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International Standard ISO 7211/6

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

Textiles — Tissus — Construction — Méthodes d'analyse — Partie 6: Détermination de la masse des fils de chaîne et de trame par unité de surface dans un tissu

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

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It has been approved by the member bodies of the following countries:

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France

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INTERNATIONAL STANDARD ISO 7211/6-1984 (E)

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

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 template[1] to mark (or a **die** to cut) a square or a rectangle of known area of not less than 150 cm^2. 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

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.

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.

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 sufficent 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.