



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

Contents

1.0	Regional Laboratory Service Map	2
2.0	General Information on Firearm/Tool Mark Section	3
3.0	Case Acceptance Policy.....	3
4.0	Firearms Examination	5
A.	Collection and Packaging	5
1.	Fired Bullets, Fragments, Pellets, and Wadding:	6
2.	Fired Cartridge Cases and Shotshells:.....	6
3.	Unfired Cartridges or Shotshells:.....	7
4.	Firearms:.....	7
B.	Special Requirements	8
5.0	Distance Determination (Clothing for Gunpowder Residue).....	9
6.0	Serial Number Restoration	10
7.0	NIBIN (National Integrated Ballistics Information Network) (FADB)	10
8.0	Tool Marks (TM)	11
A.	Collection and Packaging	11
1.	Tool mark from the Crime Scene	11
2.	Suspect Tool.....	12
9.0	Fracture Match	12
A.	Collection and Packaging	13
10.0	Laboratory Submission Form.....	13
11.0	DO's and DON'Ts Appendix	13
A.	Firearms	13
B.	Fired Bullets	14
C.	Fired Cartridge Cases/Shotshells	14
D.	Unfired Ammunition.....	14
E.	Serial Number Restoration	15
F.	Clothing Analysis for Gunpowder	15
G.	Tool Marks	15

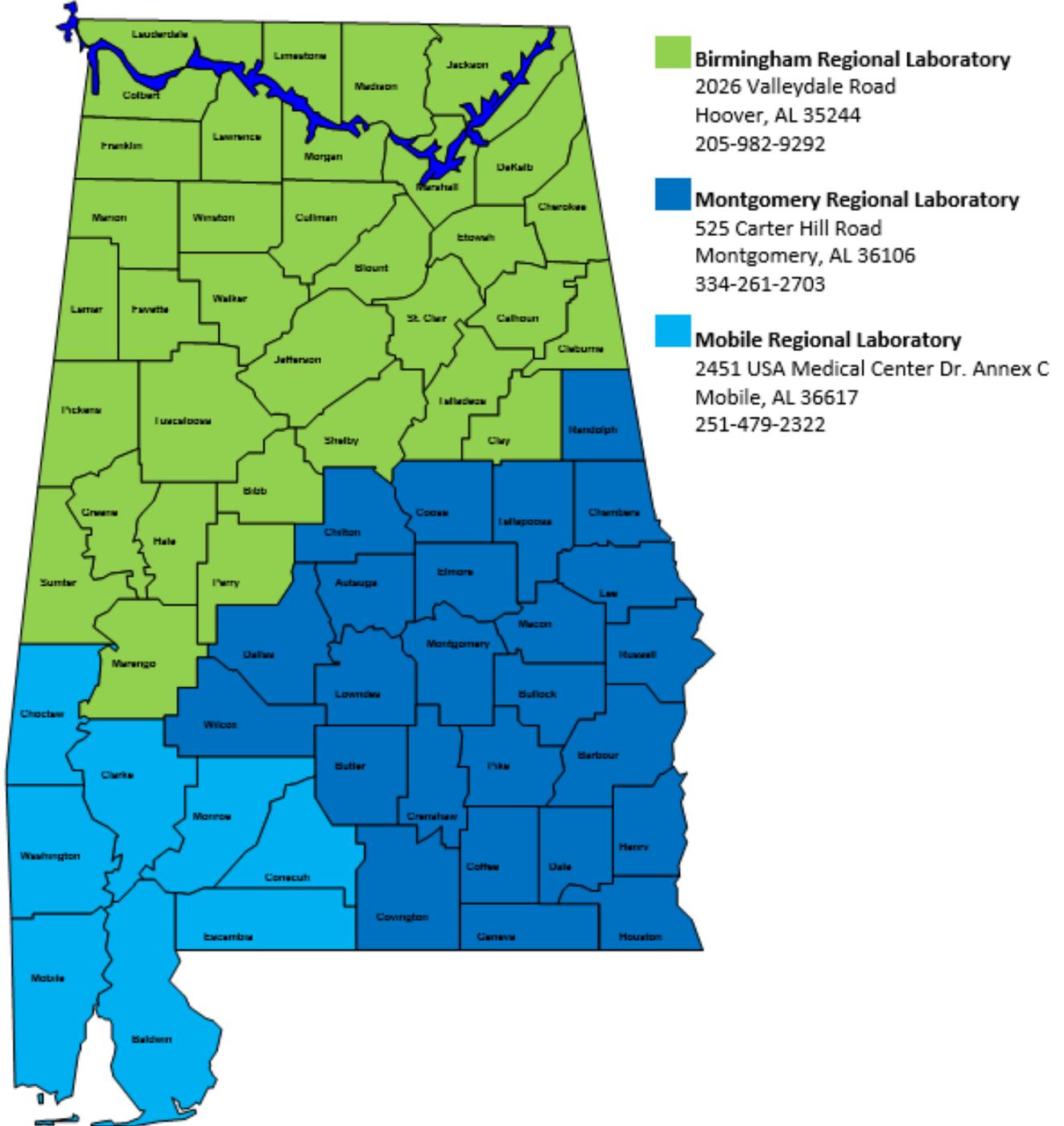


Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

1.0 Regional Laboratory Service Map





Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

2.0 General Information on Firearm/Tool Mark Section

The Forensic Firearm and Tool Mark Section (FTS) is responsible for the examination of firearms, fired ammunition components, ammunition, tools, and related evidence. The Section utilizes forensic microscopes to examine evidence and make comparisons. The FTS maintains a firing range that is used for test firing and related purposes. The Section also utilizes a water tank and/or cotton to facilitate the recovery of test specimens used in firearms examinations. The FTS is located in the Birmingham, Montgomery and Mobile Regional Laboratories of the Alabama Department of Forensic Sciences (ADFS).

The FTS located in Hoover, AL maintains the state BrassTrax system, which is linked to the National Integrated Ballistics Information Network (NIBIN). NIBIN is a searchable computerized national forensic database of images for the potential association of individual characteristics found on fired cartridge cases. NIBIN is an evidence screening tool that provides possible links between fired specimens (from various crime scenes), therefore providing possible links between crimes not previously known by law enforcement to be connected.

The following describes the examinations commonly performed, the evidence you should submit, some information you may see in our reports, and/or some of the information we may need from you to conduct our examinations.

3.0 Case Acceptance Policy

Please note that exceptions to these policies may be made on a case-by-case basis, at the discretion of the discipline chief, laboratory director and/or section chief.

- **“RUSH” CASES** - Requests for “RUSH” examinations of evidence must have a demonstrable need, such as, needing results for warrants, making an imminent arrest, or similar circumstances. In cases where a “RUSH” request is made to examine evidence for imminent court proceedings, the FTS requests to have a minimum of fifteen (15) working days to complete such cases.
- **CROSS REFERENCE CASES** - Firearms submitted for comparison to evidence in other cases will not be compared unless there is some demonstrable investigative link between the firearm and the evidence in the other case. If such a link is not present, firearms meeting the guidelines for NIBIN entry will be examined, test fired, and “entered” into NIBIN. Non-NIBIN firearms such as revolver may be compared if a link is present. Non-NIBIN caliber firearms will not be routinely compared if no link is present.
- **FIRE CARTRIDGE CASES FOUND IN FIREARM** - Fired cartridge cases found in and/or removed from the cylinder of a revolver or from the chamber of other types of firearms will not be routinely examined or compared microscopically.



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

- **TOOL MARKS/FRACTURE MATCH** - Before any case involving a tool mark and/or fracture (physical comparison) request is accepted, there must be a suspect tool/known sample- (fracture) available that can be linked to a suspect via possession, latent prints, DNA, and/or demonstrable investigative information. If no such tool or link is available, the case will not be accepted. Property crime cases involving tool mark and/or fracture (physical comparison) requests will not be routinely accepted. Such cases with crimes against persons usually will be accepted.
- **HUNTING/WILDLIFE** related firearm cases will not be routinely accepted unless personal injury is involved.
- **ANIMALS** - Firearm cases involving crimes against animals will not be routinely accepted.
- **SUICIDES** - Firearm cases involving suicides, attempted suicides, or murder-suicides will not be routinely accepted.
- **NIBIN** - Firearms submitted for NIBIN entry only, which do not meet the guidelines for NIBIN entry, will be returned without examination. Firearms and/or fired specimens submitted for NIBIN entry must have been found property, seized or collected in reference to a criminal act. Badly rusted, corroded, or non-functional firearms submitted for NIBIN entry only, will not be restored to a functional condition for test firing unless this can be easily accomplished.
- **BB GUNS** - Pellet guns, BB guns, and/or non-firearm replicas of firearms will not be routinely examined.
- **EVIDENCE NOT REQUIRING EXAMINATION** - Contributors should only submit evidence that requires examination. Extraneous items that do not require examination but are being submitted merely for the purpose of simplifying the chain of custody should not be submitted. Contributors also should strive to submit all of the evidence that requires examination at one time, if possible.
- **RETURN OF EVIDENCE WITHOUT EXAM** - Unexamined or partially examined firearm and/or tool mark evidence that is present in the FTS may be returned to the submitter if authorized by the Discipline Chief or Section Chief and written correspondence is received from the contributor.
- **NON-STANDARD EXAMINATIONS** - Cases with requests for any unusual or non-standard examinations will not be routinely accepted and must accompany a request from the firearm section supervisor. Please note that the FTS does not conduct firearm e-traces and/or registration checks.



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

4.0 Firearms Examination

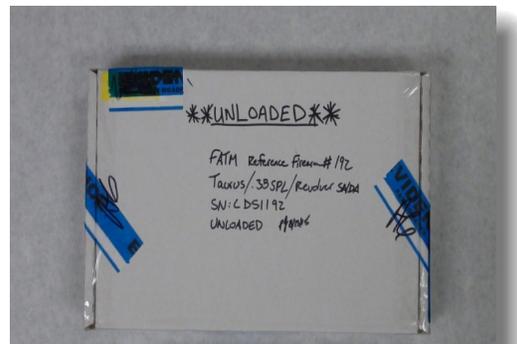
Firearms are a tool that produces tool marks when the tool (firearm) comes into contact with a cartridge case or bullet. Physical contact between a tool and the surface of an object produces marks not only characteristic of the type of tool used, but marks that may be individual to a single tool. Examples of these types of tool marks are a bullet passing through the barrel of a firearm and/or a cartridge case in contact with the breech face/firing pin of a firearm. In each instance, the working surfaces of the tool can leave their individual characteristics upon the damaged surface of an object. The laboratory can perform the following tests:

- comparison of the questioned bullets or cartridge cases to each other to determine if they were fired in the same firearm
- comparison of test fire samples from a firearm to questioned bullets or cartridge cases
- bullet caliber classification (General Rifling Characteristics)
- shotgun component analysis (shot/pellet size, gauge determination of waddings)
- barrel length determination (altered barrel length)
- trigger pull analysis
- drop test analysis (determine if firearm will discharge if dropped)
- serial number restoration
- distance determination (muzzle to object) *Note: no analysis performed on shooter clothing or hands*
- Firearms Database (*SEE BELOW NIBIN SECTION*)

A. Collection and Packaging

Recommendation of suitable Packaging Materials:

- Manila envelopes (bullets, cartridge cases, etc.)
- Cardboard box (firearms and sharps)





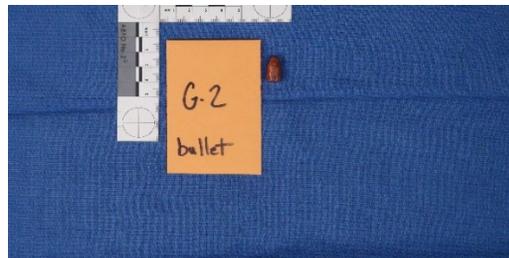
Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

1. Fired Bullets, Fragments, Pellets, and Wadding:

- Forceps or other sharp instruments to remove bullets as they may further damage the evidence. Bullets from bodies should not be packaged before rinsing off blood and tissue since body fluids will be corrosive to the bullet. Gently rinse the bullets/fragments/pellets/wadding under running water and air-dry them prior to packaging.
- Use a separate container for each bullet. Pellets from the same area may be packaged in the same container. If a projectile is embedded in wood or some other material, remove it exercising extreme care. If it cannot be removed without damaging it, then carefully cut out the whole area around it and submit it to the laboratory with the projectile in place. Do not clean or change the condition of items recovered from the scene. Investigators should not mark fired bullets, fragments, pellets, and wadding for identification due to the danger of damaging individual characteristics used for comparison. Package each item separately in an appropriate-sized container and label the container and seal. Pellets may be packaged together if they were found in the same location. Do not seal wet exhibits in plastic before they are thoroughly air-dried. Do not use glass containers for the packaging of exhibits due to potential injury to personnel from breakage.



2. Fired Cartridge Cases and Shotshells:

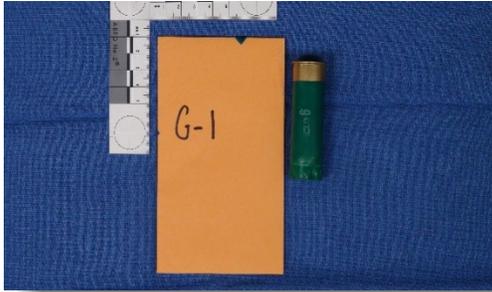
- Do not mark the cartridge cases and shotshells. Place each exhibit in a suitable container, mark the container, and seal it. All exhibits may be placed inside a single outer package for ease of submission.



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES



3. Unfired Cartridges or Shotshells:

- Collect from the crime scene any cartridges/shotshells of the same brand and type in case the laboratory requests them for testing and distance determinations. Only submit these upon the request of the laboratory. Do not mark the unfired cartridges or shotshells. Seal them all in appropriate containers and mark the containers. Contributors may routinely submit less than five (5) unless requesting distance determination.

4. Firearms:

- Record the condition of the firearm before you handle it, i.e., position of hammer, safety, slide, cylinder, jammed, etc. The primary concerns when packaging a firearm is rendering it safe and the preservation of the evidence including blood, trace evidence, and latent prints that may be present. Handle the firearm carefully to avoid loss of trace evidence or latent prints. Additionally, if DNA analysis is being requested, a facial mask and gloves should be worn while handling to prevent contamination. DNA and fingerprint analysis must be completed prior to submission to the FTS. Do not clean, dry fire, test fire, take apart, or work the action, except to unload. Never place any object in the barrel (plastic tie straps used to demonstrate that the firearm is unloaded are the exception). Unload carefully and record the position of the cartridge cases and unfired cartridges/shotshells as you remove them. Any evidence firearm with possible blood or body fluids should be air-dried, then packaged in a cardboard box labeled with a "BIOHAZARD" label.

a. Revolvers:

- Before opening the cylinder, mark each side of the cylinder at the top strap with a sharpie pen, being careful not to destroy latent prints or trace evidence. Open the cylinder and draw a diagram or photograph the back view indicating which chamber was under the hammer. On the diagram, number each chamber and identify the cartridge/cartridge case in it by the headstamp and whether or not there is a firing pin impression. Remove each cartridge/cartridge case and place it in a manila envelope numbered to correspond with the chamber from which the

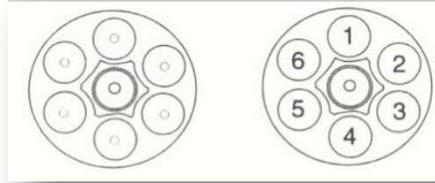


Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

cartridge/cartridge case was removed. Fired cartridge cases found in and/or removed from the cylinder of a revolver will not be routinely examined or compared microscopically.



b. Pistols or Rifles with Detachable Magazines:

- Remove the magazine and leave the cartridges in it. Place in manila envelope or other container. Remove the cartridge/cartridge case from the chamber, if present and place it in an envelope or other container and mark the container. ALWAYS submit the magazine and the cartridges/ cartridge cases that have been removed from the firearm's chamber and/or magazine.

c. Derringers:

- Note which barrel each cartridge/cartridge case came from. Remove each cartridge/cartridge case and place in an appropriately marked container.

d. Rifles and Shotguns with Fixed Magazines:

- Do not cycle the cartridges/shotshells through the action if you can avoid it. Unload the firearm the same way it is loaded. Remove the cartridge/shotshell from the chamber, package separately, and mark the package. Remove the remaining cartridges/shotshells which can be packaged together.

B. Special Requirements

- If a firearm cannot be unloaded or there are special circumstances, call the laboratory and have a firearm examiner tell you how to proceed. Call the FTS prior to your arrival if you must bring a loaded gun into the laboratory. Boldly mark the package with the words: **WARNING: LOADED FIREARM.**
- If the firearm is found in freshwater, immediately immerse it in the same water in a suitable container such as a Rubbermaid container. Caution: Corrosion may occur if a wet firearm remains exposed to air for even a short period of time. If the firearm is found in saltwater, immediately submerge in vegetable oil or other water displacing lubricant. Submit the firearm to the laboratory as soon as possible.



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

5.0 Distance Determination (Clothing for Gunpowder Residue)

When fired, a mixture of burned and unburned gunpowder and vaporized primer material is expelled out the firearm's muzzle along with the bullet or shot pellets and wad(s). This gunshot residue may indicate how far away the muzzle of a firearm was from the entry site at the moment of discharge.

- Note the sequence and condition of the clothing, i.e., T-shirt under flannel shirt, shirt unbuttoned, etc. Collect all clothing containing suspected bullet holes. Submit only outermost garment. Handle carefully so as not to displace or remove any gunshot residue. Air dry clothing on a clean piece of paper. When dry, place another piece of paper on top and fold for placement in a paper bag and seal. Mark the paper bag for identification. Package each item of clothing separately to avoid cross-contamination. Provide information as to the number and location of bullet holes in the body. If possible, collect and submit ammunition of the same type used in the crime (e.g. ammunition from the firearm's magazine, unused ammunition from a box at the scene, etc.).



NOTE: The suspect's clothing will not be routinely accepted for gunshot residue analysis. Approval of the Firearm Section Supervisor is necessary. Call the laboratory for information when submitting other types of items with a suspected bullet hole.



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

6.0 Serial Number Restoration

The obliteration of serial numbers and manufacturer's marks is often done to prevent tracing ownership of articles. The laboratory uses mechanical and chemical processes that may restore the original marking in whole or in part.

- Package the evidence in a manner that will protect the area where the serial number has been obliterated. Contact the laboratory prior to delivering large items or have a question of item to restore.
- NO attempt should be made to restore the serial number prior to submitting it to the laboratory for serial number restoration.

7.0 NIBIN (National Integrated Ballistics Information Network) (FADB)

In the past, firearm examiners were greatly limited in their ability to associate fired components from separate incidents unless an investigative lead was developed to warrant a comparison of the evidence. NIBIN is a database-driven multimedia imaging system designed for imaging the markings made by the firearm on fired components to increase the effectiveness of the forensic firearm examiner. Using NIBIN, examiners are able to search unsolved case files, store classification data and images, and simulate a comparison microscope for comparing fired cartridge cases and shotshells. This technology enables the firearm examiner to connect otherwise unrelated shooting events in the same city and/or between two different cities. In addition, by comparing test-fired cartridge cases and shotshells from confiscated firearms, an examiner can establish a connection to a specific firearm that may also tie it to a specific suspect resulting in the complete resolution of an unsolved shooting event.

Capabilities include:

- Digital image capturing of fired cartridge cases and shotshells that meet imaging criteria through a software program known as "BrassTRAX"
- Interactive side-by-side comparison emulating a comparison microscope with 3D capability
- Sharing database information with other crime laboratories, both state and nationwide, if requested
- Automated search and retrieval of unsolved case images and fired standards

AGENCY TEST FIRE PROGRAM

- agency test fires the firearm for submission to NIBIN
- large submitters may contact FTS for training on the program
- green envelope is provided by FTS
- to inquire contact Firearms Section Supervisor



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

NON-COMPARISON DATABASE SCREEN

- no firearm or no suspect (shooting into occupied/unoccupied dwelling; investigative inquiry)
- submission request will need "Non-Comparison Database"
- blue envelope is provided by FTS
- to inquire contact Firearms Section Supervisor

WHAT IS NOT IMAGED IN NIBIN

The following guns/evidence are not suitable for entry into the NIBIN database and are not accepted:

- No bullets/projectiles of any caliber
- single shot/break open shotguns
- derringers
- antique firearms
- black powder firearms
- "BB" guns
- weapons purchased in a "Buy-Back" or "Guns for Cash" program

8.0 Tool Marks (TM)

Tool Marks are impressions or marks produced when a tool comes into contact with an object; the tool is generally the harder of the two objects. Physical contact between a tool and the surface of an object produces marks not only characteristic of the type of tool used, but marks that may be unique to a single tool. Examples would include a screwdriver used to pry open a cash box, a crowbar used on a steel door frame, a pair of bolt cutters used on a chain link fence, or a pair of wire cutters or pruning shears used on copper power lines. In each instance, the working edges of the tools can leave their individual characteristics upon the damaged surface of an object. The laboratory can perform the following tests:

- comparison of the questioned tool mark to a suspect tool to determine if the tool did, could have, or did not make the questioned tool mark

A. Collection and Packaging

Recommendation of suitable Packaging Materials:

- Manila envelopes (casts and/or small objects)
- Cardboard box (large tools and sharps)



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

1. Tool mark from the Crime Scene

- Do not try to “fit” anything into the tool mark, as this will damage the individual characteristics that may be present.
- Take an overall photograph of the item containing the tool mark and the item’s surroundings. Whenever possible, submit the item containing the tool mark. Place your identifying mark in an area away from the tool mark. If the object is too small to mark, i.e., a broken screwdriver tip, or if you have casts, put them in an appropriate-sized container and label the container.
- Package the tool mark in such a way that they will not be damaged or contaminated. Package and seal the whole item, when possible, and package each item separately. If the item is too large, cover the tool mark area with cardboard to protect it. Never tape directly over the tool mark.
- For items that are too large or otherwise impractical to submit, two (2) casts of each tool mark should be collected and may be submitted. Call the laboratory for assistance on casting tool marks.

2. Suspect Tool

- Handle carefully to avoid damage and loss or contamination of trace evidence. Do not attempt to determine if a found tool “fits” in the tool mark. This may alter or obliterate the tool mark and trace evidence may be lost or added.
- Do not clean the suspect tool. Put your identifying marks in an area away from the working edges of the tool or on the packaging.
- Package the tool to prevent the loss of trace evidence and to protect the working edges from damage. The working edges may be wrapped with paper and the paper secured to the shaft of the tool with tape. Do not put tape directly on the working edges.
- Package each tool separately. Do not put the tool in the same container as the objects displaying the tool mark.
- When possible, submit only the tool that exhibits class characteristics similar to those of the questioned tool mark. If in doubt, call the lab for assistance.

9.0 Fracture Match

The forensic examination of fractures and breaks involves the macroscopic and microscopic comparison of the contour of the break and the character of the tool mark observed on the external surface surrounding the break. The comparison may also involve the microscopic examination of the pattern of characteristics observed within the interior fracture. Example would include pieces of vehicle grille or light from crime scene to a question sample recovered from a questioned vehicle. The laboratory can perform the following tests:



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

- comparison of the question object to another question and/or known object to determine if the items were once one piece

A. Collection and Packaging

Recommendation of suitable Packaging Materials:

- Manila envelopes (casts and/or small objects)
- Cardboard box (large objects)

NOTE: Property crime cases involving tool mark requests will not be accepted without the approval of the Firearm Section Supervisor.

10.0 Laboratory Submission Form

Each request for forensic examination must include an Alabama Department of Forensic Sciences [Evidence Submission Form](#). This form is located at www.adfs.alabama.gov under the FORMS tab and labeled General Evidence Submission Form.

- Please include the description of evidence being submitted and number of items (Example: five (5) cartridge cases, one (1) Ruger pistol, two (2) bullets)
- Select FA/TM from Service Requested section
- Additional Examination Requested section should include a category
 - FIREARMS EXAMINATION **(FATM)**
 - GENERAL COMAPARISON
 - BARREL LENGTH
 - TRIGGER PULL ANALYSIS
 - DROP TEST ANALYSIS***
 - SERIAL NUMBER RESTORATION
 - NIBIN **(FADB)**
 - DISTANCE DETERMINATION*** **(FATM)**
 - TOOL MARKS*** **(TM)**
 - FRACTURE MATCH*** **(TM)**

****Note: Examinations that are not routinely performed may require additional information.*



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

11.0 DO's and DON'Ts Appendix

A. Firearms

- DO record the serial number, make, and caliber of the firearm for identification before sending.
- DO place the firearm in a sturdy box and secure or package it to prevent shifting, mark UNLOADED on box.
- DO place any unfired cartridges/shotshells that have been removed from the firearm in a separate sealed container. This container may be packaged in with the firearm. Boxes must be used for packaging firearms. Paper bags tend to rip and firearms should never be tightly wrapped in paper.
- DO call the laboratory ahead of time if a loaded firearm must be submitted. Mark the packaging with: WARNING: LOADED FIREARM.
- DO submit the cartridge magazines with the pistols and rifles.

- DON'T place any object in the barrel (plastic tie straps used to show that the firearm is unloaded are the exception).
- DON'T clean the bore, chamber, or cylinder before submitting the firearm.
- DON'T take the firearm apart or test-fire before submitting to the laboratory.
- DON'T submit cases involving crimes against animals unless a gun is submitted and approved by the Firearm Section Supervisor.
- DON'T submit replica guns, BB guns and pellet guns unless the submission is approved by the Firearm Section Supervisor.
- DON'T attempt to restore the serial number of a firearm prior to submitting it to the laboratory.

B. Fired Bullets

- DO place bullets in manila envelope after wrapping in wax paper to prevent movement in package. Place only one bullet in each envelope. Pellets from the same area may be placed in the same envelope.
- DO submit all fired bullets and fragments recovered.
- DO gently rinse and air dry projectiles removed from victims.

- DON'T clean fired bullets from crime scenes.
- DON'T wrap fired bullets, fragments, etc., in cotton or tissue paper.
- DON'T place identification marks on bullets as this could destroy marks made by the firearm.
- DON'T put bullets in glass containers.
- DON'T touch fired bullets without examination gloves.

C. Fired Cartridge Cases/Shotshells

- DO mark the envelope for identification.
- DO place each fired cartridge case/shotshell in a separate envelope.

- DON'T mark fired cartridge cases/shotshells.
- DON'T place marks of identification on the primer end of fired cartridge cases/shotshells.



Alabama Department of Forensic Sciences

Firearm and Tool Mark Section

EVIDENCE SUBMISSION GUIDELINES

D. Unfired Ammunition

DO try to recover any ammunition of the same brand and type for test firing and comparison purposes.
Submit less than five (5) unless requesting distance determination.
DO mark the envelope for identification.

DON'T mark ammunition unless removing from magazine or chamber.

E. Serial Number Restoration

DO protect the area where the serial number has been obliterated.
DO contact the laboratory prior to submitting any large items.

DON'T attempt to restore any serial number prior to submitting to the laboratory.

F. Clothing Analysis for Gunpowder

DO note the sequence of the clothing, i.e. T-shirt under open flannel shirt.
DO only submit the outermost garment worn, i.e. no boxer shorts if jeans are outer garment.
DO handle carefully to preserve any gunshot residue around suspected bullet holes.
DO contact Firearm Section Supervisor if multiple bullets holes in garment.
DO completely air dry clothing prior to submission.
DO package in white butcher paper and brown paper bag.
DO mark the paper bag for identification.

DON'T package clothing in plastic even after air drying.

DON'T submit suspect's clothing for Gunpowder analysis without prior approval from the Firearm Section Supervisor.

G. Tool Marks

DO protect all areas of tools that may contain trace evidence with plastic bags or other wrappings.
DO submit the entire object with the tool mark to the laboratory if possible. If not, photograph the mark in its location, and then remove the damaged area for submission to the laboratory.
DO for items that are too large or otherwise impractical to submit, two (2) casts of each tool mark should be collected and may be submitted. Call the laboratory for assistance on casting tool marks.

DON'T attempt to "fit" a tool into the evidence damage tool mark.

DON'T use the suspect tool for any reason.

DON'T submit tool mark involving property crimes without prior approval from the Firearm Section Supervisor.