

Evidence Handling and Processing for IEDs

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Evidence Handling and Processing for IEDs

1 INTRODUCTION

This procedure describes the requirements for the handling and processing of improvised explosive devices (IEDs), components thereof, and related items for trace evidence.

2 SCOPE

This procedure applies to all personnel who perform examinations in the sub-disciplines of Hairs and Fibers within the Scientific and Biometrics Analysis Unit (SBAU).

3 EQUIPMENT

- Stereo binocular microscope
- Permount[®] mounting medium
- Xylene substitute or Xylene
- un-du[®] or equivalent
- Glass microscope slides
- Glass microscope coverslips
- General Laboratory Supplies
- Personal protective equipment, as appropriate

4 SAMPLING

4.1 Representative Sampling

A representative sample is a selection of hair and/or fibers that attempts to capture the varying characteristics of the total hairs and/or fibers collected from an item of evidence.

For a known fiber sample selection, the representative sample will attempt to represent the range of colors and apparent fiber types comprising the item.

5 PROCEDURE

5.1 Evidence Inventory in SBAU-Trace

- A. After the evidence has been delivered to the discipline, the evidence container(s) and/or packaging will be opened, and the contents inventoried.
 1. If any of the evidence container(s) and/or packaging is damaged or in an unsealed condition, it will be recorded in the case notes.
 2. A decision to proceed with evidence processing will be dependent on the circumstances of the case and the nature of the packaging.
- B. The items received will be inventoried.
 1. Items received will be compared to the itemized listing on the Chain-of-Custody.
 2. If anything is missing or if items are present that are not listed as being delivered, it will be brought to the attention of an Examiner and the appropriate Evidence Management personnel.

3. The description of the items received should be consistent with any information received in the Request for Examination.
 4. Any discrepancies found will be brought to the attention of appropriate Evidence Management personnel.
- C. The type, nature, and condition of the primary packaging of the submitted item(s) will be recorded in the case notes. If the primary packaging is not sealed, but examinations will still be conducted, the lack of seal will be noted, and the packaging sealed upon completion of the SBAU-Trace examination.
- D. Multiple examination requests on submitted items of evidence require that testing be conducted in proper sequence to optimize results and to minimize loss, cross-transfer, contamination, and degradation.
1. If examination of evidence by another discipline precludes/prevents the ability to conduct trace evidence examination(s), the appropriate Evidence Management personnel will be notified.
 2. If examinations by another discipline should be conducted prior to trace evidence examinations but have not, appropriate personnel will be notified.

5.2 Processing Improvised Explosive Devices, Derivatives, and Associated Items

Before evidence is processed, the processing area and all utensils (*e.g.*, forceps, scissors) will be cleaned using, at a minimum, a spray cleaner such as Cavicide® and a lint free wipe. Utensils will be cleaned, at a minimum, between cases or between items within a case, if deemed appropriate.

- A. Gloves, at a minimum, will be changed between cases or between items within a case, if deemed appropriate based on the items submitted. Other PPE will be changed as necessary. Facemasks will be worn during the processing of items/cases that have potential for DNA analysis.
- B. Each case will be processed over clean paper that is placed on the surface of a table. Paper will be changed, at a minimum, between cases or between items within a case, if deemed appropriate based on the items submitted.
- C. Accessory lighting and magnification may be used as needed.
- D. Items of evidence will be described to include any useful information, such as type of device, device construction, details of components, and any indications of previous exploitation/examination.
- E. Evidence may be photographed with a digital camera. The photograph will include the date the photo was taken, the item number of the evidence, and the FBI Laboratory number, either in the photo or its caption, and will be included in the case notes.
- F. Unexposed areas of the evidence are typically the only areas processed for hairs and/or fibers. This includes the adhesive side of tape adhering to the device or other tape, the inside of the device if unopened, and from within hot glue. Hairs and/or fibers will not be recovered from the adhesive side of tape that has been previously exposed prior to receipt in SBAU-Trace or found as loose debris. Additional areas may be processed on a case-by-case basis at examiner discretion.

- G. The screening of the evidentiary item is typically facilitated by the use of a stereobinocular microscope. Potential hairs and/or textile fibers will be picked off of the item with forceps and mounted directly onto glass microscope slides following the procedures listed below (See Section 5.2.1).
- H. Items with a potential explosive nature (*e.g.*, explosively formed projectiles and detonation cord) may need to be processed outside the main Laboratory. Potential hairs and/or textile fibers will be picked off of the item with forceps and placed in paperfolds for further examination in the SBAU-Trace laboratory suite or may be directly mounted onto glass microscope slides. If paperfolds or slides are generated, they will be appropriately marked. Paperfolds and slides, for FA cases, will be assigned an item number(s) after return to the Laboratory, if necessary.
- I. Tape will be placed on plastic sheeting after processing. If the tape needs to be cut, the ends will be distinctly cut (*e.g.*, pinking shears, notching). An indication that the tape was cut will be added to the processing notes. For Explosives Unit managed cases, a notation will also be made in the case communication log. The plastic sheeting will be appropriately marked with the Laboratory number, specimen number, initials of the processor, and, if appropriate, a description of where the tape was located (*e.g.*, tape from battery).
 - 1. For DNA items/cases, plastic that has been UV treated will be utilized. Identification of ends possibly suitable for potential DNA analysis, to include the outermost and innermost pieces will be marked on the plastic sheeting. This will be added to the processing notes by indicating that the plastic sheeting/tape was annotated for DNA.
- J. Tape in FA cases may be subdivided at the conclusion of the trace evidence examinations to facilitate DNA and latent print examinations. Tape will be reported by SBAU-Trace as a part of the item the tape originated from. If any tape remains in or on the item and is not sub-divided, this will be indicated in the processing notes. An absence of this information in the processing notes implies that all of the tape was sub-divided.
- K. Fabric and cordage will be described regarding condition, color, and general construction. Fabric and cordage may be processed for hairs and/or fibers on a case-by-case basis. If necessary, a known sample of fabric or cordage will be removed and placed in a paperfold, and appropriately marked with the Laboratory number, specimen number, and initials of the processor. It may additionally be labeled with the two letter country code the evidence originated from and other identifying information if there are multiple types of fabric/cordage in the item. Information regarding color and construction will be input into the appropriate SBAU-Trace database.
- L. After the item of evidence has been processed, it will be returned to its primary packaging, sealed, and placed into the external container. Plastic sheeting with processed tape will be placed in a separate sealed zip lock bag, labeled as tape from the appropriate specimen number, subdivided and barcoded for FA cases, and placed into the external container. The external container will be sealed after all items have been processed, sealed, and placed into it.

5.2.1 Debris Screening and Slide Preparation

- A. Hairs and fibers will be mounted on a clean glass microscope slide using a suitable mounting medium such as Permount[®]. The microscope slide will be appropriately marked with the Laboratory number, specimen number, and initials of the processor. Slides may additionally be labeled with the two letter country code the evidence originated from.
- B. Placing a thin film of solvent (*e.g.*, Xylene substitute) on the surface of the slide will allow hair and fiber samples to adhere temporarily until the mounting medium is applied. Using clean forceps, hairs and fibers will be placed onto the slide and arranged so they can be completely covered by the glass coverslip.
- C. Excess solvent will be blotted off prior to the mounting medium being applied, if needed. The used blotter paper will be discarded in the appropriate receptacle (see FBI Laboratory Safety Manual) between slides.
- D. Forceps will be carefully cleaned between different items/paperfolds/pillboxes.
- E. When a large number of hairs or fibers are present on the evidence/in the debris, a representative sample (See Section 4.1) may be mounted. The number of hairs and/or fibers mounted on glass microscope slides may be influenced by the types of hairs or fibers present, known hair or fiber samples (if available), and the circumstances of the case. The letters "R/S" will be placed on the glass microscope slide and will be included in the case notes to indicate that a representative sample of hairs and/or fibers were mounted.
- F. When mounting several hairs of different lengths on a single slide, the length of the longest hair will be recorded on the slide.
- G. When intact yarns ≥ 1 " in length are identified, they will be characterized (*e.g.*, color & construction) before being preserved in a paperfold for potential comparison purposes.
 - 1. Intact yarns ≤ 1 " may be preserved separately, as appropriate.
 - 2. At the discretion of the examiner, a known fiber sample may be mounted of the intact yarn.

5.2.2 Selection and Preparation of Known Hair or Fiber Slides

5.2.2.1 Hairs

- A. If known hair samples are received and will be examined, the known hairs will also be mounted by following the steps in Section 5.2.1. The letters "KN" to signify "Known Sample," will be written on the end of the glass microscope slide.

5.2.2.2 Fibers

- A. A known sample will be selected that attempts to represent the range of colors and fiber types comprising the textile and placed in a paperfold.
- B. If possible, known samples will not be taken from damaged areas because of potential future fabric examinations.
- C. Fiber samples representing all of the different colors and types of fibers comprising the textile will be mounted. Warp fibers and weft/fill fibers may be mounted separately. Sewing thread and button thread fiber samples may also be mounted.

- D. Known fibers will be mounted by following the steps in Section 5.2.1. The letters “KN” to signify “Known Sample,” will be written on the end of the glass microscope slide.

5.3 Processing Debris Collected at Other Laboratories

Debris collected at other laboratories will only be examined if details on the location where it was collected from are provided and fall within the criteria established by SBAU-Trace (See Section 5.2.G). A qualified SBAU-Trace Examiner or Physical Scientist will make the determination on the suitability for examination if Evidence Management personnel request assistance. For FA cases, if an item of debris is received in SBAU-Trace and will not be examined, an entry will be made in the Case Communication Log to document the reason. For Legacy cases, if an item of debris is received in SBAU-Trace and will not be examined, the Evidence Management Unit will be notified to make a comment in EXPeRT.

5.4 Processing Clothing and Other Large Items by Scraping

SBAU-Trace does not routinely process evidence by scraping. If a case is submitted that contains items that will be scraped, SBAU-Trace will follow the Trace Evidence Unit’s *Evidence Handling and Processing Procedure* ([TRACE-200](#)) Section 6.2.1.

5.5 Processing Letter Cases

SBAU-Trace does not routinely process letter cases. If a case is submitted that contains envelopes with stamps/labels, SBAU-Trace will follow the Trace Evidence Unit’s *Evidence Handling and Processing Procedure* ([TRACE-200](#)) Section 6.2.2.1.

6 SECONDARY EVIDENCE

- A. Material derived from an item of evidence is designated as secondary evidence. In SBAU-Trace examples of secondary evidence include (but are not limited to) the following: glass microscope slides, plastic pillboxes, paperfolds, and vacuum canisters.
- B. Slides and paperfolds generated will be assigned separate item numbers from any other secondary evidence.
- C. All secondary evidence will be accounted for on the SBAU-Trace FA Secondary Evidence Inventory (SEI) [form](#) or the SBAU-Trace Secondary Evidence Inventory (SEI) [form](#).

7 REVISION HISTORY

Revision	Issued	Changes
00	02/01/2022	Drafted new manual combining requirements from previous Evidence Handling and Evidence Processing documents.
01	07/17/2023	Updated 5.2 I. to indicate use of pinking shears for SBAU-Trace tape cuts and labeling for DNA of outermost and innermost pieces of tape with protected ends.
02	11/15/2023	Updated 5.2.I to include addition of adding reference to cutting tape in notes and com log for EU managed cases. Moved DNA information to 5.2.I.1 and moved information on sub-dividing tape to 5.2.J. Renumbered rest of 5.2.