

Specification for

# Airbricks and gratings for wall ventilation

ICS 91.060.10

Confirmed  
January 2010

# Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/519, Masonry and associated testing, upon which the following bodies were represented:

Autoclaved Aerated Concrete Products Association  
 Brick Development Association  
 British Ceramic Research Ltd.  
 British Precast Concrete Federation Ltd.  
 Building Employers' Confederation  
 Concrete Block Association  
 Department of the Environment (Building Research Establishment)  
 District Surveyors' Association  
 Local Authority Organizations  
 Mortar Producers' Association Limited  
 National House-building Council  
 Royal Institute of British Architects  
 Stone Federation

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

British Civil Engineering Test Equipment Manufacturers' Association  
 Calcium Silicate Brick Association Limited  
 Consumer Policy Committee of BSI  
 Federation of Civil Engineering Contractors

This British Standard, having been prepared under the direction of the Sector Board for Building and Civil Engineering, was published under the authority of the Standards Board and comes into effect on 15 April 1995

© BSI 2010

First published June 1933  
 First revision March 1945  
 Second revision February 1967  
 First published as BS 493-2 December 1970  
 Number changed to BS 493 by amendment in November 1980  
 Second edition April 1995

The following BSI references relate to the work on this standard:  
 Committee reference B/519  
 Draft for comment 93/105570 DC, DC 10/30155844

ISBN 978 0 580 72795 5

## Amendments issued since publication

Amd. No.	Date	Comments
A1	30 September 2010	See foreword

# Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 References	1
3 Definitions	1
4 Materials	1
5 Manufacturer's certificate	2
6 Marking	2
7 Airbricks for external use (class 1 units)	2
8 Wall ventilators or gratings for internal use (class 2 units)	3
Annex A (informative) Information to be supplied by the purchaser for the purpose of an order or enquiry	5
Annex B (normative) Test for impact resistance of airbricks	5
Figure 1 — Square hole design	2
Figure 2 — Rectangular hole design	2
Figure 3 — Louvre design	3
Figure B.1 — Falling ball impact apparatus	6
Table 1 — Dimensions of airbricks	3
Table 2 — Unobstructed air space (minimum)	3
Table 3 — Dimensions of ventilators or gratings	4
Table 4 — Unobstructed air space (minimum)	4
List of references	Inside back cover

## Foreword

BS 493:1995+A1:2010 supersedes BS 493:1995, which is withdrawn.

The start and finish of text introduced or altered by Amendment No. 1 is indicated in the text by tags  $\boxed{A1}$   $\langle A1 \rangle$ . Minor editorial changes are not tagged.

Amendment No. 1 has updated all references in Clause 4 and the Normative references.

The present standard is in accordance with the requirements and recommendations for the co-ordination of dimensions in building given in BS 6750 and BS 6954-1 to BS 6954-3 respectively.

Some typical examples of airbricks are illustrated, but it is not possible to include the wide range of patterns which can conform to this standard.

*Product certification.* Users of the British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing product 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 are forwarded by BSI to the Association of British 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.

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 cannot 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 6, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

## 1 Scope

This British Standard specifies requirements for two classes of wall ventilating units as follows:

- class 1: airbricks for use in external walls;
- class 2: wall ventilators or gratings for internal use.

Some typical examples of designs are shown in Figure 1, Figure 2 and Figure 3. Other patterns may however be supplied, provided they conform to the requirements of this standard.

Guidance on the information to be supplied by the purchaser when ordering is given in Annex A. This standard contains no requirements for the following properties.

*Durability* (other than resistance to colour change of thermoplastics materials). It is recommended that where there is uncertainty about durability then expert advice should be sought.

- a) *Fire properties of thermoplastics materials*. The general use of thermoplastics airbricks, wall ventilators and gratings in isolation in masonry is considered to have an insignificant effect on the spread of fire. However, special consideration should be given to the use of thermoplastics airbricks where it is intended to group a number of them together, e.g. for boiler house ventilation.
- b) *Compressive strength of thermoplastics airbricks*. The general use of these in isolation is considered to have an insignificant effect on masonry strength. However, special consideration should be given to their use where it is intended to group a number of them together, e.g. for boiler house ventilation.

## 2 References

### 2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies: any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

### 2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

## 3 Definitions

For the purposes of this standard the definitions of BS 6100 apply together with the following.

### 3.1 airbrick

a unit having apertures to allow for the passage of air which is normally built into external walling

### 3.2 wall ventilator or grating

a unit having apertures to allow for the passage of air which is either built into or fixed to internal walling, normally in conjunction with an external airbrick

### 3.3 wall hold

the surface of the airbrick in contact with the surrounding masonry

## 4 Materials

**A1** The following materials may be used for the manufacture of airbricks, wall ventilators and gratings and shall conform to the requirements given.

- a) *Concrete*. The constituent materials shall be cement conforming to BS EN 197-1, BS EN 197-4, BS 4027 or BS 6610, aggregate conforming to BS EN 12620 except for grading requirements and, if used, pigments for concrete conforming to BS EN 12878.
- b) *Clay, fireclay or terra-cotta*, which may or may not be glazed.
- c) *Thermoplastics*, meeting the following requirements:
  - 1) Tensile strength shall be not less than 39 MN/m<sup>2</sup> when tested in accordance with Method 320B of BS 2782-3:Methods 320A to 320F:1976.
  - 2) Elongation at break shall be not greater than 25% when tested as in 1) above.
  - 3) When tested by the methods given in Annex B airbricks shall exhibit, as a minimum, no cracks or breakage.<sup>1)</sup> **A1**

<sup>1)</sup> Other types of deformation are not requirements in this standard and if required as a performance parameter should be the subject of purchase contract

**A1**) 4) When tested in accordance with BS EN ISO 877, the colour fastness of the materials used to produce thermoplastics components shall show no visible change in colour at stage 5/1.

d) *Copper*, conforming to BS EN 1976 and BS EN 1978 or copper alloys containing a minimum copper content of 55%.

e) *Aluminium*, conforming to LM25-M, LM25-TE, LM25-TB7, LM25-TF or LM 6-M, as specified in BS EN 1559-1, BS EN 1559-4, BS EN 1676 and BS EN 1706.

f) *Plaster* (for internal use only), conforming to BS EN 13279-1.

g) *Steel, carbon, steel plate, or sheet*, conforming to BS EN 10130, which shall be galvanized in accordance with BS EN ISO 1461, or plastics coated, or continuously hot-dipped zinc coated steel sheet or plate conforming to BS EN 10346 or stainless steel plate or sheet conforming to BS EN 10029, BS EN 10048, BS EN 10051, BS EN 10095, BS EN ISO 9445-1 and BS EN ISO 9445-2. **A1**

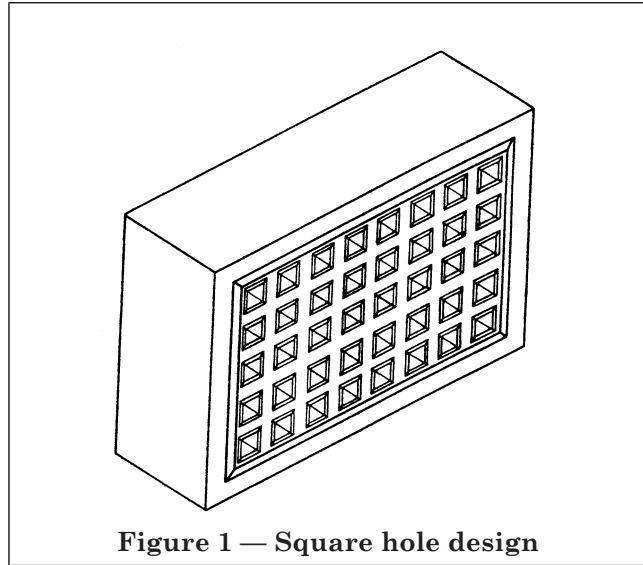


Figure 1 — Square hole design

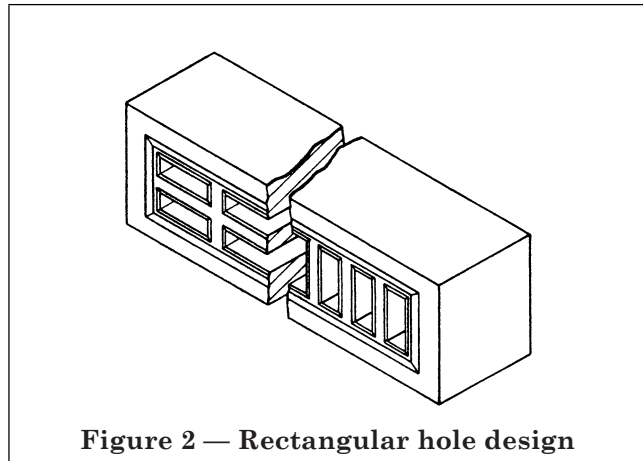


Figure 2 — Rectangular hole design

## 5 Manufacturer's certificate

The manufacturer shall satisfy himself that airbricks, wall ventilators or gratings conform to this British Standard at the time of despatch and shall provide a certificate to this effect upon the request of the purchaser.

The certificate shall include a note of the free area of the airbrick. The purchaser or his representative shall be granted facilities, if required, for the purpose of inspecting the finished units prior to delivery.

## 6 Marking

**6.1** Airbricks conforming to this standard shall be marked with the BS number i.e. "BS 493, class 1".<sup>2)</sup>

**6.2** Wall ventilators or gratings conforming to this standard shall be marked with the BS number, i.e. "BS 493, class 2".<sup>2)</sup>

## 7 Airbricks for external use (class 1 units)

### 7.1 Materials and design

Airbricks for external use shall be manufactured in any of the materials specified in clause 4, except plaster, and shall be of the following design:

- a) circular, square or rectangular hole design (see Figure 1 and Figure 2);
- b) "louvre" design (see Figure 3).

<sup>2)</sup> Marking **A1** BS 493 **A1** on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable

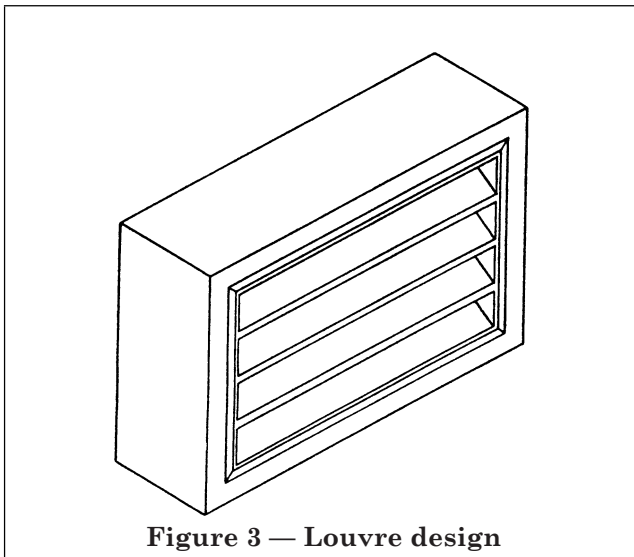


Figure 3 — Louvre design

## 7.2 Workmanship

Airbricks shall be constructed true to shape. Apertures shall be cleanly formed and if tapered, shall be so designed that the maximum cross-sectional area shall be at the outer face of the airbrick. There shall be no restriction on the pattern of apertures provided.

The outer face of airbricks shall be of uniform texture and free from flaws.

NOTE Units may be supplied coloured to the customer's requirements.

## 7.3 Dimensions

Airbricks shall be of the sizes specified in Table 1.

NOTE The thickness of airbricks will vary according to the material in which they are made, but it is recommended that the depth from the face of the airbrick to the back of the aperture should be such as to provide adequate protection against weather conditions likely to be experienced.

Table 1 — Dimensions of airbricks

Dimensions in millimetres

Co-ordinating size	Work size	Upper limit of manufactured size	Lower limit of manufactured size
200 × 75	190 × 65	190 × 65	185 × 60
200 × 100	190 × 90	190 × 90	185 × 85
200 × 200	190 × 190	190 × 190	185 × 85
225 × 75 <sup>a</sup>	215 × 65	215 × 65	210 × 60
225 × 150 <sup>a</sup>	215 × 140	215 × 140	210 × 135
225 × 225 <sup>a</sup>	215 × 215	215 × 215	210 × 210
300 × 100	290 × 90	290 × 90	285 × 85
300 × 200	290 × 190	290 × 190	285 × 185
300 × 225	290 × 215	290 × 215	285 × 210
300 × 300	290 × 290	290 × 290	285 × 285

<sup>a</sup> Airbricks of these types are intended to bond with the metric brick format of 225 mm × 112.5 mm × 75 mm.

## 7.4 Apertures

### 7.4.1 Circular, square or rectangular hole design

The size and shape of the apertures shall be such that a steel ball of 9.5 mm nominal diameter shall not pass through.

### 7.4.2 Louvre design

The shape of the louvre hole apertures shall be such that when viewed at an angle of 90° to the face, any strip of light seen through the apertures shall not exceed 3 mm in height. The size and shape of apertures shall be such that a steel ball of 9.5 mm nominal diameter shall not pass through.

### 7.4.3 Air space

The minimum unobstructed cross-sectional area of air space in airbricks of any design shall be as specified in Table 2.

Table 2 — Unobstructed air space (minimum)

Co-ordinating size of airbrick mm	Unobstructed air space mm <sup>2</sup>
225 × 75	1 290
225 × 150	2 580
225 × 225	4 500
200 × 75	1 100
200 × 100	1 600
200 × 200	3 250
300 × 225	5 400
300 × 100	2 400
300 × 200	4 800
300 × 300	7 700

## 7.5 Wall hold

The depth of wall hold of the airbrick whether continuous flange or otherwise, shall be not less than 50 mm.

## 8 Wall ventilators or gratings for internal use (class 2 units)

### 8.1 Materials and design

Wall ventilators or gratings for internal use shall be manufactured in any of the materials specified in clause 4, and shall be of the following designs:

- circular, square and rectangular hole design including the closable type (known as the "hit and miss");
- "louvre" design.

## 8.2 Workmanship

Wall ventilators or gratings shall be constructed true to shape. Apertures shall be cleanly formed, and if tapered, shall be so designed that the maximum cross-sectional area shall be at the outer face, (i.e. the side facing into the room). There shall be no restriction on the pattern of apertures provided.

The face of the ventilator or grating shall be hard and of a smooth and uniform texture, but the back shall have a rougher finish for good keying and fixing, unless the ventilator is of the “screw-on type.”

## 8.3 Additives

Where plaster is used for the manufacture of ventilators or gratings, it shall be reinforced with scrim, chopped fibre or stringing. No other materials shall be added except those necessary to control the working characteristics, setting and hardness or to impart anti-corrosion or anti-fungicidal properties.

## 8.4 Dimensions

The co-ordinating sizes of ventilators and gratings shall be as given in Table 3. Larger co-ordinating sizes shall be in accordance with BS 6750. The work size of ventilators and gratings shall have regard to the size of the aperture, the method of fixing and the finish of the surrounding surface.

The minimum thickness of ventilators or gratings in clay, concrete or plaster shall be 13 mm and the minimum thickness for metal gratings shall be 5.6 mm.

## 8.5 Apertures

### 8.5.1 Circular, square and rectangular hole design (including “hit and miss”)

The size and shape of the apertures shall be such that a steel ball of 9.5 mm nominal diameter shall not pass through. This requirement shall be met by the “hit and miss” type when in the fully open position.

### 8.5.2 “Louvre” design

The shape of the louvre hole apertures shall be such that when viewed at an angle of 90° to the face, no light shall be visible through them. The size and shape of the aperture shall be such that a steel ball of 9.5 mm nominal diameter shall not pass through.

### 8.5.3 Air space

The minimum unobstructed cross-sectional area of air space in ventilators or gratings of any design, measured before the fixing of any screens (see 8.7) shall be as specified in Table 4.

**Table 3 — Dimensions of ventilators or gratings**

Co-ordinating size mm
225 × 75
225 × 150
225 × 225
200 × 75
200 × 150
200 × 100
200 × 200
300 × 100
300 × 200
300 × 300

**Table 4 — Unobstructed air space (minimum)**

Co-ordinating size of ventilator or grating mm	Unobstructed air space <sup>a</sup> mm <sup>2</sup>
225 × 75	2 400
225 × 150	4 800
225 × 225	9 000
200 × 75	2 200
200 × 150	4 400
200 × 100	3 250
200 × 200	6 500
300 × 100	4 800
300 × 200	8 500
300 × 300	14 400

<sup>a</sup> In the case of the “hit and miss” design, this area is measured when the ventilator is in the fully open position.

## 8.6 Width of web surround

The width of web surround, measured from the edges of the apertures to the edge of the ventilator or grating shall be not less than 25 mm.

## 8.7 Screening

If requested by the purchaser, ventilators or gratings shall be fitted on the back face with an insect-proof screen manufactured from corrosion-resisting material.<sup>3)</sup>

## 8.8 Testing of plaster units

Ventilators or gratings manufactured from plaster shall show no signs of disintegration, popping or pitting, when immersed in cold water for a period of 24 h.

<sup>3)</sup> Suitable screen materials are perforated zinc of the “safe-hole” pattern, of thickness 0.5 mm or copper mesh of thickness 0.4 mm



## Annex A (informative)

### Information to be supplied by the purchaser for the purpose of an order or enquiry

The following information should be supplied by the purchaser when making an enquiry or placing an order:

- a) class of units required, i.e. class 1 or class 2 (see clause 1);
- b) co-ordinated size of units required (see 7.3);
- c) design required i.e. circular, square or rectangular hole or louvre design (see 7.1 and 8.1);
- d) material in which units are to be made (see clause 4);
- e) whether units are to be self-coloured or otherwise (see 7.2);
- f) whether any screening is required for class 2 units (see 8.7);
- g) whether a manufacturer's certificate of compliance is required (see clause 5).

## Annex B (normative)

### Test for impact resistance of airbricks

#### B.1 Principle

A hardened steel bar is allowed to fall through a specified distance to strike the centre of the face of the test specimen. The specimen is then examined visually.

For the ambient temperature test, condition the specimen for not less than 1 h.

#### B.2 Sampling and conditioning

Test at least five whole airbrick specimens for each of the two temperature ranges  $20\text{ °C} \pm 2\text{ °C}$  and  $-30\text{ °C} \pm 2\text{ °C}$ . For the low temperature test place the specimens in a low temperature chamber for not less than 1.5 h.

#### B.3 Apparatus

**B.3.1** *Steel cylinder*, with hardened hemispherical end of diameter  $37.5\text{ mm} \pm 1\text{ mm}$  and with a mass of approximately 540 g.

**B.3.2** *A device to hold the steel bar at a predetermined height prior to the drop*, e.g. electromagnetic device.

**B.3.3** *Two cylindrical tubes*, one of internal diameter  $40\text{ mm} \pm 1\text{ mm}$  and length  $910\text{ mm} \pm 2\text{ mm}$  and the other of internal diameter  $40\text{ mm} \pm 1\text{ mm}$  and length  $608\text{ mm} \pm 2\text{ mm}$ .

**B.3.4** *Test stand and jig*, of rigid, relatively non-deformable material e.g. steel upon which the specimen can be restrained from horizontal movement.

**B.3.5** *Low temperature chamber*, capable of maintaining a temperature of  $-30\text{ °C} \pm 2\text{ °C}$ .

#### B.4 Procedure

For the low temperature test, subject the specimens to impact within 30 s of removal from the low temperature chamber.

Fix the specimen to the stand, facing surface uppermost (see Figure B.1) the whole on a rigid base, e.g. concrete. For the impact test at  $20\text{ °C} \pm 2\text{ °C}$  (ambient room temperature) select the appropriate cylinder and use a drop height of  $914\text{ mm} \pm 2\text{ mm}$ . For the impact test at  $-30\text{ °C} \pm 2\text{ °C}$  select the appropriate cylinder and use a drop height of  $610\text{ mm} \pm 2\text{ mm}$ . Allow the ball to fall onto the specimen. Remove the specimen and examine visually.

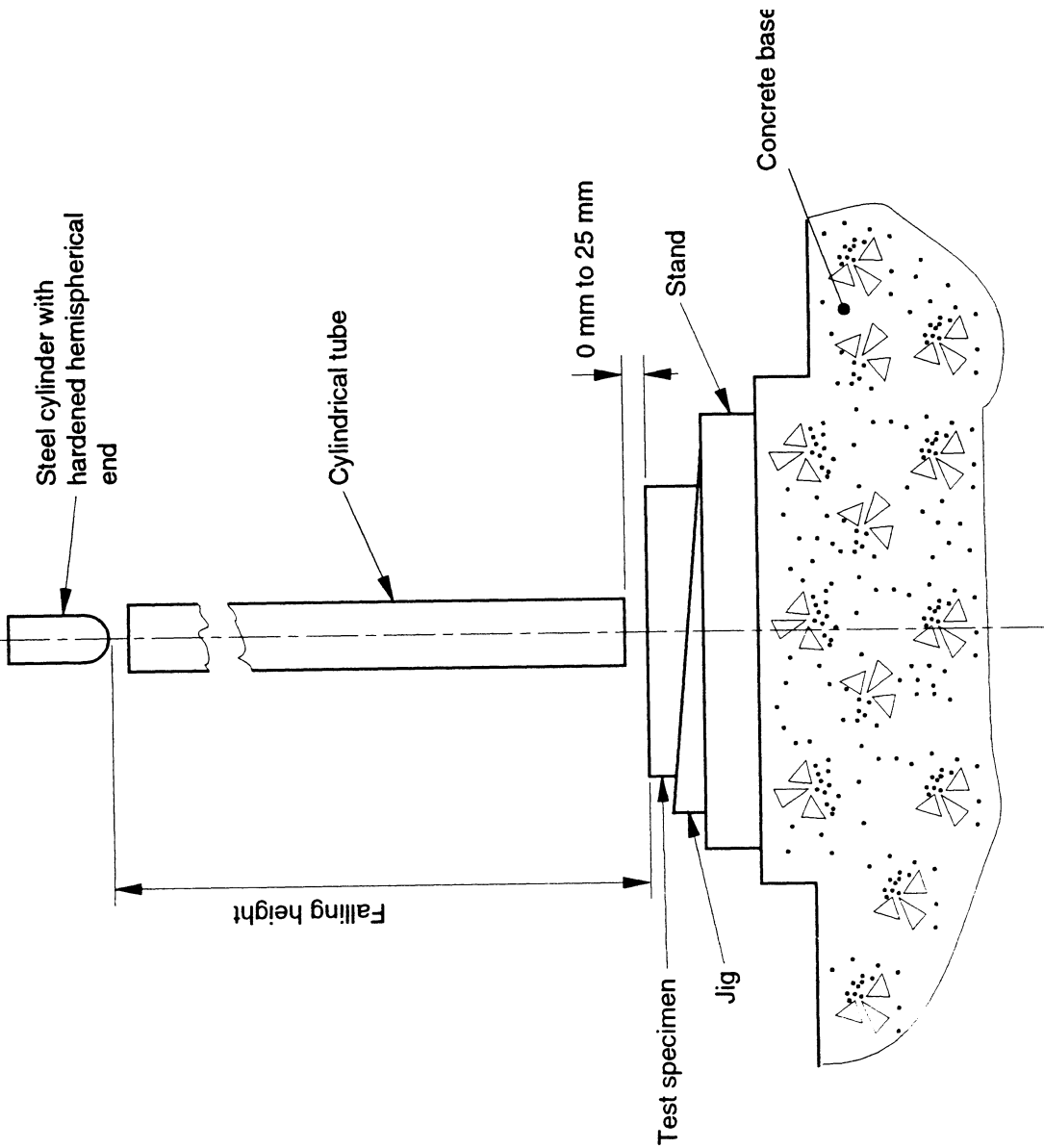


Figure B.1 — Falling ball impact apparatus

# List of references (see clause 2)

## Normative references

### BSI publications

BRITISH STANDARDS INSTITUTION, London

**A1** BS 1191-1, *Excluding premixed lightweight plasters*

BS 2782-3:Methods 320A to 320F:1976 + A1:1994, *Methods of testing plastics – Part 3: Mechanical properties – Methods 320A to 320F: Tensile strength, elongation and elastic modulus*

BS 4027, *Specification for sulfate-resisting Portland cement*

BS 6610, *Specification for Pozzolanic pulverized-fuel ash cement*

BS 6750, *British Standard specification for modular coordination in building*

BS EN 197-1, *Cement – Part 1: Composition, specifications and conformity criteria for common cements*

BS EN 197-4, *Cement – Part 4: Composition, specifications and conformity criteria for low early strength blastfurnace cements*

BS EN 1559-1, *Founding – Technical conditions of delivery – Part 1. General*

BS EN 1559-4, *Founding – Technical conditions of delivery – Part 4: Additional requirements for aluminium alloy castings*

BS EN 1676, *Aluminium and aluminium alloys – Alloyed ingots for remelting – Specifications*

BS EN 1706, *Aluminium and aluminium alloys – Castings – Chemical composition and mechanical properties*

BS EN 1976, *Copper and copper alloys – Cast unwrought copper products*

BS EN 1978, *Copper and copper alloys – Copper cathodes*

BS EN 10029, *Specification for tolerances on dimensions, shape and mass for hot rolled steel plates 3 mm thick or above*

BS EN 10048, *Hot rolled narrow steel strip – Tolerances on dimensions and shape*

BS EN 10051:1991 + A1:1997, *Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels – Tolerances on dimensions and shape*

BS EN 10095, *Heat resisting steels and nickel alloys*

BS EN 10130, *Cold rolled low carbon steel flat products for cold forming – Technical delivery conditions*

BS EN 10346, *Continuously hotdip coated steel flat products – Technical delivery conditions*

BS EN 12620:2002 + A1:2008, *Aggregates for concrete*

BS EN 12878, *Pigments for the colouring of building materials based on cement and/or lime – Specifications and methods of test*

BS EN 13279-1, *Gypsum binders and gypsum plasters – Part 1: Definitions and requirements*

BS EN ISO 877 (BS 2782-5:Method 550B:1996), *Plastics – Methods of exposure to direct weathering, to weathering using glass-filtered daylight, and to intensified weathering by daylight using Fresnel mirrors*

BS EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods (ISO 1461:2009)*

BS EN ISO 9445-1, *Continuously coldrolled stainless steel – Tolerances on dimensions and form – Part 1: Narrow strip and cut lengths (ISO 9445-1:2009)*

BS EN ISO 9445-2, *Continuously coldrolled stainless steel – Tolerances on dimensions and form – Part 2: Wide strip and plate/sheet (ISO 9445-2:2009) **A1***

## Informative references

### BSI publications

BRITISH STANDARDS INSTITUTION, London

BS 6954, *Tolerances for building.*

BS 6954-1:1988, *Recommendations for basic principles for evaluation and specification*

BS 6954-2:1988, *Recommendations for statistical basis for predicting fit between components having a normal distribution of sizes*

BS 6954-3:1988, *Recommendations for selecting target size and predicting fit*

---

# BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

## Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

## Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

## Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

## Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

If permission is granted, the terms may include royalty payments or a licensing agreement. Details and advice can be obtained from the Copyright Manager. Tel: 020 8996 7070.