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**Textiles — Tests for colour fastness —  
Part E05:  
Colour fastness to spotting: Acid**

*Textiles — Essais de solidité des coloris —  
Partie E05: Solidité des coloris aux acides*

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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-E05 was prepared by Technical Committee ISO/TC 38, *Textiles*, Subcommittee SC 1, *Tests for coloured textiles and colorants*.

This fifth edition cancels and replaces the fourth edition (ISO 105-E05:2006), 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.

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# Textiles — Tests for colour fastness —

## Part E05:

### Colour fastness to spotting: Acid

#### 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 dilute solutions of organic and mineral acids.

Four tests differing in severity are provided. Any or all can be used, depending upon the nature of the fibre.

#### 2 Normative references

The following referenced documents are indispensable for the application of this document. 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, *Textiles — Tests for colour fastness — Part A01: General principles of testing*

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-A05, *Textiles — Tests for colour fastness — Part A05: Instrumental assessment of change in colour for determination of grey scale rating*

ISO 105-E07, *Textiles — Tests for colour fastness — Part E07: Colour fastness to spotting: Water*

#### 3 Principle

Drops of a solution of acid are placed on the specimen, the surface of which is rubbed gently with a glass rod to ensure penetration. The change in colour of the textile, while it is still wet and after drying, is assessed either visually or instrumentally.

NOTE The change in colour of the wet specimen can be assessed after 10 min, if this is of interest for the evaluation of dyestuffs.

#### 4 Reagents and materials

4.1 **Pipette or dropper.**

4.2 **Glass rod**, with a rounded end.

4.3 **Grey scale for assessing change in colour**, complying with ISO 105-A02.

4.4 **Acetic acid solution**, containing 300 g of glacial acetic acid (CH<sub>3</sub>COOH) per litre of water (4.8).

**4.5 Sulfuric acid solution**, containing 50 g of concentrated sulfuric acid ( $H_2SO_4$ ) ( $\rho$  1,84 g/ml) per litre of water (4.8).

**4.6 Tartaric acid solution**, containing 100 g of crystalline tartaric acid ( $HO_2CCHOHCHOHCO_2H$ ) per litre of water (4.8) (especially for acetate fibres).

**4.7 Hydrochloric acid solution**, containing 350 g of concentrated hydrochloric acid (HCl) per litre of water (4.8).

**4.8 Grade 3 water** (see ISO 105-A01).

NOTE See Table 1 for a list of the chemical solutions and pH levels of the reagents used in this method.

**4.9 Spectrophotometer or colorimeter**, for assessing change in colour, complying with ISO 105-A05.

## 5 Test specimen

**5.1** Prepare a test specimen as described in 5.2 to 5.4 for each acid to be used.

**5.2** If the textile to be tested is fabric, use a specimen measuring 40 mm  $\times$  100 mm.

**5.3** If the textile to be tested is yarn, knit it into fabric and use a specimen measuring 40 mm  $\times$  100 mm, or make a wick of parallel lengths 100 mm long and about 5 mm in diameter, tied near both ends.

**5.4** If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet measuring 40 mm  $\times$  100 mm.

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## 6 Procedure

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**6.1** Place the specimen in a clean, dry, flat-bottomed dish. Spot the specimen at room temperature with the appropriate solution so that, after working the solution into the specimen with the glass rod, a spot of diameter approximately 20 mm is formed. In the case of water-repellent fabrics, the amount of solution shall not exceed 0,5 ml.

**6.2** Assess the change in colour of the wet spot after 10 min with the grey scale (4.3) or instrumentally, in accordance with ISO 105-A02 or ISO 105-A05, respectively.

**6.3** Place the specimen on a flat surface and allow to dry at room temperature.

**6.4** Assess the change in colour of the specimen using either the grey scale (4.3) or instrumentally, in accordance with ISO 105-A02 or ISO 105-A05, respectively.

**6.5** Repeat steps 6.1 to 6.4 for each solution used.

**6.6** It is recommended that the test for resistance to water spotting, in accordance with ISO 105-E07, be carried out to ascertain that the change in colour is not due to the action of water alone.

## 7 Test report

The test report shall include the following information:

- a) a reference to this part of ISO 105 (ISO 105-E05:2010);
- b) the date of the test;
- c) all details necessary for the identification of the sample tested;
- d) the numerical grey scale rating or instrumental assessment for the change in colour of the dried specimen for each kind of acid used, and additionally for the change in colour when wet, if of interest;
- e) the result of the test for resistance to water spotting (see 6.6);
- f) any deviation, by agreement or otherwise, from the procedure specified.

**Table 1 — pH levels of solutions listed**

Chemical solution	pH
Acetic acid	1,8 to 2,4
Hydrochloric acid	0,1 to 0,3
Sulfuric acid	0,6 to 0,8
Tartaric acid	1,5 to 1,8

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