
**Safety footwear with resistance to
chain saw cutting**

Chaussures de sécurité résistantes aux coupures de scie à chaîne

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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Sampling and conditioning	2
5 Classification	2
6 Requirements	3
6.1 General	3
6.2 Design	7
6.3 Construction	8
6.4 Resistance to chain saw cutting	9
7 Marking	9
8 Information to be supplied	10
8.1 General	10
8.2 Protection against chain saw cutting	11
8.3 Penetration resistance	11
8.4 Antistatic footwear	11
8.5 Insocks	12
Annex A (informative) Assessment of the footwear by the wearer	13
Bibliography	16

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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. 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. 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.

The committee responsible for this document is ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 3, *Foot protection*.

This second edition cancels and replaces the first edition (ISO 17249:2004) which has been technically revised. It also incorporates the Amendment ISO 17249:2004/Amd 1:2007.

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Safety footwear with resistance to chain saw cutting

1 Scope

This International Standard specifies requirements for safety footwear with resistance to chain saw cutting.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20344:2011, *Personal protective equipment — Test methods for footwear*

ISO 20345:2011, *Personal protective equipment — Safety footwear*

EN 381-3, *Protective clothing for users of hand-held chain-saws — Part 3: Test methods for footwear*

EN 50321, *Electrically insulating footwear for working on low voltage installations*

3 Terms and definitions

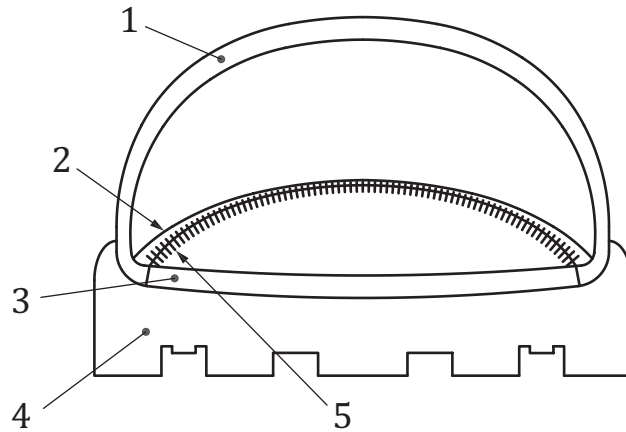
For the purposes of this document, the terms and definitions given in ISO 20345 and the following apply.

3.1

feather line

line around the inside of the footwear where the foot enclosure turns from vertical to horizontal

Note 1 to entry: This is not ordinarily the same as the insole edge or sole edge. See [Figure 1](#).



- Key**
- 1 upper
 - 2 feather line
 - 3 insole
 - 4 outsole
 - 5 Strobil stitching

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Figure 1 — Position of the feather line
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4 Sampling and conditioning

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The minimum number of samples shall be that specified in ISO 20344:2011, Table 1, for general test methods and [Clause 6](#) for job-related test methods.

All test pieces shall be conditioned in a standard atmosphere of (23 ± 2) °C and (50 ± 5) % relative humidity for a minimum of 48 h before testing, unless otherwise stated in the test method.

The maximum time which shall elapse between removal from the conditioning atmosphere and the start of testing shall be not greater than 10 min, unless otherwise stated in the test method.

Each test piece shall individually satisfy the specific requirement, unless otherwise stated in the test method.

The uncertainty of measurement for each test method described in this International Standard shall be assessed. One of the two following approaches shall be used:

- a statistical method, e.g. that given in ISO 5725-2;^[1]
- a mathematical method, e.g. that given in ENV 13005.^[3]

5 Classification

Safety footwear with resistance to chain saw cutting shall be classified in accordance with ISO 20345:2011, Table 1.

6 Requirements

6.1 General

Three levels of performance (see [Table 4](#)) of safety footwear with varying resistance to chain saw cutting are specified according to the different chain saw speeds.

Safety footwear with resistance to chain saw cutting shall conform to the requirements given in [Tables 1](#), [2](#), [3](#) and [4](#).

Table 1 — Requirements

	Requirement	Reference		Classification		Symbol
		ISO 20345:2011	This International Standard	I	II	
Design	Height of upper	5.2.1		X	X	
	Seat region	5.2.2		X	X	
	Design		6.2	X	X	
	Construction		6.3	X	X	

NOTE The applicability of a requirement to a particular classification is indicated in this Table by the following:

X The requirement shall be met. In some cases the requirement relates only to particular materials within the classification — e.g. pH value of leather components. This does not mean that other materials are precluded from use.

O If the component part exists, the requirement shall be met. The absence of X or O indicates that there is no requirement.

^a If the property is claimed, the requirement given in the appropriate clause shall be met.

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Table 1 (continued)

	Requirement	Reference		Classification		Symbol
		ISO 20345:2011	This International Standard	I	II	
Whole footwear	Sole performance:	5.3.1				
	Construction	5.3.1.1		X		
	Upper/outsole bond strength	5.3.1.2		X		
	Toe protection:	5.3.2				
	General	5.3.2.1		X	X	
	Internal length of toecaps	5.3.2.2		X	X	
	Impact resistance	5.3.2.3		X	X	
	Compression resistance	5.3.2.4		X	X	
	Behaviour of toecaps	5.3.2.5		X	X	
	Leak proofness	5.3.3			X	
	Specific ergonomic features	5.3.4		X	X	
	Slip resistance	5.3.5		a	a	SRA SRB SRC
	Penetration resistance	6.2.1		O	O	P
	Electrical properties:	6.2.2				
	Antistatic footwear	6.2.2.2		a	a	A
	Electrically insulating footwear	6.2.2.3		a	a	See EN 50321
	Resistance to inimical environments:	6.2.3				
	Heat insulation of sole complex	6.2.3.1		a	a	HI
	Cold insulation of sole complex	6.2.3.2		a	a	CI
	Energy absorption of seat region	6.2.4		a	a	E
Water resistance	6.2.5		a		WR	
metatarsal protection	6.2.6		a	a	M	
Ankle protection	6.2.7		a	a	AN	
Resistance to chain saw cutting		6.4	X	X		

NOTE The applicability of a requirement to a particular classification is indicated in this Table by the following:
X The requirement shall be met. In some cases the requirement relates only to particular materials within the classification — e.g. pH value of leather components. This does not mean that other materials are precluded from use.
O If the component part exists, the requirement shall be met. The absence of X or O indicates that there is no requirement.
a If the property is claimed, the requirement given in the appropriate clause shall be met.

Table 1 (continued)

	Requirement	Reference		Classification		Symbol
		ISO 20345:2011	This International Standard	I	II	
Upper	General	5.4.1		X	X	
	Thickness	5.4.2			X	
	Tear strength	5.4.3		X		
	Tensile properties	5.4.4		X	X	
	Flexing resistance	5.4.5			X	
	Water vapour permeability and coefficient	5.4.6		X		
	pH value	5.4.7		X		
	Hydrolysis	5.4.8			X	
	Chromium VI content	5.4.9		X		
	Water penetration and water absorption	6.3.1		a		WRU
	Upper construction	6.3.2		X		
Cut resistance	6.3.3		a	a	CR	
Vamp lining	Tear strength	5.5.1		X		
	Abrasion resistance	5.5.2		X		
	Water vapour permeability and coefficient	5.5.3		X		
	pH value	5.5.4		X		
	Chromium VI content	5.5.5		X		
Quarter lining	Tear strength	5.5.1		O		
	Abrasion resistance	5.5.2		O		
	Water vapour permeability and coefficient	5.5.3		O		
	pH value	5.5.4		O		
	Chromium VI content	5.5.5		O		
Tongue	Tear strength	5.6.1		O		
	pH value	5.6.2		O		
	Chromium VI content	5.6.3		O		
<p>NOTE The applicability of a requirement to a particular classification is indicated in this Table by the following:</p> <p>X The requirement shall be met. In some cases the requirement relates only to particular materials within the classification — e.g. pH value of leather components. This does not mean that other materials are precluded from use.</p> <p>O If the component part exists, the requirement shall be met. The absence of X or O indicates that there is no requirement.</p> <p>a If the property is claimed, the requirement given in the appropriate clause shall be met.</p>						

Table 1 (continued)

	Requirement	Reference		Classification		Symbol
		ISO 20345:2011	This International Standard	I	II	
Outsole	Thickness	5.8.1		X	X	
	Tear strength	5.8.2		X		
	Abrasion resistance	5.8.3		X	X	
	Flexing resistance	5.8.4		X	X	
	Hydrolysis	5.8.5		X	X	
	Interlayer bond strength	5.8.6		O	O	
	Resistance to fuel oil	5.8.7		a	a	FO
	Cleated area	6.4.1		X	X	
	Thickness of cleated outsoles	6.4.2		X	X	
	Cleat height	6.4.3		X	X	
	Resistance to hot contact	6.4.4		a	a	HRO

NOTE The applicability of a requirement to a particular classification is indicated in this Table by the following:

X The requirement shall be met. In some cases the requirement relates only to particular materials within the classification — e.g. pH value of leather components. This does not mean that other materials are precluded from use.

O If the component part exists, the requirement shall be met. The absence of X or O indicates that there is no requirement.

a If the property is claimed, the requirement given in the appropriate clause shall be met.

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Table 2 — Basic requirements for insoles and/or insocks

Options			Component to be assessed	Requirements of ISO 20345:2011 to fulfil						
				Thickness 5.7.1	pH ^a 5.7.2	Water absorption, desorption 5.7.3	Insole abrasion 5.7.4.1	Chromium VI ^a 5.7.5	Insock abrasion 5.7.4.2	
1	No insole or, if present, not fulfilling the requirements	Non-removable insock	Insock	X	X	X		X	X	
2	Insole present	No insock	Insole	X	X	X	X	X		
3		Seat sock present								
4		Full insock, non-removable	Insock and insole together	X		X				
5		Full insock, removable and water permeable ^b	Insole	X	X	X	X	X		
	Insock			X			X	X		
5	Full insock, removable, not water permeable ^b	Insole	X	X	X	X	X			
		Insock		X	X			X	X	

X The requirement shall be met.

^a Those requirements are only for leather. <https://standards.iteh.ai/catalog/standards/sist/aca5cb7f-94c8-449d-84df-4a8478ac9281/iso-17249-2013>

^b A water permeable insock is one that, when tested in accordance with ISO 20344:2011, 7.2, lets water through in 60 s or less.

6.2 Design

The minimum height, l , of the protective area (see [Figure 1](#)) shall be in accordance with [Table 3](#). At least 3 sizes shall be checked (smallest, largest and intermediate). The right and left footwear shall be checked.

No point of the top of the upper shall be lower than the minimum height, l , of the protective area (see [Figure 1](#) and [Table 3](#)).

Table 3 — Minimum height of the top of the protective area

Footwear size		Minimum height l (mm)
French	English	
36 and below	Up to 3 ½	162
37 and 38	4 to 5	165
39 and 40	5 ½ to 6 ½	172
41 and 42	7 to 8	178
43 and 44	8 ½ to 10	185
45 and above	10 ½ and above	192