

Code of practice for

Design and installation of damp-proof courses in masonry construction

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 Policy 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 Agreement
- British Ceramic Research Ltd.
- Consumer Policy Committee of BSI
- Contract Flooring Association
- Copper Development Association
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property Services Agency)
- Institute of Building Control
- Institute of Clerks of Works of Great Britain Inc.
- Lead Sheet Association
- Local Authority Organizations
- Mastic Asphalt Council and Employers' Federation
- Natural Slate Quarries Association
- Packaging and Industrial Films Association
- Royal Institute of British Architects
- Royal Institution of Chartered Surveyors
- Society of Chemical Industry

This British Standard, having been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1991

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The following BSI references relate to the work on this standard:
Committee reference ECB/44
Draft for comment 84/14417 DC

ISBN 0 580 18849 3

Amendments issued since publication

Amd. No.	Date	Comments

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Foreword

This British Standard has been prepared under the direction of the Elements and Components (of Diverse Materials) for Buildings Standards Policy Committee. It supersedes the information contained in Appendix C of BS 743 which is deleted by amendment. It also supersedes clause **10** of section 3 of CP 102: section 1 and section 2 of CP 102 and CP 102 have already been superseded by BS 8102 and the remaining text of CP 102 is to be amended.

This British Standard is intended as a guide to the design and installation of damp-proof courses in masonry constructions covered by BS 5628 which gives general recommendations for the design and construction of brick and block masonry, including materials and components. In BS 5628-1 the following recommendation is given: Designers should pay particular attention to the characteristics of the materials chosen for damp-proof courses. Materials which squeeze out are undesirable in highly stressed walls, and the effect of sliding at the damp-proof course should be considered especially in relation to lateral loading. In general, advice on the resistance to compression, tension, sliding and shear should be sought from the manufacturers of the damp-proof course.

Many of the basic principles in this standard are relevant to other forms of construction.

In drafting this standard it has been assumed that the design will be undertaken by appropriately qualified and experienced designers having regard to the recommendations and calculation methods contained in BS 5628 and that construction will be carried out by trained operatives under the direction of qualified supervisors.

BSI has published draft methods of test for flexural bond strength and short term shear strength and creep deformation of damp-proof courses. These drafts (DD 86-1 and DD 86-2) aim to provide basic data for future performance specifications for damp-proof course materials. A further document, DD 86-3 describes characteristic strengths of damp-proof course materials used in conjunction with designated mortars.

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 14, 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 contains recommendations for the selection, design and installation of damp-proof courses (DPCs) in both solid and cavity masonry constructions: it does not cover the waterproofing of underground structures, such as basements, where water is under hydrostatic pressure (see BS 8102). This standard does not deal with the installation of chemical DPCs (see BS 6576) nor with the control of condensation (see BS 5250) nor with the surface treatment of masonry with water repellents (see BS 6477).

Guidance on basic principles concerning DPCs, their function and their installation in masonry is given in clause 3.

NOTE The titles of publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this British Standard the definitions given in BS 6100-5 apply.

3 Basic principles

Water is the prime cause of deterioration in building materials and constructions and the presence of moisture encourages growth of mould which is injurious to health.

Building Regulations, framed to protect the safety, health and welfare of building occupants, require that buildings be designed to be stable and to ensure that water neither damages the building fabric nor penetrates to the interior where it may constitute a health hazard to occupants.

Ground water can penetrate building fabric from below, rising vertically by capillary action.

Water falling vertically as rain, hail and snow is under a slight head of pressure. It can also, under the influence of the wind, travel obliquely, horizontally, and even vertically upwards.

Residual water also comes under the influence of gravity and thus exerts pressure.

Figure 1 illustrates typical positions in which DPCs may be required: BS 5628-3 should be consulted for further advice.

The function of a DPC is to prevent moisture or water passing from one part of a construction to another.

DPCs should be designed in conjunction with flashings and damp-proof membranes to ensure a continuous barrier. Not only should they form a barrier to the passage of water but they should also deflect such water to the exterior of the building where it can safely drain away.

DPCs should be installed with care. The constructions in which they are installed should have sufficient stability to preclude settlement or lateral movement which may impair the performance of the DPC.

The necessary inclusion of a DPC in masonry construction may materially affect overall structural performance by introducing a plane of weakness. The overall stability of the structure should be considered in relation to the loads imposed upon it by the weight of the construction and by external forces such as wind pressures, thermal and moisture movements (see BS 5628-1 and BS 5628-3).

4 Materials

The materials that should be used to form DPCs in masonry fall into three groups:

- a) *flexible materials*, such as sheet lead, sheet copper, bitumen DPC, bitumen/sheet metal composites, polyethylene, bitumen polymer, pitch polymer;
- b) *semi-rigid materials*, such as mastic asphalt;
- c) *rigid materials*, such as dense bricks and slates, bedded in cement mortar.

DPC materials should comply with the British Standards listed in Table 1. Other materials may also prove suitable for forming DPCs: the specifier should satisfy himself that they have been properly evaluated and found suitable for such use.

See clause 5 for information on the selection of DPC materials.

5 Design

5.1 Exposure conditions

The designer should first determine the degree of exposure, the risk of penetration from any direction (upwards, downwards or horizontally) and the consequences of water penetration.

NOTE DPCs need not be provided where they are not necessary, e.g. above a suitably designed impervious lintel, beneath an impervious sill or continuous coping, or across openings protected by overhanging eaves.

5.2 Primary protection

Careful design, including the provision of weathered copings, sills, overhangs and projections, should provide primary protection which will eliminate or greatly reduce the risk of damage to building fabric and help to prevent water penetration to the interior of the building.

5.3 Integrated design of DPCs

DPCs should be designed in conjunction with membranes and flashings to form a complete system of protection impervious to moisture.

NOTE The preparation of three-dimensional drawings helps to focus attention on critical details and on those junctions which require lapping or sealing; it also identifies areas where it may be advantageous to use prefabricated components.

