भारतीय मानक

Indian Standard

IS 6359 : 2023

वस्त्रादि के अनुकूलन की विधि

(पहला पुनरीक्षण)

Method for Conditioning of Textiles

(First Revision)

ICS 59.080.01

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

January 2023 **Price Group 4**

Physical Methods Test Sectional Committee, TXD 01

FOREWORD

This Indian Standard (*first revision*) was adopted by the Bureau of Indian Standards after the draft was finalized by the Physical Methods Test Sectional Committee and approved by the Textiles Division Council.

Most of the textiles being hygroscopic in nature, the relative humidity and temperature of the atmosphere affect their physical and mechanical properties appreciably. In order that reliable comparisons was to be made among different materials and products and among different laboratories, it is necessary to standardize the humidity and temperature conditions and the procedure by which the textile material may be brought to the moisture equilibrium before testing.

The conditioning temperature of 20 °C ± 2 °C as specified in International Standards is not suitable for tropical countries like India where the atmospheric temperature is normally much higher than 20 °C. It is almost impossible to maintain this temperature, especially during summer when the atmospheric temperature rises even up to 50 °C. The temperature of 27 °C ± 2 °C for conditioning of the test specimens for tropical countries like India shall be referred in this standard.

This standard was originally published in 1971. The present revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) The time interval for moisture equilibrium for testing in an accelerated conditioning system has been specified;
b) Principle for the rapid/accelerated conditioning has been specified;
c) The requirements for the standard alternative atmosphere have been specified; and
d) References to Indian standards have been updated.

In the preparation of this standard, considerable assistance has been derived from ISO 139 : 2005 ‘Textiles — Standard atmospheres for conditioning and testing’.

The composition of the Committee responsible for the formulation of this standard is listed in Annex A.

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

METHOD FOR CONDITIONING OF TEXTILES

(First Revision)

1 SCOPE

1.1 This standard prescribes a procedure for conditioning of all textile materials.

1.2 This standard also prescribes a procedure for pre-conditioning of textiles which would be necessary if specified in the standard test method or specification for the material under test before conditioning.

2 REFERENCES

The standards listed below 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 subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.

IS 196 : 1966 Atmospheric conditions for testing (*revised*)

3 TERMINOLOGY

3.1 Standard Atmosphere — The environment of controlled relative humidity (RH) and temperature in which textiles are conditioned and tested.

3.2 Relative Humidity — The ratio of the actual pressure of the water vapour in the atmosphere to the saturation vapour pressure at the same temperature. The ratio is usually expressed as a percentage.

NOTE — Under normal circumstances, the sling or whirling hygrometer or Ashman's are the most convenient instruments for measuring relative humidity, they are sufficiently accurate for this purpose.

4 PRINCIPLE

4.1 The principle followed is to allow the textile material to remain in the conditioning room during its absorption cycle for a sufficient time to reach moisture equilibrium.

4.2 Rapid/Accelerated Conditioning

The system that permits specimens to reach equilibrium with the standard atmosphere for testing textiles at a significantly faster rate than if the specimens are exposed to the atmosphere in a static state.

5 REQUIREMENTS

5.1 Atmospheric Conditions for Testing (Standard)

The atmosphere in which physical tests on textile materials are performed. It has a relative humidity of 65 percent and a temperature of 27 °C (*see* IS 196).

5.2 Standard Alternative Atmosphere

5.2.1 Specific standard atmosphere shall have a temperature of 23 °C and relative humidity of 50 percent.

5.2.2 Non-tropical standard atmosphere shall have a temperature of 20 °C and relative humidity of 65 percent.

NOTE — The alternative atmosphere may be used only if the parties involved agree on its use.

5.2.3 Tolerance limits for temperature and relative humidity shall be ± 2 °C and ± 2 percent respectively.

5.3 Moisture Equilibrium for Testing

The condition reached by the sample or specimen during free exposure to moving air controlled at specified conditions. For test purposes, moisture equilibrium shall be reached by absorption, starting from relatively low moisture content. Moisture equilibrium for testing is considered to have been reached when successive weighing carried out at intervals of not less than 2 h of the textile materials freely exposed to the moving air differ by less than 0.25 percent. In the case of an accelerated conditioning system, a shorter interval for successive weighing of 2 min to 10 min shall be used.

5.4 Pre conditioning

To bring a sample or specimen to a relatively low moisture content [equilibrium in an atmosphere between 10 percent and 25 percent RH and not exceeding 50 °C (*see* Note)] prior to conditioning in a controlled atmosphere for testing. While preconditioning is frequently translated as pre-drying, specimens should not, in fact, be brought to the oven-dry state.

NOTE — These conditions may be obtained by heating air at 65 percent RH and 27 °C (the standard atmosphere) to a temperature up to 50 °C in air circulating type oven.

6 APPARATUS

6.1 Conditioning Room or Chamber

Equipped with apparatus capable of maintaining a standard atmosphere for conditioning and testing throughout the room or chamber within the specified tolerances of relative humidity and temperature and having arrangements for maintenance of proper air circulation (*see* **5.1** and **5.2**).

6.2 It shall also be equipped with instruments for recording relative humidity and temperature.

6.3 Pre conditioning Cabinet or Room

Equipped with apparatus capable of maintaining an atmosphere for pre-conditioning of textiles throughout the room or chamber within the specified tolerances of relative humidity and temperature (*see* **5.4**).

6.4 Balance

Capable of weighing to an accuracy of at least 0.25 percent of the sample weight.

7 PROCEDURE

7.1 Determine the relative humidity and temperature of the conditioning room or chamber (*see* **5.1**) and, if preconditioning is also to be carried out, find the relative humidity and temperature of the preconditioning cabinet or room to check whether the conditions meet the specified values of relative humidity and temperature or not. If the conditions are not as required, make adjustments to bring them to the desired limits of temperature and humidity.

7.1.1 If both preconditioning and conditioning are prescribed in the test method or the specification for the material, proceed as given in **7.2** and **7.3**, and if only conditioning has been prescribed, omit **7.2**.

7.2 Expose the specimen or sample in the atmosphere for preconditioning in such a way as to expose, as far as possible, all portions of the material to the atmosphere until the moisture equilibrium is attained (*see* Note 1).

7.3 Expose the specimen or sample (already pre-conditioned, if so required) in the standard atmosphere in such a way as to expose, as far as possible, all portions of the material to the atmosphere until the moisture equilibrium is attained (*see* Note 1 and Note 2).

NOTES

1 In case the material received is in package form, it is preferable to prepare test specimens in loose or open form so that all portions get uniformly exposed to the preconditioning or conditioning atmospheres. For example, in the case of yarn in the form of cones or cheeses, suitable skeins may be prepared for conditioning.

2 For guidance purposes, it may be noted that the minimum time required for the various types of textile materials having moisture regain values of less than 5 percent is about 6 h to reach moisture equilibrium while for those having moisture regain values of more than 5 percent it is 24 h.

7.4 The textile materials conditioned as above be tested according to the procedure laid down in the product specification or test method standard.

ANNEX A
(*Foreword*)

COMMITTEE COMPOSITION
Physical Methods of Test Sectional Committee, TXD 01

Organization	*Representative(s)*
Central Institute for Research on Cotton Technology (CIRCOT) Mumbai	DR PRADEEP MANDHYAN (***Chairperson***)
Bidhata Industries Pvt Limited, Mumbai	SHRI R. K. PACHERIWALA SHRI ROHIT PACHERIWALA (*Alternate*)
Central Institute for Research on Cotton Technology (CIRCOT), Mumbai	DR T. SENTHILKUMAR DR ARPUTHARAJ A. (*Alternate*)
Central Silk Technological Research Institute, Bangalore	DR SUBHAS V. NAIK DR PRAKASH BHAT (*Alternate*)
Delta Ropes Mfg Co, Kolkata	SHRI ANAND MAJARIA SHRI AAYUSH MAJARIA (*Alternate*)
DGQA (T and C), New Delhi	COL MANISH KUMAR SHRI R. K. BARUAH JAG (NFSG) (*Alternate*)
Garware Technical Fibres Limited, Pune	SHRI KISHOR DARDA SHRI SACHIN KULKARNI (*Alternate*)
ICAR-NINFET, Kolkata	DR SURAJIT SENGUPTA DR NAGESH KUMAR (*Alternate*)
IIT, Delhi (Textile Department), Delhi	PROFESSOR R. S. RENGASAMY PROFESSOR APURBA DAS (*Alternate*)
Indian Jute Industries Research Association, Kolkata	MS SAUMITA CHOUDHURY SHRI D. P. GON (*Alternate*)
Indian Jute Mills Association, Kolkata	SHRI S. K. CHANDRA SHRI J. K. BEHERA (*Alternate*) SHRI RAMA SHANKAR UPADHYAY (*Young Professional*)
Intertek India Private Limited, Gurugram	SHRI PRIYANK BHARDWAJ
Kusumgar Corporates, Mumbai	SHRI YOGESH KUSUMGAR DR M. K. TALUKDAR (*Alternate*)
Ministry of Defence (DGQA), Kanpur	SHRI R. K. BORUAH SHRI S. S. KASHYAP (*Alternate*)
North India Textile Research Association, Ghaziabad	SHRI SANJEEV SHUKLA SHRI HIMAYAT KIDWAI (*Alternate*)
Office of the Development Commissioner (MSME) (Testing Centre and Testing Station Division)	SHRI PHOOL SINGH SHRI G. S. KHANDELWAL (*Alternate*) SHRI VED P. SHARMA (*Young professional*)
Office of the Jute Commissioner, Kolkata	SHRI SOMYADIPTA DATTA SHRI MAHADEB DUTTA (*Alternate*)

Organization	*Representative(s)*
Office of the Textile Commissioner, Mumbai	SHRI SHIVA KUMAR S. SHRI N. K. SINGH (*Alternate*)
SGS India Pvt Limited, Chennai	DR KARTHIKEYAN K. SRIMATI ANITHA JEYARAJ (*Alternate*)
Testtex India Laboratories Pvt Limited, Mumbai	SHRIMATI MEETA SHINGALA SHRI MAHESH SHARMA (*Alternate*)
Texanlab Laboratories Pvt Limited, Mumbai	SHRI HARIT SARDANA SHRI VIVEK PATIL (*Alternate*)
Textiles Committee, Mumbai	SHRI KARTIKAY DHANDA DR P. RAVICHANDRAN (*Alternate*)
Thanawala & Co, Mumbai	SHRI HEMAL THANAWALA SHRI VIVAAN THANAWALA (*Alternate*)
The Arvind Mills Limited, Ahmedabad	SHRIMATI MAMTA CHAUDHARY (*Alternate*)
The Bombay Textile Research Association, Mumbai	SHRI R. A. SHAIKH SHRIMATI PRAGTI KULKARNI (*Alternate*)
The Synthetic and Art Silk Mills Research Association, Mumbai	DR MANISHA MATHUR SHRIMATI A. A. SUDAM (*Alternate*)
Tirupati Technik, Mumbai	SHRI VISHAL MASAND
Tuv Rheinland (India) Pvt Limited, Gurgaon	DR P. S. SUNDARAM SHRI SHIVENDRA PARMAR (*Alternate*)
Uster Technologies India Marketing Pvt Limited, Ahmedabad	SHRI JAGDISH KULKARNI
VJTI, Mumbai	DR SURANJANA GANGOPADHYAY DR S. P. BORKAR (*Alternate*)
Wool Research Association, Thane	MS SEEMA PATEL SHRI MAYUR BASUK (*Alternate*)
World Traders Manufacturing Co, Mumbai	SHRI VARUN GUPTA SHRI ADITYA GUPTA (*Alternate*)
In Personal Capacity (*B-21, Parijat, Talepakhadi, Eskar Road, Borivali, Mumbai-400091*)	DR R. P. NACHANE
BIS Directorate General	SHRI J. K. GUPTA, SCIENTIST 'E'/DIRECTOR AND HEAD (TEXTILES) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI ASHWANI KUMAR
SCIENTIST 'B'/ASSISTANT DIRECTOR
(TEXTILES), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: TXD 01 (19786).

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	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. CHANDIGARH. CHENNAI. COIMBATORE. DEHRADUN. DELHI. FARIDABAD. GHAZIABAD. GUWAHATI. HIMACHAL PRADESH. HUBLI. HYDERABAD. JAIPUR. JAMMU & KASHMIR. JAMSHEDPUR. KOCHI. KOLKATA. LUCKNOW. MADURAI. MUMBAI. NAGPUR. NOIDA. PANIPAT. PATNA. PUNE. RAIPUR. RAJKOT. SURAT. VISAKHAPATNAM.

Published by BIS, New Delhi