



Standard Terminology Relating to Walkway Safety and Footwear¹

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1. Scope

1.1 The terminology standard covers terminology related to walkway safety and footwear.

1.2 Words adequately defined in standard dictionaries are not included. Included are words that are particular to this industry and those contained in standards under the jurisdiction of ASTM Committee F13 on Pedestrian/Walkway Safety and Footwear.

2. Referenced Documents

2.1 ASTM Standards:²

F5859 Test Method for Determining the Traction of Footwear on Painted Surfaces Using the Variable Incidence Tester (Withdrawn 2005)³

F489 Test Method for Using a James Machine (Withdrawn 2005)³

F609 Test Method for Using a Horizontal Pull Slipmeter (HPS)

F694 Test Method for Heel-Attaching Strength of Women's Shoes (Withdrawn 2008)³

F695 Practice for Ranking of Test Data Obtained for Measurement of Slip Resistance of Footwear Sole, Heel, and Related Materials

F802 Guide for Selection of Certain Walkway Surfaces When Considering Footwear Traction (Withdrawn 2012)³

F1240 Guide for Ranking Footwear Bottom Materials on Contaminated Walkway Surfaces According to Slip Resistance Test Results

F1637 Practice for Safe Walking Surfaces

F1694 Guide for Composing Walkway Surface Investigation, Evaluation and Incident Report Forms for Slips, Stumbles, Trips, and Falls

F2232 Test Method for Determining the Longitudinal Load Required to Detach High Heels from Footwear

F2412 Test Methods for Foot Protection

F2413 Specification for Performance Requirements for Protective (Safety) Toe Cap Footwear

F2508 Practice for Validation, Calibration, and Certification of Walkway Tribometers Using Reference Surfaces

F2892 Specification for Performance Requirements for Soft Toe Protective Footwear (Non-Safety / Non-Protective Toe)

F2913 Test Method for Measuring the Coefficient of Friction for Evaluation of Slip Performance of Footwear and Test Surfaces/Flooring Using a Whole Shoe Tester

F2948 Guide to Walkway Auditor Qualifications

F2965 Guide for Selection of Walkway Surfaces and Treatments When Considering Aggressive Contaminant Conditions in Commercial and Industrial (Not Including Construction) Environments

F2966 Guide for Snow and Ice Control for Walkway Surfaces

3. Terminology

adhesion, *n*—the tendency of one surface to adhere to another surface prior to movement due to dwell time, as well as other factors.

aggressive contaminants, *n*—substances that create a gross separation between the footwear bottom and the walkway surface. **F2965**

anti-icing materials, *n*—dry or liquid snow and ice control materials applied before a snow and ice event intended to prevent precipitation from bonding (that is, freezing) with the pavement, or weaken bonds formed for easier removal. **F2966**

arch, *n*—the bony framework of the foot extending from the heel to the toes and sustained by the muscles and ligaments in the form of an arch. Also, the bottom curve of a shoe last from heel to ball.

barefoot, *adv or adj*—with the feet uncovered or unclothed; without shoes or stockings.

bollard, *n*—a thick, low, short, post, often of iron or steel and usually used in series, provided for the purpose of excluding

¹ This terminology is under the jurisdiction of ASTM Committee F13 on Pedestrian/Walkway Safety and Footwear and is the direct responsibility of Subcommittee F13.91 on Editorial and Terminology.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

or diverting motor vehicles from a road, lawn, or path. **F1637**

box toes, *n*—are semi-rigid materials which can be molded to the shape of the last during shoe making. This provides the reinforcement and shape retention on the critical area of the toe of the footwear. **F2892**

breast, *n*—the forward or front face of a shoe heel.

calibration, *n*—the set of operations that establishes, under specified conditions, the relationship between the values obtained by a walkway tribometer and the corresponding supplier reference values. **F2508**

carpet, *n*—permanently secured fibrous floor covering.

DISCUSSION—Area rugs, mats, and runners are not considered to be carpet for the purpose of this practice. **F1637**

clean, *n*—free from visible or tactile contamination.

coating, *n*—a layer of any substance intentionally applied to a surface to modify its functional or decorative characteristics.

coefficient-of-friction (COF or μ), *n*—a dimensionless number: the ratio of two forces acting at the interface of two contacting solid bodies. The force used in the numerator is parallel to the surfaces and the force used in the denominator is perpendicular (normal) to the surfaces. See also *dynamic coefficient of friction*.

coefficient of friction (COF), *n*—the ratio of the horizontal component of force (parallel to the walkway surface and passing through the tester center of gravity) required to overcome the friction to the normal component of the vertical force (weight) of the object. **D5859**

coefficient of friction, *n*—the ratio of the frictional force to the force, usually gravitational, acting perpendicular to the two surfaces in contact. This coefficient is a measure of the relative difficulty with which the surface of one material will slide over an adjoining surface of itself, or of another material. The static or starting coefficient of friction (μ_s) is related to the force measured to begin movement of the surfaces relative to each other. The kinetic or sliding coefficient of friction (μ_k) is related to the force measured in sustaining this movement. **F489**

contaminant, *n*—any substance between and not a part of either of the two surfaces; *contaminant, contaminating, contamination*.

contamination, *n*—any undesirable solid or liquid material that rests upon a surface or exists between two mating surfaces; *contaminant, contaminating*.

contra lateral, *adj*—located, occurring, or acting on the opposite side of the body.

cross slope, *n*—the slope of a pedestrian walkway that is perpendicular to the direction of travel. **F1637**

de-icing materials, *n*—snow and ice melting products applied on top of a layer of snow or ice, or both, that is bonded to the pavement. **F2966**

dwelt time, *n*—the duration of time beginning at the instant a tribometer's test foot is placed upon the surface to be tested, and ending at the instant a shear force is applied to the sensor.

dynamic coefficient of friction (DCOF), *n*—a coefficient of friction, μ_d , obtained during relative translation between two contacting solid bodies; used interchangeably with *kinetic coefficient of friction*.

element, *n*—an identifiable part of an architectural component, for example, a stair handrail, tread, riser, or landing. **F1637**

fair, *adj*—a smooth transition between adjacent surfaces. **F1637**

fall, *n*—undesirable descent due to the force of gravity, usually from a standing posture or during ambulation, to a lower level, usually the ground or floor.

fit, *n*—the ability of the shoe or hosiery to conform to the size, width, shape, and proportion of the foot.

floor surface, *n*—See *walkway surface*.

footwear, *n*—wearing apparel for the feet (such as shoes, boots, slippers, or overshoes), excluding hosiery.

footwear, *n*—shoes, including boots, sandals, slippers, or foul weather gear such as overshoes and rubbers, or a combination thereof. **F1637**

forefoot, *n*—the portion of the shoe extending forward from the break of the joint to the toe, also called forepart. **F2232**

foreseeable pedestrian path, *n*—any place where a pedestrian could reasonably be expected to walk. **F1637**

foxing, *n*—a piece of material applied to the upper or extending around the outsole of a boot or shoe.

friction, *n*—resistance to the relative motion of one body sliding, rolling, or flowing over another with which it is in contact.

friction, *n*—the resistance developed between the physically contacting surfaces of two bodies when there is a movement or attempted movement of one body relative to the other parallel to the plane of contact. **D5859**

friction, *n*—the resisting force that arises when a surface of one substance slides, or tends to slide, over an adjoining surface of itself or another substance. Between surfaces of solids in contact there may be two kinds of friction: (1) the resistance opposing the force required to start to move one surface over another, and (2) the resistance opposing the force required to move one surface over another at a variable, fixed, or predetermined speed. **F489**

guiding document, *n*—a standard, regulation, law, code, directive, statute, ordinance, or similar document that nominally limits, requires, or otherwise guides certain activities or conditions; the specific relevance or applicability of the document may vary. **F2948**

heel, *n*—a solid part of a shoe or boot projecting downward and attached to or forming the back part of the sole under the heel of the foot.

- heel attachment strength**, *n*—the force in pounds measured under the testing conditions of Test Method **F2232** required to detach the heel from the sole/insole assembly. **F2232**
- heel breast**, *n*—the forward or front face of a shoe heel.
- heel breast**, *n*—the front face of the shoe heel. **F2232**
- heel height**, *n*—the vertical distance from the top back edge of the heel to the plane of the tread (wear) surface of the heel. **F2232**
- heel seat**, *n*—the part of a shoe to which the heel is attached.
- hosiery**, *n*—any covering of the foot not intended for ground contact during ambulation, such as socks, stockings, etc.
- insert/footbed/sockliner (all removable)**, *n*—footbed normally made of a foam product with leather or fabric cover shaped to cover the entire insole which can be inserted between the foot and insole board. **F2412, F2413, F2892**
- insole**, *n*—the part of the shoe that is a structural anchor to which the upper and heel are fastened during manufacture. It may or may not be covered on the foot side by material referred to as a socklining. **F2232**
- insole**, *n*—foundation of the shoe; the inner sole of the shoe which is next to the foot, under the sock liner or insert, onto which the upper is lasted. **F2412, F2413, F2892**
- insole**, *n*—that part of the shoe which is between the foot and the outsole, and to which the upper is fastened during manufacture. It may or may not be covered on the foot side by an aesthetic material referred to as a socklining. **F694**
- ipsilateral**, *adj*—located, occurring, or acting on the same side of the body.
- last**, *n*—solid hinged form, in the general shape of a foot, around which footwear is constructed. **F2412, F2413, F2892**
- lasting**, *v*—building of footwear around a specific foot form. **F2412, F2413, F2892**
- lining**, *n*—term used to describe all components that can be used to construct the interior of the upper portion of the footwear. **F2412, F2413, F2892**
- mudguard**, *n*—a strip of material applied to a shoe upper just above the sole intended as a protection against dampness or as an ornament.
- outsole**, *n*—the bottom sole of the shoe, the surface of which is exposed to wear. **F694**
- outsole**, *n*—the bottom (sole) of the shoe: including the surface which is exposed to wear. **F2232**
- outsole and heel**, *n*—exterior bottom platform of the footwear; the bottom surface. **F2412**
- paired t-test**, *n*—a test of statistical significance based on the use of student's t-distribution and used to compare two sample means. **F2508**
- pedestrian**, *n*—a person using legs or leg surrogates (for example, prosthetic limbs, crutches, etc.) as the principal mechanism for locomotion.
- planar**, *adj*—flat. **F1637**
- pricker points**, *n*—in testing footwear, a modification of the foot form in which needle points of steel 1/8 in. (3.2 mm) long are used to prevent vertical movement of the test specimen. **F694**
- product category**, *n*—description for a type of footwear designed and manufactured for a specific hazard or hazards. **F2412, F2413, F2892**
- product classification**, *n*—footwear manufactured to meet a minimum performance requirement for a specific hazard or hazards. **F2412**
- protective footwear**, *n*—footwear that is designed, constructed, and classified to protect the wearer from a potential hazard or hazards. **F2412, F2413, F2892**
- protective toe cap**, *n*—component designed to provide toe protection that is an integral and permanent part of the footwear. **F2412, F2413**
- quarter**, *n*—one side of the upper of a shoe or boot from heel to vamp.
- quarter**, *n*—entire back portion of the footwear upper. **F2412, F2413, F2892**
- ramp**, *n*—a walkway surface that has a slope steeper than 1:20 (5%). **F1637**
- reference surfaces (RS's)**, *n*—specified materials, identified in Section 7 of Practice **F2508**, that have experimentally demonstrated slip properties for a select population of pedestrians and serve as references for walkway tribometer measurements. **F2508**
- seatboard**, *n*—a reinforcement (if used) of the insole where the heel is attached. **F2232**
- self-cleaning**, *adj*—property of a walkway surface or treatment where foot pressure breaks up or displaces, or both, a contaminant on a walkway surface in a manner that restores direct contact between the walkway surface and the footwear bottom in contaminated conditions. **F2965**
- shank**, *n*—the steel or wood piece inserted in the arch of the shoe for reinforcement. **F694**
- shank**, *n*—a reinforcement in the arch (instep) of the shoe between the insole and outsole made from steel, wood, fiberboard or plastic (individually or in combination). **F2232**
- shankboard**, *n*—the back part of the insole which is fabricated from a firm fibreboard. It is contoured to the arch of the foot for support. **F694, F2232**
- SIC**, *n*—Standard Industrial Classification, as referenced in *Standard Industrial Classification*, Office of Statistical Standards, Executive Office of the President, Office of

Management and Budget, U.S. Department of Commerce.
F1694

sidewalk, *n*—a paved surface, such as concrete or asphalt, usually parallel and adjacent to streets. **F1637**

size, *n*—length and breadth measurements of footwear determined by using a specific grading; the American system of footwear grading. **F2412, F2413, F2892**

slider, *n*—a 76 ± 1 mm circular test specimen cut from sheet material.

DISCUSSION—Should a shape and or size of slider other than a 76 mm circular shape be used, it shall be documented within the test report.

F2913

slider 96, *n*—a pre-described rectangular test specimen intended for use in calibration of the test surface. **F2913**

slip, *n*—a term denoting lubricity of two surfaces sliding in contact with each other. In a sense, it is the antithesis of friction in that high coefficient of friction denotes low slip and low coefficient of friction high slip. **F489**

slip resistance, *n*—the relative force that resists the tendency of the shoe or foot to slide along the walkway surface. Slip resistance is related to a combination of factors including the walkway surface, the footwear bottom, and the presence of foreign materials between them.

DISCUSSION—Slip resistance is dependent upon many factors, such as material and condition of the walkway surface, material and condition of the shoe sole or heel material, the physical abilities of the user, the attempted or proposed activities of the user, the presence of any contaminants on any or both of the surfaces, and other factors. **F1637**

slip resistant, *n*—the provision of adequate slip resistance to reduce the likelihood of slip for pedestrians using reasonable care on the walking surface under expected use conditions. **F1637**

socklining (non-removable), *n*—fabric material placed over the insole, footbed, or insert that may be imprinted with a brand name or other designation. **F2412, F2413, F2892**

soft toe (absence of protective toe cap), *n*—which are commonly called box toe in footwear industry. **F2892**

soling material, *n*—exterior bottom platform of the footwear; the bottom surface. **F2413, F2892**

specimen, for protective footwear, *n*—footwear units evaluated for various hazards.

DISCUSSION—Footwear units may be a left foot, a right foot, or a matched pair. The exact number and type of footwear units is indicated by test method. **F2412**

static slip resistance, *n*—the force required to cause one body in contact with another to begin to move. This force is generally proportional to the perpendicular force between the surfaces; the ratio of the former to the latter is called the coefficient of friction. The ratio (with the decimal point moved one place to the right) is used to designate slip index as measured by the Horizontal Pull Slipmeter. **F609**

supplier, *n*—any individual, agent, company, manufacturer, or organization responsible for the walkway tribometer prior to receipt by the user. **F2508**

surface characteristics, *n*—a set of terms considered to be the minimum needed to precisely describe the condition of a surface especially regarding slip resistance (material, contamination, slope, texture, hardness, coating, temperature).

test foot, *n*—shoe bottom material or surrogate mounted on the walkway tribometer that comes into contact with the surface being tested. **F2508**

top lift, *n*—the top or outer layer or wearing surface of leather, rubber, plastic, or composition on the heel of a shoe. **F694**

top piece (toplift), *n*—the bottom layer of a heel (wear surface) usually made of leather, rubber, plastic, steel, or elastomers. **F2232**

upper, *n*—the parts of a shoe or boot that are above the sole.

upper, *n*—parts of a shoe or boot that are above the sole. **F2412, F2413, F2892**

validation, *n*—the set of operations that establishes, under specified conditions, the proper ranking and differentiation of reference surfaces by a walkway tribometer. **F2508**

walkway, *n*—walking surfaces constructed for pedestrian usage including floors, ramps, walks, sidewalks, stair treads, parking lots and similar paved areas that may be reasonably foreseeable as pedestrian paths. Natural surfaces such as fields, playing fields, paths, walks, or footpaths, or a combination thereof, are not included. **F1637**

walkway auditor, *n*—a person competent to offer reliable observations and opinions regarding the conformance of an audited walkway to relevant safety guidelines or requirements. **F2948**

walkway surface, *n*—a structure intended to be used by a person attempting to walk.

walkway surface hardware, *n*—includes manhole covers, cellar doors used as walking surfaces, junction box covers, cleanout covers, hatches, sidewalk elevator covers, sewer grates, utility covers, and similar elements that pedestrians can reasonably be expected to walk on. **F1637**

walkway tribometer, *n*—any apparatus used to measure the frictional forces acting at an interface between a walkway surface and shoe material. **F2508**

4. Acronyms

COF—coefficient of friction

DCOF—dynamic coefficient of friction

SCOF—static coefficient of friction

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