BRITISH STANDARD

BS 6515:1984

Incorporating Amendment No. 1

Specification for

Polyethylene damp-proof courses for masonry

UDC 699.822:678.742.2

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Elements and Components (of Diverse Materials) for Buildings Standards Committee (ECB/-) to Technical Committee ECB/44 upon which the following bodies were represented:

Associated Lead Manufacturers Limited
Association of British Roofing Felt Manufacturers
Association of Jute Spinners and Manufacturers
Autoclaved Aerated Concrete Products Association
Brick Development Association
British Board of Agrément
British Ceramic Research Association
British Engineering Brick Association
British Lead Manufacturers' Association
British Plastics Federation
Copper Development Association
Department of the Environment (Building Research Establishment)
Department of the Environment (Property Services Agency)
Greater London Council
Institute of Building Control Officers
Institute of Clerks of Works of Great Britain Incorporated
Mastic Asphalt Council and Employers' Federation
North Wales Slate Quarries Association
Royal Institute of British Architects
Royal Institution of Chartered Surveyors
Society of Chemical Industry

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

Coopted members

This British Standard, having been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 September 1984

The following BSI references relate to the work on this standard:
Committee reference ECB/44
Draft for comment 81/10439 DC

ISBN 0 580 13966 2

Amendments issued since publication

Amd. No.	Date of issue	Comments
5444	October 1986	Indicated by a sideline in the margin

Contents

Foreword

This British Standard has been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings Standards Committee. This standard supersedes the requirements of clause **6** of BS 743:1970. The major change from the requirements specified in BS 743 is the inclusion of methods for determining thickness and impermeability.

The intention is to cover the different damp-proof course (d.p.c.) materials in BS 743 by publishing new British Standards or amending existing British Standards, after which BS 743 will be withdrawn.

Research is in progress to develop test methods as a basis for a future performance-based specification for damp-proof courses (see DD 86).

For guidance on the use of polyethylene damp-proof courses, see Appendix D. Further information is given in BS 5628-1 and 5628-3.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their 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 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 the composition, thickness, finish and impermeability of polyethylene damp-proof courses intended for use in masonry constructions.

NOTE The titles of the publications referred to in this standard are listed on page 6.

2 Definitions

For the purposes of this British Standard, the definitions given in BS 6100-1.0 apply.

3 Composition

The damp-proof course (d.p.c.) shall consist of black low-density polyethylene sheet having a mass in the range 0.425 kg/m^2 to 0.60 kg/m^2, formed from a polyethylene polymer of a melt flow rate of five or less when measured according to BS 2782:Method 720A and having a density within the range 0.915 g/mL to 0.925 g/mL at 23 °C when tested according to method 620A, 620B or 620D of BS 2782:Methods 620A to 620D:1980. When determined as described in Appendix A, the sheet shall contain a minimum of 2 % by mass of evenly dispersed carbon black and shall contain not more than 5 % by mass of material other than polyethylene.

4 Thickness

Nine specimens taken from a roll of d.p.c. material and measured as described in Appendix B shall have a single layer of thickness not less than 0.46 mm.

5 Finish and impermeability

The sheet shall be free from air bubbles and, when tested as described in Appendix C, shall have no visible pin holes.

NOTE A surface texture is permitted.

6 Marking and packaging

The finished d.p.c. shall be packed in rolls, each roll containing not less than 8 m in length.

Each roll shall be labelled legibly with the number and date of this British Standard, i.e. BS 6515:1984[1)].

[1)] Marking BS 6515:1984 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, Quality Assurance Division, BSI, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ for certification marks administered by BSI or to the appropriate authority for other certification marks.

Appendix A Method of determining mass of material other than polyethylene

A.1 Procedure

Determine the mass of material other than polyethylene using the procedure described in clauses **3**, **4** and **5** of BS 2782:Method 452B:1978.

A.2 Calculation and expression of results

A.2.1 Calculate the percentage by mass of material other than polyethylene using the following formula:

$$\frac{m_2}{m_1} \times 100$$

where

m_1 is the mass of the sample taken (in g);

m_2 is the mass of residue after heating in the combustion tube (in g).

A.2.2 Calculate the carbon black content as a percentage by mass using the following formula:

$$\frac{m_2 - m_3}{m_1} \times 100$$

where

m_1 is the mass of the sample taken (in g);

m_2 is the mass of the residue after heating in the combustion tube (in g);

m_3 is the mass of the ash after heating in the muffle furnace (in g).

Appendix B Method of measuring thickness

B.1 Principle

The thickness of nine specimens taken from a 1 m long sample of the d.p.c. is measured using either a stage micrometer or an eyepiece micrometer.

B.2 Apparatus

B.2.1 *Microscope,* of at least × 40 magnification, equipped with measuring devices capable of making measurements to an accuracy of 0.01 mm. The microscope may be used either in conjunction with a stage micrometer (**B.2.3**) to make direct measurements (see **B.4.2**), or may incorporate a ruled glass disc or an eyepiece micrometer with a scale divided into 100 equal units (see **B.4.3**).

B.2.2 *Microscope lamp,* or other means of illuminating the specimen under test. The illumination shall be as nearly vertical to the specimen as possible.

B.2.3 *Glass stage micrometer,* for calibrating the eyepiece, or for placing over the sample to measure the thickness directly. If used to measure the sample, the graduations shall be in contact with the specimen.

B.2.4 *Vice,* or other apparatus for holding the specimen under the microscope, with just sufficient clamping pressure to hold the specimen steady without distorting it.

B.2.5 *Sharp cutting tool,* e.g. a razor blade in a holder.

B.2.6 *Cutting board,* of hardwood or other suitable cutting surface.

B.3 Preparation of specimens

Place a 1 m long sample of the d.p.c. on the cutting board. Cut specimens as shown in Figure 1 as follows. Hold the cutting instrument firmly, perpendicular to the long axis of the specimen, and then apply sufficient pressure so that a clean straight cut at least 50 mm long is made completely through the sample in one stroke. Take care not to distort the sample or turn the knife from the perpendicular. Make a similar cut parallel to the first cut 10 mm apart and then cut each end so that the specimen can be removed from the sample.

B.4 Procedure

B.4.1 *General.* Mount the specimen in the vice with the long edge up, so that the edge is exposed about 6 mm above the jaws of the vice. Measure the thickness using a stage micrometer as described in **B.4.2** or using an eyepiece micrometer as described in **B.4.3**.

B.4.2 *Measurement with stage micrometer.* Locate the vice and specimen under the microscope, and place the stage micrometer on the cut surface of the specimen, with the ruled surface in contact with the material. Adjust the illuminating source so that the light strikes the specimen as near to the vertical as possible. Focus the microscope to a sharp image. Read the thickness of the specimen in millimetres directly from the rulings on the stage micrometer, estimate to the nearest 0.01 mm and record.

B.4.3 *Measurement using microscope with a ruled glass disc or eyepiece micrometer.* Place the ruled glass disc or the eyepiece micrometer in the eyepiece and calibrate it by observing the stage micrometer. Then locate the vice and specimen under the microscope, adjust the illuminating source so that the light strikes the specimen as near to the vertical as possible and focus the microscope to a sharp image. Measure the thickness by counting the rulings or the divisions on the ruled glass disc in the eyepiece that cover the distance from one edge of the specimen to the other, and by applying the appropriate calibration factor.

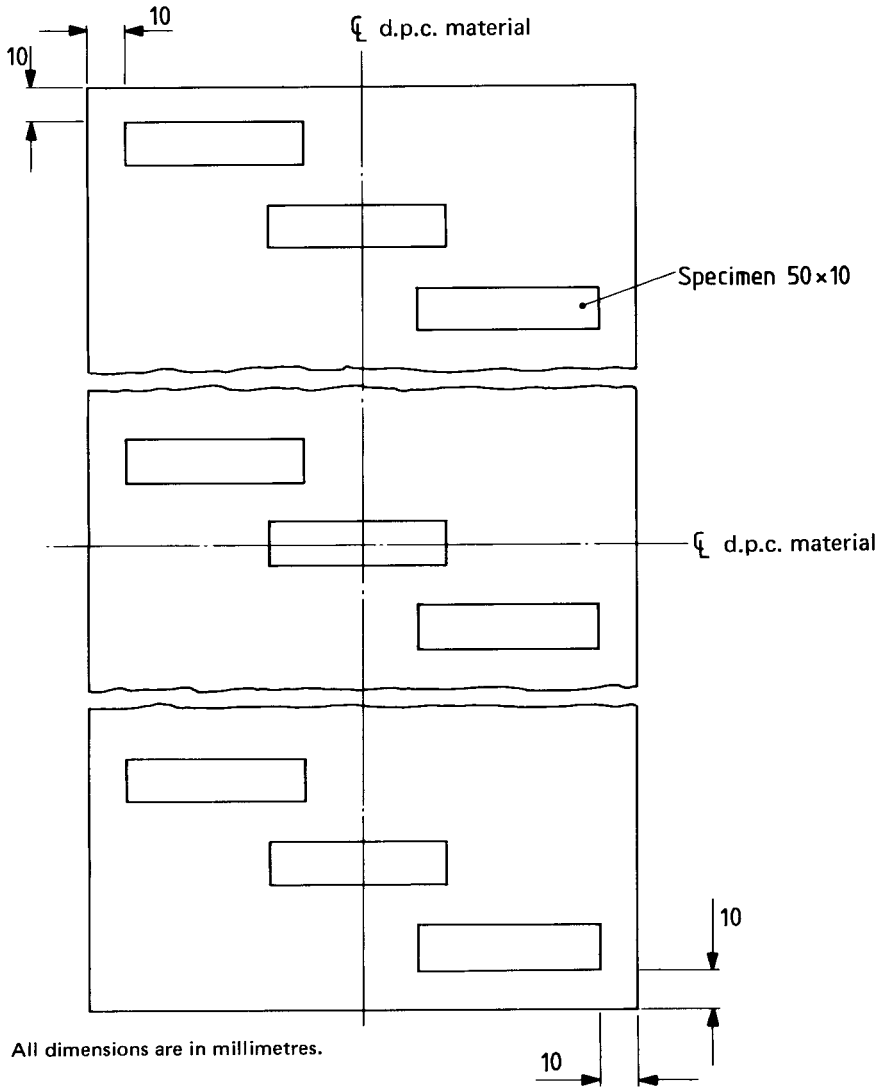


Figure 1 — Specimens for determination of thickness

B.5 Expression of results

Record the thickness of each specimen to the nearest 0.01 mm.

Appendix C Method for assessing impermeability

C.1 Apparatus

C.1.1 *Viewing box,* of internal dimensions 250 mm × 250 mm × 250 mm with the internal surfaces painted white and illuminated by a 25 W lamp (see Figure 2). The top of the box shall have a central 200 mm × 50 mm slot with sides parallel to the corresponding edges of the box. Guiding runners, 250 mm in length and parallel to the long dimension to the long dimension of the slot, shall be placed 80 mm apart, either side of the slot, with fixed strips acting as light shields by protruding over the guides towards the slot by 13 mm. The area between the guides shall be covered by clear glass. A hood, to reduce incident light when viewing the d.p.c. strip, shall be placed over the guide area, with slots at the sides to allow the d.p.c. test strip to pass through. A number of holes in the sides of the viewing box shall be made for cooling purposes.

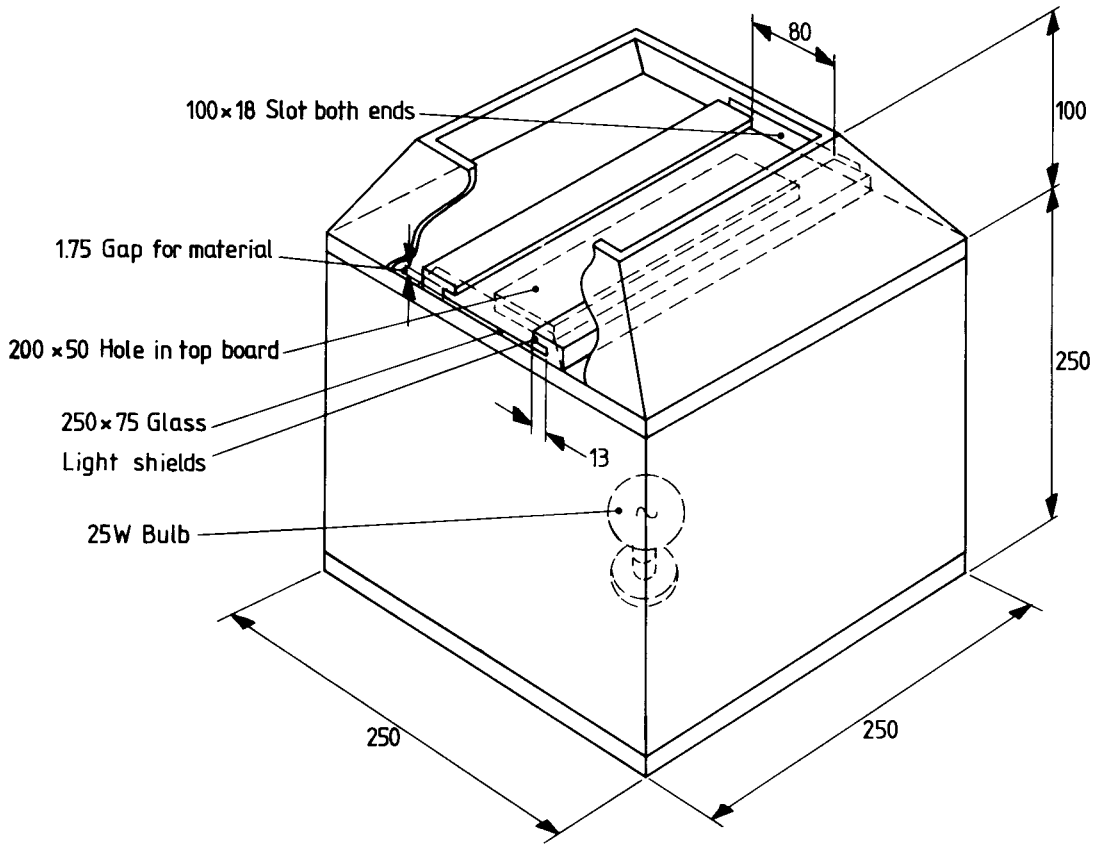
C.2 Preparation of test strips

From a 1 m long sample of the d.p.c., cut 75 mm wide test strips along the full length of the sample.

From sheet between 75 mm and 150 mm in width, cut one strip. From sheet between 150 mm and 225 mm in width, cut two strips. From sheets of width greater than 225 mm, take three strips, one from each edge and one from the centre of the sample.

C.3 Procedure

Pass each test strip through the guides and over the light source with the hood in position. Inspect the strip and record any visible pin holes.



All dimensions are in millimetres.

Figure 2 — Viewing box for impermeability test

Appendix D Recommended uses for polyethylene damp-proof courses

Table 1 gives guidance on the suitability of polyethylene damp-proof courses for various types of construction.

Table 1 — Recommended uses for polyethylene damp-proof courses

Conditions within masonry	Remarks	Recommendation
a) High compressive stress (> 2.50 N/mm^2) e.g. buildings higher than 10 storeys		Suitable
b) Medium compressive stress (0.50 N/mm^2 to 2.50 N/mm^2) e.g. buildings from 4 to 10 storeys		Suitable
c) Low compressive stress (0.10 N/mm^2 to 2.50 N/mm^2) e.g. buildings up to 4 storeys		Suitable
d) Minimal compressives stress (< 0.10 N/mm^2) with lateral load, e.g. copings, parapet walls		Not suitable
e) High shear stress, e.g. retaining walls, etc.		Not suitable
f) High flexural stress, e.g. freestanding walls, parapets, etc.		Not suitable
g) Water movement upwards	Upward movement of water is normally prevented just above ground level	Generally suitable, but see e) and f)
h) Water movement downwards	Downward movement of water needs to be prevented at many levels, e.g. parapets, chimneys and above lintels in cavity walls	Not suitable
i) Water movement horizontally	Horizontal movement of water needs to be prevented where the outer leaf of a cavity wall is returned to close the cavity or where a d.p.c. in a wall and a d.p.c. in an abutting floor are at different levels	Suitable

Publications referred to

BS 743, *Materials for damp-proof courses*[2)].

BS 2648, *Performance requirements for electrically-heated laboratory drying ovens.*

BS 2782, *Methods of testing plastics.*

BS 2782:Method 452B, *Determination of carbon black content of polyolefin compound.*

BS 2782:Methods 620A to 620D, *Determination of density of solid plastics excluding cellular plastics (immersion method, pyknometer method, sink-float method, density gradient column method).*

BS 2782:Method 720A, *Determination of melt flow rate of thermoplastics.*

BS 5628, *Code of practice for use of masonry*[2)].

BS 5628-1, *Structural use of unreinforced masonry.*

BS 5628-3, *Materials and components, design and workmanship.*

BS 6100, *Glossary of building and civil engineering terms.*

BS 6100-1.0, *General.*

CP 121, *Walling.*

DD 86, *Damp-proof courses*[2)].

DD 86-1, *Methods of test for flexural bond strength and short term shear strength.*

DD 86-2, *Method of test for creep deformation.*

[2)] Referred to in the foreword only.

BSI certification marks

A licence to use the Kitemark or "Safety Mark" on or in relation to a product will be granted to any manufacturer or producer who demonstrates that he can and will be able consistently to make that product to the requirements specified in the British Standard product specification. His capability of doing so is initially established by assessment of his production process, quality control organization and test facilities against the required Part of BS 5750 "Quality systems", and by testing the product against all the criteria of the relevant standard. The licensee is required to document for BSI the Quality Plan setting out his specific Quality practices, resources and activities relevant to achieving compliance with the product standard. BSI carries out unannounced inspection visits to the manufacturer's works and audit testing of the product, and may withdraw the licence for any failure of the manufacturer to comply with the relevant standard. The presence of the mark on or in relation to a product is an assurance that the goods have been produced under an independently assessed quality system and have been subject to testing and the periodical inspection of the manufacturer's works in accordance with the certification trade mark regulations of BSI.

The Kitemark

The 'Safety Mark'

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

BSI
389 Chiswick High Road
London
W4 4AL