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## **Terminology Used for Forensic Footwear and Tire Evidence**



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## Foreword

This document is a compilation of terms commonly used in footwear and tire examination. It was compiled from texts and publications used as common references in the field of forensic footwear and tire examination. Examiners should be familiar with these common terms and utilize them in notes, worksheets and reports. By using common terminology, the discipline will limit confusion and improve communication amongst examiners and when expressing findings to law enforcement, courts and juries.

This document was proposed by the Footwear and Tire Terminology Task Group, formed by the Footwear and Tire Examination Scientific Area Committee of the Organization of Scientific Area Committees.

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

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## Table of Contents

1	Scope .....	1
2	Normative References .....	1
3	Terms and Definitions .....	1
	Annex A (informative) Bibliography .....	20

# Terminology Used for Forensic Footwear and Tire Evidence

## 1 Scope

This technical report is targeted for forensic science professionals actively engaged in the discipline of footwear and tire examination. It is not intended to define every term potentially applicable to forensic footwear and tire evidence, but define commonly used terms in the discipline.

## 2 Normative References

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

## 3 Terms and Definitions

### 3.1

#### **abrasion**

Wearing away rubber from tires by friction due to high speed, locked wheel braking. Abrasion will be at right angles to the direction of travel, also on shoulder and sidewall.

### 3.2

#### **accidental characteristic**

See **randomly acquired characteristic**.

### 3.3

#### **adhesive lifter**

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

### 3.4

#### **air bubble**

A globule of air trapped within a solid material such as a footwear outsole.

### 3.5

#### **alternate light source**

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

### 3.6

#### **aspect ratio**

The proportion of the tire's height to its width.

### 3.7

#### **asymmetric tread design**

A tire tread pattern divided circumferentially, such that one half of the tread design is not a mirror image of the other half.

### 3.8

#### **bead**

A hoop of steel wires within a tire that hold the tire on the rim.

### 3.9

#### **bias tire**

A tire that has plies which cross over one another at an angle.

### 3.10

#### **bias-belted tire**

A bias tire with added reinforced belts that lie beneath the tread.

### 3.11

#### **BIO-FOAM®**

A commercial product comprised of collapsible foam developed for recording of three-dimensional anatomical impressions of the feet, but also used for the recording of footwear outsoles.

### 3.12

#### **biscuit**

Pre-formed or extruded pieces of soling compound that are placed in molds and pressed into the shape of a footwear outsole or heel.

### 3.13

#### **blade**

Thin pieces of metal in footwear and tire molds that result in molded sipes.

### 3.14

#### **blocker**

An oversized outsole made of one or more components that is later cut to size.

### 3.15

#### **blunt force pattern injury**

An injury to the skin by an object resulting in a pattern that may replicate the design of the object. (Also known as a **pattern contusion**.)

### 3.16

#### **Brannock Device®**

A foot-measuring device.

### 3.17

#### **CAD/CAM**

#### **Computer Aided Design/ Computer Aided Manufacturing**

Computer systems used to design and manufacture footwear and tires.

### 3.18

#### **calendering**

A process where raw rubber passes between a series of large steel rollers. The final roller impresses the outsole design into the rubber that is later cut into soles. Rollers are also used to help prepare raw rubber for the production of rubber biscuits for the compression molding process.

### 3.19

#### **carcass**

The portion of the tire that includes the liner, plies, belts, and beads which forms the foundation for the tread and sidewall.

**3.20****cast**

A method of preserving and recovering an impression utilizing an appropriate casting material.

**3.21****casting material**

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

**3.22****center rib**

A row of continuous rubber or disconnected tire tread blocks around the circumference of a tire and is evenly centered within the tire tread design.

**3.23****chart board**

A solid laminated board with a covering of white paper on at least one side (not foam core board) used to provide a firm and smooth backing when obtaining known tire impressions.

**3.24****chemical etching**

A process wherein a textured pattern is applied to selective areas of a mold surface. The mold is later dipped in an acid bath that etches the pattern into the mold. The details within a chemically etched pattern are specific to an original mold.

**3.25****class characteristic**

A feature shared by two or more items of footwear or tires. The footwear outsole or tire tread design and the physical size features of a footwear outsole or tire tread are two common manufactured class characteristics. General wear of the outsole or tire tread is also a class characteristic. Class characteristics establish membership within a specific group.

**3.26****clicker**

A hydraulic machine that forces a steel die through outsole and/or midsole materials in a cookie-cutter fashion.

**3.27****coaxial light**

Illumination from the precise direction of the imaging lens (e.g. either through the lens or with a beam-splitter in front of the lens).

**3.28****compression molding**

A method for making footwear outsoles and tires where the material is placed into an open mold, which is then closed and subjected to heat, time, and pressure.

**3.29**

**cord**

Fabrics placed under tension and covered with rubber. Used to form the plies of the tire.

**3.30**

**correspond**

Agreement of observed characteristics between two objects.

**3.31**

**degree of wear**

The extent to which the design of a footwear outsole or tire tread has been changed due to erosion.

**3.32**

**dental stone**

A generic gypsum product generally having a strength rating of 8,000 psi or higher, commonly used to cast footwear and tire impressions.

**3.33**

**design**

The manufactured pattern of a footwear outsole or tire tread. Design is a class characteristic.

**3.34**

**design/size relationship**

The tendency for a footwear outsole or tire tread design to have either more design elements, or larger design elements, or both, as the footwear or tire size increases throughout the size range produced.

**3.35**

**die cut**

Outsoles or other footwear components produced by forcing a sharpened steel die through pre-formed outsole material with the assistance of a clicker machine.

**3.36**

**direct attach**

A manufacturing process where the upper of the footwear is joined to the midsole or outsole material.

**3.37**

**directional tread design**

A tire tread pattern that is designed or intended to rotate in one direction only.

**3.38**

**dissimilarity**

A feature in an impression having the appearance of potentially originating from a different shoe or tire but lacking sufficient detail for confirmation.

**3.39**

**distortion**

An unclear or inaccurate representation of the footwear or tire in an impression due to interference in the impression-making process or its subsequent retrieval



**3.40**

**DOT number**

Department of Transportation serial number assigned to every tire sold in the United States which gives information regarding the manufacturer, size, and date of manufacture of the tire.

**3.41**

**dry casting**

A method utilizing the layering of dry dental stone powder and misted water.

**3.42**

**dry origin impression**

An impression formed when the substrate, materials being transferred, and the outsole or tire tread are dry (e.g. footwear impressions in dust).

**3.43**

**dual tire assembly**

A pair of tires mounted side-by-side on a fixed wheel assembly.

**3.44**

**electrical discharge machine**

**EDM**

A machine which uses electrical discharges to produce a desired design in a footwear or tire mold.

**3.45**

**electrostatic detection apparatus**

**ESDA®**

**electrostatic detection device**

An instrument used to visualize paper fiber disturbances (e.g. indentations, erasures, typewritten material/lift off, footwear and tire impressions).

**3.46**

**electrostatic lifting**

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

**3.47**

**element**

A single geometric component of a footwear outsole or tire tread design.

**3.48**

**elimination impressions, photographs, and/or items**

Footwear or tires, or recordings of footwear outsoles or tire treads, from sources such as police officers, paramedics and their vehicles for the purpose of comparing to the questioned crime scene impressions.

**3.49**

**enhancement**

Improving the visibility of an impression through physical, photographic, digital, optical, or chemical means.

**3.50**

**ethylene vinyl acetate**

**EVA**

A soling compound often produced in an expanded form.

**3.51**

**examination quality photograph**

A photograph that contains sufficient quality of information for the purpose of conducting a forensic footwear and tire examination.

**3.52**

**exclusion**

This is the highest degree of non-association between a questioned impression and known source based on sufficient differences observed during the comparison of class and/or randomly acquired characteristics between the questioned impression and the known footwear or tire. In the opinion of the examiner the particular known footwear or tire was not the source of and did not make the impression.

**3.53**

**exemplar**

An item of known origin used in footwear and tire examinations.

**3.54**

**explainable differences**

Variations in appearance that can be attributed to factors such as distortion, movement and pressure. These differences do not result in an exclusion decision.

**3.55**

**feathering (tires)**

Wear pattern where tire tread ribs are worn lower/smoothier on one side and higher/sharper on the other side.

**3.56**

**fixative**

A process or reagent that helps secure the blood to the substrate or secures the substrate itself (e.g. snow, sand, etc.) so that it is not destroyed or degraded during chemical enhancement.

**3.57**

**flash**

**flashing**

Excess material from the molding process.

**3.58**

**footwear**

Any apparel worn on the foot, such as shoes, boots, sandals, etc.

**3.59**

**forensic light source**

A filtered light source that may be fixed or tunable to a variety of spectral ranges.

### **3.60**

#### **foxing**

#### **foxing strip**

A strip of rubber wrapped around the lower part of some footwear to cover the gap or seam between the upper and the outsole.

### **3.61**

#### **full impression**

An impression that represents all, or nearly all, of the heel to toe portions of the outsole or the full width and circumference of the tire.

### **3.62**

#### **gelatin lifter**

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

### **3.63**

#### **general outsole design**

A general category of footwear outsole patterns (e.g. herringbone pattern, lugged outsole pattern, wave pattern, and plain soles).

### **3.64**

#### **general wear**

The condition (degree and position of wear) of the overall footwear outsole or tire tread, ranging from new to extremely worn, related to its degree of use. General wear is a class characteristic that may be used to include or exclude footwear or tires.

### **3.65**

#### **grooves**

The space or channels that separate the tire tread ribs and elements. Circumferential grooves run around the circumference of the tire. Transverse or lateral grooves, also known as slots, run across the tire tread design.

### **3.66**

#### **holes**

The result of erosion of a footwear outsole or tire tread that is so extreme that it results in removal of the outer layers of the outsole or tread materials, often resulting in irregular edges. These irregular edges are randomly acquired characteristics. Random holes due to punctures are also randomly acquired characteristics.

### **3.67**

#### **Identicator<sup>®</sup>**

An inkless method of recording footwear impressions on white chemically treated paper.

### **3.68**

#### **identification**

The highest degree of association assigned to a questioned impression and known source based on the agreement of class and randomly acquired characteristics when there is sufficient quality and quantity of information.

**3.69**

**identifying characteristics**

See **randomly acquired characteristics**.

**3.70**

**impression**

The product of direct or indirect physical contact between item(s) such as footwear or tire resulting in the transfer and retention of characteristics of that item.

**3.71**

**injection molding**

A manufacturing method where the outsole and/or midsole is made by forcing material into a closed mold. Outsoles can be molded individually as unit soles or directly onto the footwear upper as direct attach outsoles.

**3.72**

**insole**

A cushioned liner that occupies the inner surface of an item of footwear where the foot rests and is placed there for comfort or protection. The insole may or may not be removable.

**3.73**

**known impression**

See **test impression**.

**3.74**

**known footwear or tire**

An item of footwear or a tire of documented origin that is compared to a questioned footwear or tire impression.

**3.75**

**label (manufacturer's sizing label)**

A label placed on the tongue or other inside surface of the footwear that contains information including but not limited to the manufacturer's name, shoe size, country of manufacturer, style number, dating information, barcodes, etc.

**3.76**

**lacks sufficient detail**

Observation of features which do not allow the examination of certain class or randomly acquired characteristics.

**3.77**

**latent impression**

An impression not readily visible to the naked eye.

**3.78**

**last**

A form made of wood, metal, or synthetic material that approximates the size and shape of a foot. The upper of the footwear is stretched over the last and held in a specific shape and size throughout the manufacturing process. The size on the manufacturer's label is directly related to the size of the last.

**3.79**

**lift**

An adhesive or other medium used to capture and preserve an impression.

**3.80**

**liner**

A thin layer of butyl rubber compound that holds the air inside the tire.

**3.81**

**logo**

A name, design, or pattern that is the trademark of the manufacturer that may appear on the footwear upper or on the outsole.

**3.82**

**low profile**

A term describing a tire that has a low aspect ratio, thus a short sidewall.

**3.83**

**manufacturing defect**

Unintended damage, defects or flaws in the footwear outsole or tire tread that occurs during manufacturing, which depending on their cause, could result in class or randomly acquired characteristics.

**3.84**

**manufacturing variable**

Features that occur during the manufacturing process that do not appear on all of the footwear/tires but may appear on more than one. Examples would be the precise positioning of foxing strips, the precise cutting of die cut or Wellman cut soles, the positioning of stitching that is added to the bottom of some soles, or a bent sipe blade in a tire mold, etc.

**3.85**

**meaningful difference**

A characteristic which demonstrates the particular known footwear or tire was not the source of the impression.

**3.86**

**Mikrosil™**

Silicone casting material used to lift footwear impressions that have been treated with fingerprint powder.

**3.87**

**midsole**

A component positioned between the upper and the outsole on some footwear to provide cushioning and support.

**3.88**

**mold**

A metal cavity containing a footwear outsole or tire tread design used to produce footwear or tires.

**3.89**

**mold characteristic**

Those design and size features of a particular mold.

**3.90**

**mold cure**

Term used by tire manufacturers to describe the vulcanization of a tire in the molding process.

**3.91**

**mold parting line**

The dividing line between two halves of a shell mold, or between the segments of a segmented mold.

**3.92**

**natural crepe rubber**

A crude form of coagulated natural rubber having a crinkled or knobby texture.

**3.93**

**natural rubber**

A natural product derived from latex tapped from rubber trees.

**3.94**

**negative impression**

An impression that has resulted from the removal of a substance from a substrate by a footwear outsole or tire tread.

**3.95**

**noise treatment**

The mixed arrangement of tread block sizes used by the tire industry to reduce noise generated by tires.

**3.96**

**notches**

Small void areas that extend off of grooves or slots of a tire design but don't fully cross the rib or tread block.

**3.97**

**oblique lighting**

Illumination from a light source that is at a low angle of incidence, or even parallel, to the surface of the item. (Also known as **side lighting**.)

**3.98**

**offset**

The distance from the wheel's centerline to the wheel's mounting surface. Offset is measured as positive or negative.

### **3.99**

#### **open pour molding**

The manufacturing process for the outsoles in which the polyurethane (PU) is poured directly into the mold cavity. Single unit soles are made by pouring the PU into the mold and allowing the outsole to harden. Direct attached soles can be made utilizing this process. (See **direct attach**.)

### **3.100**

#### **outsole**

The bottom portion of the footwear that comes into contact with the substrate.

### **3.101**

#### **outsole design**

A specific pattern or arrangement of elements on an outsole typically associated with a manufacturer and having a name and/or style number.

### **3.102**

#### **partial or fragmented impression**

An impression that does not represent the entire footwear outsole or tire tread.

### **3.103**

#### **patent impression**

An impression visible to the naked eye.

### **3.104**

#### **pattern**

See **design**.

### **3.105**

#### **pattern contusion**

(See **blunt force pattern injury**)

### **3.106**

#### **physical size**

The dimensions, shapes, spacing and relative positions of the footwear outsole design components and tire tread blocks (not the same as the manufacturer's footwear or tire size). Physical size is a class characteristic.

### **3.107**

#### **pitch length**

The circumferential length allotted for a single tire tread element, as designated on the blue print drawing for each tire design and size.

### **3.108**

#### **pitch sequence**

The full arrangement of pitch lengths around the full circumference of a tire, specific to a certain design and size.

### **3.109**

#### **plane polarized light**

Illumination consisting of light rays with a single vibration direction.

**3.110**

**ply**

Rubber-coated parallel cord fabric placed over the liner forming the tire carcass.

**3.111**

**pneumatic tire**

A tire filled with air under pressure.

**3.112**

**Polyurethane**

**PU**

A polyester or polyether-based polymer used in both the outsoles and midsoles of footwear.

**3.113**

**Polyvinylsiloxane**

Dental casting material formulated to render fine detail.

**3.114**

**polyvinyl chloride**

**PVC**

A thermoplastic polymer used in footwear outsoles.

**3.115**

**position and orientation of wear**

The location and direction of an area of erosion on a footwear outsole or tire tread. Examples of location of wear include wear along the medial edge of the footwear outsole and wear along the outer edge of a tire tread. The position and orientation of wear can change as a footwear outsole or tire tread is worn.

**3.116**

**positive impression**

See **transfer impression**.

**3.117**

**pressed outsole**

An outsole made in the compression mold.

**3.118**

**printer's ink**

A highly toned oil-based black ink. Printer's inks that set up in two to four hours are often used in the production of full circumference known tire impressions.

**3.119**

**proficiency test**

An exam that tests a person's and/or an organization's ability to meet a certain level of skill in a particular activity, field of study, etc.



**3.120**  
**questioned**

An item of unknown source (impression or otherwise).

**3.121**  
**radial ply tire**

A tire whose plies run from bead to bead at right angles to the centerline of the tread.

**3.122**  
**randomly acquired characteristic**

A feature on a footwear outsole or tire tread resulting from interaction with an object(s) including, but not limited to: cuts, scratches, tears, holes, stone holds, abrasions and the acquisition of debris. The position, orientation, size and shape of these characteristics differentiate a footwear outsole or tire tread from other footwear outsoles or tire tread with similar class characteristics. Randomly acquired characteristics are essential for an identification of a particular item of footwear or tire as the source of an impression.

**3.123**  
**release agent**

Any product that prevents substrate material from adhering to the cast.

**3.124**  
**residue impression**

Formed by the deposition of a substance from the footwear or tire onto another surface.

**3.125**  
**retreaded tire**

A used tire to which a new tread has been added.

**3.126**  
**rib**

Row of continuous rubber or disconnected tire tread blocks that run circumferentially around a tire to form the tread pattern, further distinguished as center, intermediate, or shoulder ribs.

**3.127**  
**rim diameter**

The diameter of the rim that supports the tire bead and is expressed in inches, such as 13", 16", 16.5" etc.

**3.128**  
**Ritz Stick®**

A commercial device for measuring foot length and width.

**3.129**  
**roller transport film**

A seven-mil Estar film base material designed to wet rollers and pick up loose particles on all types of roller transport photo-processing machines used along with fingerprint powder to produce known impressions of footwear and tires.

**3.130****rolling circumference**

The linear distance traveled by a tire in one revolution under load.

**3.131****Schallamach pattern**

Patterns that develop as ridges on rubber material as a result of repeated abrasive forces. These patterns are highly individual and randomly acquired characteristics. They continue to change rapidly as affected by continued abrasion.

**3.132****section height**

The distance from the rim to the tread surface of an unloaded tire.

**3.133****section width**

The distance between the sidewalls of an inflated tire, exclusive of any lettering or designs.

**3.134****segmented tire mold**

A mold consisting of several segments that open and close around the tire. The sidewall plates are mounted separately.

**3.135****shell tire mold**

Also known as a two-piece mold, it consists of a top and bottom, each containing a sidewall ring and half of the full-circle tread design.

**3.136****shoe perimeter**

The outer border or edge of the footwear outsole that defines its overall physical size and shape. Some perimeters may be comprised of a border such as a molded border or a foxing strip.

**3.137****shoe size**

The size a manufacturer designates for an item of footwear and places on a label in the footwear and/or footwear outsole, and shoe box. There is not a strict dimensional relationship between a manufacturer's shoe size and the length and width of the outsole.

**3.138****shoe size grading**

The gradual increase or decrease in physical size and content that a manufacturer uses for each half size. In general, each half size will result in an approximate measurement change of 4.2 mm in length of the outsole.

**3.139****shoulder**

The portion of the tire where the sidewall and tread meet.

**3.140**  
**side-by-side**

A comparison method performed by placing objects next to one another.

**3.141**  
**sidewall**

The portion of the tire between the shoulder and the bead that contains the tire information.

**3.142**  
**similar**

An observation that an impression shares a general likeness with a known footwear or tire. (Similar should not be confused with correspond.)

**3.143**  
**sipes**

Thin slits in a footwear outsole or tire tread to create better traction. True sipes in footwear are those that are cut into an outsole during manufacture. True sipes in tire treads are cut in the tread only after market. True sipes must be flexed to open. Imitation sipes are molded and remain open.

**3.144**  
**slot**

A lateral groove on a tire tread separating tread blocks.

**3.145**  
**snow print powder**

An accelerated plaster that is applied in a prescribed way and is capable of casting all forms of snow impressions.

**3.146**  
**Snow Print Wax™**  
**Snow impression wax**

Aerosol waxes used to coat the surface of snow impressions prior to casting.

**3.147**  
**specific location of wear**

A defined area of erosion on a footwear outsole or tire tread. Examples of a specific location of wear are a worn tire sipe or a small area of worn stippling on a footwear outsole. Specific locations of wear may allow for a greater level of discrimination or association between questioned impressions and known footwear or tires.

**3.148**  
**specific outsole design**

The precise arrangement of design elements of part or all of a footwear outsole. The precise size/shape and arrangement of design elements in an outsole of one style and manufacturer's size are normally distinguishable from other sizes of the same manufacturer's style. See **design/size relationship**.

**3.149**

**sprue**

The piece of material that represents the passageway where the molding material was injected into the mold to form an outsole and remains attached to the outsole at that point. The sprue is removed before sale.

**3.150**

**sprue mark**

A small circular mark typically left on the surface of the back of the heel of the outsole after the sprue has been removed.

**3.151**

**standard**

See **test impression**.

**3.152**

**stippling**

A pattern hand struck onto the surface of a mold using a steel die containing a selected design. The tip of the die is small and requires numerous, often overlapping, strikes. These multiple strikes result in a fine pattern on the surface of the mold, and subsequent outsoles that come from that mold. Because of the highly variable manner in which hand stippling is applied, it is specific to a given mold.

**3.153**

**stone hold**

A stone held in a recessed area of a footwear outsole or tire that may or may not be replicated in an impression.

**3.154**

**sulfur**

A substance used for casting snow impressions.

**3.155**

**sulfur cement**

A reinforced modified sulfur material, available in flake form that is a safer, stronger alternative to using pure sulfur in casting snow impressions.

**3.156**

**superimposition**

A visual comparison performed by placing one object over the other.

**3.157**

**synthetic rubber**

Any artificial elastomer that simulates the qualities of natural rubber.

**3.158**

**tandem**

Tires set immediately one behind the other.

**3.159****tears**

Fractures that have occurred in footwear outsoles or tire treads that reflect irregular edges. Tears are randomly acquired characteristics.

**3.160****test impression**

An impression made from a footwear or tire used as an aid for comparison purposes.

**3.161****texture**

A rough surface or shallow design added to surfaces of a mold through the process of chemical etching or hand struck stippling that is transferred to the footwear during the molding process. Texture is unique to specific molds.

**3.162****three-dimensional impression**

An impression made on surfaces such as soil, sand, snow or mud with dimensions of length, width, and depth.

**3.163****tire footprint**

The contact area of a tire tread against a flat surface when under load, also known as a contact patch.

**3.164****tire profile**

See **aspect ratio**.

**3.165****toe bumper guard**

A thick strip of rubber that, in some footwear designs, is placed around the front perimeter of the footwear surrounding the toe area.

**3.166****track width**

The distance between the center points of the tires from one side of the vehicle to the other (e.g. from the center point of the right front tire to the center point of the left front tire). On a dual axle vehicle, this is the distance from the center points between the dual tires from one side of the vehicle to the other.

**3.167****transfer impression**

An impression made on a two dimensional surface by a footwear or tire as a result of coming in contact with and acquiring dust, residue, blood, mud, or other materials that the footwear or tire subsequently deposits or transfers to a substrate in the form of an impression.

**3.168****tread**

The designed part of the tire that comes into contact with the road.

**3.169**

**tread block**

A single geometric component of a tire tread design.

**3.170**

**tread depth**

A vertical measurement between the top of the tread to the bottom of the tire's deepest groove, measured in 32<sup>nds</sup> of an inch.

**3.171**

**tread depth gauge**

A device used to measure the depth of the tire tread.

**3.172**

**tread design**

A specific pattern or arrangement of design elements on a tire tread typically associated with a manufacturer and having a name and/or style number. (Also used to describe footwear outsoles.)

**3.173**

**TreadPrint™<sup>1</sup>**

A commercial product used to make inkless tire test impressions.

**3.174**

**tread wear indicator**

Bands of raised rubber, sometimes called “wear bars”, that are 2/32 of an inch above the bottom of the main grooves of a tire.

**3.175**

**tread width**

The width of the tire tread from one edge to the other in an impression. Not to be confused with section width.

**3.176**

**turning diameter**

The diameter of the smallest circle produced during a vehicle's tightest turn, as measured from the outer edge of the outmost front tire in that turn.

**3.177**

**two-dimensional impression**

An impression with dimensions of length and width.

**3.178**

**unit outsole**

An individual heel or outsole that must be glued and/or stitched to the upper.

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<sup>1</sup> This term is used as an example only, and does not constitute an endorsement of this product by the AAFS Standards Board.

**3.179**

**upper**

The top portion of the footwear excluding the outsole or midsole.

**3.180**

**unvulcanized/raw rubber**

Rubber not subjected to the process of vulcanization. The handling of this material may result in randomly acquired characteristics.

**3.181**

**variations**

Imprecise duplication and deviations among repetitions of the same process.

**3.182**

**vent**

Drilled hole or gap between tire mold components allowing for the release of air during mold cure.

**3.183**

**vulcanization**

A process in which a rubber compound is heated under pressure causing a chemical change which transforms the rubber from a soft, tacky substance to tough, hard rubber.

**3.184**

**wear**

Erosion of the surfaces of a footwear outsole or tire tread during use.

**3.185**

**Wellman outsole cutting machine**

A machine used to cut outsoles from unvulcanized calendered outsole material.

**3.186**

**wet media film**

A clear drafting film, preferably with a minimum thickness of 4 mils, capable of accepting ink, which is used to obtain inked impressions of tires.

**3.187**

**wet origin impression**

An impression formed under wet conditions including impressions consisting of residues of blood, grease, mud and other wet substances.

**3.188**

**wheel base**

The distance between the front and rear axles of a vehicle. An approximation of this dimension can be obtained by measuring the distance from the leading edge of the rear tire track to the leading edge of the front tire track on the same side of the vehicle.

## 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 available to the working group members 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 by the authors of this document.

- 1] Bodziak, W.J. *Footwear Impression Evidence Footwear Impression Evidence: Detection, Recovery and Examination*. 2nd ed.; CRC Press: Boca Raton, FL, 2000.
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- 7] Rossi, W.A. Rossi, D.P.M. *The Complete Footwear Dictionary*. Krieger Publications Company, 2<sup>nd</sup> edition March 10, 2000.

**SWGTHREAD documents can be downloaded from:**

<http://treadforensics.com/index.php/standards/swgtread>

SWGTHREAD, *Standard for Terminology Used for Forensic Footwear and Tire Impression Evidence*, 2013.





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