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Best Practice Recommendation for Lifting of Footwear and Tire Impressions



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Foreword

This document was developed to provide best practice recommendations for personnel responsible for lifting footwear and tire impressions. Following the recommendations set forth in this document will optimize the recovery of impressions.

The methods included in this document may not cover all aspects of unusual or uncommon conditions. Deviations from this document may preclude examination of recovered impressions.

This document is not intended as a substitute for training in the lifting of footwear and tire track evidence. Completion of a training program and experience in these skills is essential to understanding and applying the principles outlined in this document.

While this document mentions other methods such as photography, physical and chemical development and casting, it is not intended to give specific instructions on the selection of devices or use of these techniques.

This document does not cover safety measures related to lifting impression evidence. Personnel must refer to their agency safety protocols and the operating instructions of the equipment they utilize.

This document was revised, prepared, and finalized as a standard by the Footwear and Tire Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Footwear and Tire Track Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science. This document is a revision of the SWGTREAD Guide for the Lifting of Footwear and Tire Impression Evidence.

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the term '**shall**' indicates that a provision is mandatory, and can be audited for compliance

the term '**should**' indicates that a provision is not mandatory, but recommended as good practice.

All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

Keywords: *lifting footwear and tire impressions, lifting impression evidence, two-dimensional impressions, lifters, casting.*

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Best Practice Recommendation for Lifting of Footwear and Tire Impressions

1 Scope

This document provides the best practice recommendations for personnel responsible for lifting footwear and tire impressions. The recommendations set forth in this document optimize the recovery of impressions. The procedures included in this document may not cover all aspects of lifting footwear or tire impressions. Deviations from this document may/may not preclude examination of recovered impressions. This document is not intended as a substitute for training in the lifting of footwear and tire track evidence.

2 Normative References

There are no normative reference documents. Annex A, Bibliography, contains informative references.

3 Terms and Definitions

For purposes of this document, the following definitions apply.

3.1

adhesive lifter

Any material coated with a tacky substance for the purpose of lifting impressions.

3.2

alternate light source

Equipment used to produce light (or to restrict light) at various wavelengths to enhance or visualize potential items of evidence.

3.3

casting material

Dental stone, snow print plaster, sulfur, or other suitable materials specifically used to accurately recover three-dimensional impressions. Some casting materials are also successful for lifting two dimensional impressions.

3.4

electrostatic lifting

The process of using an electrostatic charge to transfer dry origin impressions from the substrate to a film.

3.5

gelatin lifter

A commercial product with gelatin applied to a pliable backing used to lift impressions.

3.6

Polyvinylsiloxane

PVS

Dental casting material formulated to render fine detail.

3.7

white light source

Equipment used to produce white light (e.g., flash light) to visualize potential items of evidence.

4 Recommendations

4.1 General

Examiners should use the least invasive method first, prior to lifting impressions, photograph or digitally capture the impression. The order and use of these individual techniques is determined by considerations such as substrate, components of the impression, and environmental conditions. If in doubt, treat all impressions as dry origin and apply the methods listed below. If unsuccessful, attempt collection as indicated for wet origin impressions.

4.1.1 Lifted impressions should be labeled and packaged with pertinent case related information (e.g. case number, substrate, direction of travel).

4.1.2 Multiple lift attempts should be considered.

4.2 Equipment

The following is a list of equipment that can be used when lifting of footwear and tire impressions.

- a) alternate light source;
- b) white light source (flash, other types of white light);
- c) electrostatic lifting material;
- d) adhesive and gelatin lifting material;
- e) casting material; and
- f) Polyvinylsiloxane (PVS) casting materials.

4.3 Electrostatic Lifter

4.3.1 Electrostatic lifting is useful for the detection and lifting of dry origin dust and residue impressions. Utilizing electrostatic charge, the electrostatic lifting devices transfer a dry origin questioned impression onto a film.

4.3.2 There are a number of electrostatic lifting devices and materials available. Consult the manufacturer's guideline for specific operating instructions.

4.3.3 Generally, electrostatic lifting is the first technique used, as this process will not prevent the use of other lifting and enhancement techniques subsequently.

4.3.4 To visualize the lifted impressions, the lifts should be examined in a dark room with a high intensity light source held at an oblique angle to the surface of the lift.

4.3.5 The lifting film should never be reused.

4.3.6 Lifts should be photographed prior to packaging.

4.3.7 Smaller lifts can be stored in individual clean dust free containers (e.g., file folders, clean boxes, etc.). These containers should never be reused. Larger lifts can be stored by carefully rolling the non-lifting surface on the outside. After rolling, the edge can be secured with a small piece of tape.

4.3.8 Electrostatic lifts are fragile and impressions can be destroyed by any wiping action across the surface of the lift. Electrostatic lifts retain a charge and care should be taken in packaging. Electrostatic lifts should be submitted for examination as soon as possible.

4.4 Gelatin Lifters

4.4.1 Footwear-sized gelatin lifters are used for lifting dust, residue, blood, and wet origin impressions, as well as impressions developed with fingerprint powder.

4.4.2 Gelatin lifters are available in white, black and clear. White lifters provide greater contrast with impressions enhanced with dark colored powders. Black lifters provide greater contrast with light colored powders and residue impressions. Clear lifters should be used with a backing that provides adequate contrast.

4.4.3 Gelatin lifters may stretch when the clear cover is removed. Care should be taken when removing the cover to limit the stretch. The lifter should be allowed to rest until it returns to the original size, before applied to the impression.

4.4.4 Gelatin lifts of residue impressions should be photographed as soon as possible after collection prior to packaging and/or replacing the acetate.

When replacing the clear cover, place the clean side of the clear cover in contact with the gelatin lift or use a new acetate cover. The side previously in contact with the gel lift should not be replaced on the impression to prevent re-deposition of the residue.

4.4.5 Gelatin lifts can be stored in individual clean dust free containers. These containers should never be reused. Gelatin lifts should be submitted for examination as soon as possible.

4.5 Adhesive Lifters

4.5.1 Adhesive lifters are available in white and clear. They include footprint-sized sheets and various widths of rolled tapes. White backgrounds are recommended for clear adhesive. Clear adhesive on a clear background is not recommended. These lifts are normally used for impressions developed with dark colored powders and are not recommended for lifting dust or residue impressions. Rolled tapes are available in five inch widths and are preferred to narrower tapes.

4.5.2 Adhesive lifts should be placed in a container that is large enough to hold the lifts and protects the lifts from damage (e.g., manila envelope, paper bag, plastic bag, etc.).

4.6 Casting Material

4.6.1 Casting material such as dental stone, can be used to lift two-dimensional impressions (e.g., mud, blood and tire residues) from a variety of two-dimensional surfaces (e.g., concrete, tile and linoleum). A thick layer of dental stone can be poured over the impression area and lifted when dry. Ensure a release mechanism such as a stick or other device is placed at edge of impression prior to pouring. This will help with lifting the cast after hardening.

4.6.2 Dental stone casts should be allowed to dry for approximately 48 hours prior to packaging.

4.6.3 Two-dimensional casts should not be cleaned.

4.6.4 Casts should be packaged in breathable containers that prevent damage (e.g., cardboard box, etc.).

4.7 Polyvinylsiloxane (PVS) Casting Materials

4.7.1 Polyvinylsiloxane (PVS) casting materials can be used to lift impressions that have been enhanced with powder. These products lift the complete powdered impression and are particularly useful on textured surfaces.

4.7.2 Casts should be packaged in breathable containers that prevent damage (e.g., cardboard box, etc.).

4.8 Limitations

Footwear and tire impression evidence may have inherent limitations that can interfere with the procedures in this document. Limitations, when known, should be noted and recorded. Limitations can be due to substrate features, quality of original impressions, environmental factors, and methods of collection and visualization/detection.

Annex A **(informative)**

Bibliography

This is not meant to be an all-inclusive list as the group recognizes other publications on this subject may exist. At the time this document was drafted, these were the publications used for reference. Additionally, any mention of a particular software tool or vendor as part of this bibliography is purely incidental, and any inclusion does not imply endorsement.

- 1] ASB Technical Report 097, *Terminology Used for Forensic Footwear and Tire Evidence*. First Edition 2019¹.
- 2] Adach, E., Knapp, W. "Lifting Two-Dimensional Footwear and Fingerprint Impressions Using Dental Stone." *RCMP Gazette*, Vol. 63, No. 2, 2001, 17-19.
- 3] Bodziak, W.J. *Forensic Footwear Evidence*. 3rd ed.; CRC Press: Boca Raton, FL, 2017.
- 4] Carlsson, K "Comparison of Lifting Shoeprints with Gelatine Lifter Versus Electrostatic Methods." *Information Bulletin for SP/TM Examiners* 4 (1), 109-120,1998.
- 5] Cassidy, M.J. *Footwear Identification*; Public Relations Branch of the Royal Canadian Mounted Police: 1980. (Reprinted by Lightning Powder Company, Inc. 1995.).
- 6] Geller, J. "Casting on Road Surfaces." *JFI*, 40 (5), 1990.
- 7] IAI *Recommended Course of Study for Footwear & Tire Track Examiners*, International Assoc. for Identification². Mendota Hgts., MN, 2006.
- 8] McDonald, P., *Tire Imprint Evidence*, CRC Press, Boca Raton, FL, 1992.
- 9] McConaghey, D., "Resting Gelatin Lifters Prior to Use", *JFI*, 63 (6), 2013.

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<http://treadforensics.com/index.php/standards/u-s/standards-swgthread>

¹ <https://www.asbstandardsboard.org/published-documents/>

² <https://www.theiai.org/>



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