

OFFICIAL USE ONLY



Techniques
in Collecting

Explosive and Gunshot Residue

UNITED STATES
TREASURY DEPARTMENT
Bureau of Alcohol,
Tobacco and Firearms

59496

contents

I	Introduction	2
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II	Gunshot Residue Test	3
	Materials Needed	3
	Collecting Gunshot Residue	4

III	Explosive Residue Test	5
	Materials Needed	5
	Collecting Explosive Residue	6

IV	Additional Information desired by the Laboratory Personnel	7
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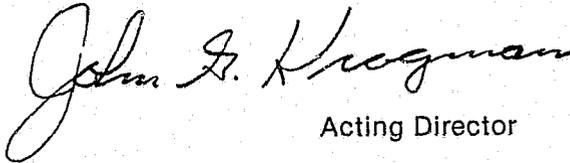
V	Packaging and Transmittal to Forensic Laboratory	8
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VI	Areas to Consider for Residue	10
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I. INTRODUCTION

The misuse of firearms and explosives has been a growing problem in the United States for several years. In 1968, in order to meet the investigative needs of law enforcement personnel, the Bureau of Alcohol, Tobacco and Firearms began a continuing program to develop and improve techniques for collecting explosive and gunshot residue for forensic examination.

This training publication documents what are currently the best techniques for obtaining evidence for court presentation. Prepared in conjunction with the ATF Forensic Science Branch, Rockville, MD., and those ATF field personnel experienced in criminal investigation, this publication represents one of ATF's expanding and continuous efforts to offer assistance to State and local law enforcement in their fight against crime.

A handwritten signature in cursive script, reading "John G. Hoggman".

Acting Director

II. GUNSHOT RESIDUE TEST

This test is designed to provide an indication if an individual has recently fired or handled a weapon. Normally after 6 hours, any gunshot residue the individual may have on his hands will rub off through normal activity; i.e., putting his hands in pockets, handling different items, etc. The residue is a fine powder, and therefore:

1. Gunshot residue can be removed by washing (cleansing) the hands, so it is important to swab the hands of the suspect as soon as possible.
2. Conduct the test before fingerprinting the suspect.
3. In homicide or suicide cases, victim's hands should be protected by covering them with plastic bags until the residue can be collected. Afterward send swabs and plastic bags used to the laboratory.
4. Generally, it has been found by the ATF laboratory that most of the .22 caliber ammunition available today does not contain the elements, Barium and Antimony, which are the elements detected in the gunshot residue test. It is especially important in situations involving .22 ammunition to swab the cartridge case to establish that these elements were present in the casing. No problem has been encountered with centerfire cartridges or shotgun shells of any caliber, gauge, or brand.

Materials Needed

1. Plastic dropping bottle of 5 percent nitric acid solution.
2. Plastic-shaft, cotton-tipped swabs. (DO NOT use wood-stemmed swabs as they may contain substances that interfere with the test.)
3. Disposable plastic gloves.
4. Plastic containers or bags. (DO NOT use glass bottles as they can contaminate the swabs.)
5. Labeling materials.

The above materials can be obtained at a drugstore, a local hospital, or laboratory supply house.

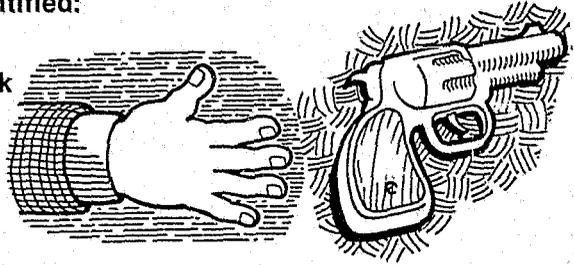
Collecting Gunshot Residue

The following steps should be adhered to in preparing to swab the suspected areas to be tested for gunshot residue:

1. Thoroughly wash your hands.
2. Put on clean plastic gloves.
3. Moisten two single-ended, cotton-tipped, plastic-shaft swabs with six drops of 5 percent nitric acid per swab and immediately place these swabs in a plastic container or bag. Label these swabs "CONTROL." These swabs will be analyzed to determine the purity of the materials used in collecting suspected gunshot residue. When plastic bags are used for hand protection, send a control bag to the laboratory.
4. Moisten two swabs with 5 percent nitric acid. (DO NOT DIP the swabs in the solution.)
5. Using both swabs, thoroughly swab the back of the RIGHT HAND, web area, index finger, and UPPER WRIST. (Hold the subject by the forearm. DO NOT hold his hand.)
6. Place both swabs in a clean plastic container or bag and label the container "RIGHT BACK OF (John Doe)." Also, mark the label with your initials and the date.
7. Using the same procedure as described in step 5, swab the right palm of the suspect. As each of these areas is processed with a pair of swabs, these swabs are packaged and labeled as in step 6 above.
8. Similarly swab the left hand as in steps 5, 6 and 7.
9. Swab the cartridge case (if available) with a single swab moistened with six drops of 5 percent nitric acid. If the cartridge case is to be examined for ballistic markings, use distilled or tap water, since the acid solution may obliterate characteristic markings on the casing which would prevent ballistic comparisons. Then, package and label this swab as in step 6 above.
10. Swab the gun (if available) at the area where primer normally sprays residue with a single swab moistened with six drops of 5 percent nitric acid, then package and label this swab as in step 6 above. This step is not necessary if the cartridge casing is available for swabbing.

11. Inventory your containers and insure that they are properly identified:

- a. Control
- b. Right back
- c. Left palm
- d. Left back
- e. Left palm



12. Optionally collect residues as listed below when shoulder weapons are used.

- a. Firearm
- b. Cartridge
- c. Right cheek of face
- d. Left cheek of face



III. EXPLOSIVE RESIDUE TEST

This test is designed to show if an individual has handled explosive materials recently. Success of the test depends on the lapse of time between the handling of explosive materials and the time of obtaining the evidence. For better results, process the suspect as soon as possible. The explosive residue is more lasting than the gunshot residue, although:

1. Explosive residue can be removed by repeated washings with soap and water.
2. Even routine activity may eventually remove explosive residue.

Materials Needed

1. Polyethylene or glass dropping bottle of Acetone.
2. Wooden-shaft, cotton-tipped swabs. (DO NOT use plastic swabs as Acetone will deteriorate plastic.)
3. Disposable rubber gloves.

4. Sealable glass containers. (DO NOT use plastic containers as the Acetone will deteriorate many plastics.)
5. Labeling materials.

The above materials can be obtained at a drugstore, a local hospital, or laboratory supply house.

Collecting Explosive Residue

The following steps should be followed in preparing to swab the areas to be tested for explosive residue:

1. Thoroughly wash your hands.
2. Put on clean rubber gloves.
3. Moisten two single-ended, cotton-tipped, wooden-shaft swabs with Acetone and immediately place these swabs in a glass container. Label these swabs "CONTROL." These swabs will be analyzed to determine the purity of the materials used in collecting suspected explosive residue.
4. Moisten two swabs with Acetone. (DO NOT DIP the swabs in the solution.)
5. Using both swabs, thoroughly swab the BACK AND PALM of the RIGHT HAND, UNDER THE FINGERNAILS, and BETWEEN THE FINGERS. (Hold the subject by the forearm. DO NOT hold his hand.)
6. Place both swabs in a clean glass container and label the container "RIGHT HAND OF (John Doe)." Also, mark the label with your initials and the date.
7. Using the same procedure as described in step 5, swab the left back, left palm, and left fingers of the suspect with a single pair of swabs. These swabs are packaged and labeled as in step 6 above.
8. Clean the residue from under the right fingernails and left fingernails and package in containers labeled RIGHT AND LEFT. (Under the fingernails is the best source for residues. Clean out the residue with a clean knife, or tool, and transfer the scrapings to clean paper. Then place the papers, folded, into SMALL glass vials.)

9. Further suspect processing should include consideration of wearing apparel and especially pockets of clothing. (See illustrations on page 10.)
10. Other areas for explosive residue search should include **PREMISES AND VEHICLES** of the suspect. (See illustrations on pages 10 and 11.)

NOTE:

- (1) It is best to collect the clothing and submit it to the lab for processing rather than having the investigator attempt to remove residues.
- (2) To avoid contamination, clothing should not be handled before swabbing of body parts or other items.
- (3) All hand swabs or clothing should be packaged separately from debris and suspected explosive.
- (4) Total vacuum sweepings of a vehicle should be collected and sent for lab processing.

In both instances, speed in collecting materials to be processed, rapid transmittal to the lab, and packaging the materials to be processed in airtight containers is important since small traces of explosive vapors will eventually be lost through "Evaporation."

IV. ADDITIONAL INFORMATION desired by the laboratory personnel

1. Brief circumstances surrounding the incident.
2. Date and time of incident.
3. Type of firearm or bomb, if known.
4. Type of ammunition or explosive, if known.
5. Date and time of swab test.
6. Incident location by Federal jurisdiction or city, county and State.
7. Name, address, and telephone number of agency submitting evidence.
8. Be specific in what you request from the laboratory. (Please list your requests by individual questions and by number if possible.)

9. Include in your transmittal letter what disposition of the evidence you desire. (If immediate presentation for court is not contemplated, the evidence, generally, will be returned to sender upon completion of the examination.)
10. Identify your case or investigation number with EACH shipment and, if necessary, should your evidence pertain to separate case control numbers, package by individual incidents.

V. PACKAGING and Transmittal to FORENSIC LABORATORY

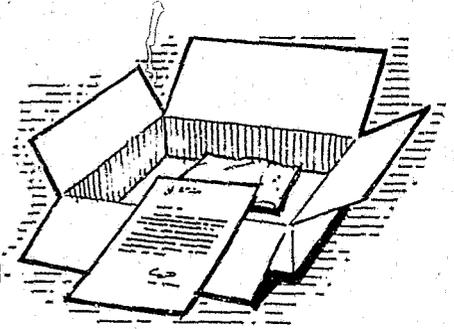
1. Properly package and seal evidence containers. (Explosive residue should be sealed airtight to preserve vapor evidence for Vapor Trace Analysis.)
2. Properly identify evidence containers.
3. Package evidence for transmittal to laboratory and include transmittal letter *INSIDE* package.
4. DOUBLE wrap evidence and label as indicated in the following illustrations.



PACKAGING

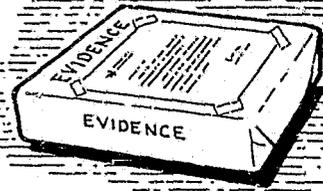
1

Copy of transmittal letter **INSIDE** with evidence.



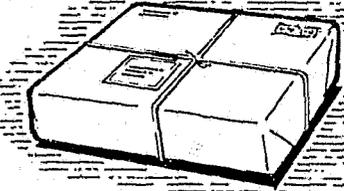
2

First wrapping; mark **EVIDENCE**; attach another copy of transmittal letter on **OUTSIDE** of first wrapped package.



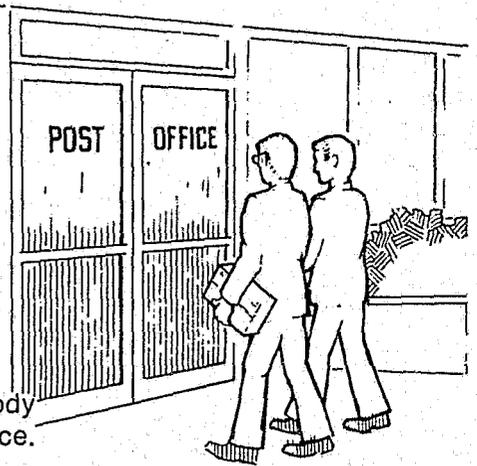
3

Second wrapping; seal for first-class mail; request return receipt; and address direct to Forensic Science Branch as listed on the last page of this publication.



4

Protect the chain of custody **TO** and **FROM** the post office.



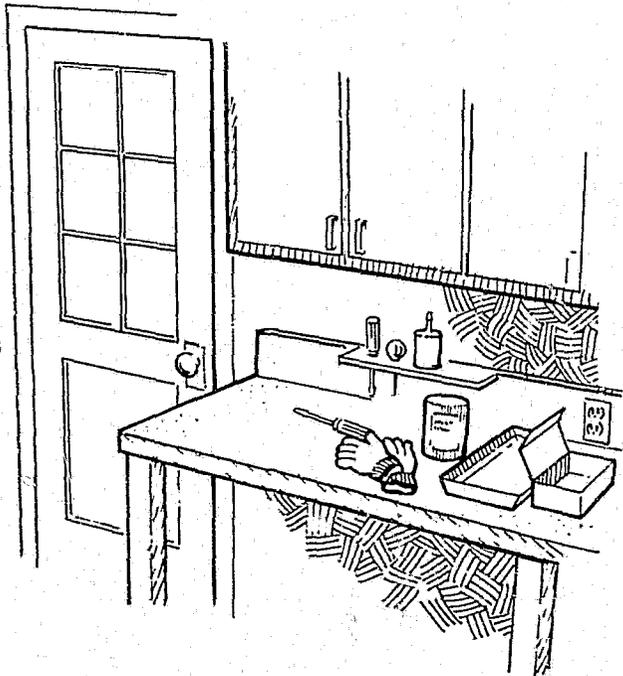
VI. AREAS TO CONSIDER FOR RESIDUE (Explosives)

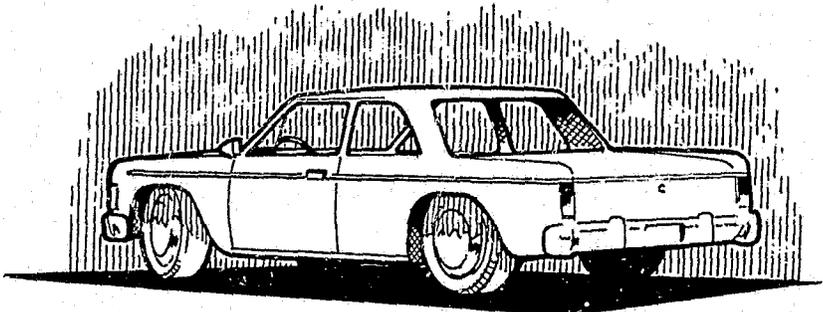
Explosives residues include fine particles and organic nitrate vapors which are identifiable. A person who handles or transports explosives or who may work in an illegal "bomb factory" may unknowingly pick up these residues.



- Hair
- Comb
- Clothing
- Handkerchief
- Hands & Fingernails
- Pockets
- Socks
- Shoes

- Work benches
- Tools
- Containers
- Gloves
- Door knobs





- Handles • Trunk Compartment • Steering Wheel (Acetone may react with the plastic used.)
 - Drive Controls (Shift, Signals, Dash Items)
 - Seats (Should be vacuumed separately.)
 - Floorboards (Should be vacuumed separately.)
-

FOR analysis of EXPLOSIVE RESIDUE mail evidence to:

- (1) Chief, Forensic Science Branch
Bureau of Alcohol, Tobacco and Firearms
National Laboratory Center
1401 Research Blvd.
Rockville, MD 20850
- (2) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
3835 NE Expressway
Atlanta, GA 30301
- (3) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
29 Post Office and Courthouse Bldg.
Cincinnati, OH 45202
- (4) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
2nd and Chestnut Sts.
Room 1104
Philadelphia, PA 19106
- (5) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
Bldg. 233, Naval Station
Treasure Island, CA 94130

**For analysis of GUNSHOT RESIDUE
mail evidence to:**

- (1) Chief, Forensic Science Branch
Bureau of Alcohol, Tobacco and Firearms
National Laboratory Center
1401 Research Blvd.
Rockville, MD 20850
- (2) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
Bldg. 233, Naval Station
Treasure Island, CA 94130
- (3) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
3835 NE Expressway
Atlanta, GA 30301
- (4) Chief, Field Laboratory
Bureau of Alcohol, Tobacco and Firearms
2nd and Chestnut Sts.
Room 1104
Philadelphia, PA 19106

NOTES:

END