Violet," (2000).

Processing Guide for Developing Latent Prints, "Gentian Violet," USDJ/FBI, (2000).

MATERIALS:

- Gentian Violet or Crystal Violet Powder
- Balance
- Graduated cylinder, Glass tray, Storage bottles
- Magnetic stirrer/stirring bar (or other stirring device)

INTRODUCTION:

Gentian Violet (or Crystal Violet) is a biological stain that is used in the laboratory to visualize latent print deposits on the adhesive side of many tapes. It reacts with sebaceous sweat and epithelial cells that are transferred to the adhesive surface upon contact. Gentian Violet can also be used to develop prints on non-porous surfaces contaminated with grease and oils.

PROCEDURE:

Gentian Violet Working Solution: weigh out one gram of powdered Gentian Violet. Measure 1000 ml of distilled water and pour into glass tray. Add the Gentian Violet slowly. Combine the ingredients and stir using the stirring device for approximately twenty-five minutes. After the stain is completely mixed in the water, the solution is ready for use. Gentian Violet is usually made for the examination process as needed, tested, and discarded after use.

Application: items may be dipped in the solution or painted on with a small brush for approximately 1 to 2 minutes. Rinse by running cold tap water over the tape. Latent prints should appear purple in color. Black tape can be processed in the

same manner. The resulting latents can then be transferred to resin-coated photo paper and photographically reversed.

ADDITIONAL INFORMATION:

Safety: Gentian Violet/Crystal Violet is a suspected human carcinogen. It is known to effect the kidney, ureter, bladder, and thyroid of animals. It can be harmful if inhaled, and is irritating to the eyes and skin. Therefore, Gentian Violet should not be used in large amounts. A respirator should be used when working with the dry form, and Gentian Violet should be prepared and used in a fume hood or well-ventilated area. The examiner should wear a lab coat, heavy duty (non-disposable) gloves, and a face shield if there is a chance of the liquid splashing into the eyes.

Control tests: are easily accomplished by placing one's own fingerprints on the adhesive side of a piece of transparent tape and following the processing guidelines. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of Gentian Violet are:

- It is effective, simple, and inexpensive.
- Gentian Violet may develop prints on adhesive surfaces that were previously invisible.

Disadvantages of Gentian Violet are:

- Gentian Violet should not be used on water-soluble adhesives.
- Gentian Violet should not be used in large amounts.
- Extra safety precautions need to be taken.

PLP 17.11.0. SMALL PARTICLE REAGENT PROCESSING

REFERENCES:

Manual of Fingerprint Development Techniques, British Home Office, (1998), chapter 4.

Advances in Fingerprint Technology, Henry C. Lee and R.E. Gaensslen, (1991), pages 82-83.

Technical Notes #1-2757, Lightning Powder Co.

MATERIALS:

- Molybdenum Disulfide
- Distilled water, Photo Flo 200
- Processing tray, Spray bottle
- 1500 ml beaker
- Balance
- Magnetic stirrer/stirring bar

INTRODUCTION:

Small particle reagent (SPR) consists of a suspension of fine molybdenum disulfide (MoS2) particles in a detergent solution. This solution works like a liquid fingerprint powder by adhering to the fatty portion of the latent print residue resulting in a gray colored latent. Small particle reagent works best on surfaces that have been, or are wet. Surfaces that need other forensic examinations such as serology, questioned document, or trace examinations should be carefully evaluated prior to processing to determine if the SPR procedure will have an impact on subsequent examinations.

PROCEDURE:

SPR may be used in two ways; dipping or spraying. Dipping is the preferred method as spraying is less sensitive. Spraying should only be considered when no other method is feasible.

Small Particle Reagent Working Solution:

1. Place a 1500 ml beaker on magnetic stirrer base.
2. Add 1000 ml of distilled water to the beaker.
3. Place an appropriately sized stirring bar in the beaker.
4. Dissolve 30g of MoS2 in the water. (MoS2 comes in 30g bottles.)
5. Add three to four drops of Photo Flo 200 to the solution.

The SPR is put into a storage bottle, labeled, and stored until needed. The shelf life is two to three months.

Application using the SPR dipping procedure:

1. Stir the SPR thoroughly and pour the solution into a tray.
2. Agitate the solution in the tray and add the item to be processed to the solution.
3. After two or three minutes, remove the item from the SPR and gently rinse with tap water. Allow the surface to dry and inspect for any suitable latent prints. Any latent prints developed should be photographed and lifted.

Application using the SPR spray processing procedure:

1. Put the SPR into a spray bottle and shake thoroughly. The bottle should be shaken often to keep the MoS2 in suspension.
2. Spray the SPR onto the item being examined. If the location of the latent prints is known, spray the area above the prints and allow the SPR to flow over the prints.
3. Gently rinse the processed area with tap water and allow it to dry.
4. Inspect the area that was processed, photograph and lift any usable latent prints.

ADDITIONAL INFORMATION:

Safety: There does not appear to be any health hazards associated with MoS2, but the process should be monitored to see if there are any allergies. Lab coats, rubber gloves, and face shields (if there is a chance of the solution becoming airborne) should be worn.

Control tests: An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages to the SPR treatment are:

- SPR is inexpensive, non-toxic, and easy to use.
- SPR can be used to process items that have gotten wet and can be used in the rain.

Disadvantages to the SPR treatment are:

- SPR is very messy and hard to clean up.
- It is difficult to prevent damage to latent prints located on the bottom side of an item being tray processed.

PLP 17.12.0 SUDAN BLACK PROCESSING

REFERENCES:

Manual of Fingerprint Development Techniques, British Home Office, Chapter 4, (1998).

Lightning Powder Technical Note No. 1-0034, "Sudan Black", (May, 1995).

MATERIALS:

- Sudan Black B powder, methanol, distilled water
- Beaker, glass tray, 100 ml graduated cylinder
- Balance
- Spatula, stirring rod
- Glass bottle

INTRODUCTION:

Sudan Black B is a dye which stains fatty components of sebaceous sweat to produce a blue-black image. It is less sensitive than some other processes for latent fingerprint detection but is of particular use on waxy surfaces. Examples of some other surfaces include those contaminated with grease, foodstuff, or dried deposits of soft drink. Sudan Black will also enhance super-glue developed fingerprints. Sudan Black B is NOT suitable for use on porous surfaces. Surfaces that need other forensic examinations such as serology or trace should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

Sudan Black B Working Solution: place 15g of Sudan Black powder into a 2-liter glass beaker. Add 1-liter of methanol and stir with a plastic stirring rod. Add 500 ml of distilled water to the beaker and stir with the stirring rod. A black working solution will result. Some of the Sudan Black will not dissolve, but will remain as particulate matter floating in the solution or may appear as sediment. Pour the solution, including any solid matter, into a clean glass bottle with a tight-fitting screw top. Label the container appropriately. The working solution has an indefinite shelf life.

Application: shake the container of Sudan Black working solution and pour a sufficient amount into a tray that is large enough to hold the item of evidence. Soak the item for 2-3 minutes. Rinse the article in cool, running tap water. For large items, pour the solution over the surface, catching the run off in a tray for reuse. Rinse with cool running tap water.

Allow the item to dry at room temperature. Applying heat is not recommended. Evaluate the latent prints only after they have dried completely. Reprocessing can sometimes enhance faintly developed latent prints.

Latent prints developed with Sudan Black should be photographed. While it is possible to lift the prints with tape, the tape frequently does not lift the print sufficiently. Therefore, it is strongly recommended to photograph the latent prints before attempting to lift them.

ADDITIONAL INFORMATION:

Safety: there are no known health hazards associated with Sudan Black B provided that the examiner wears a lab coat, non-porous gloves, and eye protection (if there is any risk of the solution splashing). The Sudan Black working solution contains methanol. Methanol is toxic in quantities as small as 30 ml and should not be allowed to come in contact with the skin, eyes, or mouth. It is possible for methanol to be absorbed through the skin. If methanol comes into contact with the eyes or mouth, the area should be flushed with generous amounts of water and a doctor consulted. Inhalation of methanol vapors should be kept at a minimum and the Sudan Black should be used in a well-ventilated area.

Control tests are easily accomplished by placing one's own oil contaminated fingerprints on a non-porous object and following the processing guidelines. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of Sudan Black:

- Sudan Black is inexpensive and non-toxic.
- Sudan Black is useful on contaminated surfaces.

Disadvantages of Sudan Black:

- Sudan Black is relatively insensitive to uncontaminated prints.
- It is ineffective on dark or printed plastic items.
- Sudan Black can interfere with most other forensic examinations (including but not limited to handwriting, ink, paper and indented impressions, body fluids, fibers, hairs, and paint).

PLP 17.13.0. FLAME TECHNIQUE

REFERENCES:

Friction Ridge Skin, James F. Cowger, (1983), page 102.

Scott's Fingerprint Mechanics, Robert D. Olsen, (1971), pages 260-263

Fingerprint Techniques, Andre A. Moenssens, (1971), pages 126-127

MATERIALS:

- Camphor blocks/masking tape
- Shallow metal or Pyrex container
- Matches
- Fingerprint brushes

INTRODUCTION:

Some hard, smooth surfaces, especially galvanized metal, present problems for the latent examiner in the detection of latent print deposits. The latent prints dry out and resist the adhesion of cyanoacrylate esters and/or powders. The use of a dense smoke, such as that produced by the combustion of camphor, provides heat which softens the latent print deposit and the particulate in the smoke bonds with the deposit and colors the ridge detail so that the latent print can be visualized. Surfaces that need other forensic examinations such as serology or trace examinations should be carefully evaluated prior to processing to determine if the flame technique will have an impact on subsequent examinations.

PROCEDURE:

Preparation for the use of the flame technique is quite simple.

1) A block of camphor is placed in the metal or glass container. One edge of the block is ignited with a match or cigarette lighter. The combustion of the camphor produces a dense black smoke.

2) The surface to be examined with the flame technique is passed through the column of smoke until the surface is coated with a thin layer of soot particles.

The examiner needs to ensure that the surface does not get too hot as this may cause damage to the item being examined. Care must also be taken to make sure that the layer of soot does not become too heavy as the ridge detail may be destroyed or obscured.

3) After the surface is coated with a layer of soot, the surface is brushed with a fiberglass fingerprint brush and any suitable latent prints are photographed and/or lifted at the discretion of the examiner.

ADDITIONAL INFORMATION:

Safety is a concern because of the open flame required for use. Established laboratory practices concerning the use of open flames should be observed. This technique should be done in a fume hood or in a well-ventilated area to avoid contamination of the air with smoke and accidentally setting off the fire alarm.

Advantages of using the flame technique are:

- It is a simple, inexpensive, and easy process.
- Latent prints can be detected on some surfaces such as copper and galvanized metal where standard techniques may not work as well.
- The flame technique may be used after cyanoacrylate and standard fingerprint powders have been used.

Disadvantages of using the flame technique are:

- It is a dirty process due to the dense oily smoke produced by the combustion of the camphor.
- Surfaces processed with this technique can be damaged if too much heat is applied to the surface.
- Any technique that requires the use of an open flame has associated risks that must be considered.

PLP 17.14.0. TAPE-GLO

REFERENCES:

Lightning Powder Technical Notes, "Tape-Glo," (2000).

Material Safety Data Sheet, "Tape-Glo," (1999).

MATERIALS:

- Tape-Glo
- Water
- Pyrex tray
- Alternate light source
- Photographic equipment

INTRODUCTION:

Tape-Glo is an orange colored fluorescent dye used for the development of latent friction ridge impressions on the adhesive side of tapes and other adhesives. Tape-Glo is especially useful for the processing of dark colored tapes such as black electrical tapes. In the past, the adhesive side of electrical tape was processed by utilizing Gentian Violet and then attempting to transfer the latent print onto a piece of resin coated photo-paper. Tape-Glo provides a more direct an less labor intensive way to visualize these prints. Surfaces that require other forensic examinations, such as trace or serology, should be carefully evaluated prior to processing to determine if this procedure will have an impact on subsequent examinations.

PROCEDURE:

Adhesive surfaces can be dipped in the Tape-Glo or they can be sprayed with it as it is non-toxic. Dipping allows for better saturation. Select a tray large enough to contain the object to be processed. Place the tape in the tray adhesive side up, and pour enough Tape-Glo to cover the tape in the tray. The adhesive surface should be completely covered with a thin film. Allow the Tape-Glo to remain on the adhesive surface for at least 10-15 seconds. Remove tape from the tray and rinse thoroughly with water. Distilled water is suggested, but not required. Examine the adhesive surface with the alternate light source set to approximately 450 nm

under an orange filter. Any useable latents can then be photographed. It is not necessary for the tape to be dried before photographing. The orange colored filter should also be used to photograph the latent prints. It is possible to process paper or cloth backed adhesives by brushing the Tape-Glo on to the adhesive surface. The paper or cloth backed tape should be soaked in water for 30 seconds prior to the application of the Tape-Glo. Care must be taken to avoid getting the Tape-Glo on the porous surface as it could cause background fluorescence when viewed. Tape-Glo should be stored out of direct sunlight and at room temperature.

ADDITIONAL INFORMATION:

Safety: while Tape-Glo does not contain any flammable materials, it may be an irritant, so standard precautions should be taken to avoid contact with eyes and skin. This can be accomplished by wearing a lab coat, gloves, and a face shield or goggles (if there is a chance of it splashing in the face). It is not necessary for Tape-Glo to be used in a fume hood, and it is safe to use at scenes of crime.

Control tests: are easily accomplished by placing one's own fingerprints on the adhesive side of a piece of tape and following the processing guidelines. An examiner can not proceed with the processing of the evidence until a control test baring satisfactory results (positive) has been carried out and documented in the laboratory case notes and on the control tests work sheet.

Advantages of Tape-Glo:

- Tape-Glo is safe and easy to use.
- It is pre-mixed.
- Tape-Glo is good for developing prints on dark colored tape.

Disadvantages of Tape Glo:

- Tape-Glo must be visualized and photographed in a darkened area utilizing an alternate light source or laser.

18.0.0. FORMS (FLP)

FLP 18.1.0.

CHEMICAL:_____

PREPARATION INFORMATION:_____

_____

_____

_____

_____

SHELF LIFE:_____

REFERENCE:_____

_____

_____

_____

QC
METHOD:_____

_____

_____

DATE RECEIVED	MSDS	DATE OPENED	EXPIRATION DATE

FLP 18.2.0.

REAGENT: _____

PREPARATION INFORMATION: _____

_____

_____

_____

_____

SHELF LIFE: _____

REFERENCE: _____

_____

_____

_____

QC METHOD: _____

_____

_____

DATE	NAME OF PREPARER	MANUFACTURER/LOT #OF INGREDIENTS	COMMENTS/ RESULTS OF QC

FLP 18.3.0.

ISPFS

LATENT FINGERPRINT SECTION

TRAINING MANUAL REVISION FORM

Date:_____

Proposed by:_____

Add Amend Repeal

Section:_____ Page:_____

Summary:

Proposed Language:

Forward form to Latent Fingerprint Section Supervisor.

FLP 18.4.0.

ISPFS

LATENT FINGERPRINT SECTION

SOP REVISION FORM

Date:_____

Proposed by:_____

Add Amend Repeal

Section:_____ Page:_____

Summary:

Proposed Language:

Forward form to Latent Fingerprint Section Supervisor.

FLP 18.5.0.

CONTROL TESTS

DATE	AMIDO BLACK	DFO	GENTIAN VIOLET	IODINE	NINHYDRIN	PHYSICAL DEVELOPER	RHODAMINE 6G	SMALL PARTICLE REAGENT	STICKY SIDE POWDER	SUDAN BLACK

LATENT SECTION EXAMINATION WORKSHEET

LAB#

EXAMINER:

Page ____ of ____

PHOTO LATENTS: Yes ___ No___

Exam Start Date ____________

Exam Finish Date ____________

TYPE OF EXAM
(List # for order of processing sequence)

Reagent Test?		+/-	+/-		+/-	+/-	+/-		+/-	+/-	+/-

NV-no value
IRD-insufficient ridge detail
NDP-no ridge detail present

IL-inherent luminescence
S&S-signed and sealed
FPC-fingerprint card
LLC-latent lift card

+ Test pos.,utilizing known standard
– Test neg.,

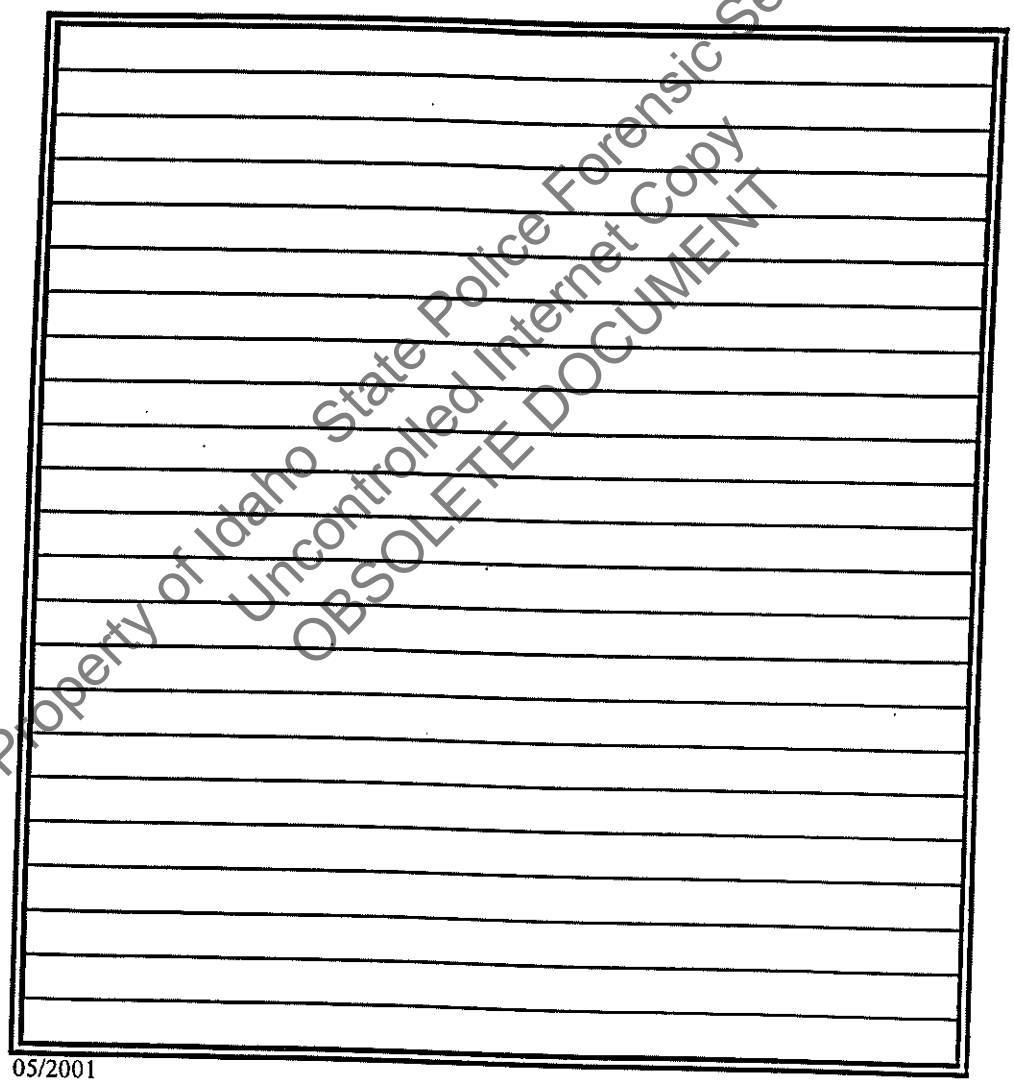
Lab Exh #	Agy Exh #	Description of Evidence	Exam.	Visual	CA	R6G	Light	Nin	PD	DFO	Powder	Sticky	AFIS		Results
			Sequence												
			Date												
			By												
			Sequence												
			Date												
			By												
			Sequence												
			Date												
			By												
			Sequence												
			Date												
			By												
			Sequence												
			Date												
			By												
			Sequence												
			Date												
			By												

04/2001

IDAHO STATE POLICE
Forensic Services
Latent Section

Case Notes

Lab. No. Agency Case No. Date



05/2001

19.0.0. EQUIPMENT (ELP)

ELP 19.1.0. REVIEW OF THE IDAHO AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM

REFERENCES:

Advances in Fingerprint Technology, Henry C. Lee and R. E. Gaensslen, (1991), pages 164-191.

Technical Policies and Procedures Manual, Western Identification Network, Inc.

INTRODUCTION:

The Idaho Automated Fingerprint Identification System (AFIS) is housed in the Bureau of Criminal Identification (BCI) and is a member of the Western Identification Network, Inc.(WIN).

All latent fingerprints submitted to AFIS are processed by the BCI staff. Any latents that do not receive a "HIT" against the fingerprint database remain in AFIS. AFIS will continue to search these latents until a "HIT" is made, or the statue of limitations runs out.

When a "HIT" is received, the case file, latent print, and fingerprint card are submitted to a latent fingerprint examiner for comparison. When an identification is made by the examiner, it must be verified by another examiner, after which an identification report is generated, and the submitting agency notified.

ELP 19.2.0. MORE HITS FORENSIC DIGITAL IMAGE PROCESSING SYSTEM

REFERENCES:

More Hits User Manual-Forensic Image Tracking System, (Version 2.0)

INTRODUCTION:

The More Hits Digital System is a computerized program that enables the examiners to use the information contained in an image more effectively. Digital images can be further visualized or enhanced utilizing a number of tools. The system is extremely versatile in that images can come from the digital cameras, a flat bed scanner, or from filmstrips.

PROCEDURE:

The More Hits Digital System allows the operator to adjust the contrast, brightness, black levels, lateral orientation, background noise, and tonal perspective of a captured image. The amount and kind of image processing used on an image is up to the examiner's discretion.

See the More Hits Digital System SOP.

ELP 19.3.0. OPERATION OF THE METLER TOLEDO BALANCE

REFERENCES:

Operating Instructions-Mettler Toledo BD Balances

INTRODUCTION:

This balance is designed for basic weighing operations. It provides a weighing range from 0-200g, with a readability of 0.01g. The Mettler Toledo Balance has an AC adapter, but may also be run using 8 AA batteries.

PROCEDURE:

To weigh an item- turn the balance on by pressing the ON button briefly. The scale is now in weighing mode. Press the O/T button to zero the balance. Place the item on the scale and record the weight.

To weigh out a certain amount of a material- turn the balance on by pressing the ON button briefly. The scale is now in weighing mode. Place the weigh boat or other container on the balance and press the O/T button to tare the container. Begin adding the material, the net weight of the contents is displayed. When the weigh boat or other container is removed from the balance, the weight of the container (tare) is displayed as a negative value.

To turn the balance off –press and hold the OFF button until "Off" is displayed.

ADDITIONAL INFORMATION:

For directions on calibration, switching weighing units, counting, and plus/minus and percent weighing see the Operating Instructions Manual. See also Section 4.1.0.

Maintenance: quality control checks will be made every 90 days, or more frequently if needed. The 0.10g, 1.00g, and 100.00g standards will be used and the results noted in the Equipment Maintenance Log.

ELP 19.4.0. OPERATION OF THE OHAUS TRIPLE BEAM BALANCE

INTRODUCTION:

The OHAUS triple beam balance is mainly used as a back up to the Metler Toledo digital balance. It is stored in the chemical lab. The routine operation of the OHAUS triple beam balance is given below.

PROCEDURE:

1. Set the balance up on a flat, level, even surface such as one of the work benches.
2. Slide the weights on the beams to the left until the "windows" on the sliding weights read zero in the center and are in the notches that can be felt when moving the weights.
3. The weigh boat or other container is placed on the pan and the large knob (on the left of the beam) is rotated right or left until the beam indicator centers on zero. This reading means the beam has been balanced on zero and will not include the weight of the boat or other container in the weight measurement.

4. When weighing, the material is placed in the weigh boat and the weights are slid to the right until the indicator balances. The combination of weights is read and the weight is recorded.

5. If a certain amount of a substance is to be weighed out, the beams are adjusted to read the desired weight (the weight above the tare weight) and the substance is added to the weigh boat until the beam balances.

ADDITIONAL INFORMATION:

Maintenance: since this balance is used only as a backup, quality control checks will only be preformed when it is going to be used.

ELP 19.5.0.OPERATION OF THE SANYO/GALLENKAMP FINGERPRINT DEVELOPMENT CABINET

REFERENCES:

Sanyo/Gallenkamp Instruction Manual for the FDC185 Fingerprint Development Cabinet, (1994).

SCOPE:

The Sanyo/Gallenkamp Fingerprint Development Cabinet is a controlled atmosphere unit for the heating of items in a heat and/or humidified environment. The ability to control the heat and humidity is especially useful when making examinations of latent print evidence that has been treated with ninhydrin or DFO (1,8 Diazafluoren-9-ONE).

OPERATION:

The Gallenkamp Fingerprint Development Cabinet can be operated in the ninhydrin sequence or DFO sequence. Determination of the required heat and humidity control is dependent upon the examination desired. Details of the operation of the cabinet can be obtained in the operation section of the Gallenkamp Instruction Manual. The most commonly used sequence is the one for ninhydrin. The dry bulb temperature should be set to 80.0° C. and the wet bulb temperature should be set at 70.0° C. A step-by-step usage guide can be found on pg. 14 of the instruction manual.

ADDITIONAL INFORMATION:

Additional information regarding maintenance, service, additional programming, and program profiles can be obtained by consulting the Gallenkamp Operator's Manual.

ELP 19.6.0. OMNIPRINT 1000(A)

REFERENCES:

Advances In Fingerprint Technology, Henry Lee and R. E. Gaensslen, pages 90, 115-118.

An Introduction to Lasers, Forensic Lights, and Fluorescent Fingerprint Detection Techniques, E. Roland Menzel, (1991).

Friction Ridge Skin, James F. Cowger, (1983), pages 106-107.

Omnichrome Evidence Detection with Forensic Laser Technology, (1989).

Omniprint 1000A Operating Instructions, Omnichrome.

INTRODUCTION:

The Omniprint 1000(A), Alternate Light Source, is a monochromatic light source that has a range of 450-570 nm with one port of white light. The Omniprint is used for the visualization of latent prints that have a natural, inherent luminescence, or prints that have been processed with a fluorescing dye-stain or powder. The light can also be used to detect the presence of certain body fluids such as semen and saliva. The monochromatic light can be used in the examination of documents involving inks and obliterated or indented writings.

PROCEDURE:

The OP1000 and OP1000A are easy to operate. However, the following setup must be followed in order to maximize the lifetime of the lamp and to ensure the safety of the user. Anyone who will be operating this system should become familiar with these instructions. If any questions arise, feel free to contact Omnichrome's forensic staff.

Setup: unpack the unit from the box. Fully unwind electrical cord from the bottom supports. Open the lid and check to see that both switches are in the "off" position. Plug the unit into a three-prong, grounded outlet. If an extension cord is used, it must be a heavy-duty grounded cord. Retain the box and packaging material in case the unit must be shipped.

Attach the fiber optic cable or liquid light guide. These cables are located in the black pouch under the lid. Remove the protective plastic cap from the end of the cable. Carefully insert the end of the cable into the opening on the unit.

The operator may unscrew the lens from the cable and attach the lens directly to the unit, allowing hands-free operation. The lid can be removed from the unit by sliding it off to the right.

When using the fiber optic cable, do not use the white light selection at full power for more than thirty seconds, as this will damage the cable.

The unit is now ready to be started. The following steps must be taken to properly operate the unit.

1. Turn the power rocker switch on. The switch will light, and the fan will begin to operate. Make sure the fan comes to full operating speed. You should be able to hear the fan come to this speed in a few seconds.

2. You may now turn on the lamp switch. The lamp should turn on in a few seconds. A ticking sound prior to the lamp engaging is normal.

3. To select wavelengths, turn the knob marked "Wavelength Selector Knob". A green light will appear next to the selected wavelength.

4. By observing evidence under the various wavelengths, and using the different colored goggles (yellow, orange, or red), proper wavelength and filter can be selected.

Safety: there are three types of hazards associated with the use of the Omniprint these are electrical, chemical, and light related.

As with other electrical appliances, guard against electrical shock. This can be accomplished by insuring that all connections are proper and that no loose, damaged, or frayed wires exist. Make sure the Omniprint is unplugged before attempting any maintenance and do not use outdoors if wet conditions exist.

Always use proper lab safety guidelines when using powders, dyes, and other chemicals. To properly protect themselves, examiners should know which personal protective equipment is appropriate as well as the hazards associated with each chemical being used with the alternate light source.

While the Omniprint is not a laser, the safety precautions are the same because high intensity light sources do pose health hazards. The eyes are generally more vulnerable than the skin, and appropriate eye protection must be used to protect them. Permanent eye damage can occur from reflected, refracted, or direct illumination to the eye. This is important because most of the light emitted by the Omniprint is not absorbed, but is reflected and scattered off the surface being examined. Extreme care should be taken around highly reflective surfaces. Never look directly into the light or allow beams to bounce off the surface into your eyes or the eyes of another person in the vicinity. The nature and extent of all potential hazards are not yet known because in-depth assessments have not been made on most of the high intensity light sources used in forensic identification work.

Shutdown: the OP1000 is a high intensity light source. It is best to allow the unit to run for longer periods of time. Omnichrome recommends a minimum operating time of fifteen minutes, instead of turning the unit off and on for short periods of time. Repeatedly turning the unit off and on will shorten the life of the lamp, which is rated for 70 hours of use. The lamp should be left on for at least three minutes at a time. Law enforcement agencies report that the lamp may last longer if the unit is operated according to these instructions. To turn off the unit, the following steps should be taken.

1. Push the lamp rocker switch to off. You must now wait for the unit to cool down.

2. After feeling the body of the unit and the exhaust, and determining that the unit is cool, the power rocker switch may be turned off.

3. Remove the fiber optic cable or liquid light guide, and replace the protective plastic cap on the end of the cable.

4. Loosely wind the cable and replace in black pouch. Place pouch in lid.

5. Unplug the unit and rewind electrical cord around the base of the unit.

6. Replace and latch lid onto unit.

Lamp Replacement: replacing burned-out lamps in the system is relatively simple, however; care should be taken to follow the below listed directions. Improperly replaced lamps could cause shorts within the unit. This type of damage can be costly to repair. Before attempting to change lamps, make

sure the unit is turned off, unplugged, and that the following steps have been read and understood.

1. Verify that the unit is off and unplugged.

2. Unscrew knobs on control panel. These knobs are tightened to finger-tight pressure only and should not be difficult to remove. Pliers should not be used to tighten or loosen any knobs.

3. Pull out control panel to reveal the inner portion of the unit.

4. Disconnect lamp plugs from sockets.

5. Unscrew lamp from retainer. Again, these screws should be finger-tight and easily removed.

6. Pull out the old lamp from retainer.

7. Place the new lamp in the retainer by matching and centering the glass alignment bump on the lamp to the alignment notch on the retainer. Do not touch the interior portion of the lamp, this will damage the lamp.

8. Place mounted lamp into bracket by matching the painted area on the lamp retainer to the painted area on the lamp bracket. This is critical to ensure that the lamp is properly oriented in unit.

9. Finger-tighten thumb screws.

10. Firmly plug in the lamp.

11. Replace panel in unit.

12. Finger-tighten knobs.

Please refer the manufacturer's Operating Instructions for more information on use or lamp replacement.

ELP 19.7.0. FUMING TORCH

REFERENCES:

FIVIS by 3M , Technical Note, Lightning Powder Co., (March, 1994).

ULTRATORCH, Lynn Peavey Co., Catalog (1999).

MATERIALS:

- Fuming Wand
- Butane Refill
- Fuming Cartridges

INTRODUCTION:

The super-glue fuming torch is a method used to process items for the acceptance of powders and dye-stains which enable visualization of the latent prints. Some of the advantages to using the wand over other super-gluing methods are that it can easily be directed at a small portion of a large object, or for quickly fuming small objects. It can also be useful for processing the insides of vehicles either in their entirety or in part.

PROCEDURE:

See Lightning Powder Co. Technical Notes dated March, 1994 for complete operating instructions and recommendations.

ADDITIONAL INFORMATION:

Additional caution must be taken when using this method because it is easy to over fume objects.

Safety: if used in a closed area or small room, respiratory protection is necessary in the form of a fume hood, vent fan system or un-vented goggles and personal organic vapor respirator with dust/mist pre-filter.

Warning, the tip of the wand and the cartridges become very hot during use and may cause severe burns if touched.

ELP 19.8.0. COLEMAN VACU-PRINT

REFERENCES:

Coleman Vacu-Print Instruction and Notes, Lightning Powder Co. (August, 1999).

MATERIALS:

- Coleman Vacu-Print Table-top Chamber
- Coleman Vacu-Print Long (rifle) Chamber
- Vacuum Pump/Motor with hose
- Dual Connector
- Vacuum Pump Oil, one quart

INTRODUCTION:

The Coleman Vacu-Print equipment allows for super-glue fuming of evidence in an air-evacuated, sealed chamber. This method allows for shorter fuming times, requires a smaller amount of super-glue, and does not require the addition of moisture. Vacuum fuming deposits a thinner layer of super-glue on the item, which may be more conducive to dye- staining. This method has proven very successful for fuming plastic bags as they do not have to be unfolded or have large amounts of space in between them.

PROCEDURE:

See Lightning Powder Co. Technical Notes dated August, 1995 for complete operating instructions and maintenance requirements.

ADDITIONAL INFORMATION:

Safety: "Do not place pressurized items such as sealed soda cans, sealed glass bottles, or aerosol cans in the chamber. They can expand rapidly or explode as air pressure is evacuated from the chamber, potentially causing injury" (Lightning Powder Co.).

ELP 19.9.0. CIMAREC STIRRING HOT PLATE

REFERENCE:

Cimarec Stirring Hot Plates Operation Manual and Parts List, Thermolyne (1993).

MATERIALS:

- Stirring/hot plate
- Stir bar

INTRODUCTION:

The Cimarec stirring hot plate is a general-purpose stirring/heating device intended for laboratory use.

PROCEDURE:

Place a flat bottomed vessel on the plate, add the required chemicals for the specific reagent being mixed, place the magnetic stir bar in the vessel, and slowly turn the dial labeled "STIR" until a satisfactory agitation rate is reached.

None of the reagents currently used in the Latent Section require the addition of heat to facilitate mixing.

ADDITIONAL INFORMATION:

Safety: always use a properly grounded (three pronged) outlet and disconnect from the power supply before attempting any maintenance.

APPENDIXES

Appendix A FORMULARY

AMIDO BLACK

Working Solution:

3-5 grams Amido Black
100 ml Glacial Acetic Acid
900 ml Methanol

Rinse Solution:

100 ml Glacial Acetic Acid
900 ml Methanol

May also use distilled water after Rinse Solution

Amido Black 10B
Amido Black 12B
Napthol Blue Black
Naphathlene Black

Buy top grade of all Chemicals.
The shelf life of Amido Black is indefinite.

NINHYDRIN (Ozone Safe)

Working Solution:

30 ml concentrate	X 4 = 120 ml
Fill to 1 liter with N-Hexane	X 4 = 4 liters
Clarify with 2- Propanol if needed	

Stock Solution (concentrate):

1st 300 ml 2-Propanol	X 2 = 600 ml
2nd 100 ml Acetic Acid	X 2 = 200 ml
3rd 50 grams Ninhydrin	X 2 = 100 g

Stir with magnetic stirrer (may take up to an hour to dissolve).

The development of latent prints with ninhydrin requires a warm moist environment. Carefully monitor the development of latent prints, so that they do not become over developed.

RHODAMINE 6 G

Working Solution:

0.1 gram	Rhodamine 6G
1 liter	Methanol

Place approximately 0.1 gram of Rhodamine 6G into a 1-liter plastic spray bottle and add approximately 1-liter of Methanol, then gently agitate to mix the R6G and Methanol.

Rinse Solution:

1-liter of Methanol in a 2nd plastic spray bottle.

The shelf life of Rhodamine 6G is indefinite.

PHYSICAL DEVELOPER KITS

Working Solution:

5 ml Solution "A" (20% silver nitrate solution) to
90 ml of solution "B" (reductant solution)

Stir working solution for approximately 1 minute with glass or plastic stirring rod.

This is a working solution of 18:1. For a larger quantity of working solution just add 5 ml of solution "A" to every 90 ml solution "B". If needed, all of bottles "A" and "B" can be mixed together.

Do not mix the working solution until ready to use, as it has a short shelf life once mixed.

SMALL PARTICAL REAGENT

Working Solution:

1. Place a 1500 ml beaker on the stirrer base.
2. Add 1000 ml distilled water to the beaker.
3. Put an appropriately sized stir bar in the beaker.
4. Dissolve 30 g of MoS2 in the water. (MoS2 comes in 30g bottles)
5. Add 3 to 4 drops of Photo Flo 200 to the solution.

The shelf life on Small Particle Reagent is approximately two to three months.

SUDAN BLACK

Working Solution:

1. Place 15 grams of Sudan Black powder into a 2-liter glass beaker.
2. Add 1-liter methanol and stir with plastic stirring rod.
3. Add 500 ml of distilled water to the beaker and stir with the stirring rod.

The working solution has an indefinite shelf life.

1,8 - DIAZAFLUOREN - 9 - ONE (DFO)

Stock Solution:

1. 0.5 gram DFO
2. 100 ml Methanol
3. 100 ml Ethyl Acetate
4. 20 ml Acetic Acid

Total 220 ml solution

Working Solution:

1. 220 ml DFO stock solution
2. 780 ml Petroleum Ether

Total 1000 ml solution

Do not mix the working solution until ready to use.
Formula can be cut in half if needed.

STICKY-SIDE POWDER

Working Solution:

1. Place 1 tsp. Sticky-Side Powder into a shallow jar
2. Fill a brown dropper-bottle half full of water and half full of Photo-Flo 200 and shake well.

Using the dropper, add this solution to the powder in the shallow jar until you have a paste with the consistency of thin paint.

GENTIAN VIOLET

Working Solution:

1. Weigh out 1 gram of powered Gentian Violet
2. Measure out 1000 ml of distilled water and pour into a glass tray.

Add the Gentian Violet to the distilled water slowly. Stir using a stirring device for approximately twenty-five minutes.

*It should be noted that exact measurements and portions when preparing chemical solutions are desirable for consistent quality, but successful results in developing latent fingerprints are not dependent upon unequivocal accuracy. There is a margin of error in preparing chemical solutions for latent fingerprint techniques without adversely affecting the successful development of latent prints.

Appendix B SUPPLIES

1. Brushes

1.1. A wide variety of types, shapes, and sizes of brushes are available for processing evidence with powders. The supply of different kinds of brushes required in the Latent Print Section depends on the colors and types of powders used. An ample number of appropriate brushes will help to preclude cross-contamination of powders and brushes. While larger brushes are ordinarily used for large areas and smaller brushes on concentrated work or individual latent prints, fiberglass brushes are often used for both instances.

1.2. The four primary categories of brushes are feather, fiberglass, hair, and magnetic.

1.3. Brushes are available commercially, see list of suppliers.

2. Lifting Materials

2.1 Lifting materials for latent fingerprint work consist primarily of transparent or opaque adhesive coated materials. All are available commercially.

2.2 Tape - special latent print lifting tape comes in both transparent or frosted, and is available in a number of different widths.

2.3. Hinge lifts -consist of a transparent lifting medium (tab) attached to clear, black, or white plastic backing tabs.

2.4. Rubber lifters – are available in black or white with transparent covers.

2.5. Gelatin lifts -are available in black, white, or transparent backgrounds and come in various sizes.

3. Magnifying Glasses

3.1. Fine quality magnifying glasses are essential to latent print examination work. The usual magnification is approximately 4.5 times. Henry, Battley and other types of reticules are marketed to fit these magnifying glasses.

3.2 Head mounted magnifying glasses are useful during certain processing and examination procedures. These units are available commercially.

3.3. Magnifying glasses should be cleaned with commercially available window/lens cleaner. No caustic chemicals should be applied to the lens.

4. Powders

4.1. Many commercially produced latent print "dusting" powders are available and many are very similar from company to company. No powder is universally applicable to all types of non-porous surfaces and most examiners need to stock a variety of types and colors of powders for specialized applications.

5. Miscellaneous Items

5.1. Glassware- specific types of glassware (beakers, graduated cylinders, pipettes, etc.) required for chemical processing are available commercially.

5.2. Stirring devices - glass stirring rods, magnetic stirrers, plastic stirring rods, etc., are available commercially.

5.3. Forceps - tweezers, forceps and tongs are all available commercially.

5.4. Storage bottles - glass and plastic bottles are available commercially.

5.5 Pans and dishes - glass, ceramic, plastic, or metal pans are available commercially.

5.6. Personal protective equipment - lab coats, gloves (latex, vinyl, cotton, etc.), safety glasses, alternate light source goggles, respiratory masks, booties, etc., are all available commercially.

5.7. Maintenance of these items should be conducted during use and cleaning. Any items that become cracked, strained, scratched, or torn, causing them to be unserviceable or non-protective, should be disposed of and replaced.

Appendix C SECURITY/SAFETY

Appendix C-1 EMERGENCY NOTIFICATION

Supervisor Raymond A. York FS	Work 884-7148	Home 344-2473	Pgr. 391-2360
Manager Rachel Farnsworth FS	Work 884-7171	Home 288-2240	Pgr. 391-0204
Major Ralph W. Powell FS	Work 884-7207	Home 884-8967	Pgr. 424-4238
Assistant Deputy Director Saundra DeKlotz	Work 884-7003 Cell 867-3795	Home 336-3595	Prg. 391-2482

FIRE
POLICE **911**
AMBULANCE

POISON CONTROL **1 800 860 0620**

Appendix C-2 LAB OPENING AND CLOSING PROCEDURES

OPENING

Each person must use their assigned 4-digit code plus # to enter the door and turn off the alarm.

If you are the only person in the Latent Fingerprint Section, re-lock the door after entering, and turn on all the lights.

The lab door to BCI is to remain closed and locked at all times, as is the door to the evidence vault.

CLOSING

The last person to leave needs to secure the front door by locking and alarming it.

The last latent examiner to leave must do the following:

- Turn off the fume hoods.
- Turn off the lights and the Gallenkamp in the photo lab.
- Lock chemical lab and powder lab doors.
- Check to make sure all irons are off and unplugged.
- Check to make sure all bag sealers are turned off over the weekend.
- Make sure forensic lights and alternate light sources are turned off.
- Turn off lights in the digital lab.
- Make sure all fans are turned off.
- Turn off all lab lights.
- Make sure all computers are turned off.
- Each examiner should lock their own evidence cabinet.

Appendix C-3 FIRE ALARM EVACUATION PLAN

When an alarm is sounded (fire bell), all persons will evacuate the building using the following routes:

Photo Lab
Examiner's office areas
Digital Lab
Chemical Lab
Latent Processing/Powder Lab
Supervisor's office
Evidence reception area

EXIT: west door commonly known as the employee/evidence receiving door.

If exit is blocked, employees will evacuate through the next nearest exit.

Upon evacuating the building, employees will gather at the **flag poles** and await further instructions. A head count will be taken.

To assist with the evacuation of the building, the following persons are responsible for the following assignments:

Section Supervisor will ensure everyone is clear of the section. (Alternate - Latent Examiner Sr.)

Latent Section Safety Officer will act as monitor and ensure all doors have been closed and locked. (Alternate - Latent Examiner Sr.)

Appendix C-4 SPILL CONTROL

General Spill Safety Procedures

- Attend to any persons who may have been contaminated.
- Notify persons in the immediate area about the spill (post a sign).
- Evacuate all non-essential personnel from the spill area.
- If the spilled material is flammable, turn off ignition and heat sources.
- Avoid breathing vapors of the spilled material. If necessary, use a respirator.
- Leave on or establish exhaust ventilation if it is safe to do so.
- Secure supplies to effect clean-up.
- During the clean up, wear appropriate apparel.

GENERAL CLEAN-UP PROCEDURES
Liquid Materials

- Absorb liquid materials onto an inert spill pillow or absorbent/kitty litter.
- Place spill pillow or absorbent into a sealed container.
- Mark container with chemical composition if known.

Solid Materials

- Sweep up and place in a sealed container.
- Mark container with chemical composition if known.

Acids

Cover the contaminated area with a neutralizing compound such as sodium bicarbonate or soda-ash and slaked lime mixture (50:50), or a spill pillow. When using the neutralizing compounds, it is possible to mix with water and make a slurry. After application to the spill, it is possible to scoop up the mixture and wash down the drain using an excess of water.

Bases or Alkalis

Solids should be swept up, diluted with water, and neutralized with 6M HCL in a large plastic container. After this process is completed, the solution may be washed down the sink using an excess of water. Solutions can be neutralized with acid and mopped up, or absorbed with a spill pillow. Again, the mixed solution may be discarded down the drain using an excess of water. Care should be taken when adding acids to strongly basic solutions as a strong exothermic reaction could occur, resulting in these materials contacting the individual.

Flammables and Combustibles

Eliminate all sources of ignition and heat that exist nearby. Clean-up should follow recommended procedures for the compound in question.

If you are not sure how to clean something up, consult the MSDS. Accidental release/spill/leak procedures are highlighted in pink.

Appendix C-5 CLANDESTINE LABORATORY SAFETY

Refer to the Idaho State Police Forensic Services Health and Safety Manual.

- Response Plan
- Personal Protective Equipment
- Safety
- Site Control & Decontamination
- Site Emergencies
- Incident Reporting
- Terms
- Resource Agencies

Appendix C-6 SAFETY

Refer to the following manuals for in-depth safety issues.

- Forensic Services Standard Operating Procedures
- ISPFS Health and Safety Manual
- MSDS Book

Appendix D MEASUREMENTS/TABLES AND EQUIVALENTS

METRIC EQUIVALENTS:

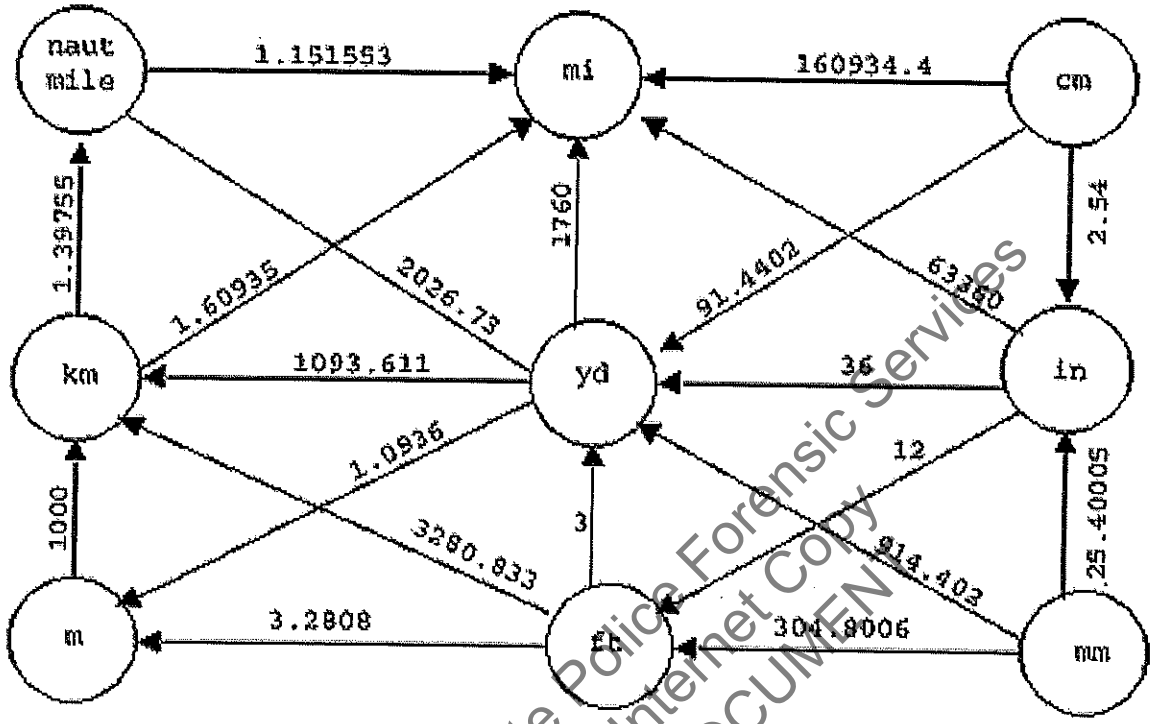
DRY:

1 pound (lb)	= 453.6 grams (g)
1 ounce (oz)	= 28.35 grams (g)
1 gram (g)	= 0.035 ounces (oz)
1 milligram (mg)	= 0.001 grams (g)

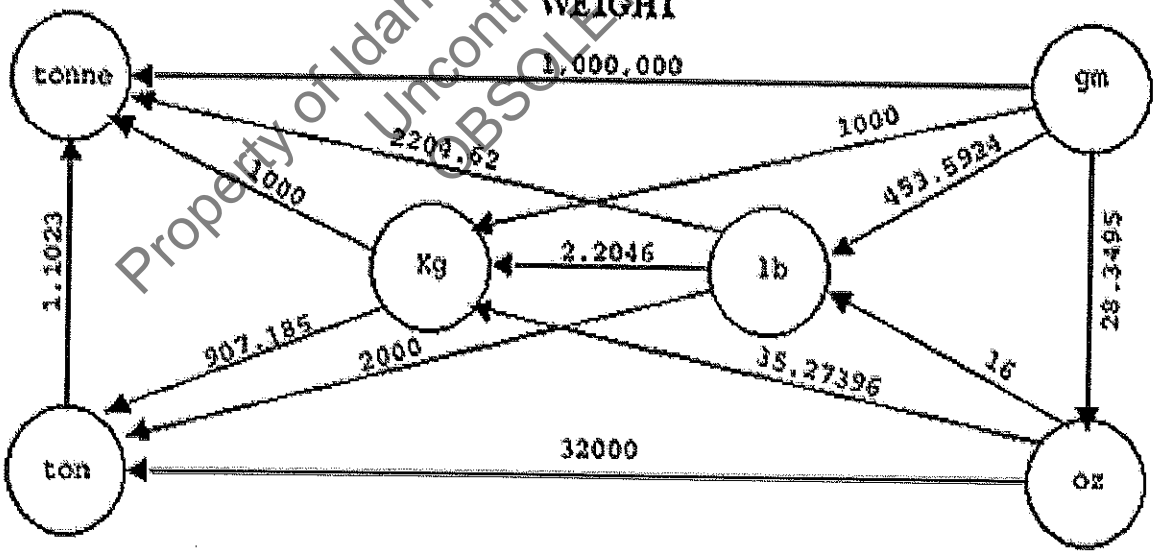
LIQUID:

1 milliliter (ml) (cc)	= 0.034 fluid ounces (oz)
1 liter (l)	= 1000 milliliters (ml)
1 fluid ounce (oz)	= 29.573 milliliters (ml)
500 milliliters (ml)	= .5 (1/2) liter (l)
1 gallon (gal)	= 3.79 liters (l)

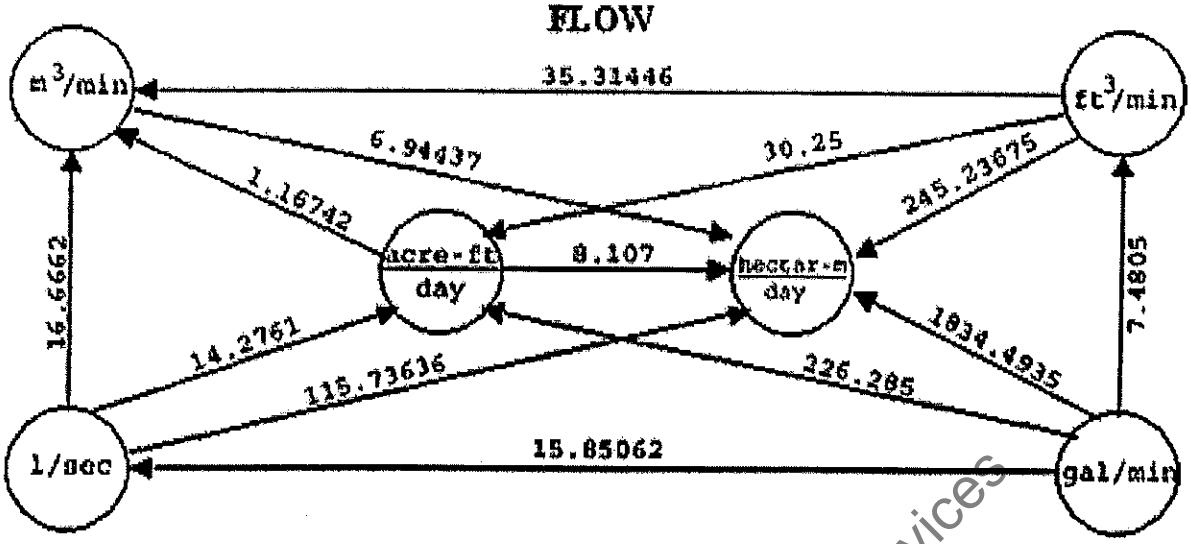
LENGTH



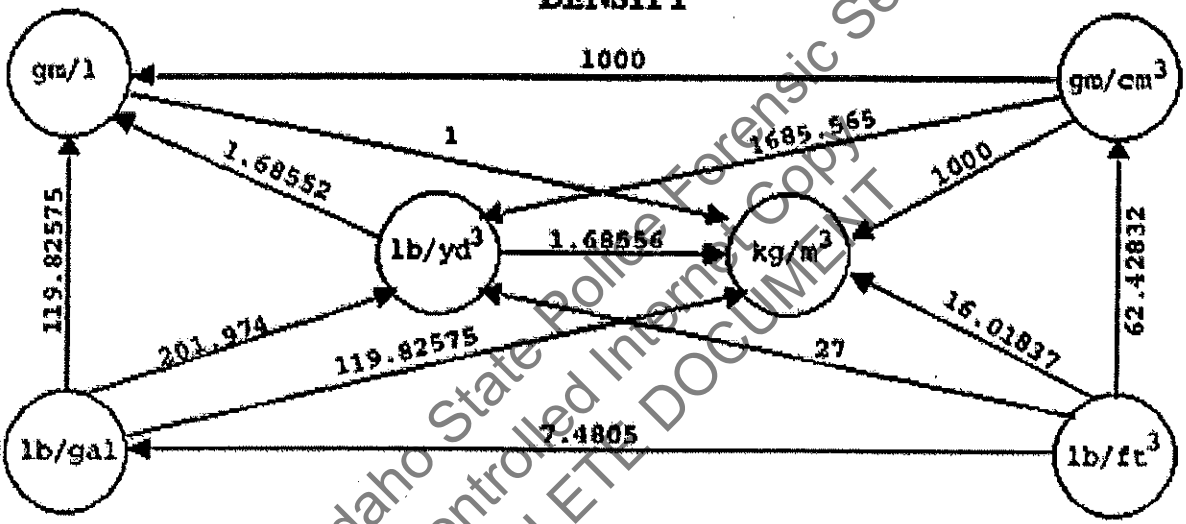
WEIGHT



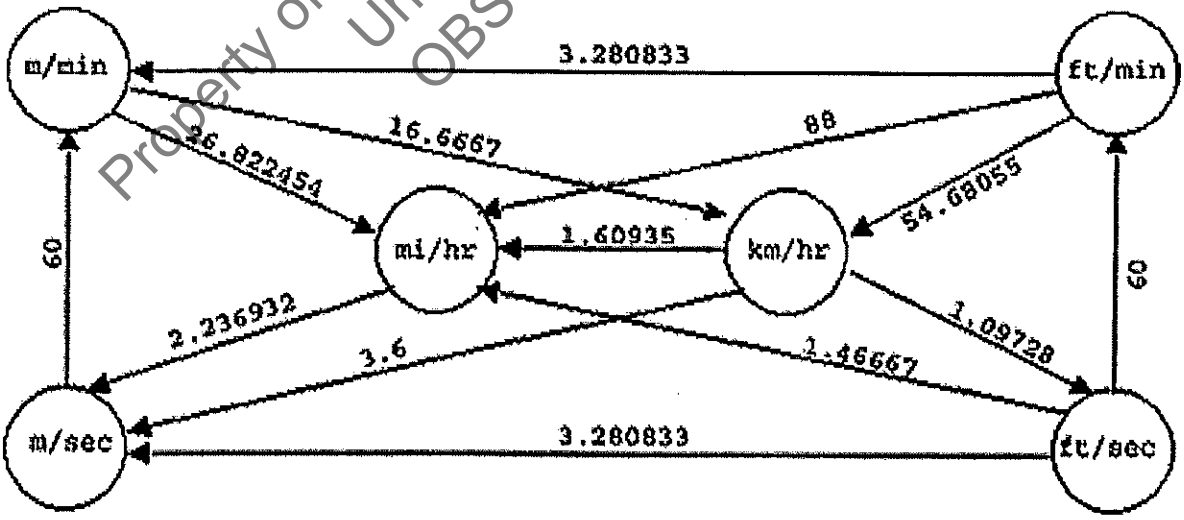
FLOW



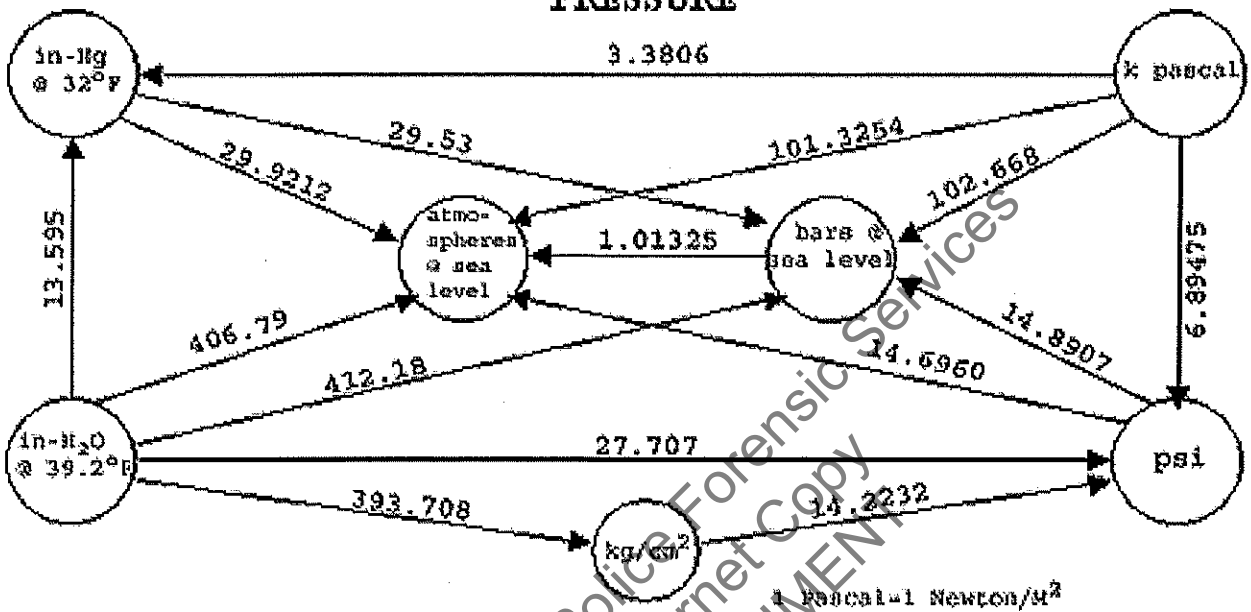
DENSITY



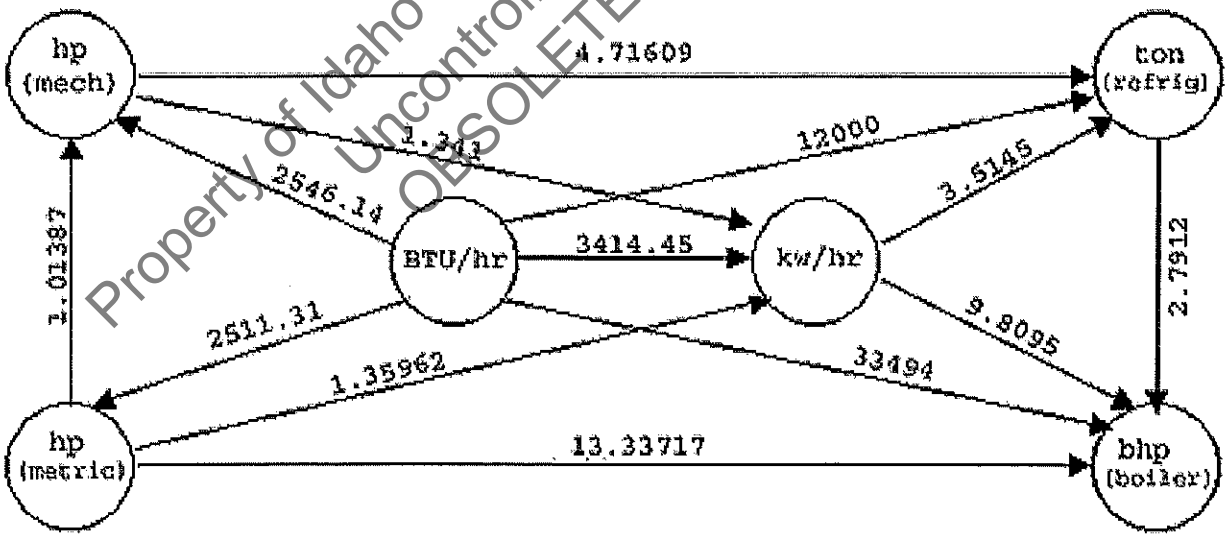
VELOCITY

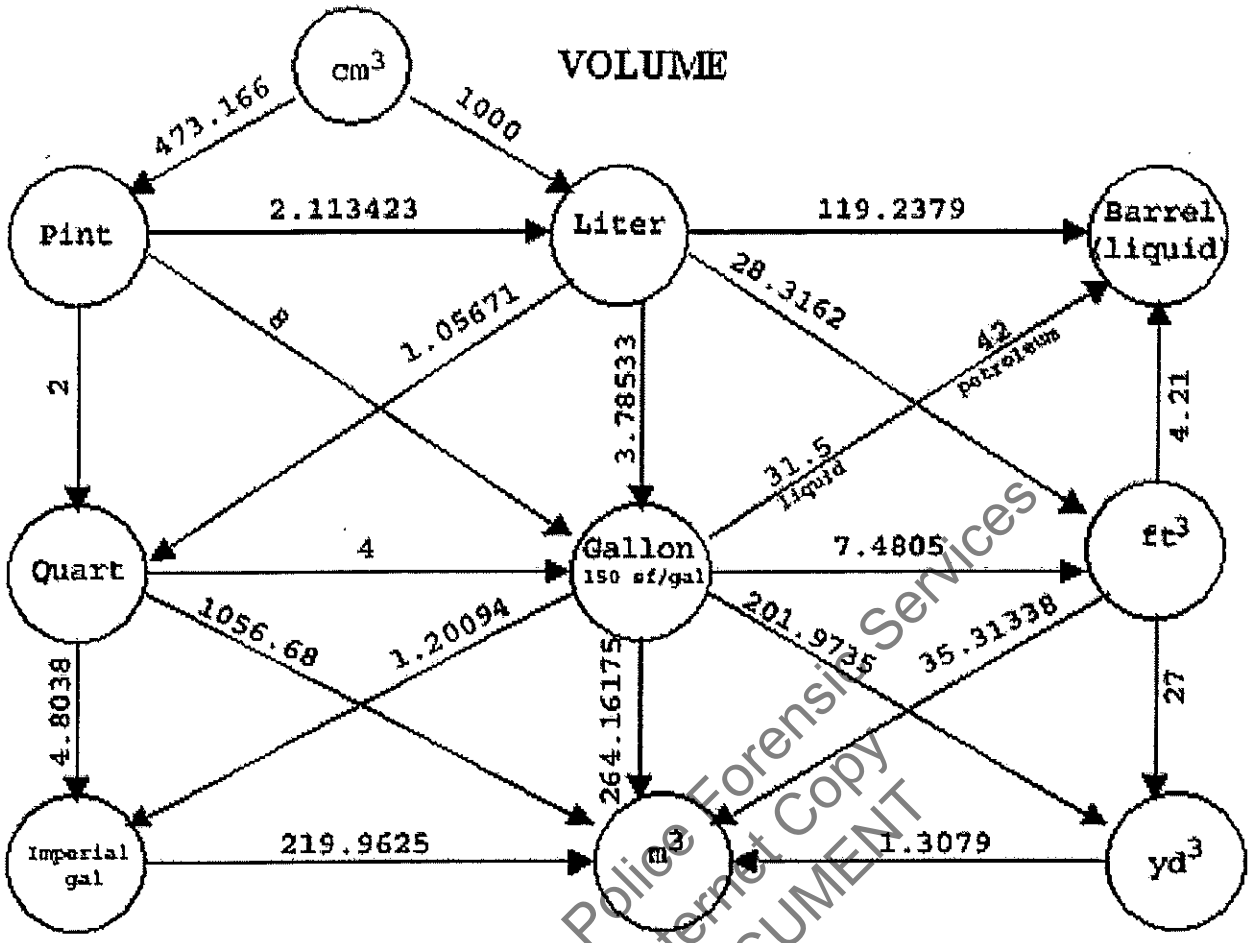


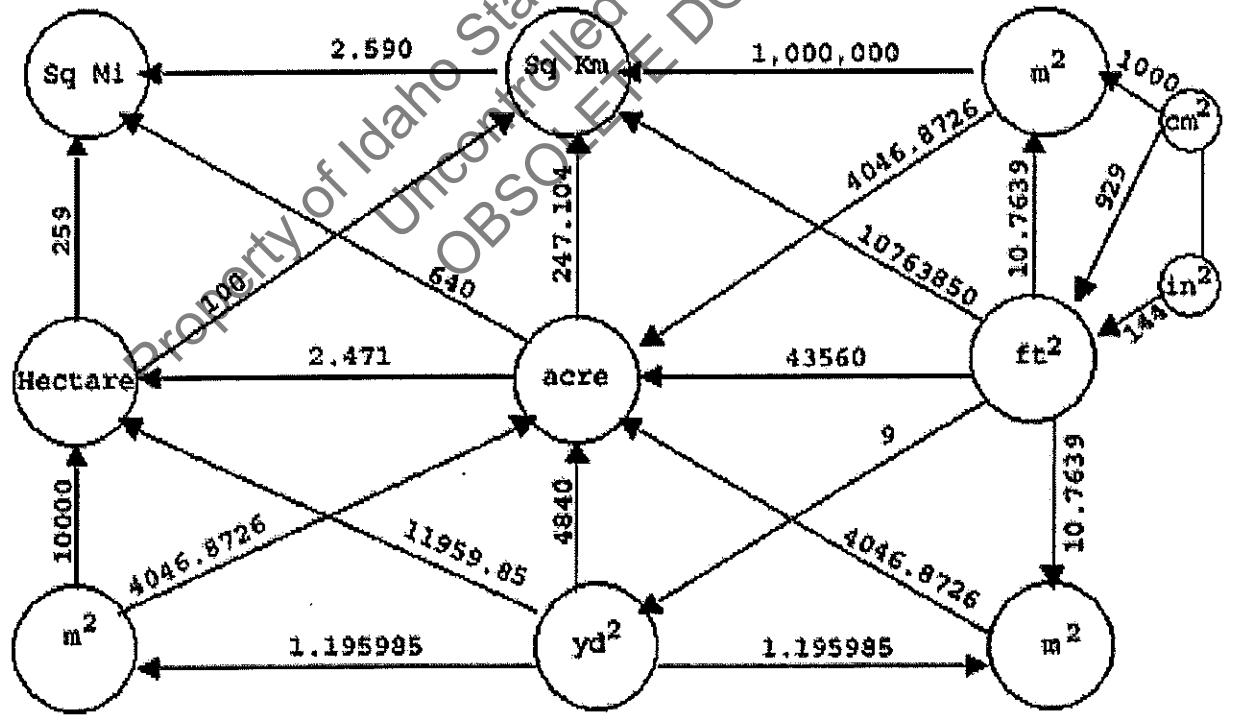
PRESSURE



ENERGY







Appendix E REFERENCES

Advances in Fingerprint Technology, Henry C. Lee & R.E. Gaensslen

American Society of Crime Laboratory Directors (ASCLD), Accreditation Manual

Chemical Formulas and Processing Guide for Development of Latent Fingerprints, U.S. Department of Justice, Federal Bureau of Investigation

Criminal Investigation, Basic Perspectives, Paul B. Weston and Kenneth M. Wells

Idaho State Police, Forensic Services, Health and Safety Manual

Department of Law Enforcement, Idaho State Police, Policies Manual

Idaho State Police, Forensic Services, Procedure Manual

Effective Expert Witnessing, Jack V. Matson

Federal Bureau of Investigation Advanced Latent Fingerprint School Text

Federal Bureau of Investigation Fingerprint Training Manual, Identification Division Technical Section

Fingerprints, Palms, and Soles, An Introduction to Dermatoglyphics, Harold Cummins and Charles Midlo

Fingerprint Techniques, Andre A. Moenssens

Fingerprints and the Law, Andre A. Moenssens

Forensic Image Tracking System, More Hits User Manual

An Introduction to Lasers, Forensic Lights and Fluorescent Fingerprint Detection Techniques, Dr. E. Roland Menzel

Journal of Forensic Identification, International Association for Identification

Kodak Professional DCS 420 Digital Camera User's Guide, Eastman Kodak Co.

Kodak Professional DCS Cameras Quick Guide 12/05/96, Eastman Kodak Co.

Law for the Expert Witness, Daniel A. Bronstein

Lightning Powder Co. Technical Notes

Manual of Fingerprint Development Techniques, Police Scientific Development Branch, Home Office U.K.

Nikon N90 Instruction Manual

Omniprint 1000A Operating Instructions, Mell es Griot

Safety Guidelines, International Association for Identification

The Science of Fingerprints, U.S. Department of Justice, Federal Bureau of Investigation

Scott's Fingerprint Mechanics, Robert D. Olsen Sr.

Technical Notes - Lightning Powder Co.

Techniques of Crime Scene Investigation, Barry A.J. Fisher

INFORMATION FOR THIS MANUAL AND ANY ADDITIONAL INFORMATION REGARDING ANY OF THE TECHNIQUES DESCRIBED HEREIN CAN BE FOUND IN THE LATENT PRINT SECTION LIBRARY.

Appendix F RECOMMENDED TRAINING FOR A LATENT FINGERPRINT EXAMINER (BASIC TO ADVANCED)

1. Fingerprint Classification
   FBI 40 hrs.

2. Advanced Latent Fingerprint Techniques and Chemical Processing
   FBI 40 hrs.

3. Advanced Palm Print Identification
   International Association for Identification. 24 hrs.

4. Digital Image Workshop
   Forensic Identification Training seminars, Ltd. 40 hrs.

5. Advanced Ridgeology Comparison Techniques
   Forensic Identification Training Seminars, Ltd. 40 hrs.

6. Mastering Expert Testimony
   Forensic Identification Training Seminars, Ltd. 40 hrs.

7. Rynerson & Chison Homicide Investigation School
   Location to be announced. 60 hrs.

8. Administrative Advanced Latent Fingerprint School
   FBI Academy Quantico, VA. 120 hrs.

9. D.E.A. Clan-Lab Certification Course
   Location to be announced. 40 hrs.

10. P.O.S.T. Instructor Development Course
    P.O.S.T. Meridian, ID 32 hrs.

11. Latent Fingerprint Photography
    FBI Academy Quantico, VA. . 80 hrs.

12. Basic Black & White Photography workshop
    Nicon/Kodak Law Enforcement Photography.

13. International Association for Identification Annual Education Conferences (Held Nationwide).

14. Pacific Northwest Division of IAI meetings and training conferences (Held in the Northwest).

15. International Association for Identification Latent Print Certification (CLPE).

16. Crime Scene Technician, (CST) Level I

17. Crime Scene Analyst, (CSA) Level II

18. Senior Crime Scene Analyst Level III

All class hours are approximated.

Appendix G MANUFACTURES AND/OR DISTRIBUTORS OF FINGERPRINT EQUIPMENT (DECEMBER, 1999)

ACE Fingerprint Equipment Laboratories, Inc
P.O. Box 288
Wake Forest, NC 27588
Phone 1-800-426-7072
Fax 1-919-556-6176
E-Mail acefel@mindspring.com
Fingerprint Equipment and Accessories

Aldrich
1001 West Saint Paul Ave
Milwaukee, WI 53233
Phone 1-800-558-9160
Fax 1-800-962-9591
Scientific Equipment

Fisher Scientific Laboratories
711 Forbes Ave
Pittsburgh, PA 15219-9919
Phone 1-800-766-700
Fax 1-800-926-1166
Scientific Equipment and Supplies

GRAINGER
5576 Irving Street
Boise, ID 83706-1288
Phone 1-208-377-2801
Fax 1-208-375-0869
Industrial and Commercial Equipment and Supplies

Identicator Corp.
4051 - T Glencoe Ave.
Marina Del Rey, CA 90292
Phone 1-310-305-8181
Fax 1-310-578-1910
Fingerprint Equipment and Accessories

Kinderprint Company, Inc.
P.O. Box 16
Marinez, CA 94553
Phone 1-800-227-6020
Fingerprint Equipment and Accessories

Lightning Powder Co., Inc.
1230-T Hoyt St. SE
Salem, OR 97302
Phone 1-800-852-0300
Fax 1-503-588-0398
Fingerprint Equipment and Accessories

Lynn Peavy Co.
11148 Thompson Ave.
P.O. Box 14100
Lenexa, KS 66215
Phone 1-800-255-6499
Fingerprint Equipment and Accessories

Melles Griot
2251 Rutherford Road
Carlsbad, CA 92008
Phone 1-800-645-2737
Fax 1-760-438-5208
E-Mail mnolte@aol.com
Fingerprint Equipment and Accessaries

SIRCHIE Finger Print Laboratories, Inc
100 Hunter Place
Youngsville, NC 27596
Phone 1-800-356-7311
Fax 1-800-899-8181
E-Mail sirchie@nando.net
Fingerprint Equipment and Accessaries

RICE SAFETY EQUIPMENT CO.
5500 West Howard
Skokie, IL 60077
Boise, ID Phone 1-800-452-7433
Fax 1-208-378-4929
Safety Equipment and Accessories