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Textiles - Woven Fabrics - Determination of Number of Threads per Unit Length

机织物密度的测定

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Textiles-Woven Fabrics-Determination of Number of Threads per Unit Length

This standard is based on the international standard ISO 7211/2-1984 "Textiles - Woven Fabrics – Construction - Methods of Analysis - Part 2: Determination of Number of Threads per Unit Length".

1 Subject Content and Application Scope

This standard specifies three methods for the determination of number of threads per unit length 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.

This standard is applicable to the determination of number of threads per unit length in various woven fabrics.

Method A: Dissection of fabric, suitable for all fabrics, in particular, complicated weaves.

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

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

Note: Three methods using parallel line gratings, tapered line gratings and optoelectronic scanning density meter for the determination of number of threads per unit length in woven fabrics have been given in Annex A (Informative) for information. These methods have low measurement accuracy and limitation but can be used to give rapid and rough estimates.

2 Normative References

GB 6529 Textiles - Standard Atmospheres for Conditioning and Testing

3 Definitions

3.1 Number of threads per unit length: warp number and weft number per unit length in woven fabrics under no wrinkle or tension, generally expressed with root/10cm.

3.2 Number of threads in warp direction: number of warp threads per unit length in

specified in GB 6529, and arbitration test shall adopt Grade 2 standard atmosphere. Routine inspection may be carried out in general atmosphere.

7 Test Specimen

The specimens shall be flat and smooth and free from wrinkle and obvious skew.

No specially prepared specimens are required except for method A, but determine 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 atmosphere for testing for at least 16h before making the test.

8 Method A - Dissection of Fabric

8.1 Apparatus

a. Steel ruler: with a length of 5~15cm and with millimetre scale on the ruler surface;

b. Dissecting needle;

c. Scissors.

8.2 Procedure

8.2.1 Take test specimens slightly larger than the minimum measuring distance at proper position of the specimen after conditioning.

8.2.2 Remove partial thread from the specimen edge, and measure with a steel ruler to make the specimen reach the specified minimum measuring distance 2cm, with an allowable tolerance of 0.5 thread.

8.2.3 Remove above-mentioned prepared specimens one by one from the edge; to be convenient for counting, arrange the threads into a group with 10 roots, then obtain the number of threads in fabrics in warp (weft) direction within a certain length.

8.2.4 If the warp and weft densities are determined simultaneously, take a rectangular specimen to make the lengths of warp and weft directions meet the minimum measuring distance. Remove the specimens, then obtain the number of warp threads and weft threads within a certain length.

9 Method B - Counting Glass

9.1 Apparatus

Annex A

Method for the Determination of the Number of Threads Using Gratings and Optoelectronic Scanner

(Informative)

A1 Method D-Parallel line grating

This method is suitable only for fabrics where thread patterns yield interference bands that are readily visible.

A1.1 Principle

The number of threads is determined through observing the interference bands produced when the parallel line grating is placed on the fabric.

A1.2 Apparatus

Parallel line grating, divided into several grades according to different specifications.

A1.3 Determination method

Place the grating selected as most suitable on the fabric with its lines parallel to the threads of the tested system. If a suitable grating has been chosen, a number of bands parallel to the edge of the grating will be seen. Count the number of threads according to the following rules:

A1.3.1 If, when the grating and tested fabric are rotated with a small angles, the transverse bands appear (vertical to grating line), the number of threads in tested fabric is equal to the grating mark number.

A1.3.2 If, when the grating is rotated slightly, the bands appear to rotate in the same direction as the grating, the number of threads per unit length in tested fabric is equal to the grating mark number minus the number of bands.

A1.3.3 If, when the grating is rotated slightly, the bands appear to rotate in the opposite direction as the grating, the number of threads per unit length in tested fabric is equal to the grating mark number plus the number of bands.

A1.4 The calculation and expression of results and the test report are in accordance with the content of Chapter 11 and Chapter 12 of this standard.

A2 Method E-Taper line grating

This method is suitable only for fabrics where thread patterns yield interference bands that are readily visible.

A2.1 Principle

The number of threads is determined through observing the interference bands produced when the taper line grating is placed on the fabric.

A2.2 Apparatus

Taper line grating, divided into several grades according to different specifications.

A2.3 Determination method

Lay the fabric flat, place the grating selected as most suitable on the fabric with its long side parallel to the tested threads. Curvilinear pattern approximate to symmetry will appear at this time, and the scale reading to which the two short arms of this cross point give the threads per centimetre in fabric.

A2.4 The calculation and expression of results and the test report are in accordance with the content of Chapter 11 and Chapter 12 of this standard.

A3 Method F-Optoelectronic scanning

This method is applicable to the determination of the number of threads per unit length in various plain and twill fabrics.

A3.1 Principle

Make incident light emit to fabric specimen through a condenser, reflected light of warp threads or weft threads in fabric forms one-way grating band image through optical system, convert this image to electric impulse signal through optoelectronic scanning, amplify and shape, and then drive a nixie tube through a counting system to directly indicate the number of warp (weft) threads in fabric within 5cm length.

A3.2 Apparatus

Optoelectronic scanning thread counter, with a minimum measuring distance of 5cm.

A3.3 Determination method

A3.3.1 Power on, open the power supply switch of the host, then the nixie tube and light source lamp will light.

A3.3.2 Place a piece of white paper below the apparatus, and regulate the output voltage to about 4.5V.

A3.3.3 Selecting measurement grade

Additional Explanation

This standard was proposed by the Department of Science & Technology Development of China Textile Association.

This standard shall be under the jurisdiction of the Standardization Research Institute of China Textile Association.

Standardization Research Institute of China Textile Association AND Shanghai Textile Standard Measurement Institute are responsible for drafting this standard.

Chief drafting staffs of this standard: Zheng Yuying, He Jieren.

This standard was established in 1988 and revised in 1995.

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