INTERNATIONAL STANDARD

ISO 105-X11

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Textiles — Tests for colour fastness —

Part X11:
Colour fastness to hot pressing

Textiles — Essais de solidité des teintures —
Partie X11: Solidité des teintures au repassage à chaud

Reference number
ISO 105-X11:1994(E)

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.

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.

International Standard ISO 105-X11 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 1, *Tests for coloured textiles and colorants*.

This fourth edition cancels and replaces the third edition (ISO 105-X11:1987), of which it constitutes a minor revision.

ISO 105 was previously published in thirteen "parts", each designated by a letter (e.g. "Part A"), with publication dates between 1978 and 1985. Each part contained a series of "sections", each designated by the respective part letter and by a two-digit serial number (e.g. "Section A01"). These sections are now being republished as separate documents, themselves designated "parts" but retaining their earlier alphanumeric designations. A complete list of these parts is given in ISO 105-A01.

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Textiles — Tests for colour fastness —

Part X11:
Colour fastness to hot pressing

1 Scope

1.1 This part of ISO specifies a method for determining the resistance of the colour of textiles of all kinds and in all forms to ironing and to processing on hot cylinders.

1.2 Tests are given for hot pressing when the textile is dry, when it is damp and when it is wet. The end-use of the textile usually determines which test should be made.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 105. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 105 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 105-A01:1994, *Textiles — Tests for colour fastness — Part A01: General principles of testing.*

ISO 105-A02:1993, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour.*

ISO 105-A03:1993, *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining.*

ISO 105-F:1985, *Textiles — Tests for colour fastness — Part F: Standard adjacent fabrics.*

ISO 139:1973, *Textiles — Standard atmospheres for conditioning and testing.*

3 Principle

3.1 Dry pressing

A dry specimen is pressed with a heating device at a specified temperature and pressure for a specified time.

3.2 Damp pressing

A dry specimen is covered with a wet cotton adjacent fabric and pressed with a heating device at a specified temperature and pressure for a specified time.

3.3 Wet pressing

The upper surface of a wet specimen is covered with a wet cotton adjacent fabric and pressed with a heating device at a specified temperature and pressure for a specified time.

3.4 Assessment

The change in colour of the specimen and the staining of the adjacent fabric are assessed by comparison with the grey scales immediately and again after a period of exposure to air in accordance with ISO 105-A01:1994, clause 10.

4 Apparatus

4.1 Heating device, consisting of a pair of smooth parallel plates, equipped with an accurately controllable electrical heating system and giving a pressure on the specimen of 4 kPa ± 1 kPa.

4.1.1 In order to obtain the required pressure (4 kPa ± 1 kPa) the total area of the wool flannel padding (4.3) should bear a suitable relationship to the mass of the plate pressing down on the padding. If the fabric to be tested has an appreciable thickness, it will be necessary either to increase the area of the test specimen or to augment the pressure-bearing surface using a suitable template made from the same material as the test specimen. If the plates of the heating device are smaller than the specimen, the pressure (ratio of weight of top plate to its area) will depend on the design of the apparatus.

4.1.2 Heat should be transferred to the specimen from the upper side only; if the lower plate is equipped with a heating system which cannot be turned off, the heat-resistant sheet (4.2) with which the device shall in any case be fitted acts as a heat shield.

4.1.3 The heating device may be the same as that used in the test for colour fastness to dry heat (excluding pressing) [see ISO 105-P01:1993, *Textiles — Tests for colour fastness — Part P01: Colour fastness to dry heat (excluding pressing)*, subclause 4.1], and a suitable insulating material (4.2) shall be used, whether the bottom plate is heated or not, to minimize heat transfer to or from the bottom of the test assembly.

4.1.4 If a heating device is not available, a household iron may be used, but its temperature should be measured with a surface pyrometer or with temperature-sensitive papers. The iron should be weighted so that its area and total weight are in the appropriate ratio to exert a pressure of 4 kPa ± 1 kPa. However, due to temperature differences between different points on the surface of the iron, accuracy and reproducibility are limited. When a hand iron is used, this fact shall be stated in the test report.

4.2 Smooth heat-resistant sheet, of thickness 3 mm to 6 mm.

The heat-resistant sheet used for insulation should be smooth and not warped. It is best to complete the specimen assembly on the heat-resistant sheet before placing it in the heating device (4.1). The heat-resistant sheet should be cooled and the wet wool dried between tests.

4.3 Padding, wool flannel of mass per unit area approximately 260 g/m^2.

Two layers of wool flannel are used to make a pad of thickness approximately 3 mm. Similar smooth wool fabrics or felt can be used to give a pad of thickness approximately 3 mm.

4.4 Undyed, bleached and unmercerized cotton cloth, of mass per unit area 100 g/m^2 to 130 g/m^2 and with a smooth surface.

4.5 Cotton adjacent fabric, complying with section F02 of ISO 105-F:1985, measuring 40 mm × 100 mm.

4.6 Grey scale for assessing change in colour, complying with ISO 105-A02, and **grey scale for assessing staining,** complying with ISO 105-A03.

4.7 Grade 3 water (see ISO 105-A01:1994, subclause 8.1).

5 Test specimen

5.1 If the textile to be tested is fabric, use a specimen 40 mm × 100 mm.

5.2 If the textile to be tested is yarn, knit it into fabric and use a piece 40 mm × 100 mm or wind it closely round a piece of thin inert material measuring 40 mm × 100 mm to form a layer having only the thickness of the yarn.

5.3 If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet 40 mm × 100 mm and sew the sheet onto a piece of cotton adjacent fabric (4.5) to support the fibre.

6 Procedure

6.1 General

6.1.1 The choice of pressing temperature used depends to a large extent on the type of fibre and on the construction of the fabric or garment. In the case of blends it is further suggested to use the temperature appropriate to the fibre with the lowest heat resistance. The following temperatures cover three commonly used pressing conditions:

110 °C ± 2 °C

150 °C ± 2 °C

200 °C ± 2 °C

When necessary, other temperatures may be used, provided that they are specially noted in the test report.

6.1.2 Specimens of materials that have been subjected to any heat or drying treatment shall be conditioned in the standard temperate atmosphere for testing textiles, in accordance with ISO 139, i.e. 65 % ± 2 % relative humidity and a temperature of 20 °C ± 2 °C, before they are tested.

6.1.3 The bottom plate of the heating device is covered with the heat resistant sheet (4.2), wool flannel padding (4.3) and dry, undyed cotton cloth (4.4), whether the plate is heated or not.

6.2 Dry pressing

Place the dry specimen on top of the cotton cloth covering the wool flannel padding (see 6.1.3). Lower the top plate of the heating device and leave the specimen for 15 s at the specified pressing temperature.

6.3 Damp pressing

Place the dry specimen on top of the cotton cloth covering the wool flannel padding (see 6.1.3). Soak a piece of cotton adjacent fabric (4.5) measuring 40 mm × 100 mm in grade 3 water (4.7), and squeeze or extract it to contain its own mass of water. Place the wet fabric on top of the dry specimen. Lower the top plate of the heating device and leave the specimen for 15 s at the specified pressing temperature.

6.4 Wet pressing

Soak the specimen and a piece of cotton adjacent fabric 40 mm × 100 mm (4.5) in grade 3 water (4.7) and squeeze or extract them to contain their own mass of water. Place the wet specimen on top of the dry cotton cloth covering the wool flannel padding (see 6.1.3) and place the wet adjacent fabric on the specimen. Lower the top plate of the heating device and leave the specimen for 15 s at the specified pressing temperature.

6.5 Assessment

6.5.1 Assess the change in colour of the specimen by comparison with the appropriate grey scale (4.6) immediately and again after the specimen has been allowed to condition for 4 h in the standard atmosphere for testing textiles.

6.5.2 Assess the staining of the cotton adjacent fabric by comparison with the appropriate grey scale (4.6). Use the more heavily stained side of the cotton adjacent fabric for the assessment.

7 Test report

The test report shall include the following information:

a) the number and year of publication of this part of ISO 105, i.e. ISO 105-X11:1994;

b) all details necessary for the identification of the sample tested;

c) the test procedure (dry, damp or wet), the heating device used and the temperature of the heating device;

d) the numerical grey scale ratings for change in colour immediately after testing and after conditioning for 4 h in the standard atmosphere for testing textiles;

e) the numerical grey scale rating for staining of the adjacent fabric.

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