भारतीय मानक
Indian Standard

IS 12722 : 2024

वस्त्रादि — फर्श पर बिछाए जाने वाले — गोली परीक्षण द्वारा ज्वाला प्रतिरोध निर्धारण विधि

(पहला पुनरीक्षण)

Textile — Floor Coverings — Determination of Flame Resistance by Tablet Test

(First Revision)

ICS 13.220.40

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

October 2024 **Price Group 5**

Textiles Protective Clothing Sectional Committee, TXD 32

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Textiles Protective Clothing Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1989 and it is being revised again to update the reference in the standard.

The conventional textile floor coverings manufactured from wool, silk jute, etc, are now increasingly being manufactured utilizing blends containing man-made fibres. Their flammability depends upon the constituent fibres, exposure conditions during actual use and the nature of flame retardant treatment imparted. The floor coverings are normally subjected to various treatments, such as shampooing, dry-cleaning, washing and hot water extraction cleaning during actual use. The flame retardant finish is required to withstand these treatments. Since the type of such treatments vary considerably depending upon the end use, it is recommended that the type and number of such treatments may be as agreed to between the buyer and the seller.

This standard was first published in 1989 and it is being revised again to update the reference in the standard.

While preparing this standard, considerable assistance has been derived from ISO 6925 ‘Textile floor coverings — Burning behaviour — Tablet test at ambient temperature’, issued by the International Organization for Standardization (ISO).

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’.

Indian Standard

TEXTILE FLOOR COVERINGS — DETERMINATION OF FLAME RESISTANCE BY TABLET TEST

(First Revision)

1 SCOPE

1.1 This standard prescribes a method for the determination of flame resistance of textile floor coverings in a horizontal position when exposed to a small source of ignition under controlled laboratory conditions.

1.2 The method is applicable to all types of textile floor coverings irrespective of their construction or their fibre composition. The method may also be applicable to unfinished material.

1.3 The results obtained on specimens in a horizontal position, as specified in this standard, do not apply to the behaviour of the textile floor covering when used in another position, particularly in a vertical position.

NOTE — The method should be used solely to assess the properties of materials or systems in response to heat and flame under controlled laboratory conditions and should not be used for the evaluation or regulation of the hazard of textile floor coverings under actual fire conditions. The method has been used extensively in the trade for acceptance testing and is considered satisfactory as a test for acceptance of merchandise, provided that an appropriate sampling plan such as given IS 7877 (Part 1). Methods of sampling and tests for handmade carpets: Part 1 Sampling and selection of areas of physical tests and chemical analysis, is used.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subjected to revision, and parties to agreements based on this standard are encourage to investigate the possibility of applying the most recent edition of these standards.

3 PRINCIPLE

A specimen of textile floor covering is exposed in a horizontal position to the action of a small ignition source (methenamine tablet) under specified conditions and the resulting damaged length is measured.

4 APPARATUS

4.1 Test Box

A test box with inside dimensions of 300 mm × 300 mm × 300 mm and made from hard, fire resistant insulation board with similar thermal properties to asbestos cement board, not less than 6 mm thick. The chamber is open at the top and has a flat removable base made of the same material as above. The joints shall be air tight.

NOTE — Any other test chamber giving identical results may be used.

4.2 Square Metal Plate

The square metal plate shall be of size 230 mm × 230 mm, 6.5 mm ± 0.5 mm thick, with a 206 mm diameter hole cut in the centre of the plate.

4.3 Desiccator(s)

The desiccator shall be required for storing the methenamine tablets (*see* **5.1**) and the bone dry specimens (*see* **6.4.2**). It is recommended that self-indicating silica gel is used as desiccant.

4.4 Circulating Air Oven

The oven shall be ventilated, forced draught and thermostatically controlled at 105 ºC ± 2 ºC throughout the enclosure.

4.5 Glove — disposable, of polyethylene, polypropylene or rubber

4.6 Rule — graduated in mm

4.7 Vacuum Cleaner

A vacuum cleaner of which all surfaces in contact with the specimen are flat and smooth, shall be required.

4.8 Laboratory Fume Hood

Laboratory fume hood of about 2 m^3 capacity, capable of being closed and having its draught turned off during the test shall be required. The front or one of the sides of the hood shall be of glass in order to permit observation of the specimen during the test.

4.9 Timing Device

Requirement of timing device shall be optional.

5 REAGENTS

5.1 Methenamine Tablet

Tablets of hexamethylenetetramine, flat, having a mass of 150 ± 5 mg and a diameter of 6 mm.

NOTE — Storage of the tablets in a desiccator reduces the tendency to crack upon ignition.

6 PREPARATION OF TEST SPECIMENS

6.1 Sampling

Sampling of specimens shall be carried out in accordance with IS 7877 (Part 1).

6.2 Dimensions and Number

Cut at least eight specimens, each 230 mm ± 3 mm square, from each sample.

6.3 Underlays

The use of an underlay is not specified. However, subject to agreement between the interested parties, this method can be used to assess the effect of an underlay in combination with a textile floor covering.

6.4 Conditioning of Test Specimens

6.4.1 Clean each specimen with the vacuum cleaner (4.7) until the pile is free from fluff or loose ends of yarn, fibres, etc.

6.4.2 Condition the test specimens in a manner that will permit free air circulation so that they are not resting upon one another, in one of the following ways, or as agreed between the interested parties:

a) In the standard atmosphere of 27 °C ± 2 °C and 65 percent ± 2 percent relative humidity in accordance with IS 6359; and

b) By drying the specimens in the oven (4.4) at 105 °C ± 2 °C for 2 h, removing the specimens from the oven with a gloved hand (*see* 4.5) and placing the specimens immediately in the desiccator (4.3) for at least 1 h, until they reach ambient temperature.

NOTE — The use of bone dry specimens may be more stringent than the use of specimens conditioned at 65 percent relative humidity. However, it may be that use of specimens conditioned at 65 percent relative humidity is more realistic. Performance requirements should be set accordingly.

7 DURABILITY OF FLAME RETARDANT TREATMENT

For checking the durability of flame retardant treatment applied to the textile floor-coverings, the type and number of treatments for shampooing, dry-cleaning, washing and/or hot water extraction cleaning, etc shall be as per the agreement between the buyer and the seller (*see also* IS 11471 and IS 11969).

8 PROCEDURE

8.1 Carry out the test in an atmosphere having a temperature between 15 °C and 35 °C and a relative: humidity between 20 percent and 70 percent.

8.2 Place the test chamber (4.1) in the laboratory fume hood (4.8) with the ventilation turned off.

8.3 Remove a specimen from the conditioning atmosphere or desiccator according to the method of conditioning chosen in (6.4) with a gloved hand and, if there is a pile, brush it in a direction opposite to the lay to bring the pile to an upright position.

8.4 Place the specimen flat on the floor of the test box with the use surface uppermost, ensuring the specimen is horizontal. Place the metal plate (4.2) on top of the specimen, and line up the outside edges of the plate with those of the specimen.

8.5 Place a methenamine tablet (5.1) flat and in the centre of the specimen and ignite the tablet with a lighted match which shall only lightly touch the upper face of the tablet. If ‘used, start the timing device (4.9). Do not touch the specimen with the lighted match.

8.5.1 If more than 2 min elapses between removal of the specimen from the conditioning atmosphere or the desiccator and ignition of the tablet, repeat the procedure specified in 8.1 to 8.5 with a new conditioned specimen. Close the fume cupboard.

8.5.2 If the tablet cracks upon ignition, consider the test result void.

8.6 Allow the ignition flame or any propagated flame to burn until extinction or until the flame or glowing reaches the edges of the hole in the metal plate. Terminate the test when either of the above conditions is reached. Stop the timing device, if used. Start the ventilation in the fume hood to eliminate any volatile products of combustion.

8.7 After each specimen has been tested, lift the removable base from the test chamber and fret it of any residue which would prevent the next specimen from lying in a horizontal plane. Allow sufficient time between each test for the test chamber to cool to ambient temperature ± 5 °C .

8.8 Repeat the procedure specified in 8.3 to 8.7 on each specimen.

8.9 On each s pecimen measure, to the nearest mm, the maximum distance between the centre of the specimen and the edge of the damaged zone using the rule (4.6).

8.10 If required, measure the time in seconds from the ignition of the tablet to the moment when the flame or glowing reaches the edge of the hole in the metal plate, using the timing device (4.9).

9 EXPRESSION OF RESULTS

The results of the test shall be the value obtained for each specimen (*see* 8.9).

10 TEST REPORT

10.1 The test report shall include the following information:

a) A statement of the sampling plan used;

b) Whether a separate underlay was incorporated in the test (*see* 6.3);

c) The conditioning atmosphere used for the test specimens (*see* 6.4);

d) For each specimen, the damaged length as determined in 8.9;

e) If required, the flame spread time measured according to (8.10); and

f) Any operating detail not stated in this standard or any incident likely to have an effect on the test results.

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 6359 : 2023	Method for conditioning of textiles (*first revision*)
IS 7877 (Part 1 to Part 4) : 2023	Methods of sampling and tests for hand-made carpets (*first revision*)
IS 11471 : 2020/ ISO 2551 : 2020	Textile floor coverings and textile floor coverings in tile form — Determination of dimensional changes due to the effects of varied water and heat conditions and distortion out of plane (*first revision*)
IS 11969 : 2020/ ISO 18168 : 2015	Textile floor coverings — Colour fastness to shampooing (*first revision*)

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Textiles Protective Clothing Sectional Committee, TXD 32

Organization	*Representative(s)*
Northern India Textile Research Association, Ghaziabad	DR ARINDAM BASU **(*Chairperson*)**
Aeronav Industrial Safety Appliances, Noida	SHRI SANDEEP HORA
Arvind Limited, Ahmedabad	SHRI PABITRA SAHOO SHRIMATI PALAK KAKKAR (*Alternate*)
Avient Protective Materials Limited, Pune	SHRI HARSH WARDHAN SHARMA SHRI RAKESH GAIKWAD (*Alternate*)
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Central Industrial Security Force, New Delhi	SHRI ANAND SAXENA SHRI RAVINDRA KUMAR MEEL (*Alternate*)
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Confederation of Indian Industry, New Delhi	SHRI SAUNAK BANERJEE
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SHRI MAYUR KATIYAR
SCIENTIST 'B'/ASSISTANT DIRECTOR
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This Indian Standard has been developed from Doc No.: TXD 32 (25492).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: 5th Floor/MTNL CETTM, Technology Street, Hiranandani Gardens, Powai Mumbai 400076	25700030 25702715

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Published by BIS, New Delhi