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STANDARD

ISO
105-X02

Fourth edition
1993-11-01

Textiles — Tests for colour fastness —

Part X02:

Colour fastness to carbonizing: Sulfuric acid

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Textiles — Essais de solidité des teintures —

Partie X02: Solidité des teintures au carbonisage: Acide sulfurique

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Reference number
ISO 105-X02:1993(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-X02 was prepared by Technical Committee ISO/TC 38, *Textiles*, Sub-Committee SC 1, *Tests for coloured textiles and colorants*.

This fourth edition cancels and replaces the third edition (ISO 105-X02:1987), 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.

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Textiles — Tests for colour fastness —

Part X02:

Colour fastness to carbonizing: Sulfuric acid

1 Scope

This part of ISO 105 specifies a method for determining the resistance of the colour of textiles in all forms to the manufacturing operation designed to remove vegetable impurities by treatment with sulfuric acid at high temperatures. The method is mainly applicable to wool and textiles containing wool.

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-A01:1989, *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.*

3 Principle

A specimen impregnated with sulfuric acid solution is dried, baked, rinsed and neutralized. The changes in colour after rinsing, neutralizing and drying are assessed with the grey scale.

4 Apparatus and materials

4.1 Oven, for drying specimens in air at $60\text{ °C} \pm 2\text{ °C}$ and baking in air at $105\text{ °C} \pm 2\text{ °C}$.

4.2 Sulfuric acid solution, containing 50 g of concentrated sulfuric acid (ρ 1,84 g/ml) per litre.

4.3 Sodium carbonate solution, containing 2 g of anhydrous sodium carbonate per litre.

4.4 Test control: A dyeing of CI Mordant Red 3 (Colour Index, 3rd Edition) treated with potassium dichromate.

The test control is prepared by entering a well wetted-out pattern of wool cloth at 40 °C into a dye-bath containing 1 % CI Mordant Red 3 (Colour Index, 3rd Edition), 10 % sodium sulfate decahydrate ($\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$) and 3 % acetic acid (300 g/l), all percentages being calculated on the mass of the pattern, at a liquor ratio of 40:1.

The dye-bath is raised to the boil in 30 min and boiled for a further 30 min. If necessary, the dye-bath is exhausted by careful addition of 1 % to 3 % acetic acid (300 g/l) or 1 % sulfuric acid (ρ 1,84 g/ml), well diluted with water. The bath is boiled for a further 15 min after addition of the acid. The dye-bath is cooled down by addition of cold water, and 0,5 % potassium dichromate dissolved in water is added. The dye-bath is raised to the boil again and boiled for 30 min. The pattern is then removed, rinsed in cold, running tap-water and dried.

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

5 Test specimen

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

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

5.3 If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet measuring 40 mm × 100 mm.

6 Procedure

6.1 Carry out the operations described below in 6.2 to 6.5 with the test specimen and the test-control specimen in parallel, in separate baths.

6.2 Immerse the specimen in the sulfuric acid solution (4.2) for 15 min at room temperature (liquor ratio 20:1). Squeeze it to leave in 80 % of its own mass of solution.

6.3 Dry the specimen by hanging it in an oven for 30 min, or longer if necessary, at 60 °C ± 2 °C. Then bake it by heating for 15 min at 105 °C ± 2 °C.

6.4 Rinse the specimen for 5 min in cold, running tap-water and then divide it into two equal parts. Dry one half by hanging it in air at a temperature not exceeding 60 °C.

6.5 Agitate the other half for 30 min at room temperature in the sodium carbonate solution (4.3) (liquor ratio 40:1). Then rinse it for 5 min in cold, running tap-water and dry it by hanging it in air at a temperature not exceeding 60 °C.

6.6 Assess the effect on the unneutralized test-control specimen with the grey scale. If the change in colour is not equal to the rating "2 yellower" on the appropriate scale, the test has not been carried out correctly, and the operations described in 6.1 to 6.5 inclusive shall be repeated with a fresh test specimen and a fresh test-control specimen.

6.7 Assess the change in colour of each half of the test specimen with the grey scale.

7 Test report

The test report shall include the following particulars:

- a) the number and date of publication of this part of ISO 105 (i.e. ISO 105-X02:1993);
- b) all details necessary for the identification of the sample tested;
- c) the numerical ratings for change in colour for both the rinsed and the neutralized portions of the test specimen.

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