

Specification for

Waterproof Building Papers

UDC 691.144 – 676.266.1

Co-operating organizations

The Bituminous Products Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Association of British Roofing Felt Manufacturers*	National Association of Master Asphalters
Association of Waterproof Paper Manufacturers*	National Federation of Builders' and Plumbers' Merchants*
British Tar Industry Association	National Federation of Building Trades Employers*
Department of the Environment*	Pitch Fibre Pipe Association of Great Britain
Department of the Environment Building Research Station	Refilled Bitumen Association Limited
Federation of Civil Engineering Contractors	Royal Institute of British Architects
Felt Roofing Contractors Advisory Board*	Royal Institution of Chartered Surveyors
Institute of Petroleum*	Society of Chemical Industry
Institution of Civil Engineers	Standardization of Tar Products Tests Committee
Institution of Structural Engineers	
Mastic Asphalt Council and Employers Federation	

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

British Paper and Board Makers' Association (Incorporated)	National Council of Building Material Producers
Cement and Concrete Association	National Federation of Roofing Contractors
Institute of Purchasing and Supply	Technical Section of the British Paper and Board Makers' Association
Institution of Municipal Engineers	

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Foreword

This metric edition of BS 1521 has been prepared under the authority of the Bituminous Products Industry Standards Committee as part of the change to the metric system in the construction industry, giving values in terms of SI units; for further information on SI units, reference should be made to BS 3763, “*The International System of units (SI)*”.

The recommendations for the co-ordination of dimensions in building, as laid down in BS 4011¹⁾, BS 4330²⁾, PD 6444³⁾ and PD 6445⁴⁾, are embodied in sub-clause 2.3 of this standard. The 1 000 mm width of roll is suitable for use on buildings constructed with modular components.

The standard was first issued in 1949 and revised in 1965. This metric version is virtually the same in technical content as the 1965 edition which is now withdrawn. However, the method of determining the tensile strength (dry) has been omitted and reference should now be made to BS 4415, “*Method for the determination of tensile strength of paper and board*”.

This British Standard deals with waterproof papers used in building and civil engineering works for various purposes other than damp-proof courses.

Owing to the wide range of building papers available it is considered undesirable to specify the constituent materials and the object of the present standard is to lay down minimum requirements to which the finished products shall conform.

Users should bear in mind, when selecting a type of paper to meet their specific requirements, that no durability tests are provided, neither is a distinction made in this standard between papers capable of forming a water vapour barrier and what are known as breather type papers. For information on breather type papers, reference should be made to BS 4016, “*Building papers (breather type)*”.

Attention is called to the following specifications that deal with materials that may also be used for the purposes covered by this standard:

BS 743, *Materials for damp-proof courses. Metric units.*

BS 747, *Roofing felts.*

NOTE Attention is drawn to the certification facilities offered by BSI; see 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 4, 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⁾ BS 4011, “*Recommendations for the co-ordination of dimensions in building. Basic sizes for building components and assemblies*”.

²⁾ BS 4330, “*Recommendations for the co-ordination of dimensions in building, controlling dimensions*”.

³⁾ PD 6444, “*Recommendations for the co-ordination of dimensions in building*” Part 1. “*Basic spaces for structure, external envelope and internal sub-division.*”

⁴⁾ PD 6445, “*Recommendations for the co-ordination of dimensions in building: Tolerances and joints. The derivation of building component manufacturing sizes from co-ordinating sizes*”.

1 Scope

This British Standard specifies the quality, workmanship, dimensions and performance requirements for two classes of waterproof building papers. Each class is divided into two grades and each grade into two types as follows:

- 1) *Class A*. For building purposes, such as for the prevention of draughts or the ingress of water into wall or pitched roof structures but not for damp-proof courses such as are normally required by building byelaws.

Class A papers are of two grades. They are:

- a) Grade A1, having higher tensile strength and bursting strength test requirements.
- b) Grade A2, having lower tensile strength and bursting strength test requirements.

- 2) *Class B*. For temporary purposes, such as for the protection of concrete during curing or as an underlay to concrete to prevent moisture being absorbed by the base.

Class B papers are of two grades. They are:

- a) Grade B1, having a higher bursting strength test requirement.
- b) Grade B2, having a lower bursting strength test requirement.

All grades are sub-divided into the following types:

Types which are not reinforced with fibres	Types which have fibrous reinforcements
A1	A1F
A2	A2F
B1	B1F
B2	B2F

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

2 General

2.1 Building papers shall consist of one or more laminae of paper or felted fibre, with or without fibrous reinforcement, and shall incorporate a waterproofing medium.

2.2 The building paper shall conform to the requirements of Clause 3 or Clause 4, as appropriate.

2.3 The paper shall be supplied in standard rolls of 50 m length and in multiples of 50 m and in widths of 1 000 mm, 1 250 mm, 1 500 mm, 2 000 mm and 2 150 mm.

Other widths may be cut from these sizes to meet special requirements. Half rolls of 25 m length may also be supplied.

2.4 The material shall be free from visible defects and shall not become sticky in the roll under the normal climatic conditions encountered in the British Isles, provided that the rolls are properly stacked on end and not laid flat.

2.5 Papers complying with the requirements of this British Standard are likely to vary in permeability to water vapour (see the sixth paragraph of the Foreword). Purchasers with specific requirements as to such permeability should consult the vendor in order that the degree of permeability may be the subject of agreement between the purchaser and the vendor. BS 3177 shall be used as the basis for determining the permeability of waterproof building paper to water vapour.

2.6 Where the paper is reinforced by fibre there shall not be less than 18 strands to 300 mm, both lengthwise and crosswise.

3 Class A papers for building purposes

3.1 *Tensile strength (dry)*. When determined in accordance with BS 4415 and reporting the average of five tests in each direction in kN/m width, the tensile strength shall be not less than the appropriate values given in Table 1.

NOTE It is recommended for fibre reinforced materials that a sample width of 50 mm be used in determining the dry tensile strength.

Table 1 — Tensile strength (dry)

Tensile strength (dry)	Grades A1, A1F	Grades A2, A2F
	kN/m	kN/m
Strength in machine direction (lengthwise) per metre of width	12.40	8.80
Strength in cross direction (crosswise) per metre of width	7.20	5.20

3.2 *Tensile strength (wet)*. When determined in accordance with Appendix A, the tensile strength of the material shall be not less than the appropriate values in Table 2.

NOTE It is recommended for fibre reinforced materials that a sample width of 50 mm be used in determining the wet tensile strength.

Table 2 — Tensile strength (wet)

Tensile strength (wet)	Grades A1, A1F	Grades A2, A2F
	kN/m	kN/m
Strength in machine direction (lengthwise) per metre of width	6.40	4.40
Strength in cross direction (crosswise) per metre of width	3.60	2.80

3.3 Bursting strength (dry). When determined in accordance with the requirements of BS 3137, the bursting strength of the material shall be not less than:

Grades A1, A1F	Grades A2, A2F
550 kN/m ²	480 kN/m ²

3.4 Bursting strength (wet). When determined in accordance with Appendix B the bursting strength of the material shall be not less than:

Grades A1, A1F	Grades A2, A2F
340 kN/m ²	280 kN/m ²

3.5 Resistance to Water penetration. When determined in accordance with Appendix C the filter paper shall be free from staining after 24 hours.

3.6 Reaction. When determined in accordance with the requirements of BS 2924, the pH of the water extract shall be not less than 4.5 and not greater than 7.5.

4 Class B papers for temporary purposes

4.1 Bursting strength (wet). When determined in accordance with Appendix B the bursting strength of the material shall be not less than:

Grades B1, B1F	Grades B2, B2F
210 kN/m ²	140 kN/m ²

4.2 Resistance to water penetration. When determined in accordance with Appendix C the filter paper shall be free from staining after 3 hours.

5 Selection of rolls for sampling

5.1 In the case of dispute, the manufacturer shall be given a reasonable opportunity to have a representative present at the time of sampling.

5.2 To obtain an average sample of each consignment, the following number of rolls shall be selected at random for examination:

up to 100 rolls,	select 5 rolls
over 100 and up to 200 rolls,	select 6 rolls
over 200 and up to 500 rolls,	select 7 rolls
over 500 and up to 1 000 rolls,	select 8 rolls
over 1 000 rolls,	select 9 rolls.

6 Selection of test specimens from roll samples

To obtain test specimens the selected roll shall be unrolled approximately 3 m from the outside edge and cut at right angles to the edge of the roll to obtain two strips 1 m in length by the width of the roll. One of these strips shall be used for analysis, the other being retained for the manufacturer in case of dispute. Three samples, at least 100 cm² in area, shall be cut from the centre and both edges of the strip selected, discarding the outer 75 mm on both sides.

7 Marking

Each roll of waterproof building paper shall be marked with the following markings.

- 1) The number of this British Standard, i.e., BS 1521.
- 2) The grade of paper (e.g., B1F).
- 3) The length of the roll in metres.

If the roll is wrapped, the markings shall be on the wrapping. If the roll is not wrapped, the markings shall be either on the roll itself or on a substantial label attached firmly to the roll.

NOTE 1 The mark BS 1521 on or in relation to the product is a claim by the manufacturer that it complies with the requirements of this standard.

NOTE 2 Attention is drawn to certification facilities offered by BSI; see the inside back cover of this standard.

Appendix A Tensile strength (wet)

The test shall be carried out as in BS 4415, except that the paper shall be separately and totally immersed for 3 hours in water at a temperature of 23 ± 1 °C prior to testing. Upon removal of the paper from the water, the surplus water shall be removed from the paper by means of blotting paper, light pressure only being applied during the blotting operation. If excess water remains after the blotting, it may easily be seen by the appearance of a highly reflecting area on the surface. If this is the case, further blotting is necessary.

Reporting. Report the average of the five tests in each direction in kilonewtons per metre of width.

Appendix B Bursting strength (wet)

The test shall be carried out on ten specimens of the material.

The paper shall be totally immersed for 7 hours at 23 ± 1 °C. Upon removal of the paper from the water, the surplus water shall be removed from the paper by means of blotting paper, light pressure only being applied during the blotting operation. If excess water remains after the blotting, it may easily be seen by the appearance of a highly reflecting area on the surface. If this is the case, further blotting is necessary. The test shall then be carried out in accordance with the requirements of BS 3137.

Reporting. The average of the ten tests shall be reported in kilonewtons per square metre (kN/m^2).

Appendix C Resistance to water penetration

The test shall be carried out on one specimen of the material.

A representative piece of paper, circular in shape, shall be securely clamped over the base of a cylinder having a cross-sectional area of at least 25 cm^2 .

A 0.05 % eosin or acid scarlet solution in water shall then be poured into the cylinder to a depth of 100 mm. The solution shall be at 23 ± 1 °C.

A filter paper shall be clamped in the underside of the specimen and the apparatus allowed to stand for the specified period at room temperature.

Reporting. Report the specimen as “free from stain” if the filter paper, when removed from the specimen, shows no trace of the coloured solution.

Publications referred to

This standard makes reference to the following British Standards:

BS 2924, *Methods for the determination of pH value, conductivity, and chloride and sulphate contents of aqueous extracts of paper and board.*

BS 3137, *Method for determining the bursting strength of paper and board⁵⁾.*

BS 3177, *Method for determining the permeability to water vapour of flexible sheet materials used for packaging.*

BS 4415, *Method for the determination of tensile strength of paper and board.*

⁵⁾ In course of preparation.

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