



**SLOVENSKI STANDARD**  
**SIST EN 1049-2:1999**

**01-marec-1999**

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**Tekstilije - Tkanine - Konstrukcija - Analizne metode - 2. del: Ugotavljanje števila niti na dolžinsko enoto (ISO 7211-2:1984, spremenjen)**

Textiles - Woven fabrics - Construction - Methods of analysis - Part 2: Determination of number of threads per unit length (ISO 7211-2:1984 modified)

Textilien - Gewebe - Untersuchungsverfahren - Teil 2: Bestimmung der Anzahl der Fäden je Längeneinheit (ISO 7211-2:1984 geändert)

Textiles - Tissus - Construction - Méthodes d'analyse - Partie 2: Détermination du nombre de fils par unité de longueur (ISO 7211-2:1984 modifiée)

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**Ta slovenski standard je istoveten z: EN 1049-2:1993**

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**ICS:**

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EUROPEAN STANDARD

EN 1049-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 1993

UDC 677.064:677.017.353

Descriptors: Textiles, woven fabrics, tests, determination, numbers, yarns

English version

**Textiles - Woven fabrics - Construction - Methods  
of analysis - Part 2: Determination of number of  
threads per unit length (ISO 7211-2:1984  
modified)**

Textiles - Tissus - Construction - Méthodes  
d'analyse - Partie 2: Détermination du nombre  
de fils par unité de longueur (ISO 7211-2:1984  
modifiée)

Textilien - Gewebe - Untersuchungsverfahren -  
Teil 2: Bestimmung der Anzahl der Fäden je  
Längeneinheit (ISO 7211-2:1984 Geändert)

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This European Standard was approved by CEN on 1993-12-16. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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### Foreword

This European Standard has been taken over by CEN/TC 248 "Textiles and textile products" from the work of ISO/TC 38 "Textiles" of the International Organization for Standardization (ISO). This European Standard is based on ISO 7211-2:1984.

This European Standard shall be given the status of a national standard, either by publication of an identical standard, either by endorsement, at the latest by June 1994, and conflicting national standards shall be withdrawn at the latest by June 1993.

The Standard was approved and in accordance with the following CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

### Endorsement notice

The text of the International Standard ISO 7211-2:1984 was approved by CEN as a European Standard with the common modifications as given below:

Clause 5: Delete the existing text and replace by "The atmosphere for preconditioning, conditioning and testing shall be as specified in EN 20139".

Clause 10: Delete the second paragraph and replace by "When fabrics involving fancy weaving are patterned by small areas of 2 or more type of threads in warp and welt directions, count the number of threads of each type in a periodic pattern and then calculate the number of threads per 10 cm after measuring the periodicity and repeat pattern".

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Annex: Under the title delete "forms part of the standard" and insert "included for information purposes".

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International Standard



7211/2

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**Textiles — Woven fabrics — Construction — Methods of analysis —  
Part 2: Determination of number of threads per unit length**

*Textiles — Tissus — Construction — Méthodes d'analyse — Partie 2: Détermination du nombre de fils par unité de longueur*

First edition — 1984-03-15

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Ref. No. ISO 7211/2-1984 (E)

**Descriptors :** textiles, woven fabrics, tests, determination, numbers, yarns.

## 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 7211/2 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:

Australia	India	Portugal
Belgium	Iran	Romania
Brazil	Iraq	South Africa, Rep. of
Bulgaria	Israel	Spain
Canada	Italy	Sweden
China	Jamaica	Tanzania
Czechoslovakia	Japan	Turkey
Egypt, Arab Rep. of	Korea, Rep. of	United Kingdom
Finland	Mexico	USSR
Germany, F.R.	Netherlands	Venezuela
Ghana	New Zealand	
Hungary	Poland	

The member body of the following country expressed disapproval of the document on technical grounds:

France

# Textiles — Woven fabrics — Construction — Methods of analysis —

## Part 2: Determination of number of threads per unit length

### 1 Scope and field of application

This part of ISO 7211 specifies three methods for the determination of the number of threads per centimetre in woven fabrics. Any of the three methods may be used, the choice depending on the character of the fabric. However, in case of dispute method A is recommended.

**Method A:** Dissection of fabric, suitable for all fabrics. This is the most laborious method but has fewer limitations than the others; in particular, it is the only one that is really suitable for the examination of certain folded structures and other complicated weaves.

**Method B:** Counting glass, suitable for woven fabrics with more than 50 threads per centimetre.

**Method C:** Traversing thread counter, suitable for all fabrics.

Where the number of threads per centimetre is low, it may be convenient to express the results as the number of threads per decimetre.

NOTE — Methods using parallel line gratings and tapered line gratings have been given in the annex for information. These methods have not been considered accurate enough to be used as standard test methods but can be used to give rough and ready estimates for routine testing.

### 2 Reference

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

### 3 Principle

Three methods of determining the number of threads per centimetre are specified, any of which may be used, the choice depending on the character of the fabric. The principles are as follows:

**Method A:** A section of fabric of dimensions in accordance with those given in clause 4 is dissected and the number of threads counted. The threads that are to be counted are preferably short, 1 or 2 cm being suitable.

**Method B:** The number of threads visible within the aperture of a specified counting glass is determined.

**Method C:** The number of threads per centimetre of the fabric is determined with the aid of a traversing thread counter.

### 4 Minimum measuring distance

Use the appropriate minimum measuring distance specified in the table.

Table — Minimum measuring distance

Number of threads per centimetre	Minimum measuring distance cm	Number of threads per test piece	Accuracy in percentage (count to within 0,5 thread)
Less than 10	10	Less than 100	Greater than 0,5
10 to 25	5	50 to 125	1,0 to 0,4
25 to 40	3	75 to 120	0,7 to 0,4
More than 40	2	More than 80	Less than 0,6

For the method A, take test pieces containing at least 100 threads.

For narrow fabrics having a width of 10 cm or less, count all warp threads including the selvedge ends and express the result as threads per full width.

When fabrics are patterned by broad areas of higher or lower density of thread spacing, select test specimens containing at least one weave repeat (see clause 10).

### 5 Conditioning and testing atmosphere

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

### 6 Test specimens

No specially prepared specimens are required except for method A (see 7.2), but count the threads at not less than five different points selected to represent the fabric as fully as possible. Expose the fabric or specimens to the standard atmosphere for testing for at least 16 h before making the test.

## ISO 7211/2-1984 (E)

**7 Method A — Dissection of fabric****7.1 Apparatus**

**7.1.1 Clamp**, holding two short pins parallel and with their points being within  $\pm 0,02$  cm of the minimum measuring distance specified in clause 4.

Alternatively, when a clamp is not available,

**7.1.2 Two dissecting needles** and

**7.1.3 Heavy steel rule.**

**7.2 Procedure**

Take five specimens at random (see clause 6) 0,4 to 0,6 cm longer than the minimum measuring distance specified in clause 4 and sufficiently wide to facilitate handling. Take care not to disturb the distribution of threads, especially in a loosely woven fabric.

Pass the pins in the clamp (7.1.1) through a specimen 0,2 to 0,3 cm from each end. Remove the shorter threads (those in the direction to be counted) from the specimen outside the two pins, so that the measuring distance of fabric between the pins remain. Then remove the short threads from the specimen and count them. Count any threads impaled on a pin as half a thread. It is usually convenient to employ a pair of pointed forceps to remove the threads. The threads may be arranged in groups of ten for convenience in counting.

An approved alternative method where a clamp is not available is to insert two dissecting needles (7.1.2) the required distance apart by sliding their points down the appropriate graduation marks of a heavy steel rule (7.1.3) placed on edge.

**8 Method B — Counting glass****8.1 Apparatus**

**8.1.1 Counting glass**, the aperture width of which shall be  $2 \pm 0,005$  cm or  $3 \pm 0,005$  cm at all places. The thickness of the base plate at the edges of the aperture shall not exceed 0,1 cm.

**8.2 Procedure**

Use a measuring distance in accordance with clause 4.

Lay the fabric flat on a horizontal surface and place the counting glass (8.1.1) on the fabric so that one of the edges of its aperture is parallel to the warp threads.

In some fabrics, it is possible to see and count every thread. If this is not possible, weave repeats may be counted. Select a thread in the weave repeat which can be identified readily and position the counting glass so that this thread is adjacent to one side of the aperture of the counting glass. Count the number of

whole repeats in the measuring distance, plus the remaining individual threads. Determine the number of threads in a repeat by analysis of the weave or dissection of the fabric.

Count the number of warp threads, or the number of weave repeats, or the number of warp thread units and fractions of a unit bounded by the appropriate pair of opposite sides of the aperture. Repeat with one of the edges of the aperture parallel to the weft threads, and count the number of weft threads or weave repeats or number of weft thread units in a similar manner.

If the face of the fabric is composed mainly of one set of threads, as with certain twills, sateens, etc, it may be found easier to count on the back of the fabric, where the weave design is more readily recognizable.

**9 Method C — Traversing thread counter****9.1 Apparatus**

**9.1.1 Traversing thread counter**, incorporating a low-power microscope, of X 4 to X 20, mounted so that it can be traversed by means of a screw over a graduated base sufficiently long to meet the minimum measuring distance requirements of clause 4. Types with an index line in the eyepiece or a pointer traversing with and visible through the microscope are equally suitable.

**9.2 Test procedure**

Use a measuring distance in accordance with clause 4.

Lay the fabric flat on a horizontal surface and place the thread counter (9.1.1) upon it in such a way that when the screw is turned the microscope moves across the fabric in a direction that is either parallel to the warp or parallel to the weft, depending on which set of threads is being counted. Count the number of threads over the appropriate minimum measuring distance.

In some fabrics it is possible to see and count every thread passed by the pointer or index line as it moves across the fabric. If this is not possible, weave repeats may be counted. Begin counting from a thread in the weave repeat which can be readily identified. Count the number of whole repeats in the measuring distance, plus the remaining individual threads. Determine the number of threads in a repeat by analysis of the weave or dissection of the fabric.

If the face of the fabric is composed mainly of one set of threads, as with certain twills, sateens, etc., it may be found easier to count on the back of the fabric, where the weave design is more readily recognizable.

**10 Calculation and expression of results**

Calculate the number of threads per centimetre. Quote the mean of individual results for each direction, that for the warp threads as ends per centimetre and that for the weft as picks per centimetre. The number of threads per square centimetre is given by the sum of the mean ends and picks per centimetre.



When fabrics are patterned by broad areas of higher or lower density of thread spacing, determine the number of threads in each area and report the number of threads per centimetre for different areas of the pattern.

## 11 Test report

The test report shall include the following particulars:

- a) a reference to this International Standard (ISO 7211/2);
  - b) the standard atmosphere used (temperate or tropical);
  - c) the actual method used (A, B or C);
  - d) the measuring distance used;
  - e) the number of measurements made;
  - f) the number of warp ends per centimetre and weft picks per centimetre and the mean value of warp ends per centimetre and weft picks per centimetre. If the fabric is patterned by broad areas of greater and lower density, and if required, this information can be given for each different portion of the pattern.
- Where the number of threads is low, it is permissible to express and report the results as the number of threads per decimetre. For narrow fabrics (see clause 4), report the results as the number of threads per full width;
- g) if required, the number of threads per square centimetre (or square decimetre);
  - h) details of any deviation from the method.

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