



SAN DIEGO POLICE DEPARTMENT
FORENSIC SCIENCE SECTION



Crime Scene Unit Manual

Approved July 18, 2017

Issuing Authority: Frank Healy, Quality Manager

1.1 UNIT DESCRIPTION AND FUNCTIONS

General office hours are 0630 to 1700 hours, Monday through Friday. Crime Scene Specialists are on 24-hour call back for homicide investigations and other crime scenes. The CSS services are requested by a sergeant (or above), the watch commander, or laboratory supervisors.

The Crime Scene Unit consists of one Supervising Crime Scene Specialist and eight Crime Scene Specialists (CSS). The CSS photographs and collects evidence at crime scenes, autopsies, search warrants, hospitals, and suspect processing. Additionally, they process evidence and crime scenes for latent prints. Civilians fill all positions within this unit.

The position of Crime Scene Specialist requires the following education:

completion of an Associate of Science degree or higher, in Forensic Technology

OR

completion of an A.S. degree, or higher, in another field and a community college certificate in Forensic Technology

The Crime Scene Unit utilizes Interns and Volunteers to process evidence for latent prints and to assist at crime scenes.

Crime scene specialists give expert testimony in court relating to their scope of work.

TECHNICAL SUPPORT

The Crime Scene Unit will use Interns and Volunteers to fill the position of Technical Support. The following qualifications are required for the position:

18 years of age or older.

Have a valid California Drivers License.

Pass the department background process.

Commit to working for one year at a minimum of 16 hours a week, between the hours of 6:30am-5:00pm, Monday-Friday.

Must have completed the following classes:

Fingerprint Identification
Advanced Fingerprint Identification
Basic Forensic Photography
Basic Forensic Technology
Advanced Forensic Photography

Technical Support personnel will be trained in the identification, collection and preservation of latent prints, DNA, trace, shoe/tire impression, and blood evidence. Upon completion of this training the Technical Support personnel will be competency tested in the above mentioned areas. The Technical Support trainee will have 90 days to complete their training and pass their competency test.

If the Technical Support Trainee passes the competency test, they will start performing independent case work. Technical Support personnel will be allowed to work on all cases except homicide case evidence.

The Technical Support Trainee will be allowed to attend crime scenes under the supervision of a Crime Scene Specialist. They will not be allowed to take photographs and/or collect items of evidence. With the exception that they will be allowed to assist the Crime Scene Specialist with the processing of the crime scene for latent print evidence (including homicide scenes), 30 days after passing the competency test and working independent case work. If an intern assists with processing and/or collects latent prints at a scene, they will be required to create a note page which will be included with the Crime Scene Specialist's report.

2.1 WORK REQUESTS

The Clerical Unit logs all incoming requests into the LAN database and distributes the request(s) to the Crime Scene Unit supervisor.

If any request requires trace or biological evidence collection, the CSS may consult with the Trace Evidence Unit or Forensic Biology Unit supervisor.

The initials of the CSS, intern, or volunteer and the date of receipt of the laboratory request will be entered into the tracking database by the crime scene specialist supervisor.

Cartridge cases will not be processed for latent prints.

Cigarette butts will go straight to Forensic Biology for DNA analysis prior to any attempt at latent print development.

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2.2 ASSIGNING WORK

Vehicle and “RUSH” fingerprint processing requests will be assigned as soon as possible.

The CSS assisting with casework (evidence and/or photographs) will be responsible for generating the appropriate documentation and reports.

Each CSS will be responsible for generating the appropriate documentation and reports for all casework.

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2.3 HANDLING EVIDENCE

Outer packaging (boxes, envelopes, etc) used to transport sealed evidence will not be sealed.

All evidence bags, tags, and/or containers will be labeled with the barcode, incident number, case number, homicide team number and/or unit, victim or suspect name, location collected and the CSS name and I.D. number.

A Laboratory Chain of Custody Form (PD-482) will be completed when evidence is received or released by the CSS outside of Property Room procedures. These forms are not required for field transfers of evidence. The original Chain of Custody form will be placed into the case packet and retained in the laboratory files.

Blood vials: Blood vials will be stored in a plastic tube. A barcode label will be generated and placed on the outside of the plastic storage tube. The CSS will place their initials, I.D. number and date on the blood vial at the time of collection. After preparing a reference blood swatch the blood vial will be placed in the plastic tube, capped, and sealed. Half-inch evidence tape will be used to cover the tube cap. The evidence tape will be signed across the tape and tube.

Reference Blood Swatch(es): A reference blood swatch will be made from blood vial evidence that is received from the Medical Examiner's Office. The swatch will be air dried, placed in an envelope, and then sealed with evidence tape. The swatch will be placed in a freezer packet for storage in the Property Room freezer.

Small, individually packaged, evidence items containing possible DNA (such as blood, swabs, cigarette butts, hair, fingernail scrapings, etc) should be air dried and placed in a freezer packet. The freezer packet may be temporarily stored in the Crime Scene Unit freezer. Items inside the freezer packet will be individually sealed. The outer freezer packet does not have to be sealed. The packet containing the evidence will be taken to the Property Room for freezer storage when the crime scene unit report is completed.

Evidence items that may decompose at room temperature (food, diapers, etc) should be stored in the Property Room refrigerator.

All Latent Print related evidence will be barcoded and impounded in the Property Room.

2.4 REPACK POLICY FOR NARCOTICS ITEMS TO BE PROCESSED FOR FINGERPRINTS

For general narcotics evidence, the evidence will be repackaged by the Forensic Chemistry Unit. The narcotic substance will be retained in the vault. The empty container/package will be released to the CSU for processing.

The following exceptions will be released to the CSU without repackaging:

Cases with large brick items.

Cases with very small items, such as balloons.

These cases cannot be repackaged without destroying possible DNA and fingerprint evidence.

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2.5 BARCODES

All evidence will be assigned a unique barcode number in the barcode system with few exceptions (i.e. officer's gun).

Barcodes will be generated in sequential order by incident number in the barcode system.

All items of evidence must be accounted for in the crime scene unit report disposition.

Duty weapons from officers are placed on the crime scene unit report (if applicable), but not in the barcode system. The duty weapon will be released to the homicide sergeant or lieutenant.

All Latent Print related evidence will be accounted for in the crime scene unit report and barcode system. One "Property" barcode will be generated for each latent print envelope, attached to the outside of the envelope, and will be impounded in the Property Room.

Blood samples are accounted for on the crime scene unit report and in the barcode system. The subject from which the sample was taken will be listed under "Owner's Name" in the barcode system. A "Property" barcode will be generated and attached to the outside of the plastic protective tube. The blood sample will be impounded in the Narcotics Vault. The "Station Impounded" field in the barcode system will be "Property Room – HQ."

Discs containing digital images pertaining to crime scene related events ("Master" and "Working Copies") will be accounted for in the crime scene unit report and in the barcode system. One barcode will be generated for each disc and attached to the outside of the jewel case. The discs will be impounded in the Property Room.

All additional items (i.e. swabs) generated from evidence will be referenced in the comments section (barcode system) of the evidence from which the additional item was collected.

All notes that are generated in the comments field of the barcode system will include the author's initials, ID number and date created.

Each unit will generate their own additional items in the barcode system and will impound directly to the Property Room.

The minimum fields that will be documented in the barcode system are:

Incident number

Case number (if applicable)

Charges

Incident date

Station impounded

Recovered by / date / time

Recovery address

Recovery location

Assigned to detective (if known)

Victim / suspect / owner (if known)

Evidence hold

Evidence category

Item type

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2.6 RELEASING / RETURNING EVIDENCE TO THE PROPERTY ROOM

All evidence will be taken to the Property Room and/or Narcotics Vault within forty-five days after the scene/morgue work has been completed. Evidence can be held in the Laboratory longer than forty-five days with supervisor's approval.

Evidence will not be left in the stink tank for longer than forty-five days. If the evidence is not dry or has a strong odor, it will be heat-sealed in pouches for impound in the Property Room. Evidence can be held in the stink tank longer than forty-five days with supervisor's approval.

Evidence will generally be returned to the Property Room by the person who signed it out.

Refer to the general laboratory policy manual for releasing and viewing evidence (policy 1.4).

The Property Room will coordinate all evidence mailing.

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3.1 EVIDENCE INVENTORY ROOM PROCEDURES

All evidence will be placed in a covered container or a hood if not being physically worked on.

Only one case is allowed in the hood at a time.

The dowel and floor area of the hood will be protected with paper from contaminated evidence.

Hoods must be on when evidence is being dried.

Evidence will be removed from the hoods when the evidence is dry.

All evidence placed into the hoods will be tracked in the Evidence Tracking Log. The following information will be included in the log: Date item was placed in the hood, date the item was removed from the hood, CSS name and ID # and Case #/ Incident #/ Victim or Suspect's name.

The hood will be bleached before and after use.

Hangers are to be disposed of in "sharps" containers.

Perishable evidence will be placed in the refrigerator or freezer (depending on the type of evidence) until the evidence list is completed.

Butcher paper will be spread out on the countertop when working with evidence.

The countertop will be bleached before and after use.

3.2 FINGERPRINT PROCESSING ROOM

The main purpose of the Evidence Processing Room is to process evidence for latent prints.

Evidence received for processing will not be kept in the Crime Scene Unit longer than 90 days without supervisory approval. The outer packaging will be marked with the initials of the Crime Scene Specialist working the case and the date the evidence was received.

Latent print development work requests should include a brief description of each item submitted. The original completed report will go in the laboratory files. The report will be distributed according to normal clerical procedures. A copy of the report may be retained by the CSS.

Impound all obtained latent print cards, photographs, and discs directly to the Property Room.

Hoods and/or the plenum wall must be on when evidence is being processed on the shelves in front of the plenum wall.

Most chemical processing will be done in the hoods.

One full bottle of acetone Ninhydrin and one full bottle of Heptane Ninhydrin shall be on hand at all times.

Chemically processed items will be removed from the hood when dry.

You should consult with the Questioned Documents Unit before processing paper items.

Most fingerprint powder application will be done on the plenum counter or inside a hood. The center counter will not be used for fingerprint powder application without supervisor approval.

Large items will be processed on butcher paper on the floor.

Hangers will be disposed of in sharps containers.

Zinc wipes and controls from the VMD will be disposed of in the blue hazardous materials container.

3.4 GENERAL HOUSEKEEPING

OFFICE AREA

Biohazard evidence will not be handled or stored in the office area.

SUBJECT PROCESSING ROOM

This room is used for photography and suspect/subject processing. This room will be inspected and made safe prior to suspect/subject processing. The desk will be cleaned with a bleach solution before and after use. A new piece of butcher paper will be put on top of the desk prior to use.

DRYING CABINETS

Use bleach solution for cleaning before and after use.

Whenever evidence is placed in a hood, the Crime Scene Specialist must log the required information in the Evidence Tracking Log.

There are three filters in both of the self-contained hoods: a carbon/ hepa filter, a main pre-filter, and a standard door filter. The carbon/hepa filter should be changed a minimum of every two years or as needed. The main and standard door pre-filters should be changed yearly or as needed.

3.5 HANDLING INCOMING EVIDENCE FROM SOURCES OTHER THAN THE PROPERTY ROOM

In the interest of personnel safety, all containers (duffle bags, briefcases, etc.) will be examined for the presence of hazardous materials, chemicals or explosives before being brought into the building.

If all of the drying hoods are full, the evidence should be dried in the Stink Tank. The Crime Scene Specialist will advise the supervisor of the situation at the beginning of the next working day. Also, Forensic Biology can provide hood space if necessary, after first checking with the Forensic Biology Unit supervisor.

In order to avoid possible contamination, no evidence will be left in the Evidence Inventory Room unless the bag or container holding the evidence is closed or covered.

If a packaged item is to be repackaged, the original package must be kept with the evidence.

Once the crime scene unit report is completed, the evidence will be taken to the Property Room.

All evidence that has a strong odor will be dried in the Stink Tank. The evidence will not be kept in the Stink Tank for more than forty-five days. The evidence must be impounded in the Property Room unless permission is given by the unit supervisor to store the evidence for a longer period of time.

3.6 PHOTOGRAPHING CRIME SCENES

The scene and evidence items will be photographed using a series of photos (overall, location, close-up).

Visible friction ridge impressions such as bloody prints, greasy prints, etc., will be photographed in TIFF format with a digital camera. Always include a scale and identifying marks, such as letters in the photographs. Direction indication may also be necessary, especially when photographing latent prints.

Impression evidence will be photographed in TIFF format with a digital camera. Always include a scale. Pertinent information such as initials, time, date, etc., can be included. The camera should be perpendicular to the impression. The flash should be held in at least twelve different positions (approximately 0, 15, and 45 degrees) on each side of the impression. A location photograph should be taken to show location and overall patterns for investigative purposes.

When photographing scenes where there are layers of clothing, debris, papers, etc., photographs must be taken when each layer of material is removed.

Before the subject is moved, detailed photographs need to be taken at the scene to document the subject's position, hands, location, and any pertinent blood spatter.

When the body is moved at the scene and areas not already photographed are exposed, additional photographs will be taken to document those areas.

After the subject is removed from the scene by the Medical Examiner's Office, photographs will be taken of the area where the subject was lying.

The discs will be labeled with the following information:

- barcode number
- case number (if applicable)
- incident number
- subject's name
- CSS initials and ID number
- Unit handling the case (i.e., Homicide Team)
- date(s) photographs were taken.

Images taken as part of a Homicide investigation can be uploaded to the Homicide Unit V:drive. If the images uploaded are the “Master” images, the CSS will send an email to the Detective letting them know not to make copies. Once the images have been replaced with the “Working Copy” images, a follow-up email will be sent letting Detective know they can now make copies.

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3.7 OFFICER INVOLVED SHOOTING (OIS) PHOTOGRAPHS

The following photographs will be taken of all officers involved in an OIS:

Full length overalls of all four sides

Upper torso, front and back

Facial view

Injuries

Damage to the officer's uniform and utility belt

Any other photographs deemed necessary

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3.8 PROCESSING SUBJECTS AT THE MEDICAL EXAMINER'S OFFICE

The CSS is required to bring the following personal protective equipment:

- Shoe covers
- Lab coat
- Face mask
- Eye protection

The CSS will provide personal protective equipment for every SDPD representative attending the autopsy. The CSS will complete the proper documentation at the Medical Examiner's Office to ensure that the department will not be charged for personal protective equipment.

Photograph the plastic lock on the body bag.

Photograph the body in the following sequence:

- Prior to the removal of the protective bags
- Clothed
- Unwashed/unclothed
- Washed

Close-up photographs should generally include the following:

- Facial view
- Overall and segmented views of all sides
- Close-ups of injuries, and pertinent evidence
- Views of the hands unwashed and washed
- Tattoos and scars

Injuries, tattoos, scars, and gunshot residue/stippling generally will be photographed with a scale.

Evidence will be packaged and properly documented.

The following evidence should be collected or received from the victim/suspect and/or the Medical Examiner's Office, depending on the circumstances of the case:

HAIR:

Head hair: Collect at least 20 hairs from each of five areas of the scalp (front, center, back, and both sides). The hairs will be obtained by pulling and finger combing.

Pubic hair: Collect at least 20 hairs from different areas of the pubic region. The hairs will be obtained by pulling and finger combing.

Note: If the hair is saturated in blood, it can be collected after the body has been washed. If the hair is not saturated in blood, it should be collected prior to the body being washed. These guidelines are subject to the condition of the subject's hair. In some cases it may not be necessary or even possible to collect the suggested number of hairs. Each situation will dictate whether trace evidence that might be present in the hair is significant or not. Laboratory personnel can use their discretion as appropriate.

OTHER:

Fingernail scrapings from each hand will be packaged separately

Blood sample

Rib bone

Inked finger and palm prints

GSR kits

Instructions for GSR collection:

1. Put on new gloves.
2. Remove the enclosed folded paper and lay it out to provide a clean working surface for taking the samples.
3. Remove the disc marked "R" or "L" from the clear plastic cylinder. DO NOT separate the disc from the plastic cylinder.
4. Repeatedly, press the metal disc onto the fingers and the web area in between, extending to the tip of the fingers. It is critical that this step be done slowly. If the disc is not pressed slowly against the surface, particles may not be recovered. Using the same disc, continue sampling the palm side of the fingers and hand.
5. Carefully return the disc to the plastic cylinder.
6. Repeat steps 2, 3, 4 and 5 using the other disc "R" or "L."
7. Place both vials containing used discs into the envelope and seal with the evidence seal. Place initials, date and time on the seal.

3.9 PROCESSING LIVE SUBJECTS

Processing of live subjects is generally done in the Subject Processing Room. It is the responsibility of the CSS to make sure that anything that could be used as a weapon is cleared off the tables, counters, and floors.

No processing will be done without sworn personnel present.

Evidence will be packaged and properly documented.

The following photographs will be taken:

- Full length overalls of all four sides
- Upper torso, front and back
- facial views
- Front and back of both hands
- unclothed upper torso front and back when needed.
- Injuries (visible or claimed injuries), tattoos, scars, and any additional pertinent marks (using a scale)

The following will be collected depending on the circumstances of the case:

- GSR kits
 - Mouth reference swabs
 - Fingernail scrapings from each hand, packaged separately
 - Hair standards generally include head and pubic. Comb through the hair to collect any loose evidence prior to plucked samples (when needed). Take at least 60 to 100 plucked head hairs (approx. 20 from each area: top, right, left, center and back). Pubic hair standards should consist of at least 15 plucked hairs
 - Clothing
- Detectives will generally be responsible for the following:

- Blood sample
- Urine sample
- Breath test
- Inked prints and handwriting exemplar

Subjects in sexual assault cases are processed by medical personnel through a city contract.

3.10 DIGITAL PHOTOGRAPHY

PRIMARY CRIME SCENE PHOTOGRAPHY

Digital photographs taken as the primary photographic documentation of the crime scene will be taken at the best practical compression quality, to be determined by the intended use of the images (minimum of JPEG fine quality—large file, or higher)

No images will be deleted from the memory card until after the data has been successfully recorded to a disc that becomes write-protected after the transfer process closes.

IMAGE TRANSFER AND STORAGE POLICY

For each case, the crime scene digital images will be transferred from the camera/card to a computer and then to a disc. The disc will contain only one case.

Appropriate labeling will be added to each disc electronically by entering case information into the computer during the image transfer phase.

The disc will be labeled with the following information:

- barcode number
- case number (when applicable)
- incident number
- subject's name
- CSS initials and ID number
- Unit handling the case
- date(s) photographs were taken
- Summary of contents (scene/autopsy/suspect processing)

In all cases, one disc containing unaltered images will be made. This disc will be labeled “MASTER.” A functional working copy disc will be made containing user-friendly images. This disc will be labeled, “WORKING DISC.” The “MASTER” disc will be sealed in a separate jewel case with evidence tape and the “WORKING” disc will be placed in a sealed jewel case. The master disc will be unsealed only to make a replacement copy of the working disc should the working disc become lost or damaged. The working disc will be copied as needed for detectives, DA, and other authorized persons.

The master and working discs will each be assigned a barcode number and will be impounded in the Property Room.

DIGITAL PHOTOGRAPHY OF LATENT/PATENT PRINT IMAGES

The Crime Scene Unit is responsible for the digital photography of latent and patent print evidence. Digital photographs will be taken only of prints suitable for comparison and/or elimination purposes. If it is questionable as to whether a print is of value for comparison, a photograph will be taken. A qualified individual (one who has passed a latent print proficiency test) must make this determination. A more experienced CSS or a latent print examiner II may be consulted as to which prints should be photographed. Interns are not qualified to make this determination.

When photography is necessary, the CSS or intern/volunteer will photograph the print. No images will be deleted from the memory card until the images have been transferred onto a disc.

The following information will be included in the documentation of latent print photographs:

Initials and ID number
Date
Case number (if applicable)
Incident number
Name the type of document (i.e., pawn slip, envelope, etc.)
Source of the print (such as stove, front passenger door, etc.)

Arrows will be used on the evidence when it is necessary to show the direction of the print or as appropriate.

BURNING A PHOTOGRAPHIC DISC OF LATENT PRINTS

When taking photographs of latent print evidence the following method will be followed to save and store the images:

One "Master" disc with the original image will be made.
One "Working" disc with the original image will be made. A 1:1
image using the chosen software will be included in the "Working" disc.

These two discs will be assigned a barcode number and impounded in the Property Room.

If using the DCS system for specialized techniques, the analyst will use the method described in the DCS section of the manual.

DCS DIGITAL CAPTURE SYSTEM

This equipment allows the capture, enhancement, and printing of high resolution images of fingerprints, palm prints, and footmarks using an SLR digital camera. This system allows printing of these images, protecting valuable evidence from alteration or loss.

The clarity of images can also be enhanced prior to comparison and identification using image processing software. The software provides overall control of various steps of capturing, validating, processing and printing an image. Many functions can be performed automatically, thereby minimizing the workload of the operator. Disc burning software allows images and other data to be transferred to a disc.

Operating Procedures for the DCS:

Log on to the DCS system.

In the “Captured image” area of the main DCS screen add the following information to set up folders.

Case: incident number

Use the barcode number

Image Image#1

Insure that the focus point on the camera matches the “Calibration” information in the “Calibration” area of the main screen.

Set the correct camera settings in the “Camera Settings” area of the main screen.

Preview the image. If everything is correct, “Capture Evidence” to take the digital image.

Capture the image using an SLR camera or a scanner.

A validated image is automatically saved to the “D:DSC\Working Folder”.

A working copy of the image appears on screen to allow enhancements.

The individual analyst will determine which steps if any to take in the enhancement process.

If the analyst determines enhancements are needed, the following documentation is required in the case notes:

Note that the "DCS system" was used.

Note which tool box(es) were used (such as: Ninhydrin, Powders, US \$, etc) on each image.

Click 'Enhance here'

Click 'Convert To'

Click 'Gray Scale 8'

Save the working image. It will be placed into the “D:DSC\Working Folder” under the incident number you input on the main screen.

Burn two copies of the correct folder to a disc. Label one “Master” and one “Working,” and seal the “Master” one.

The two discs will be assigned a barcode number and impounded in the Property Room.

An audit trail will be included with every folder and will be included on the disc. A "Maintenance Log" will be kept with the system. Any maintenance and software/hardware upgrades will be maintained in this log.

3.11 CRIME SCENE UNIT CLEANING POLICIES

WEEKLY CLEAN-UP ASSIGNMENT

The following duties are assigned to be performed on a weekly basis:

- replace sharps containers as needed
- hose down the Stink Tank as needed

GENERAL CHEMICAL HYGIENE POLICIES

- No eating is allowed in the tiled areas. Only closed container drinking is allowed.
- Carpeted areas are vacuumed as per the Building Maintenance schedule.

EVIDENCE PROCESSING ROOM

- The countertop paper is changed as needed.
- The lay-down paper is usually changed on a daily basis.
- The hoods will be bleached before and after evidence is placed in them.
- The fingerprint hoods will be cleaned as needed.
- Building Maintenance cleans the tops of the wall shelving units.
- The floor mat will be changed as needed.

STINK TANK

- New paper will be laid down prior to placing evidence on the shelf.
- Shelves will be bleached before and after evidence is placed on the shelves.

EVIDENCE INVENTORY AND STORAGE ROOMS

The hoods and countertops will be bleached after the removal of case evidence. This will be logged on the hood cleaning log sheet.

The face shield and drying box will be bleached after each use.

CRIME SCENE SPECIALIST OFFICES

Cubicles will be maintained as neatly as possible.

No biohazard evidence will be carried into, or stored in, the office area.

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3.12 CALL-OUT POLICY

Crime scene specialists will be in a rotation of first call, second call, and third call. When staffing permits there will be an emergency fourth call position assigned. The CSS will have their assigned cellular phones with them at all times. It is the goal to safely respond to the scene within one hour.

The homicide team sergeant, laboratory supervisor(s), Watch Commander, or case detective(s) are responsible for calling the first call CSS and appropriate criminalist. The first call CSS is responsible for fielding all calls and assigning the appropriate CSS to the scene.

The CSS should request that the homicide sergeant call a criminalist if any of the following criteria are met:

- significant blood spatters
- sexual assault homicides
- multiple victims
- body dumps
- Officer involved shootings.

On-call CSS will take home a lab van. They shall have their police identification cards, badges, cell phone and valid concealed weapons permit if they choose to carry a gun while working.

The on-call CSS will respond to both homicide and non-homicide calls when needed.

If overlapping or concurrent calls are received it is the responsibility of the first call CSS to notify the emergency fourth call CSS, if available, to help cover the rotation and any call outs if needed.

It is the responsibility of all the CSS to maintain clean and well-stocked evidence kits. Any items used or depleted from the vans will be replaced as soon as possible.

It is the responsibility of all CSS to notify the supervisor or order boss if equipment in the vans is missing or broken.

A CSS will try to schedule vacations, T.O.'s and other leave when they are not on call. If training schedules, vacations, or other situations develop which conflict with the on-call schedule, the CSS will arrange for another CSS to take their call. If substitutions are made, the unit supervisor will be notified in advance.

The CSS assigned to the scene will be the primary. They will also be responsible for the processing of any evidence items on the case. They will cover all related events unless otherwise arranged. If they are off call and someone is needed after hours they will be given the option to cover the team or call. If they do not want to or cannot cover the call it will be the responsibility of the first call CSS to assign the call to someone in the rotation.

It is the responsibility of the first call CSS to call all of the other CSS in the rotation and notify them of any call outs and/or changes in the rotation. Notification of call outs and/or rotation changes will be done within one hour of the initial call (unless it is between the hours of 10pm and 7am. Then the notification should be done at 7am).

The emergency fourth call CSS will only be notified if two CSS are out at a scene at the same time or there is an emergency situation (such as a family emergency with an on-call person, the on-call person is sick, emergency doctor's appointment that can't be changed, etc). As soon as the emergency situation has been dealt with or one of the CSS who was called out has completed their duty the fourth call person will be moved back to emergency fourth call. If there is a need to have the emergency fourth call person stay in the rotation (such as one of the CSS gets a case that will keep them in the field on a search warrant and the like for an extensive period of time) then all CSS in the rotation should be notified of the change. If there are any questions during your rotation, please call the on call supervisor or unit supervisor and we can make the final decision as needed.

3.13 EVIDENCE COLLECTION AT CRIME SCENES

The proper collection of evidence from a crime scene is the responsibility of the crime scene specialist. The decision of what is to be collected should be a joint effort between the CSS, the homicide team, lead detective, other unit detectives, and criminalist (if present).

Each container of evidence will be marked at the scene with a brief description of the item, its location, the time, the date and your initials. The condition (e.g., apparently bloody, soiled, and wet) of the item should be noted on the container and in the crime scene unit report. All evidence will be assigned a unique barcode number in the barcode system with few exceptions. Identifying placards used at scenes will be accounted for in the barcode system. Each container will be properly documented before the evidence goes to the Property Room. A barcode label (CSU) will be generated and placed on the packaging. If latent lifts are collected from the scene, the lift cards will be filled out as completely as possible at the scene. This includes a diagram showing the location of the lift.

Each Crime Scene Specialist is responsible for generating a crime scene unit report. See the standardized crime scene unit report format (Section 5 of unit manual).

Evidence containers having blood on the outside surface or that have become blood soaked, will be placed inside secondary container and the evidence and the original container have been dried.

A biohazard label will be placed on all packages containing biohazard evidence.

Any kind of processing (latent print processing, etc.) and appropriate controls will be documented in case notes. The results of the processing, and applied methods, will be included in the crime scene unit report.

The results of any processing for latent prints at a crime scene, and the method(s) used, will be documented in the notes and report. The areas that were processed will also be documented in your notes.

3.14 MULTIPLE CRIME SCENE MANAGEMENT

Crime scene specialists are frequently called upon to leave the primary scene to process a related scene. This could be for search warrant purposes, processing a subject or vehicle, or finding a secondary or primary crime scene related to the current investigation site.

Proper management of multiple crime scenes involves following numerous administrative and technical precautions.

Refer to QA policy 6.3.

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3.15 COLLECTION AND PROCESSING OF FIREARMS

The Crime Scene Specialist is responsible for all photographic documentation of the condition of the firearm at the crime scene. If a firearm criminalist is present at the scene they are responsible for the written documentation of the firearm.

A firearm may be rendered safe by the CSS or firearms criminalist. This does not mean unloading the weapon.

A revolver cylinder should be marked to show cylinder position if it is going to be opened. The CSS may de-cock the hammer on a revolver if they are comfortable and confident with the procedure.

A semi-automatic weapon (rifle, pistol) will be handled as follows:

Make the firearm safe (if needed);

Leave the magazine loaded and **DO NOT** remove any round in the chamber;

Package for transport;

If the weapon has jammed (not completely ejected a fired or unfired round) or the slide/bolt is not all the way closed, do not do anything to the weapon. Transport it as is for rifles and shotguns, activate the safety (if needed).

PROCESSING THE FIREARM AT THE LABORATORY

All firearms will be unloaded by the Firearms Unit before any processing occurs. If the CSS is certain the firearm is unloaded and the firearm was not collected at the crime scene, the firearm can be processed without having the Firearms Unit unload it. If the firearm was collected at the crime scene and the CSS has any doubt about the firearm being loaded it will be unloaded by the Firearms Unit before any processing occurs.

The firearm will not be impounded in the Property Room until all latent print and DNA processing is completed, unless the firearm(s) is determined not to be of

evidentiary value (i.e: Domestic Violence weapons, death investigation) and the Sergeant in charge of the investigation gives you written authorization not to process the firearm(s).

The gun cabinet is used to store weapons, loaded or unloaded, requiring firearms examination. The criminalist retrieves the weapon from the gun cabinet and returns it to the same location upon completion of the firearms examination. If a Firearms Processing Packet is generated, it is the responsibility of the analyst who created it to generate a barcode and impound it directly to the Property Room. Once the firearm is confirmed unloaded it can be stored in any other approved evidence storage areas.

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3.16 EVIDENCE COLLECTION FROM BUTCHER PAPER INSIDE THE HOOD

Evidence being placed in the hood will be dried over clean butcher paper.

If the Crime Scene Specialist observes debris from the evidence items, the debris will be collected. If the debris can be associated with one of the items in particular, the debris will be packaged and marked accordingly. If the debris cannot be associated to an item in particular, it will be given a separate barcode number and described as having come from the butcher paper under the specified item numbers.

If an evidence item is to be placed directly on paper for drying, multiple layers of paper will be used. The top layer in direct contact with the evidence item will be collected, labeled, and packaged with the item.

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3.17 VEHICLE PROCESSING

Vehicle processing includes the examination, collection, and documentation of latent fingerprints and other physical evidence. Refer to the laboratory general policy manual on call outs and vehicle processing (green manual, pg. 11-1) for procedures on dealing with vehicles.

The vehicle processing request (Form PD-1032-LA) shall indicate what type of examination is needed. The finished report shall reflect what areas were processed and the results of any presumptive testing. The report will list any evidence that was collected.

Any latent lifts recovered will be impounded to the Property Room.

Vehicle processing should commence within four (4) working days of being assigned.

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3.18 CARRYING CONCEALED WEAPON POLICY

INDIVIDUALS APPROVED TO APPLY FOR A CONCEALED CARRY PERMIT (CCW)

Only those deemed “qualified personnel” will be approved to apply for a concealed carry permit through the Department. This will include all current crime scene personnel to encompass Crime Scene Specialists, Crime Scene Reconstruction Team members and trainees, as well as Criminalists who respond to crime scenes as part of their regular duties.

CCW RESTRICTIONS

The CCW’s will be issued by the San Diego Sheriff’s Office. The Department will support the CCW with the following policy restrictions: Valid only in the course of duties as a (insert title here) with the San Diego Police Department. The CCW will only be valid while the employee is on-duty.

On-duty is defined as any field work done outside of a police facility. This includes traveling to and from crime scenes. In addition, the employee who is actively on-call and may need to respond to a crime scene from his or her current location is considered on-duty.

TRAINING

A qualified employee shall complete in-service firearms training, and fulfill all other requirements as set forth for firearms qualifications, as outlined in Department Procedure 1.05.

EXPECTATIONS

All Department policies and procedures regarding firearm safety must be adhered to.

A qualified employee authorized by the Chief of Police to carry a firearm during the course of his or her duties shall be required to carry the firearm while on-duty. See 12.2 for the interpretation of on-duty for purposes of this policy.

“Carrying” means that the firearm is physically on the employee’s person, either in a holster or in an attached bag (fanny pack). Carrying does not include keeping the firearm in a crime scene kit, or locked up in a vehicle.

A qualified employee will be required to sign an acknowledgement and agreement of the above policy, as well as DP 1.05. This acknowledgement will be kept in the employee's divisional file.

Any employee who feels an unrestricted CCW is appropriate in his or her case may petition the Laboratory Manager in writing to have the restrictions lifted.

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4.1 POWDERING AND LIFTING

Although this may be the oldest and least sophisticated of development techniques, it is still the best method of use on many dry smooth non-porous surfaces. Latent prints are developed when fingerprint powder adheres to residues left by contact from the friction ridge areas.

MATERIALS AND EQUIPMENT

1. Fingerprint powder
2. Latent print brush
3. Latent lifting tape or other lifting devices
4. Latent lift cards
5. Scissors
6. Marking device

SAFETY CONCERNS

This procedure is relatively safe and the only safety concern is the inhalation of the fingerprint powder.

SAFETY EQUIPMENT AND PROCEDURES

In the lab, the Crime Scene Specialist is required to wear:

Dust particle mask (recommended)

Lab coat

Gloves

Goggles (optional)

At crime scenes, the Crime Scene Specialist is required to wear:

Dust particle mask (recommended)

Lab coat or other protective crime scene apparel.

Gloves

Goggles (optional)

OTHER

In the lab all powdering should be performed at a powdering station in front of a functioning plenum hood.

PROCEDURE

Place a small amount of powder into a disposable dish.
Use a new fingerprint brush (if available).

Apply a small amount of new fingerprint powder to the brush by dipping the brush into the powder. Additional powder can be applied later if necessary.

Lightly dust the area to be processed for latent prints.

When a print is fully developed stop the dusting.

Lay the tape over the prints and smooth the tape as much as possible to remove air pockets.

Gently lift the tape from the surface.

Place the tape on a latent lift card and smooth the tape with your finger.

Cut the excess lifting tape if needed.

Mark the lift card as to item, area, position and direction of the latent print(s) that were lifted.

Mark the evidence as to lift number and position of each lift (when possible).

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

If other techniques are being considered, they should be performed prior to dusting since they are usually not as effective after the powdering process.

NOTES: If during the dusting process a print develops then starts to fade, do not attempt to develop any further, as most likely the print will be destroyed.

Many times additional lifts can be made from prints and, quite often, the later lifts are superior in quality to the first lift.

As a general rule, a powder should be used which will contrast with the color of the surface.

Rubber lifts can be utilized for making lifts on curved surfaces.

Mikrosil is also excellent for lifting prints on rough and curved surfaces.

Glue can be used to lift a powder developed print from a surface.

Faint bloody prints on non-porous surfaces like glass can often be enhanced by powdering, or with Coomassie Blue. These prints should be photographed prior to dusting and prior to lifting. Don't attempt any processing of bloody prints until they are completely dry and have been photographed.

DNA CONSIDERATIONS

Never dip the brush directly into the jar. Use a separate reservoir of powder, discarding any leftover powder and its container.

If DNA evidence is or might be a consideration in the case, use a new brush(es) so as to avoid possible contamination, unless swabbing for DNA material is completed first.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

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4.2 FLUORESCENT POWDER

Fluorescent fingerprint powder is an extremely fine textured powder that acts like other fingerprint powders by adhering to latent print residues. The advantages are that the adherence of just a small amount of powder is necessary to visualize prints with the laser and fluorescent powder will give better results on irregular non-porous surfaces and on some vinyl. The disadvantage of this technique is that it usually only performs well on relatively "moist/oily" prints.

Fluorescent fingerprint powder is marketed under the name "Redwop" and "Greenwop".

EQUIPMENT AND MATERIALS

Laser or High Intensity Light Source.

Fluorescent fingerprint powder.

Clean fiberglass filament or feather dust style fingerprint brush.

Photographic system.

SAFETY CONCERNS

The fluorescent powder is not considered to be dangerous.

The operator should use caution to prevent injury to the skin and eyes from laser light.

SAFETY EQUIPMENT AND PROCEDURES

The Crime Scene Specialist is required to wear:

Gloves latex or plastic.

Lab coat or coveralls.

Laser goggles.

Dust particle mask is recommended.

PROCEDURE

Place powder in disposable dish.

Use a new fiberglass filament or feather duster style fingerprint brush or a clean, used brush that has been dedicated for this purpose.

Dip the brush into the fluorescent powder reservoir. Use this powder very sparingly since this powder tends to "paint" the background and a little of this powder goes a long way.

With the laser or light source operating and goggles on:

Lightly dust the area for latent prints.

Photograph any usable prints that develop (see Photography Section).

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

This technique is usually used only when other methods of development are not feasible, therefore, additional processing is not usually performed after this process.

NOTES

Some examiners have reported success in lifting prints developed with fluorescent powder, then photographing the lifts while viewed under the laser. However, this method is not recommended.

Because the prints developed with fluorescent powder are so brilliant, the room doesn't have to be totally darkened to detect or photograph these prints.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London, 1993 Edition

4.3 NINHYDRIN

Ninhydrin is an extremely efficient method of developing latent prints on porous surfaces. The age of the prints is of little consequence when processing with Ninhydrin since the development of prints over 100 years old has been documented. Ninhydrin reacts with the amino acids of the latent print residue to develop prints purple in color.

Ninhydrin is also effective in enhancing partial and faint impressions in blood. (See Notes in this section).

Ninhydrin can be applied by dipping, brushing or spraying.

MATERIALS AND EQUIPMENT

Trays

Tongs or tweezers

Ninhydrin solution

Drying racks

Steam iron

SAFETY CONCERNS

Ninhydrin and the solvents used with Ninhydrin are considered to be harmful if ingested or absorbed by the skin.

SAFETY EQUIPMENT AND PROCEDURES

The crime scene specialist is required to wear:

When applying the solution:

Gloves impervious to solvents

Lab coat

Goggles when there is any possibility of splashing

When examining:

Latex or plastic gloves

OTHER

Whenever possible processing will be conducted in a fume hood. If it is not possible to process in the fume hood or if spraying must be conducted, the analyst will also be required to wear a mask with organic vapor filters.

Processing must be performed near an eye wash station.

Whenever possible, articles treated with Ninhydrin will be placed in a plastic bag with a warning label.

PROCEDURE

Prepare working solution of Ninhydrin (Formulas will follow at the end of this Section).

Apply the Ninhydrin: (To minimize the risk of exposure, spraying will be used only when dipping or brushing is not feasible).

Dipping Process:

The solution is poured into a clean shallow dish or tray.

Immerse the evidence for a maximum of 5 seconds, handle with tweezers.

Allow the evidence to dry completely.

Spraying:

Spray the solution evenly over the surface until the surface is wet. Allow the evidence to dry completely.

The use of heat and steam will expedite the development of the latent prints.

Photograph usable prints.

Processing scenes with Ninhydrin

Take all necessary precautions for fire hazards by turning off all gas at the scene and notify SDG&E. The electricity should be turned off when necessary.

Use the department issued respirator, which must be used anytime Ninhydrin is being sprayed.

Protective clothing (i.e. gloves, plastic suit) should be worn in all cases.

Ninhydrin can be brushed, rolled, or sprayed onto the desired surface.

After processing the scene, a new bottle of Ninhydrin should be mixed. This should be done no later than three (3) days after processing the scene

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

Laser excitation of Ninhydrin processed evidence

Physical Developer (see Notes)

CONTROL

Paper with latents from various individuals. This will be tested per batch and documented in the reagent log. A purple in color print will develop with a positive control.

NOTES

Once the item is treated with Ninhydrin, wait 10 days and photograph the developed prints. Document the date and time examined, prior to photography. The best results are obtained by waiting at least 10-days prior to applying heat and moisture. Heat and moisture accelerate the development of latent prints. In emergency/rush cases, heat and moisture can be applied after 24 hours with supervisory approval.

After the heat and moisture, take photographs of the newly developed prints.

It should be noted that prints that were developed before the application of heat and moisture have been known to disappear when the heat and moisture were applied.

Sometimes it will take many days for prints to develop. Ninhydrin prints will fade and eventually disappear. This fading process can start as soon as a few months after processing, therefore, photographing usable prints is essential for preservation and documentation.

D.F.O. cannot be used after Ninhydrin although limited success with Ninhydrin has been reported using D.F.O. first and Ninhydrin second.

If papers have been subjected to moisture, Physical Developer is the best method to try after processing with Ninhydrin.

To enhance partial bloody impressions, the best results are usually obtained by lightly misting the areas with Ninhydrin then allowing the area to develop for a couple of days. It may be necessary to repeat this procedure several times before the print develops to its optimum. Any prints processed in this manner should be photographed prior to processing and at each stage of development.

Only one batch of the same Ninhydrin formula will be in use at a time. Should a second batch be made prior to the depletion of the current batch, the new batch will be labeled with a DO NOT USE label until the current batch has been depleted.

NINHYDRIN FORMULAS

ACETONE NINHYDRIN - Used for all general purposes. It will cause most ink to smear or run. If the writing is important, use the Heptane mixture. Make sure the writing is documented by photography or photocopying before processing.

FORMULA

- 35 grams of Ninhydrin
 - 1 gallon of Acetone (Industrial Grade)
1. Pour the Ninhydrin into the acetone.
 2. Shake well until the Ninhydrin is dissolved.

HEPTANE NINHYDRIN - To be used with the spray equipment and on items of evidence that have important writing. Make sure the writing is documented by photography or by using the Xerox machine before processing.

FORMULA

- 40 grams of Ninhydrin
 - 60 ml of Methanol
 - 1000 ml of Ethyl Acetate
 - 1 gallon of Heptane
1. Put the Ninhydrin into a glass beaker that will hold at least 1400 ml.
 2. Add the Methanol and place the beaker into a tray of warm water and stir the solution until dissolved.
 3. When the Ninhydrin is dissolved remove the beaker and add the Ethyl Acetate and stir until thoroughly mixed.
 4. Mix this with the one gallon of Heptane. It makes a little over one (1) gallon of solution.

Note: 3.78 liters = 1 gallon

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.4 CYANOACRYLATE (SUPER GLUE) FUMING

When not using the MVC5000 Chamber

Superglue (Ethyl Methyl Cyanoacrylate) vapor polymerizes on some latent fingerprints to produce a white deposit. The polymerization is thought to be catalyzed by the water and possibly some other constituents of latent fingerprints. Although best suited for dry non-porous surfaces such as metals and plastics, good results have been obtained on semi porous black glossy papers. Because this is a chemical reaction, this technique may be more efficient than powders on older prints that have little moisture left in them and with prints on slick surfaces, which may be destroyed by brushing in the powder method.

MATERIALS AND EQUIPMENT

Cyanoacrylate packet or liquid glue in a dish

Cyanoacrylate cabinet

Various clips to suspend evidence

Beaker (for warm water, if necessary)

Tongs

Small fan (if necessary)

SAFETY CONCERNS

Cyanoacrylate fumes will irritate the mucous membranes. In the glue form it will bond skin to skin and skin to other objects. Extreme heat can create cyanide gas.

SAFETY EQUIPMENT AND PROCEDURES

The Crime Scene Specialist is required to wear:

Gloves - latex or plastic

Lab coat

Goggles (recommended when unloading the cabinet or applying the glue).

When opening any of the Cyanoacrylate (CA) fuming cabinets, be certain the exhaust hoods are operational and do not attempt to remove evidence from the cabinets until all the fumes are exhausted. Avoid contact between the CA glue and the skin.

PROCEDURE

1. Place the evidence in a Cyanoacrylate cabinet.
2. Place a beaker of warm water in the CA cabinet.
3. Open a glue pack or pour liquid glue into dish and place in the cabinet.
4. Turn on the small fan to circulate the fumes.
5. Close the CA cabinet.
6. Prints usually develop within 30 minutes (a large cabinet may take longer).
7. After an appropriate amount of time has elapsed, examine the evidence to see if development has taken place. (It's best to include a control item to insure development has occurred).
8. If development has not occurred the process can be repeated. (It's best to perform this process in several short intervals than one long one since over-development can take place).
9. Although developed prints should stay on the evidence for an extended period of time, the prints may be further preserved through photography and/or powdering and lifting.

CONTROLS

1. Place a fresh print on an acetate sheet and place the sheet into the tank for simultaneous development with the evidence. A white in color print will develop with a positive control.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

1. Photography (to document and preserve).
2. Dye staining.
3. Fluorescent examination.
4. Powdering (to create contrast).
5. Lifting (after powdering and photographing).

NOTES

Since fingerprint powders inhibit the fluorescence examination, it is preferable to utilize the powdering method last. Often the dye staining process will actually condition the CA prints so they can be lifted easier.

Cyanoacrylate fuming develops prints best when the humidity is 60% or more. Prints developed without sufficient humidity are almost clear in color instead of being chalk white. The clear prints are not as porous or absorbent and therefore will not produce good results on the dye staining and fluorescence examination. Poor quality CA prints can usually be re-fumed with humidity to produce better results.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.5 DYE STAINING

Dye staining of Cyanoacrylate (CA) fumed evidence often produces results when CA fuming by itself has failed to detect usable latents. This technique is utilized with good results on non-porous surfaces. The dye is absorbed by the CA developed prints that are more porous than the surface. The laser dye then fluoresces when illuminated by laser or high intensity light sources of the appropriate wavelength.

MATERIALS AND EQUIPMENT

1. Laser, High Intensity Light Source or UV Light (for Ardrex).
2. Laser dye in solution.
3. Clips to hang evidence while it dries.
4. Photographic system.

SAFETY CONCERNS

Some laser dyes are considered to be carcinogens and the solvents used with these dyes are harmful when inhaled and may cause death if ingested.

Possible injury to skin and the eyes from the laser light.

SAFETY EQUIPMENT PROCEDURES

The Crime Scene Specialist is required to wear:

When applying the dye solution:

Chemical and solvent resistant gloves.

Lab coat.

Goggles when mixing or applying the dye solution.

Respirator with organic vapor canisters when not working in the hood and when mixing or applying the laser dye.

When examining:

Particle masks are recommended.

Laser goggles when the laser is on.

OTHER

The preparation and application of laser dyes will take place under a properly ventilated hood.

Processing must be performed near an eye wash station.

Any evidence treated with laser dye shall be thoroughly dried before being moved to any other area of the laboratory.

Place the evidence on paper or other appropriate material when moving to other areas. Dispose of these papers after the evidence is bagged and sealed.

Whenever possible, articles treated with a laser dye will be placed in a plastic bag with a warning label.

If the evidence cannot be bagged, place the warning label directly on the item.

Laser goggles must be worn in the laser examination room when the laser is being operated.

PROCEDURE

After the evidence has been fumed with Cyanoacrylate (Super Glue)

Prepare the laser dye (formulas will follow at the end of this section).

Apply an even coat of the dye solution with the use of a rinse bottle.

Rinse off the excess dye with a rinse bottle containing Methanol when using Rhodamine 6G and Radiant Orange. With Ardrex, rinsing is not recommended.

Allow the evidence to dry thoroughly. Most dyes will dry completely in 15-30 minutes.

While wearing the appropriate laser goggles examine under laser or high intensity light source illumination.

Photograph any usable prints (see Photography Section).

CONTROL

Acetate strip with a known print that has been fumed with Cyanoacrylate Esther (that produced a positive Cyanoacrylate control). This is tested per batch and documented in the reagent log. A fluorescent print will develop with a positive control, when viewed using an alternative light source.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

Re-application of dye to increase the luminescence of prints.

Powdering and photographing.

Lifting powdered prints.

NOTES

The use of fingerprint powders (particularly black) can interfere with fluorescence examination. Additionally, application of the laser dye solution often enhances the powdering process by creating prints that lift easier; therefore, the powdering process should follow the dye staining and fluorescence examination.

Sometimes articles like plastic baggies will get small pools of the dye inside them. To prevent this from happening, many examiners cut along the sides of baggies to create a flat surface that's easier to work on.

When the dye is still wet it will luminescence so brightly that the fluorescence could obscure prints.

An ultraviolet light can be used to detect prints developed with the Ardrex method of dye staining.

DYE-STAINING SOLUTIONS

RHODAMINE 6G AND RADIANT ORANGE

In a one liter rinse bottle:

Dissolve .01 gram of Rhodamine 6G or Radiant Orange dye in 1 liter of Ethyl Alcohol.

Laser quality dye is not required. Technical grade dye is sufficient for forensic

Applications.

ARDROX:

Working Solution:

2 ml Ardrex P 135 D

10 ml Acetone

25 ml Methanol

10 ml 2-Propanol

8 ml Acetonitrile

945 ml Petroleum Ether

Pour Ardrex into a clean, dry 1 liter glass beaker. Add Acetone to the beaker while stirring with a magnetic stirrer. Add the Methanol and stir. Add the 2-Propanol and stir. Add the acetonitrile and stir. Add the Petroleum Ether and stir until solution is an even color. A clear, pale greenish-yellow solution will result. Transfer solution into a clean, dry, labeled 1 liter glass bottle with a screw top. This solution will last indefinitely. Solution left in a wash bottle will undergo evaporation which in time will decrease the shelf life.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

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4.6 PHOTOGRAPHY

Photography is a non-intrusive technique that is often vital to the preservation and documentation of latent prints.

Although it would be difficult to list each instance where photographic techniques should be applied, the following examples are meant to serve as a guideline for the Analyst.

Crime Scene Specialist/Interns/Volunteers should photograph latent prints in the following instances:

Whenever a print may be critical to the case.

When a print is visible

When a print appears to be in blood

Prior to lifting prints if there is concern there may be difficulty in making the lift

When a usable print is on an item that will be subjected to additional processing and there is a possibility of damaging the print

When prints are detected with fluorescent techniques

When prints are developed with chemical methods and it is possible the print will fade or disappear with time

MATERIALS AND EQUIPMENT

Camera.

Lens.

Filter(s).

Light source.

Scales(s).

Shutter release cable (optional).

Tripod or camera stand if necessary.

SAFETY CONCERNS

There is nothing in the photographic process itself that would endanger the crime scene specialist. However, the Crime Scene Specialist must use caution in handling the evidence being photographed.

SAFETY EQUIPMENT AND PROCEDURES

The Crime Scene Specialist is required to wear:

Gloves latex or plastic (when handling evidence).

Lab coat (when handling evidence).

PROCEDURES

Available Light Photography

Prepare the camera by selecting the appropriate:

Lens

Filters (if necessary, see NOTES and Fluorescent Photography for suggestions).

Select the correct camera settings for:

ISO/ASA

Exposure mode (usually "A" for aperture priority)

Lens aperture (f stop)

Refer to the camera manual if necessary.

Adjust the evidence and lighting source to provide the best image of the print. Examples of lighting techniques and when it is appropriate to use each technique follow in this Section.

Photograph the print(s). Place a scale in the photograph.

NOTE PAGE PHOTOGRAPHY

Photographs of evidence for evidence processing reports can be taken for note pages.

For other than homicide evidence, the original photograph will be saved to a designated computer under "Case Notes." The photographs will be saved under the case number and/or incident number by month and year they were taken. The photos are saved to a disc and secured.

For homicide evidence, the photographs will be saved to discs as "Master" and "Working Copy" "Note Disc," and will be barcoded and impounded to the Laboratory files as previously stated.

FLUORESCENT PHOTOGRAPHY

The basic procedures for this technique are similar to those of available light photography. What makes Fluorescent Photography unique is that it utilizes a laser (or high intensity light source) as the light source. It is conducted in a darkened area and a filter must be used that blocks particular unwanted wave lengths of light while allowing the desired light to pass through the filter so it may be photographed. The wavelength of light will determine what filter must be used to detect the fluorescence. For most wavelengths used in forensics, an orange filter is used. If the 570 nm wave length of the variable light source unit is used, a red filter is necessary.

Occasionally when examining or photographing prints on highly reflective surfaces, green light that interferes with the prints is detected. This interference can be deleted by adding an additional filter of the same color to the camera lens.

TIFF format with a digital camera will be used.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

More of a documentation process than an actual development technique, photography is used to document existing prints and should be utilized prior to and after each step of sequential processing.

NOTES

When photographing prints on round or uneven surfaces, close the aperture of the lens (a higher f stop) for a greater depth-of-field, making more or all of the print in sharp focus.

FILTERS

Color filters are used in black and white photography to create contrast by either darkening or lightening the prints or the background. To lighten a color use a filter closest to that color. To darken a color, a filter of the opposite color is used. The below chart can be used as a guide.

FILTER	DARKENS	LIGHTENS
Red	Blue & Green	Red
Blue	Red, Green & Yellow	Blue
Green	Red, Blue & Magenta	Green
Magenta	Green	Red, Blue & Magenta
Yellow	Blue	Red, Green & Yellow
Cyan	Red	Green, Blue & Cyan

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.7 CRYSTAL VIOLET (GENTIAN VIOLET)

Crystal Violet stains the fatty constituents of sebaceous sweat producing purple colored latents. The primary applications of this dye are for the visualization of prints on the adhesive side of tapes and on surfaces contaminated with grease or oil.

MATERIALS AND EQUIPMENT

Bottle of Crystal Violet

Tray to catch runoff

Tongs

Funnel to pour dye back into bottle

SAFETY CONCERNS

This dye is very toxic if swallowed or absorbed by the skin.

SAFETY EQUIPMENT AND PROCEDURES

The Crime Scene Specialist is required to wear:

When applying the dye solution:

Heavy duty gloves impervious to solvents

Lab coat

Goggles, if there is any possibility of splashing into the eyes

When examining:

Latex or plastic gloves

OTHER

Only apply in a well-ventilated area such as a fume hood

Processing must be performed near an eye wash station.

If spilled on skin, wash with cold water for a minimum of 5 minutes.

Whenever possible, articles processed with Crystal Violet will be placed in a plastic bag with a warning label.

PROCEDURE

1. Pour the dye into a tray. Pour a sufficient amount so the evidence can be covered with dye by moving the evidence around in the tray with tongs. (Preparation of dye follows at the end of this section).
2. Rinse off the excess dye under a trickle of cold running water.
3. Hang the evidence up and let it air dry.
4. Pour the remaining dye back into the bottle (if not contaminated).
5. Examine the evidence and photograph usable prints.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

Additional processing is not applicable after this technique has been used.

CONTROL

Sticky side of adhesive tape with latent print. This is will be tested per use and documented in the case notes. A violet color print will develop with a positive control.

NOTES

Basic Fushin (Rosalyne Chloride) is another dye that can be substituted for Crystal Violet. Basic Fushin has the added advantage of fluorescing under the illumination of lasers and light sources used for forensic examination. (See Fluorescent Examinations).

Distilled or nanopure Water Formula:

In a 200-250ml glass beaker:

1. Add 1.0 gram of Crystal Violet to 100ml distilled or nanopure water. The PH of the water should be between 7-8 for best results.

Clean glassware is essential for this solution.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.8 AMIDO BLACK

Amido black stains proteins found in blood. This solution is best used to develop or enhance prints containing blood on non-porous surfaces. Some porous materials can be processed with Amido black; however, considerable background staining can occur. Background color should also be considered as Amido black stains blood a blue-black color.

MATERIALS AND EQUIPMENT

Trays/Beakers

Amido black Working and Rinse Solutions

Photographic equipment

SAFETY CONCERNS

Amido black processing solutions all contain acetic acid which is a corrosive. Methanol which is toxic and highly flammable is also used in two of the three solutions.

Specific health hazards for Amido black are unknown; therefore, prevent contact with skin or mucous membranes and/or consumption.

SAFETY EQUIPMENT AND PROCEDURES

Prepare and apply in a fume hood

The Crime Scene Specialist is required to wear:

When applying or preparing solutions:

Gloves impervious to solvents

Lab coat

Goggles when there is any chance of splashing into the eyes

When examining:

Latex or plastic gloves

Lab coat

OTHERS

Items contaminated with blood should be handled in accordance with the Blood borne Pathogens Exposure Control Plan.

PROCEDURE

1. Prepare Working Solution of Amido black and Rinse Solutions.
2. Pour sufficient amount of Methanol into a clean, dry glass container to immerse the item, or area of the item, to be treated.
3. Place item, or area, into the Methanol for one hour. Cover container to prevent evaporation of Methanol. (If item size prohibits immersion, the impression should be heated with a lamp or fan heater for at least one hour).
4. Pour sufficient Working Solution into a clean, dry glass container to treat article. Pour a similar volume of Acetic Acid-Methanol Solution into a second container and an equal volume of Acetic Acid-Distilled or nanopure Water Solution into a third container.
5. Immerse article in Working Solution until finger prints become a blue-black color. This will take two or three minutes. Replenish solution as necessary. Discard used solution.
6. Immerse article in Acetic Acid-Methanol Solution. Rock container gently until excess dye has been removed from the background. Change solution if it becomes heavily contaminated with dye and discard after use.
7. Immerse article in Acetic Acid-Distilled or nanopure Water Solution. Rock container gently for 30 seconds. Change solution if it becomes heavily contaminated with dye and discard after use.
8. Allow articles to dry at room temperature.
9. Photograph any usable latent prints.

CONTROL

Acetate sheet with bloodstain. This is used per batch and documented in the reagent log. A blue/black colored print will develop with a positive control.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

Powders (see Notes)

Ninhydrin (Porous Surfaces)

Laser Light

Physical Developer

NOTES

Powders and Ninhydrin should be used prior to Amido black.

Photograph powder developed bloody prints, do not lift. Powder may be used after Amido black and then lifted.

Laser Light and Physical Developer should be used after Amido black.

AMIDO BLACK FORMULAS

WORKING SOLUTION

1 gm Naphthalene Black 12B or Naphthol Blue Black 10B

50 ml Acetic Acid

450 ml Methanol

Place Naphthalene in a clean, dry 1-liter glass beaker. Add the Methanol to the beaker. Add the 50 ml of Acetic Acid*. Stir with a magnetic stirrer for at least 30 minutes. A blue-black Working Solution will result. Transfer solution into a clean, dry, labeled 1-liter glass bottle with a screw top. This solution will keep for one year.

ACETIC ACID-METHANOL SOLUTION

100 ml Acetic Acid

900 ml Methanol

Pour Methanol into a clean, dry 2-liter beaker. Add Acetic Acid to the Methanol*. Stir with a plastic stirring rod. A colorless solution will result. Transfer solution into a clean, dry, labeled 1-liter glass bottle with a screw top. This solution will keep for one year.

ACETIC ACID-DISTILLED OR NANOPURE WATER SOLUTION

50 ml Acetic Acid

950 ml Distilled or nanopure Water

Pour Distilled or nanopure Water in a clean 2-liter glass beaker. Add Acetic Acid to the Distilled or nanopure Water. Stir with a plastic stirring rod. A colorless solution will result. Transfer solution into a clean, dry, labeled 1-liter glass bottle with a screw top. This solution will keep indefinitely.

*Always add acid to other chemicals. Never pour water or alcohols into any acid. This may cause a violent chemical reaction which could splatter back causing severe burns.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene if Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.9 STICKY-SIDE POWDER

Sticky-side powder is used to process the sticky-side of adhesive tapes and labels for latent prints. As with any chemical process, it is suggested to experiment on non-evidence items to become familiar with this process.

EXCELLENT RESULTS ON:

duct tape	masking tape	packing labels
Band Aid	plastic surgical tape	double-sided foam tape
paper-backed label	clear plastic tape	reinforced packing tape

GOOD TO FAIR RESULTS ON:

cloth surgical tape
frosted plastic tape
adhesive edge of 3M Post-it notes

POOR RESULTS ON:

black electrical tape (due to poor contrast)
some paper labels and tapes
labels with dried-out adhesives

The non-adhesive side of the tape should be processed prior to the sticky side.

The non-adhesive side may be processed carefully with Superglue and/or magnetic powder.

The use of cyanoacrylate fuming prior to using SSP does not inhibit the SSP from working.

Sticky-Side powder may be used after Gentian-Violet.

MATERIALS AND EQUIPMENT

Sticky-Side Powder

Photo-Flo 200

Water (Distilled or nanopure or Tap)

Small soft-bristled paint brush or camel hair fingerprint brush

Mixing jar

Dropper bottle

SAFETY CONCERNS

This procedure is relatively safe. The main safety concern is the inhalation of the powder.

PROCEDURE

Method #1:

Place about one teaspoon of Sticky-Side Powder in a shallow jar.

Fill a dropper bottle half full of water and half full of Photo-Flo 200. Shake well. Using the dropper, add this solution to the powder in the shallow jar until you have a solution with the consistency of thin paint.

Use a small brush or camel hair fingerprint brush to "paint" the liquid mixture onto the adhesive side of the tape or label.

Leave it on for 10 to 15 seconds and then rinse it off with water. The tape can be rinsed under running water, but the preferred method is to gently agitate it in a bowl of water.

When most of the solution is rinsed off of the tape or label, examine it. Photograph any developed prints.

If the solution is left on too long, it becomes difficult to rinse off. The solution will adhere too strongly to some tapes and labels. The solution may be applied but it must be rinsed immediately. The other alternative is to use Method #2 for these types of tapes and labels.

Photograph any developed prints (see last paragraph).

Method #2:

A second method for processing adhesive tapes and labels which are not suitable for the painting process, is a soaking process. Add some Sticky-Side powder to a bowl or tray of water. The rinse water left over from Method #1 can be saved and used for this method.

Agitate the bowl of water to stir up the Sticky-Side powder and submerge the tape pieces or labels with the sticky side up.

Allow the floating particles of Sticky-Side powder to settle on the tape. This process may take some time to develop the latent prints. The resulting prints may also be rather faint.

Photograph any developed prints (See 'Notes').

Method #3:

A third method for processing adhesive tapes and labels is by putting the Sticky-Side Powder solution in a jar with a lid.

Shake or agitate the content of the jar until the solution turns into soap suds or foam.

Slowly emerge the tape into the foamy solution and allow the solution to saturate or cover the tape for 10 to 20 seconds.

Rinse the tape thoroughly with cold running tap water.

The solution can be saved and re-used.

CONTROL

Sticky side of adhesive tape with latent prints. This is documented in the case notes per use. A black or white colored print will develop with a positive control.

NOTES

SSP is believed to stick to lipids (fats) or salts and/or skin cells, much like Gentian Violet.

Sticky-Side Powder may be applied several times to enhance the contrast of the print.

Overdevelopment can sometimes be removed on some tapes by rinsing off with a strong stream of water.

When photographing the SSP-developed fingerprints, the use of an ALS or laser will quite often enhance the prints. Since the SSP absorbs light (much like Ninhydrin does), the print might be enhanced by causing the background to fluoresce, creating more contrast between the print and the background.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

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4.10 COOMASSIE BRILLIANT BLUE R250

Coomassie Blue is a protein stain used to enhance blood prints on both porous and nonporous surfaces. Following the staining of bloody prints no serological analysis can be performed; therefore, any serology sample must be removed from the item prior to processing for latent prints.

MATERIALS AND EQUIPMENT

Trays/Beakers/Spray Bottles

Coomassie Brilliant Blue working and rinse solutions

Photographic equipment

SAFETY CONCERNS

Coomassie Brilliant Blue processing solutions all contain acetic acid, which is a corrosive. Methanol is toxic and highly flammable. It is used in both solutions.

SAFETY EQUIPMENT AND PROCEDURES

The Crime Scene Specialist is required to wear:

When Examining:

Latex or plastic gloves impervious to solvents should be worn.

Lab coat should be worn.

Goggles when there is any chance of splashing into the eyes.

Prepare solutions in a fume hood.

Items contaminated with blood should be handled in accordance with the Blood borne pathogens exposure control plan.

PROCEDURES

Items, depending on size, can either be dipped or sprayed with this process. Coomassie Brilliant Blue process consists of a two part processing procedure. The first being the developer solution, the second being the de-staining solution.

CONTROL

Acetate strip with known blood stain. This is tested per batch and logged into the reagent log. A blue colored print will develop with a positive control.

COOMASSIE BRILLIANT BLUE FORMULAS

Developer Solution:

4 grams of Coomassie Brilliant Blue R250

40 ml Glacial Acetic Acid

200 ml of Methanol

200 ml of Distilled or nanopure Water

De-staining Solution:

40 ml Glacial Acetic Acid

200 ml of Methanol

200 ml of Distilled or nanopure Water

Always add acid to other solutions. Never pour water or alcohols into any acid. This may cause a violent chemical reaction which could splatter and cause severe burns.

ADVANTAGES

Can be used after Laser, Superglue, and Powders on non-porous items of evidence.

Can be used after Laser, DFO, and Ninhydrin on porous items of evidence.

Very good shelf life of approximately six (6) months.

Article can be reprocessed to enhance reaction if necessary.

DISADVANTAGES

Not as sensitive as Amido Black.

No serological examination can be conducted after this process is used.

The background cannot be readily de-stained on porous items.

Sometimes the reaction will fade after heat is applied or items are air-dried.

Fresh blood must be fixed or air-dried before processing.

Will not develop palmar sweat latent prints.

Care must be exercised to avoid destruction of some painted surfaces. Spot testing should be conducted.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.11 DOCUMENTATION, COLLECTION, & PRESERVATION OF FOOTWEAR IMPRESSIONS

DOCUMENTATION

Photographs should be taken of the general area.

After the impression is documented with measurements, it must be photographed with TIFF quality images before it is cast. If a trail of multiple impressions is going to be photographed, lettered placards should be placed next to each impression.

When photographing an impression it is best to mount your camera on a tripod. Be sure the camera lens is parallel with the surface of the impression.

Place a 90° ruler next to the impression.

Place a compass or a directional indicator next to the shoe print to indicate which direction is north. Be sure to include an item number if you are going to cast the print.

When photographing the print, hold the strobe at an oblique angle. Take twelve photographs using the strobe on a different side of the impression each time.

CASTING THE IMPRESSION

Before an impression is cast, it may be necessary to build a dam around the impression to contain the "die stone" mixture.

A thin layer of hair spray may be carefully applied before casting. This will help harden the impression before the "die stone" is applied.

Add 12 oz. (one soda can) of water to a pre-measured zip-lock bag of "die stone". Squeeze the bag until the "die stone" is thoroughly mixed (the mixture should have the consistency of pancake batter).

Begin pouring the mixture to one side of the impression allowing it to flow into the impression. Never pour the mixture directly into the impression.

Before the casting has completely hardened, scratch the necessary information on the top side of the cast- such as your initials, date, north direction, and item number.

After the "die stone" has dried, it should be lifted out of the ground. Do not wash or clean the soil or debris from the casting at this time.

After transporting to the laboratory let the casting air dry for at least 48 hours before final packaging.

Package the casting in a porous container such as a cardboard box.

See next method for Electrostatic Dust Lifter.

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4.12 ELECTROSTATIC DUST PRINT LIFTER

PROCEDURE

Locate the print by using oblique lighting.

Wipe the lifting film with the static neutralizer supplied in the kit.

Place the lifting film over the suspected print with the metalized side up.

Plug the ground lead into the Power Unit. This is the alligator clip or the telescoping wand, depending which unit is being used.

Place the telescoping wand approximately 1" away from the lifting film. If the print is being lifted from paper or fabric, use the ground plate and alligator clip.

Turn the "voltage-adjust" knob to the low setting.

Push the "on/off" button to turn the unit on. The red light will glow when the unit is turned "on".

Touch and hold the probe on the lifting film until the film lays flat. To accomplish this, the voltage can be increased, as needed, by twisting the "voltage adjust" knob.

Smooth the film by using the roller that is in the kit.

Turn the Unit "off" and wait for the charge to dissipate.

Remove the film and examine with oblique light.

Tape the film to a piece of cardboard and place in the storage box for transportation.

The lifted print should be photographed by using oblique lighting and then fixed with hair spray when possible.

CONTROL

Check the operation of the Electrostatic Dust Print Lifter before each use with a control following the steps below:

1. Apply dirt or dust to a shoe.

2. Touch that shoe to the same type of surface you are going to use the Electrostatic Dust Lifter on.
3. Lift the control print you created with the Electrostatic Dust Print Lifter.
4. Document in your notes that you tested the Electrostatic Dust Print Lifter and what the results of the control test were.
5. A dust print will develop on the film with a positive control.

REFERENCES

1. U.S. Department of Justice Federal Bureau of Investigation Laboratory Division
Processing Guide for Developing Latent Prints
Revised 2000
2. Scene of Crime Handbook of Fingerprint Development Techniques
Police Scientific Development Branch
Home Office London
1993 Edition

4.13 METAL DETECTORS

Metal detectors are used to locate hidden/buried metal items that could be important evidence that would have otherwise been overlooked.

MATERIALS AND EQUIPMENT

Metal Detector #1: Garrett CSI 250 with serial number “5216448.”

Metal Detector #2: Garrett CSI 250 with serial number “5216443.”

PROCEDURE

1. Turn on the metal detector.
2. Check to insure the metal detector is working by holding it close to a metal object, you should hear a beeping sound.
3. If the metal detector does not turn on or you don't hear the beeping sound, change the battery and retest (ensure you are using a metal item as your control).
4. Move metal detector over area you are searching.
5. You must include the following information in your case notes when using a metal detector:
 - a) Which metal detector you used.
 - b) That you tested the metal detector and the control was positive.
 - c) The area that you search using the metal detector.

CONTROLS

A binder clip is included in each metal detector notebook. This clip can be used as the control to make sure that the detector is working.

You should hear a beeping sound as you run the detector over the clip.

REFERENCE

For further instruction see the operation manual for the specific metal detector you are using.

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4.14 VACUUM METAL DEPOSITION

Vacuum metal deposition (VMD) is used to process most smooth non-porous surfaces, particularly plastics and packaging material like polyethylene. Experimentation should be done with non-evidence items to see how it works on different surfaces.

EXCELLENT RESULTS ON:

Plastics, films, negatives, glass, smooth metal, smooth leather surface, wax paper, fine smooth fabrics and paper money.

POOR RESULTS ON:

Rough surfaces, heavily contaminated surfaces.

MATERIALS AND EQUIPMENT

VMD Chamber

Gold

Zinc

Acetic acid

SAFETY CONCERNS

This procedure is relatively safe. Precautions should be taken when cleaning chamber to avoid the zinc dust and any biohazards from the evidence. Acetic acid is used for cleaning the windows.

PROCEDURES

START-UP AND PROCESSING

Turn on water and air. Check indicator lights.

Turn on POWER, MECHANICAL PUMP, and DIFFUSION PUMP switches

OPEN the locked panel that has the key – the toggle switches inside are labeled

Flip the first toggle to MANUAL mode

Flip the VENT toggle UP and LOOSEN DOOR DOGS

Flip the VENT toggle DOWN after the door opens

Load Gold, Zinc, Evidence, and Control

Close door and TIGHTEN DOOR DOGS

Flip the ROUGH toggle UP

When the “Chamber TC Pressure Gauge” reaches approximately 120 mili torr

Flip the ROUGH toggle DOWN

Flip the FORELINE toggle UP

Flip the HIVAC toggle UP

When the “Chamber Pressure” gauge reads 10^{-4} or higher

Turn on the SOURCE POWER switch to the metal sources

Flip “Side Select” toggle to LEFT (gold source)

Turn POWER CONTROL knob to vaporize gold

(Wear protective goggles when viewing)

Turn off SOURCE POWER switch

Flip toggle to RIGHT (zinc source)

Turn on the SOURCE POWER switch to the metal sources

Turn CHAMBER LIGHT on

Turn POWER CONTROL knob to vaporize zinc

(Maintain current level of 19amps on "CURRENT" display screen)

View the control card during the zinc phase and quickly turn off current when control card begins to darken. (SOURCE POWER switch OFF or turn POWER CONTROL knob OFF)

Turn CHAMBER LIGHT off

Flip toggle to LEFT (gold source)

Turn on the SOURCE POWER switch to the metal sources to burn off zinc

Wait 60 seconds for zinc beads to cool

Flip HIVAC and FORELINE toggles DOWN

Flip VENT toggle UP and LOOSEN DOOR DOGS

NOTE: Some prints will fade, so photographs should be taken as soon as possible.

This method can interfere with Forensic Examination for handwriting, ink, paper and indented impressions, body fluids, fibers, hairs and paint.

CONTROLS

Make a fresh test print on the test strip and place into the VMD chamber for simultaneous development with the evidence.

Used test strips are collected in the chemical waste container and disposed of through the hazardous chemical waste collection.

A grey/silver colored print will develop with a positive control.

SYSTEM SHUT DOWN

Close door and tighten door dogs

Flip ROUGH toggle UP until VACUUM INTERLOCK indicator light goes on

Flip ROUGH toggle DOWN

Turn DIFFUSION PUMP switch OFF

Wait 20 minutes for the pump to cool

Turn POWER switch OFF

Turn MECHANICAL PUMP switch OFF

Turn off the water and air

CLEANING THE VMD CHAMBER

Prepare a 25% solution of Acetic acid by mixing one (1) part of Acetic acid to three (3) parts of water (3:1).

Apply a small amount of acidic acid to a paper towel. Wipe the inside of the viewing ports and the glass light covers until metal coating is removed.

PREVENTIVE MAINTENANCE

The VMD will normally receive annual preventive maintenance. This maintenance generally consists of the following: cleaning windows, cleaning boxes, cleaning lights, checking for leaks (air, water, and oil), checking oil level in mechanical pump, and (if necessary) changing the oil in the mechanical pump.

The Crime Scene Specialist or Technical Support person who does the maintenance is required to fill out the maintenance log. The log information will include; date, initials, ID number, and a check off of the above mentioned maintenance items.

REFERENCE

1. Vacuum Metal Deposition Fingerprint Recovery System FPRC-24B, Steve Todd

4.15 CYANOACRYLATE (SUPER GLUE) FUMING CHAMBER “MVC5000”

Superglue fuming (also known as Cyanoacrylate or CA fuming) is a well-established method for developing latent fingerprints on a wide range of items collected from a crime scene.

The superglue fuming technique involves exposing the items to a high concentration of both superglue vapor (Ethyl Cyanoacrylate) and water vapor. In such an environment, the individual molecules in the superglue vapor (the monomer) have a tendency to link together, or polymerize, on any surface to form a solid white deposit (the polymer). This tendency to polymerize, however, is greatly enhanced on the trace deposits, which make up the latent fingerprint. The fuming technique, therefore, has the effect of revealing or developing the fingerprints as a visible white print, which is suitable for further examination.

Constant good results require that the operating conditions are closely controlled. Equally important, in order to protect the operator from harmful exposure to superglue vapor, certain precautions need to be observed.

MATERIALS AND EQUIPMENT

Cyanoacrylate liquid

Cyanoacrylate aluminum foil dish

Cyanoacrylate chamber with proper distilled or nanopure water levels

Plastic squeeze bottle with distilled or nanopure water

SAFETY CONCERNS

Cyanoacrylate fumes will irritate the mucous membranes. In the glue form, it will bond skin and skin to other objects. Extreme heat can create cyanide gas. The chamber is equipped with a self-extracting (purge) system that will remove all vapors prior to opening the door. This purging system is good for 80 cycles. The cycles are displayed on the viewing screen in the door.

SAFETY EQUIPMENT AND PROCEDURES

The Crime Scene Specialist is required to wear:

Gloves – latex or plastic

Lab coat

A dust mask should be worn when changing carbon filters

PROCEDURES

When opening the Cyanoacrylate (CA) fuming door, press the blue OPEN DOOR button, then turn the door handle clockwise (vertical) from its horizontal position. The door will unlock for 6 seconds, and will then beep every 7 seconds while the door is open. When closing the door, close and turn the handle back to the horizontal position and then press down on the handle making sure the viewing screen shows DOOR CLOSED.

CARBON FILTERS

The internal Computer system will alert the user that the two carbon filters in the door need to be changed. This occurs approximately every eighty runs.

The Crime Scene Specialist or Technical Support person who changes these filters is required to fill out the maintenance log, which should be attached to the chamber. The log information will include; name, ID number and the date the filters were changed.

START-UP AND PROCESSING

Turn on the POWER SUPPLY, (the PSU5000 on the floor at the right side of the cabinet). This unit will normally remain on at all times.

Turn on the green CABINET POWER button on the door.

Wait for the 10-minute purge as the cabinet clears out any CA fumes. If the cabinet has been operating and is in the standby mode, it will purge itself every 10 minutes and then door will open immediately.

Load the evidence making sure not to touch the glass or allow any strong impacts of the evidence and glass. The bottom platform will hold up to 400 pounds. There are 4 shelves on each side, holding up to 40 pounds each. Large items, such as household doors, should be propped against the metal bar permanently attached to the back wall. Other items can be hung on the sliding bars located at the top of the cabinet.

The door is neither self-closing nor self-locking so there is no danger of becoming trapped inside the cabinet.

The Humidifier Water Tank is located on the door. When installed, it is filled with 3.5 liters of distilled or nanopure water. The viewing screen of the door will indicate when water needs to be added. Remove the white plastic bung and fill with the water. Take care not to spill water onto the filter units or glue heater located under the tank. Replace the plastic bung.

Place the control on the "S" shaped metal hook and hang on shelf close to the front glass to monitor the gluing.

Fill the aluminum foil glue dish with 4 grams of liquid glue. 4 grams should adequately cover the entire bottom of the dish. Larger amounts of glue (6 grams) can be used when filling the cabinet with multiple items. Select a new and clean dish from the box and flatten the bottom. Never reuse a dish as dangerous gasses will form.

Place the glue dish containing the superglue on the heater plate, which should be clean and free from carbon dust or polymer deposit. Cover the dish with the weighted ring to assure proper heat coverage for the glue.

Close the door and return the handle to its horizontal position. Press down on the handle to insure it locks and the Door Closed indicated on the viewing screen.

Push the blue AUTO CYCLE for the gluing process to start. The white HALT button can be pushed to stop the process prior to the heating of the glue and the cabinet will stop the process and allow the door to open. Once the gluing process starts, the cabinet must go through the 40-minute purge cycle before it will allow the door to be opened.

When the process is complete and the viewing screen indicates that you can open the door, remove and discard the aluminum glue plate.

Remove evidence, view and complete the fingerprinting process.

CONTROLS

Place a fresh print on an acetate sheet and place the sheet into the cabinet for simultaneous development with the evidence.

The control used should match the surface of the evidence being processed. A white colored print will develop with a positive control.

THE TREATMENT CYCLE

Humidify cycle: Water is evaporated from the internal humidifier tank to raise the relative humidity inside the cabinet to an adequate level (normally 80%). This may take 5-15 minutes depending on the number and type of items loaded in the cabinet and the ambient humidity.

Glue cycle: Superglue is vaporized by heating the glue dish and allowing the polymer to deposit on the latent fingerprints. This will take 15 minutes unless you enter different glue cycle time in the setup menu (between 10 and 80 minutes). The glue dish will be heated to, and then maintained at, a temperature of 120°C throughout the glue cycle. The humidifier will continue to operate to maintain the humidity at an adequate value.

Purge cycle: The concentration of airborne superglue vapor in the cabinet is reduced to a safe level by circulating the air through activated carbon filters. This will take 40 minutes. If there is a fault in one of the purge fans/filter units, a double purge cycle of 80 minutes will be performed.

AUTO OR MANUAL

The control system of the cabinet allows the unit to be used in the auto or manual treatment cycle.

Auto mode: After you have started the treatment cycle by pressing AUTO CYCLE, it runs to completion without any further intervention. The auto treatment cycle can be halted at any time by pressing HALT.

Manual mode: The separate process cycles (humidify, glue and purge) must be started by pressing the HUMIDIFY CYCLE, GLUE CYCLE, and PURGE CYCLE buttons in turn, at the correct time.

The manual treatment cycle can be halted at any time by pressing HALT. The manual cycle offers the operator a more flexible method of ensuring satisfactory development of fingerprints.

CHANGING THE GLUE CYCLE TIME

If you wish to change the glue cycle time CT from its initial setting of 15 minutes, you can enter any value between 10 minutes and 80 minutes. To enter a value of CT, proceed as follows:

Press MENU to enter the setup menu. The screen display shows Setup Menu – Glue Time – CT. Press the ↑ to increase the value of CT or press ↓ to decrease CT. When you are satisfied with the selected value press MENU. The screen display shows Setup Menu – Exit. Press the ↑ or ↓ to exit the setup menu and return to standby mode. READY will display on the viewing screen.

The 40 minute purge cycle is enough to purge 14 grams of glue from the chamber. Therefore, no additional time should be added on this cycle.

TYPICAL SCREEN DISPLAY

The top line of the screen explains the process running and total time. The bottom line explains the time remaining, temperature, and humidity.

1. Ready
2. After pressing AUTO CYCLE
3. Initializing (fans will start)
4. Auto. Humid 15
07:35 25C RH56
5. Auto Glue CT
15:00 120C RH80
6. Initializing
7. Full purge 40
40:00 30C
8. Ready (to open door)

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING

Photography (to document and preserve).

Dye staining.

Fluorescent examination.

Powdering (to create contrast).

Lifting (after powdering and photographing).

CLEANING THE GLASS

When cleaning the glass inside the chamber, use a Windex type of cleaner and paper towels. The WypAll brand type of towel should not be used inside the chamber because they do not remove all the moisture that paper towels will. When wiping down the glass you want to hear a “squeak”. This insures it is clean and free of moisture. When the glass is clean, the CA fumes have nothing to attach themselves to so cleaning will be less frequent.

SPECIAL NOTICE

Changing the carbon filters and the humidifier wick must be done at the proper intervals. Refer to the manufacturer’s instructions in the user guide to perform these operations.

NOTES

The MVC5000 in the auto mode will normally develop most prints. It is recommended by the manufacturer to keep a log of the different items processed that require longer or shorter CT development times. This will save time for others using the chamber in the future.

The walls in the chamber are made of double laminated glass. Extra care not to touch or impact them with evidence or other items should be given.

The viewing screen on the door will indicate any faults detected and display that fault so corrective measures can be taken.

REFERENCE

1. Mason Vectron Forensic Science Equipment MVC5000 Instruction Manual & User Guide.

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4.16 COLLECTION OF BIOLOGICAL STAINS OR GENERAL DNA SWABBING

MATERIALS

Plastic dropper bottle filled with distilled or nanopure water.

Cotton tipped swabs with a wood base.

Two sizes of small manila envelopes (one fitting within the other) or cardboard swab storage box (a paper bindle may also be use).

Gloves, mask, and lab coats must be worn when swabbing items in the laboratory for possible DNA evidence.

A hood is available for collecting DNA swabs and is highly recommended when possible.

Collection of biological stains including blood, semen, and saliva.

PROCEDURE

Being careful not to touch the swab with the dropper bottle, place one-two drops of water on the end of a sterile cotton swab. It may not be necessary to wet the swab if the stain is still wet. When wetting the swabs with distilled or nanopure water, enough water will be applied to the swabs to make them moist but not so much that the swabs are soaked.

Collect small stains using the very tip of the swab. Do not roll the swab. The small amount of material should be concentrated at the tip of the swab. Collect large stains by rolling the swab in the stain so that a large amount of stain is collected on the swab. Place the swab in the smaller of the two manila envelopes or paper bindle. The wooden stick may have to be partially broken off. Place the smaller manila envelope or paper bindle containing the swab inside the second larger manila envelope. The larger manila envelope should have all the necessary information concerning the collection of the swab. Alternatively the swab may be placed in a cardboard swab box. The box should also be labeled with all the appropriate information and placed into a manila envelope.

REMARKS

Control swabs of a stain free area should be collected whenever circumstances warrant their collection (see below for guidelines).

Stains will only be collected with swabs at crime scenes if the stained substrate itself cannot be collected (e.g. stain of pavement or structure).

Collection of general DNA swabs from firearms, tools, etc.

PROCEDURE

Being careful not to touch the swab with the dropper bottle, place one-two drops of water on the end of a sterile cotton swab. When wetting the swabs with distilled or nanopure water, enough water will be applied to the swabs to make them moist but not so much that the swabs are soaked.

Collect general DNA swabs by vigorously rubbing/rolling the swab on the area thought to contain DNA so that a large amount of material is collected on the swab.

Place the swab in the smaller of the two manila envelopes or paper bindle. The wooden stick may have to be partially broken off. Place the smaller manila envelope or paper bindle containing the swab inside the second larger manila envelope. The larger manila envelope should have all the necessary information concerning the collection of the swab. Alternatively the swab may be placed in a cardboard swab box. The box should also be labeled with all the appropriate information and placed into a manila envelope.

REMARKS

Swabbing an item for DNA prior to other processing: Items with textured areas that are not likely to yield usable latent fingerprint evidence should have those areas swabbed for DNA prior to any other processing of the item. A sticker will be placed on the evidence packaging indicating that the swab has been collected.

Fingerprint processing prior to DNA swabbing: Items that have a large amount of smooth areas that may yield usable latent fingerprint evidence should be processed for latent prints prior to swabbing for DNA. Any small areas unsuitable for latent prints can be swabbed for DNA prior to latent print processing. If an item is to be swabbed for DNA after fingerprint processing, then a new brush and clean powder will be used. The swabbing of the small areas prior to latent print processing should not preclude swabbing of the remaining areas

for DNA after print processing. The intent is to collect potential DNA evidence from as much of the

surface of the item as possible while maintaining the integrity of that potential DNA evidence. A sticker will be placed on the evidence packaging indicating that the swab has been collected.

On Property Crime cases which involve multiple items in one container: If there are more than three items in the container, the examiner will pick the three items the examiner believes will result in the best DNA profile and will process them for DNA and prints using a new brush, clean powder and separate swabs for each of these items. The rest of the items in the container should be processed together using one brush and the same powder and will not be swabbed for DNA unless specific circumstances exist.

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4.17 USE OF THE POLILIGHT PL500 ALTERNATE LIGHT SOURCE

MATERIALS

Polilight PL500 Alternate Light Source

Orange and yellow goggles or filters

PROCEDURES

Note: The Polilight PL500 is a high intensity light source, which if used inappropriately has the potential to be a hazard to the eyes and skin. Users should use the Polilight PL500 with the awareness that both their own eyes and skin, and those in close proximity should be protected at all times. Even with protective goggles exposure time needs to be considered.

Make sure the light guide with black focusing lens is connected to the Polilight unit.

Place the Polilight PL500 on a solid surface and turn the power switch on back panel to the up (ON) position. Ensure the air flow around the unit is not obstructed.

Conduct a quality control check of the Polilight PL500 using known biological fluid stains prior to examining evidence: The biological fluid will fluoresce with a positive control.

The known biological stains will be checked with all wavelengths desired in the examination (the 450 and 490 nm wavelengths are recommended for most evidence items) and the results of the quality control check will be recorded in the case notes.

Filter tuning is achieved by using the wavelength specific numerical buttons located on the front control panel or on the hand held remote control box. (See the figures below)

Once a filter has been selected it can be fine-tuned. Fine tuning will decrease the wavelength and is used to optimize illumination conditions for specific materials. The fine tuning has a range from t0 - t40.

Figure 1

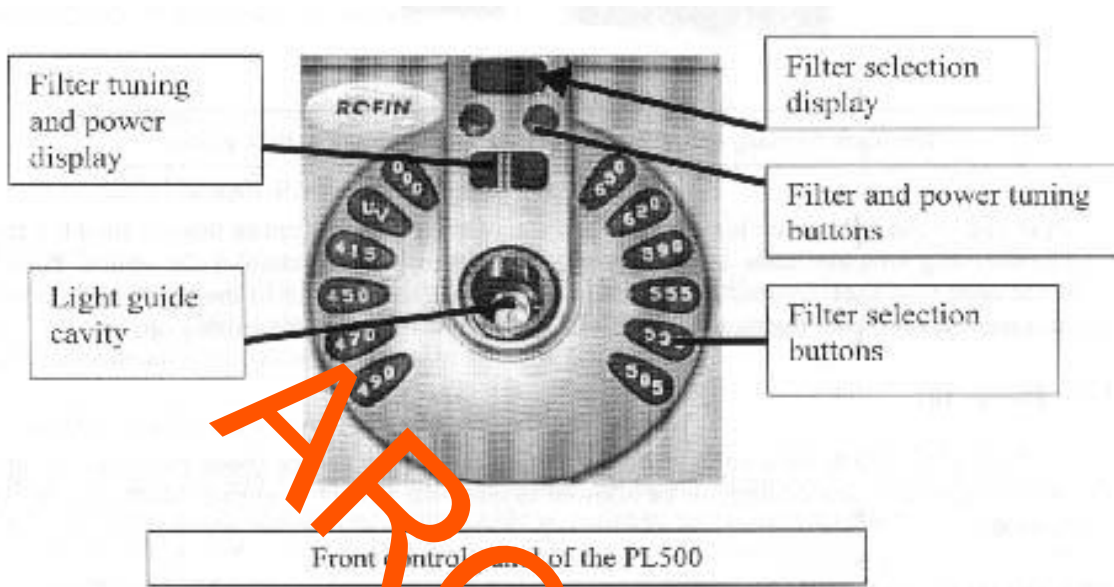
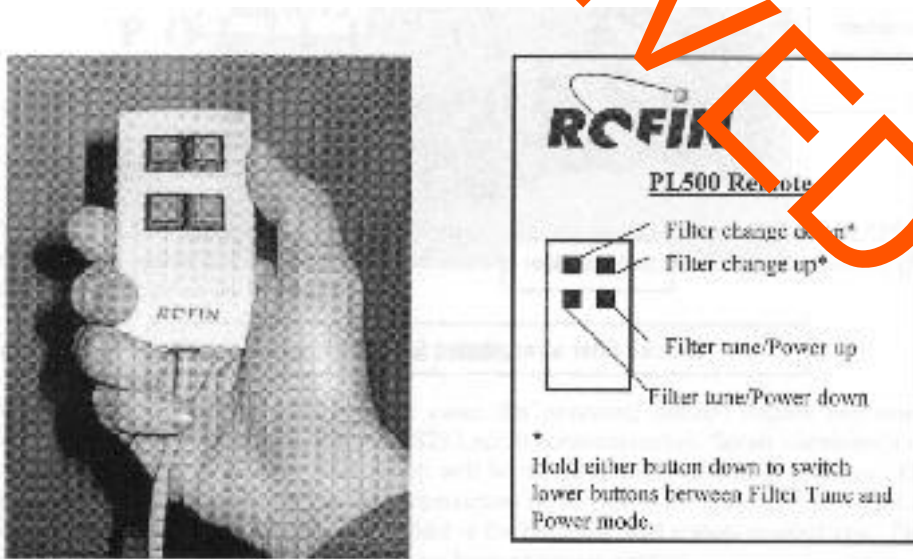


Figure 2



PL500 Hand held remote control. (User instructions are printed on the rear side)

Once a filter has been selected the intensity can be tuned by changing the power setting. The power setting has a range from P1 (lowest power) - P8 (highest power).

Systematically pass the light over the entire item to be examined. A fluorescent area may indicate the presence of a body fluid stain. Note the area for further testing.

Once the examination is complete, turn the power switch on back panel to the down (OFF) position.

Secure the Polilight PL500 by either placing it on a stable surface or removing the power cable, remote control, and liquid light guide from the main unit and placing them in the carrying case.

REFERENCES

1. Auvdel MJ. Comparison of Laser and High-Intensity Quartz Arc Tubes in the Detection of Body Secretions. J Forensic Sci. 1988 Jul;33(4):929-45.
2. Rofin Australia Pty. Ltd. POLILIGHT PL500 (Version 2) Multi-Waveband Tunable Light Source Instruction Manual

4.18: DFO (1,8-DIAZAFLOUREN-9-ONE)

DFO is a Ninhydrin analogue that reacts with the amino acids present in latent print residue. Like Ninhydrin, DFO is used to develop prints on paper. In some early testing DFO has been found to develop more prints than Ninhydrin, however, the results obtaining with DFO have been somewhat inconsistent. The inconsistency, along with the increased costs, time, and effort in processing, has kept DFO from being used more widely.

MATERIAL AND EQUIPMENT:

Laser or High Intensity Light

Source. DFO solution.

Dry heat source

Photographic system

SAFETY CONCERNS:

Very little research has been conducted on the safety of DFO. Since it is an amino reactant it should be treated the same as Ninhydrin.

SAFETY EQUIPMENT AND PROCEDURES:

The Crime Scene Specialist is required to

wear: When applying the solution:

Gloves impervious

to solvents Lab coat

Goggles when there is any possibility of splashing in the eyes

When examining:

Laser goggles during the examination

Latex or plastic gloves during the examination

OTHER:

Processing will be conducted in a fume hood.

Processing will be performed near an eye wash station.

Whenever possible, articles processed with DFO will be placed in a plastic bag with a warning label.

PROCEDURE:

Prepare the DFO solution. (The formula will follow at the end of this Section).

Dip the evidence into the DFO solution.

Allow the evidence to air dry. Greater success has been reported when the dipping and drying process is repeated. (If the evidence is dipped twice, let it air dry between applications).

Dry heat may be used to expedite development.

Examine the evidence with the laser or high intensity light source using the appropriate filters. DFO prints are not usually visible in room light.

Photograph any prints that can be detected (See Photography Section).

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING:

Ninhydrin (with extremely limited results)

Physical Developer (possibly, testing not complete).

CONTROL:

A positive control will be run with casework.

4.19: PHYSICAL DEVELOPER

Physical Developer reagent contains silver ions that react with the fatty deposits of sebaceous sweat to form dark grey images of latent prints. Physical Developer is used after Ninhydrin to develop additional prints, especially on papers that have been subjected to moisture. When papers get wet, the amino acids that Ninhydrin reacts with will usually be diffused or completely washed out. However, the fatty deposits that Physical Developer reacts with are not water-soluble and will still be present when previously wetted papers are processed for latent prints. This is the only successful method of developing latent prints on paper that has been wet.

MATERIALS AND EQUIPMENT:

Treys

Tongs

Physical Developer and related solutions

Blotters or papers to set articles on while they dry

SAFETY CONCERNS:

Different ingredients in the Physical Developer solution are classified as corrosive, toxic and as irritants. However, when safety precautions are followed there is no known health hazard when Physical Developer is used properly.

SAFETY EQUIPMENT AND PROCEDURES:

The crime scene specialist is required to wear the following when applying the solution:

Gloves impervious to

solvents Lab coat

Goggles when there is any chance of splashing into the eyes

When examining:

Latex or plastic gloves

OTHER:

Processing must be performed near an eye wash station.

Whenever possible, articles processed with Physical Developer will be placed in a plastic bag with a warning label.

PROCEDURE:

After processing with Minhydrin and photographing prints already developed:

Mix enough chemicals to cover the article being processed.

Pour chemicals into a glass dish.

Submerge article in solution until saturated (the time will vary).

Remove article and rinse carefully with cool tap water.

Hang the article in the hood to dry.

Photograph any prints that develop.

This procedure can be repeated if necessary.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING:

Physical Developer is the last method to use in processing porous surfaces.

CONTROL:

Wet paper with latent prints. This will be tested per use and documented in the case notes.

NOTES:

Faint prints may be improved by reprocessing.

A thorough rinsing process is necessary to remove excess chemicals to limit background development.

Physical Developer will also develop impressions left by some rubber gloves and soles of shoes.

Prints may develop at different speeds, so after the first prints develop continue the immersion process in the Physical Developer Solution as long as additional prints continue to develop or the background begins to darken.

PHYSICAL DEVELOPER FORMULA (WORKING SOLUTION)

Commercially prepared solutions are available. These solutions will save considerable preparation time. These solutions are available from Lightning Powder Co.

1. Place Part 'A' (5ml) in a clean 100 ml glass beaker.
2. Add Part 'B' (90 ml).
3. Stir until thoroughly mixed.

REFERENCES:

1. User Guide to Physical Developer; S.A. Hardwich User Guide 14-81, Home Office Scientific Research and Development Branch, December 1981.
2. Physical Developer - An Evaluation and Some Modifications; Barry Rimmer and Harold Tuthill, Identification Canada October 1989.
3. Fingerprint Development Techniques, Home Office Scientific Research and Development Branch.

4.20: SMALL PARTICLE REAGENT

Small Particle Reagent (SPR) is a suspension of Molybdenum Disulphide particles that adheres to the fatty constituents of latent print deposits to form a grayish deposit.

The practical applications of this method of development are limited. SPR is usually used on wet non-porous items only when it is not practical to let these items air dry and employ other more efficient methods of latent print development.

MATERIALS AND EQUIPMENT:

Spray bottle of Small Particle Reagent.

Lifting tape

Lift cards

Scissors

SAFETY CONCERNS:

Small Particle Reagent is not believed to present any health hazards

SAFETY EQUIPMENT AND PROCEDURES:

When handling SPR the Crime Scene Specialist should wear:

Gloves (latex or plastic)

Appropriate coveralls in the field

Goggles if there is any possibility of splashing in the eyes

PROCEDURE:

SPR can be dipped or sprayed. Dipping would be the preferred method in the lab, however, since air drying and the utilization of other techniques is more conducive to print development, we would not use SPR in the lab. Therefore, this procedure is written for possible use in the field in inclement conditions where spraying would be the only alternative.

Mix 30 grams of Molybdenum Disulphide and 1 drop of Photo Flo with 1 liter of distilled or nanopure water.

Pour into a spraying device with an adjustable nozzle.

Shelter the area to be processed from direct rainfall.

Shake the container of SPR to assure the particle matter is suspended (the SPR mixture follows at the end of this Section).

Spray the area being examined.

Photograph usable prints.

After the area has dried you may be able to lift the print.

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING:

This technique is considered as a "last resort" technique on wet evidence so there is little or no documenting on additional techniques to use after SPR. However, if the evidence can later be moved to the lab and dried, other techniques such as powdering and cyanoacrylate fuming could possibly detect prints.

CONTROL:

Latent print on acetate that is wet. This is tested per use and documented in the case notes.

NOTES:

If after an application of SPR faint prints insufficient for identification appear, an additional treatment may enhance the latent prints.

REFERENCES:

1. Home Office, Scientific Research and Development Branch
2. Lightning Powder Company, Directions to SPR Kit.

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4.21: INHERENT LUMINESCENCE

Inherent Luminescence occurs when trace elements of latent prints luminesce from laser light naturally without any processing. Very few prints will exhibit this trait. Prints that may luminesce inherently are prints left in some type of contamination, particularly body fluids.

MATERIALS AND EQUIPMENT:

Laser or High Intensity Light Source.

Photographic system.

SAFETY CONCERNS:

None other than the possible injury to skin and the eyes from the laser light.

SAFETY EQUIPMENT AND PROCEDURES:

The Crime Scene Specialist is required to wear:

Gloves - latex or plastic

Lab coat

Laser goggles

PROCEDURE:

1. Examine the evidence with the laser or high intensity light source. If a light source with multiple wavelengths of light is available, the evidence can be viewed under each wavelength with the appropriate filter.
2. Photograph any prints that are detected (see Photography Section).

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING:

After photographing prints detected with inherent luminescence or if no prints are detected with this technique, utilize the methods of development that would be most appropriate for this surface.

NOTES:

Because physiological fluids will exhibit inherent luminescence, sexual assault cases are the most conducive for this type of examination.

REFERENCES:

1. Procedures for Latent Print Processing with Lasers, Office of the Attorney General, Bureau of Forensic Services, Sacramento, California.
2. Inherent Fingerprint Luminescence - Detection by Laser, B.E. Dairymple, J.M. Duff, and E.R. Menze, *Journal of Forensic Sciences*, June 1976.

4.22: CAMPHOR SOOT

This technique is used infrequently, however, in certain cases especially where "patent" prints have been etched into glass or metal Camphor fuming has been proven successful. This method was derived from the "Pine Tar" fuming technique that was utilized years ago.

MATERIAL AND EQUIPMENT:

Block of Synthetic Camphor

Available at drug store for under \$2.00

Block good for approximately 40 applications

Clean brush

Metal lid

Match

Lift tape

Lift

cards

Scissors

SAFETY CONCERNS:

There is an open flame

(small). There is soot in the

air.

The procedure is safe; however, a dust mask should be used.

SAFETY EQUIPMENT:

The Crime Scene Specialist is required to

wear: Dust mask

Lab coat

Gloves

OTHER:

This procedure must be conducted in a well ventilated area.

PROCEDURE:

1. Locate the area to be examined.
2. Place a small (1/4" X 1/4") piece of Camphor in the metal lid.
3. Ignite the Camphor.
4. Hold the area to be processed 3 or 4 inches above soot.
5. When soot covers area to be examined remove from above soot and allow cooling.
6. Remove excess soot by lightly dusting with a clean brush.
7. Photograph print(s).
8. Lift print(s).

ADDITIONAL TECHNIQUES OF SEQUENTIAL PROCESSING:

Photography (Photography should be conducted prior to and after the Camphor method).

NOTES:

The method is not used to search for latent prints; it is applied to select areas with patent type prints.

Use extreme care with evidence that could ignite or melt.

This technique works best on glass and metal.

REFERENCES:

1. Joe Sypnicki - DCJ Latent Prints – Sacramento

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4.23: LUMINOL

The Luminol test is a presumptive test for the detection of latent bloodstains not visible to the naked eye. The test is based on the peroxidase-like activity of the hemoglobin molecule. Hemoglobin derivatives greatly enhance the chemiluminescence exhibited by luminol when it is oxidized in alkaline solution.

The luminol test is very well suited for, but not limited to, crime scene applications, especially where there is a suspicion of possible clean-up of bloodstained areas. This test may also be employed to help in the visualization of certain bloodstain patterns that may be only partially visible to the naked eye (i.e. drag marks, shoe impressions, etc.).

POLICY:

This test is not to be used as a substitute for careful visual examination for blood. The area of interest should be searched in daylight or with the aid of high intensity light prior to the use of luminol.

A criminalist will be called to the scene to take part in the luminol procedure and to interpret any patterns that may develop.

REAGENTS AND MATERIALS:

Luminol powder (3-aminophthalhydrazide)

Sodium Perborate

Sodium Carbonate

Distilled or nanopure water

Plastic hand pump spray bottle

1L plastic bottle

CONTROLS:

Positive Control: Known blood (or bloodstained area) or a copper penny.

Negative Control: Area void of any suspected bloodstains.

PROCEDURE:

The following proportions of reagents should be employed to produce 100mL of luminol spray:

0.1g	luminol powder
0.7g	sodium perborate
5.0g	sodium carbonate
100mL	distilled or nanopure water

Weigh out the appropriate amount of the reagents and place them into a plastic 50mL tube. If the reagents are not to be used immediately it is best to store the sodium perborate in a separate 50mL tube. The luminol and the sodium carbonate may be stored together. Once the reagents are mixed together they have a limited shelf life (approximately 24 hours).

Measure the appropriate amount of water and place it in a plastic bottle. Immediately prior to luminol application the reagents may be added to the water in the plastic bottle and thoroughly mixed. Once mixed the luminol reagent should be decanted into the plastic hand pump spray bottle. Undissolved powder may have a tendency to clog the pump mechanism.

Prior to the application of the luminol spray, a copper penny should be placed in the general vicinity of the area to be tested. Set up any camera equipment required for documentation of the chemiluminescence at this point, if required.

Darken the area suspected of containing latent bloodstains to near or total darkness. It is advisable to allow time for eyes to adjust to darkness.

The nozzle of the plastic hand pump spray bottle should be set to the finest mist setting. Lightly spray the area of interest, as well as the copper penny. If applicable lightly spray an area known to contain bloodstains, as well as a known negative area.

INTERPRETATION:

A strong chemiluminescence (positive reaction) should be exhibited by the penny in the form of a chemiluminescent “bluish glow” when the copper penny is sprayed with the luminol mixture. This glow results from the penny because the luminol mixture is known to react with certain metal halides of copper and iron. The positive reaction from the penny can be used as a quality control of the luminol mixture.

A positive reaction in the area of interest is also identified by the presence of a strong chemiluminescent “glow,” which lasts several seconds. Caution must be exercised in interpreting faint, or weak, reactions as well as “flashes” which could result from the interaction of luminol with metallic halides. Generally, “flashes” will fade to total darkness immediately after spraying, while a positive bloodstained area will exhibit a longer lasting continuous reaction.

The chemiluminescence exhibited from the oxidation of luminol by a bloodstained area is bluish-white in nature and best visualized under total darkness.

Positive reactions with the luminol reagent should be judged on the color of the reaction, the intensity of the reaction, and the duration of that reaction.

It is important to note that luminol will react to produce false positive with any agent that can oxidize the chemical directly. Some cleaning agents (i.e. Drano and Pine-sol) as well as metallic halides can produce false positive with the luminol reagent. A positive reaction obtained with the luminol reagent, even a strong, long lasting chemiluminescence, is not enough to confirm the presence of blood.

It should also be noted that luminol will not interfere with further presumptive testing, human origin through HemaTrace, or subsequent DNA testing.

COLLECTION:

General evidence collection guidelines should be used for the collection of luminol positive areas. If a luminol positive stain is going to be collected using a swab, use the sponge-tipped swab provided specifically for the collection of luminol positive stains. The preservation steps are the same although drying time is longer.

DOCUMENTATION:

Case notes regarding luminol application should always be taken as with any forensic procedure. Documentation through photography is highly recommended (where possible). Documentation of luminol reactions can be accomplished with 400 ASA or higher TIFF format digital camera (with exposure times of approximately thirty seconds). Photographic documentation of the luminol reaction is best accomplished in near or total darkness. It is recommended that a control (available light or flash) photograph be taken of the area to be sprayed. A reliable reference scale should be placed in the area to be photographed. It is important that the camera not be moved between the control photograph and the luminol photograph so that proper orientation and reference can be inferred.

SAFETY CONCERNS:

May be harmful by inhalation, ingestion, or skin absorption. Causes skin and eye irritation. Material is irritating to mucous membranes and upper respiratory tract. Goggles, rubber gloves, and a respirator may be worn. Use in a well ventilated area. Do not breathe the chemical dust. In case of contact, immediately flush eyes with water for 15 minutes and wash hands with soap and copious amounts of water.

REFERENCES:

1. Sourcebook in Forensic Serology, Immunology and Biochemistry., National Institute of Justice (1980).

4.24 : SUDAN BLACK

Sudan Black is a dye, which stains fatty components of sebaceous sweat to produce a blue-black image. The formulation contains solid particles of dye as well as dye in solution. It is less sensitive than some other processes for latent fingerprint detection but is useful on surfaces, which are contaminated with grease, foodstuff, or dried deposits of soft drinks. It will also enhance super glue developed prints.

This method is appropriate for non-porous surfaces such as glass, metals, and plastics if contaminated with greasy or oily materials.

MATERIALS AND EQUIPMENT:

Sudan Black working solution.

Tray for soaking

Spray bottles.

Tongs or tweezers

Tap water for rinsing

Photograph equipment.

SAFETY CONCERNS:

Sudan Black should be used in a well-ventilated area. If used for long periods of time a fume hood should be used.

When Sudan Black is used at a crime scene, cartridge type respirators must be worn.

If you are treating an area larger than one square yard, cartridge type respirators must be worn.

All sources of ignition must be extinguished, as Sudan Black fumes are flammable.

SAFETY EQUIPMENT AND PROCEDURES:

When preparing or applying solutions:

Gloves impervious to solvents

Lab coats

Goggles

Respirators as needed

Tap water for washing eyes in emergency

PROCEDURE:

1. Prepare working solution of Sudan Black.
2. Photograph any visible prints before any further processing.
3. Shake container of working solution and pour into a clean dish.
4. Remove any metallic looking film from surface by blotting with paper.
5. Immerse evidence in working solution for approximately 2 minutes.
6. Rinse evidence under cold running tap water until excess dye has been removed.
7. Let evidence dry at room temperature.
8. Photograph developed prints.
9. Evidence can be reprocessed if prints are faint.

CONTROL:

Latent print on a latent print card. This is tested once per batch and logged in the reagent log.

WORKING SOLUTION:

15 Grams Sudan Black

1 Liter denatured ethanol.

500 ml distilled or nanopure water

Place 15 grams Sudan Black in a 2-liter glass beaker. Add 1 liter denatured ethanol and stir. Add 500 ml of distilled or nanopure water and stir again. A black working solution will result. Some Sudan Black will not dissolve and will remain in a particulate matter. Pour the solution, including any solid matter, into a clean glass bottle with a tight fitting cap.

Label the container appropriately. The shelf life is indefinite.

REFERENCES:

1. Manual of Fingerprint Development Technique 1986, Scientific Research and Development Branch, London.
2. Lightning Powder Web site: Redyep.com

4.25 : UN-DU (ADHESIVE TAPE SEPARATION)

Un-Du is utilized as a method to remove adhesive tapes, labels, and postage stamps from various surfaces and still be able to process the adhesive side of the item for latent prints.

It temporarily “neutralizes the adhesive,” allowing for easy separation from its applied position.

MATERIALS AND EQUIPMENT:

Bottle of Un-Du.

SAFETY CONCERNS:

Inhalation of this product’s vapor may cause irritation; therefore its application should be conducted with adequate ventilation. This product is extremely flammable. Avoid heat, open flame or other source of ignition.

SAFETY EQUIPMENT AND PROCEDURES:

The Forensic Specialist/Intern/Volunteer should wear:

Gloves

Lab Coat

Eye protection

PROCEDURE:

Squeeze several drops of the product onto the attached scraper tool and then allow the solution to find its way underneath the adhesive item.

The item’s adhesive is then “neutralized” and the scraper tool can be used to remove the item.

Once the item has been removed, the solution quickly evaporates from both the adhesive and its applied surface

CONTROL:

None

NOTES:

Whenever possible for porous surfaces, it is recommended against applying the solution directly on the adhesive item and avoids the use of the attached scraper tool, but rather, apply the needed amount of solution to the opposite side/surface of where the adhesive item is located. By allowing the solution to soak thru the porous item, onto the adhesive surface of the tape or label, the two items can easily be separated without excessive application (or saturation) of the solution and prohibiting possible damage created by the scraper tool.

REFERENCES:

1. Jon T. Stimac – Forensic Services Division – Oregon State Police

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4.26 : POWDER SUSPENSION SOLUTION

Powder Suspension Solution is a technique used to process latent prints on adhesive surfaces, such as tapes or labels with great success and is convenient and inexpensive to use.

EXCELLENT RESULTS ON:

Clear packaging tape Brown packaging tape

Gray duct tape Masking Tape

Black electrical tape Labels

The non-adhesive side of the tape should be processed prior to the sticky side.

The non-adhesive side may be processed carefully with Cyanoacrylate Ester and/or magnetic powder.

The use of Cyanoacrylate Ester prior to using Powder Suspension Solution does not inhibit the Powder Suspension Solution from working.

The use of Gentian Violet should be done prior to using Powder Suspension Solution.

MATERIALS AND EQUIPMENT:

Black or white fingerprint

powder Clear Ivory dish soap

Nanopure or distilled water (the colder the water the better the solution works) Camel hair fingerprint brush or small brush

Plastic disposable dish

Spoon

Lab

Coat

Gloves

Safety Goggles (recommended)

SAFETY CONCERNS:

This procedure is relatively safe. The main safety concern is the inhalation of the powder and/or contact with the solution and your eyes.

PROCEDURE:

Mix equal parts of water, clear Ivory dish soap and black or white fingerprint powder.

For Example:

Place one teaspoon of water into dish.

Place one teaspoon of clear Ivory dish soap into dish with water.

Place one teaspoon of black or white fingerprint powder into dish with water and clear Ivory dish soap.

Amounts vary, depending upon the size of the item being processed.

Mix 1-2-3 together in that order (the solution should be thin, if the solution is too thick add more water).

Using camel hairbrush "paint" the solution onto the adhesive side of the surface.

Keep the solution on the adhesive surface for approximately 15 seconds.

Rinse the "painted" adhesive surface under water and let dry (if a second application is needed repeat the above steps).

Photograph results to preserve latent prints.

Clear nail polish can be used to fix the prints on the tape.

CONTROL:

Use sticky side of adhesive tape with latent prints as a control. A control is required per use. This will be documented in the case notes per use.

NOTE:

Powder Suspension Solution is believed to stick to lipids (fats) or salts and /or skin cells, much like Sticky-Side Powder.

Powder Suspension Solution may be applied several times to enhance the contrast or the print.

Over-development can sometimes be removed on some tapes by rinsing off with a strong stream of water (use caution).

REFERENCES:

1. Southern California Association of Fingerprint Officers. The Print” Volume 14(2) March/April 1998, ppl 1-2.
2. Minnesota Division of the International Association for Identification, January 1998 issue of Gopher Identification.
3. <http://www.scafo.org/library/140201>

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4.27 : THERMAL PAPER WASHOUT

Thermal Paper Washout is an efficient method for removing the black/gray residue from thermal paper items that were previously processed with Ninhydrin. When thermal paper is processed with either Acetone based or Heptane based Ninhydrin, the paper turns black/gray because of a chemical reaction happening between the Ninhydrin and the chemical treated thermal paper. When this reaction takes place, the prints that would have been normally visible on porous items are indistinguishable due to the black/gray stain left behind. Thermal Paper Washout will remove the black/gray residue and will leave behind the visible Ninhydrin prints.

Thermal Paper Washout can be applied by dipping the items into the solution.

MATERIAL AND EQUIPMENT

Glass tray

Tongs or tweezers

Drying rack

Stirring Rod

Thermal Paper Washout Solution

Steam Iron (optional)

SAFETY CONCERNS:

Thermal Paper Washout and chemical used in Ninhydrin are considered to be harmful if ingested, inhaled, or absorbed by the skin.

SAFETY EQUIPMENT AND PROCEDURES:

The Crime Scene Specialist/Intern/Volunteer is required to wear:

When applying and

making the

solution: Gloves

impervious to

solvents Lab Coat

Goggles when there is any

possibility of splashing When

examining:

Latex gloves

OTHER:

Whenever possible processing will be conducted in a fume hood. It is not possible to process in a fume hood, the analyst must be in a well ventilated area.

Processing must be preformed near an eye wash station.

The solution will be made as needed and no storage of the solution is necessary. If there is solution left over allow the solution to evaporate in the fume hood. Do not keep any solution after processing. Disposal should be by evaporation in hood and then cleaning the container.

Whenever possible, items treated with the solution, as with all Ninhydrin treated items, will be placed in a protective plastic sleeve with a warning label.

PROCEDURE:

Prepare the working solution of Thermal Paper Washout (the formula will follow at the end of this section).

Apply the Thermal Paper Washout:

The solution is poured into a clean shallow tray.

After the item is dry from the Ninhydrin solution, immerse the item into the Thermal Paper Washout Solution. Gently agitate the solution until the black/gray residue has completely disappeared (the solution must be mixed well because it separates quickly). Allow the item to dry.

Heat and moisture can also be applied to the item after ten days.

CONTROL:

Thermal paper with latents from various individuals. This will be tested per batch before use on real evidence. The results of the control will be documented in the case notes.

NOTES:

The Thermal Paper Washout Solution can only be used for one item and the control. The black/gray residue is left behind and will not be effective after processing several items. Also, the solution evaporates quickly and must be used in a timely matter.

Once the item is treated with Ninhydrin and Thermal Paper Washout, photograph the developed prints. The best results can be obtained by waiting 10 days prior to applying heat and moisture. Heat and moisture can accelerate the development of prints and accelerate the time needed to photograph the prints.

THERMAL PAPER WASHOUT FORMULA:

-210 ml of HFE-7100 (or 55 ml)

-40 ml of Ethanol, denatured, 85.4% (or 10 ml)

1. Mix 40 ml of Ethanol to 210 ml of HFE-7100 into beaker (or for a small amount mix 10 ml to 55 ml).
2. Stir well until the solution has turned cloudy.
3. Wait until you are ready to process the item to pour the solution into a tray.

REFERENCES:

1. University of Tennessee, Law Enforcement Innovation Center

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4.28 INSECT COLLECTION GUIDELINES

The department's entomology contact is Dr. David Faulkner. His general work phone number is (619) 894-0260. He is available to answer questions or to provide assistance with insect collection.

The following are general guidelines and considerations for the processing of scenes that include insect collection.

Initial Contact Information:

- the date and hour of corpse discovery
- the date and hour the deceased was last seen alive
- the presumed manner of death
- the habitat of the scene
- the degree of corpse degradation.

Equipment Needs:

- hand net
- forceps and digging tools
- thermometer
- vials, jars, and plastic bags.

Collection:

Flies: Maggots concentrate in the head and open wounds of the deceased. After locating a maggot mass, measure the temperature of the air and of the maggot mass and note. Collect and preserve the maggot samples in 70% ethyl or isopropyl alcohol. Keep approximately two dozen maggots alive in a cooler, on ice but do not freeze.

Maggot crawl away from the body to pupate. Look under objects from three to ten meters away from the body to locate puparia. A puparium is seed-like, about ½ cm long and red to dark brown in color. Collect approximately two dozen puparia and keep them alive in a cooler, on ice but do not freeze.

Collect flying insects over corpse with a handnet or on sticky traps. Kill and preserve adult flies in 70% ethyl or isopropyl alcohol.

Make sure to look for insects in the folds of the clothing both at the scene and at the autopsy. Collect three to four soil samples from underneath the corpse if body is located outside. Refrigerate these samples, do not freeze. Soil samples need to be collected from 10 cm deep, and can be stored in Ziploc bags.

Beetles: Look for and collect larger beetles from underneath the corpse.

Labeling: Include date and time of collection on specimen label. Also note area from which the specimen was collected.

Reference:

P.Catts/N. Haskell, *Entomology and Death, a Procedural Guide* (South Carolina) pp. 168 – 170.

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5.1 NOTE TAKING

Notes will be handwritten. Forms can be used for convenience.

Either a worksheet or handwritten notes will be used to capture the following minimum information:

Initials / ID number

Case number (if applicable)

Incident number

Report designator (ie CSUE-1)

date and time of arrival at each scene/sub scene

detective/team contact information

evidence collection and photography start times, scene processing

technique (time and method)

time of departure

SPECIALIZED TECHNIQUES

Special techniques (ex: Mikrosil, ninhydrin, etc.) will be documented. The notes will list the areas processed and the results.

Latent print processing in the field will be documented in the case notes in the following manner:

Areas processed and techniques used will be handwritten in the notes and included in the report.

The location of any developed latent prints will also be documented in the case notes in one or more of the following ways:

- Handwritten information
- Photocopies of the information side of the latent print cards

- A location photograph taken with a digital camera (the image will be printed and added to the case notes)

When a latent print is developed in the laboratory, it will be documented in the case notes in the following manner:

All photographs and latent print cards must include information regarding the item from which the print was collected. If a developed latent print's specific location on an item is determined to be of importance by the analyst, the specific location (e.g., the handle of the bat; the blade of the knife; the trigger guard of the firearm) will also be documented in the case notes in the following manner:

- Handwritten
- Photocopies of the information side of the latent print cards
- A location photograph taken with a digital camera (the image will be printed and added to the case notes)

The location of swabs collected in the field will be documented in the report. The location of swabs and/or other additional items collected in the Laboratory will be documented in the case notes [e.g., the rim of the cup (barcode #); the handle of the knife (barcode #)].

Refer to QA policy 2.7 for note format.

CRIME SCENE UNIT REPORTS

A crime scene unit report will be generated for all case work where evidence is collected and/or photographs are taken and for homicide laboratory reports. Each item of evidence will be assigned a unique barcode number. A "CSU Report" of evidence items generated in the barcode system will be printed and included in the crime scene unit report as note pages. A brief description of evidence items collected and/or photographs taken will be included in the crime scene unit report at the discretion of the CSS. All crime scene unit reports should be completed within 21 days after the scene/morgue processing have been completed.

After the appropriate reviews have been completed, the distribution will be:

the original report and original notes to the laboratory case file.

Additional crime scene unit reports will be distributed in the same fashion

VEHICLE PROCESSING REQUEST

A vehicle processing request (PD-1032LA) should be submitted by the detective requesting a vehicle to be processed.

Notes documenting date, time, and method of processing can be written on the form and used as notes.

The vehicle will be identified using the vehicle license plate number, if available, in the report, notes, and latent print cards/photographs. The vehicle identification number will be recorded in the notes. Processing techniques will be included in the crime scene unit report.

LATENT PRINT PROCESSING REQUESTS

Latent print processing requests will be submitted by the detective requesting evidence to be processed for latent prints.

This request form will become a part of the final report.

The processing worksheet will be completed and included in the report.

The latent print processing report will include the following:

- Original request
- Processing worksheet
- Printed photographs (if taken)

The original report goes to the laboratory main files.

A copy of the report may be retained by the CSS.

5.2 FINAL CASE DOCUMENTATION

The final case documentation will include (if applicable):

crime scene unit report(s)

original notes

evidence transfer form from the Medical Examiner's Office, if applicable.

Final documentation will be submitted to the Clerical Unit for filing in the laboratory case file.

Latent print compact discs and/or digital video devices, photographs, and latent print cards, will be impounded in the Property Room.

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5.3 CASE REVIEW POLICY

GENERAL REQUIREMENTS

Refer to the laboratory's quality assurance policy for responsibilities of technical reviewers.

All crime scene unit reports and evidence processing reports will be technically and administratively reviewed.

Crime scene photographs will be technically reviewed with each crime scene unit report.

REVIEW ELEMENTS

The following elements will be reviewed in the technical review process:

- A. notes are complete and legible (includes dates and times)
- B. pages are numbered, initialed, and marked with case identifier
- C. photographs are marked with identifying information
- D. disposition of evidence is indicated
- E. appropriate controls are noted
- F. control measurements are noted
- G. methods used for scene and vehicle processing are detailed in the report
- H. photocopies of latent print cards collected from vehicles/scenes are included, and/or location photographs of the lift areas
- I. boxes are properly marked in the PD-877 form
- J. original condition of the evidence packaging, date, and location it was received are noted
- K. number of latent lift cards and photographs are noted
- L. the report is signed

- M. the chain of custody is indicated
- N. the technical review is indicated
- O. the "Office Use Only" box in the left top corner of the PD-877 form is complete. If more than one form is used for the work request, only the box on the first page need be filled in
- P. statements in the body of the report and conclusions are supported by the notes
- Q. latent print cards, photographs and discs are correct
- R. barcode entries are correct on the computer screen and on the printed report
- S. all minimum barcode fields are completed

The following elements will be used for the administrative review process:

- A. evidence receipt (when, where, is it sealed)
- B. page numbers, initials, and case number on note pages
- C. proper format and font
- D. case numbers/incident numbers/barcode numbers/serial numbers are correct
- E. initials and dates if necessary are on single-line cross-outs
- F. no write-over or obliterations
- G. tech review has been completed
- H. header, grammar, and spelling are all correct
- I. report is signed
- J. administrative documentation is marked
- K. date on signature block and case number match information in header

6.1 CRIME SCENE UNIT EQUIPMENT LIST

The following equipment is available in the crime laboratory vans or in the Crime Scene Unit:

- Rechargeable flashlights
- Gas powered generator with lights
- Electrostatic dust print lifter
- Metal detector

The following equipment is available for use by all of the crime scene specialists in the Crime Scene Unit of the crime laboratory:

- Alternate light source
- Vacuum metal deposition chamber

The following is a list of the camera equipment that may be included in each crime scene specialist's camera kit:

- Nikon digital camera body
- Macro-zoom lens
- Wide angle lens
- Normal macro lens
- Electronic flash

7.1 UNIT QUALITY ASSURANCE MEASURES

1:1 Printed Images

All latent print digital images that are printed by CSU personnel will be verified as 1:1 prior to release to the Latent Print Unit.

REAGENTS

The unit maintains a reagent preparation booklet and a separate reagent log.

REAGENT AND STANDARD CONTAINER LABELING

Prepared solutions must be labeled with the name of the reagent, the date of the preparation or lot number, the expiration date, initials of who prepared the solution, and date tested.

General laboratory chemicals will be labeled with the date received and initials.

EQUIPMENT

Maintenance logs are maintained for the Vacuum Metal Deposition Chamber (VMD), MVC5000 Cyanoacrylate Chamber, Metal detectors, Electrostatic Dust Print Lifters, and ALS.

MVC5000 Cyanoacrylate Chamber

The internal Computer system will alert the user that the two carbon filters in the door need to be changed. This occurs approximately every eighty runs.

The Crime Scene Specialist or Technical Support person who changes these filters is required to fill out the maintenance log, which should be attached to the chamber. The log information will include; name, ID number and the date the filters were changed.

Vacuum Metal Deposition Chamber (VMD)

The VMD will normally receive annual preventive maintenance. This maintenance generally consists of the following: cleaning windows, cleaning boats, cleaning lights, checking for leaks (air, water, and oil), checking oil level in mechanical pump, and (if necessary) changing the oil in the mechanical pump.

The Crime Scene Specialist or Technical Support person who does the maintenance is required to fill out the maintenance log. The log information will include; date, initials, ID number, and a check off of the above mentioned maintenance items.

Controls are specified in the individual methods.

All other general quality policies are covered in the laboratory's quality system policies.

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8.1 TRAINING

NEW CRIME SCENE SPECIALISTS

Crime scene and evidence processing training for new crime scene specialists will consist of evidence collection, photography, and processing of evidence for latent prints. Training will be conducted by the crime scene supervisor or a CSS assigned to training. The trainer has ultimate responsibility to determine if the crime scene is appropriate for training.

Evidence Processing

Personnel will be trained in the identification, collection and preservation of latent prints, I.N.S., trace shoe/tire impression, and blood evidence. Upon completion of this training the all personnel will be competency tested in the above mentioned areas.

Evidence Collection

Each new Crime Scene Specialist will respond to and collect all of the evidence on a minimum of *six crime scenes.

This will include suspect processing and collecting and/or receiving evidence from the deceased and the Medical Examiner's staff.

A crime scene unit report will be completed and submitted for review.

Photography

Each new Crime Scene Specialist will be given a photography assignment by the Supervising Crime Scene Specialist.

Each new Crime Scene Specialist will respond to and photograph a minimum of *six crime scenes.

This will include photographing crime scenes, victim/suspect processing, autopsies, and any other required photographs.

A crime scene unit report will be completed and submitted for review.

Prior to conducting any evidence collection or photography, the trainee will observe at least six scenes.

Eight Crime Scenes:

Evidence collection will be done at a minimum of two crime scenes, without incorporating photography.

Photography will be done at a minimum of two crime scenes, without incorporating evidence collection.

Both evidence collection and photography will be done simultaneously at a minimum of four crime scenes.

Vehicle Processing

The trainee will conduct photography and fingerprint processing (and evidence collection if applicable) for a minimum of two vehicles under the direct supervision of a CSS.

A crime scene unit report will be submitted for review.

Processing Evidence for Latent Prints

Each new CSS will be responsible for processing the necessary evidence for latent prints.

A competency test will be performed and a laboratory report will be completed and submitted for review.

Finalize Training

After the initial training period, the new CSS will process a minimum of one complete homicide scene in the presence of the unit supervisor. The number of scenes processed in this manner is at the discretion of the supervisor.

Upon completion of all of the above requirements and the related competency the new CSS will be assigned to independent crime scene work.

Reports

All reports generated by a Crime Scene Specialist trainee will be co-signed by the trainer.