INTERNATIONAL STANDARD ISO 2313

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Textile fabrics — Determination of the recovery from creasing of a horizontally folded specimen by measuring the angle of recovery

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 2313 was drawn up by Technical Committee ISO/TC 38, *Textiles*.

It was approved in October 1971 by the Member Bodies of the following countries :

Australia	India	Romania
Belgium	Iran	South Africa, Rep. of
Brazil	Ireland	Spain
Canada	Japan	Sweden
Denmark	Netherlands	Thailand
Egypt, Arab Rep. of	New Zealand	Turkey
Finland	Norway	United Kingdom
Germany	Poland	U.S.A.
Hungary	Portugal	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

France
Switzerland

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0 INTRODUCTION

Creases in textile fabrics diminish at varying rates on the removal of the creasing forces. The magnitude of the crease recovery angle is an indication of the ability of a fabric to recover from accidental creasing.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining the angle of recovery of fabrics from creasing. The results obtained by this method for textile fabrics of very different kinds cannot be compared directly.

Attention is drawn to the fact that for some types of fabrics, the limpness, thickness and tendency to curl of the specimen may give rise to very ill-defined crease recovery angles, and therefore an unacceptable lack of precision in making measurements. Many wool and wool mixture fabrics come under this heading.

2 REFERENCE

ISO/R 139, *Standard atmospheres for conditioning and testing textiles.*

3 DEFINITION

crease recovery angle : The angle formed between the two limbs of a strip of fabric previously folded under prescribed conditions, at a specified time after removal of the creasing load.

4 PRINCIPLE

A rectangular specimen of prescribed dimensions is folded by means of a suitable device and maintained in this state for a specified short time under a specified load. This creasing load is removed, the specimen allowed to recover for a specified time, and the crease recovery angle then measured.

5 APPARATUS

5.1 Apparatus for loading the specimen (press)

This apparatus consists of the following parts :

a) A press to apply a total load of 10 N[1] on an area of 15 mm × 15 mm of the folded specimen.

It shall be possible to complete the removal of the load within a period of less than 1 s.

b) Two flat pressure plates which remain parallel to one another throughout the period of the application of the load to the specimen. On the lower plate an area of 15 mm × 20 mm shall be marked or other provisions made to facilitate correct placement of the specimen.

An example of a loading apparatus is shown in Figure 1.

5.2 Instrument for measuring the crease recovery angle

The instrument consists of the following parts :

a) A circular scale divided in degrees and correct to $\pm 0.5^\circ$. It shall be possible to read the angle correct to the nearest degree without parallax error.

b) A specimen grip to hold the specimen in such a manner that the fold lies in a horizontal line through the centre of the circular scale. The edge of the grip shall lie 2 mm from the centre of the scale, as shown in Figure 2.

The specimen grip shall be rotatable about this axis to keep the free limb of the specimen in a vertical position.

A suitable device is shown in Figure 2.

5.3 Auxiliary devices

5.3.1 Stop-watch.

5.3.2 Tweezers with broad, spade shaped jaws.

1) Weight of a body of mass 1.019 kg is approximately equal to a force of 10 N.

5.3.3 Paper or **metal foil** not thicker than 0.02 mm.

6 SAMPLING

Cut the samples so as to be as representative as possible of the whole delivery. Pending the publication of an International Standard for sampling, take samples in accordance with the national standards or established rules.

Newly finished fabrics and fabrics that have been subject to washing, dry cleaning or pressing treatments may show a gradual improvement in crease recovery. Store samples from such fabrics for at least 6 days under room conditions before specimens are taken.

The creasing propensity for cellulosic and protein fibre materials varies with time over a much longer period than 6 days, and to cancel any ageing effects, soak these fabrics in water at 20 °C for 30 min, centrifuge and steam press while still damp before conditioning as in 7.4.

7 TEST SPECIMENS

7.1 Selection

In order to ensure a representative average for the fabric to be tested, take specimens in the manner shown in Figure 3, and ensuring that specimens are taken not less than 50 mm from the selvedges. Do not take specimens from creased, wrinkled, bent, or deformed parts. Mark the length, for example (warp) direction on the face side of the fabric.

7.2 Dimensions

Cut rectangular specimens each 40 mm long and 15 mm wide.

7.3 Number

Unless otherwise agreed by the parties interested in the test results, prepare not fewer than 20 specimens for each test, half of them taken with their short sides parallel to the warp (woven fabric) or wales (knitted fabric) or the direction marked "length" (non-woven fabric) and the other half with their short sides parallel to the weft (woven fabric) or courses (knitted fabric) or at right angles to the length direction (non-woven fabric).

7.4 Conditioning

a) Condition the specimens for at least 24 h in one of the standard atmospheres for testing textiles according to ISO/R 139, (20 ± 2 °C and 65 ± 2 % relative humidity, or 27 ± 2 °C and 65 ± 2 % relative humidity) ensuring exposure of all surfaces to the air, for instance by placing the specimens on wire-gauze or mesh. Take suitable steps to ensure that equilibrium is approached from the dry side, but in no circumstances expose the specimens to a temperature above 50 °C. After the specimens have been conditioned, handle them solely with tweezers or rubber fingerstalls. Strict observance of all test conditions in respect of preparation and handling of specimens is essential if reliable values of crease recovery angle are to be obtained.

b) For high humidity determinations, condition the specimens for at least 24 h at a temperature of 35 ± 2 °C and 90 ± 2 % relative humidity.

8 PROCEDURE

8.1 General conditions

Conduct all testing in the test atmosphere chosen (see 7.4a and 7.4b). Screen the testing equipment from draughts, from the operator's breath and from excessive heat radiation from lighting appliances.

8.2 Loading

Fold the specimen end to end and hold in this position by tweezers, gripping no more than 5 mm from the ends. Where the surfaces of the specimens show any tendency to adhere, place a sheet of paper or metal foil 18 mm × 15 mm between the limbs of the specimen (see Figure 4). Then place the specimen on the marked area of the lower plate of the loading device, and apply the load gently, without delay.

Fold half the number of test specimens face to face, the other half back to back. Load the specimens for 5 min ± 5 s. Thereafter remove the load quickly but smoothly so that the specimen does not suddenly spring open, completing the removal in less than 1 s. By means of tweezers, transfer the specimen directly to the specimen holder of the measuring instrument. To make the transfer, hold in the flat of the forceps that arm of the specimen which is to hang down and gently introduce the other arm between the two parts of the grip as far as – but no farther than – the back stop, taking care not to disturb the existing crease formation.

8.3 Measurement of the crease recovery angle

While the specimen is in the holder, adjust the instrument continuously to keep the suspended free limb always in a vertical position.

Read the crease recovery angle 5 min after the removal of the load and the paper or metal foil from the folded specimen.

If the free limb twists or curls slightly, use a vertical plane through its centre and the axis of the circular scale to serve as a basis for reading the crease recovery angle.

9 EXPRESSION OF RESULTS

Calculate the mean value, to the nearest degree, for the following :

1) crease across length (for example, warp) direction

   a) face to face,

   b) back to back;

2) crease across transverse (for example, weft) direction

   a) face to face,

   b) back to back.

10 TEST REPORT

The test report shall include the following particulars :

a) reference to this International Standard;

b) simple designation of the tested cloth;

c) whether a standard or high humidity atmosphere was used;

d) date of beginning of pre-conditioning and conditioning, and duration of exposure of the specimens to the standard atmosphere for testing textiles;

e) date of test;

f) number of specimens evaluated;

g) mean values calculated in accordance with section 9 for face and back of the sample, to the nearest degree in both longitudinal and transverse directions;

h) standard deviation and confidence interval, if required.

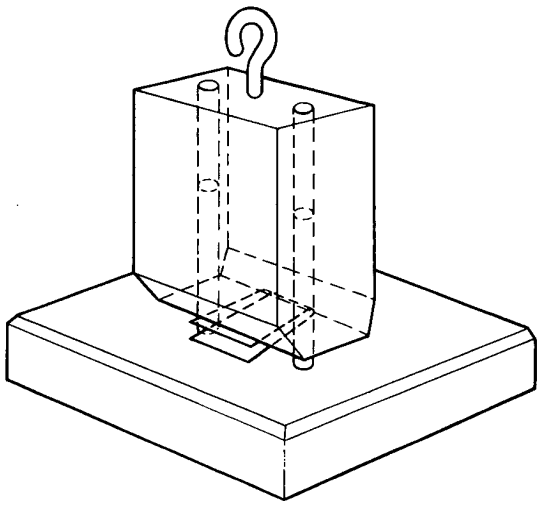

FIGURE 1 — **Apparatus with vertical guides for loading the specimen**

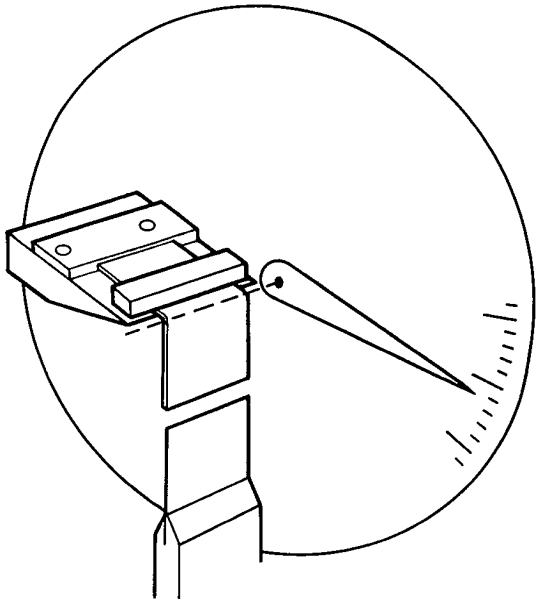

FIGURE 2 — **Instrument for measuring the crease recovery angle**

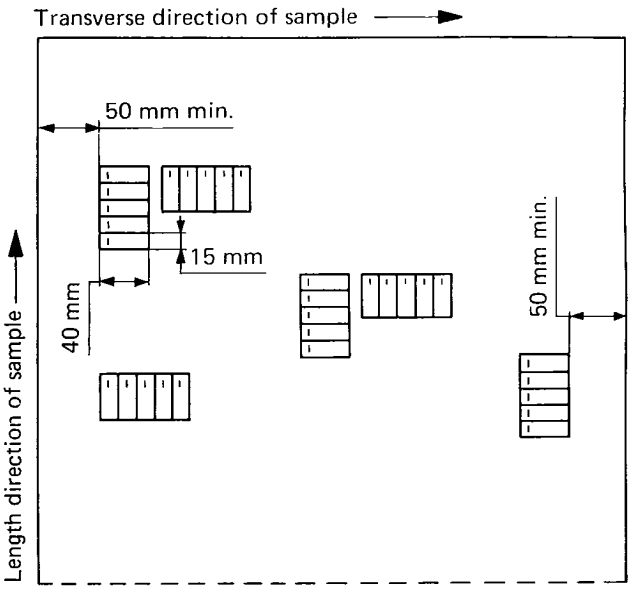

FIGURE 3 — **Example for taking 30 specimens and marking length direction**

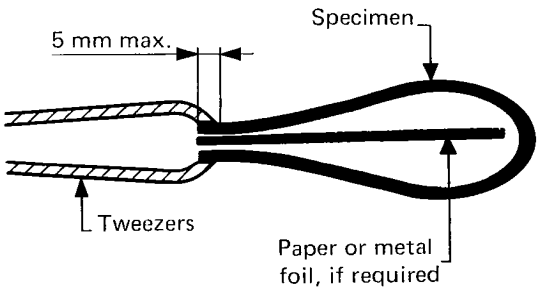

FIGURE 4 — **Folding of specimen**