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METHOD FOR ANALYSIS OF DIMENSIONAL CHANGE OF KNITTED PRODUCTS AFTER WASHING

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ABSTRACT

This article is in accordance with ISO 3005, ISO 7771, ISO 3759, testing for dimensional change after washing, dry cleaning, soaking and steaming. It also includes learning how to make, mark and measure textiles and clothing.
The method used in this article is described as applicable to fabrics, knitted fabrics and finished textiles.

KEYWORDS

ISO 3005, ISO 7771, ISO 3759, ISO 139, knitted, measuring, dimensions

Introduction

Selection of samples for testing.

For fabrics and knitted fabrics, representative samples are selected. Samples are cut from parts of fabric and linen spaced more than 1 m from the end of the roll. Tissue samples are taken from areas with different longitudinal and transverse threads. Before cutting the sample from the web, the longitudinal direction is identified.

Knitted fabric made on circular knitting machines, tubular knitted samples are tested in a flat form, for which the coupons are cut lengthwise and laid flat in one layer.

Solid knitwear, seamless knitwear and knitwear for finishing fabrics are tested as clothing.

Measuring instruments.

The ruler, flexible steel ruler or fiberglass tape must be graduated in millimeters and its length must be greater than the maximum dimension to be measured.

The accuracy of the fiberglass tape should be checked at least every 6 months.

- Tools for applying precise control marks:

a) indelible paint, used if necessary with a grid template;
b) thin threads of contrasting colors in relation to the color of the fabric;
c) hot wire for making small holes in thermoplastic materials;
d) brackets suitable for tests during which the specimens are not shaken, e.g.
for soaking in water;

- a smooth flat surface with dimensions allowing the finished products to be laid out in a straightened state;
- working racks for finished clothes.

Atmospheric conditions for conditioning and testing

Atmospheric conditions for conditioning and testing shall comply with those given in ISO 139.
Selection of samples for testing.
For fabrics and knitted fabrics, representative samples are selected. Samples are cut from parts of fabric and linen spaced more than 1 m from the end of the roll. Tissue samples are taken from areas with different longitudinal and transverse threads. Before cutting the sample from the web, the longitudinal direction is identified.
Knitted fabric made on circular knitting machines, tubular knitted samples are tested in a flat form, for which the coupons are cut lengthwise and laid flat in one layer.
Solid knitwear, seamless knitwear and knitwear for finishing fabrics are tested as clothing.
Dimensions
Cut samples of at least 500x500 mm in size, with edges parallel to the length and width of the fabric/canvas. For fabrics/canvases less than 650 mm, the full width of the sample is used and measurements are taken as agreed between the parties concerned. ISO 22198 is used for measuring the length and width of large fabrics and fabrics.
If the fabric may unravel during testing, the edges of the sample are overcast using a non-shrink thread.
Conditioning
The sample is maintained under preconditioning conditions (Section 5) for at least four hours or until constant weight is achieved.
NOTE Constant mass is achieved when measurements taken at one hour intervals do not show a change in mass of more than 0.25%.
Method of measurement
The sample is laid out in a straightened form on a smooth flat surface and the folds are straightened without stretching the sample. A ruler is placed on the sample, being careful not to deform it. Measure the distances between marks with an accuracy of 1 mm.

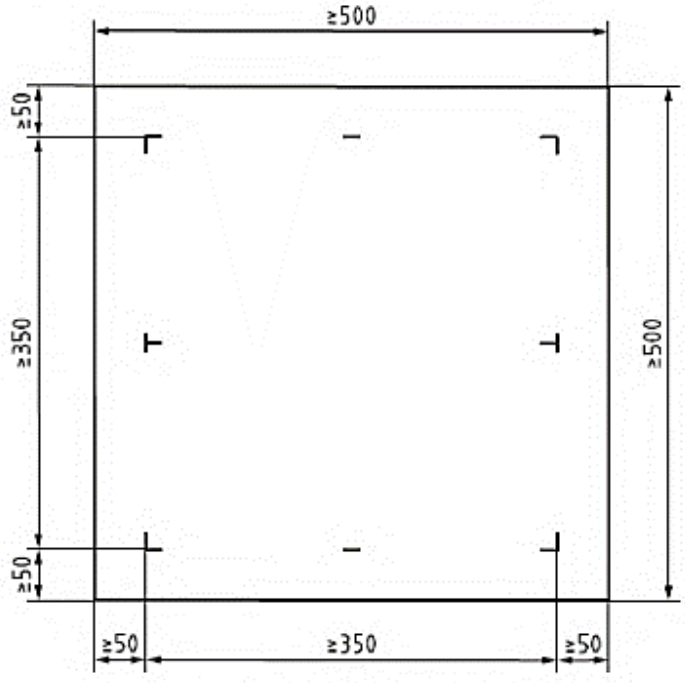

Figure 1 - Marking of fabric/canvas sample

Measuring locations

Shoulder garments (including dresses, coats, pajamas, blouses and vests)

The measurement locations should be as follows:

a) the length of the collar for clothes with a buttoned collar;

b) length from the bottom of the armhole to the bottom edge of the garment;

c) the length of the front from the junction of the shoulder seam and neckline to the bottom of the product;

d) back length from the middle of the collar to be sewn in to the bottom of the product;

e) the length of the bottom seam of the sleeve from the armhole to the bottom of the sleeve;

f) the width of the back between the sleeve seams, measured at a distance equal to half the length of the armhole, or the width of the yoke between the sleeve seams;

e) the width of the product (for example, half the girth size) in at least three places at approximately equidistant points below the center of the sprout line;

h) sleeve width under the armhole;

i) the width of the sleeve at the bottom edge of the cuff or the bottom edge of the sleeve;

Trouser type products

The measurement locations should be as follows:

a) the length of the front seam from the waistband seam to the crotch seam;

b) the length of the middle seam from the back seam of the waistband to the crotch seam;

c) the length of the crotch from the middle seam to the bottom of the trousers; if the leg is short, measure from the bottom of one leg to the bottom of the other leg through the middle seam;

d) width at the waist;

f) the width of the trousers at the bottom;

f) the width of the trousers in the middle between the middle seam and the bottom of the trouser leg, those at knee level (for short trousers this measurement can be omitted);

e) the width of the trousers at hip level.

Work suits, overalls, bib aprons, corsets, slips and one-piece swimsuits

Combine the categories of shoulder garments and trouser garments and, where appropriate, replace the measurement locations presented as follows:

- replace c) with “the length from the middle of the neck to the middle seam or end of the gusset or fastener”;
- replace d) with “the length from the middle of the sprout line to the crotch.”

Skirts.

The measurement locations should be as follows:

a) the length from the waist to the bottom of the product, excluding the belt, if any, from the middle of the front and the middle of the back;

b) belt width;

c) width at not less than three points, equidistant from each other, located below the top edge of the skirt or below the top edge of the belt, if any.

Method for measuring finished textile products

Follow the described procedure using the following measuring locations:

a) total length;

b) overall width.

Registration of measurement results

The percentage change in size is calculated using the following formula

$$\frac{x_t - x_0}{x_0} * 100 \quad (1)$$

x 0 - initial size, mm;

x t - size measured after processing, mm.

Record changes in dimensions separately as a percentage of the corresponding original value. A plus sign (+) is used to show an increase in size, and a minus sign (-) is used to show a decrease in size.

Test report

The test report must contain the following information:

a) reference to ISO 3759 standard;

b) description, brand and size of the products being tested;

c) description of each measurement location;

d) description of the procedures used;

e) The results are given according to formula 1.

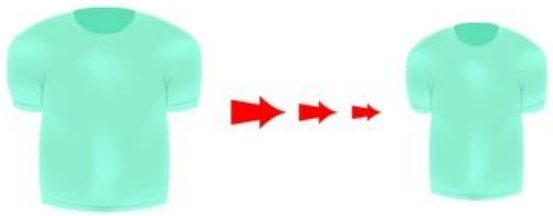

Fig.2. Changes in the dimensions of fabrics after washing

Table.1. Changes in size after washing fabrics of different composition.

Sample no.	Length of fabrics before washing (mm).		Length of fabrics after washing (mm).		% change in size.	
	Width	Height	Width	Height	Width	Height
1	510	350	500	338	-1.96%	-3.43%
2	510	350	540	365	5.88%	4.29%
3	510	350	490	320	-3.92%	-8.57%
4	510	350	500	325	-1.96%	-7.14%
5	510	350	543	376	6.47%	7.43%

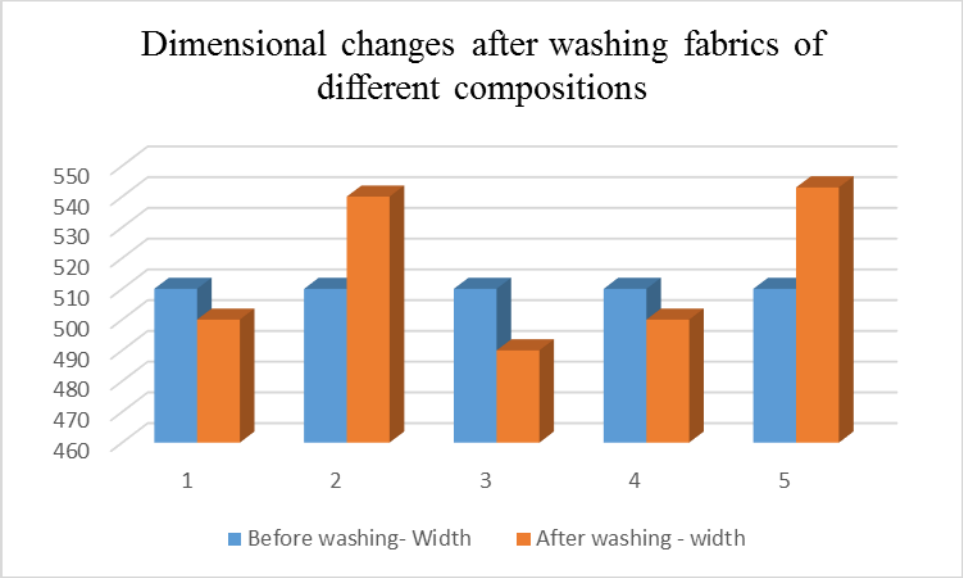

Fig.3. Changes in size after washing fabrics of different composition - by width

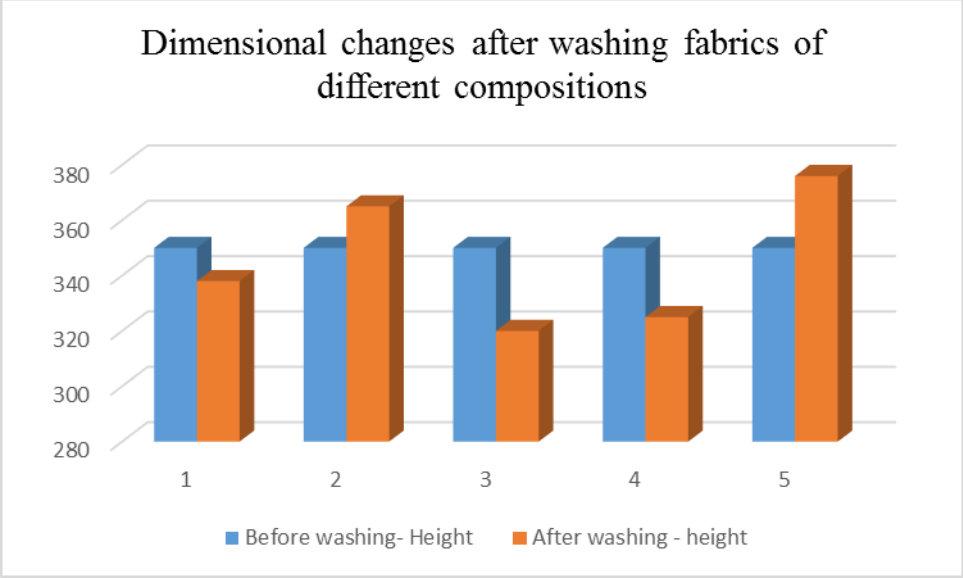

Fig. 4. Changes in size after washing fabrics of different compositions - by length

Record changes in dimensions separately as a percentage of the corresponding original value. A plus sign (+) is used to show an increase in size, and a minus sign (-) is used to show a decrease in size.

Test report

The test report must contain the following information:

a) reference to ISO 3759 standard;

b) description, brand and size of the products being tested;

c) description of each measurement location;

d) description of the procedures used;

e) The results are given according to formula 1.

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