

Guide for the Examination of Footwear and Tire Impression Evidence

1. Scope

- 1.1 This Guide provides procedures for the examination of footwear and tire impression evidence in the laboratory.
- 1.2 The particular procedures and methods employed in a given case will depend on the evidence.
- 1.3 This Guide may not cover all aspects of unusual or uncommon conditions.
- 1.4 This Guide does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this Guide to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
- 1.5 This Guide is not intended as a substitute for training in the forensic examination 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 Guide.
- 1.6 This Guide relates to the examination of footwear and tire impressions after they are documented and collected in the field.

2. Terminology

Class characteristics: manufactured features that are shared by two or more shoes or tires

Design: the manufactured pattern of a shoe outsole or tire tread

Identification: the positive association of an impression as having been made by a single shoe or tire to the exclusion of all others

Individual characteristics: a particular feature individual to a specific shoe or tire that resulted from a random occurrence

Physical size and shape: the size, shape, spacing, and relative positions of the outsole design and tire tread elements (not the same as the manufacturer's shoe or tire size)

Questioned Impression: An impression made by a shoe or tire whose origin is unknown

Wear: erosion of shoe outsole or tire tread due to friction and abrasive forces with the ground

3. Significance and Use

- 3.1** The procedures outlined here are grounded in the generally accepted body of knowledge and experience in the examination of footwear and tire impression evidence. By following these procedures, a forensic footwear and tire tread examiner can reliably reach an opinion regarding the source of an impression.
- 3.2** Footwear and tire tread impressions are examined for the purpose of aiding forensic investigations

4. Interferences

- 4.1** Footwear and tire impression evidence may have inherent limitations that can interfere with the procedures in this Guide. Limitations, when known, should be noted and recorded.
- 4.2** Limitations can be due to substrate features, quality and quantity of original impressions and methods of collection.

5. Equipment and Requirements

- 5.1** Appropriate light source(s) of sufficient intensity to allow fine detail to be distinguished
- 5.2** Magnification
- 5.3** Finely divided scale
- 5.4** Imaging or other equipment for recording observations as required
- 5.5** Sufficient time and facilities to complete all applicable procedures
- 5.6** Chemicals, materials, and equipment necessary for documenting, reproducing, and/or enhancing
- 5.7** Materials necessary for collection of test impressions
- 5.8** Reference and resource materials

- 5.9 Equipment, process, and methodology for recording/saving results in the case files

6. Procedures

- 6.1 All procedures shall be performed when applicable and noted when appropriate. These procedures need not be performed in the given order.
- 6.2 Examinations, relevant observations, and results should be documented. The examination notes must include a complete record of observations to support conclusions reached. These notes should include, but are not limited to, the following:

- 6.2.1 Initial description, condition of evidence, and packaging
- 6.2.2 Photographs, images or diagrams of evidence as appropriate
- 6.2.3 Relevant observations of similarities or differences

Note: At various points in these procedures, if differences in class characteristics are present or if an impression is lacking in quality or comparability, then the examiner may discontinue or limit the procedure(s). The reasons for such a decision shall be documented and reported accordingly.

- 6.3 Record and document the initial condition of the submitted evidence
 - 6.3.1 Determine if all original impression evidence has been submitted.
- 6.4 Preparation of Evidence
 - 6.4.1 Questioned evidence may require initial preparation prior to the examination process. This preparation may include cleaning casts, recognition and preservation of other relevant physical evidence, photographic documentation, and printing of photographic images.
 - 6.4.2 Known shoes and tires require documentation of condition, brand, and general design features
 - 6.4.3 Assign identifiers to each item of evidence
- 6.5 Evaluate the questioned impression evidence for the following:
 - 6.5.1 Quality, clarity, and comparative potential

6.5.2 Enhancement potential

6.5.3 Presence or absence of class characteristics

6.5.3.1 If no class characteristics are present discontinue these procedures and report accordingly

6.6 Processing and enhancement of impressions

6.6.1 Refer to the Guide for the Detection of Footwear and Tire Impressions in the Laboratory

6.6.2 Document and photograph all procedures utilized

6.7 Comparison with known footwear or tires

6.7.1 Visual comparison of design

6.7.1.1 If design is different, document, discontinue these procedures and report accordingly

6.7.1.2 If design is similar, prepare test impressions and continue with these procedures

Note: Refer to the Guide for the Preparation of Test Impressions from Footwear and Tires

6.7.2 Specific design and physical size and shape of design

6.7.2.1 If specific design and/or physical size and shape of design, to include noise treatment (pitch sequence) of tires, are different, document, discontinue these procedures and report accordingly

Note: If physical size is different, consider scaling, perspective and other issues.

6.7.2.2 If specific design and physical size and shape of design correspond, continue with procedure

6.7.3 Wear

6.7.3.1 If the position and degree of general wear are different, document, and evaluate possible wear changes between date of crime and date shoes or tires were recovered.

6.7.3.2 If the position and degree of general wear corresponds, continue with procedure

6.7.4 Individual characteristics

6.7.4.1 Individual characteristics should be evaluated according to their position, size, shape, orientation and clarity. When sufficient individual characteristics are present in the questioned impression and correspond with respective features in the known shoe or tire, an identification can be effected. Evaluate, document and report accordingly.

Note: Due to varying circumstances, not all individual characteristics will reproduce in every impression. Therefore the absence of an individual characteristic is not a basis for elimination and does not preclude identification.

6.8 Information regarding the possible make/model and/or manufacturing source of the shoe or tire that made the questioned impression may be determined using reference materials/sources. Manufacturing, production, distribution and sizing information may also be determined with assistance from the specific manufacturers. This information may be useful for investigative purposes.

7. Report

7.1 Examinations conducted, procedures utilized, evidence photographed, and conclusions reached should be documented and may also appear in a report.

8. Bibliography

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