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International Standard ISO 7211/4

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Textiles — Woven fabrics — Construction — Methods of analysis — Part 4: Determination of twist in yarn removed from fabric

Textiles — Tissus — Construction — Méthodes d'analyse — Partie 4: Détermination de la torsion d'un fil prélevé 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.

International Standard ISO 7211/4 was developed by Technical Committee ISO/TC 38, *Textiles*, and was circulated to the member bodies in November 1982.

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

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INTERNATIONAL STANDARD ISO 7211/4-1984 (E)

Textiles — Woven fabrics — Construction — Methods of analysis — Part 4: Determination of twist in yarn removed from fabric

0 Introduction

Although the twist in a yarn removed from a fabric is determined on the same apparatus as is used for determining the twist in yarn withdrawn from a package (see ISO 2061), there are some differences of technique. In particular, care must be taken to avoid alteration of twist during transfer of the yarn from the fabric to the apparatus.

A standard mounting tension is also required to remove the crimp which is present in most yarns as a result of incorporation in fabrics.

Alterations in twist may occur when a yarn is incorporated into or removed from a more complex structure. To determine the twist in the single yarns from a sample of the folded yarn, however, it is essential to untwist the latter, thus re-inserting twist in the single yarns. The results of twist tests on these single yarns will, therefore, indicate the state of the yarn prior to the folding operation and not when it is functioning as a component of the folded yarn.

1 Scope and field of application

This part of ISO 7211 specifies a method for the determination of twist in yarns removed from woven fabrics. The method is only applicable to yarns spun on conventional systems, and is not applicable to OE (open-end spun) or interlaced yarns, for example.

2 References

ISO 2, *Textiles — Designation of the direction of twist in yarns and related products.*

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

ISO 2061, *Textiles — Determination of twist in yarns — Direct counting method.*

ISO 7211/3, *Textiles — Woven fabrics — Construction — Methods of analysis — Part 3: Determination of crimp of yarn in fabric.*

3 Principle

A length of yarn is removed from the fabric and, while under tension, is secured in two clamps which are at a known distance apart. One of these clamps is then rotated until all twist is removed from the length of yarn.

4 Apparatus

4.1 Twist counter, consisting of a pair of clamps, one of which shall be rotatable in either direction and positively connected to a revolution counter. The clamps shall be adjustable to permit testing yarn lengths as specified in the table. For certain folded, cabled and similar yarns, it may be convenient to make provision for displacement of the non-rotatable clamp to allow for change in length of the test specimen during untwisting. Means shall be provided for applying the appropriate straightening tension (see ISO 7211/3) prior to clamping.

4.2 Dissecting needle.

4.3 Means for magnifying the specimen being tested.

5 Conditioning and testing atmosphere

One of the atmospheres for conditioning and testing textiles as defined in ISO 139 shall be used for conditioning and testing.

6 Test specimens

Expose the piece or pieces of fabric from which specimens are to be removed to the standard atmosphere for testing for at least 16 h.

Remove single threads from strips of fabric each containing more threads than will be withdrawn for testing and at least 7 cm to 8 cm longer than the test length cut as follows.

The warp threads in a woven fabric are from many different packages and the warp is thus already sampled for testing.

For testing, take one strip of fabric in the warp direction of sufficient width to provide the required number of specimens (see the table). Since each weft package covers a certain length of fabric, cut five strips from the weft direction at different places in the sample and of sufficient width to provide the required number of specimens (see the table).

Where more than one strip of fabric is used, divide the number of tests approximately equally between the strips.

The test length shall be as given in the table. Unless otherwise stated, the number of specimens shall be not less than that given in the table, which is the minimum required to give a reasonably accurate mean. The minimum number of tests to attain the accuracy for any specific purpose shall be determined statistically.

Table — Test length and number of tests

Type of yarn	Minimum number of tests	Test length cm
Folded and cabled yarns	20	20
Continuous filament yarn (single)	20	20
Spun yarn (single) [1) 2)]	50	2,5

1) When grey yarn (single) dry spun from long bast fibres is under test, 20 tests may be made using 20 cm test lengths.

2) For some cotton yarns, a minimum length of 1,0 cm may be required.

7 Procedure

7.1 Direction of twist

Withdraw one thread and hold the ends in such a position that a short length (about 10 cm) is in a vertical position. Examine the vertical section of the thread and determine if the slope of the yarn elements (fibres, filaments or component yarns) conforms to the slope of the central portion of the letters "S" or "Z". Note the direction of twist as "S" or "Z" (see ISO 2).

7.2 Amount of twist

Grip one end of the thread nearest the edge of the strip and withdraw it sideways sufficiently for it to be fastened in the rotatable clamp of the twist counter (4.1), set in the zero position. Complete this before releasing the end. Then grip the other end of the same thread, withdraw the rest of the thread sideways from the fabric, and then fasten this end, after applying the appropriate straightening tension in the non-rotating clamp before releasing the end of the thread. Use a straightening tension in accordance with ISO 7211/3.

The above procedure allows the thread to be transferred from the fabric to the testing machine without disturbance of twist, and the portion of thread which is between the clamps need not have been handled during the mounting.

Remove the twist by turning the rotatable clamp. Insert the dissecting needle (4.2) and draw it between the fibres or other structural components to indicate the removal of the twist. Record the number of turns of the rotatable clamp necessary to remove the twist. When the nominal number of turns in the test specimen does not exceed 5, record the individual test results to one tenth of a turn. When it is between 5 and 15, record the individual test results to 0,5 turn and when it exceeds 15, record the results to the nearest unit.

Repeat the process with further threads from the strip, cutting away the exposed fringe of cross threads as required to allow easy withdrawal of the threads for testing.

When the twist in a component of a compound structure is measured, first use the apparatus to separate the components. Remove these and secure their ends to avoid alteration of twist. Insert the components separately in the apparatus and determine the twist as above.

8 Calculation and expression of results

Calculate the number of turns per metre for each specimen as follows:

$$\text{turns/m} = \frac{\text{number of turns recorded}}{\text{test length, in centimetres}} \times 100$$

Calculate the mean value for each of warp and weft.

9 Test report

The test report shall include the following particulars:

a) a reference to this International Standard (ISO 7211/4);

b) the standard atmosphere used (temperate or tropical);

c) the twist direction, "S" or "Z", of the yarns and any component yarns;

d) the test length used;

e) the results of each test, in turns per metre;

f) the mean of the results of each test, in turns per metre;

g) details of any deviation from the method.