EVIDENCE HANDLING GUIDE AND LABORATORY CAPABILITIES GUIDE - TRACE EVIDENCE: PHYSICAL FIT/ FRACTURE MATCH

CONTACT INFORMATION

If you have any questions concerning the Trace Evidence laboratory examination capabilities or evidence handling procedures, please call the Forensic Training Section or the Trace Evidence Section at the Forensic Laboratory that services your area.

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OVERVIEW

Physical fit/fracture match examinations are performed to determine whether two or more objects were, at one time, a portion of a single unit. A physical fit is the strongest type of association reported.

The Trace Evidence Section typically conducts physical fit examinations on a variety of evidence types including but not limited to plastic, paint (Figure A), tapes, glass, fabric, plastic bags (Figure B), vehicle parts (Figure C), ropes, and cordage.

Additional information, Section Procedures, and Training Manuals can be found on the DFS website.

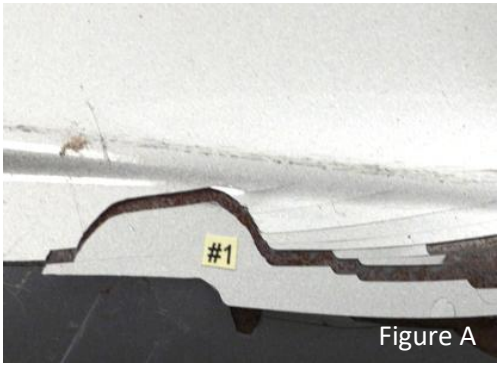


Figure A

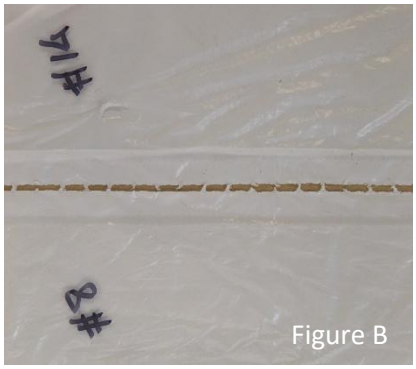
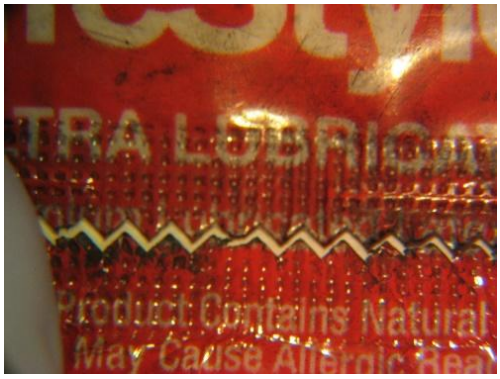


Figure B

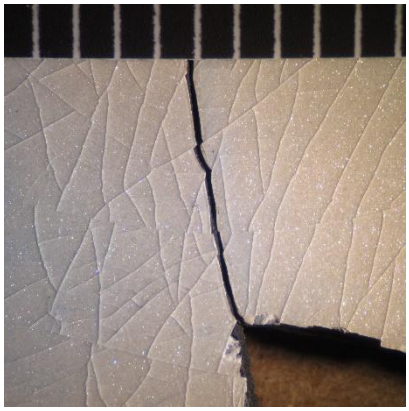

Figure C

CAPABILITIES AND SERVICES

ANALYSIS



The Trace Evidence Section analyzes evidence submitted by law enforcement agencies to determine whether or not one or more items were at one time a portion of a single unit. Typically, when a material having reasonable rigidity breaks, irregularities appear at the broken edge which create pieces with corresponding features. Other types of materials may be subject to separation by cutting, tearing, shattering and so forth. When pieces of evidence are found to have corresponding edges and features that realign in a specific sequence, the examiner can report that the fractured materials physically fit together to form one continuous piece and were, at one time, a portion of a single unit.



In the laboratory, this evidence is examined visually and by using stereomicroscopy, when applicable. When a physical fit is not possible, a physical and chemical comparison may be conducted. A physical and chemical comparison may result in a disassociation (the two objects could not have come from the same source) or an association, but not at the strongest level of association.

TRAINING

The Trace Evidence Section also provides training for user agencies. This includes training law enforcement officers and evidence collectors about trace evidence to teach them how to recognize, collect, properly preserve, and submit various types of evidence to DFS for analysis. The Section also has the unique opportunity to provide an understanding of the types of examinations the forensic laboratory can perform to assist various investigations or other customized training courses, as requested.

COLLECTION GUIDELINES

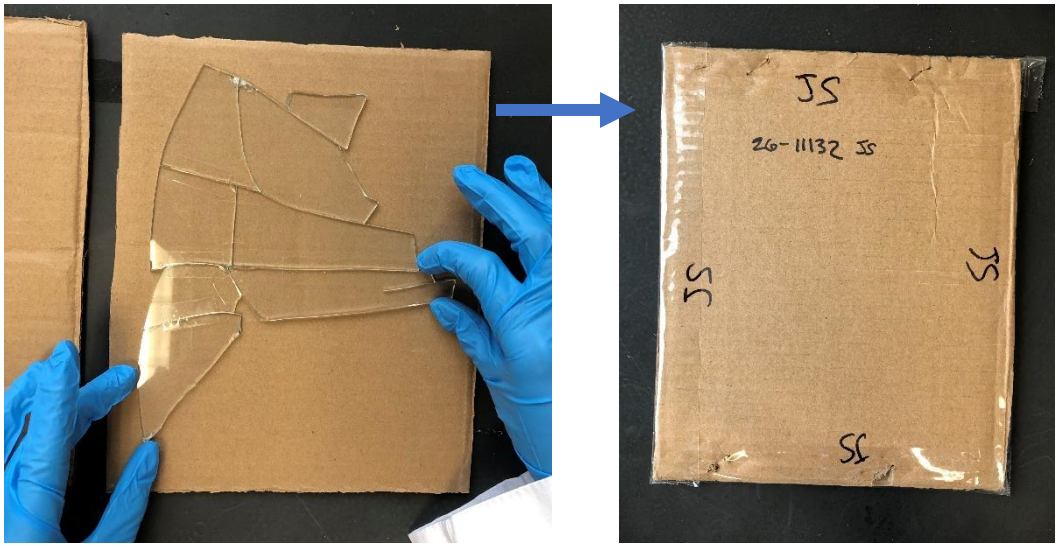
Collect all recovered pieces from the scene as well as any possible source(s) of the questioned evidence, either in its entirety or at least a portion which includes the damage or severed edges(s).

PACKAGING

ITEM – FRACTURED (BROKEN) ITEMS

METHOD – Protect the broken/torn items from further damage. Package in plastic or paper bags or boxes and cushion with tissue. For sharp objects, avoid paper or glass containers. Cardboard "sandwiches" (see image below) may also assist in protecting from further breakage. If the item is particularly fragile, place the item in a box cushioned with tissue.

DISCUSSION - DO NOT attempt to physically fit/fracture match evidence in the field, as this may alter the edges or cause the transfer of other materials. To prevent contamination of any adhering surface material, keep items recovered from different scenes separate. If a physical fit attempt is successful, the forensic examiner will call or email asking if any remaining examinations are necessary. Oftentimes the strength of the physical fit conclusion precludes the need for further testing.



SUBMISSION GUIDELINES

REQUEST FOR LABORATORY EXAMINATION

See the General Submission of Evidence Section for general information and pictures. The Request for Laboratory Examination (RFLE) for Trace Evidence analysis should include a brief statement of fact about the case. Briefly indicate, with respect to each item submitted, the requested analysis for that item. Be sure to include where samples were collected from (e.g., crime scene or suspect's home) to assist in determining which are questioned or known items. A sample RFLE can be found on the DFS website.

SUBMISSION REMINDERS

Protect evidence from further damage.

Indicate the edges of fractured objects that have been damaged or separated by investigators, first responders, or medical examiner staff (e.g., the ends of tape or rope which were cut by EMT). This can be done by marking a piece of paper over the separated ends and securing it in place with a small piece of tape.