

Textiles — Tests for colour fastness —

Part A04: Method for the instrumental assessment of the degree of staining of adjacent fabrics

The European Standard EN ISO 105-A04:1999 has the status of a
British Standard

ICS 59.080.01

National foreword

This British Standard is the English language version of EN ISO 105-A04:1999. It is identical with ISO 105-A04:1999. It supersedes BS 1006-A04:1990 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee TCI/81, Colour fastness testing and colour measurement, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled "International Standards Correspondence Index", or by using the "Find" facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN ISO title page, page 2, the ISO title page, pages ii to iv, pages 1 and 2 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This British Standard, having been prepared under the direction of the Sector Committee for Materials and Chemicals, was published under the authority of the Standards Committee and comes into effect on 15 October 1999

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English version

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the instrumental assessment of the degree of staining of
adjacent fabrics**

(ISO 105-A04:1989)

Textiles — Essais de solidité des teintures —
Partie A04: Méthode instrumentale pour
l'évaluation du degré de dégorgeement des tissus
témoins
(ISO 105-A04:1989)

Textilien — Farbechtheitsprüfungen —
Teil A04: Methode zur instrumentellen
Bewertung des Anblutens der Begleitgewebe
(ISO 105-A04:1989)

This European Standard was approved by CEN on 25 June 1999.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

The text of the International Standard from Technical Committee ISO/TC 38 "Textiles" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 105-A04:1989 has been approved by CEN as a European Standard without any modification.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

INTERNATIONAL
STANDARD

ISO
105-A04

First edition
1989-12-01

Textiles — Tests for colour fastness —

Part A04 :

Method for the instrumental assessment of the
degree of staining of adjacent fabrics

Textiles — Essais de solidité des teintures —

*Partie A04 : Méthode instrumentale pour l'évaluation du degré de
dégorgement des tissus témoins*



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Descriptors: Textiles, fabrics, dyes, tests, determination, colour fastness, staining of colour.

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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 105-A04 was prepared by Technical Committee ISO/TC 38, *Textiles*.

ISO 105 was previously published in 13 “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.

1 Scope

This part of ISO 105 specifies an instrumental method for assessing the degree of staining of adjacent fabrics in any fastness test, as an alternative to the visual method.

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

ISO 105-J01:1989, *Textiles — Tests for colour fastness — Part J01: Measurement of colour and colour differences.*

3 Principle

The colour of an adjacent fabric which has been subjected to a fastness test in contact with the fabric under test and that of a specimen of the adjacent fabric which has been subjected to the fastness test in the absence of the fabric under test are measured. The colour difference between them is calculated in CIELAB units and converted to a staining-scale rating by means of a simple equation.

4 Apparatus

Spectrometer or colorimeter, capable of measuring the colour of a specimen of the size of one stripe in a multifibre adjacent fabric (see ISO 105-F10) and which irradiates the specimen with light resembling that of standard illuminant D₆₅ or standard illuminant C.

5 Test specimen

Mount the adjacent fabric which has been subjected to a fastness test, together with a specimen of the adjacent fabric which has been subjected to the fastness test in the absence of the fabric under test, on non-optically-brightened white card stock.

6 Procedure

6.1 Measure the colour of the piece of adjacent fabric which has been subjected to the fastness test in the absence of the fabric under test.

6.2 Measure the colour of the adjacent fabric which has been subjected to the fastness test as part of a composite specimen. If the staining is uneven, several measurements shall be made and the arithmetic mean value employed in the calculations. If the instrument permits different viewing geometries to be used, the preferred method is to include the specular component.

6.3 Calculate the colour difference ΔE_{CIELAB} and the magnitude of the lightness difference ΔI_{CIELAB} between the adjacent fabrics, as described in **6.1** and **6.2**, to two places of decimals. Either of two CIE instrument geometries may be used:

- a) sphere (d/0°), specular included;
- b) 0°/45° or 45°/10°.

Calculations shall be performed using the CIE 10° observer and illuminant D₆₅, with the 2° observer and illuminant C being a permitted alternative.

6.4 Calculate, to two places of decimals, the grey-scale difference ΔE_{GS} equivalent to ΔE_{CIELAB} using the following equation:

$$\Delta E_{\text{GS}} = \Delta E_{\text{CIELAB}} - 0,4 \sqrt{(\Delta E^{*2} - \Delta I^{*2})}$$

6.5 Calculate, to two places of decimals, the staining-scale rating (SSR) using one of the following equations:

$$\text{Ratings 1 to 4} \quad \text{SSR} = 6,1 - 1,45 \ln (\Delta E_{\text{GS}})$$

If SSR is greater than 4, recalculate using the following equation:

$$\text{Ratings 4 to 5} \quad \text{SSR} = 5 - 0,23 \Delta E_{\text{GS}}$$

6.6 Determine from Table 1 the staining-scale rating to be reported.

Table 1 — Staining-scale rating

Calculated SSR	Reported SSR
5,00 to 4,75	5
4,74 to 4,25	4–5
4,24 to 3,75	4
3,74 to 3,25	3–4
3,24 to 2,75	3
2,74 to 2,25	2–3
2,24 to 1,75	2
1,74 to 1,25	1–2
< 1,25	1

7 Test report

Include the staining-scale rating (instrumental) from Table 1 and a reference to this part of ISO 105 in the test report of the colour fastness test concerned.

Annex ZA (normative)

Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

Publication	Year	Title	EN	Year
ISO 105-J01	1997	<i>Textiles — Tests for colour fastness — Part J01: General principles for measurement of surface colour</i>	EN ISO 105-J01	1999

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