INTERNATIONAL STANDARD

ISO 16322-2

First edition
2005-06-01

Textiles — Determination of spirality after laundering —

Part 2: Woven and knitted fabrics

Textiles — Détermination du vrillage après lavage —

Partie 2: Étoffes tissées et tricotées

Reference number
ISO 16322-2:2005(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16322-2 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 2, *Cleansing, finishing and water resistance tests*.

ISO 16322 consists of the following parts, under the general title *Textiles — Determination of spirality after laundering*:

— *Part 1: Percentage of wale spirality change in knitted garments*

— *Part 2: Woven and knitted fabrics*

— *Part 3: Woven and knitted garments*

Textiles — Determination of spirality after laundering —

Part 2:
Woven and knitted fabrics

1 Scope

This part of ISO 16322 specifies three procedures (diagonal marking, inverted-T marking and mock-garment marking) to measure the spirality or torque of woven and knitted fabrics after laundering.

The results obtained from different procedures may not be comparable.

This part of ISO 16322 is not intended to measure the spirality of fabrics as manufactured, but rather the spirality after laundering.

NOTE Some fabric constructions, such as denim, can have spirality intentionally introduced during manufacturing. Fabrics made on circular knitting machines can have inherent nonverticality of wale alignment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 6330, *Textiles — Domestic washing and drying procedures for textile testing*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
spirality
torque
⟨in textiles⟩ fabric condition, wherein filling yarns or knitted courses are angularly displaced from a line perpendicular to the edge or side of a fabric or garment

4 Principle

Test specimens are cut, prepared, marked, and laundered according to specified procedures. Spirality is measured in millimetres, percentage of a marked distance, or angle of nonverticality.

5 Apparatus

5.1 Automatic washing machine, as described in ISO 6330, the type agreed upon between parties.

5.2 Automatic drying machine, as described in ISO 6330, and agreed upon between parties.

5.3 Calibrated ruler, at least 500 mm in length, with 1 mm graduated marks.

5.4 Conditioning rack.

5.5 Sewing machine.

5.6 Inverted T-square, at least 500 mm in length.

5.7 Marking template, of dimensions (380 × 380) mm, (530 × 510) mm or (680 × 380) mm.

6 Conditioning

Condition the fabric or garments in the standard atmosphere for testing in accordance with ISO 139, for a minimum of 4 h before cutting, sewing or measuring the fabric specimens.

7 Test specimen preparation and marking procedures

7.1 Procedure A — Diagonal marking

7.1.1 Test specimen preparation

Prepare three specimens for marking from appropriate locations across a fabric sample. Cut three 380 mm × 380 mm single-layer fabric specimens aligned with the selvedge or tubular fold line in selected locations with different length and width yarns.

7.1.2 Diagonal marking procedure

Mark two pairs of 250 mm benchmark sets parallel to the length, and two pairs of 250 mm benchmark sets perpendicular to the width, to make a square.

Draw a line through each of the four sets of adjacent benchmarks to denote the square formed.

Label the corners A, B, C and D in a clockwise direction starting at the lower left corner (see Figure 1).

7.2 Procedure B — Inverted-T marking

7.2.1 Test specimen preparation

This marking procedure is particularly suited to narrow-width fabrics.

Cut three 680 mm × 380 mm specimens with the long dimensions aligned with the selvedge, or folded edge if the samples are a tubular knit.

7.2.2 Inverted-T marking

Draw a line, YZ, across the width of the specimen 75 mm above the edge of the specimen.

Place benchmark A perpendicular to the YZ line midway along the horizontal line.

Using a T-square device, mark point B 500 mm above point A on the vertical line (see Figure 4).

7.3 Procedure C — Mock-garment marking

7.3.1 Test specimen preparation

Fold the fabric with the selvedge edges together.

Place a 580 mm × 510 mm template on the fabric with the long direction parallel to the selvedge.

Cut a double thickness.

NOTE The underlayer may not be aligned with a warp or wale line nor will the 510 mm dimension necessarily be aligned with weft or course lines. However, pattern pieces for apparel assembly are typically aligned with selvedges rather than with warp or wale yarn lines.

7.3.2 Mock-garment marking

Place face sides together so that the two 580 mm long edges are even, as well as the shorter 510 mm edges.

Sew a 12 mm over-edged seam along each long direction and one short direction. Turn seams to the inside, forming an open-ended bag or pillowcase-type specimen to simulate a garment panel.

Stitch the unsewn edges of specimen to make a hemmed edge.

Measure and record distances along the seamed edges, lines AB and CD, of each specimen (see Figure 6).

8 Laundering

8.1 Laundering conditions

Select laundering conditions, according to ISO 6330, that correspond to those to which the item will be exposed, or to those intended to be on the care label of garments made from the fabric.

8.2 Laundering cycles

Perform the selected number of laundering cycles agreed upon between the parties concerned.

8.3 Conditioning

After the final laundering cycle, condition specimens according to ISO 139.

9 Assessment

9.1 General

Lay the specimens on a flat smooth surface and remove any major creases.

9.2 Assessment by procedure

9.2.1 Procedure A — Diagonal marking

9.2.1.1 Normal assessment

After laundering, measure and record distances AC and BD in millimetres (see Figure 2).

Calculate the percentage spirality (X) for each specimen to the nearest 0,1 % as follows:

$$X = 100\left[2\frac{(\mathrm{AC}-\mathrm{BD})}{(\mathrm{AC}+\mathrm{BD})}\right]$$

where

AC is the diagonal distance across the specimen from point A to point C;

BD is the diagonal distance across the specimen from point B to point D.

Calculate and report the mean percentage spirality for the specimens tested.

NOTE This formula assumes that the angle between the two diagonals remains a right angle after laundering. In reality, due to shrinkage during laundering, this angle does not remain a right angle. Hence, the spirality results obtained by this equation are an approximation of the actual spirality.

9.2.1.2 Alternative assessment option

An alternative assessment option is to extend line AD in each direction across the width of the specimen (see Figure 1).

Place the horizontal leg of a right-angle device along line AD so that the second leg is perpendicular downward from point B.

Draw benchmarks A′ and D' to intersect line AD (see Figure 3).

Measure and record the length of lines AA′, DD′, AB, and CD to the nearest millimetre.

Calculate the percentage spirality (X) to 0,1 % for each specimen as follows:

$$X = 100\frac{(\mathrm{AA}'+\mathrm{DD}')}{(\mathrm{AB}+\mathrm{CD})}$$

Calculate and report the mean percentage spirality for the specimens tested.

The mean distance of AA′ or DD′ to the nearest millimetre may also be reported as the spirality distance, if desired.

9.2.2 Procedure B — Inverted-T marking

After laundering, place the horizontal leg of a right angle device along line YZ and the second leg on a perpendicular downward from point B. Place a benchmark on line YZ that corresponds to point A’ in Figure 5.

Measure and record the length of lines AA′ and AB to the nearest millimetre.

Calculate the percentage spirality (X) to 0,1 % for each specimen as follows:

$$X = 100\left(\frac{\mathrm{AA}'}{\mathrm{AB}}\right)$$

Calculate and report the mean percentage spirality for the specimens tested. The mean distance of AA′ to the nearest millimetre may also be reported as the spirality distance, if desired.

9.2.3 Procedure C — Mock-garment marking

After laundering, measure and record the distances of lines AA′, DD′, AB and CD of the specimen to the nearest millimetre (see Figure 7).

Calculate the mean percentage spirality (X) to the nearest 0,1 % for each specimen as follows:

$$X = 100\frac{(AA' + DD')}{(AB + CD)}$$

Calculate and report the mean percentage spirality for the specimens tested.

The mean distance of AA′ or DD′ to the nearest millimetre may also be reported as the spirality distance, if desired.

10 Test report

The test report shall contain the following:

a) reference to this part of ISO 16322, i.e. ISO 16322-2:2005;

b) details of sample tested;

c) mean percentage spirality, or spirality distance (millimetres);

d) marking procedure used;

e) laundering procedure and type washer used;

f) number of laundering cycles.

Dimensions in millimetres

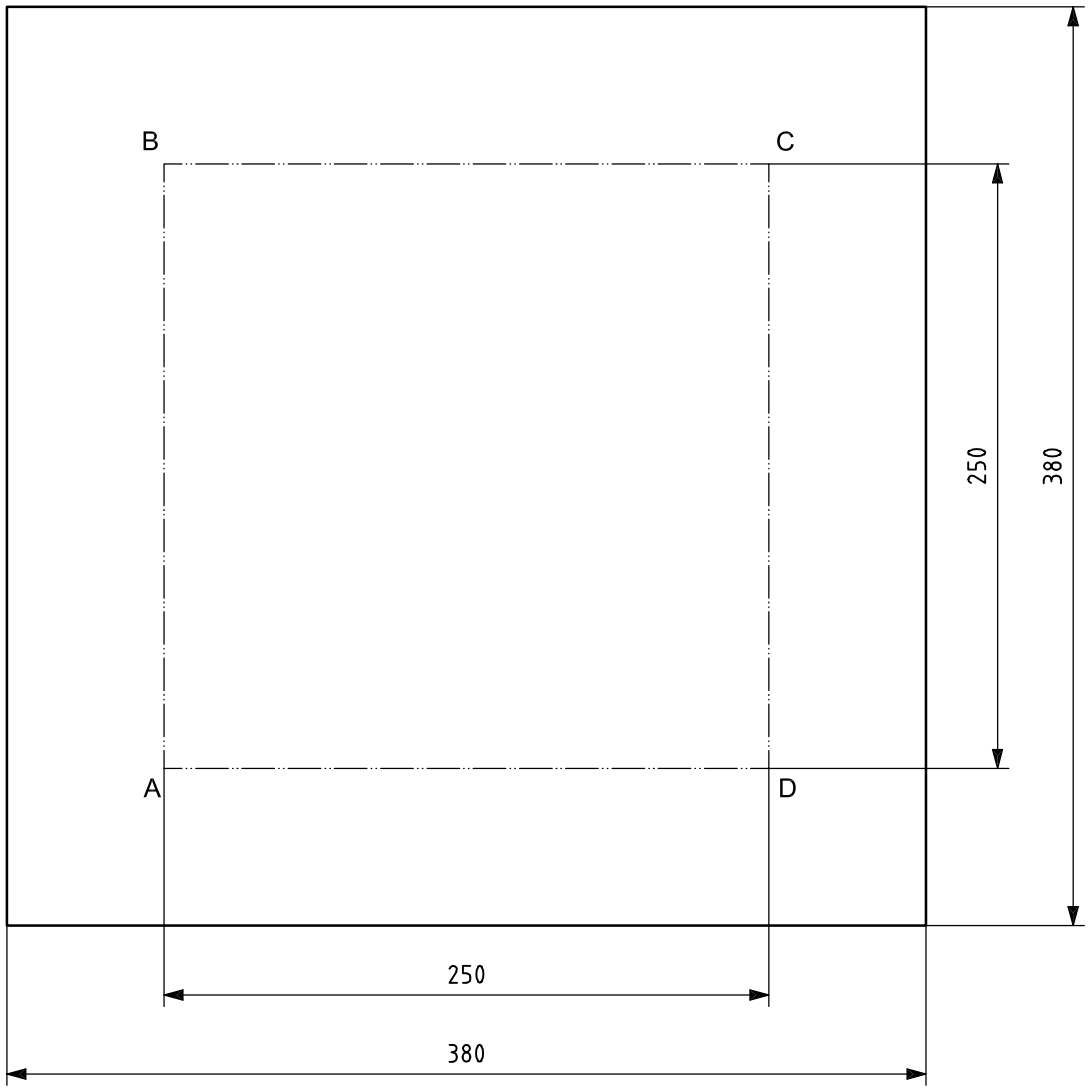
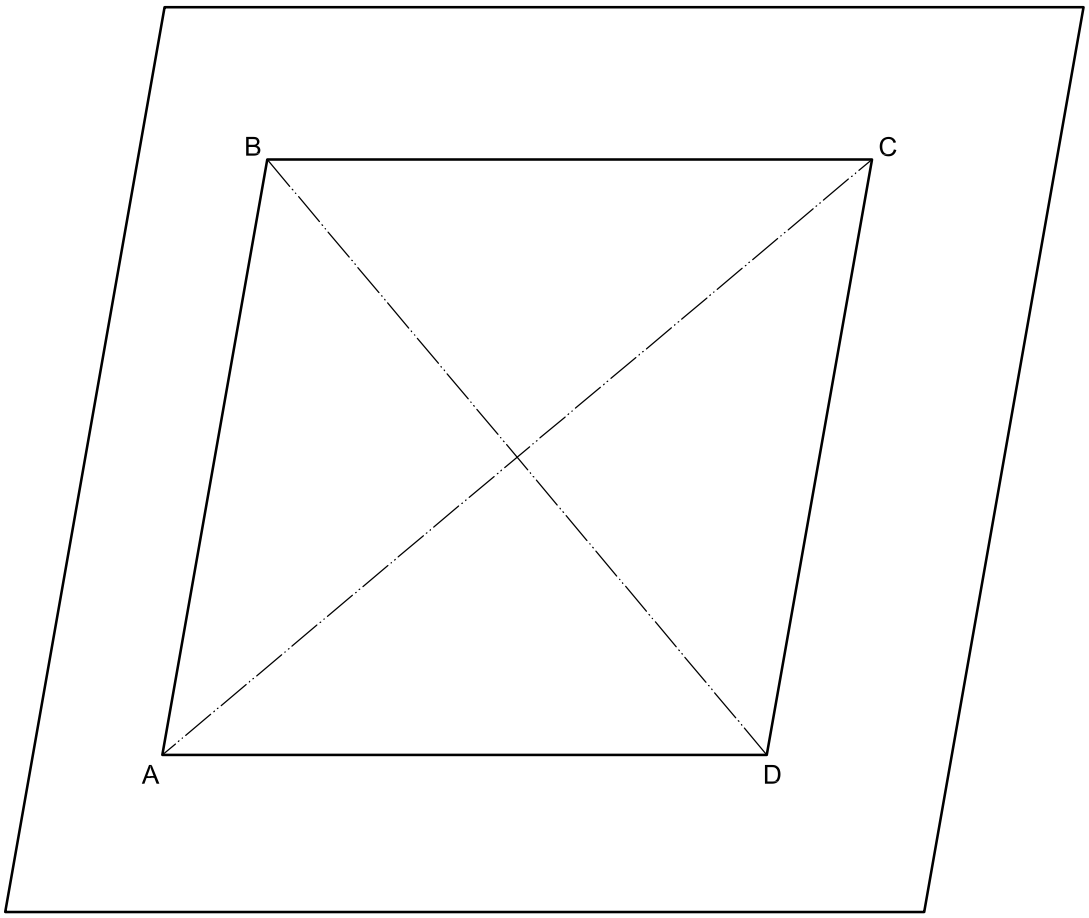
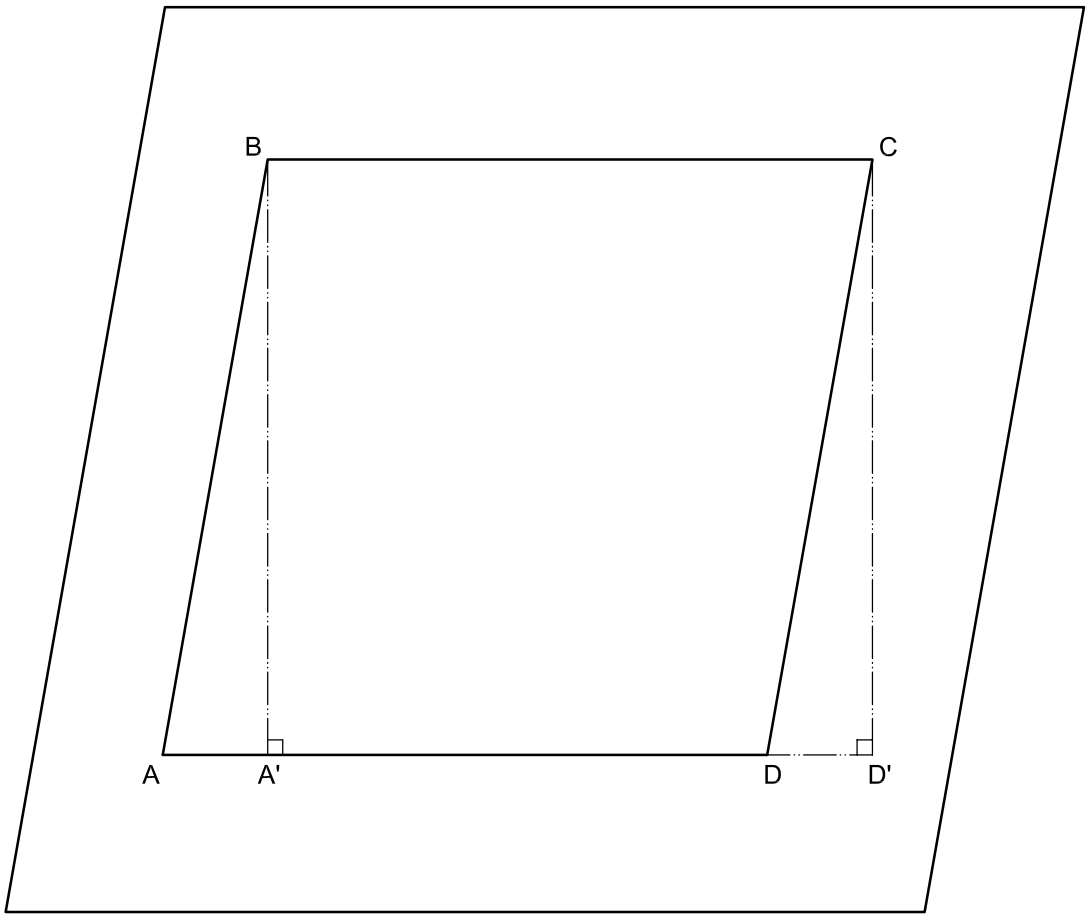


Figure 1 — Fabric specimen with diagonal marking before laundering



NOTE The spirality direction in the figure is for illustration only. Spirality can be in either direction.

Figure 2 — Fabric specimen with diagonal marking after laundering



NOTE The spirality direction in the figure is for illustration only. Spirality can be in either direction.

Figure 3 — Fabric specimen with diagonal marking after laundering, optional procedure

Dimensions in millimetres

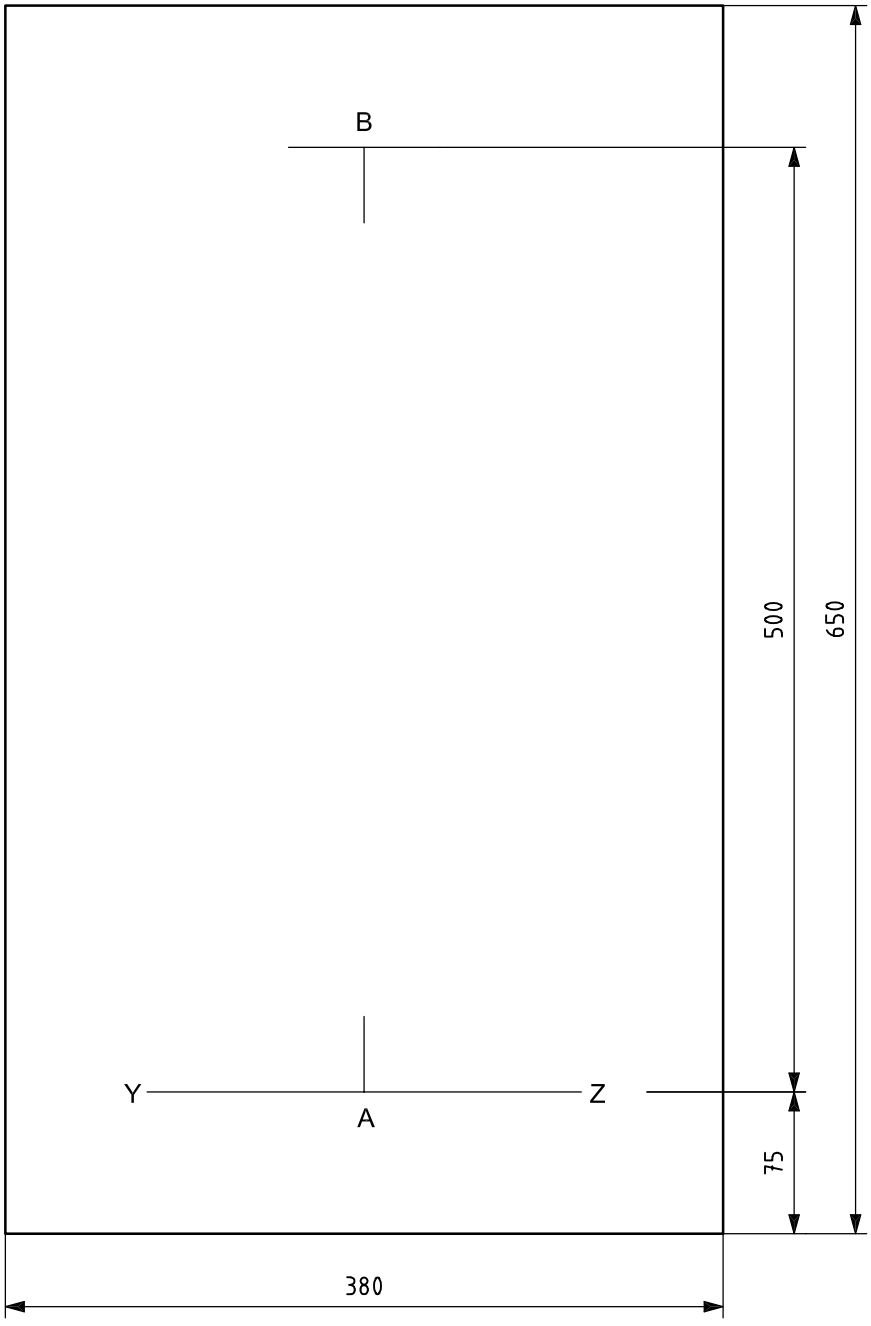


Figure 4 — Fabric specimen with inverted-T marking before laundering

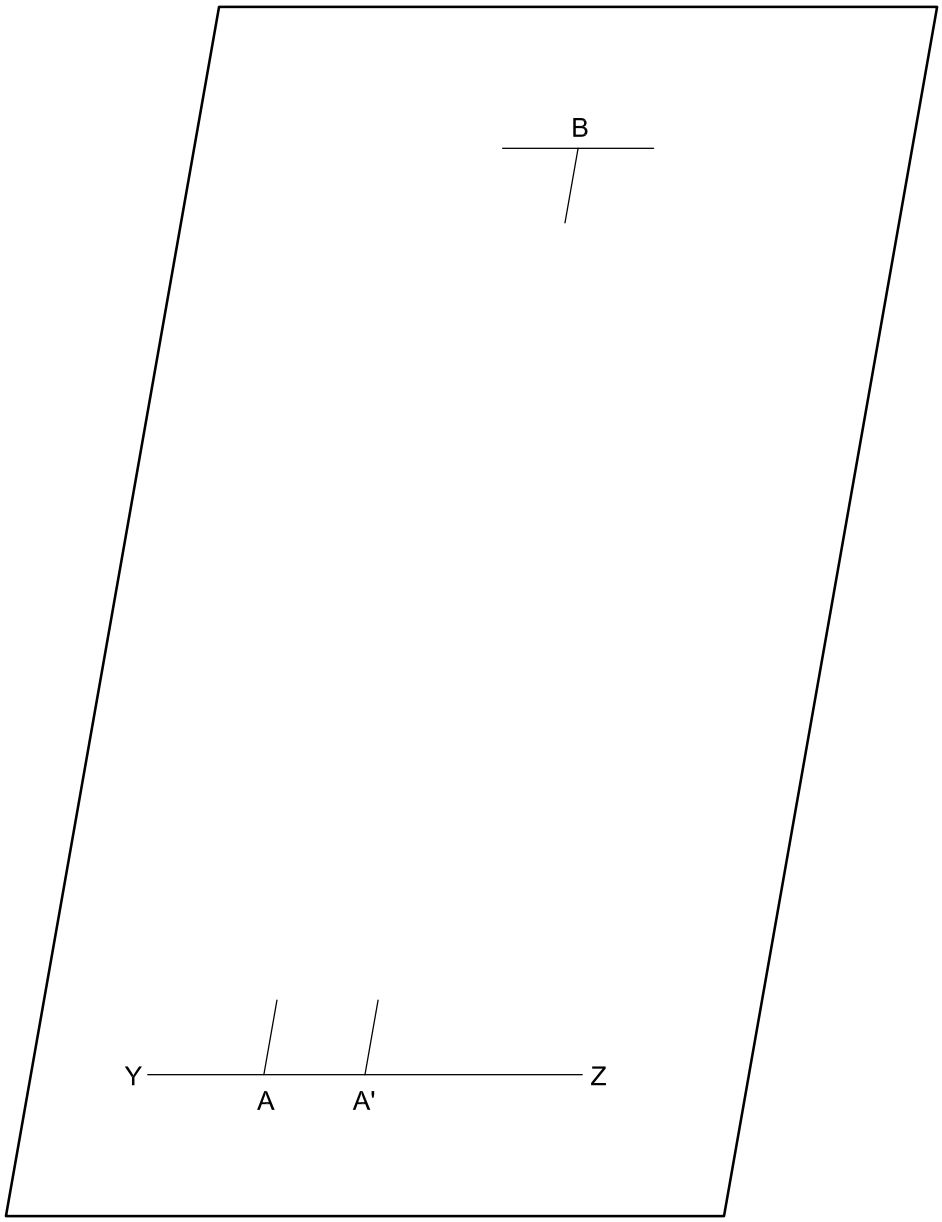
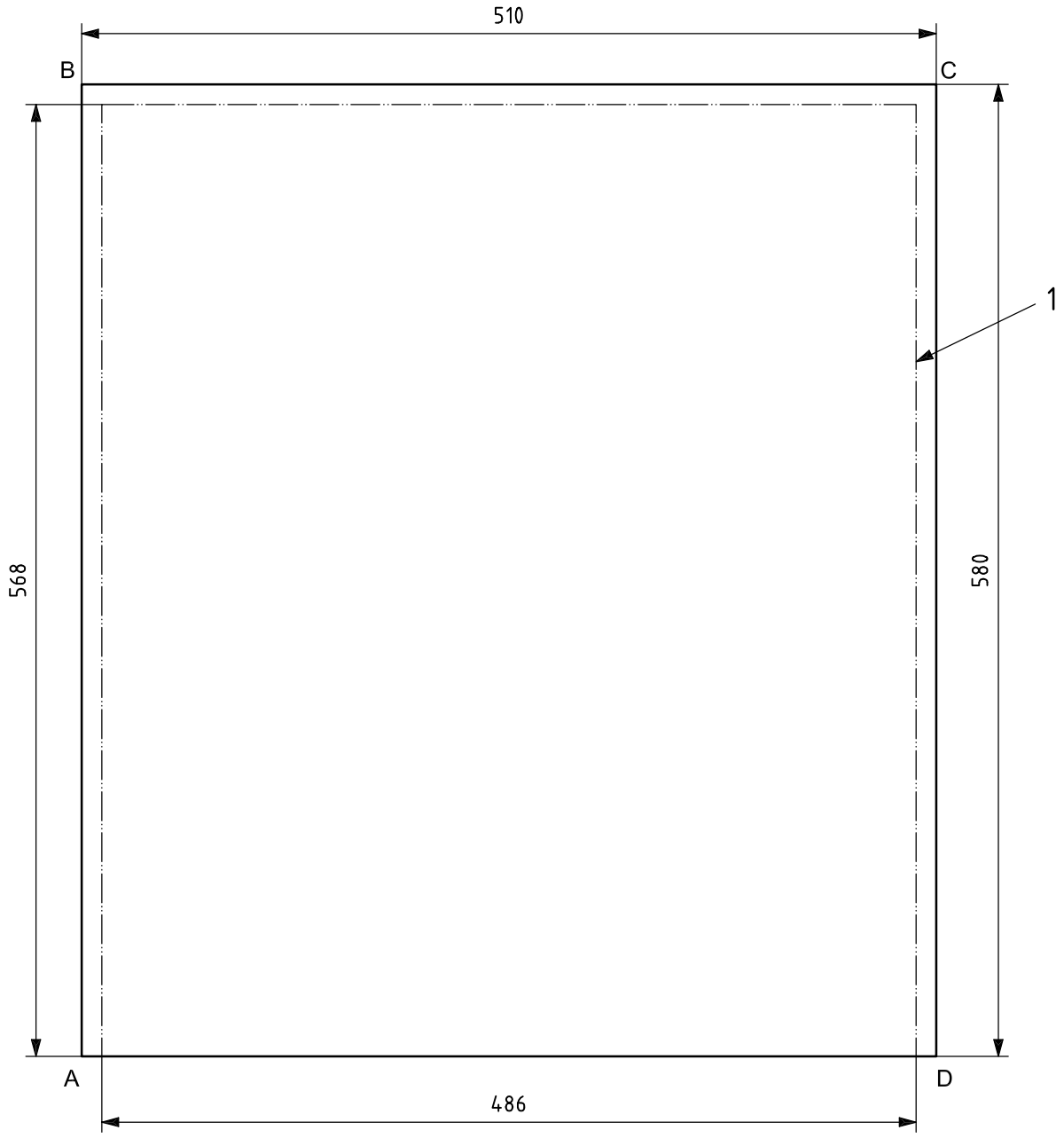


Figure 5 — Fabric specimen with inverted-T marking after laundering

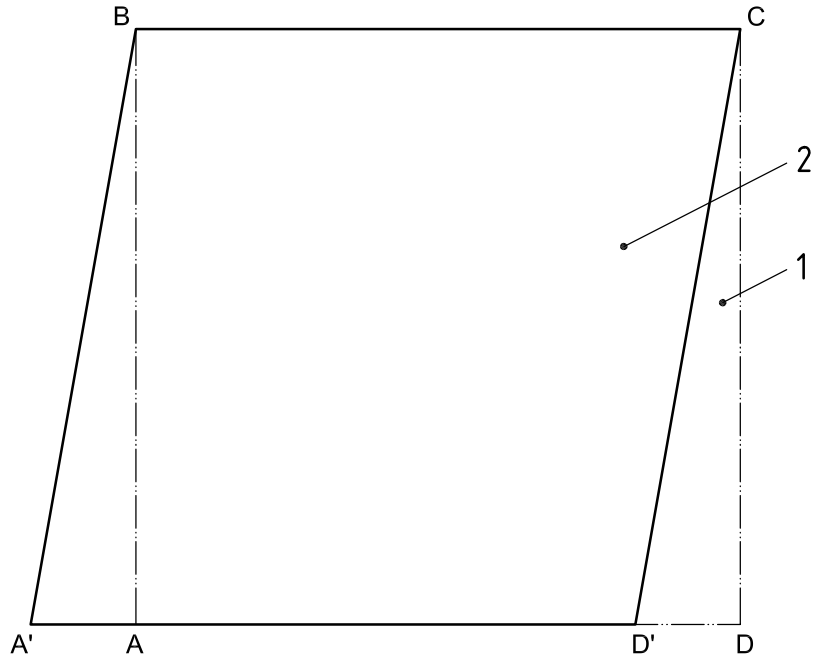
Dimensions in millimetres



Key

1 over-edged seam line

Figure 6 — Fabric mock garment before laundering



Key

1 original specimen

2 fabric after laundering

NOTE The spirality direction in the figure is for illustration only. Spirality can be in either direction.

Figure 7 — Fabric mock garment after laundering

Bibliography

[1] AATCC Test Method 179 — *Skewness Change in Fabric and Garment Twist Resulting from Automatic Home Laundering*

ICS 59.080.01

Price based on 13 pages