

Australian/New Zealand Standard™

Occupational protective footwear

Part 3: Specification for safety footwear (ISO 20345:2004, MOD)



AS/NZS 2210.3:2009

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee SF-003, Occupational Protective Footwear. It was approved on behalf of the Council of Standards Australia on 16 June 2009 and on behalf of the Council of Standards New Zealand on 26 June 2009.

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The following are represented on Committee SF-003:

Association of Accredited Certification Bodies
Australasian Fire Authorities Council
Australian Chamber of Commerce and Industry
Australian Industry Group
Department of Defence (Australia)
Footwear Manufacturers Association of Australia
New Zealand Footwear Industry Association
New Zealand Leather & Shoe Research Association
Plastics and Chemicals Industries Association
Testing Interests (Australia)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-003, Occupational Protective Footwear to supersede AS/NZS 2210.2:2000, *Occupational protective footwear, Part 2: Requirements and test methods* (in part) as well as AS/NZS 2210.3:2000, *Occupational protective footwear, Part 3: Specification for safety footwear*, as well as AS/NZS 2210.7:2001, *Occupational protective footwear, Part 7: Additional specifications for safety footwear*.

This Standard has been adopted with national modifications and has been reproduced from the International Standard ISO 20345:2004, *Personal protective equipment—Safety footwear* ISO 20345:2004/Cor.1:2005, ISO 20345:2004/Cor.2:2006, and ISO 20345:2004/Amd.1:2007, and has been varied as indicated in Appendixes ZZ and ZA to take into account of Australian and New Zealand conditions. The Corrigenda and Amendment have been added after the source text.

The objective of this Standard is to provide manufacturers and users with requirements for footwear intended for use in workplace applications.

The objective of this revision is to adopt the current edition of ISO 20345.

As this Standard is reproduced from an international standard, the following applies:

- (a) Its number appears on the cover and title page while the international standard number appears only on the cover.
- (b) In the source text ‘this European Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian/New Zealand Standard</i>
EN ISO	AS/NZS
20344 Personal protective equipment—Test method for footwear (ISO 20344:2004)	2210 Occupational protective footwear 2210.2 Part 2: Test methods

NOTE: Any international Standards not listed have not been adopted as Australian or Australian/New Zealand Standards.

Guidance for the selection, care and use of protective footwear is not covered by this Standard but is provided in AS/NZS 2210.1, *Occupational protective footwear, Part 1: Guide to selection, care and use*.

The terms ‘normative’ and ‘informative’ are used to define the application of the appendix to which they apply. A normative appendix is an integral part of a standard, whereas an informative appendix is only for information and guidance.

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AUSTRALIAN/NEW ZEALAND STANDARD

Occupational protective footwear

Part 3:

Specification for safety footwear (ISO 20345:2004, MOD)

1 Scope

This European Standard specifies basic and additional (optional) requirements for safety footwear.

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 12568:1998, *Foot and leg protectors – Requirements and test methods for toecaps and metal penetration resistant inserts*

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

3 Terms and definitions

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

NOTE The component parts of footwear are illustrated in figures 1 and 2.

3.1

safety footwear

footwear, incorporating protective features to protect the wearer from injuries which could arise through accidents, fitted with toecaps, designed to give protection against impact when tested at an energy level of at least 200 J and against compression when tested at a compression load of at least 15 kN

3.2

leather

3.2.1

full grain leather

hide or skin tanned to be imputrescible having conserved the totality of its grain

3.2.2

corrected grain leather

hide or skin tanned to be imputrescible which has been subjected to mechanical buffing to modify its grain structure

3.2.3

leather split

flesh or middle part of a hide or skin tanned to be imputrescible obtained by splitting a thick leather

3.3

rubber

vulcanized elastomers

3.4

polymeric materials

for example polyurethane or polyvinylchloride

3.5**insole**

non-removable component used to form the base of the shoe to which the upper is usually attached during lasting

3.6**insock**

removable or permanent footwear component used to cover part or all of the insole

3.7**lining**

material covering the inner surface of the upper

NOTE 1 The wearer's foot is in direct contact with the lining.

NOTE 2 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.

3.7.1**vamp lining**

material covering the inner surface of the forepart of the upper

3.7.2**quarter lining**

material covering the inner surface of the quarters of the upper

3.8**cleat(s)**

protruding part(s) of the outer surface of the sole

3.9**rigid outsole**

sole which, when the complete footwear is tested in accordance with EN ISO 20344:2004, 8.4.1, can not be bent through an angle of 45° under a load of 30 N

3.10**cellular outsole**

outsole having a density of 0,9 g/ml or less with a cell structure visible under 10x magnification

3.11**penetration-resistant insert**

footwear component placed in the sole complex in order to provide protection against penetration

3.12**safety toecap**

footwear component built into the footwear designed to protect the toes of the wearer from impacts up to an energy level of at least 200 J and compression at a load of at least 15 kN

3.13**seat region**

back part of the footwear (upper and sole)

3.14**conductive footwear**

footwear whose resistance, when measured according to EN ISO 20344:2004, 5.10, lies in the range of 0 to 100 kΩ

3.15**antistatic footwear**

footwear whose resistance, when measured according to EN ISO 20344:2004, 5.10, lies above 100 k Ω and is less than or equal to 1 000 M Ω

3.16**electrically insulating footwear**

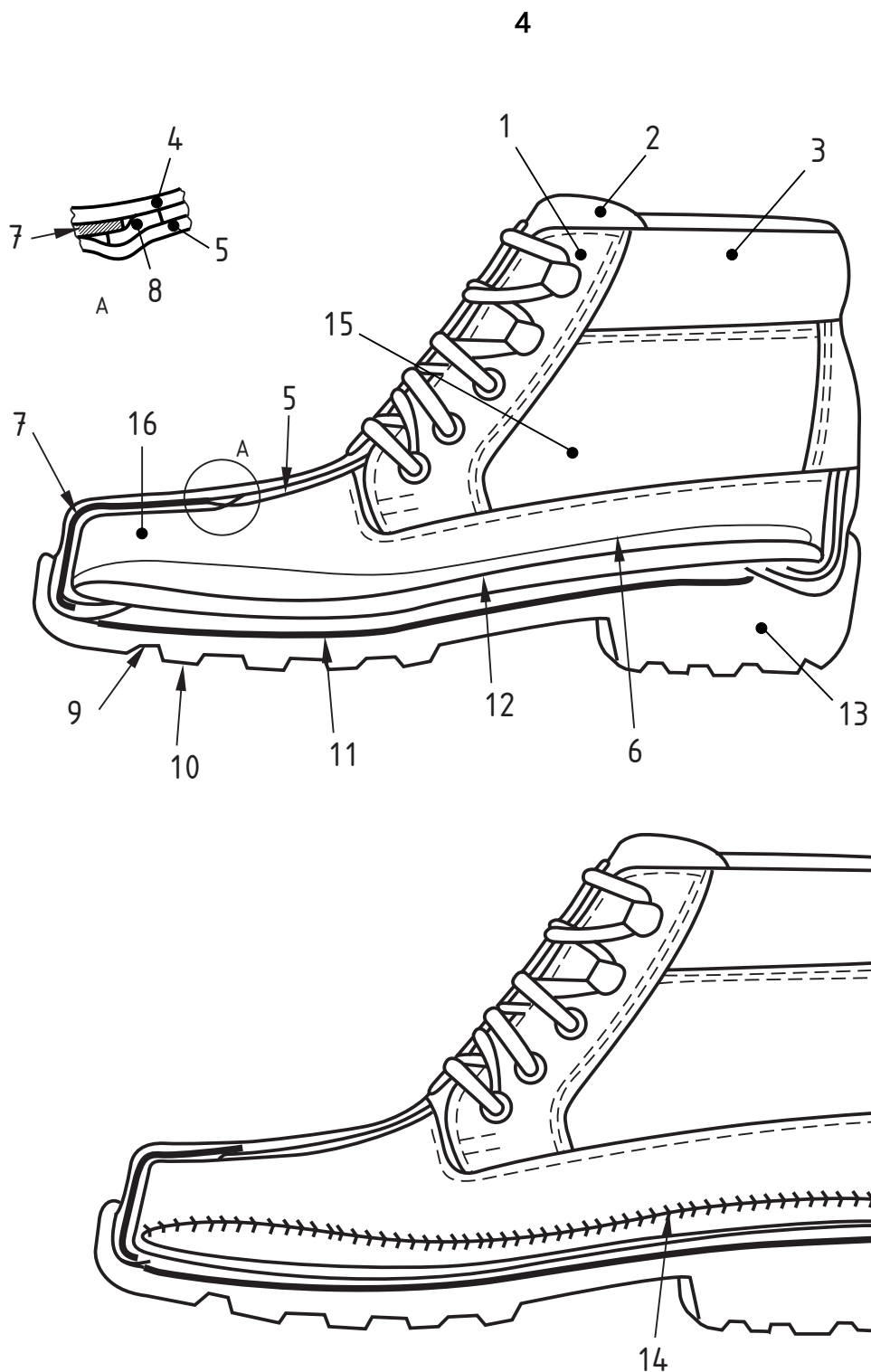
footwear which protects the wearer against electrical shocks by preventing the passage of dangerous current through the body via the feet

3.17**fuel oil**

aliphatic hydrocarbon constituent of petroleum

3.18**specific job related footwear**

safety, protective or occupational footwear relating to a specific profession, e.g. footwear for firefighters, footwear with resistance to chain saw cutting, etc.



Key

1	Facing	6	Insock	11	Penetration-resistant insert
2	Tongue	7	Toecap	12	Insole
3	Collar	8	Edge covering, e.g. foam strip	13	Heel
4	Upper	9	Outsole	14	Strobel stitching
5	Vamp lining	10	Cleat	15	Quarter
				16	Vamp

Figure 1a) Parts of footwear of Strobel construction

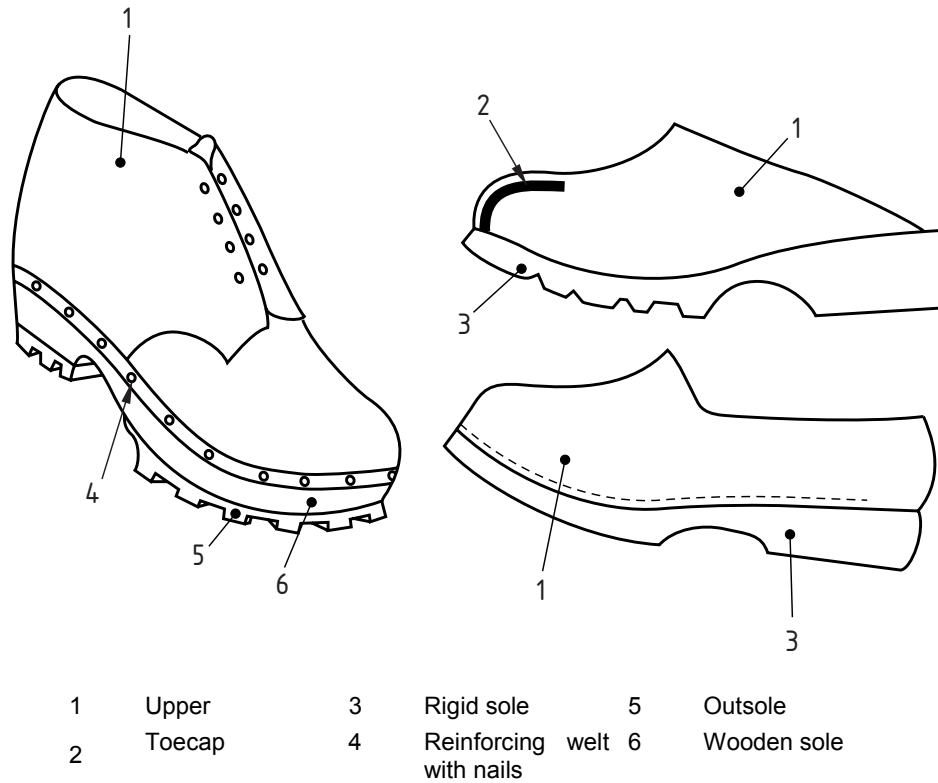


Figure 1b) Parts of footwear of conventional construction

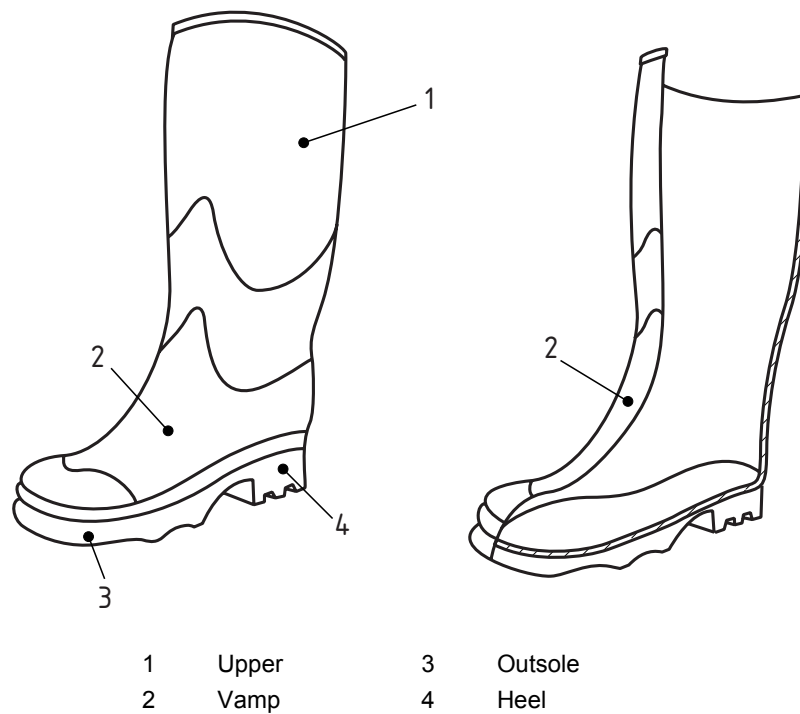


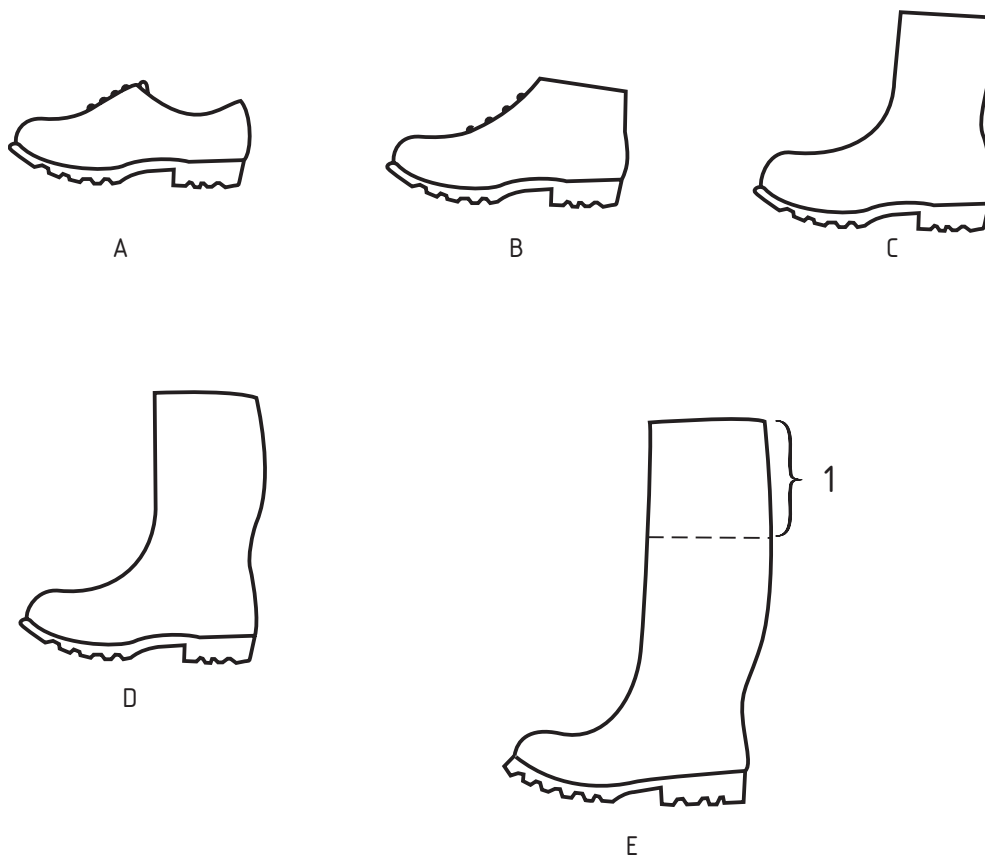
Figure 2 — Parts of all-rubber (i.e. vulcanized) or all polymeric (i.e. entirely moulded) footwear

4 Classification

Footwear shall be classified in accordance with table 1.

Table 1 — Classification of footwear

Code designation	Classification
I	Footwear made from leather and other materials, excluding all-rubber or all-polymeric footwear
II	All-rubber (i.e. entirely vulcanized) or all-polymeric (i.e. entirely moulded) footwear



1 Variable extension which can be adapted to the wearer

A Low shoe

B Ankle boot

C Half-knee boot

D Knee-height boot

E Thigh boot

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

Figure 3 — Designs of footwear

5 Basic requirements for safety footwear

5.1 General

Safety footwear shall comply with the basic requirements given in table 2 and one of the 5 options given in table 3.

Footwear without both an insole and insock or without an insole but with a removable insock is non-compliant with this standard.

Table 2 — Basic requirements for safety footwear

Requirement		Clause	Classification	
			I	II
Design	Height of upper	5.2.1	X	X
	Seat region:	5.2.2		
	Design A			X
	Design B, C, D, E		X	X
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
	Leakproofness	5.3.3		X
	Specific ergonomic features	5.3.4	X	X
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	
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	

Table 2 — Basic requirements for safety footwear (concluded)

Requirement		Clause	Classification	
			I	II
Tongue	Tear strength	5.6.1	O	
	pH value	5.6.2	O	
	Chromium VI content	5.6.3	O	
Outsole	Thickness of non-cleated outsoles	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	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.				

Table 3 — Basic requirements for insoles and/or insocks

Options			Component to be assessed	Requirements to fulfil					
				Thick-ness 5.7.1	pH ^a 5.7.2	Water absorp-tion desorp-tion 5.7.3	Abras-ion 5.7.4.1	Chrom-ium VI ^a 5.7.5	Abras-ion 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 ^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 means that the requirement shall be met.									
NOTE For removable insocks see 8.3.									
^a those requirements are only for leather									
^b a water permeable insock is one that, when tested in accordance with EN ISO 20344:2004, 7.2, lets water through in 60 s or less									

5.2 Design

Footwear shall conform to one of the designs given in figure 3.

5.2.1 Height of upper

The height of the upper measured in accordance with EN ISO 20344:2004, 6.2, shall be as given in table 4.

Table 4 — Height of upper

Footwear size		Height			
French	English	Design A mm	Design B mm min.	Design C mm min.	Design D mm min.
36 and below	up to 3 ½	< 103	103	162	255
37 and 38	4 to 5	< 105	105	165	260
39 and 40	5 ½ to 6 ½	< 109	109	172	270
41 and 42	7 to 8	< 113	113	178	280
43 and 44	8 ½ to 10	< 117	117	185	290
45 and above	10 ½ and above	< 121	121	192	300

5.2.2 Seat region

The seat region shall be closed.

5.3 Whole footwear

5.3.1 Sole performance

5.3.1.1 Construction

When used an insole shall be present in such a way that it cannot be removed without damaging the footwear.

5.3.1.2 Upper/outsole bond strength

When footwear, other than with a stitched sole, is tested in accordance with the method described in EN ISO 20344:2004, 5.2, the bond strength shall be not less than 4,0 N/mm, unless there is tearing of the sole, in which case the bond strength shall be not less than 3,0 N/mm.

5.3.2 Toe protection

5.3.2.1 General

Toecaps shall be incorporated in the footwear in such a manner that they cannot be removed without damaging the footwear.

With the exception of all-rubber and all-polymeric footwear, footwear fitted with internal toecaps shall have a vamp lining or an element of the upper that serves as a lining, and in addition the toecaps shall have an edge covering extending from the back edge of the toecap to at least 5 mm beneath it and at least 10 mm in the opposite direction.

Scuff resistant coverings for the toe region shall be not less than 1 mm in thickness.

5.3.2.2 Internal length of toecaps

When measured in accordance with the method described in EN ISO 20344:2004, 5.3, the internal toecap length shall be in accordance with table 5.