

INTERNATIONAL  
STANDARD

**ISO**  
**105-X04**

Fourth edition  
1994-09-01

---

---

**Textiles — Tests for colour fastness —**  
**Part X04:**  
Colour fastness to mercerizing

*Textiles — Essais de solidité des teintures —*  
*Partie X04: Solidité des teintures au mercerisage*



Reference number  
ISO 105-X04:1994(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-X04 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-X04:1987), 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.

© ISO 1994

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization  
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

# Textiles — Tests for colour fastness —

## Part X04: Colour fastness to mercerizing

### 1 Scope

This part of ISO 105 specifies a method for determining the resistance of the colour of textiles to the action of concentrated solutions of sodium hydroxide used in mercerizing. The method is mainly applicable to cotton and to mixtures containing cotton.

### 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.*

### 3 Principle

**3.1** A specimen of the textile in contact with a specified adjacent fabric is treated with sodium hydroxide solution, rinsed, acidified, rinsed again and dried. The change in colour of the specimen and the staining of the adjacent fabric are assessed by comparison with the grey scales.

**3.2** As completely resistant specimens may show an apparent increase in depth of colour, these cannot be rated 5 (no change) by the normal method of assessment. In such cases, therefore, only the changes in hue and lightness can be assessed using the grey scale, without consideration of the increase in depth, and such assessments should be marked with an asterisk (\*). The meaning of the asterisk should be explained in a footnote.

#### EXAMPLES

5\*: Increase in depth (not considered); no change in hue and lightness.

3-4 redder\*: Increase in depth (not considered); the hue became redder, matching grey scale 3-4.

2 bluer, duller\*: Increase in depth (not considered); the shade changed in hue and lightness, matching grey scale 2.

**3.3** Specimens whose colour does not increase in depth shall be assessed in the normal manner and the results shall not be marked with an asterisk.

## EXAMPLE

2 weaker, bluer, duller: Loss in depth (considered) and change in both hue and lightness corresponding to grey scale 2.

## 4 Apparatus and reagents

**4.1 Cotton adjacent fabric**, complying with section F02 of ISO 105-F:1985, measuring at least 100 mm × 100 mm, for evaluating staining.

**4.2 Metallic frame**, for holding specimen. A metal frame suitable for the test has two folding wings which can be locked in the closed position by a wing-nut. Each of the two wings is an open square of about 80 mm × 80 mm. All four sides of the frame are corrugated or contain needle bars in order to hold the composite specimen firmly during the treatment. The rigid frame for yarns and threads should be slightly larger than the corrugated or needle bar frame for fabrics and fit into the latter.

**4.3 Sodium hydroxide**, aqueous solution, 300 g/l.

**4.4 Sulfuric acid**, aqueous solution containing 5 ml of concentrated sulfuric acid ( $\rho$  1,84 g/ml) per litre.

**4.5 Acetic acid**, aqueous solution containing 10 ml of glacial acetic acid per litre.

**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.

## 5 Test specimen

**5.1** If the textile to be tested is fabric, sew a specimen measuring at least 100 mm × 100 mm to an equal-sized piece of the cotton adjacent fabric (4.1) around all four sides. Fasten this composite specimen to the frame (4.2) firmly, but without excessive tension.

**5.2** If the textile to be tested is yarn or thread, wind an amount of it equal to the mass of the cotton adjacent fabric on a rigid frame firmly, but without excessive tension, with the strands close together and parallel to provide an area at least 100 mm × 100 mm. Sew an equal-sized piece of the cotton adjacent fabric (4.1) to this area along the two sides which cross the strands.

## 6 Procedure

**6.1** Immerse the composite specimen with the coloured material uppermost in the sodium hydroxide solution (4.3) at  $20\text{ °C} \pm 2\text{ °C}$  for 5 min. Rinse the composite specimen in the frame by pouring on it 1 litre of water at  $70\text{ °C} \pm 2\text{ °C}$  over a period of 1 min and then rinsing in cold, running tap-water for 5 min.

**6.2** Remove the composite specimen from the frame and immerse in it the sulfuric acid solution (4.4) or in the acetic acid solution (4.5) for 5 min, at a liquor ratio of 50:1. Rinse the specimen in cold, running tap-water until neutral.

**6.3** Remove the stitching along three sides of the specimen (one side for yarns and threads) and dry it by hanging it in air at a temperature not exceeding  $60\text{ °C}$ , taking care that the adjacent fabric and the coloured material are kept apart except at the remaining stitching.

**6.4** If the specimen shows increased depth of colour, assess the change in hue and/or lightness only, using the appropriate grey scale (4.6). Assess the staining of the adjacent fabric by comparison with the appropriate grey scale (4.6).

**6.5** If the specimen does not show increased depth of colour, assess the change as an overall contrast (see 3.3) and the staining of the adjacent fabric by comparison with the grey scales.

## 7 Test report

The test report shall include the following information:

- the number and year of publication of this part of ISO 105, i.e. ISO 105-X04:1994;
- all details necessary for the identification of the sample tested;
- in the case of assessments in accordance with 6.4, any changes in hue and/or lightness of the specimen marked with an asterisk and the numerical grey scale rating for staining of the cotton adjacent fabric;
- in the case of assessments in accordance with 6.5, the numerical grey scale rating for change in colour of the specimen and the numerical grey scale rating for staining of the cotton adjacent fabric.

This page intentionally left blank

STANDARDSISO.COM : Click to view the full PDF of ISO 105-X04:1994

This page intentionally left blank

STANDARDSISO.COM : Click to view the full PDF of ISO 105-X04:1994