Designation: F2892 – 11

Standard Specification for Performance Requirements for Soft Toe Protective Footwear (Non-Safety / Non-Protective Toe)[1]

This standard is issued under the fixed designation F2892; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

Current ASTM standards F2412 and F2413 provide test methods and performance requirements for footwear requiring a protective safety toe cap. In industry there are many jobs that do not require toe protection from impact or compression. This committee has developed non-safety toe cap (soft toe) requirements to allow manufacturers to demonstrate the performance level of non-safety toe cap (soft toe) footwear.

1. Scope

1.1 The principle purpose of this specification is the certification of protective footwear. Certification must be performed by independent third party laboratories in order for footwear to bare the ASTM marking.

1.2 The specification contains performance requirements for footwear to protect workers' feet from the following hazards by providing: *(1)* conductive properties (Cd) which reduce hazards that may result from static electricity buildup; and reduce the possibility of ignition of explosives and volatile chemicals; *(2)* electric hazard protection (EH), to protect the wearer when accidental contact by stepping on live electric wires; *(3)* static dissipative properties (SD) to reduce hazards due to excessively low footwear electrical resistance that may exist where SD footwear is required; *(4)* puncture resistance (PR) footwear devices.

1.3 This specification covers minimum requirements for the performance of footwear to provide protection against a variety of workplace hazards other than the toe area that can potentially result in injury.

1.4 This specification is not intended to serve as a detailed manufacturing or purchasing specification, but can be referenced in purchase contracts to ensure that minimum performance requirements are met.

1.5 Controlled laboratory tests used to determine compliance with the performance requirements of this specification shall not be deemed as establishing performance levels for all situations to which individuals may be exposed.

1.6 Any changes to the original components of safety footwear such as replacing or adding after market footbeds/inserts could cause failure to any or all parts, or a combination thereof, of this specification rendering the ASTM Soft Toe Protective Footwear label invalid.

1.7 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.8 *This standard 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 standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B117 Practice for Operating Salt Spray (Fog) Apparatus

F1646 Terminology Relating to Safety and Traction for Footwear

F2412 Test Methods for Foot Protection

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

2.2 *Federal Standards:*[3]

29 CFR 1910.132 Personal Protective Equipment–General Requirements

29 CFR 1910.136 Personal Protective Equipment–Occupational Foot Protection

[1] This specification is under the jurisdiction of ASTM Committee F13 on Pedestrian/Walkway Safety and Footwear and is the direct responsibility of Subcommittee F13.30 on Footwear.

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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] Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, http://dodssp.daps.dla.mil.

2.3 *Canadian Standards Association Standard*[4]
CAN/CSA Z195 Protective Footwear

3. Terminology

3.1 *Definitions:*

3.1.1 *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.

3.1.2 *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.

3.1.3 *insole, n*—foundation of the shoe; the inner sole of the shoe which is next to the foot, under the sockliner or the insert, onto which the upper is lasted.

3.1.4 *last, n*—solid hinged form, in the general shape of a foot, around which footwear is constructed.

3.1.5 *lasting, v*—building of footwear around a specific last.

3.1.6 *lining, n*—term used to describe all components that can be used to construct the interior of the upper part of the footwear.

3.1.7 *product category, n*—description for a type of footwear designed and manufactured for a specific hazard or hazards.

3.1.8 *protective footwear, n*—footwear that is designed, constructed, and classified to protect the wearer from a potential hazard or hazards.

3.1.9 *quarter, n*—entire back portion of the footwear upper.

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

3.1.11 *socklining (non-removable), n*—material placed over the insole, footbed or insert which maybe imprinted with a brand name or other designation.

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

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

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

4. Significance and Use

4.1 This specification contains requirements to evaluate the performance of footwear for the following:

4.1.1 Conductive properties which reduce hazards that may result from static electricity buildup, and reduce the possibility of ignition of explosives and volatile chemicals, (Cd).

4.1.2 Electric hazard by stepping on live wire (EH).

4.1.3 Static dissipative (SD) properties to reduce hazards due to excessively low footwear electrical resistance that may exist where SD footwear is required.

4.1.4 Puncture resistance footwear devices, (PR).

4.2 Any changes to the original components of the soft toe protective footwear such as replacing or adding after market footbeds/inserts could cause failure to any or all parts, or a combination thereof, of this standard rendering the ASTM MARKING INVALID. Soft Toe Protective footwear specimens or samples shall be retested for any of the following changes.

4.2.1 Change in construction method used to make footwear or change in factory in which footwear is produced.

4.2.2 Change in the upper or insole material thickness greater than 25 %, change to the soling system, or a change in the hardness of the outsole.

4.2.3 Change in shape of last used in the manufacturing of footwear.

4.2.4 Change in material or supplier of protective insole.

5. Performance Requirements for Foot Protection

5.1 *Conductive Protective Footwear (Cd):*

NOTE 1—Conductive footwear is not intended to be worn by personnel working near open electrical circuits.

5.1.1 Conductive protective footwear shall be constructed and manufactured to provide protection for the wearer through conductance with a maximum 500 000 ohm resistance, against hazards that may result from static electricity buildup, thus reducing the possibility of ignition of an explosion in situations such as munitions manufacture.

5.1.1.1 Footwear shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds.

5.1.1.2 Footwear shall be of a construction that facilitates a stable electrically conductive path. All external components shall be made of non metallic materials.

5.1.2 Conductive protective footwear shall be determined by evaluating three specimens in accordance with Test Methods F2412.

5.1.3 The specimens shall demonstrate resistance between 0 and 500 000 ohms.

5.1.4 Any specimen or sample of conductive footwear that does not meet the performance requirement constitutes a non compliance for the product category.

5.2 *Electric Hazard Resistant Footwear (EH):*

NOTE 2—Electrical hazard protection is severely deteriorated in the following conditions: excessive wear on the soling material or exposure to wet and humid environments, or both. Work footwear can become contaminated with conductive materials. For example, soles can pick up metal shavings etc. which may reduce the effectiveness of the protection. In step potential environments, dielectric overshoes should be used.

5.2.1 Electric hazard footwear shall be constructed, and manufactured so that the footwear outsole can provide a SECONDARY SOURCE OF ELECTRIC HAZARD PROTECTION TO THE WEARER AGAINST THE HAZARDS BY STEPPING ON LIVE ELECTRICAL CIRCUITS, ELECTRICALLY ENERGIZED CONDUCTORS, PARTS OR APPARATUS.

[4] Available from Canadian Standards Association (CSA), 5060 Spectrum Way, Mississauga, ON L4W 5N6, Canada, http://www.csa.ca.