

**SANTA BARBARA COUNTY
SHERIFF'S OFFICE
FORENSICS UNIT**

COLLECTION OF FIREARMS AND TOOLMARK EVIDENCE AT CRIME SCENES

1.0 FIREARMS BACKGROUND

The proper collection and storage of evidence is one of the most important steps in the processing of any crime scene. Firearms evidence can help to identify which gun fired a particular bullet or cartridge case, the distance from which a weapon may have been fired (muzzle to target distance), and can be used to possibly determine who may have handled the firearm or cartridge case either through fingerprints or DNA.

2.0 FIREARMS MATERIALS AND EQUIPMENT

A. Materials

1. Small pillboxes.
2. Small manila envelopes.
3. *Sharpie*®- like pen.
4. Firearm Box.
5. Clean tissue (Kimwipes®) or cotton.

B. Equipment

1. Metal detector
2. Global Positioning System (GPS)

3.0 FIREARMS COLLECTION PROCEDURE

A. General

1. DO NOT place a loaded firearm into a firearms box. All firearms must be rendered safe before transporting and will not be accepted into the laboratory if they are loaded.
 - a. EXCEPTION: If the firearm is jammed or you are unable to render it safe, a firearms examiner should be contacted and consulted regarding the best way to process this particular item of evidence.
2. Unload the firearm at the scene.
 - a. If the crime scene response person is familiar with a particular

weapon then they can check the weapon and clear it. If that particular individual is not familiar with that type of weapon then they should not attempt to unload it or render it safe.

b. Revolvers

If the firearm is a revolver, then the position of the cylinder as well as the chamber from which each cartridge or cartridge case was unloaded should be marked. Mark the cylinder on each side of the top strap (that part of the frame directly above the cylinder) and number each cartridge or cartridge case as it is removed from the firearm.

Mark the cartridge or cartridge case under the firing pin as #1 and mark the remaining cartridge cases in a clockwise direction. If the cylinder can be swung out of the revolver, the chambered cartridges can be photo-documented prior to removal. In addition, a sketch illustrating the location of the chambered live cartridges and/or discharged cartridge cases can be made on the interior surface of the lid of the firearm box.

c. Semi-Automatics (self-loading)

Remove the magazine from the firearm. Clear the chamber of any cartridges. Mark the cartridge that was found in the chamber. If the magazine can be removed from the firearm, remove, mark, and count any of the ammunition from the magazine .

3. Marking the Items

- a. Each cartridge case will be placed into a separate box or envelope with the item number, date, initials of the person who collected it, case number, and a description of the item (optional).
- b. One may also indicate on the box (exterior packaging) the position of the cartridge case in the revolver cylinder, or if the cartridge case was in the chamber of the semi-automatic firearm.

4. Firearm

- a. The firearm, once unloaded, must be placed into a firearms box in order to preserve other forms of evidence including trace evidence and biological evidence. The firearm should, when possible, be secured inside the box with plastic ties. Under no circumstances should anything be inserted into the barrel of the

gun.

- b. If the grip of the firearm is unsuitable for fingerprinting, then depending on the circumstances, a forensic response team member should collect possible DNA samples by swabbing the handgrip of the weapon. This can be performed at the crime scene or in the laboratory.

B. Bullets

1. Collect any bullet, bullet jacket or bullet fragments from the scene and place into separate pillboxes or coin envelopes.
2. Mark the container with the item number, date, and initials of who collected the item and case number.
3. Do not mark on the bullets themselves.

C. Cartridges and Cartridge Cases

1. Expended cartridge cases or unexpended cartridges found at a scene will be collected as individual items and placed into either a pill box or small manila envelope.
2. Mark the exterior of the package with the item number, date, case number and initials of who collected it.
3. When appropriate, all unexpended rounds of ammunition recovered at the crime scene will be collected for submittal to the local DOJ Crime Lab (Firearms Unit).

D. Shot and Shot Wadding

1. Recover as much of the shot (pellets) material as possible. Pellets found in the same location can be packaged together. Package pellets and wads found at different locations separately. Do not damage the shot when it is being collected.
2. Mark the container with the appropriate information including item number, case number, date and initials of who collected it.
3. Collect all the wadding material discovered at the scene. Place each item into separate containers and mark with the appropriate information. Package the wadding material collected from different locations into separate evidence containers.
4. If present, collect any shot buffer (also known as "Grex") in the same manner as the wadding. Shot buffer is typically a white granular material and will most likely be found between the path of the barrel and the target; however, shot buffer can easily be disturbed and moved (such as by the wind).

E. Shot Patterns on Non-removable Objects

1. If a shot pattern is encountered on an item that cannot be removed for further testing, e.g., a wall, then a scaled photograph should be taken first.
2. After the photograph has been taken of the pattern, the shot material should be carefully removed from the item.
3. Place the shot into an appropriately sized container and label as before. If more than one area of shot is present and it does not appear to be from the same shot then it will be collected and packaged separately.

F. Powder Patterns

1. Clothing items

- a. If items of clothing are to be examined at the laboratory for powder patterns, they should be air-dried before packaging. Depending on field conditions, this may not be possible. These items must then be packaged for transportation then air-dried.
- b. Clothing items must be packaged into brown paper bags and not plastic bags. Each item of clothing will be packaged separately. Plastic bags will not be used for clothing items, wet or dry.
- c. Ideally, the garment should be packaged to protect the area that might have a powder pattern, according to the following guidelines:
 - Air-dry clothing article.
 - If the item must be folded to place it into the paper bag, attempt to fold the garment only twice. Fold the arms over, one in front and one in back. Then fold the garment in half and place the item into the appropriate evidence packaging.

G. Trace Evidence, including DNA, on Firearms

1. Any firearm that will be examined at the laboratory for trace evidence including blood, hair, latent fingerprints or DNA evidence must be carefully handled. When a patrol request for processing a firearm is submitted to Forensics via a Bureau of Criminalistics (BOC) request, it must indicate that trace evidence needs to be collected as well as any additional processing necessary.
2. Trace evidence that is easily visible at the scene and may be lost in transport should first be photo-documented and then removed prior to packaging and being placed in a separate envelope or appropriate sized packaging. The packaging must clearly be labeled as to source of this evidence as well as the date, case number, item number and the initials of the person who collected it.
3. If the firearm grip is unsuitable for retrieving fingerprint evidence, then swabbing the grip for DNA evidence should be considered. This is typically done at the laboratory, but some circumstances may warrant the collection at the scene. If done at the scene, it must in no way interfere with further testing of the firearm.
4. The swab or swabs of the grip should be air-dried prior to packaging and the packaging must be appropriately labeled with the item number, date, case number, initials of who collected the sample, and where the sample was collected from. Your report should reference how this particular sample was collected as well as the general condition of the grip and firearm before the swabs were collected.

H. Submission of Firearms to the SBSO Property/Evidence Room

1. **ALL FIREARMS** whether handguns or long guns, should be submitted to the laboratory in a firearms box and, when possible, secured inside the box with plastic ties.
2. The box must be a new, not recycled, box and must be sealed.
3. All appropriate case information must also be present on the evidence label which is placed on the exterior of the box.

4.0 COLLECTION OF TOOLMARK EVIDENCE

The value of any tool mark evidence is to be able to link a particular tool to a particular crime scene and hopefully the suspect. A tool mark is simply created by a harder object coming into contact with a softer object which in many cases will leave a characteristic mark of that Tool/striations/or defects present on the tools' working edge(s). The tool mark can be created by a scraping motion (crowbars, screwdrivers), shearing/pinching action (scissors, wire cutters and tin snips) or by a perpendicular force acting against the receiving object (hammers, punches and some gripping tools).

5.0 TOOLMARK MATERIALS AND EQUIPMENT

A. Materials

1. Small pillboxes.
2. Small manila envelopes.
3. *Sharpie*®- like pen.
4. Brown paper bags.
5. Mikrosil™ or other suitable casting material (e.g. Accutrans, Forensil).
6. Fingerprint powder and lifting tape.
7. Boxes (optional).

6.0 TOOLMARK COLLECTION PROCEDURE

A. Photography

1. Photograph the tool mark with normal and oblique lighting (with and without a scale). First photograph the tool mark in its general location showing its orientation. Then take medium and close-up photographs using various angles of oblique lighting (include a scale for reference).
2. Make sure that when you are taking the photograph you are perpendicular to the tool mark. In addition place an identifier in the photograph indicating at least the item number (if not the case number and date).

B. Collection of the Tool mark

1. If at all possible, the item containing the tool mark should be collected.
2. In some cases, the tool mark can be removed from the object by cutting it out. If the tool mark has to be cut-away from an object then do not cut across the tool mark itself, but cut in such a manner as to preserve the entire tool mark.
3. The entire object, if collected, should be packaged in such a manner as to protect the tool mark from harm or the loss of any trace evidence that may have been left in the tool mark.

4. If the tool mark has to be cut from the object, then it should be packaged in such manner as to protect the mark from damage and again the loss of any potential trace evidence.
5. Mark the packaging with the appropriate information regarding item number, case number, and the initials of who collected the tool mark.

C. Casting the Tool Mark

1. In those cases where the item containing the tool mark cannot be removed and the tool mark cannot be cut-away, then a cast can be made of the tool mark.
2. Use Mikrosil™ or another suitable casting material, by following the casting material directions to make a cast of the tool mark.
3. Mix the casting material using the manufacturer's instructions. Once air-dried, remove the casting material from the tool mark. If possible, mark on the casting material itself and include the item number and orientation of the tool mark. Also include this information on the packaging material as well as including the case number, date and initials of who collected it.

D. Other

1. On some surfaces which cannot be cast or removed but contain very faint tool marks, adding a fingerprint powder to the tool mark impression may be done to enhance its detail.
2. After the addition of the fingerprint powder, photograph the tool mark and attempt to lift the mark using fingerprint tape. This is done to help preserve the mark for later comparison/examination at the laboratory. Depending on the size of the tool mark, the tape lift can then be placed on a standard fingerprint card or other suitable medium for storage.
3. Appropriately mark the item with item number, case number, date and initials. In addition to the above, note the orientation of the tool mark in relationship to the object.

E. Collection of Tools

1. Collect any tool, especially those which appear recently used and which, based on their size and shape, could have made the tool marks in question.
2. Each tool collected must be packaged separately and care should be taken not to disturb any trace evidence that might be present on the tool. If trace evidence is visible on the tool at the scene and may be lost during transportation, it should first be photo-documented, then carefully removed and placed in an

appropriate container and marked as to where the trace was removed. The item number, date and who collected it should also be noted. DO NOT contact with the tool edge when removing the trace evidence as this may damage the edge of the tool.

3. DNA evidence located on the tool handles can also be collected either at the scene or at the laboratory. If DNA evidence collection is warranted, then the tool edge as well as the handle must be packaged in such a manner as to prevent contamination or damage.
 - a. The swab or swabs of the tool handle should be air-dried prior to packaging. Label the packaging appropriately with the item number, date, case number, initials of who collected the sample and where the sample was collected from. (Your report should indicate how the sample was collected as well as the general condition of the handle and tool.)
4. Appropriately mark the packaging material with the item number, case number, date and initials of who collected the item. Do not mark on the item itself at the scene.

7.0 REFERENCES

1. "Evidence Collection Guidelines", Forensic Technology for Law Enforcement Telecourse Presented on May 13, 1993, www.police.ucr.edu/collect.html.
2. Scientific Working Group on Material Analysis (SWGMAT), Trace Evidence Recovery Guidelines, January 1998.
3. Lee, Henry C. (Editor), Physical Evidence, Printed by Magnani & McCormick, Connecticut Insurance Industry.
4. Lee, Henry C., Palmbach, Timothy M. and Marilyn T. Miller. "Henry Lee's Crime Scene Handbook", Academic Press, 2001.

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