भारतीय मानक
Indian Standard

IS 11926 : 2024

वस्त्रादि — ऑटोमोटिव टायरों के लिए पॉलीएमाइड टायर कॉर्ड का कपडा — विशिष्टि

(पहला पुनरीक्षण)

Textiles — Polyamide Tyre Cord Fabric for Automotive Tyres — Specification

(First Revision)

ICS 59.080.30

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October 2024

Price Group 5

Technical Textiles for Mobiltech Applications Sectional Committee, TXD 38

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Technical Textiles for Mobiltech Applications Sectional Committee had been approved by the Textiles Division Council.

Polyamide tyre cords play a pivotal role in enhancing the strength and resilience of automotive tyres. Their high tensile strength and flexibility contribute to improved performance and safety on the roads. This standard on polyamide tyre cords further ensures that these cords meet quality and safety benchmarks, assuring consumers of reliable and durable tyres for automotive vehicles.

This standard was first published in 1987. This revision has been brou in the light of experience gained since its publication and to incorporate the following major changes: → made

a) The title of the standard has been modified;

b) Scope of the standard has been modified to incorporate the three additional varieties of yarn with a nominal linear density of 210 (3 ply), 280 (2 ply) and 315 (2 ply);

c) Existing varieties have been rationalized to align the requirements of twist per metre (TPM), breaking strength, elongation at predetermined load, elongation at breaking load and thickness as per the current industrial practices;

d) Amendments to Indian Standards have been incorporated;

e) References to the Indian Standards have been updated; and

f) BIS certification marking clause has been modified.

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 — POLYAMIDE TYRE CORD FABRIC FOR AUTOMOTIVE TYRES — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements of nine varieties of grey polyamide tyre cord fabric used in the manufacturing of automotive tyres.

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 Indian Standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TERMINOLOGY

For the purpose of this standard the following definitions in addition to those given in IS 4910 (Part 1) shall apply.

3.1 Tyre Cord — A particular construction of filaments of polyamide, used as the structural reinforcement of pneumatic tyres.

3.2 Tyre Cord Warp Sheet (Tyre Cord Fabric) — A planar textile structure consisting of tyre cord warp with widely spaced weft threads. The latter merely serves to hold the warp cords in position for processing.

4 MANUFACTURE

4.1 Yarn

The yarn used for the manufacture of tyre cord shall be continuous filament yarn of nylon 6 or nylon 66 when tested as per the method prescribed in IS 667. The yarn should be satisfactory in evenness and reasonably free from defects, such as undrawn yarn, broken filaments, oil stains and other extraneous material.

4.2 Tyre Cord

The tyre cord shall be made out of 2 or 3 yarns as stated in **4.1** by plying these together by applying the necessary twist. The tyre cord shall be evenly twisted and shall be reasonably free from defects, such as knots, slubs, kinks, etc, that would affect the serviceability of the cord.

4.3 Cord Joints

Cord joints shall be sewn spliced or air spliced in such a manner as to obtain at least 85 percent of the minimum breaking load specified for the cord at the joined portion. The maximum number of sewn joints for a particular length of cord shall be subject to agreement between the buyer and the seller.

4.4 Weft Yarn

The weft yarn used in the manufacture of tyre cord fabric shall be made of cotton or other suitable fibre with a linear density of 14 tex to 30 tex (20 ^{s} to 42 ^{s} count).

4.5 Tab (or Header)

Tabs (or headers) shall be provided at each end of the warp sheet roll and at intermediate positions in the roll as agreed to between the buyer and the seller.

4.6 Tabby

One tabby shall be provided for each creel load or for a suitable number of rolls as agreed to between the buyer and the seller.

5 REQUIREMENTS

5.1 The constructional particulars of the fabric, namely, end/dm, picks/dm, fibre used in the weft, total number of ends, linear density of weft, roll length and width and mass (g/m^2) shall be as agreed to between the buyer and the seller subject to the tolerances given in Table 1 when tested as per the test method indicated against corresponding characteristic.

5.2 Tyre cords of different varieties, as used in the tyre cord fabric, shall conform to the requirements given in Table 2.

5.3 The requirements of tyre cord for heat shrinkage and heat shrinkage force, heat degradation and creep characteristics shall also be as agreed to between the buyer and the seller and the test shall be carried out

as per the method given in IS 4910 (Part 5), IS 4910 (Part 7) and IS 4910 (Part 10) respectively.

6 PACKING

6.1 Unless otherwise agreed to between the buyer and the seller, the tyre cord fabric shall be packed as given in **6.2**.

6.2 Tyre cord fabric shall be attached to a roller of suitable dimensions and wound evenly and tightly onto the roller. The roll shall be covered with at least one layer of polyethylene film of a minimum 100 micron thickness (*see* IS 2508) and finally wrapped in one layer of hessian cloth conforming to Type 1 of IS 2818 or any other sacking cloth. Discs of suitable size shall be applied at the roll ends and final wrapping layer of hessian/sacking cloth shall be securely sewn in order to protect the roll from contamination of ingress of moisture or physical damage.

7 MARKING

7.1 Each roll of the tyre cord fabric shall be marked with the following by attaching the printed label:

a) Manufacturer's name and recognized trademark, if any;

b) Width of the roll/sheet;

c) Variety of cord;

d) Length, mass of roll;

e) Date of manufacture;

f) Lot number/batch number; and

g) Any other information as required by the law in force/provided by the manufacturer.

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

The sampling and criteria for conformity of tyre cord fabric shall be as prescribed in IS 4910 (Part 12).

Table 1 Tolerance Construction Particulars of Tyre Cord Fabric

(*Clause* 5.1)

Sl No.	Characteristic	Tolerance	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Ends/dm	± 1.25 percent	—
ii)	Picks/dm	± 10 percent	IS 1963
iii)	Width, mm	± 20 mm	IS 1954
iv)	Mass, g/m^2	± 3 percent	IS 1964
v)	Total number of warp ends	Nil	—

Table 2 Requirements of Polyamide Cords for Fabric (Warp Sheet) for Automotive Tyres

(*Clause* 5.2)

Variety No.	Nominal Linear Density of Yarn, Tex	No. of Plies	Linear Density of Cord, Tex	Twister per Metre		Breaking Strength on 25 cm Test Length N (kgf), *Min*	Elongation at Pre-determined Load, Percent						Elongation at Breaking Load, percent	Thickness, mm
				Singles (Z twist)	Plied (S twist)		44 N	66.6 N	89.2 N	111 N	133 N	153 N		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	94	2	210	472	472	130 (13.3)	13.0	—	—	—	—	—	31.0	0.54
2	94	2	215	510	510	130 (13.3)	14.0	—	—	—	—	—	32.0	0.55
3	140	2	315	394	394	200 (20.4)	—	13.0	—	—	—	—	31.0	0.66
4	140	3	475	315	315	295 (30.1)	—	—	—	14.0	—	—	33.0	0.80
5	188	2	420	335	335	270 (27.5)	—	—	13.0	—	—	—	32.0	0.75
6	210	2	475	315	315	295 (30.1)	—	—	—	14.0	—	—	32.0	0.80
7	210	3	710	260	260	440 (44.9)	—	—	—	—	—	14.0	32.0	0.97
8	280	2	630	260	260	400 (40.8)	—	—	—	—	14.0	—	32.0	0.95
9	315	2	710	260	260	440 (44.9)	—	—	—	—	—	14.0	32.0	0.97
Tolerance	—	—	± 3 percent	± 16 tpm	± 16 tpm	—	± 2 percent						± 5	± 0.04 mm
Method of Test	IS 4910 (Part 2)	—	IS 4910 (Part 2)	—	—	IS 4910 (Part 3)	IS 4910 (Part 3)							IS 4910 (Part 8)

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 832 (Part 1) : 2021/ISO 2061 : 2015	Textiles — Determination of twist in yarns: Part 1 Direct counting method (*third revision*)
IS 1954 : 2024/ ISO 22198 : 2006	Textiles — Fabrics — Determination of width and length (*third revision*)
IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 2508 : 2024	Polyethylene films and sheets — Specification (*fourth revision*)
IS 2818 : 2015	Textiles — Hessian — Specification (*third revision*)
IS 4910	Tyre yarns, cords and tyre cord fabrics made from man-made fibres — Method of test:
(Part 1) : 2023	Definition of terms (*second revision*)
(Part 2) : 2023	Linear density (*second revision*)
(Part 3) : 2023	Load and elongation characteristics (*second revision*)
(Part 5) : 2023	Heat shrinkage and heat shrinkage force (*second revision*)
(Part 7) : 2023	Heat degradation (*second revision*)
(Part 8) : 2023	Thickness (*second revision*)
(Part 10) : 2023	Creep (*second revision*)
(Part 12) : 2024	Sampling for tyre yarns, cords and tyre cord fabrics made from polyamide (*first revision*)

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Technical Textiles for Mobiltech Applications Sectional Committee, TXD 38

Organization	*Representative(s)*
Northern India Textile Research Association, Ghaziabad	DR M. S. PARMAR (***Chairperson***)
Arvind Limited, Ahmedabad	MS MAMTHA CHAUDHARY SHRI PABITRA SAHOO (*Alternate*)
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Textiles Committee, New Delhi	SHRI KARTIKEYA DHANDA SHRI RAVICHANDRA (*Alternate*)
The Synthetic & Art Silk Mills Research Association, Mumbai	SHRI SANJAY SAINI SHRI PREMNATH SURWASE (*Alternate*)
Uniproducts Pvt Ltd, Rewari	SHRI VIKAS YADAV
BIS Directorate General	SHRI J. K. GUPTA, SCIENTIST 'E'/DIRECTOR AND HEAD (TEXTILES) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

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

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This Indian Standard has been developed from Doc No.: TXD 38 (24934).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi