

Coated fabrics for use in the manufacture of water penetration resistant clothing —

Part 4: Specification for water vapour permeable coated fabrics

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Plastics and Rubber Standards Policy Committee (PRM/-) to Technical Committee PRM/78, upon which the following bodies were represented:

- British Coal Corporation
- British Plastics Federation
- British Railways Board
- British Resin Manufacturers' Association
- British Rubber Manufacturers' Association
- British Textile Technology Group
- Department of Health
- Department of the Environment (Building Research Establishment)
- Electricity Association
- Furniture Industry Research Association
- Home and Contract Furnishing Textiles Association
- Home Office
- Industrial Safety (Protective Equipment) Manufacturers' Association
- London Regional Transport
- Made-up Textiles Association
- Man-made Fibres Producers' Committee
- Ministry of Defence
- National Union of Dyers, Bleachers and Textile Workers (NUDBTW)
- RAPRA Technology Ltd
- SATRA Footwear Technology Centre
- Society of Motor Manufacturers and Traders Limited

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Foreword

This Part of BS 3546 has been prepared under the direction of the Plastics and Rubber Standards Policy Committee.

The title of BS 3546 has been changed to reflect more accurately the content and intended usage of the standard.

In preparing this Part of BS 3546 the committee has taken into account the many coated fabrics, which are at present on the market, which can be manufactured employing various production techniques to produce an infinite range of performance orientated materials suitable for the manufacture of water penetration resistant clothing which is also moisture vapour permeable.

To achieve this flexibility, a manufacturer is required to provide information relating to the performance characteristics of the coated fabric in terms of the requirements in Table 1 (see clause 3).

Table 2 specifies the other physical and colour fastness requirements that are applicable to all materials encompassed by this Part of BS 3546.

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 12, 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 Part of BS 3546 specifies requirements for a coated fabric which has the ability to allow permeation of water vapour whilst maintaining a high degree of water penetration resistance.

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

2 Definitions

For the purposes of this British Standard the following definitions apply.

2.1

coated fabric

a material composed of two or more layers, at least one of which is of a textile material (woven, knitted or nonwoven) and at least one of which is a substantially continuous polymeric film, bonded closely together by means of an added adhesive or by the adhesive properties of one or more of the component layers

2.2

water penetration resistance (WPR)

the ability of a coated fabric to withstand a hydrostatic head pressure when tested in accordance with method 29A of BS 3424-26:1990 prior to any previous chemical and/or physical testing

NOTE Although this Part of BS 3546 does not include a requirement for water penetration resistance in the “as received” condition, i.e. prior to any previous chemical and/or physical testing, it is recommended that the term “water penetration resistant” should not be applied to any coated fabric that does not exhibit a WPR greater than 10 kPa when tested in the “as received” condition.

2.3

water proof

a deprecated term which implies that its water penetration resistance is equivalent to its hydraulic bursting strength

2.4

water vapour permeable

the ability of a coated fabric to transmit water vapour above a minimum index level when tested in accordance with Appendix C prior to any previous chemical and/or physical testing

NOTE 1 An alternative term in common usage is breathable.

NOTE 2 It is recommended that neither the term water vapour permeable nor breathable be applied to any coated fabric that exhibits a water vapour permeability index less than 40%.

2.5

water vapour permeability index (WVPI)

the water vapour permeability of a material expressed as a percentage of a known reference standard

2.6

delamination

the partial or whole separation of two, or more, of the component layers of a coated fabric. This can be either a fabric to polymer separation or a separation within the actual polymeric layer

NOTE See 6.3 of BS 3424-9:1990.

3 Marking

Each roll of coated fabric shall have a label attached bearing the following distinguishing information.

- The name and/or distinctive mark of the manufacturer and a means of identifying the manufacturing batch number.
- The number of this British Standard, i.e. BS 3546-4¹⁾, and the producer's quality code relating to that material.
- The fibre types employed in the manufacture of the textile component(s) of the coated fabric (see BS 4815).
- Whether the coated fabric has been given a water repellant finish, and if so what type, e.g. fluorocarbon or cross-linked silicone.

The following information shall be provided on a separate data sheet, identifiable by the producer's quality code, which shall accompany each order.

NOTE It is not necessary to provide a data sheet for each roll of coated fabric in an order.

WVPI

WPR after flexing

WPR after ageing, washing and flexing
bursting strength

tear strength

end usage (either outer or liner).

Example 1. A coated fabric having the following characteristics:

- a WVPI of 75 %;
- a WPR after flexing of 25 kPa;
- a WPR after ageing, washing and flexing of 15 kPa;
- a minimum bursting strength of 800 N;
- a minimum tear strength of 38 N;

¹⁾ Marking BS 3546-4 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 therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

would be designated as follows:

75	25	15	800	38	Outer
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Example 2. A coated fabric having the following characteristics:

- a WVPI of 75 %;
- a WPR after flexing of 25 kPa;
- a WPR after ageing, washing and flexing of 15 kPa;
- a minimum bursting strength of 200 N;
- a minimum tear strength of 19 N;

would be designated as follows:

75	25	15	200	19	Liner
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4 Sampling

Samples shall be taken that are representative of the manufacturing batch from which they are drawn and from which specimens for testing shall be selected in accordance with Figure 1. Subject to Appendix A, sampling shall be carried out at the discretion of the testing authority.

5 Testing and compliance

5.1 Population size

The minimum performance values specified in Table 1 and Table 2 shall apply to the manufacturing batch as a whole.

5.2 Tests on each sample

The tests shall be conducted as specified in Table 1 and Table 2 on specimens extracted from each sample.

5.3 Index tests

5.3.1 In the event of any individual burst or tear strength test result (x) being lower than the requirements described as “minimum” in Table 1, the results of the series of such tests shall be subject to analysis in accordance with the provisions of Appendix B.

5.3.2 If the lower confidence limit of the mean, as calculated in accordance with Appendix B, is at or above a requirement described as “minimum” in Table 2, the bulk of the coated fabric which the sample represents shall be deemed to comply with this Part of BS 3546, in respect of that physical property.

5.3.3 If the lower confidence limit of the mean, as calculated in accordance with Appendix B, is below a requirement described as “minimum” in Table 1, in respect of burst or tear strength, two further samples shall be taken from the same source as the original sample and test specimens shall be taken from each sample so that duplicate tests may be conducted in respect of that physical property.

The results shall jointly be subject to analysis in accordance with Appendix B. If the lower confidence limit of the means as calculated in accordance with Appendix B is still below the requirement described as “minimum” in Table 1, the bulk of the coated fabric which the samples represent shall be deemed not to comply with this Part of BS 3546.

However, if the lower confidence limit of the mean is at or above the requirement described as “minimum” in Table 1, the bulk of the coated fabric which the samples represent shall be deemed to comply with this Part of BS 3546 in respect of that physical property.

5.4 Pass/fail tests

If any of the specimens tested for the properties specified in Table 1 and Table 2, excepting burst and tear strength, fails to comply with the requirements specified in Table 1 and Table 2, the tests which the specimen has failed shall be repeated twice. For this purpose, two further samples shall be taken from the same source as the original sample and test specimens shall be taken from each sample so that duplicate tests may be conducted.

If all the re-test results comply with the relevant requirements of Table 1 and/or Table 2, the bulk of the coated fabric that the samples represent shall be deemed to comply with this Part of BS 3546. If any of the results of the re-tests are not in accordance with the relevant requirements of Table 1 and/or Table 2, the bulk of the coated fabric that the samples represent shall be deemed not to comply with this Part of BS 3546.

6 Performance

6.1 Water penetration and mechanical properties

When tested by the appropriate method given in Table 1, the coated fabric shall comply with the minimum requirement specified in Table 1.

6.2 Colour fastness and other physical properties

When tested by the appropriate method given in Table 2, the coated fabric shall comply with the requirements specified in Table 2.