VIRGINIA DEPARTMENT OF FORENSIC SCIENCE

EVIDENCE HANDLING & LABORATORY CAPABILITIES GUIDE

LATENT PRINTS

Contact Information

If you have any questions concerning the Latent Print examination capabilities or evidence handling procedures, please call the Training Section or the Latent Print Section at the Forensic Laboratory that services your area.

Laboratory	Section Contact	Phone Number
Central	**Sylvia Buffington-Lester**	**(804) 588-4125**
Northern	**Jessica Davis**	**(703) 334-9752**
Eastern	**Lee Kennedy**	**(757) 355-5851**
Western	**Lyle Shaver**	**(540) 283-5910**

OVERVIEW

Examiners in the Latent Print Section develop and recover latent prints from items of evidence, compare latent prints to known prints and conduct database searches.

After developing the latent print on items of evidence, the prints are digitally captured or placed onto lift cards. Often latent prints are enhanced to obtain a better contrast. If the prints of a suspect or victim are known, the latent prints are compared. Database searches of suitable latent prints are conducted when there are no known suspects or elimination prints are not available or have been excluded.

Automated Fingerprint Identification System (AFIS)

Latent fingerprints and palm prints can be searched in the Virginia AFIS or FBI Next Generation Identification (NGI) system.

Latent prints submitted to or developed by DFS personnel are evaluated to determine if they are of sufficient quality for an AFIS search. Latent prints that are not identified through AFIS are added to the unsolved latent database. As new fingerprint and palm print cards are entered into the system, they are automatically searched against each latent print in the unsolved latent database.

Types of Processes Utilized by the Department of Forensic Science (DFS) Latent Print Section:

- Visual examination (always done first)
- Amido Black (protein enhancer for blood prints)
- Alternate Light Source (ALS) (utilized with florescent dye stains post cyanoacrylate fuming)
- Gentian Violet (skin cell stain for sticky side of tape)
- Ninhydrin (chemical for developing latent prints on porous surfaces, such a paper)
- Physical Developer (chemical for developing latent prints on wet paper)
- Powders (preferably black powder, which is effective on smooth, non-porous surfaces)
- Small Particle Reagent (liquid powder solution effective on wet porous evidence)
- Cyanoacrylate (super glue fuming is appropriate for all types of non-porous surfaces)
- Dye Stains, such as MBD, are used to detect prints with an ALS on non-porous evidence after using Cyanoacrylate fuming

DEFINITIONS

Automated Fingerprint Identification System (AFIS) – A database of known finger and palm prints which latent prints from evidence can be searched against. In Virginia, the database is located at the Virginia State Police Headquarters.

Elimination Prints - Known prints of persons who could have had legitimate access to an item being submitted for latent print examination or an item or location from which prints have been recovered and submitted (e.g., business owner/employee or homeowner/resident where a burglary is being investigated).

Exclusion - The determination by an examiner that there is sufficient quality and quantity of detail in disagreement to conclude that two areas of friction ridge impressions did not originate from the same source.

Inconclusive - The determination by an examiner that there is neither sufficient agreement to individualize, nor sufficient disagreement to exclude.

Individualization - The determination by an examiner that there is sufficient quality and quantity of detail in agreement to conclude that two friction ridge impressions originated from the same source.

Next Generation Identification (NGI) – FBI biometric identification system which replaced the Integrated Automated Fingerprint Identification System (IAFIS)

Known Prints – These are impressions of the friction ridges that have been intentionally recorded via printer's ink or electronic scanning. Recording known comprehensive prints (Figure 1) in this format helps ensure the entire friction ridge surfaces of the fingers and palms are captured. Submission of comprehensive known prints provides the laboratory with the greatest opportunity to conduct complete latent print examinations.

Figure 1 – Forms for Comprehensive Prints

Latent Print – These prints may or may not be readily visible and could require some type of processing in order to better develop and detect them.

Each friction ridge found on the fingers, palms, toes and soles has a row of pores that excrete perspiration. Composition of perspiration:

98.5 to 99.5% water (Water evaporates so field processing is best in most cases on non-porous material).

0.5 to 1.5% - chlorides (salts), urea, amino acids, etc.

Intermittent contact with other body parts, such as hair and skin may also leave a layer of oils on the ridges. When items are touched, an impression of the friction ridges is left, via the aforementioned transfer mediums.

Patent Print – These prints are normally readily visible. When friction ridges come into contact with materials such as soil, blood, ink, oil and paint or are impressed into substances such as putty or wax, impressions of the friction ridge skin are visible before any processes are employed.

COLLECTION GUIDELINES

Latent prints developed through powder processing methods should be lifted and submitted to the laboratory. Detailed information concerning the case, date, location and orientation of the latent should be recorded on the back of the lift card (Figure 2).

Date:	**-Sketch of Latent Lift Location- (indicate latent lift orientation)**
Case#:	
Offense	
Recovery Location (Address):	
Location of Latent Lift _____ _____ _____	
Officer: _____ **Badge/Code #:** _____	

(Figure 2)

If latent prints at a crime scene appear to be visible (patent prints), or if the lift process may pose unique challenges, the prints should be photographed.

If any item of evidence is to be submitted to the lab for processing, do not attempt any field processing or recovery of latent prints. Certain powders and other processes may interfere with chemical or other tests that could be utilized by the DFS personnel.

Latent Print Photography

The camera should be mounted on a tripod, perpendicular to the latent print so that the film/digital sensor plane and the print are parallel. The print should fill the frame to ensure it is captured at a minimum of 1000 ppi in a RAW or TIFF format. The print should be first photographed without a scale, then with a scale. Any additional photographs of the latent print can be taken with a scale. The scale is important to allow for 1:1 (actual) size reproduction for comparison purposes. The scale should include, at minimum, the case number and the photographer's initials.

ITEM - Non-Porous or Non-Absorbent Surfaces (Glass, Metal, Tile, etc.)

METHOD - Items should be packaged in a rigid container, avoiding contact with the packaging material and the surface which is to be processed for latent prints. It is acceptable to place numerous, individually numbered and packaged items in one box if all items need to be examined by the Latent Print Section. Ensure items will not contaminate others in the same package (e.g., a leaking bottle, coated in blood or other fluids that may transfer to other surfaces).

DISCUSSION - Unnecessary layers of packaging and handling may damage or even destroy a print(s). Handle the items in a manner **inconsistent** with normal handling, by the edges or textured areas.

ITEM - Porous or Absorbent Surfaces (Paper, Untreated Wood, Cardboard, etc.)

METHOD –

Dry Paper Items:

Dry paper items can be collected and placed into plastic check (document) protectors or zip lock plastic bags.

Wet Paper Items:

Wet paper items should be air dried and once dry can be packaged as you would dry items. For additional information on handling wet paper items refer to the Questioned Document section of this guide, particularly if a document exam is also being requested.

DISCUSSION - Identifiable prints have been developed on items that have been exposed to water. Care should be taken when handling these items. Keep to a minimal amount of handling, even when wearing gloves. Glove marks have been developed with certain processes.

ITEM - Patent (Visible) Prints

METHOD - Close-up photographs using the above explained protocols should be taken prior to attempts to collect the prints.

IMPORTANT COLLECTION CONSIDERATIONS:

For visible prints on small objects, such as a window pane, collect the entire object. If the item is too large to submit, such as a bloody patent print on a wall, it may be necessary to cut out a section of the wall with the patent print. Be sure to leave a reasonable amount of wall surface material surrounding the patent print. A protective covering, **not tape**, may be placed over the print provided that the covering does not come into contact with the print. For example: if the print is on a door, a small paper box can be taped to the door, over the print for protection.

DISCUSSION - Photographs are important because damage to the impression may occur during attempts to remove the surface containing the print.

Avoid pressing or touching the impression with your finger or any object to see if the substance is dry or tacky. Doing so may result in damage to the print.

SUBMISSION REMINDERS

Do not apply any processing techniques, including but not limited to, powder, super glue, ninhydrin, etc., to any items that you submit to the laboratory.

Do not place tape on items of evidence where you think there may be latent prints.

Do not add shredded paper, foam peanuts or additional packaging material to the box as it will rub against the surface and possibly damage prints.

Appropriate elimination prints (victims, family members, caretakers, store clerks, bank tellers, etc.) should accompany the evidence being submitted. Provide a State Identification Number (SID #) for suspects if available.

If a SID # is not available, every effort should be made to obtain a set of comprehensive finger and palm prints and submit them with the evidence. When possible, record and submit comprehensive post mortem prints. Clear, full size copies of known fingerprints may be submitted in lieu of originals if the originals are not available.

If there are no known suspects, or it is not possible to obtain suspect known prints prior to evidence submission (e.g., unable to locate suspect, lack of probable cause or suspect's consent), please indicate this on the Request for Laboratory Examination form (RFLE).

Good, quality known prints are important and necessary. Smudged or blurred prints, overlays, too much ink, prints outside the blocks or off-centered, etc., will reduce the chances for an individualization to be effected.

If it is a re-submission, note the previous FS Lab number in the appropriate space on the RFLE and provide any digital media that was included with the evidence when the laboratory returned the evidence to your agency.

An item number may be assigned to each latent lift card, or to a group of lift cards. If the latent lifts are collected under one item number, it is recommended that each latent lift in the group be given a unique identifying alpha suffix (e.g., Item 4-a, 4-b, 4-c).

Recommended digital image file format is TIFF. Many digital camera systems will not capture in a TIFF format, but rather a RAW (proprietary) format. Most systems will include software that allows for the conversion of images from RAW to TIFF. For additional guidance in this important step contact the Latent Print or Training Sections. Ensure that sharp objects such as broken glass or knives are packaged safely and properly labeled:

> CAUTION - CONTAINS SHARP OBJECT(S) - BROKEN GLASS.
>
> *NOTE: Paper bags are not considered to be good packaging materials for sharp or broken objects. Sharp objects can easily puncture the bag and cause injury.*