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Methods for

Determination of the mass of warp and weft per unit area of fabric

[ISO title: Textiles — Woven fabrics — Construction — Methods of
analysis — Part 6: Determination of the mass of warp and weft per
unit area of fabric]

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Fibres, Yarns, Fabrics and Production Standards Committee (FBM/-) to Technical Committee FBM/11 upon which the following bodies were represented:

- British Clothing Industry Association
- British Retailers' Association
- British Textile Employers' Association
- Central Council of the Irish Linen Industry
- Confederation of British Wool Textiles Limited
- Consumer Standards Advisory Committee of BSI
- Department of Trade and Industry (Chemicals, Textiles, Paper and Miscellaneous Division)
- Furnishing Fabrics Association
- Institute of Trading Standards Administration
- International Wool Secretariat
- Knitting Industries' Federation Ltd.
- Mail Order Traders' Association of Great Britain
- Man-made Fibres Producers' Committee
- Manchester Testing House
- Ministry of Defence
- Society of Dyers and Colourists
- Textile Distributors' Association
- Textile Institute
- Textile Research Council
- Coopted members

This British Standard, having been prepared under the direction of the Fibres, Yarns, Fabrics and Production Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 September 1984

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Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
0 Introduction	1
1 Scope and field of application	1
2 References	1
3 Principle	1
4 Apparatus	1
5 Conditioning and testing atmosphere	1
6 Test specimens	1
7 Procedure	2
8 Calculation and expression of results	2
9 Test report	2
Publications referred to	Inside back cover

National foreword

This revision of this British Standard, which has been prepared under the direction of the Fibres, Yarns, Fabrics and Production Standards Committee, supersedes BS 2866:1972, which is withdrawn. It is identical with ISO 7211:1984 *“Textiles — Woven fabrics — Construction — Methods of analysis — Part 6: Determination of the mass of warp and weft per unit area of fabric”*, published by the International Organization for Standardization (ISO).

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Where the words “International Standard” and “this part of ISO 7211” or “ISO 7211-6” appear, referring to this standard, they should be read as “British Standard” and “BS 2866” respectively.

Cross-references

International Standards	Corresponding British Standards
ISO 139:1973	BS 1051:1981 <i>Glossary of terms relating to the conditioning, testing and mass determination of textiles</i> (Technically equivalent ^a)
ISO 3801:1977	BS 2471:1978 <i>Methods of test for textiles — Woven fabrics — Determination of mass per unit length and mass per unit area</i> (Identical)

^a This British Standard glossary contains all the relevant information which, in the International Standard, is written in terms of requirements.

The Technical Committee has reviewed the provisions of ISO/TR 5090, to which reference is made in the text, and has decided that they are acceptable for use in conjunction with 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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, 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.

0 Introduction

It is common practice to describe fabrics by the mass per unit area (see ISO 3801) and the ends and picks per centimetre, but this leaves the proportions of warp and weft in the fabric uncertain. Any desired balance of cover between warp and weft can be stated without specifying the yarn linear densities by giving separate values for the masses of warp and weft per unit area of the fabric.

1 Scope and field of application

This part of ISO 7211 specifies methods for determining the mass of the warp and weft threads per unit area of fabric after the removal of any non-fibrous matter.

2 References

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*.

ISO 3801, *Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area*.

ISO/TR 5090, *Textiles — Method for the removal of non-fibrous matter prior to quantitative analysis of fibre mixtures*.

3 Principle

Method A: The outline of the fabric specimen to be dissected is marked in the form of a square or rectangle, and the non-fibrous matter is removed while the marked area still forms part of a larger sample and the threads cannot, therefore, be lost from it. If the amount of non-fibrous matter is to be determined, it is stipulated that the larger sample shall be a square cut with its diagonals parallel to the directions of the threads in the fabric. If the amount of non-fibrous matter has not to be determined, the larger sample may be of any shape or size.

Method B: A specimen of known area is dissected and the non-fibrous matter is removed from the warp and weft threads.

4 Apparatus

4.1 Indelible marking ink

4.2 Scissors

4.3 Dissection needle

4.4 Small template¹⁾ to mark (or a **die** to cut) a square or a rectangle of known area of not less than 150 cm². The length to width ratio of the rectangle shall not exceed 4.

4.5 Large template, to mark (or a **die** to cut) a square which is sufficiently large to enclose the area marked with the smaller template (4.4) when placed with its diagonals parallel to the sides of the enclosed square or rectangle.

4.6 Balance, accurate to 0,1 % of the smallest quantity to be weighed.

5 Conditioning and testing atmosphere

The standard atmospheres for pre-conditioning, conditioning and testing textiles as specified in ISO 139 shall be used.

6 Test specimens

6.1 Conditioning

Before marking or cutting, expose the samples from which the test specimens will be removed to the standard atmosphere for conditioning until it is in equilibrium with that atmosphere.

Take the specimens from each sample.

6.2 Method A

With the aid of the large template (4.5), mark in pencil on the sample a square with its diagonals in the direction of the warp and weft threads. In the centre of the square, and with the aid of the small template (4.4), mark in indelible ink (4.1) a square or rectangle with its sides in the directions of the warp and weft threads. Cut the larger square from the sample by means of the scissors (4.2) and identify the warp and weft directions. Alternatively, remove the larger square from the sample by means of a die.

When the amount of non-fibrous matter has not to be determined, the larger specimen may be of any shape or size, provided that the threads are retained in the inner marked area during the removal of added matter.

6.3 Method B

With the aid of the small template (4.4), mark in pencil a square or a rectangle with its sides as closely as possible parallel to the warp and weft threads. Cut the square or rectangle from the fabric by means of the scissors (4.2) and identify the warp and weft directions. Alternatively, remove a square of the appropriate size from the fabric by means of a die.

¹⁾ A suitable template is 15,8 cm · 15,8 cm; the yarn mass in grams multiplied by 40 gives the number of grams per square metre.

7 Procedure

7.1 Method A

Remove any non-fibrous matter from the sample by a method described in ISO/TR 5090. Expose the sample to the atmosphere for conditioning and testing until equilibrium is attained.

Cut along the sides of the inner square or rectangle which was marked on the sample before the removal of added matter. Determine the mass of the marked area to an accuracy of 0,1 %.

Working over paper of a colour suitable for showing up fragments of the yarn and fibre from the fabric being tested, fray out from one edge of the square or rectangle, and collect together, the threads more easily removed from the fabric. From time to time, cut off the fringe of threads remaining in the other direction of the fabric and collect the short lengths together, keeping them separate from the more easily removed threads. When the whole of the marked area has been dissected into warp and weft threads, determine the mass of the two sets of threads separately to an accuracy of 0,1 %. The sum of these two masses shall not differ from the mass of the fabric before dissection by more than 1 %.

Where the sum of the masses of warp and weft threads differs by more than 1 % from the mass of the fabric specimen, the procedure has not been followed with sufficient accuracy. Repeat the procedure in order to achieve the required accuracy.

NOTE Long rectangular specimens are easier to dissect than squares, but the dissection of the latter may be facilitated by cutting into several rectangles with their lengths in the direction of the threads more easily removed from the fabric.

7.2 Method B

Dissect the specimen of known area into warp and weft threads over paper of a colour suitable for showing up fragments of yarn from the fabric being tested. When the dissection of the specimen has been completed, remove the non-fibrous matter from the two sets of threads separately by a method described in ISO/TR 5090, taking care that no loss of fibre occurs during the process.

Dry the threads and bring them into equilibrium with the standard atmosphere for testing, from the dry side by exposing them freely to that atmosphere. Determine the mass of the two sets of threads separately to an accuracy of 0,1 %.

8 Calculation and expression of results

From the conditioned masses of warp and weft, free from added matter, and the known area of the specimens dissected, calculate the mass per unit area of warp, weft and fabric and express each in grams per square metre.

9 Test report

The test report shall include the following particulars:

- a) a reference to this International Standard (ISO 7211-6);
- b) the standard atmosphere used (temperate or tropical);
- c) the method used (A or B);
- d) the method used for removal of non-fibrous matter;
- e) the mass of warp and weft per unit area of each specimen and, if required, the mass per unit area of the fabric, all expressed in grams per square metre;
- f) details of any deviation from the method.

Publications referred to

See national foreword.

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