For BIS Use Only

BUREAU OF INDIAN STANDARDS
(*New Delhi*)

AGENDA

Technical Textiles for Buildtech Applications Sectional Committee, TXD 34 11th Meeting

Date/Day	Time	Venue
30 July 2024 (Tuesday)	1100 h	Through CISCO Webex Video Conferencing

CHAIRMAN: Prof (Dr) Abhijit Majumdar, IIT, Delhi

MEMBER SECRETARY: Shri Swapnil, Scientist B/Assistant Director, Textiles

Item 0 WELCOME & INTRODUCTORY REMARKS

Item 1 CONFIRMATION OF THE MINUTES OF THE PREVIOUS MEETING

1.1 The minutes of the 10th meeting of TXD 34 held on 06 November 2023 through CISCO webex video conferencing were circulated vide BIS DG letter no. TXD 34/A2.10 dated 21 November 2023. No comments have been received.

1.1.1 The Committee may **CONFIRM** the minutes.

Item 2 SCOPE AND COMPOSITION OF TXD 34

2.1 The present scope and composition of the Committee are given in **Annex 1 (Pages 4 to 6)**.

2.1.1 The Committee may **REVIEW**.

Item 3 ISSUES ARISING OUT OF PREVIOUS MEETINGS OF TXD 34

3.1 Summary of actions taken on the various decisions of the last meeting is given in **Annex 2 (Page 7)**.

3.1.1 The Committee may **NOTE**.

Item 4 DRAFT STANDARD FOR FINALIZATION

4.1 As per the decisions of the committee during the 9th meeting of TXD 34, the following draft Indian standard was issued in wide circulation for two months for eliciting technical comments from stakeholders:

Sl No.	Doc No.	Title
1	TXD 34 (23882)	Textiles — Poly Vinyl Chloride PVC Coated Tensile Fabric Architectural Membranes — Specification

The draft standard as issued under wide circulation is given in **Annex 3 (Pages 8 to 13)**. No comments have been received from various stakeholders.

4.1.1 The committee may **DECIDE**.

Item 5 COMMENT ON PUBLISHED INDIAN STANDARD

5.1 Comments have been received from Shri Tarun Agrawal, on IS 16481:2016 'Textiles — Synthetic Micro Fibres for Use in Cement Based Matrix — Specification (first revision)' are given in **Annex 4 (Page 14)**.

5.1.1 The committee may **DECIDE**.

5.2 In the 9th meeting of TXD 34, the committee scrutinized the comments received on 'IS 11057 : 1984 Specification for industrial safety nets' and decided that M/s Karan safety Pvt. Ltd. shall provide clause wise changes proposed along with proper justification and data for the proposed changes in the standard. Inputs have been received as given in **Annex 5 (Pages 15 to 18)**.

5.2.1 The committee may **DECIDE**.

Item 6 REVIEW OF PUBLISHED INDIAN STANDARD

6.1 As per procedure of BIS, standards which were published/reaffirmed five years ago or before are required to be reviewed to assess adequacy of the requirements specified. Review is carried out keeping in view the changes in technology, current industrial practices and the needs/expectations of the consumers/users so as to decide regarding further reaffirmation/ revision/withdrawal/amendment of the standards under review.

6.1.1 The list of Indian Standard due for review is given below:

Sl No.	IS No.	Title
1.	IS 15272 : 2020 / ISO 8936 : 2017	Textiles — Awnings for Leisure Accommodation Vehicles — Requirements and Test Methods (*second revision*)

6.1.2 The committee may **DECIDE**.

6.2 In the 9th meeting, the committee scrutinized the list of the standards due for review in 2023-24. Actions on various decision on review are as follows:

IS Number	IS Title	Action
IS 11057 : 1984	Specification for industrial safety nets	Standard is under review.

IS 12991 : 2005	Textiles – Camping tents and caravan awnings – Vocabulary and list of equivalent terms (first revision)	Review document circulated to members for eliciting technical comments/ inputs/ suggestions. No comment has been received. The review analysis/proformas was circulated to members through BIS Standards Portal for eliciting technical comments as given in **Annex 6 (Pages 19 to 21)**.
IS 15566 : 2005	Textiles - Caravan awnings - Functional requirements and test methods	The standard has been withdrawal.

6.2.1 The committee may **NOTE** and **DECIDE**.

Item 7 DATE AND PLACE OF NEXT MEETING

Item 8 ANY OTHER BUSINESS

ANNEX 1

(*Item* 2.1)

Scope & Composition of Technical Textiles for Buildtech Applications Sectional Committee, TXD 34

Scope: To formulate Indian Standards for terminology, testing and specification for technical textiles for build-tech applications such as building infrastructure, landscaping, decoration, hoardings etc.

Meeting(s) held	**Date & Place**
08th Meeting	15 November 2022 (Video Conferencing)
09th Meeting	28 August 2023 (Video Conferencing)
10th Meeting	06 November 2023 (Video Conferencing)

Sl No.	ORGANIZATION REPRESENTED	NAME OF THE REPRESENTATIVE PRINCIPAL/ (ALTERNATE)	ATTENDANCE
1.	Indian Institute of Technology Delhi	Prof (Dr) Abhijit Majumdar (Chairman)	3/3
2.	Association of Synthetic Fibre Industries, New Delhi	Shri M S Verma Shri S C Kapoor (Alternate)	2/3
3.	Bekaert Industries Private Ltd, Pune	Shri Ganesh Chaudhari Shri Navneet Narayan (Alternate)	0/3
4.	Central Building Research Institute, Roorkee	Shri S. K. Singh	0/0
5.	Cement Manufacturers Association, Noida	Dr Sujit Ghosh Shri K Jayasankar (Alternate) Shri Shubho Chakravarty (Alternate)	3/3
6.	Central Public Works Department, Delhi	Nomination awaited	0/0
7.	CSIR-Structural Engineering Research Centre, Chennai	Shri V Ramesh Kumar Smt. Smitha Gopinath (Alternate)	3/3
8.	E I DuPont India Pvt Limited, Gurugram	Shri Manish Bansal Shri Atanu Acharya (Alternate)	0/3
9.	Entremonde Polycoaters Limited, Agra	Dr K. M. S. Reddy	0/0

10.	Garware Technical Fibres Limited, Pune	Shri Rajendra Ghadge Shri Sachin P Kulkarni (Alternate)	2/3
11.	Indian Technical Textile Association, Mumbai	Dr Anup Rakshit	2/3
12.	Kalyani Polymers Private Limited, Bangalore	Shri Rajiv Gauri Shri Sunil Nama (Alternate)	0/0
13.	Ministry of Surface Transport, New Delhi	Nomination awaited	0/0
14.	Ministry of Textile, New Delhi	Dr Mukesh Kumar Sinha	1/1
15.	National Highway Authority of India	Nomination Awaited	0/0
16.	National Institute of Technology, Jalandhar	Dr. Palaniswamy N K Dr. A K Choudhary (Alternate)	0/0
17.	NBCC, Delhi	Nomination awaited	0/0
18.	Nina Concrete System Pvt Ltd, Mumbai	Shri Rakesh Gupta Shri Kaushal Parikh (Alternate)	2/3
19.	Northern India Textile Research Association, Ghaziabad	Nomination awaited	0/0
20.	Oriental Infrastructure Limited, New Delhi	Col A K Bhasin	0/3
21.	Owen Cornings, Mumbai	Ms Niharika	0/3
22.	PEC University of Technology, Chandigarh	Dr S K Singh Dr Sanjay Mathur (Alternate)	0/3
23.	P N Safety Industries, Mumbai	Mr. Chetan Nalavade Mr. Ganesh Patil (Alternate)	1/1
24.	Plastindia Foundation, Mumbai	Shri Surender Chaudhary Shri L K Singh (Alternate)	3/3
25.	Reliance Industries Ltd, Mumbai	Shri Rajiv Gauri Shri Manish Tiwari (Alternate)	3/3
26.	Shapoorji Pallanji & Co P Limited, Mumbai	Shri Manoj Kawalkar Hemant Gopinath Joshi (Alternate)	2/3
27.	Shri Ram Institute for Industrial Research, Delhi	Shri Vinay Kumar Samania Dr. Bhuvneshwar Rai (Alternate)	1/3
28.	SRF Technical Fibres Limited, Chennai	Smt Angelina Divya	1/3
29.	Textiles Committee, New Delhi	Shri J.D. Barman Dr. P Ravichandran (Alternate)	2/3

30.	The Synthetic and Art Silk Mills Research Association, Mumbai	Shri Ravi Prakash Singh Shri Premnath Surwase	3/3
31.	Techno Ceiling Products	Nomination Awaited	0/0

ANNEX 2
(*Item* 3.1)

SUMMARY OF ACTIONS TAKEN ON THE MINUTES OF THE PREVIOUS MEETINGS OF TXD 34

Item No.	Decision	Action taken
2.1	**SCOPE AND COMPOSITION OF TXD 34**	Updated composition is given in **Annex 1**
4	**RESEARCH AND DEVELOPMENT PROJECT** In the 10th meeting, the committee considered the proposed Terms of Reference (ToR) for Scaffolding nets.	ToR approved and Project has been allocated to NIT Jalandhar

ANNEX 3
(*Item* 4.1)

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

Draft for comments only Doc: TXD 34 (23882)
19 October 2023

भारतीय मानक मसौदा

वस्त्रादि —— पॉली दवनाइल क्लोराइड (पीवीसी) लेदपत तन्य कपडा वास्तुदिल्प दिल्ली —— विशिष्टि

Draft *Indian Standard*

TEXTILES — POLY VINYL CHLORIDE (PVC) COATED TENSILE FABRIC ARCHITECTURAL MEMBRANES — SPECIFICATION

ICS : 59.080.40

Technical Textile for Buildtech Applications Sectional Committee, TXD 34

Last date for receipt of comments is 18 December 2023

FOREWORD

(*Formal foreword to be added later*)

Architectural membrane can disperse natural light with condensed heat load with higher light transmission during daytime and is sufficient to reduce artificial lighting requirement by 5 to 20 percent. It absorbs solar energy and reduces the heat load. Most of the structural fabrication is carried out off site. It is an excellent alternative to polycarbonate or glass as roof glazing system with low maintenance.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

1.1 This standard specifies requirements for two types of PVC (Poly Vinyl Chloride) coated tensile fabric also known as architectural membrane for use in buildings, swimming pools and stadiums etc.

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 subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 TERMS AND DEFINITIONS

For the purpose of this standard the following definitions shall apply:

3.1 Tensile Fabric Structure

Tensile fabric structures are characterized by the tensioning of a membrane system, typically with wire or cable. Using tension throughout structure provides the membrane with critical structural support. Tensile architecture is the most common form of thin-shell structures.

4 MATERIALS AND MANUFACTURE

4.1 Architectural membrane shall be manufactured from PVC polyester tensile fabric and PVDF (Polyvinylidene fluoride or polyvinylidene difluoride) coated on both sides of fabric.

4.2 The membrane shall have a double lacquering made out of highly concentrated PVDF on both side, double side primer, double PVC coating and be weldable without grinding.

5 REQUIREMENTS

5.1 The tensile Membrane shall be made with dimensions as per the agreement between the buyer and the seller. The tolerance given in Table 1 shall be permissible for length and width.

Table 1
(*Clause* 5.1)

Sl No.	Dimension	Tolerance (percentage)	Method of test, Ref to
(1)	(2)	(3)	(4)
i)	Length	–5	IS 1954
ii)	Width	–5	IS 1954

5.2 The architectural membrane shall have variability in design and execution depending upon the desired output of the customer. It shall be designed for rapid construction having larger span for more coverage. The membrane structure shall be welded into a single weatherproof skin with

no extension joints. The membrane shall be highly flexible and not suffering any peeling of the topcoat (lacquering).

5.3 The tensile fabric shall conform to the requirements as specified in Table 2.

Table 2 Requirements for PVC Coated Tensile Fabrics
(*Clause* 5.3)

Sl No.	Characteristic	Requirement		Method of Test, Ref to
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Recommended yarn count, dtex	2200	1100	IS 7703 (Part 1)
ii)	Mass per unit area, g/m^2, *Min*	1550	900	IS 1964
iii)	Tensile strength, 50 mm strip, N, *Min*			IS 1969 (Part 1)
	a) Warp b) Weft	10000 9000	4200 4000	
iv)	Tensile elongations, Percent, *Min*			IS 1969 (Part 1)
	a) Warp b) Weft	— —	20 26	
v)	Tear strength, N, *Min*			IS 6489 (Part 1)
	a) Warp b) Weft	2000 2000	500 450	
vi)	Colour fastness to light, *Min*	6	6	IS/ISO 105 B02
vii)	Resistance to cracking	----- complies -----		IS 16346
viii)	Resistance to flame, mm/min, *Max*	100		IS/ISO 3795
ix)	Light transmission, Percent	------- 4.5 to 5.5 ------		ISO 9050
x)	Solar transmission, Percent	------- 4.5 to 5.5 ------		ISO 9050
xi)	Flex Testing (100000 cycles)	No Crack		IS 7016 (Part 4)
xii)	Water Proofness, at 200 psi	No Leak		IS 7016 (Part 7)

6 PACKING

The tensile fabric shall be packed in roll form with maximum roll width of 2.5 m or as agreed between the buyer and seller.

7 MARKING

7.1 Unless otherwise agreed to between the buyer and seller, the tensile fabric roll shall be marked with the following information:

a) Product identification;
b) Length and width in metres;
c) Type of material (Type 1, type 2);
d) Roll Number/Lot number; and
e) Other declarations required as per law in force.

7.2 BIS Certification Marking

7.2.1 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

8 SAMPLING

8.1 Lots

All tensile membrane rolls/bundles of same construction and types dispatched to a buyer against one dispatch note shall constitute a lot.

8.2 Unless otherwise agreed to between the buyer and the seller, the number of architectural membrane rolls/bundles to be selected at random from a lot shall be as given in col 3 of Table 3. Number of test specimen and criteria for conformity shall be as given in Table 4

Table 3 Scale of Sampling
(*Clause* 8.2)

SI No.	No. of Rolls/Bundles in Lot	Sample size	Sub-Sample Size	Permissible No. of Defective Rolls/Bundles
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	3	2	0
ii)	51 to 150	5	2	0
iii)	151 to 300	8	3	1
iv)	301 to 500	13	5	2
v)	501 and above	20	5	3

Table 4 Number of test Specimen and Criteria for Conformity
(C*lause* 8.2)

Sl No.	**Characteristics**	**No. of rolls/bundles**	**Criteria for conformity**
(1)	(2)	(3)	(4)
i.	Material and manufacture, dimensions and mass	According to col 3 of Table 3	The defective rolls do not exceed the corresponding number given in col 5 of Table 3
ii.	All other Requirements	According to col 4 of Table 3	All the specimen shall pass the tests.

ANNEX A
(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 1954 : 1990	Determination of length and width of woven fabrics – Methods (*second revision*)
IS 1964 : 2001	Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 1969 (part 1) : 2009	Textiles – Tensile properties of fabrics – Determination of maximum± force and elongation at maximum force: Part 1 Strip method (*third revision*)
IS 6489 (Part 1) : 2011	Textiles – Tear properties of fabrics Part 1 Determination of tear force using ballistic pendulum method (Elmendorf) (*second revision*)
IS 7016 (Part 4) : 2003 (Part 7) : 2023	Methods of test for coated and treated fabrics: Part 4 rubber - Or plastics - Coated fabrics - Determination of resistance to damage by flexing (*second revision*) Part 7 Determination of Resistance to Penetration by Water (*third revision*)
IS 7703 (Par 1) : 1990	Methods of test for man-made fibres continuous filament flat yarn – Part 1 Linear density (*first revision*)
IS 16346 : 2015	Geosynthetics - Method of test for evaluation of stress crack resistance of polyolefin geomembranes using notched constant tensile load test
IS/ISO 3795 : 1989	Road Vehicles and Tractors and Machinery for Agriculture and Forestry - Determination of Burning Behaviour of Interior Materials
IS/ISO 105-B02 : 2014	Textiles – Tests for colour fastness – Part B02 Colour fastness to artificial light: Xenon arc fading lamp test

ANNEX 4
(*Item* 5.1)

Comment received from Shri Tarun Agrawal, on IS 16481:2016

Dear Sir,

IS code 16481:2016 Annexure D, section D-2.3 specifies that alkali resistance of fiber is checked at 30+/- 2 Celsius temperature.

When it was pointed in a meeting that in India, ambient temperature goes beyond 50 C and due to heat of hydration, the temperature in wet concrete goes much beyond 50C, some members pointed out that this is a false information and in North India the temperature hardly goes beyond 25 Celsius.

Unfortunately, the scientist representing BIS and professor from IIT were quiet and supported that temperature hardly goes up.

It is well known that some type of fibers decomposes faster at higher temperature in alkaline medium. Still by allowing alkaline stability test at 30+/-2 Celsius, lots of fibers being used in concrete is decomposing and leading to major cracks and cavities in the concrete. There by Quality of govt work is questionable and may result is major accidents in future.

We would also like to point out that under amendment No. 2 January 2023, the synthetic fiber has been allowed to retain 85% strength in alkaline condition. This means 15% decomposition has been allowed at 30+/-2 Celsius for 28 days of testing. That means in next 28 days another 15% decomposition may take place and eventually with few months the fiber will not have any presence.

This mail is just to put things on records, how a lobby is trying to sell inferior material and with the help of BIS scientists and IIT professors, they are compromising with the quality of Govt construction work.

This information is private for few days, but may become public soon, the BIS will have to give explanation to INDIA and may be lots of constructions in INDIA will have to be redone as fibers inside the concrete has decomposed and created cavities.

Hope as a TRUE Indian Citizen you will rectify these mistakes and prevent future accidents, etc.

Regards

Tarun Agrawal

ANNEX 5
(*Item* 5.2)

TEMPLATE FOR SENDING COMMENTS ON BIS DOCUMENTS

Date:		Document No.	IS 11057	Title of the Document	Specification for Industrial safety nets
Name of the commentator/ Organization	Mohammad Karam Industries		Abbreviation of the Commentator/ Organization:		KSPL

(Comments on each clause/subclause/table/flg, etc be started on a fresh box. Information in column 5 should include reasons for the comments/suggestions for modified wording of the clauses when the existing text/ provision is found not acceptable. Adherence to this format facilitates Secretariat's work)

Abbreviation of the Commentator/ Organization:	**Clause/ Subclause No. (e.g. 3.1)**	**Paragraph No./Figure No./Table No. (e.g. Table 1)**	**Type of Comment** 1)	**Comments/Suggestions along with Justification for the Proposed Chage**	**Proposed Change/Modified Wordings**	**Committee Decision**
KSPL	1 Scope		te	3 different types of net added in the scope	This standard prescribes the requirements of industrial safety nets made from mad made fibres and designed to catch personnel and or debris falling whilst work in high buildings, and structural work of shipbuilding is being carried out. Requirements are specified for the following types:	

					1. Safety nets with border ropes of two types one suitable for use at maximum duty height up to 6 m and the other for maximum duty height of 1 m. **2.** Safety nets attached on metal frame for horizontal use **3.** Safety nets attached on metal frame for vertical use **4.** Safety nets with border ropes attached to a gallows type support. This standard also covers recommendations o the care of nets.	
KSPL	2		te	Definitions updated		
KSPL	4		te	Designation Added, to introduce safety nets attached to a metal frame for horizontal use.	**4.0 Designation** Type 1A Safety nets with border ropes for use at maximum duty height up to 6 m Type 1B Safety nets with border ropes for use at maximum duty height up to 1 m	

					Type 2 Safety nets attached on metal frame for horizontal use	
KSPL	6.4		te	In performance requirements, Deflection requirement for type 2 nets added	**6.4** The deflection at the centre of the net, when subjected to impact as described in Appendix A, shall not be greater than **1** 2m or one-half of the length of the shortest side, whichever is more for Type 1A and Type 1B nets. 2 for type 2 nets not greater than the length of the shortest side of the net The test mass shall be held by the net after each drop. Permanent deformation of supporting frame work is allowed. The test mass shall not touch any element of the supporting frame work.	

KSPL	Appendix A		te	In Appendix A, dynamic test method for type 2, type, type 3 and type 4 nets added	Refer to appendix AA, A2, A3, A4 in the draft standards attached.	

1) Type of comment: ge = general te = technical ed = editorial

ANNEX 6
(*Item* 6.2)

REVIEW ANALYSIS/PROFORMAS

REVIEW ANALYSIS OF INDIAN STANDARD
(To be submitted to the Sectional Committee)

1. **Sectional Committee No. & Title:** TXD 34 (Technical Textiles for Buildtech Applications Sectional Committee)

2. **IS No:** IS 12991 : 2005

3. **Title:** Textiles – Camping tents and caravan awnings – Vocabulary and list of equivalent terms (first revision)

4. **Date of review:** 26 March 2024

5. **Review Analysis**

i) Status of standard(s), if any from which assistance had been drawn in the formulation of this IS.

Standard (No. & Title)	Whether the standard has since been revised	Major changes	Action proposed
NA	**NA**	**NA**	**NA**

ii) Status of standards referred in the IS

Referred standards (No. & Title)	IS No. of this standards since revised	Changes that are of affecting the standard under review	Action proposed
NA	NA	NA	NA

iii) Any other standards available related to the subject & scope of the standard being reviewed (International/regional/other national/association/consortia, etc or of new or revision of existing Indian Standard)

Standard (No. & Title)	Provisions that could be relevant while reviewing the IS	Action proposed
NA	NA	NA

iv) Technical comments on the standard received, if any

Source	Clause of IS	Comment	Action proposed
NA	NA	NA	NA

v) Information available on technical developments that have taken place (on product/processes/practices/use or application/testing/input materials, etc)

Source	Development	Relevant clause of the IS under review that is likely to be impacted (Clause & IS No.)	Action proposed
INTERNAL (TXD)	Terms and Definitions	3	All the terms and definitions has been changed and same shall be updated while revising the standard.

vi) Issues arising out of changes in any related IS or due to formulation of new Indian Standard

Related IS and its Title (revised or new)	Provision in the IS under review that would be impacted & the clause no. or addition of new clause/provision	Changes that may be necessary in the Standards under review	Action proposed
NA	NA	NA	NA

vii) Any consequential changes to be considered in other IS

Related IS to get impacted	Requirements to be impacted
NA	NA

1. Any other observation:

i. Foreword shall be modified while revising the Indian standard.

2. Recommendations:

Based on the above observations, this standard is recommended to the latest version of ISO and committee may reaffirm and revise the standard for a further period of 5 years.