

Protective clothing — Footwear and gaiters for use in molten metal foundries — Requirements and test methods

ICS 13.340.50

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PH/1, Safety, protective and occupational footwear, upon which the following bodies were represented:

- British Footwear Association
- British Leather Confederation
- British Measurement and Testing Association
- British Rubber Manufacturers Association Ltd.
- BSIF Distributor Association
- BSIF Test and Certification Association
- Chief and Assistant Chief Fire Officers' Association
- Civil Aviation Authority
- Electricity Association
- Fire Brigades Union
- Health and Safety Executive
- London Fire and Emergency Planning Authority
- Metropolitan Police
- Office of the Deputy Prime Minister
- Personal Safety Manufacturers' Association
- RAPRA Technology Ltd.
- Safety Equipment Distributors Association
- SATRA Technology Centre
- Society of Motor Manufacturers and Traders Limited
- Transport and General Workers Union
- UK Steel Association
- Co-opted members

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Foreword

This British Standard has been prepared by Technical Committee PH/1. It supersedes BS 4676:1983, which is withdrawn.

Footwear and gaiters for use in molten metal foundries are intended to reduce the severity of, or prevent, injuries to the foot and lower leg resulting from splashes of molten metal. The footwear is also intended to provide protection against impacts on, and crushing of, the toe area and some resistance to slipping. Protection against impacts in the instep and metatarsal area may also be provided.

This revision of BS 4676 has been produced to bring the standard up to date by including where possible the latest European test methodology, with references to the relevant requirements and test methods in BS EN ISO 20345:2004.

WARNING. This British Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Product certification/inspection/testing. Users of this British Standard are advised to consider the desirability of third-party certification/inspection/testing of product conformity with this standard. Appropriate conformity attestation arrangements are described in BS EN ISO/IEC 17025. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 19 and a back cover.

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1 Scope

This British Standard specifies requirements and test methods for footwear and gaiters for use by workers in molten metal foundries. Two types of footwear are specified, Type 1 footwear, to provide protection against mechanical hazards, and to provide protection against molten metal when worn with the gaiters specified in this standard, and Type 2 footwear to provide protection against mechanical hazards and against molten metal, without the need for gaiters.

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.

BS 3144:1968 including Amendment 1:2003, *Methods of sampling and physical testing of leather*.

BS 5131-5.13:1980, *Methods of test for footwear and footwear materials — Part 5: Testing of complete footwear — Section 5.13: Measurement of the strength of stitched seams in upper and lining materials*.

BS EN 531:1995, *Protective clothing for workers exposed to heat*.

BS EN 702, *Protective clothing — Protection against heat and flame — Test method: Determination of the contact heat transmission through protective clothing or its materials*.

BS EN 13287:2004, *Personal protective equipment — Footwear — Test method for slip resistance*.

BS EN ISO 4048:1998, *Leather — Determination of matter soluble in dichloromethane*.

BS EN ISO 15025:2002, *Protective clothing — Protection against heat and flame — Method of test for limited flame spread*.

BS EN ISO 20344:2004, *Personal protective equipment — Test methods for footwear*.

BS EN ISO 20345:2004, *Personal protective equipment — Safety footwear*.

3 Terms and definitions

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

3.1

Type 1 footwear

footwear designed to provide protection against mechanical hazards, intended for general duties in a foundry and designed to provide protection against molten metal when worn with the gaiters specified in this standard

3.2

Type 2 footwear

footwear designed to provide protection against mechanical hazards and against molten metal, designed for use on its own without the need for gaiters

3.3

gaiter

protector covering the lower leg and ankle, designed to be worn with Type 1 footwear to provide protection against molten metal

4 Requirements

4.1 Design

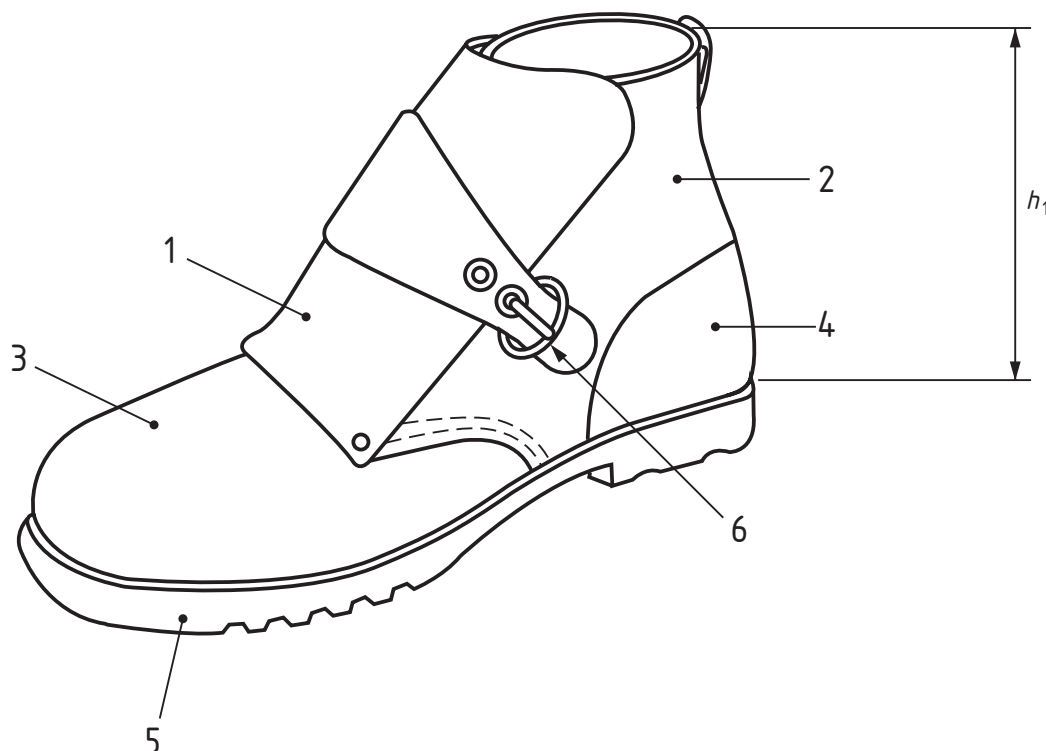
4.1.1 Footwear

Type 1 footwear shall comprise boots with an upper height ≥ 120 mm, which is at least that of ankle boots as illustrated in Figure 1. If the footwear has a divided front (with or without laces) it shall be fitted with a protective flap which completely covers the opening from the front of the instep to the top of the footwear, with all overlapping edges facing towards the back of the footwear. Any fastening systems, such as press studs, or elasticated areas on the front or side of the footwear shall similarly be covered by a protective flap.

Type 2 footwear shall comprise half-knee boots or knee-height boots with an upper height ≥ 200 mm and with a split-leg closure or a bellows closure, as illustrated in Figure 2 and Figure 3, respectively, with overlapping edges facing towards the back of the footwear. The footwear shall not be divided at the front and all fastening systems shall be at the back.

The design of the footwear shall be in accordance with the following requirements.

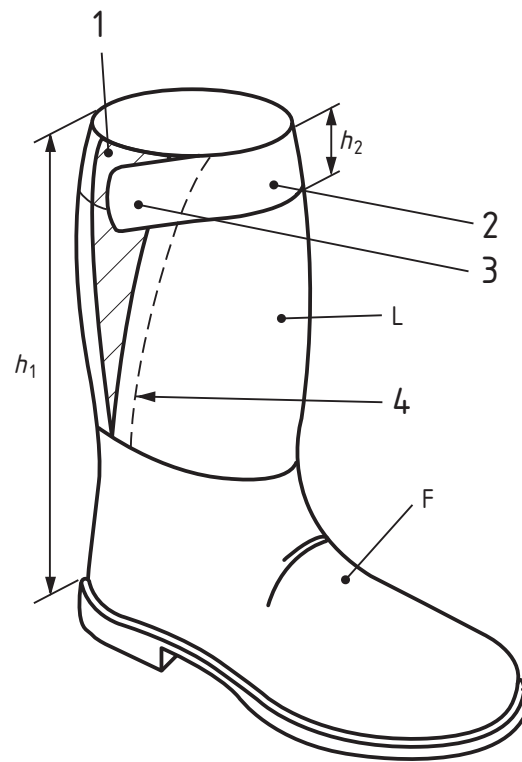
- There shall be no features on the outer surface of the footwear that could trap molten metal.
- All seams shall have an overlap of ≥ 10 mm.
- With the exception of the seam around the counter, no seams shall be upward facing.
- The vamp shall comprise a single piece.
- All metal fittings on the exterior surface of the footwear shall be covered or coated.
- If not fitted with a protective midsole, the footwear shall have a shank.



Key

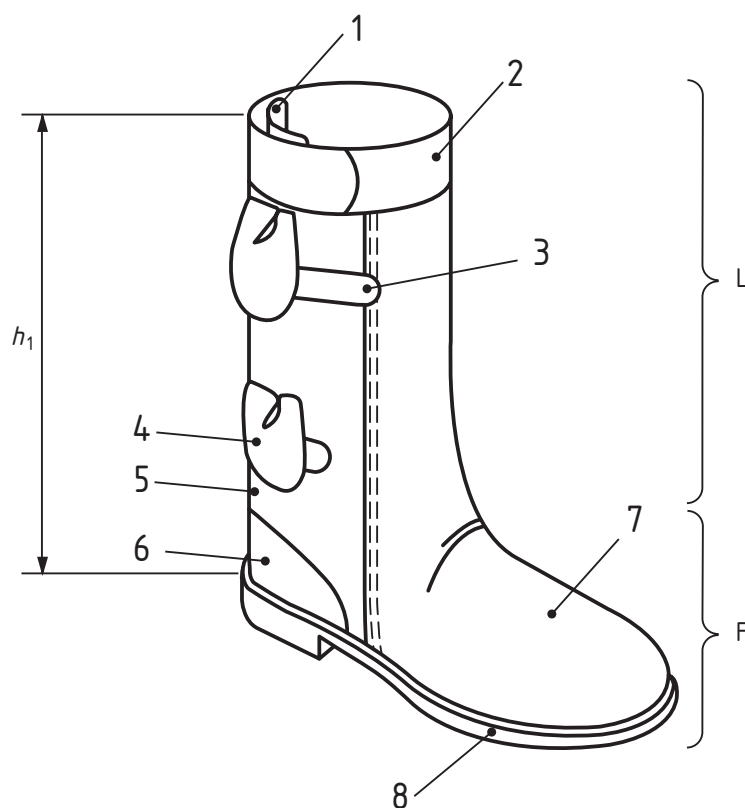
- | | |
|-------------------|------------------------|
| 1 Protective flap | 5 Outsole |
| 2 Quarter | 6 Quick release buckle |
| 3 Vamp | h_1 Height of upper |
| 4 Counter | |

Figure 1 — Example of Type 1 footwear

**Key**

- | | |
|---|--------------------------|
| 1 Fastener (such as a touch and close fastener) | L Leg section |
| 2 Top band | F Foot section |
| 3 Tug tag | h_1 Height of upper |
| 4 Fastener on reverse | h_2 Height of top band |

Figure 2 — Example of Type 2 footwear with split leg closure

**Key**

- | | |
|-------------------|-----------------------|
| 1 Bellows closure | 7 Vamp |
| 2 Top band | 8 Outsole |
| 3 Strap | L Leg section |
| 4 Covered buckle | F Foot section |
| 5 Quarter | h_1 Height of upper |
| 6 Counter | |

Figure 3 — Example of Type 2 footwear with bellows closure