

वस्त्रादि — पॉली विनाइल क्लोराइड
(पीवीसी) लेपित तन्य कपड़ा वास्तुशिल्प
झिल्ली — विशिष्टि

Textiles — Poly Vinyl Chloride (PVC)
Coated Tensile Fabric Architectural
Membranes — Specification

ICS 59.080.40

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Technical Textile for Buildtech Applications Sectional Committee had been approved by the Textiles Division Council.

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 percent 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.

The composition of the Committee responsible for the formulation of this standard is given in [Annex B](#).

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.

Indian Standard

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

1 SCOPE

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 edition 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



Table 1

(Clause [5.1](#))

SI No.	Dimension	Tolerance, Percent	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Length	– 5	IS 1954
ii)	Width	– 5	IS 1954

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.

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)

SI No.	Characteristic	Requirement		Method of Test, Ref to
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Recommended yarn count, dtex	2 200	1 100	IS 7703 (Part 1)
ii)	Mass per unit area, g/m ² , <i>Min</i>	1 550	900	IS 1964
iii)	Tensile strength, 50 mm strip, N, <i>Min</i>			IS 1969 (Part 1)
	a) Warp	10 000	4 200	
	b) Weft	9 000	4 000	
iv)	Tear strength, N, <i>Min</i>			IS 6489 (Part 1)
	a) Warp	2 000	500	
	b) Weft	2 000	450	
v)	Colour fastness to light, <i>Min</i>	6	6	IS/ISO 105-B02
vi)	Resistance to cracking	complies		IS 16346
vii)	Resistance to flame, mm/min, <i>Max</i>	100		IS/ISO 3795
viii)	Light transmission, percent	4.5 to 5.5		ISO 9050
ix)	Solar transmission, percent	4.5 to 5.5		ISO 9050
x)	Flex testing (100 000 cycles)	No Crack		IS 7016 (Part 4)
xi)	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:

- Product identification;
- Length and width in metres;
- Type of material (Type 1, Type 2);
- Roll number/Lot number; and
- Other declarations required as per law in force.

7.2 BIS Certification Marking

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*(Clause 8.2)*

SI 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

<i>IS No./Other Standards</i>	<i>Title</i>	<i>IS No./Other Standards</i>	<i>Title</i>
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light: Xenon arc fading lamp test	IS 7016 (Part 4) : 2003/ ISO 7854 : 1995	Methods of test for coated and treated fabrics: Rubber- or plastics-coated fabrics — Determination of resistance to damage by flexing (<i>second revision</i>)
IS 1954 : 2024/ ISO 22198 : 2006	Textiles — Fabrics — Determination of width and length (<i>third revision</i>)	(Part 7) : 2023/ ISO 1420 : 2016	Determination of resistance to penetration by water (<i>third revision</i>)
IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (<i>second revision</i>)	IS 7703 (Part 1) : 1990	Methods of test for man-made fibres continuous filament flat yarn: Part 1 Linear density (<i>first revision</i>)
IS 1969 (Part 1) : 2018/ISO 13934-1 : 2013	Textiles — Tensile properties of fabrics: Part 1 Determination of maximum force and elongation at maximum force using the strip method (<i>fourth revision</i>)	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	ISO 9050 : 2003	Glass in building — Determination of light transmittance, solar direct transmittance, total solar energy transmittance, ultraviolet transmittance and related glazing factors
IS 6489 (Part 1) : 2011/ ISO 13937-1 : 2000	Textiles — Tear properties of fabrics: Part 1 Determination of tear force using ballistic pendulum method (Elmendorf) (<i>second revision</i>)		

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ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Technical Textile for Buildtech Applications Sectional Committee, TXD 34

<i>Organization</i>	<i>Representative(s)</i>
Indian Institute of Technology, Delhi	PROFESSOR ABHIJIT MAJUMDAR (<i>Chairperson</i>)
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Member Secretary
SHRI SWAPNIL
SCIENTIST 'B'/ASSISTANT DIRECTOR
(TEXTILES), BIS

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