SLOVENSKI STANDARD
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Obutev za varovanje pred kemikalijami - 3. del: Zahteve za obutev, zelo odporno proti kemikalijam v laboratorijskih razmerah

Footwear protecting against chemicals - Part 3: Requirements for footwear highly resistant to chemicals under laboratory conditions

Schuhe zum Schutz gegen Chemikalien - Teil 3: Anforderungen an Schuhe, die gegen Chemikalien unter Laborbedingungen hochwiderstandsfähig sind

Chaussure protégeant contre les produits chimiques - Partie 3: Exigences pour les chaussures hautement résistantes aux produits chimiques dans des conditions de laboratoire

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Footwear protecting against chemicals - Part 3: Requirements for footwear highly resistant to chemicals under laboratory conditions

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (prEN 13832-3:2010) has been prepared by Technical Committee CEN/TC 161 “Foot and leg protectors”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13832-3:2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

EN 13832, *Footwear protecting against chemicals*, is published in 3 parts

— Part 1 : *Terminology and test methods*

— Part 2: *Requirements for footwear resistant to chemicals under laboratory conditions*

— Part 3 : *Requirements for footwear highly resistant to chemicals under laboratory conditions*

This standard is intended for use in conjunction with EN ISO 20345, EN ISO 20346 and EN ISO 20347.

1 Scope

This standard specifies requirements for all-rubber and all-polymeric footwear constructed to be highly resistant to specific chemicals.

This standard does not cover footwear made from leather.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 13832-1:2006, *Footwear protecting against chemicals - Part 1: Terminology and test methods*

EN ISO 868, *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

EN ISO 20344:2004, *Personal protective equipment - Test methods for footwear (ISO 20344:2004)*

EN ISO 20345:2004, *Personal protective equipment - Safety footwear (ISO 20345:2004)*

EN ISO 20346:2004, *Personal protective equipment - Protective footwear (ISO 20346:2004)*

EN ISO 20347:2004, *Personal protective equipment - Occupational footwear (ISO 20347:2004)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13832-1:2006 and in EN ISO 20345:2004 apply.

4 Design

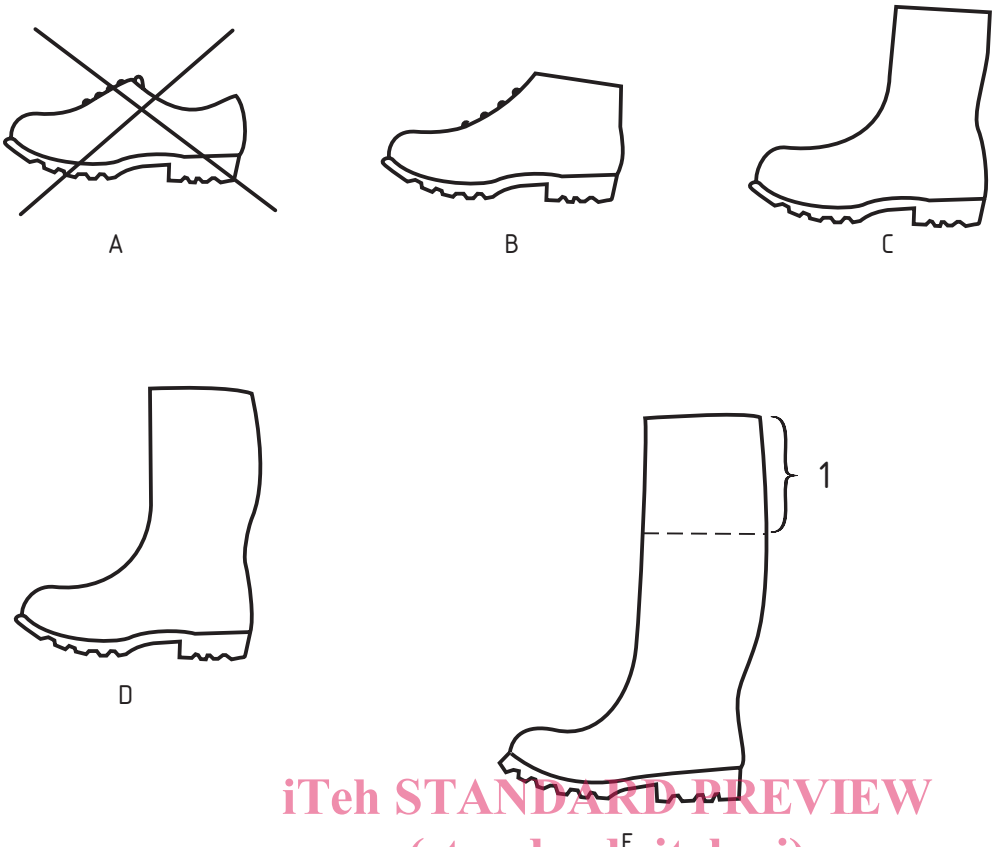
For footwear highly resistant to chemicals, only designs B, C, D or E in Figure 1 shall be used.

5 Classification

Footwear shall be classified in accordance with Table 1.

Table 1 — Classification of footwear

Code designation	Classification
II	All-rubber (i.e. entirely vulcanised) and all-polymeric footwear (i.e. entirely moulded) footwear



Key

1 Variable extension that can be adapted to the wearer

A Low shoe	C Half-knee boot	E Thigh boot
B Ankle boot	D knee-height boot	

NOTE Design E is a knee-height boot (design D) equipped with a thin impermeable material that extends the upper and that can be cut to adapt the boot to the wearer.

Figure 1 — Designs of footwear

6 Requirements

6.1 Basic requirements

Footwear constructed to be highly resistant to chemicals shall conform to the requirements specified in Table 2.

Footwear highly resistant to chemicals may or may not include a toe cap. The choice shall be made from one of the three columns (EN ISO 20345, EN ISO 20346 or EN ISO 20347) in Table 2.

Table 2 — Basic requirements for footwear highly resistant to chemicals

Requirements			Reference				Classification
			EN ISO 20345: 2004	EN ISO 20346: 2004	EN ISO 20347: 2004	EN 13832-3	II
General	Whole footwear	Types and classifications				4 and 5	X
		Height of upper	5.2.1	5.2.1	5.2.1		X
		Seat region Designs B, C ,D, E	5.2.2	5.2.2	5.2.2		X
		Specific ergonomic features	5.3.4	5.3.4	5.3.3		X
		Leakproofness	5.3.3	5.3.3	5.3.2		X
Whole footwear	Sole performance	Construction	5.3.1.1	5.3.1.1	5.3.1.1		
		Slip resistance	Amd 1 2007 table 2	Amd 1 2007 table 2	Amd 1 2007 table 2		X
	Toe Protection	General	5.3.2.1	5.3.2.1			X
		Toe cap length	5.3.2.2	5.3.2.2			X
		Impact resistance	5.3.2.3	5.3.2.3			X
		Compression resistance	5.3.2.4	5.3.2.4			X
		Corrosion resistance of metal toe caps	5.3.2.5.1	5.3.2.5.1			X
		Non- metallic toe caps	5.3.2.5.2	5.3.2.5.2			X
	Chemicals resistance	Degradation				6.2.2	X
		Permeation				6.2.3	X
Upper		General	5.4.1	5.4.1	5.4.1		X
		Thickness	5.4.2	5.4.2	5.4.2		X
		Tensile properties	5.4.4	5.4.4	5.4.4		X
		Flexing resistance	5.4.5	5.4.5	5.4.5		X
Insole/insocks		See Table 3					
Outsole		Thickness	5.8.1	5.8.1	5.8.1		X
		Abrasion resistance				6.3	X
		Flexing resistance	5.8.4	5.8.4	5.8.4		X
		Interlayer bond strength	5.8.6	5.8.6	5.8.6		O

The applicability of a requirement to a particular classification is indicated in the table by the following.

X indicates that 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 indicates that if the component part exists, the requirement shall be met.

NOTE The absence of X or O indicates that no requirement is made.

Table 3 — Basic requirements for insoles and/or insocks

Options			Component to be assessed	Requirements to fulfil in EN ISO 20345/20346/20347:2004					
				Thickness 5.7.1	pH ✱ 5.7.2	Water absorption desorption 5.7.3	Abrasion 5.7.4.1	Chromium VI ✱ 5.7.5	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	
		Seat sock present							
3		Full insock, non-removable	Insock and insole together	X		X			
			Insock		X			X	X
4		Full insock, removable and water-permeable♦	Insole	X	X	X	X	X	
			Insock		X			X	X
5		Full insock, removable, not water-permeable	Insole	X	X	X	X	X	
			Insock		X	X		X	X

NOTE For removable insocks see 9.5.

X indicates that the requirement shall be met.

♦ indicates a water permeable insock which, when tested in accordance with EN ISO 20344: 2004, 7.2, lets water through in 60 s or less.

✱ indicates those requirements that are only for leather.

6.2 Whole footwear

6.2.1 Chemicals

Table 4 lists the chemicals to be used in applying this standard.

Table 4 — List of chemicals

	Letter code	Chemical	CAS-NR	Class
1	B	Acetone	78-93-3	Ketone
2	D	Dichloromethane	75-09-2	Chlorinated hydrocarbon
3	F	Toluene	108-88-3	Aromatic hydrocarbon
4	G	Diethylamine	109-89-7	Amine
5	H	Tetrahydrofurane	109-99-9	Heterocyclic ether
6	I	Ethyl acetate	141-78-6	Ester
7	J	n-Heptane	142-85-5	Saturated hydrocarbon
8	K	Sodium hydroxide solution 30 % *d* = 1,33	1310-73-2	Alkali solution
9	L	Sulfuric acid 95 % *d* = 1,84	7664-93-9	Inorganic acid
10	M	Nitric acid (65 ± 3) %	7697-37-2	Inorganic acid
11	N	Acetic acid (99 ± 1) %	64-19-7	Organic acid
12	O	Ammonia solution (25 ± 1) %	1336-21-6	Alkali solution
13	P	Hydrogen peroxide (30 ± 1) % V/V	124-43-6	Peroxide
14	Q	Isopropanol	67-63-0	Aliphatic alcohol
15	R	Sodium hypochlorite(13 ± 1) % (of active chloride)	7681-52-9	Hypochlorite
NOTE 1 CAS-NR chemical abstract services = reference number of a chemical.				
NOTE 2 Letters B to L are identical to those given in EN 374-1: 2003, Annex A.				

6.2.2 Degradation resistance

6.2.2.1 Introduction

For footwear highly resistant to degradation by chemicals, at least three chemicals chosen in Table 4 shall be tested. Other chemicals may be used according to the intended use.

6.2.2.2 General

A footwear item protecting against chemicals shall be tested according to EN 13832-1:2006, 4.2. The sole and upper shall both be tested with the same chemicals.

After the tests, the tests pieces shall be inspected. If they are very affected (see EN 13832-1:2006, 4.2.4.3), it is considered that they fail the test.