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ISO/DIS 105-G01

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Textiles — Tests for colour fastness —

Part G01:
Colour fastness to nitrogen oxides

Textiles — Essais de solidité des teintures —

Partie G01: Solidité des teintures aux oxydes d'azote

ICS: 59.080.01

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 105-G01 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 1, *Tests for coloured textiles and colorants*.

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

Introduction

Textiles — Tests for colour fastness — Part G01: Colour fastness to nitrogen oxides

1 Scope

1.1 This part of ISO 105 specifies two methods for determining the resistance of the colour of textiles of all kinds and in all forms to the action of nitrogen oxides produced during combustion of gas, coal, oil, etc, and when air is passed over heated filaments.

1.2 The two tests differ in severity; one or both of them are used, depending on the result obtained (see 7.2.4).

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-A0I :2010, *Textiles - Tests for colour fastness - Part A01: General principles of testing.*

ISO 105-A02:2005, *Textiles - Tests for colour fastness - Part A02: Grey scale for assessing Change in colour.*

ISO 105-F07.2001, *Textiles - Tests for colour fastness - Part F07: Specification for secondary acetate adjacent fabric*

ISO 139: 2005, *Textiles -Standard atmospheres for conditioning and testing.*

3 Principle

Specimens of textiles are exposed to nitrogen oxides in a closed container until either one or three test- control specimens exposed simultaneously with the test specimens have changed in colour to a predetermined extent. The change in colour of each specimen is assessed with the grey scale.

4 Apparatus and materials

4.1 Exposure chamber (see annex A).

4.2 Nitric Oxide, from a commercially supplied cylinder or a generator (see annex B).

CAUTION - Nitric Oxide and other nitrogen ox- ides are toxic. The maximum concentration in a working room must not exceed 5 Parts per million.

4.3 Sulfuric acid, containing 1 100 g of H_2SO_4 per litre (relative density 1,603).

4.4 Sodium nitrite ($NaNO_2$), saturated solution in grade 3 water (4.13).

4.5 Sodium hydroxide, dilute Solution (approximately 100 g of NaOH per litre).

4.6 Urea, solution containing, per litre, 10 g of urea (NH_2CONH_2), buffered to pH 7 by the addition of 0,4 g of sodium dihydrogen orthophosphate dihydrate($NaH_2PO_4.2H_2O$) and 2,5 g of disodium hydrogen orthophosphate dodecahydrate ($Na_2HPO_412H_2O$), and containing 0,1 g or less of a rapid-wetting surface-active agent, for example sodium dioctyl sulfosuccinate.

4.7 Test-control fabric

4.7.1 Test-control fabric dyed with Disperse Blue 3

Prepared as follows: Acetate is uniformly dyed in an open-width dyeing machine with 0,4 % (on mass of fabric) Cl Celliton FFRN (Disperse Blue 3, Colour Index, 3rd Edition) in a dye-bath containing 1 g/l of a neutral non-ionic dispersing agent at a liquor ratio of 10:1.

The dyeing begins at 40 °C and the temperature is raised to 80 °C within 30 min. The dyeing is continued for a further 60 min. The fabric is rinsed in cold water and dried.

The colour coordinates of this dyeing are x = 0,198 8, y = 0,190 4, Y = 23,20, using Illuminant C.

The tolerance may be 2,2 CIELAB units maximum. Test-control fabric can be obtained from national standards organizations.

4.7.2 Test-control fabric dyed with Disperse Blue 56

Prepared as follows: Acetate is uniformly dyed in an open-width dyeing machine with 0,8 % (on mass of fabric) Disperse Blue 56 (K/P BLUE EBL-E) supplied by Nippon Kayaku in a dye-bath containing 0.5 ml/l of a neutral non-ionic dispersing agent at a liquor ratio of 42:1.

The dyeing is ~~was~~ done at 90°C for 60 min. The fabric is rinsed in cold water and dried.

The colour coordinates of this dyeing are x= 0,204, y = 0,210, Y = 21,17, using Illuminant D_{65} /10 degree.

The tolerance may be 2,2 CIELAB units maximum. Test-control fabric can be obtained from the Association of Japan Industrial Standard.

4.8 Standard of fading

4.8.1 Standard of fading for test-control fabric dyed with Disperse Blue 3

This is a fabric of similar appearance to the test- control fabric (4.7.1), dyed to match a faded specimen of the test control. The standard of fading can be obtained from national standards organizations.

4.8.2 Standard of fading for test-control fabric dyed with Disperse Blue 56

It is considered that the standard of fading is completed when a faded specimen of the test control is observed to have a contrast equal to ~~of~~ grade 3-4 on the ~~in~~ grey scale.

4.9 **Syringe**, for injecting oxide into the exposure chamber (4.1).

A medical syringe is best suited to the injection of the nitric oxide. For a larger exposure chamber, the gas can also be measured and transferred from the gas reservoir to the exposure chamber by means of a gas burette.

4.10 **Undyed fabric**, of the same kind(s) of fibre as the specimen.

4.11 **Grey scale for assessing Change in colour**, complying with ISO 105-A02.

4.12 **Means for providing the standard atmosphere for testing** specified in clause 5.

4.13 **Grade 3 water** (see ISO 105-A01:1989, subclause 8.2).

5 Conditioning and testing atmosphere

The standard temperate atmosphere for testing textiles (see ISO 139), i.e. a relative humidity of (65 ± 4) % and temperature of 20 °C ± 2°C, shall be used for conditioning and testing.

6 Test specimens

6.1 If the textile to be tested is fabric, use a specimen measuring 40 mm x 100 mm.

6.2 If the textile to be tested is yarn, knit it into fabric and use a piece measuring 40 mm x 100 mm or wind it closely round a frame of rigid inert material measuring 40 mm x 100 mm to form, on each side, a layer having only the thickness of the yarn.

6.3 If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet measuring 40 mm x 100 mm and sew the sheet on a piece of cotton adjacent fabric complying with ISO 105-F, section F02, to support the fibre.