

Metric units

Methods of test for resistance to air and water penetration —

**Part 2: Permeable walling
constructions (water penetration)**

UDC 69.022.32:620.162.4

Confirmed January 2010

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- British Ceramic Research Association
- British Precast Concrete Federation
- British Stone Federation
- British Woodwork Manufacturers' Association
- Cement and Concrete Association
- Insulation Glazing Association
- Metal Window Association Limited
- Ministry of Public Building and Works
- Ministry of Public Building and Works — Building Research Station
- National Federation of Building Trades Employers
- National Federation of Roofing Contractors
- Royal Institute of British Architects
- Timber Research and Development Association
- Welwyn Hall Research Association

This British Standard, having been approved by the Building Divisional Council was published under the authority of the Executive Board on 30 April 1970

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The following BSI references relate to the work on this standard:
Committee reference B/105
Draft for comment 69/816

ISBN 580 06170 1

Amendments issued since publication

Amd. No.	Date	Comments
4207	March 1983	Indicated by a sideline in the margin

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Foreword

This standard makes reference to the following British Standards:

BS 3763, *International system (SI) units*.

BS 6232, *Thermal insulation of cavity walls by filling with blown man-made mineral fibre — Part 1: Specification for the performance of installation systems*.

This Part of this British Standard, prepared under the authority of the Building Divisional Council, sets out methods of test for measuring the resistance to water penetration of permeable walling constructions without open joints.

The pressure-box type of test chamber as specified in Part 1 of this standard, “Windows and gasket glazing systems”, was chosen partly because of its simplicity and partly because this type of apparatus was being used by the laboratories associated in the Working Group on Rain Penetration of the Conseil Internationale du Bâtiment (C.I.B.).

Test procedures should be selected to give results which can be related to those obtained under natural exposure. A pressure for test purposes is specified but for further guidance reference should be made to BRE Digest No. 127, “An index of exposure to driving rain” should other test pressures be required.

These test methods should not be used to compare the relative merits of walls constructed with materials having different absorption capacities. For example, walls constructed with high absorption fired-clay bricks may give worse results than would be found in practice, whereas the converse may be true for walls constructed with low absorption fired-clay bricks. It is also difficult to apply the results of the test to walls of considerably greater height than the test panels.

In general, test method C (see 6.4) is appropriate when the apparatus is used to assess the resistance to water penetration of the external leaf of a test panel of cavity construction.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8 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 Part of this British Standard specifies methods of test for measuring the resistance to water penetration of permeable walling constructions without open joints under static air pressure. The methods are applicable to constructions which can be built in or fixed into a rigid steel frame by means of which the wall panel can be transported and secured to the pressure-box test equipment. The first method is also applicable to walling constructions, not built into a steel frame, provided an air-tight seal can be made between the pressure-box and the front face of the panel.

Three methods of recording the extent of water penetration are specified, i.e.:

- Method A. Recording, by time-lapse photography, the increase in area of dampness.
- Method B. Recording the change in weight of the specimen.
- Method C. Collecting and recording the amount of leakage through the specimen.

Much of the test apparatus and procedure is common to all three methods but where it is particular to one or two of them only, the letters A, B or C are inserted after the relevant clause numbers to indicate their ability to a particular method of recording water penetration (see above).

These test methods are not recommended for comparing the relative merits of walls constructed with materials having different absorption capacities (see foreword).

2 Definitions

For the purposes of this Part of this British Standard the following definitions apply:

2.1

open joint

a deliberate open discontinuity between two units in a walling construction

2.2

specimen

the test panel, which may either consist of a single unit or a series of units without open joints. The front face of the specimen is that facing the pressure chamber

2.3

test area

that part of the specimen, together with masking material and in-fill material where used, exposed to the test conditions

3 Apparatus

3.1 Pressure chamber. The test chamber shall be an airtight box capable of withstanding the test pressure. One of its vertical sides shall be left open so that the specimen can be secured to this side with the front face of the specimen towards the inside of the chamber. The attachment between the specimen and the chamber shall be made with bolts or any other suitable means which can withstand the test pressure. If the specimen is in a steel frame, the test chamber shall be attached to the flange of the steel frame. A gasket between the box and the steel frame or between the box and the face of the free-standing panel shall ensure an air-tight joint.

3.1.1 At least one observation window shall be provided in the test chamber to enable the front face of the specimen under test to be viewed. A door may be fitted to the side of the test chamber to provide access to allow any necessary adjustment; alternatively, the adjustments can be made through the observation windows if they can be opened.

3.1.2 The bottom of the test chamber shall be fitted with an outlet which will allow the water to run away to waste. The outlet shall incorporate a trap so as to provide a depth of water seal at least sufficient to maintain the desired air pressure within the chamber.

3.1.3 The size of the chamber shall be such as to provide a test area of at least 1 m × 1 m. An apparatus suitable for testing a wide range of walling constructions is shown in Figure 1.

Where the apparatus is used to test resistance to water penetration of blown man-made mineral fibre cavity insulation, the panel area shall be at least 3.5 m high by 3.0 m wide. (See BS 6232-1).

3.2 Air supply system

3.2.1 Air shall be passed into the chamber to maintain the specified pressure (see Clause 5). Direct draught on the face of the test specimen shall be avoided and to accomplish this it may be necessary to fit a baffle over the end of the air inlet pipe.

3.2.2 Provision shall be made to measure the air pressure difference between the inside and the outside of the test chamber, that is, across the test area, to an accuracy of $\pm 10 \text{ N/m}^2$ ($\pm 1 \text{ mmHg}$).