

# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 20347

ISO/TC 94/SC 3

Secretariat: **BSI**

Voting begins on:  
**2020-04-13**

Voting terminates on:  
**2020-07-06**

---

---

## Personal protective equipment — Occupational footwear

*Équipement de protection individuelle — Chaussures de travail*

ICS: 13.340.50

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO/DIS 20347](https://standards.iteh.ai/catalog/standards/sist/26a0b981-d658-4ef1-9ab2-07b64ad5bb80/iso-dis-20347)

<https://standards.iteh.ai/catalog/standards/sist/26a0b981-d658-4ef1-9ab2-07b64ad5bb80/iso-dis-20347>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

**ISO/CEN PARALLEL PROCESSING**



Reference number  
ISO/DIS 20347:2020(E)

© ISO 2020

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO/DIS 20347

<https://standards.iteh.ai/catalog/standards/sist/26a0b981-d658-4ef1-9ab2-07b64ad5bb80/iso-dis-20347>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword .....	v
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>1</b>
<b>4 Classification and designs .....</b>	<b>7</b>
<b>5 Basic requirements for occupational footwear .....</b>	<b>8</b>
5.1 General .....	8
5.2 Design .....	10
5.2.1 General .....	10
5.2.2 Height of upper .....	11
5.2.3 Heel area .....	11
5.3 Whole footwear .....	11
5.3.1 Manufacturing performance .....	11
5.3.2 Leakproofness .....	11
5.3.3 Specific ergonomic features .....	11
5.3.4 Slip resistance requirement .....	12
5.3.5 Innocuousness .....	12
5.3.6 Seam Strength .....	12
5.4 Upper .....	12
5.4.1 General .....	12
5.4.2 Thickness .....	14
5.4.3 Tear strength .....	14
5.4.4 Tensile properties .....	14
5.4.5 Flexing resistance .....	14
5.4.6 Water vapour permeability and coefficient .....	14
5.4.7 pH value .....	15
5.4.8 Hydrolysis .....	15
5.4.9 Chromium VI content .....	15
5.5 Lining .....	15
5.5.1 Tear strength .....	15
5.5.2 Abrasion resistance .....	15
5.5.3 Water vapour permeability and coefficient .....	16
5.5.4 pH value .....	16
5.5.5 Chromium VI content .....	16
5.6 Tongue .....	16
5.6.1 Tear strength .....	16
5.6.2 pH value .....	16
5.6.3 Chromium VI content .....	16
5.7 Insole and insock .....	16
5.7.1 Thickness .....	16
5.7.2 pH value .....	17
5.7.3 Water permeability .....	17
5.7.4 Water absorption and desorption .....	17
5.7.5 Abrasion resistance .....	17
5.7.6 Chromium VI content .....	17
5.8 Outsole .....	17
5.8.1 Design .....	17
5.8.2 Tear strength .....	18
5.8.3 Abrasion resistance .....	18
5.8.4 Flexing resistance .....	18
5.8.5 Hydrolysis .....	18
5.8.6 Interlayer bond strength .....	19

<b>6</b>	<b>Additional requirements for occupational footwear</b> .....	<b>19</b>
6.1	General .....	19
6.2	Whole footwear .....	20
6.2.1	Perforation resistance .....	20
6.2.2	Electrical properties .....	22
6.2.3	Resistance to inimical environments .....	22
6.2.4	Energy absorption of seat region .....	22
6.2.5	Water resistance .....	22
6.2.6	Ankle protection .....	23
6.2.7	Cut resistance footwear .....	23
6.2.8	Scuff caps .....	23
6.2.9	Slip resistance .....	24
6.3	Upper — Water penetration and absorption .....	24
6.4	Outsole .....	24
6.4.1	Resistance to hot contact .....	24
6.4.2	Resistance to fuel oil .....	24
6.4.3	Ladder grip .....	25
<b>7</b>	<b>Marking</b> .....	<b>25</b>
<b>8</b>	<b>Information to be supplied</b> .....	<b>26</b>
8.1	General .....	26
8.2	Electrical properties .....	27
8.2.1	Dissipative footwear .....	27
8.2.2	Antistatic footwear .....	27
8.3	Insocks .....	28
8.4	Perforation resistance .....	28
8.5	Obsolescence deadline .....	28
<b>Annex A (normative) Customized occupational footwear (adapted to fit an individual user or a single unit to fit an individual user)</b> <small>ISO/DIS 20347</small> .....		<b>29</b>
<b>Annex B (informative) Assessment of the footwear by the wearer</b> <small><a href="https://standards.iteh.ai/catalog/standards/sist/26a0b981-d658-4ef1-9ab2-07664ad5b060/iso-dis-20347">https://standards.iteh.ai/catalog/standards/sist/26a0b981-d658-4ef1-9ab2-07664ad5b060/iso-dis-20347</a></small> .....		<b>33</b>
<b>Annex C (informative) Slip Resistance</b> .....		<b>35</b>
<b>Annex ZA (informative) Relationship between this European Standard and the essential requirements of PPE Regulation 2016/425 aimed to be covered</b> .....		<b>38</b>
<b>Bibliography</b> .....		<b>40</b>

ITeH STANDARD PREVIEW

(standards.iteh.ai)

## 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://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.

Changes between this edition and the 2012 version are as follows:

- revision of terms ([Clause 3](#).)
- [Figures 1](#) to 4 revised
- [Tables 1, 2](#) and [3](#) revised
- heel area defined ([5.2.3](#))
- requirement on slip resistance revised ([5.3.5](#) and 6.2.10); marking “SR” introduced
- requirement for seam strength of hybrid footwear added (5.3.7)
- requirement for upper materials not fulfilling WVP explained ([5.4.6](#))
- abrasion of insoles revised ([5.7.5](#))
- outsole requirements revised ([5.8](#))
- outsole thickness revised ([5.8.1.1](#))
- flexing resistance of outsole clarified ([5.8.4](#))
- perforation resistant insert, depending on ISO 22568 Part 3 and 4 exchanging EN 12568:2010

## ISO/DIS 20347:2020(E)

- tolerance added ([6.2.3.1](#))
- former [Annex A](#) Hybrid Footwear included in the general text ([Table 2](#), 6.2.5.2, [Table 15](#))
- optional requirement on ankle protection clarified ([6.2.6](#))
- optional requirement for “SC” scuff caps added ([6.2.9](#))
- optional requirement for “LG” Ladder grip of outsoles added ([6.4.3](#))
- marking revised ([Table 15](#) and [16](#))
- information on obsolescence date added ([8.5](#))
- normative [Annex A](#) with requirements for customized occupational footwear added
- informative [Annex B](#) assessment of the footwear by the wearer added
- informative [Annex C](#) Slip resistance added
- requirement for electrically insulating footwear (EN 50321) deleted
- [Annex ZA](#) revised

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/DIS 20347](#)

<https://standards.iteh.ai/catalog/standards/sist/26a0b981-d658-4ef1-9ab2-07b64ad5bb80/iso-dis-20347>

# Personal protective equipment — Occupational footwear

## 1 Scope

This International Standard 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 orthopaedic customized or individual manufactured orthopaedic 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*

ISO 22568-3:2019, *Foot and leg protectors — Requirements and test methods for footwear components — Part 3: Metallic perforation resistant inserts*

ISO 22568-4:2019, *Foot and leg protectors — Requirements and test methods for footwear components — Part 4: Non-metallic perforation resistant inserts*

ISO 21064:2017, *Prosthetics and orthotics — Foot orthotics — Uses, functions classification and description*

## 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:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

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 19952:2005.

### 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

#### 3.3.1

##### **leather split**

flesh or middle part of a hide or skin, obtained by splitting a thick leather, which is tanned to be imperishable

### 3.4

#### **rubber**

vulcanized elastomers

### 3.5

#### **polymeric materials**

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 is usually attached during lasting

### 3.7

#### **insock, seat sock, footbed**

Insock: removable or non-removable footwear component used to cover completely the insole

Seat sock: removable or non-removable footwear component used to cover the insole in the heel area

footbed: removable or non-removable footwear component used to cover completely the insole; shaped according to the sole of the foot

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 it must be obligatory placed into the footwear while wearing to maintain the protection features.

### 3.8

#### **lining**

material covering the inner surface of the upper

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 toecap, or if an external piece of material is stitched to the upper to form a pocket to house the toecap, the material under the toecap acts as a lining.

### 3.9

#### **cleat**

protruding part of the outer surface of the outsole

### 3.10

#### **rigid outsole**

sole which cannot be bent through an angle of 45° under a load of 30 N

### 3.11

#### **perforation-resistant insert**

footwear component placed in the outsole complex or used as an insole 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****dissipative footwear**

footwear able to dissipate some static electricity but with low resistance between the wearer and the ground

**3.15****antistatic footwear**

footwear able to dissipate some static electricity but maintaining some resistance between the wearer and the ground

**3.16****fuel oil**

aliphatic hydrocarbon constituent of petroleum

**3.17****specific job-related footwear**

occupational footwear relating to a specific profession

EXAMPLE Motorcycle riders footwear

**3.18****customized safety footwear (adapted to fit an individual user or a single unit to fit an individual user)**

covering all individual or orthotic footwear according to ISO 21064:2017, 3.2 and other specific conditions of a foot. They 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 ...

Several types of customized safety footwear and footwear adaptations exist:

**Type 1 — equipped with customized insoles**

Occupational footwear (complying ISO 20345:2021) incorporating a customized insoles adapted to the wearers needs.

**Type 2 — modified occupational footwear**

Occupational footwear (complying ISO 20345:2021) modified from its original construction to fit to an individual user.

See examples in ISO 21064/6.4

**Type 3 — Bespoke occupational footwear**

Occupational footwear (complying ISO 20345:2021) constructed as a single unit to fit an individual user.

See examples in ISO 21064:2017, 6.3.2 and 6.3.3

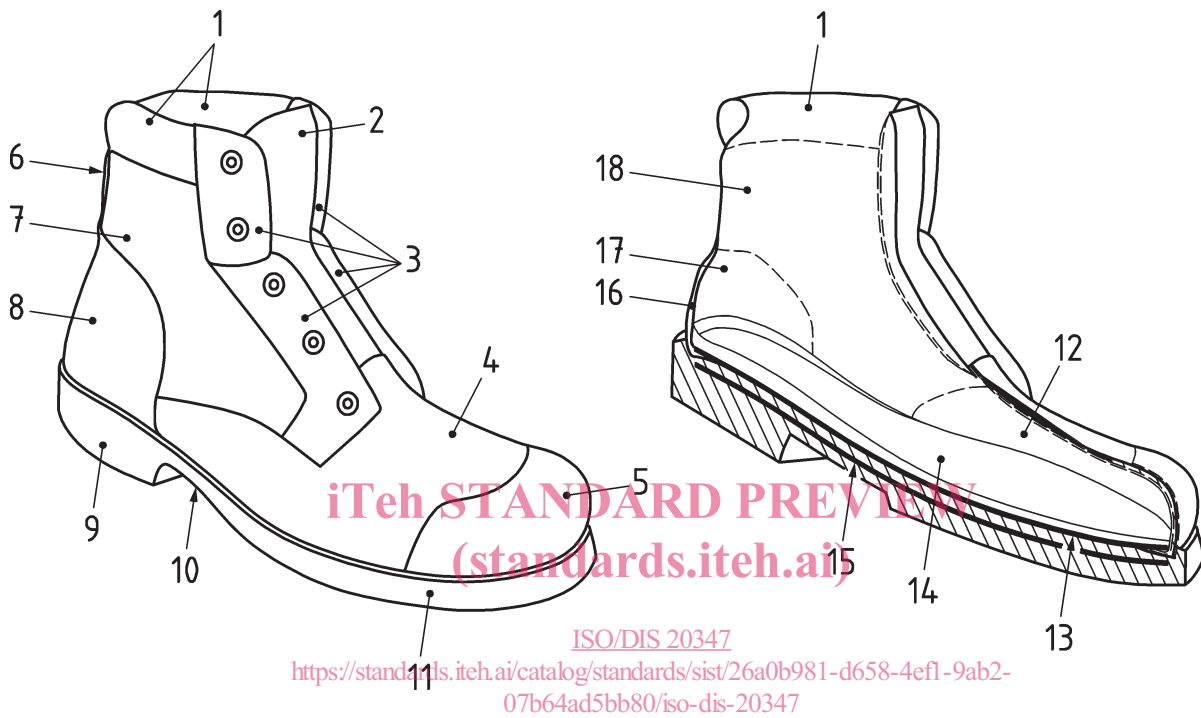
**3.19****hybrid footwear**

product with a vulcanized rubber or moulded polymeric lower foot section to the upper with a leather and/or fabric leg shaft. Hybrid footwear does not fully meet the classifications I or II as described in [Clause 4](#)

Two Hybrid footwear product types exist:

**Hybrid “moulded” footwear** — with a vulcanized rubber or all moulded polymeric foot section, often including the outsole. The foot area of this product type is unlined and usually does not incorporate an insole.

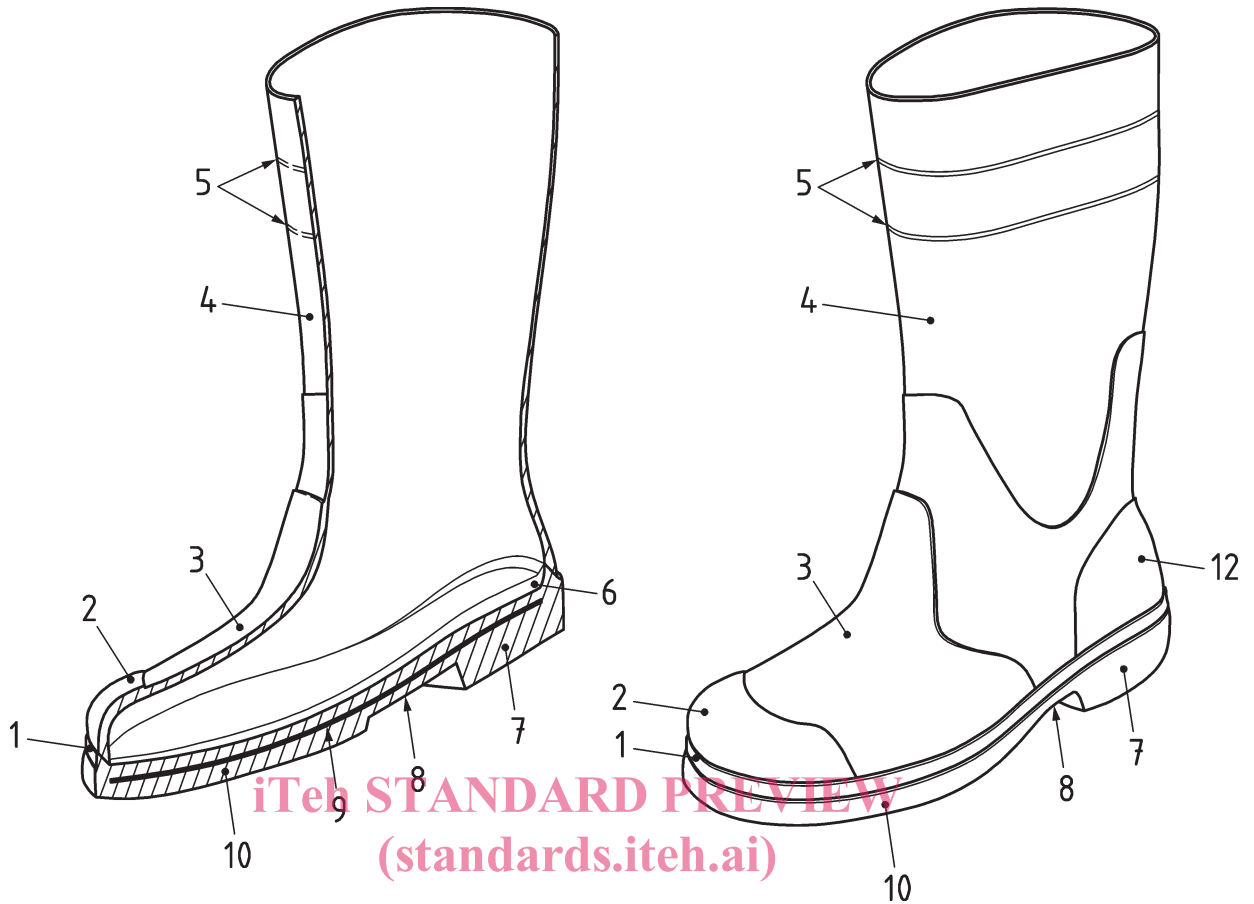
**Hybrid “constructed” footwear** — with a foot section of vulcanized rubber or all moulded polymeric that is manufactured separately and then constructed around a conventionally lasted lining/insole construction and often with a separately attached outsole.



**Key**

- |                    |                                 |
|--------------------|---------------------------------|
| 1 collar           | 11 outsole — forepart           |
| 2 tongue           | 12 vamp lining                  |
| 3 facing           | 13 insole board                 |
| 4 upper — vamp     | 14 insock/seat sock/footbed     |
| 5 scuff cap        | 15 perforation resistant insert |
| 6 back strap       | 16 counter stiffener            |
| 7 upper — quarter  | 17 counter lining               |
| 8 upper — counter  | 18 quarter lining               |
| 9 outsole — heel   |                                 |
| 10 outsole — waist |                                 |

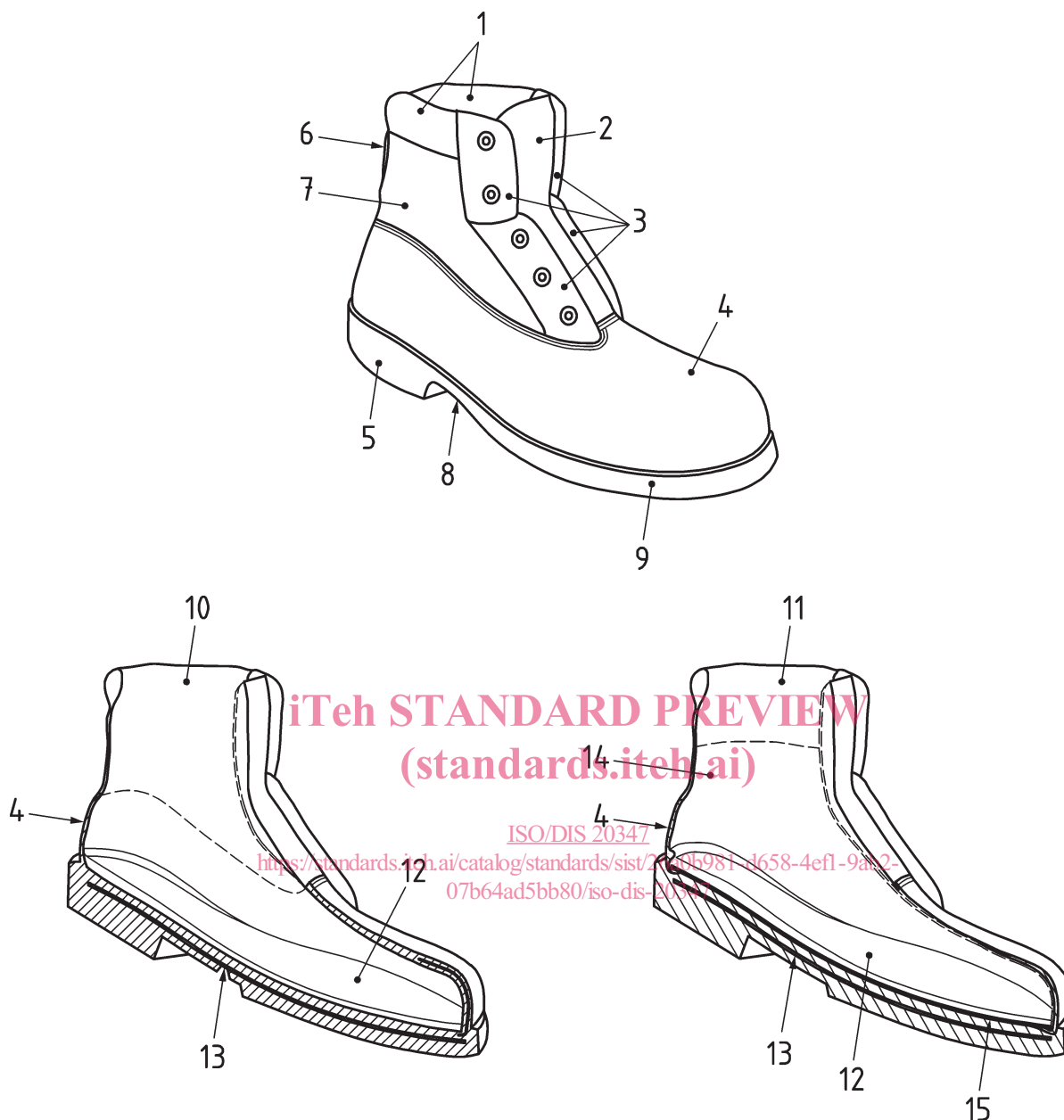
**Figure 1 — Example parts of class I occupational footwear**



**Key**

- |   |                          |    |                              |
|---|--------------------------|----|------------------------------|
| 1 | Foxing strip             | 7  | Outsole — Heel               |
| 2 | Scuff cap                | 8  | Outsole — Waste              |
| 3 | Upper — vamp             | 9  | Perforation resistant insert |
| 4 | Upper — Shaft            | 10 | Outsole — Forepart           |
| 5 | Trim marks               | 11 | Upper — counter              |
| 6 | insock/seat sock/footbed |    |                              |

**Figure 2 — Example parts of Class II occupational footwear**



Hybrid moulded (Entirely moulded lower section)    Hybrid constructed (seperately attached sole unit)

**Key**

- |  |                                 |
|--|---------------------------------|
| 1 Collar                                 | 9 Outsole — forepart            |
| 2 Tongue                                 | 10 lining                       |
| 3 Facings                                | 11 Collar lining                |
| 4 Moulded rubber or polymeric upper part | 12 insock/seat sock/footbed     |
| 5 Outsole — Heel                         | 13 Perforation resistant insert |
| 6 backstrap                              | 14 Foot section lining          |
| 7 Upper leather or fabric section        | 15 insole board                 |
| 8 Outsole — Waist                        |                                 |

**Figure 3 — Example parts of hybrid occupational footwear**

#### 4 Classification and designs

Occupational footwear shall be classified in accordance with [Table 1](#). Designs of footwear are illustrated in Figure 4.

**Table 1 — Classification of occupational footwear**

Classification	Description
Class I	made from leather and other materials, excluding all-rubber or all-polymeric footwear (see <a href="#">Figure 1</a> )
Class II	All-rubber (i.e. entirely vulcanized) or all-polymeric (i.e. entirely moulded) footwear
Hybrid footwear	See 3.20 (see <a href="#">figures 3</a> )



NOTE Design E of class I and II occupational footwear can be a knee-height boot (design D) equipped with a thin impermeable material which extends the upper which can be cut to adapt the boot height to the wearer. This design does not constitute hybrid footwear.

**Figure 4 — Example designs of occupational footwear**