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ISO 105-X16

Second edition
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Textiles — Tests for colour fastness —

Part X16: Colour fastness to rubbing — Small areas

Textiles — Essais de solidité des coloris —

Partie X16: Solidité des coloris au frottement — Petites surfaces

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 38, *Textiles*, Subcommittee SC 1, *Tests for coloured textiles and colorants*.

This second edition cancels and replaces the first edition (ISO 105-X16:2001), of which it constitutes a minor revision.

ISO 105 consists of many parts designated by a part letter and a two-digit serial number (e.g. A01), under the general title *Textiles — Tests for colour fastness*. A complete list of these parts is given in ISO 105-A01.

Textiles — Tests for colour fastness —

Part X16:
Colour fastness to rubbing — Small areas

1 Scope

This part of ISO 105 specifies a method for determining the resistance of the colour of textiles to rubbing off and staining other materials where the singling out of areas smaller than possible to test with the apparatus described in ISO 105-X12 is required.

Two tests may be made, one with a dry rubbing cloth and one with a wet rubbing cloth.

2 Normative references

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

ISO 105-A01:2010, *Textiles — Tests for colour fastness — Part A01: General principles of testing*

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

ISO 105-F09, *Textiles — Tests for colour fastness — Part F09: Specification for cotton rubbing cloth*

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

3 Principle

Specimens of the textile are rubbed with a dry rubbing cloth and with a wet rubbing cloth. The method is specifically designed for small areas of printed or otherwise coloured fabric where the singling out of areas smaller than possible to test with the standard rubbing device found in method ISO 105-X12 is required.

4 Apparatus

4.1 Suitable testing devices for determining the colour fastness to rubbing, using an alternating rotary motion and a single test finger of (25 ± 0,1) mm diameter mounted on a vertical weighted rod that rotates (405 ± 3)° with a downward force of (11,1 ± 0,5) N.

Another device has a test finger of (16 ± 0,1) mm diameter with the same downward force.

NOTE A suitable apparatus is described in Reference [1], AATCC Test Method 116. Other devices can be used provided that the same results are obtained as with the apparatus described in 4.1. There is no known correlation of results between the device used in this method and two methods described in ISO 105-X12.

4.2 Cotton rubbing cloth, desized, bleached, without finish, cut into 50 mm squares (±2 mm) for the finger used in 4.1 (see ISO 105-F09).

4.3 Soft-back waterproof abrasive paper, or grating of stainless steel wire 1 mm in diameter and mesh width about 20 mm.

Attention should be paid to the characteristics of the grating or abrasive paper used to hold the specimen as they may leave an imprint through the textile which would cause a false rating to be made. The use of the abrasive paper may be preferred for testing textile fabrics.

4.4 Grey scale for assessing staining, in accordance with ISO 105-A03.

Verification on the operation of the test and the apparatus should be made routinely and the results kept in a log. Use an in-house or established rubbing specimen and conduct three (3) dry tests.

5 Test specimens

5.1 If the textile to be tested is a fabric, specimens not less than 25 mm × 25 mm are required.

Additional specimens may be used when higher precision is needed.

5.2 If the textile to be tested is yarn or thread, knit it into fabric to provide specimens at least 25 mm × 25 mm or form a layer of parallel strands by wrapping it lengthways on a cardboard rectangle of suitable dimensions.

5.3 Before testing, condition the specimen and rubbing cloth for at least 4 h in the standard atmosphere as defined in ISO 139.

Alternative standard atmospheres as defined in ISO 139 may only be used if the parties agree and, in this case, the alternative atmosphere used shall be reported. Conditioning is done by laying each test specimen and each piece of rubbing cloth separately on a screen or perforated shelf. Some fabrics such as cotton or wool may require longer periods of conditioning.

5.4 For best results, testing should be conducted under standard atmosphere for testing textiles (see ISO 139).

6 Procedure

6.1 General

Tilt the upper half of the rotary vertical machine to open and expose the rotary crocking finger. Fasten the specimen at the point the vertical rod comes into contact with the base and place the rubbing square on the finger. Return the upper half of the machine back to the operating position with the rubbing cloth at the end of the shaft in contact with the test specimen. Apply weight to the vertical shaft to give (11,1 ± 0,5) N downward force.

6.2 Dry rubbing

Place the conditioned rubbing cloth (see 4.2 and 5.3), flat over the end of rubbing finger and turn the crank 20 turns producing 40 reciprocal turns of the vertical shaft. Turn the crank at a rate of one revolution per second. Remove the test square and condition.

6.3 Wet rubbing

Establish a technique for preparing the rubbing cloth by weighing a conditioned piece of cloth, then thoroughly soak in distilled water and reweigh to ensure take-up of 95 % to 100 %. Follow the instructions for rubbing in 6.2.

NOTE As the level of soak of the rubbing cloth might dramatically affect ratings, other levels can be used. An example of a very commonly used level of soak is (65 ± 5) % of the conditioned mass of a dry rubbing cloth.

6.4 Drying

Air dry the test cloth.

7 Evaluation

7.1 Remove any extraneous fibrous material that might interfere with the rating.

7.2 Back each tested rubbing cloth with three layers of white rubbing cloth while evaluating.

7.3 Assess the staining of the cotton rubbing cloths with the grey scale for staining (4.4) under suitable illumination (see ISO 105-A01:2010, Clause 14).

NOTE Difficulty might be experienced in making assessments of the degree of staining on the rubbing cloth as the rotary device usually exhibits greater colour transfer near the edge of the tested circle than the centre.

8 Test report

The test report shall contain the following information:

a) a reference to this part of ISO 105, i.e. ISO 105-X16:2016;

b) whether dry or wet rubbing was performed along with the percentage of soak;

c) the numerical rating for staining for each test specimen;

d) the time of conditioning of the specimens and rubbing cloth as well as the atmospheric conditions during testing.

Bibliography

[1] *Technical Manual of the American Association of Textile Chemists and Colorists*, www.aatcc.org

[2] ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing*

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