INTERNATIONAL STANDARD

ISO 105-S03

Second edition
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Textiles — Tests for colour fastness —

Part S03:
Colour fastness to vulcanization: Open steam

Textiles — Essais de solidité des teintures —
Partie S03: Solidité des teintures à la vulcanisation: Vapeur saturée

Reference number
ISO 105-S03:1993(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-S03 was prepared by Technical Committee ISO/TC 38, *Textiles*, Sub-Committee SC 1, *Tests for coloured textiles and colorants*.

This second edition cancels and replaces the first edition (included in ISO 105-S:1978), 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 S03:
Colour fastness to vulcanization: Open steam

1 Scope

This part of ISO 105 specifies a method for determining the resistance of the colour of textiles of all kinds and in all forms to the action of a typical rubber compound such as may be used in the proofing industry, and to its decomposition products, during vulcanization in open steam, either

a) under conditions that prevent live steam from coming into contact with the specimen to be tested (method A) or

b) under conditions that allow live steam to infiltrate into the adjacent fabric to be tested (method B).

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-A01:1989, *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 105-F10:1989, *Textiles — Tests for colour fastness — Part F10: Specification for adjacent fabric: Multifibre.*

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

3 Principle

A specimen of the textile under test is heated in live steam in direct contact with an (initially) unvulcanized rubber compound, the textile material being wrapped in either

a) sheeting impermeable to steam and water (method A) or

b) undyed bleached cotton fabric, but ensuring that live steam is not prevented from infiltration into the specimen (method B).

The change in colour of the specimen and the staining of the adjacent fabric are assessed with the grey scales.

4 Apparatus and materials

4.1 Jacketed autoclave, capable of holding a steam pressure on both jacket and pan of 390 kPa.

4.2 Stainless-steel open-ended tube, of diameter 40 mm ± 3 mm and wall thickness 2,5 mm ± 0,5 mm.

4.3 Sheet of uncured rubber compound, 2,5 mm ± 1,5 mm thick, consisting of the following:

100 parts pale crepe;

5 parts zinc oxide;

1 part stearic acid;

2 parts sulfur;

1 part mercaptobenzothiazole;

0,2 parts zinc diethyldithiocarbamate;

15 parts titanium oxide;

75 parts barium sulfate.

If it is necessary to transport the rubber compound, cover it with thin polyethylene film.

NOTE 1 It should be borne in mind that this test employs a basic rubber compound. Other compounding ingredients are frequently used in production and may have specific effects on colour fastness not revealed by this test.

4.4 Adjacent fabrics (see ISO 105-A01:1989, subclause 8.3).

Either

4.4.1 Multifibre adjacent fabric, complying with ISO 105-F10.

Or

4.4.2 Single-fibre adjacent fabric, complying with the relevant section of sections F01 to F08 of ISO 105-F, of the same generic kind of fibre as that in the textile to be tested, or that predominating in the case of blends.

4.5 Undyed bleached cotton.

4.6 For method A only (ingress of steam prevented): **sheeting** which is impermeable to steam and water, for example rubber-proofed fabric sheeting or plastics sheeting such as polyester, capable of withstanding a temperature of 140 °C.

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

4.8 Petroleum spirit.

5 Test specimen

5.1 Remove any polyethylene film from the sheet of uncured rubber compound (4.3) and moisten the compound with petroleum spirit (4.8).

5.2 If the textile to be tested is fabric, place a specimen measuring 40 mm × 100 mm on the sheet of uncured rubber compound. To ensure a uniform degree of adhesion, "roll" the specimen on to the rubber with a metal roller.

5.3 If the textile to be tested is yarn, knit it into a fabric and use a specimen measuring 40 mm × 100 mm, or stick a number of lengths flat and side by side on the rubber sheet to obtain the specified area of 40 mm × 100 mm (see 5.2).

5.4 If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet measuring 40 mm × 100 mm and stick this to the rubber sheet (see 5.2).

6 Procedure

6.1 Wrap the composite specimen round the stainless-steel open-ended tube (4.2), rubber face inside.

6.1.1 For method A (ingress of steam prevented), cover the specimen by tightly wrapping with one layer of adjacent fabric (4.4.1 or 4.4.2), three layers of undyed bleached cotton fabric (4.5) and two layers of impermeable sheeting (4.6), taking care that the wrapping projects beyond the edges of the composite specimen on the tube.

Securely bind the edges with string to prevent direct ingress of steam.

6.1.2 For method B (ingress of steam permitted), cover the specimen by tightly wrapping with one layer of adjacent fabric (4.4.1 or 4.4.2) and two layers of undyed bleached cotton fabric (4.5).

6.2 Place the tube in the preheated autoclave (4.1), ensuring that the temperature of the jacket is 142 °C ± 1 °C (380 kPa steam pressure) and that of the pan 139 °C ± 1 °C (350 kPa steam pressure). Carry out the test for 20 min.

6.3 Remove the tube, cool in air, remove the wrapping fabric and the adjacent fabric and condition the composite specimen and the adjacent fabric for 4 h in a standard atmosphere for testing complying with ISO 139.

6.4 Assess the change in colour of the treated specimen by comparing it with a piece of the original dyeing laid on a sheet of vulcanized rubber, and the staining of the adjacent fabric on the side in direct contact with the specimen, using the grey scales (4.7).

7 Test report

The test report shall include the following particulars:

a) the number and date of publication of this part of ISO 105, i.e. ISO 105-S03:1993;

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

c) the numerical ratings for change in colour of the specimen (see 6.4);

d) the adjacent fabric used;

e) if a multifibre adjacent fabric was used, the staining of each type of fibre in the multifibre adjacent fabric and the type of multifibre adjacent fabric used;

f) the method of wrapping used (6.1.1 or 6.1.2).

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