

SWGTHREAD

Guide for the Preparation of Test Impressions from Footwear and Tires

1. Scope

- 1.1 This Guide provides procedures for the preparation of test impressions from footwear and tires.
- 1.2 The particular procedures and methods employed in a given case will depend on the examination needs.
- 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 preparation of footwear and tire track test impressions. Completion of a training program and experience in these skills are essential to understanding and applying the principles outlined in this Guide.

2. Terminology

Biofoam: collapsible foam capable of recording a three-dimensional footwear impression

Chart board: a solid laminated board with a covering of white paper on at least one side (not foam core or gator board)

Clear film: a clear drafting film, with a minimum thickness of 4 mil, capable of accepting ink

Dental stone: a gypsum product used to cast footwear impressions

Identicator: an inkless method of recording black impressions on white treated paper

Printer's ink: a highly toned, glossy black ink that sets up in 2-4 hours

Roller transport film: a 7 mil Estar film base material designed to wet rollers and pick up loose particles on all types of roller transport photo processing machines

Treadprint: an inkless method for making tire test impressions

3. Significance and Use

3.1 The procedures outlined here are grounded in the generally accepted body of knowledge and experience for preparing footwear and tire test impressions.

3.2 Test impressions are used in conjunction with the known shoe or tire for comparison with the questioned impression.

4. Interferences

4.1 Footwear and tire 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, the method of collection, and the inability to accurately reproduce conditions under which the questioned impression was made.

Note: The inability to produce test impressions using the exact conditions under which the crime scene impressions were made does not necessarily interfere with the ability to compare the shoe or tire with those impressions.

5. Equipment and Requirements

5.1 Photographic equipment

5.2 Test impression materials

5.3 Biofoam and casting materials

6. Procedures

Prior to making test impressions, the examiner should recognize and preserve other relevant physical evidence, document, and photograph the original condition of shoe outsoles and tires, when appropriate.

6.1 Footwear test impressions

- Footwear test impressions should record fine detail with good contrast and be suitable for use in the comparison process.
- Initial test impressions should be made of the entire shoe.
- Excess dirt should be removed from the shoe with care so as not to damage the outsole before test impressions are made.
- Prior to wearing the shoe in any of the methods, consider contamination issues.
- Some methods are as follows:

6.1.1 Roller transport film and fingerprint powder

- Apply a heavy coat of fingerprint powder to the outsole of the footwear.
- Remove any excess powder by gently tapping the shoe.
- Moisten one side of a sheet of roller transport film of sufficient size.
- Remove excess water with a squeegee.
- Make an impression, while wearing the shoe, by stepping onto the roller film.
- Allow the impression and film to dry.

6.1.2 Clear adhesive and fingerprint powder

- Apply a heavy coat of fingerprint powder to the outsole of the footwear.
- Remove any excess powder by gently tapping the shoe.
- Remove protective cover from adhesive sheet.
- Lay adhesive side up on the surface where the impression will be made.
- Make an impression, while wearing the shoe, by stepping onto the adhesive film. If necessary, press the adhesive against the shoe sole to obtain a complete recording of the outsole.
 - **Note:** As an alternative method, if not wearing the shoe, the adhesive film can be pressed against the shoe outsole.
- Cover the impression with a protective sheet.

6.1.3 Identicator or other inkless methods

- Make an impression by pressing the shoe onto the inkpad and then onto the treated paper.

6.1.4 Silicone spray, wipes, or other suitable substances and magnetic fingerprint powder

- Coat the outsole of the shoe with the selected substance.
- Make an impression on the chosen surface.
- Develop the resulting impression with magnetic fingerprint powder.

6.1.5 Biofoam and dental stone

- Make an impression in Biofoam.
- Use the resulting impression for comparison to three-dimensional impressions.
- The Biofoam impression can be filled with dental stone for comparison to submitted casts.

6.1.6 Silicone materials such as Mikrosil, polyvinylsiloxane, Zetalabor

- Apply selected silicone product to the outsole of the shoe.
- Remove silicone from the shoe when cured.

Note: Other methods may be used.

6.2 Tire test impressions

- Test impressions should record the full and continuous circumference of a tire.
- Test impressions should be made with the tire mounted on a vehicle.
- Excess dirt should be carefully removed from the tire before test impressions are made.
- Methods for making tire impressions should record fine detail with good contrast and be suitable for use in the comparison process.
- Record the tire brand, make, size, DOT number, and other relevant information.
- Some methods are as follows:

6.2.1 Printer's ink with clear film

- Prepare two pieces of chart board, each of sufficient length to record a full rotation of the tire.
- Apply printer's ink to one piece of chart board.
- Cut, position, and tape clear film on the second piece of chart board.
- Roll the vehicle so that the tire travels over the inked chart board and then onto the clear film.
- Mark the film with relevant information regarding tire, position, and direction of travel.
- Allow the inked impression to dry.

6.2.2 Printer's ink with chart board

- Repeat 6.2.1, substituting chart board for the clear film, so that the inked impression will be produced on the chart board.

6.2.3 Petroleum jelly or silicone waxes on clear film with magnetic fingerprint powder

- Apply a light coat of the chosen substance to the tire surface.
- Roll the vehicle over chart board which has been covered with clear film to transfer the tire impression to the clear film.
- Mark the film with relevant information regarding the tire, position, and direction of travel.
- Develop the impression with magnetic fingerprint powder.
- Remove excess powder from the film.
- Spray the impression with acrylic spray to fix the powdered impression to the film or cover the powdered impression with clear adhesive film.

6.2.4 Petroleum jelly or silicone waxes on chart board with magnetic fingerprint powder

- Repeat 6.2.3, substituting chart board for the clear film, so that the impression will be produced on the chart board.

Note: Other methods may be used.

- 6.3 Test impressions for elimination can include photography of the shoe outsole or tire tread, any of the methods listed in 6.1 or 6.2, or any other method suitable for recording the design detail.

7. Report

- 7.1 Procedures utilized and impressions made should be labeled and documented and may also appear in a report.

8. Bibliography

Abbott, J. R. *Footwear Evidence*; Charles C. Thomas: Springfield, IL, 1964.

Bodziak, W. J. *Footwear Impression Evidence*, 2nd ed.; CRC Press: Boca Raton, FL, 2000.

Bodziak, W. J. Some Methods for Taking Two-Dimensional Comparison Standards of Tires. *J. For. Ident.* **1996**, *46* (6), 689.

Cassidy, M. J. *Footwear Identification*; Public Relations Branch of the Royal Canadian Mounted Police: 1980. (Reprinted by Lightning Powder Company, Inc. 1995.)

IAI Recommended Course of Study for Footwear & Tire Track Examiners; International Assoc. Identification: Mendota Htgs., MN, 1995.

McDonald, P. *Tire Imprint Evidence*; CRC Press: Boca Raton, FL, 1992.

Nause, L. *Forensic Tire Impression Identification*; Canadian Police Research Centre: Ottawa, ON, Canada, 2001.

Petraco, N.; Resau, R.; Harris, H. A Rapid Method for the Preparation of Transparent Footwear Test Prints. *J. For. Sci.* **1982**, *27* (4), 935-937.