

Testing coated fabrics —

Part 24: Methods 27A and 27B. Methods for determination of abrasion resistance

IMPORTANT NOTE. It is recommended that this Part be read in conjunction with the information in Part 0 “Foreword and general introduction”.

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Foreword

In preparing this Part of this British Standard consideration has been given to the various phenomena, which, although not a direct measure of abrasion resistance, are nevertheless related. In particular attention is drawn to the fact that materials having low values of kinetic coefficient of friction and which also exhibit a ratio of static to kinetic friction approaching unity, will generally have better resistance to abrasive wear than similar materials having a high coefficient of kinetic friction and a wide band between static and kinetic friction coefficients. In this regard reference can be made to BS 3424-10.

It has also to be borne in mind that materials that are particularly temperature sensitive, such as plasticized polyvinyl chloride (PVC), should be, as far as possible, protected from heat build-up during laboratory abrasion tests, if the results are to be representative of the use characteristics and if the test is not to suffer from poor reproducibility.

In addition, apart from the change in appearance following abrasion testing, some end products will require post abrasion performance testing in order to assess the extent to which the product will continue to fulfill its utilitarian role. There is however no simple relationship between abrasion resistance and wear life and consequently it is inadvisable to extrapolate abrasion results as being too indicative of other factors.

As a consequence of these many considerations it is not possible to specify a single type of abrasion test that is universally applicable to all circumstances and so two methods have been selected. Attention is drawn however to a related scuff/snag test in method 34 of BS 3424-31.

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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, 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.

This British Standard, having been prepared under the direction of the Fibres, Yarns, Fabrics and Production Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 October 1990

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1 Scope

This Part of BS 3424 describes two methods of assessing the abrasive wear characteristics of coated fabrics.

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

2 Method 27A. Determination of abrasion resistance using a Martindale abrasion machine

2.1 General

The abrasion test using the Martindale abrasion machine is presented in two modes of operation.

Mode A employs the instrument in the conventional manner and produces an abraded disc of coated fabric 38 mm in diameter. This is convenient where only the loss of finish or appearance or the mass or volume of abrasion loss is to be determined and requires only small amounts of coated fabric to be tested. Any post-abrasion tests that can be conducted are however limited with this specimen size, but it is possible to conduct liquid penetration tests (see BS 4724-1 and BS 4724-2) or cold crack tests (see BS 3424-8).

Mode B employs the instrument in inverted mode, i.e. the test specimen is placed on the abradant table instead of in the specimen holder and the abradant is mounted in the specimen holder. This provides a test specimen of approximately 125 mm × 125 mm which enables a much wider range of post-abrasion testing to be carried out, including hydrostatic head testing.

2.2 Precision

The precision statements given in Appendix A of BS 5690:1988 are based on the Martindale abrasion machine operating in the conventional mode, i.e. mode A, using a crossbred worsted abradant and 100 % wool fabric. If mode B is employed using a silicon carbide abradant on a polymer coated fabric, these precision statements will not apply.

2.3 Apparatus¹⁾

2.3.1 Abrasion machine, complying with that described in BS 5690:1988.

NOTE Information concerning the assembly, maintenance and calibration of the abrasion machine is given in Appendix A. It is essential that these recommendations are followed if excessive variability is to be avoided.

2.3.2 Silicon carbide cloth abradant, of “J” weight, grade P180 complying with BS 871.

2.3.3 Crossbred worsted abradant, as specified in BS 5690:1988.

2.3.4 Polyurethane foam backing, 3 ± 0.02 mm thick having a density of 0.043 ± 0.001 g/cm³, with a compressed thickness of 2.95 ± 0.02 mm under a pressure of 4.9 kPa.

2.3.5 Felt backing, as specified in BS 5690:1988.

2.3.6 Punch or press cutter, to cut a circle of at least 38 mm in diameter.

2.4 Conditioning and testing atmosphere

Condition the test specimens in accordance with method 4 of BS 3424-2.

Store the abradant in an atmosphere of approximately 20 °C and 65 % relative humidity.

Conduct the test in the atmosphere for conditioning and testing described in method 4 of BS 3424-2.

2.5 Procedure: mode A

2.5.1 Test specimens. Using the punch or press cutter (2.3.6) take at least four specimens at random from the coated fabric under test, ensuring as far as practicable that embossed areas, if present, are represented.

If the end point of the test required by the relevant product specification is expressed in terms of mass loss, determine the mass of each test specimen taken.

2.5.2 Setting up the machine

2.5.2.1 Mounting test specimens. Place the ring of the specimen holder in position on the mounting plate provided on the base of the machine. Insert the test specimen face side downwards, centrally in the ring. Place the metal insert carefully and centrally on top of the specimen, so that its hollowed side faces upwards, and press down.

While ensuring that the ring containing the specimen and metal insert is held firmly in the mounting plate, start to screw the top of the specimen holder on to the ring, taking care that the screw threads are not crossed. Having started the screwing down operation, use both hands to maintain a continuous downward pressure on the assembly, against the mounting plate.

NOTE This procedure will normally ensure that the specimen is securely retained in the holder in a wrinkle-free condition, and that it is ready for testing.

¹⁾ For information on the availability of test apparatus, apply to Enquiry Section, BSI, Linford Wood, Milton Keynes MK14 6LE, enclosing a stamped addressed envelope for reply.