International Standard 105/S

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Textiles — Tests for colour fastness — Part S: Colour fastness to vulcanizing

Textiles — Essais de solidité des teintures — Partie S: Solidité des teintures à la vulcanisation

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Descriptors : textiles, dyes, tests, colour fastness, visual inspection, vulcanizing tests, warm air heating, sulphur chlorides, steam heating.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

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.

International Standard ISO 105/S was developed by Technical Committee ISO/TC 38, *Textiles*.

It was submitted directly to the ISO Council, in accordance with sub-clause 5.10.1 of part 1 of the Directives for the technical work of ISO.

This part of ISO 105 cancels and replaces group S of ISO 105-1978, originally published as parts 6 and 7 of ISO Recommendation R 105/IV-1968, and part 1 of ISO Recommendation R 105/V-1969.

NOTE — International Standard ISO 105 is presented in the form of parts. Each of these parts corresponds to a group and is split up into its different component sections. This form facilitates the replacement of existing sections by successive editions as necessary.

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Textiles — Tests for colour fastness

S01 Colour fastness to vulcanizing : Hot air

1 SCOPE AND FIELD OF APPLICATION

This method is intended for determining the resistance of the colour of textiles of all kinds and in all forms to the action of a typical rubber compound, such as may be used in the proofing industry, and to its decomposition products, during vulcanization in hot air.

2 PRINCIPLE

A specimen of the textile is heated in air in direct contact with an (initially) unvulcanized rubber compound. The change in colour of the specimen is assessed with the grey scale.

3 REFERENCES

ISO 105 :

Section A01, *General principles of testing.*

Section A02, *Grey scale for assessing change in colour.*

ISO 139, *Textiles — Standard atmospheres for conditioning and testing.*

4 APPARATUS AND REAGENTS

4.1 Oven, maintained at 125 ± 2 °C, with a fan to ensure uniformity of air temperature.

4.2 Sheet of uncured rubber compound, 0,25 ± 0,15 cm thick, consisting of the following :

100 parts pale crêpe;

5 parts zinc oxide;

1 part stearic acid;

2 parts sulphur;

1 part mercaptobenzothiazole;

0,2 part zinc diethyldithiocarbamate;

15 parts titanium oxide;

75 parts barium sulphate.

If it is necessary to transport the rubber compound, it should be covered with thin polyethylene film.

4.3 Grey scale for assessing change in colour (see clause 3).

5 TEST SPECIMEN

5.1 Remove any polyethylene film from the sheet of uncured rubber compound (4.2) and moisten the compound with petroleum ether.

5.2 If the textile to be tested is fabric, place a specimen of it 10 cm × 4 cm on the sheet of uncured rubber compound. To ensure a uniform degree of adhesion, the specimen should be "rolled" on to the rubber with a metal roller.

5.3 If the textile to be tested is yarn, knit it into fabric and use a specimen 10 cm × 4 cm, or stick a number of lengths flat and side by side on the rubber sheet to obtain the specified area of 10 cm × 4 cm.

5.4 If the textile is loose fibre, comb and compress enough of it to form a sheet 10 cm × 4 cm and stick this to the rubber sheet.

6 PROCEDURE

6.1 Hang the composite specimen in the oven for 30 min at 125 ± 2 °C, uniformity of temperature being ensured by a fan.

6.2 Cool the composite specimen for 4 h in the standard atmosphere for testing.

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6.3 Assess the change in colour of the treated specimen by comparing it with a piece of the original dyeing laid on a sheet of vulcanized rubber, using the grey scale.

7 TEST REPORT

Report the numerical rating for the change in colour.

8 NOTE

It should be borne in mind that this test employs a basic rubber compound; other compounding ingredients are frequently used in production and may have specific effects on colour fastness not revealed by this test.

Textiles — Tests for colour fastness

S02 Colour fastness to vulcanizing : Sulphur monochloride

1 SCOPE AND FIELD OF APPLICATION

This method is intended for determining the resistance of the colour of textiles of all kinds and in all forms to the action of sulphur monochloride under the conditions usually occurring during the cold vulcanizing of rubber.

2 PRINCIPLE

A specimen of the textile is exposed to sulphur monochloride vapour. The change in colour of the specimen is assessed with the grey scale before and after neutralizing with ammonium hydroxide.

3 REFERENCES

ISO 105 :

Section A01, *General principles of testing.*

Section A02, *Grey scale for assessing change in colour.*

4 APPARATUS AND REAGENTS

4.1 Heated exposure chamber, in which the specimens are hung. Dry air can be aspirated through the apparatus and provision is made for putting a beaker containing sulphur monochloride, or ammonium hydroxide, inside the chamber (see figure).

4.2 Sulphur monochloride (S_2Cl_2), which should not be darker than yellow, as a brown coloration indicates decomposition.

4.3 Ammonium hydroxide solution containing 300 g of NH_3 per litre (relative density 0,88).

4.4 Grey scale for assessing change in colour (see clause 3).

5 TEST SPECIMEN

5.1 If the textile to be tested is fabric, use a specimen 10 cm × 4 cm.

5.2 If the textile to be tested is yarn, knit it into fabric and use a specimen 10 cm × 4 cm, or wind it round a piece of thin inert material 10 cm × 4 cm to obtain the specified area of the textile for test.

5.3 If the textile to be tested is loose fibre, comb and compress enough of it to form a sheet 10 cm × 4 cm and sew it on to a cotton adjacent fabric to support the fibres.

6 PROCEDURE

6.1 Suspend the specimen in the exposure chamber (4.1). Heat the air in the chamber to 50 ± 4 °C and aspirate dry air through the chamber for 15 min. Close the tap leading from the drying tower and disconnect the lead to the vacuum line.

6.2 Place a beaker containing 0,01 g of sulphur monochloride (4.2) for each litre of exposure chamber capacity inside the chamber and maintain the temperature at 50 ± 2 °C for 1 h.

6.3 Switch off the heater and aspirate dry air through the chamber for 2 h.

6.4 Remove the specimen and cut it in half across the width; replace one half in the exposure chamber. Place inside the chamber a beaker containing 0,05 g of ammonium hydroxide solution (4.3) for each litre of exposure chamber capacity. Leave at room temperature for 1 h.

6.5 Assess the change in colour of the specimen with the grey scale immediately before and after neutralizing with ammonium hydroxide.

7 TEST REPORT

Report the numerical ratings for the change in colour of the test specimen before and after neutralizing with ammonium hydroxide.

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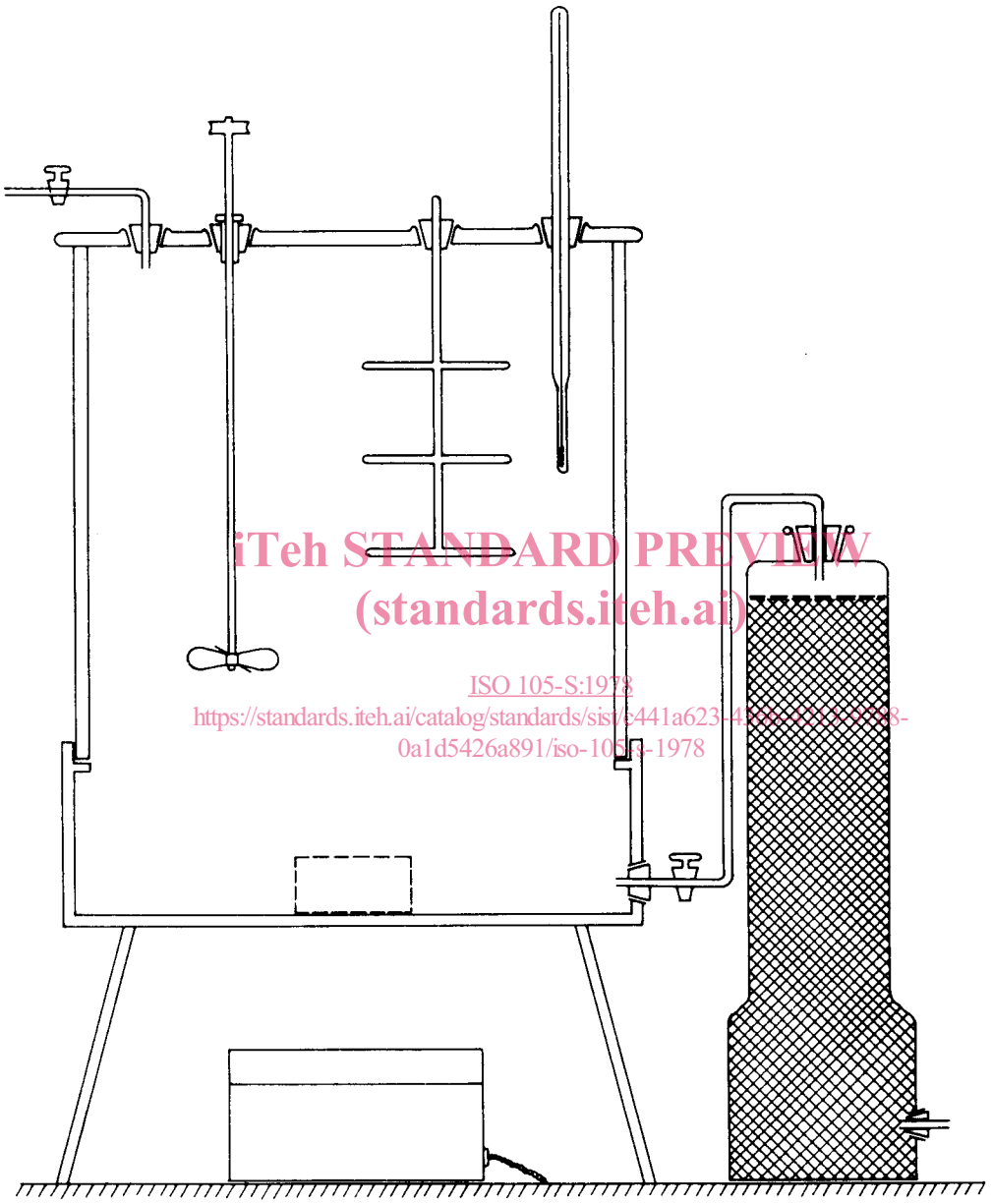

FIGURE – **Exposure chamber for vulcanizing with sulphur monochloride**

Textiles — Tests for colour fastness

S03 Colour fastness to vulcanizing : Open steam

1 SCOPE AND FIELD OF APPLICATION

This method is intended for determining the resistance of the colour of textiles of all kinds and in all forms to the action of a typical rubber compound such as may be used in the proofing industry, and to its decomposition products during vulcanization in open steam, either

a) under conditions that prevent live steam from coming into contact with the specimen to be tested (method A), or

b) under conditions that allow live steam to infiltrate into the adjacent fabric to be tested (method B).

2 PRINCIPLE

A specimen of the textile is heated in live steam in direct contact with an (initially) unvulcanized rubber compound the textile material being wrapped in either

a) sheeting impermeable to steam and water (method A),

or

b) undyed bleached cotton cloth but ensuring that live steam is not prevented from infiltration into the specimen (method B).

The change in colour of the specimen and the staining of the adjacent fabric are assessed with the grey scales.

3 REFERENCES

ISO 105 :

Section A01, *General principles of testing.*

Section A02, *Grey scale for assessing change in colour.*

Section A03, *Grey scale for assessing staining.*

4 APPARATUS AND REAGENTS

4.1 Jacketed autoclave, capable of holding a steam pressure on both jacket and pan of 390 kPa.

4.2 Stainless steel open-ended tube, of diameter 4 ± 0,3 cm, and wall thickness 0,25 ± 0,05 cm.

4.3 Sheet of uncured rubber compound, 0,25 ± 0,15 cm thick, consisting of the following :

100 parts pale crêpe;

5 parts zinc oxide;

1 part stearic acid;

2 parts sulphur;

1 part mercaptobenzothiazole;

0,2 part zinc diethyldithiocarbamate;

15 parts titanium dioxide;

75 parts barium sulphate.

If it is necessary to transport the rubber compound, it should be covered with thin polyethylene film.

4.4 Adjacent fabric, of the same generic kind of fibre as that in the textile to be tested, or that predominating in the case of blends.

4.5 Undyed bleached cotton.

4.6 For method A only (ingress of steam prevented) : **sheeting** which is impermeable to steam and water, for example rubber-proofed fabric sheeting or plastics sheeting such as polyester, capable of withstanding a temperature of 140 °C.

4.7 Grey scales for assessing change in colour and staining (see clause 3).

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Disapproved by member body of : Italy.