IS 4637 (1988): Method for determination of colour fastness of textile materials to steam under pressure [TXD 5: Chemical Methods of Test]

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO STEAM UNDER PRESSURE

(First Revision)

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Gr 2

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Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO STEAM UNDER PRESSURE

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 31 August 1988, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1968 and has been revised to align it with ISO 105/P-1978 Textiles — Tests for colour fastness PO2 — Colour fastness to pleating: Steam pleating, issued by the International Organization for Standardization (ISO) and also to incorporate changes in line with other standards on colour fastness tests.

0.3 Colour fastness of textile materials is of considerable importance to the consumer. The fastness depends not only upon the nature and depth of shade of the dyestuff used but also upon the nature of the fibre, and the method of dyeing or printing employed; the same colouring matter, when used in dyeing or printing different fibres or when applied by different methods upon the same fibre, may give vastly different results. Formulation of standard methods of test for determining colour fastness of textile materials to different agencies, likely to effect change in colour is, therefore, necessary.

0.4 The process of pleating is carried out to give textiles the stability of dimensions or shape. The colour of textile materials is likely to be affected when they are pleated by the action of dry heat or steam under pressure.

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1. SCOPE

1.1 This standard prescribes a method for the determination of colour fastness of textile materials of all kinds and in all forms to the action of steam under pressure. The materials are not pleated during test and it is emphasized that it is not intended for assessing the quality of pleating process.

1.2 Three tests, differing in severity, are prescribed, one or more of them shall be used depending on the requirements.

2. PRINCIPLE

2.1 A specimen of the textile in contact with specified adjacent fabrics is steamed under pressure and dried. The numerical ratings for change in colour of the specimen and staining of the adjacent fabrics are evaluated with grey scales.

3. SAMPLING

3.1 Sample to determine conformity of a lot of coloured textile material to a specification shall be selected so as to be representative of the lot.

3.2 Sample drawn in compliance with the relevant material specification or as agreed to between the buyer and the seller to evaluate colour fastness of the material in the lot shall be representative of the lot.

4. COMPOSITE SPECIMEN

4.1 Two Adjacent Fabrics — Each measuring 10 × 4 cm, made of same kind of fibre as that of the textile to be tested or otherwise specified. In the case of blends, two different adjacent fabrics are required corresponding to the two predominent fibres of the specimen or as otherwise specified.

4.2 Preparation of Composite Specimen

4.2.1 If the textile to be tested is fabric, place a specimen 10 × 4 cm between two adjacent fabrics and sew along all four sides to form a composite specimen.

4.2.2 If the textile to be tested is yarn, knit or weave it into fabric and treat as in **4.2.1**, or form a layer of parallel lengths of it between the two adjacent fabrics, the amount of yarn taken being

approximately equal to half the combined mass of the adjacent fabrics, sew along all four sides to hold the yarn in place and to form a composite specimen.

4.2.3 If the textile to be tested is loose fibre, comb and compress an amount approximately equal to half the combined mass of the adjacent fabrics, into a sheet 10 × 4 cm. Place the sheet between the two adjacent fabrics and sew along all four sides to hold the fibre in place and to form a composite specimen.

5. APPARATUS

5.1 Specimen Holder — consisting of a copper tube 80 mm in external diameter and 1·5 mm in thickness. The copper tube is wrapped with six layers of bleached cotton cloth (mass 125 g/m^2 approximately). The outside layer is made of bleached cotton cloth (mass 185 g/m^2 approximately). The rods at each end are made from 6 mm diameter mild steel. The strength of the springs is not critical but it must be sufficient to hold the layer tightly against the tube. The springs are fastened to one of the steel rods and should easily hook on to the other steel rod (*see* Fig. 1).

5.2 Jacketed Steamer — Provided with an instrument to measure the pressure accurately and that no water splashes on to the specimen during the test.

or

Domestic Pressure Cooker — Sufficiently large to avoid water splashing on the specimen during test.

NOTE — It is suggested that the minimum size should be 230 mm in diameter and 260 mm in height. It must be fitted with an accurate pressure gauge. If the domestic pressure cooker is used, the holder must be loosely wrapped in one layer of polyester film which projects 10 mm over each end of the holder and is not closed at the ends. The holder should then be placed in a rectangular metal container having ten holes of 1 mm diameter equally spaced along the centre of the bottom and should be sufficiently deep to reach 10 mm from the top of the specimen holder (*see* Fig. 2). The bottom of the container should be slightly concave to ensure that condensed water rapidly drains out. The container is then placed on a stand which holds it 50 mm from the surface of the water. It is suggested that the depth of water should be 30 mm. Before raising the pressure in the cooker, it is suggested that all the air should be expelled over a period of 2 minutes.

6. PROCEDURE

6.1 Mount the composite specimen in a holder between two adjacent fabrics as shown in Fig. 1.

6.2 Place the holder containing the composite specimen in a jacketed steamer or pressure cooker. Steam under one of the following sets of conditions:

Test	*Maximum Duration of Heating up Period*	*Duration of Time at Specified Temperature*	*Pressure* (kPa)	*Temperature* (°C)
	min	min		
Mild	5	5	135	108
Intermediate	8	10	170	115
Severe	15	20	270	130

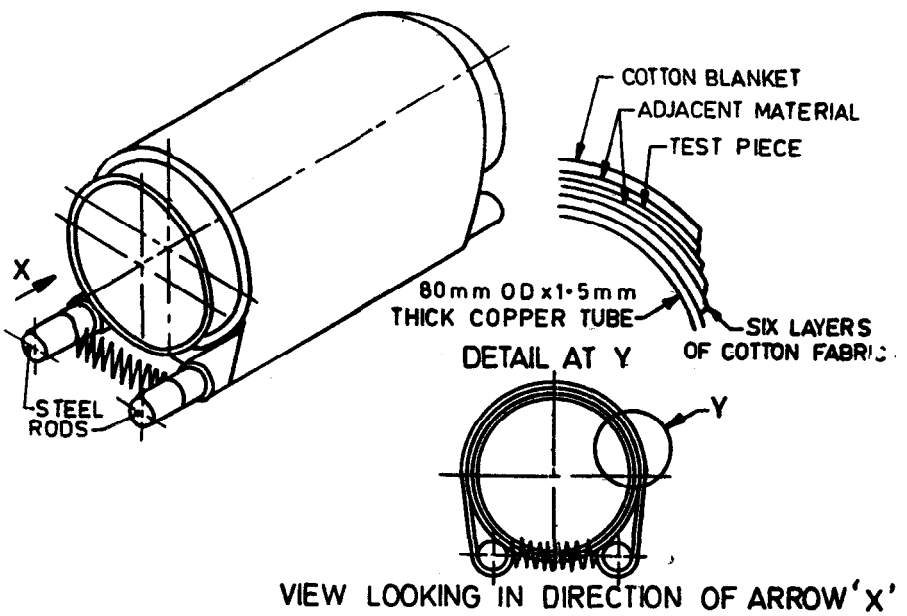

FIG. 1 SPECIMEN HOLDER

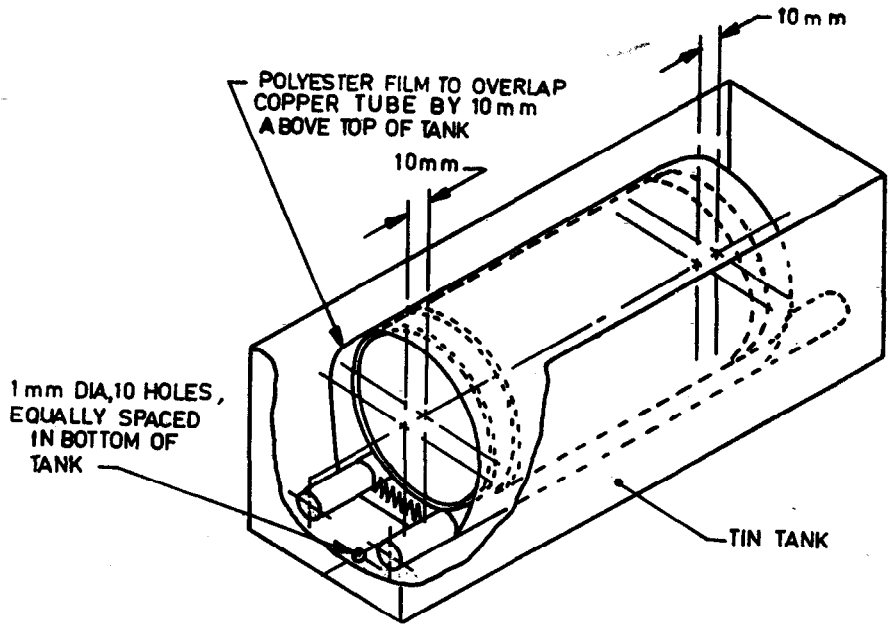

FIG. 2 ASSEMBLY FOR SPECIMEN HOLDER

NOTE 1 — The severe test is intended primarily for 100 percent synthetic textiles such as those made from polyamide and polyester fibres. It should not be used for textile containnig wool.

NOTE 2 — Specimens which liberate formaldehyde under steam pleating conditions should be tested separately.

NOTE 3 — If wool is used as one of the adjacent fabrics, it may have an adverse effect on the dye in the specimen particularly under alkaline conditions.

NOTE 4 — It should be noted that the papers used in commercial pleating occasionally contain reducing agents which, with certain colouring matters, can produce a much greater change in colour than occurs under test conditions.

6.3 After completing the steaming, release the pressure over a period not exceeding two minutes. Open out the composite specimen and dry in air in shade at a temperature not exceeding 60°C with the three parts in contact only at the line of stitching. Condition the test specimen at 27 ± 2°C and 65 ± 2 percent relative humidity for four hours.

6.4 Evaluation — Evaluate the change in colour of the test specimen by the method prescribed in IS : 768-1982* and the degree of staining of the two pieces of adjacent fabrics by the method prescribed in IS : 769-1982†.

NOTE 1 — Treated test specimens and the pieces of adjacent fabrics should have cooled after drying and should have regained their normal moisture content before evaluation.

NOTE 2 — In cases of doubt in the assessment of colour fastness ratings by a single observer, the assessment should be done by at least three observers and the overall average rating should be reported.

7. REPORT

7.1 Report the numerical rating for change in colour of test specimen and the numerical ratings for staining of the two adjacent fabrics used in the preparation of the composite specimen.

7.2 Report also the test whether mild, intermediate or severe, which has been used.

*Method for evaluating change in colour (*first revision*).
†Method for evaluating staining (*first revision*).

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