
British Standard

Safety footwear

Part 1. Specification for safety footwear other than
all-rubber and all-plastics moulded types

Chaussures de sécurité

Partie 1. Spécification des chaussures de sécurité autre que celles tout en caoutchouc ou tout en plastique du type moulé

Sicherheits-Fußbekleidung

Teil 1. Spezifikation für Sicherheits-Fußbekleidung außer ganz aus Gummi oder Kunststoff geformten Ausführungen

Foreword

This Part of BS 1870 has been prepared under the direction of the Personal Safety Equipment Standards Committee. It is a revision of BS 1870 : Part 1 : 1979 which is now withdrawn.

In this Part of BS 1870 a new format has been adopted in which details of the requirements are set out successively and their application to each of the three types of safety footwear, general use (safety general), heavy duty and clogs, is indicated by ticks in associated columns for each of these types. Requirements for safety footwear for specific purposes but not for all safety footwear are indicated by '(optional)' in the clause headings. Other Parts of BS 1870 give requirements for safety footwear in other materials: rubber footwear in Part 2, and PVC footwear in Part 3.

The Health and Safety Executive (HSE) commend the use of this British Standard to those who have duties under the Health and Safety at Work etc, Act 1974. The Standard was drawn up with the participation of HSE representatives and will be included in the list of 'Standards significant to health and safety at work', obtainable from HSE.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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Revised text

AMD 6273 February 1990	Clause 4.2.5 Delete the existing clause entirely and substitute the following: 4.2.5 When tested in accordance with BS 1309 all leather used for outer sections of the upper shall contain not less than 3.5 % (m/m) of chromium(III) oxide (Cr₂O₃) based on dry, fat free leather.'	✓	✓	✓
AMD 6273 February 1990	Clause 4.3.3 Delete the existing clause entirely and substitute the following: 4.3.3 If the outsole is rubber or synthetic material the relative volume loss when measured in accordance with Method A1 of BS 903 : Part A9 shall be not greater than 250 mm³, except for multilayered solings, where the relative volume loss from the outer layer shall not be greater than 150 mm³.'	✓	✓	
AMD 6273 February 1990	Clause 6.2.1 In paragraph 2, delete '150 J' and substitute '160 J'.			
AMD 6273 February 1990	Clause 8.6 Delete the existing clause entirely and substitute the following: 8.6 If the safety footwear is marked 'HEAT RESISTANT SOLE' and multilayered solings are used, the manufacturer shall supply with the footwear a leaflet containing the substance of the wording in appendix F.'	✓	✓	
AMD 6273 February 1990	Clause A.2.2 Wet test Delete the second paragraph entirely and substitute the following: 'Saturate the reference abradant and its backing felt with tap water and allow excess water to drip off before mounting them. Begin the test immediately. Inspect the specimens at intervals as described in BS 5690. Rewet the reference abradant and felt with approximately 30 mL of water after approximately 6400 cycles.'			
AMD 6273 February 1990	Clause A.10 Determination of the electrical resistance of outsoles Delete the first sentence entirely and substitute the following: 'Test one pair of footwear in accordance with A.1.1, A.1.2 and A.4.15 of BS 2050 : 1978.'			

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Specification

1 Scope

This Part of BS 1870 specifies the requirements for safety footwear, other than all-rubber and all-plastics moulded safety footwear. It relates to safety boots and shoes for general use, to heavy duty safety boots and to safety clogs for general use.

NOTE 1. In the following clauses the requirements as they apply to each of the three types of safety footwear are indicated by ticks in the columns on the right; absence of a tick indicates the inapplicability of a requirement to a particular type of safety footwear.

Various methods of test are given in appendix A and guidelines for assessing the quality of closing are given in appendix B. Appendices C to F give codes of practice for users of electrically conductive and antistatic safety footwear, footwear fitted with non-metallic impact resistant toecaps and footwear fitted with multilayer solings.

NOTE 2. The titles of the publications referred to in this Part of BS 1870 are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 1870 the following definitions apply.

2.1 footwear. Boots, shoes and clogs.

2.2 safety footwear. Footwear incorporating an impact resistant toecap.

2.3 boot. Footwear having a minimum leg height of 90 mm measured vertically from the insole surface at the back.

2.4 shoe. Footwear having a leg height of less than 90 mm measured vertically from the insole surface at the back.

2.5 clog. Footwear having a wooden sole.

The major components and typical constructions used for safety footwear are illustrated in figures 1 to 7.

3 Construction and design

3.1 Any construction shall be used.

3.2 Constructions shall be limited to the following:

- (a) riveted or screwed throughsole with either stitched and screwed leather outsole or stitched or stuck synthetic outsole;
- (b) outsoles direct or injection moulded to the upper.

3.3 Where constructions involve the use of metallic grindery to attach the sole complex to the upper the following shall apply.

- (a) A throughsole shall be used.
- (b) The insole shall be leather.
- (c) The attachment of the throughsole to the insole shall be with either corrosion resistant screws or rivets.
- (d) If leather outsoles are used they shall be stitched to the throughsole.
- (e) If leather outsoles are used they shall be both stitched and screwed with inherently corrosion resistant screws to the throughsole.

3.4 If the footwear is constructed by the veldtschoen method a throughsole shall be used.

3.5 Footwear shall be a boot and when the leg height is less than 190 mm the fastening shall be of a lace style with a tongue.

3.6 The tongue assembly shall consist of a pad of compressible material such as sponge or felt in a pocket formed by the tongue and the lining. The total thickness shall be not less than 6.0 mm when measured using the method given in A.3 for leather linings and the padding shall be not less than 83 mm long and, except where rounded at the top, not less than 32 mm wide.

3.7 If the leg height of boots and shoes is less than 190 mm when measured vertically from the insole surface to the top of the back of the upper, the upper shall be of a pattern which provides adequate fastening.

3.8 The upper shall be nailed or stapled to the recessed edge of the wooden sole and reinforced with a welt not less than 9.5 mm in width.

3.9 Footwear shall be closed in accordance with good trade practice (see appendix B).

4 Materials and components

4.1 Vamp linings

4.1.1 Linings shall be of dressed leather, inherently rot resistant material or material which has been rot proofed*.

4.1.2 When tested in accordance with A.1 the tear force in the two principal directions shall be not less than:

leather	30 N
non-leather	15 N

4.1.3 When tested for abrasion resistance in accordance with A.2, non-leather materials shall not develop any holes before the following numbers of revolutions have been performed:

dry	25600
wet	12800

4.1.4 When internal safety toecaps are used a vamp lining shall be included.

4.1.5 When measured in accordance with A.3 the thickness of any vamp lining shall be not less than 1.0 mm.

Safety general	Heavy duty	Clog
✓		
	✓	
	✓	
✓	✓	✓
✓	✓	✓
✓	✓	✓
✓		
	✓	
	✓	
✓		✓
✓	✓	✓
✓	✓	
✓	✓	
✓	✓	
✓	✓	
✓	✓	

*Materials treated by the normal pentachlorophenyl laurate process described in BS 2087 : Part 1 or any other treatment which gives equivalent results are acceptable.

		Safety general	Heavy duty	Clog
4.1.6 If no toe puff is included when internal safety toecaps are used, the thickness of the vamp lining and backing material (if present) when measured in accordance with A.3 shall be not less than 1.25 mm.		✓	✓	
4.2 Uppers				
4.2.1 Fabric uppers shall be made from synthetic polymer fibres.		✓		
4.2.2 When tested in accordance with A.1 the tear force in the two principal directions shall be not less than:				
leather	145 N	✓	✓	✓
non-leather, general use	70 N	✓	✓	✓
non-leather, animal fat*	30 N	✓		✓
4.2.3 When external safety toecaps are used a through vamp or vamp with a toecap shall be included.		✓	✓	
4.2.4 When measured in accordance with A.3 the thickness of the through vamp or vamp with a toecap including any toe puff shall be not less than:				
2.25 mm		✓		
2.50 mm			✓	
4.2.5 When tested in accordance with BS 1309 all-leather uppers shall contain not less than 3.5 % (m/m) of chromium (III) oxide (Cr ₂ O ₃) based on the dry, fat free leather.		✓	✓	✓
4.3 Outsoles, heels and throughsoles				
4.3.1 Outsoles shall be of leather, rubber or synthetic material.		✓	✓	
4.3.2 If the outsole is leather it shall be taken from the bend position.		✓	✓	
4.3.3 If the outsole is rubber or synthetic material the relative volume loss when measured in accordance with Method A1 of BS 903 : Part A9 shall be not greater than:				
PVC	250 mm ³	✓	✓	
rubber	250 mm ³	✓	✓	
PU Cellular	250 mm ³	✓	✓	
multilayered solings, outer layer only	150 mm ³	✓	✓	
4.3.4 If the soles are multilayered, i.e. comprised of two or more layers, and only the outer layer constitutes the wear layer, the outer layer shall be at least 2 mm thick when measured in accordance with A.4 . The overall thickness and the cleat thickness shall be as given in table 1.		✓	✓	
4.3.5 When leather board or cellulose board throughsoles are used, outsoles in welted or veldtschoen constructions shall be stitched.		✓		
4.3.6 If cleating is 2.5 mm or more in thickness when measured in accordance with A.4 , it shall be open at the periphery of the sole and heel.		✓	✓	
NOTE. The cleating may be closed at the toe region and at the back of the heel (see figure 8).				
4.3.7 Wooden soles shall be hardwood free of splits or cracks and recessed to accommodate the upper. Soles shall be reinforced with clog irons, leather, rubber or any synthetic material.				✓
4.3.8 When measured in accordance with A.4 the minimum thickness of the sole shall be as given in table 1.				

*Uppers for particular resistance to animal fats.