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 **Doc No. TXD 39 (24012)**

भारतीय मानक

**वस्त्रादि — जूतों और बूटों के लिए नायलॉन लेस — विशिष्टि**

*( पहला पुनरीक्षण )*

*Indian Standard*

**Textiles — Nylon Laces for Shoes and Boots — Specification**

*( First Revision )*

ICS 61.060

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भारतीय मानक ब्यूरो

B U R E A U O F I N D I A N S T A N D A R D S

*मानक भवन,* 9 *बहादर शाह ज़फर मार्ग, नई दिल्ली -* 110002MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG

NEW DELHI 110002

[www.bis.gov.in](http://www.bis.gov.in) [www.standardsbis.in](http://www.standardsbis.in)

**June 2024 Price Group**

Technical Textiles for Clothtech Applications Including Narrow Fabrics and Braids Sectional Committee, TXD 39

FOREWORD

Laces are strings or cords used to secure footwear, such as shoes and boots, by threading through eyelets or hooks. Nylon laces are durable and flexible known for their strength and resistance to wear and tear, nylon laces are ideal for outdoor and work footwear, providing reliable support and longevity. Beyond functionality, laces also serve as a fashion element, available in numerous colors and designs to complement or enhance the look of the footwear.

This standard was first published in 1996. This revision has been brought out in the light of experience gained since its publication and to incorporate the following major changes:

1. Title of the standard has been modified;
2. BIS certification marking clause has been modified; and
3. References to standard given in Annex A has been updated.

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

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 — NYLON LACES FOR SHOES AND BOOTS — SPECIFICATION

*( First Revision )*

**1 SCOPE**

This specification covers the requirement of nylon laces to be used in shoes and boots.

**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 MATERIALS**

**3.1** Laces shall be manufactured from bulked nylon 6 or nylon 6,6 multifilament yarn.

**3.2** The tips shall be made from transparent cellulose acetate film.

**4 MANUFACTURE**

**4.1** The laces shall be firmly and uniformly braided throughout with equal tension on each end/yarn.

**4.2** The laces shall be cut to the required length for shoes and boots as the case may be.

**4.3** The tips of the laces shall be 15 mm in length and shall be securely fixed at both the ends so that these do not come off. The tips shall not slip easily even on wetting. Alternatively heat or chemical fusing may be adopted for formation of tips. The nylon laces shall not protrude out of tips at the end.

**5 WORKMANSHIP AND FINISH**

The laces shall be free from broken filaments. Knots, if any, shall be as small as possible and firm, with the ends neatly trimmed off. The laces shall be evenly dyed, free from stains and streaks when judged by visual inspection.

**6 REQUIREMENTS**

The laces shall conform to the requirements given in Table 1.

**7 PACKING**

The laces shall be packed in pairs. The laces shall then be bundled or packed as agreed to between the buyer and the seller. Only laces of same type, length and colour shall be packed together in the same bundle of package.

**Table 1 Requirements of Laces**

(*Clause* 6)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No.** | **Characteristic(s)** | **Requirement(s)** | **Tolerance(s)** | **Method of Test, Ref to** |
| Laces for Boot | Laces for Shoes |
| (1) | (2) | (3) | (4) | (5) | (6) |
| i) | Length, cm | 90.0 ± 2 | 60.0 | ± 2 | IS 1954 |
| ii) | Flat width, mm | 6.0 + 0.5 - 0.0 | 5.0 | + 0.5- 0.0 |
| iii) | Mass per 10 pairs, g, *Min* | 70.0 | 45.0 | - | Annex B |
| iv) | Number of plaits per 2.5 cm | 30.0 ± 2 | 30.0 | ± 2 | Annex C |
| v) | Number of spindles | 32.0 | 32.0 | - | Visual |
| vi) | Breaking load, N, *Min* | 750.0 | 550.0 | - | IS 1969 |
| vii) | *p*H of aqueous extract | 6.5 to 8.5 | 6.5 to 8.5 | - | IS 1390 |
| viii) | Colour fastness to:a) Lightb) Washing (Test 3) | 4 or better | 4 or better | \_\_ | IS/ISO 105-B01orIS/ISO 105-B02IS/ISO 105-C10 |
| ix) | Elongation under 5.0 kg load, percent, *Max* | 25.0 | 25.0 | - | IS 1969 |

**8 MARKING**

**8.1** Each pair of laces shall be bound by paper band bearing the following information:

1. Manufacturer’s name initials or trademark;
2. Material (for example, nylon lace); and
3. Length in cm.

**8.2** Bach bundle or package shall have a label securely attached and bearing the following information:

1. Manufacturer’s name, initials or trademark;
2. Material (for example, nylon lace);
3. Length, in cm;
4. Colour;
5. Number of pairs; and
6. Any other information as required by the law in force.

**8.3 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 product(s) may be marked with the Standard Mark.

**9 SAMPLING AND CRITERIA FOR CONFORMITY**

**9.1 Sampling**

**9.1.1 Lot**

The quantity of laces of the same size and shade delivered to a buyer against one dispatch note shall constitute a lot.

**9.1.2** The conformity of a lot to the requirements of the standard shall be determined on the basis of the tests carried out on the laces selected from the lot.

**9.1.3** Unless otherwise agreed to between the buyer and the seller, the number of pairs of laces to be selected at random for inspection shall be in accordance with Table 2.

**9.2 Criteria for Conformity**

It shall be as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| *Sl No.* | *Characteristics* | *No. of Samples* | *Criteria for Conformity* |
| (1) | (2) | (3) | (4) |
| i) | Visual inspection  | According to col (3) of Table 2 | All sample shall pass. |
| ii) | Length, width, mass of 10 pairs and number of plaits | According to col (4) of Table 2 | The number of non-conforming pair shall not exceed the corresponding number given in col (5) of Table 2  |
| iii) | Breaking load, *p*H of aqueous extract colour fastness and elongation under 5 kg load. | According to col (6) if Table 2 | All test pieces shall meet the requirements specified. |

**Table 2 Sampling Plan**

(*Clause* 9.1.3)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl No.** | **Lot Size, No. of Pairs** | **Sample Size for Visual Inspection** | **Sub- Sample for Non -Destructive Tests** | **Permissible No of Non -Conforming Units** | **Sub Sample Size for Destructive Tests** |
| (1) | (2) | (3) | (4) | (5) | (6) |
|  | Up to 50 | 8 | 3 | 0 | 3 |
|  | 51 to 100 | 13 | 4 | 1 | 3 |
|  | 101 to 150 | 20 | 5 | 2 | 4 |
|  | 105 to 300  | 32 | 8 | 3 | 5 |
|  | 301 to 500 | 50 | 12 | 5 | 6 |
|  | 500 and above | 80 | 20 | 7 | 8 |

**ANNEX A**

(*Clause* 2)

**LIST OF REFERRED STANDARDS**

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS/ISO 105-C10 : 2006 | Textiles – Tests for colour fastness Part C10 Colour fastness to washing with soap or soap and soda (*Second Revision*) |
| IS 1390 : 2022  | Textiles Determination of pH of aqueous extract (*Third Revision*) |
| IS 1954 : 2024 : | Textiles - Fabrics - Determination of width and length (*Third Revision*) |
| IS 1969 (Part 2) : 2018 | Textiles – Tensile properties of fabrics – Part 2 Determination of maximum force using the grab method (*Fourth Revision*) |
| IS/ISO 105-B02 : 2014 | Textiles – Tests for colour fastness – Part B02 Colour fastness to artificial light: Xenon arc fading lamp test |

**ANNEX B**

(*Clause* 6 and *Table* 1)

**DETERMINATION OF MASS**

**B-1** Take a set of 10 pairs of laces from the test sample. Condition of the test sample at (65 ± 2) percent relative humidity and (27 ± 2) °C temperature for 24 h and weigh them to an accuracy of 0.5 g.

**ANNEX C**

(*Clause* 6 and *Table* 1)

**METHOD FOR DETERMINATION OF PLAITS/2.5 cm**

**C-l** The test specimen shall be conditioned at (65 ± 2) percent relative humidity and (27 ± 2) °C temperature for 48 h. The laces shall be laid down on a smooth flat measuring surface and the counting shall be carried out in a relaxed condition.

**C-2** The plaits shall be counted to the nearest l/2 plait over a distance of 25 mm. Five such determinations shall be made at random on the sample under test and then average taken.

**ANNEX D**

(*Foreword*)

**COMMITTEE COMPOSITION**

Technical Textiles for Clothtech Applications including Narrow Fabrics and Braids Sectional Committee, TXD 39

| *Organization* |  | *Representative*(*s*) |
| --- | --- | --- |
| Additional Controller CQA (General Stores), DGQA, Ministry of Defence, Kanpur  |  | Shri A. Chowdhury **(*Chairperson*)** |
| ICAR - Central Institute for Research on Cotton Technology, Mumbai  |  | Dr P. Jagajanantha |
| Federation of Indian Chambers of Commerce and Industry, New Delhi |  | Shri Anu HandaDr T. Senthilkumar (*Alternate*) |
| Indian Technical Textile Association, Mumbai |  | Dr Anup RakshitShri Vikram Jain (*Alternate*) |
| M K U Limited, Kanpur |  | Shri Sumit KhandelwalShri Rajib Pal (*Alternate*) |
| Motilal Dulichand Pvt Ltd, Kanpur |  | Shri Shailendra Nath Misra Shri Sudhir Shivhare (*Alternate*) |
| National Textile Corporation, New Delhi |  | Shri R. K. Yadav |
| Ordnance Parachute Factory, Kanpur |  | Shri V. M. BagadeShri S. Kondaiah (*Alternate*) |
| Office of Textiles Commissioner, Mumbai  |  | Shri V. K. KohliShri Humayun K. (*Alternate*) |
| SGS Limited, Gurugram  |  | Ms Anitha JeyarajShri Gaurav Saraswat (*Alternate*) |
| S L Banthia Textiles Industries Pvt Ltd, Surat |  | Shri Santosh Kumar Banthia |
| Shipra International, Kanpur |  | Shri Abhishek Kumar Agrawal |
| Sky Industries Ltd, Navi Mumbai |  | Shri Kapil MehrotraShri Michael (*Alternate*) |
| Synthetic and Art Silk Mills Research Association, Mumbai |  | Shri Sanjay SainiShri Premnath Surwase (*Alternate*) |
| Thanawala & Co, Mumbai |  | Shri Hemal Thanawala Shri Vivan Thanawala (*Alternate*) |
| The Bombay Textile Research, Association, Mumbai |  | Shri Shaikh Riyaz AhmedDr Prasanta Kumar Panda (*Alternate*) |
| U P Textile Technological Institute, Kanpur |  | Dr Prashant Vishnoi |
| Universal Yarn & Tex Pvt Ltd, Kanpur |  | Shri Rajiv K. Bhartiya |
| BIS Directorate General |  | Shri J. K. Gupta, Scientist ‘E’/Director and Head (Textiles) [Representing Director General (*Ex-officio*)]  |

*Member Secretary*

Shri Tanishq Awasthi

Scientist ‘B’/Asistant Director

(Textiles), BIS

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