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Personal protective equipment — Occupational footwear

Équipement de protection individuelle — Chaussures de travail

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO 20347 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 161, *Foot and leg protectors*, in collaboration with Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 3, *Foot protection*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 20347:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

— revision of the terms and definitions in Clause 3;

— Figure 1 to Figure 4 revised;

— Tables 1, 2 and 3 revised;

— heel area defined (5.2.3);

— requirement on slip resistance revised (5.3.4 and 6.2.9); marking “SRA, SRB and SRC” deleted; marking “SR” and “Ø” introduced;

— pH value and chromium VI tests added in 5.3.5; former separate clauses under upper, lining, tongue and insole/insock deleted;

— requirement for seam strength of hybrid footwear added (5.3.6);

— requirement for upper materials not fulfilling WVP explained (5.4.6);

— abrasion of insoles revised (5.7.4);

— outsole requirements revised (5.8);

— outsole thickness revised (5.8.2.1);

— flexing resistance of outsole clarified (5.8.5);

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— perforation resistant insert, depending on ISO 22568-3 and ISO 22568-4 exchanging EN 12568:2010;

— tolerance added (6.2.3.1);

— former Annex A Hybrid Footwear included in the general text (Table 2, 5.4.1.2);

— optional requirement on ankle protection clarified (6.2.6);

— optional requirement for “SC” scuff caps added (6.2.8);

— water penetration and absorption, symbol “WRU” deleted, symbol “WPA” introduced;

— optional requirement for “LG” Ladder grip of outsoles added (6.4.3);

— marking revised (Table 14 and 18);

— two new categories added, O6 and O7 (Table 17);

— information on obsolenscence date added (8.5);

— Annex A with requirements for customized occupational footwear added;

— Annex B assessment of the footwear by the wearer added;

— Annex C Slip resistance added;

— requirement for electrically insulating footwear (EN 50321) deleted.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Personal protective equipment — Occupational footwear

1 Scope

This document specifies basic and additional (optional) requirements for occupational footwear used for general purpose. It includes, for example, mechanical risks, slip resistance, thermal risks, ergonomic behaviour. It also specifies requirements for occupational footwear equipped with customized insocks, customized occupational footwear or individual manufactured customized occupational footwear. This standard does not cover the property of high visibility because of interaction with the clothing (e.g. trousers cover the footwear) and work area conditions (e.g. dirt, mud).

Special risks are covered by complementary job-related standards (e.g. footwear for firefighters, electrical insulating footwear, protection against chain saw injuries, protection against chemicals and against molten metal splash, protection for motorcycle riders).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20344:2021, *Personal protective equipment — Test methods for footwear*

EN 13832-3:2018, *Footwear protecting against chemicals — Part 3: Requirements for footwear highly resistant to chemicals under laboratory conditions*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

NOTE 1 The component parts of footwear are illustrated in Figures 1, 2 and 3.

NOTE 2 Further terms and definitions can be found in ISO 19952[1].

3.1
occupational footwear
footwear incorporating features to protect the wearer from injuries which could arise through accidents

3.2
upper
part or parts of a footwear that cover the toes, the top of the foot, the sides of the foot, and optionally the back of the heel; it is attached to the outsole of a footwear

3.3
leather
hide or skin tanned to be imperishable

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3.3.1
leather split
flesh or middle part of a hide or skin, obtained by splitting a thick *leather* (3.3), which is tanned to be imperishable

3.4
rubber
type of elastic *polymeric material* (3.5) which can be vulcanized

3.5
polymeric material
large molecules composed of repeating structural units (monomer) typically connected by chemical bond

EXAMPLE Polyurethane (PU) or polyvinylchloride (PVC).

3.6
insole
non-removable component used to form the base of the shoe to which the *upper* (3.2) is usually attached during lasting

3.7
insock
removable or non-removable footwear component used to cover completely the *insole* (3.6)

3.7.1
seat sock
removable or non-removable footwear component used to cover the *insole* (3.6) in the heel area

3.7.2
footbed
insock (3.7) designed according to the sole of the foot with or without the aim of correcting the posture

Note 1 to entry: “Non-removable” means that the component cannot be removed without any damage.

Note 2 to entry: “Removable” means that the component can be removed, but the protective features are only maintained when it is placed into the footwear while wearing.

3.8
lining
material covering the inner surface of the footwear

Note 1 to entry: The wearer’s foot is in direct contact with the lining.

Note 2 to entry: Where an upper is split at the forepart to house the toe puff, or if an external piece of material is stitched to the upper to form a pocket to house the toe puff, the material under the toe puff acts as a lining.

3.9
cleat
protruding part of the outer surface of the outsole

3.10
outsole
outermost part to provide footwear with the necessary traction and protection from the floor surfaces it will be in contact with

3.10.1
rigid outsole
outsole, which can be bent less than an angle of 45° under a load of 30 N

Note 1 to entry: According to ISO 20344:2021, 8.5.

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3.10.2
multi-layer outsole
made up of two or more material layers completely covering the entire surface; a tread cover of less than 0,5 mm is not considered a layer

3.11
perforation-resistant insert
component placed in the *outsole* (3.10) complex or used as an *insole* (3.6) simultaneously in order to provide protection against perforation

3.12
scuff caps
abrasion resistant materials or component to protect against scuff of the upper external toe region

3.13
heel area
counter (stiffener) area, rear part of the footwear

3.14
partially conductive footwear
footwear with low electrical resistance between the wearer and the ground, able to dissipate static electricity

3.15
antistatic footwear
footwear maintaining some electrical resistance between the wearer and the ground, able to dissipate some static electricity

3.16
fuel oil
aliphatic hydrocarbon constituent of petroleum

3.17
customized occupational footwear
covering all individual customized footwear and other specific conditions of a foot

Note 1 to entry: Customized occupational footwear integrate in their design the recipient's own physiognomy and the specific arrangements aimed at modifying, correcting, compensating, curing, preventing, relieving a pathology, e.g. overweight, diabetes, hyperhidrosis, misalignments etc …

Note 2 to entry: Several types of customized occupational footwear and footwear adaptions exist:

Type 1 — equipped with customized insocks

Occupational footwear (according to this document) incorporating a customized insocks adapted to the wearers needs.

Type 2 — modified occupational footwear

Occupational footwear (according to this document) modified from its original construction to fit to an individual user.

See examples in ISO 21064:2017,6.4

Type 3 — Bespoke occupational footwear

Occupational footwear (according to this document) constructed as a single unit to fit an individual user.

See examples in ISO 21064:2017, 6.3.2 and 6.3.3

Note 3 to entry: Adapted to fit an individual user or a single unit to fit an individual user.

Note 4 to entry: According to ISO 21064:2017, 3.2.

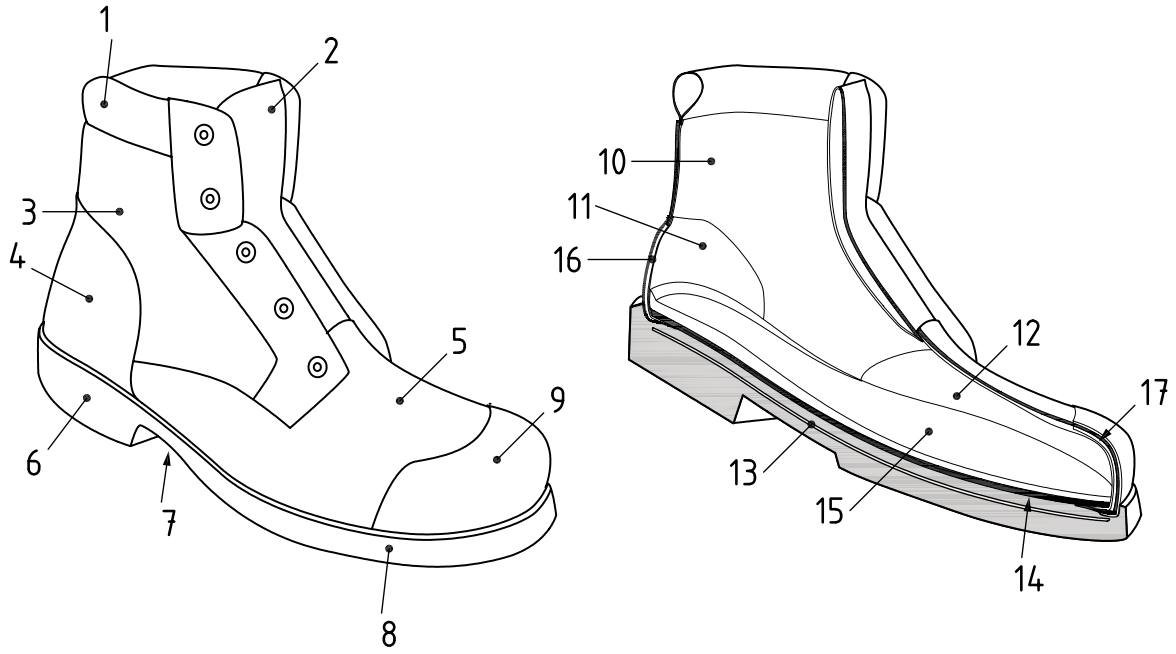
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3.18
hybrid footwear
footwear that cannot be classified as footwear of class I or II

Note 1 to entry: There are two types of hybrid footwear (other than design E boots) see 3.18.1 and 3.18.2.

3.18.1
hybrid "moulded" footwear
vulcanized rubber or all moulded polymeric foot section, often including the outsole which can be unlined and usually does not incorporate an *insole* (3.6).

3.18.2
hybrid "mounted" footwear
vulcanized rubber or all moulded polymeric foot section that is manufactured separately and then constructed around a conventionally lasted *lining* (3.8)/*insole* (3.6) construction and often with a separately attached *outsole* (3.10).

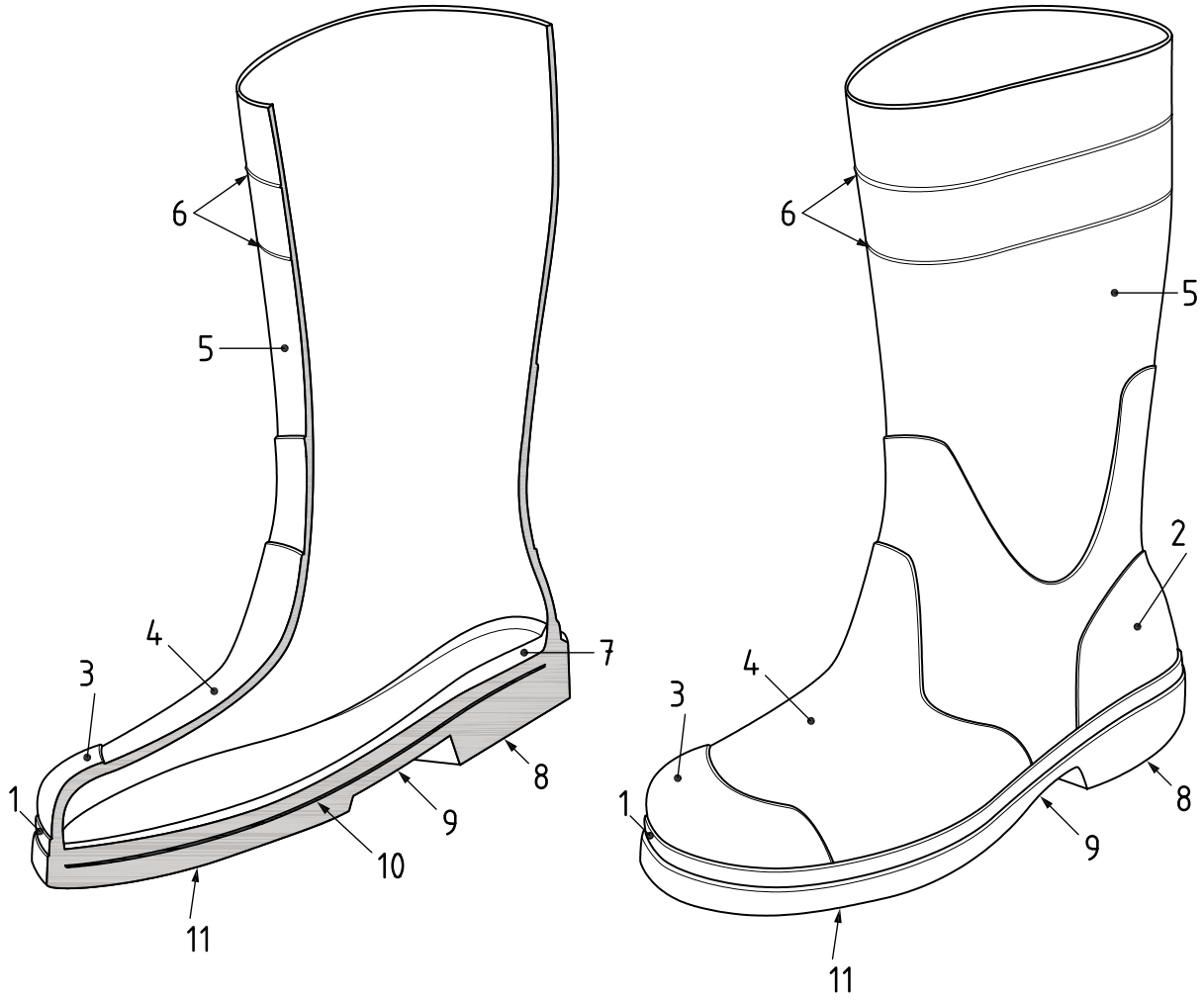


Key

1	collar	10	quarter lining
2	tongue	11	counter lining
3	upper – quarter	12	vamp lining
4	upper – counter	13	perforation resistant insert
5	upper – vamp	14	insole
6	outsole – heel	15	insock/footbed
7	outsole – waist	16	counter stiffener
8	outsole – forepart	17	toe puff stiffener
9	scuff cap		

Figure 1 — Example parts of class I occupational footwear

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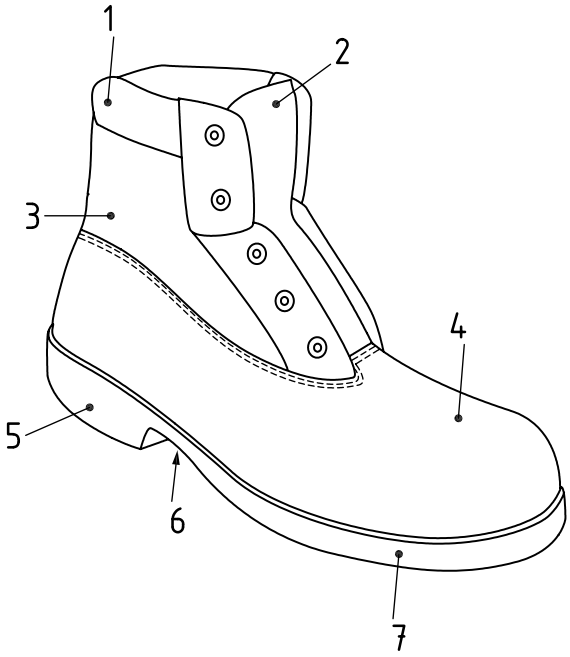


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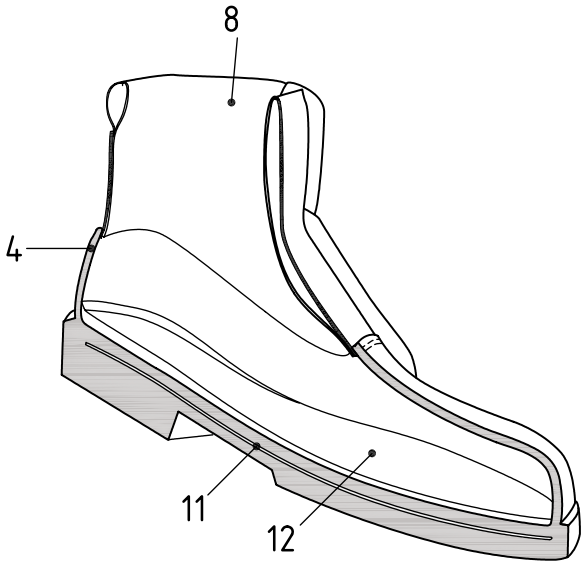
1 foxing strip
2 upper – counter
3 scuff cap
4 upper – vamp
5 upper – shaft
6 trim marks
7 insock/footbed
8 outsole – Heel
9 outsole – waist
10 perforation resistant insert
11 outsole – forepart

Figure 2 — Example parts of Class II occupational footwear

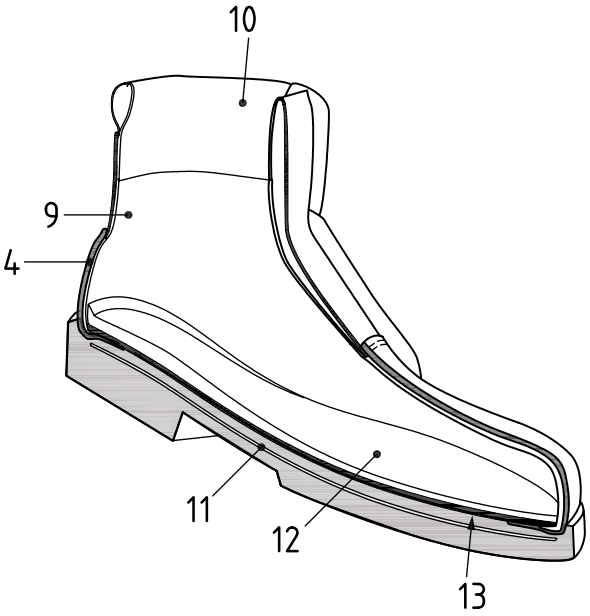
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a) Example of hybrid safety footwear in general



b) Hybrid moulded (Entirely moulded lower section)



c) Hybrid constructed (separately attached sole unit)

Key

1 collar
2 tongue
3 upper – leather or fabric section
4 upper – moulded rubber or polymeric part
5 outsole – heel
6 outsole – waist
7 outsole – forepart
8 lining
9 foot section lining
10 collar lining
11 perforation resistant insert
12 insock/footbed
13 insole

Figure 3 — Example parts of hybrid occupational footwear

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