

भारतीय मानक
Indian Standard

IS 17043 : 2018

डर्बी जूते — विशिष्ट

Derby Shoes — Specification

ICS 13.340.50; 61.060

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Price Group 7

Footwear Sectional Committee, CHD 19

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Footwear Sectional Committee had been approved by the Chemical Division Council.

Derby shoes are used by armed forces/police forces for daily wear and for marching purposes. It is occupational footwear for daily use.

This standard prescribes constructional and performance requirements of derby shoes which are to be used by armed forces/police forces. This standard is being developed under the scope of "Make in India 1.0".

Bibliography is given in Annex D and the list of committee members and experts who have actively contributed and participated in the development of this standard is given in Annex E.

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 : 1960 'Rules for rounding off numerical values (*revised*)'. 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

DERBY SHOES — SPECIFICATION

1 SCOPE

This standard prescribes requirements, methods of sampling, and tests for derby shoes made from leather with direct moulded PU-rubber sole.

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 agreement based on this Indian Standard are encouraged to investigate the possibility of applying the most recent editions of the Indian Standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 2050, 3 of IS 15298 (Part 4) and the following shall apply.

3.1 Lot — A collection of footwear in a consignment belonging to the same size and pattern or batch of manufacture. In case the batch size is small, footwear of the same size and pattern manufactured during a

period, not exceeding a fortnight, may be grouped together to form a lot (also *see* 6.1.3).

3.2 Defect — A failure or fault such that the product does not satisfy specified physical or chemical requirement, or performance characteristics. It also includes any noticeable irregularity in material, workmanship, or damage due to careless and inadequate packing.

3.3 Defective Footwear — Footwear which has one or more defects with respect to the quality characteristics under consideration.

3.4 Acceptable Quality Level (AQL) — The maximum percentage of defective product in a lot, which for the purpose of sampling of footwear, can be considered as satisfactory process average for a given characteristic.

NOTE — For every sampling plan there is an associated AQL value and this value is given as percent defective items in a lot which, under the plan, will be accepted by the purchaser.

4 PHYSICAL REQUIREMENTS

4.1 General

The derby shoes shall conform to the physical requirements given in Table 1.

Table 1 Physical Requirements for Derby Shoes

(Clause 4.1)

	Requirement	Subclause	Test on Finished Footwear/ Material
Design	Size	4.3.1	X
	Weight	4.3.2	X
	Height of Upper	4.4	X
	Ergonomic feature	4.5.2	X
	Bond strength	4.5.3	
	- Upper - outsole bond strength	4.5.3.1	X
	- Interlayer bond strength	4.5.3.2	X
Whole footwear	Slip resistance	4.5.4	X
	Electrical properties	4.5.5	
	- Antistatic footwear	4.5.5.1	X
	Heat insulation of sole complex	4.5.6	X
	Cold insulation of sole complex	4.5.7	X
	Energy absorption of seat region	4.5.8	X
Upper	Material	4.6.1	I
	Thickness	4.6.1	X
	Tear strength	4.6.2	X
	Water vapour permeability and coefficient	4.6.3	X
	Water penetration and water absorption	4.6.4	O

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Table 1 (Concluded)

	Requirement	Subclause	Test on Finished Footwear/ Material
Lining material	Material	4.7.1	I
	Thickness	4.7.1	X
	Tear strength	4.7.2	X
	Abrasion resistance	4.7.3	X
	Water vapour permeability and coefficient	4.7.4	X
Insole	Material	4.8.1	I
	Thickness	4.8.1	O
	Abrasion resistance	4.8.2	O
	Water absorption and desorption	4.8.3	O
Insocks	Material	4.9.1	I
	Thickness	4.9	X
	Water absorption and desorption	4.9.2	X
Toe puff and Counter stiffener	Abrasion resistance	4.9.3	X
	Material and thickness	4.10	O
	Material	4.11.1	I
Tongue	Thickness	4.11.1	X
	Tear strength	4.11.2	X
Closing thread	Breaking load	4.12	O
	Material	4.13.1	I
Outsole	Thickness	4.13.2	X
	Moulded density	4.13.3	X
	Hardness	4.13.4	X
	Ageing test	4.13.5	X
	Tear strength	4.13.6	O
	Abrasion resistance	4.13.7	X
	Flexing resistance	4.13.8	X
	Material	4.14	I
Eyelet	Colour peeling test	4.14	X
	Eyelet pull out test	4.14	X
Laces	Material	4.15.1	I
	Breaking load and tag retention	4.15.2	X

NOTE — Whenever possible, test pieces shall be taken from finished footwear

X Tests shall be carried out on finished footwear
 O If it is not possible to obtain large enough test piece from finished footwear, then a sample of the material from which the footwear component has been manufactured may be used and this should be noted in the test report. Manufacturer/supplier shall provide a certificate stating that the material sample provided by them has the same composition and has been prepared under similar condition which has been used for footwear.

I Identification by visual and tactile examination

4.2 Design

The design of the shoes shall be derby type and conform to design A of IS 15298 (Part 4) (see Fig 1).

4.3 Size and Weight

4.3.1 Size

Sizes shall be in the range of 4 to 12 (English system with G/H fitting) conforming to the dimensions given in IS 1638.

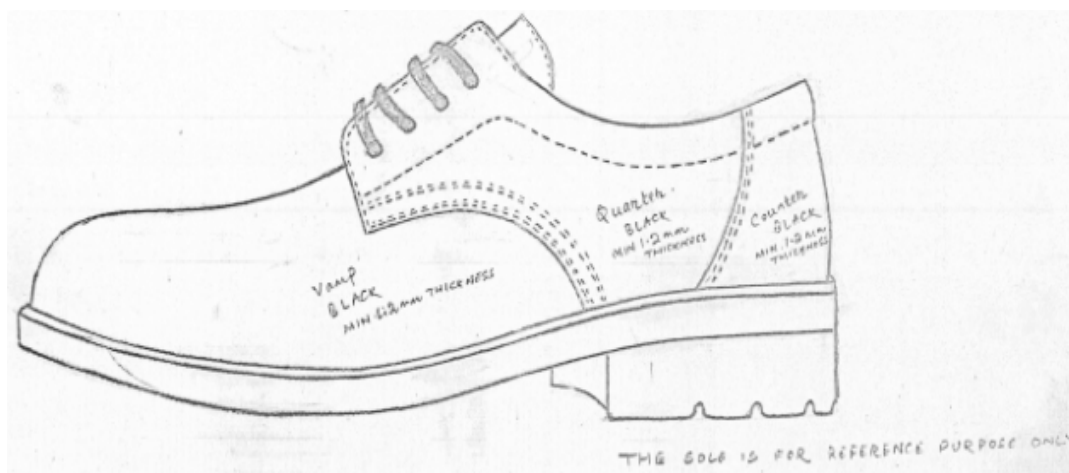


FIG. 1 DERBY SHOES

4.3.2 Weight

The maximum weight for a pair of shoes shall be as given in Table 2.

Table 2 Maximum Weight of Derby Shoe Pair

Size Category	Weight (in g), Max.
Small (sizes 4 – 6)	775
Medium (sizes 7 – 9)	850
Large (sizes 10 – 12)	925

4.4 Height of Upper

The height of the upper, when measured in accordance with 6.2 of IS 15298 (Part 1), shall be as given in Table 3.

Table 3 Height of the Upper
(Clause 4.4)

Shoe Size	Height, in mm
4	< 105
5-6	< 109
7-8	< 113
9-10	< 117
11-12	< 121

4.5 Properties of Whole Footwear

4.5.1 Construction

The upper shall be made of chrome tanned finished grain leather and lining shall be made of lining leather to absorb perspiration. The shoes are manufactured

with direct moulded cleated PU-rubber soles having anti slip design with strobel stitching.

4.5.2 Ergonomic Feature

The shoes shall be deemed to satisfy the ergonomic requirements if the questionnaire prescribed in 5.1 of IS 15298 (Part 1), are meeting with positive response for all criteria.

However, if the shoes are rigid as per 8.4.1 of IS 15298 (Part 1), then question 4.3 of Table 2 of IS 15298 (Part 1) is not applicable.

4.5.3 Bond Strength

The direct moulded shoes shall be subjected to adhesion tests. The testing shall be done at least 24 h after manufacture, after allowing the shoes to cool down to room temperature.

4.5.3.1 Upper outsole bond strength

When the shoes are tested according to method given in 5.2 of IS 15298 (Part 1), the bond strength shall not be less than 4.0 N/mm, unless there is tearing of the sole, in which case the bond strength shall not be less than 3.0 N/mm.

4.5.3.2 Interlayer bond strength

The bond between the midsole and the outer sole shall not be less than 4.0 N/mm, unless there is tearing of the sole, in which case the bond strength shall not be less than 3.0 N/mm, when tested according to method given in 5.2 of IS 15298 (Part 1).

4.5.4 Slip Resistance

When tested in accordance with 5.11 of IS 15298 (Part 1), the boots shall conform to 5.3.4.2, 5.3.4.3 or 5.3.4.4 of IS 15298 (Part 4).

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4.5.5 Electrical Properties

4.5.5.1 Antistatic footwear

When tested in accordance with 5.10 of IS 15298 (Part 1), after conditioning:

- a) In a dry atmosphere, the electrical resistance shall be greater than 100 k Ω and less than or equal to 1 000 M Ω ; and
- b) In a wet atmosphere, the electrical resistance shall be greater than 100 k Ω and less than or equal to 1 000 M Ω .

NOTE — Electrical resistance does not mean shock proof. Boots with electrical resistance are capable of reducing the amount of current reaching human body in case of accidental contact with high voltage source. The resistance performance may be reduced over time due to wear and tear.

4.5.6 Heat Insulation of Sole Complex

When tested in accordance with 5.12 of IS 15298 (Part 1), the shoes shall conform to the requirements prescribed in 6.2.3.1 of IS 15298 (Part 4).

4.5.7 Cold Insulation of Sole Complex

When tested in accordance with 5.13 of IS 15298 (Part 1), the shoes shall conform to the requirements prescribed in 6.2.3.2 of IS 15298 (Part 4).

4.5.8 Energy Absorption of Seat Region

When tested in accordance with 5.14 of IS 15298 (Part 1), the energy absorption of the seat region shall not be less than 20 J.

4.6 Upper

4.6.1 Material

The upper shall be made of finished grain leather of bovine origin with minimum thickness of 1.2 mm.

In addition to the requirements of upper leather specified in this standard, the upper leather shall also meet the requirements prescribed in IS 5677. If, for a particular characteristic, the requirement prescribed in IS 5677 differs from that prescribed in this standard, the requirement prescribed in this standard shall apply.

4.6.2 Tear Strength

When tested in accordance with clause 6.3 of IS 15298 (Part 1), the leather upper shall meet the requirement for leather given in clause 5.4.3 of IS 15298 (Part 4).

4.6.3 Water Vapour Permeability and Coefficient

When tested in accordance with clauses 6.6 and 6.8 of IS 15298 (Part 1), the water vapour permeability shall not be less than 0.8 mg/(cm².h) and the water vapour coefficient shall not be less than 15 mg/cm².

4.6.4 Water Penetration and Water Absorption

When tested in accordance with clause 6.13 of IS 15298 (Part 1), the water penetration and absorption

requirements of the footwear shall conform to clause 6.3 of IS 15298 (Part 4).

4.7 Lining Material

4.7.1 Material

The lining for all parts except vamp shall be made of combination tanned lining leather conforming to type 1 of IS 3840, with minimum thickness of 0.7 mm. If, for a particular characteristic, the requirement prescribed in IS 3840 differs from that prescribed in this standard, the requirement prescribed in this standard shall apply. Vamp lining shall be made of textile (non-woven).

4.7.2 Tear Strength

When the lining is tested in accordance with clause 6.3 of IS 15298 (Part 1), it shall satisfy the requirements prescribed for leather and textile in clause 5.5.1 of IS 15298 (Part 4).

4.7.3 Abrasion Resistance

When tested in accordance with clause 6.12 of IS 15298 (Part 1), the lining shall not develop any holes before 25 600 cycles in dry condition and 12 800 cycles in wet condition.

4.7.4 Water Vapour Permeability and Coefficient

When tested in accordance with clause 6.6 of IS 15298 (Part 1), the water vapour permeability shall not be less than 2.0 mg/(cm².h).

When tested in accordance with clause 6.8 of IS 15298 (Part 1), the water vapour coefficient shall not be less than 20 mg/cm².

4.8 Insole

4.8.1 Material

The insole shall be made of strobil fabric/cloth (woven or non-woven) of minimum thickness 2.0 mm for strobil construction.

4.8.2 Abrasion Resistance

When insoles are tested in accordance with 7.3 of IS 15298 (Part 1), the abrasion damage shall not be more severe than that illustrated by the reference test pieces for the same family of materials before 400 cycles [see 7.3.6 of IS 15298 (Part 1)].

4.8.3 Water Absorption and Desorption

When tested in accordance with 7.2 of IS 15298 (Part 1), the water absorption shall be not less than 70 mg/cm² and the water desorption shall be not less than 80 percent of the water absorbed.

4.9 Insocks

One pair of detachable insocks having minimum thickness of 3.0 mm at toe and 5.0 mm at heel with arch support shall be provided with each pair of shoes. The

radius of the inner arc concave surface shall be 7.5 to 9.0 mm and radius of outer arc shall be 8.5 to 10.0 mm. At rear heel portion, the radius of the inner arc concave surface shall be 13.5 to 15.0 mm and radius of outer arc shall be 13.0 to 15.0 mm.

4.9.1 Material

Insocks shall be made out of rubber/polymer/elastomer compound with drill/twill/suitable textile as top covering.

4.9.2 Water Absorption and Desorption

When tested in accordance with 7.2 of IS 15298 (Part 1), the water absorption shall be not less than 70 mg/cm² and the water desorption shall be not less than 80 percent of the water absorbed.

4.9.3 Abrasion Resistance

When insocks are tested in accordance with 6.12 of IS 15298 (Part 1), the wearing surface shall not develop any holes before the following number of cycles has been performed:

- a) 25 600 cycles when dry; and
- b) 12 800 cycles when wet.

4.10 Toe Puff and Counter Stiffener

The toe puff and counter stiffener shall be made of thermoplastic material with minimum thickness of 1 mm and 1.4 mm, respectively.

4.11 Tongue

4.11.1 Material

The tongue shall be made of finished grain leather of bovine origin with minimum thickness of 1.2 mm.

4.11.2 Tear Strength

When determined in accordance with 6.3 of IS 15298 (Part 1), the tear strength of the tongue shall not be less than 36 N.

4.12 Closing Thread

The sewing thread used for upper closing shall be 3 ply nylon with minimum breaking load of 35 N when tested according to the method prescribed in IS 4910 (Part 3).

4.13 Outsole

4.13.1 Material

The outsole shall be made of PU midsole and rubber outsole. The sole fixation process for midsole shall be direct moulding process, and the outsole shall be direct vulcanized rubber.

4.13.2 Thickness

When tested as per method given in 8.1 of IS 15298 (Part 1), the thickness (d_1) shall not be less than 4 mm and the cleat height (d_2) shall not be less than 2.5 mm. The outsole shall satisfy the requirement for energy absorption test as prescribed in 4.5.8.

4.13.3 Moulded Density

The density of the direct moulded PU midsole shall be 0.40 to 0.50 g/cm³ when measured as per method given in Annex A of IS 6664; and the rubber outsole density shall be maximum 1.2 g/cm³, when measured as per method A of IS 3400 (Part 9).

4.13.4 Hardness

The hardness of midsole shall be 45 ± 5 (Shore A) and outsole shall be 65 ± 5 IRHD, when tested in accordance to the methods described in IS 13360 (Part 5/Sec 11) and IS 3400 (Part 2), respectively.

4.13.5 Ageing Test

The change in initial hardness of rubber sole shall be in the range of +5 and -2 IRHD [tested according to IS 3400 (Part 2)] after ageing test at 100 ± 1 °C for 24 h in accordance with IS 3400 (Part 4). On completion of test, the rubber sole shall not develop any sign of tackiness or brittleness.

4.13.6 Tear Strength

When tested in accordance with 8.2 of IS 15298 (Part 1), the tear strength shall not be less than 5 kN/m for midsole and 8 kN/m for the outsole.

4.13.7 Abrasion Resistance

When outsoles are tested in accordance with 8.3 of IS 15298 (Part 1), the relative volume loss shall not be greater than 150 mm³

4.13.8 Flexing Resistance

When soles are tested in accordance with 8.4 of IS 15298 (Part 1), the cut growth shall not be greater than 4 mm before 30 000 flex cycles.

Spontaneous cracks are accepted in the following circumstances:

- a) Only the centre of the tread area shall be assessed for cracking, that is, cracks under the toecap zone shall be ignored;
- b) Superficial cracks up to 0.5 mm deep shall be ignored; and
- c) Soles shall be deemed to be satisfactory if cracks are not deeper than 1.5 mm, not longer than 4 mm and not more than five in number.

4.14 Eyelet

Derby shoes shall have 4 male female eyelets, and oxford shoes shall have 5 male female eyelets on quarter facing. The eyelets are recommended to be made of materials specified in 4 of IS 5041. The minimum force required to pull out the eyelets shall be 250 N, when tested as per the method given in Annex B.

The eyelet and lace assembly shall also be tested as per the method given in Annex C. After 5 000 cycles, there shall not be any change in colour of the eyelet.

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4.15 Laces

4.15.1 Material

The laces shall be round shaped nylon with minimum length of 80 cm.

4.15.2 Breaking Load and Tag Retention

The minimum breaking load of the laces shall be 400 N when tested as per the method given in IS 1969 (Part 1) or IS 1969 (Part 2). The minimum tag retention load shall be 140 N when tested as per the method given in Annex H of IS 15844.

5 CHEMICAL REQUIREMENTS

The boots and its constituent materials shall be free from toxic and hazardous chemicals and shall meet the requirements specified in IS 17011.

6 SAMPLING

6.1 Scale of Sampling

6.1.1 Samples shall be selected and examined from each lot for ascertaining the conformity of the footwear to the requirements in this standard.

6.1.2 For the purpose of formation of lots, footwear shall be considered to be different, if they differ in any of the ways enumerated below:

- a) Method of preparation;
- b) Type and material of components; and
- c) Size, shape and design.

6.1.3 The number of footwear pairs to be selected from any lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 4. Whenever the

lot size is more than 20,000 pairs, the quantity above 20 000 pairs shall be treated as another lot and samples shall be drawn as per col 2 of Table 4 corresponding to the lot size, and so on.

6.2 Methods of Selecting Footwear

6.2.1 Footwear to be selected from the lot shall be chosen at random. In order to ensure the randomness of selection a random number table may be used. For guidance to the use of random number table, IS 4905 may be referred.

6.2.2 In the absence of a random number table, the footwear pairs may be selected from the lot in the following manner: Starting from any footwear pair in the lot, the pairs shall be counted as 1, 2, 3, etc., up to r and so on, in one order. Every rth pair thus counted shall be withdrawn to constitute the sample where r is the integral part of N/n (N and n being the lot size and sample size respectively). This procedure may be stopped as soon as the required number of pairs is obtained.

6.2.3 When the footwear pairs in the lot are packed in a number of cases, a suitable number of cases (not less than 30 percent of the total in the lot) shall be first chosen at random. From each of the cases so chosen, an approximately equal number of pairs shall be picked up from its different parts so as to obtain the required number of pairs.

6.2.4 For example, if a lot consists of 1 200 pairs of footwear packed in 50 cases, each containing 24 pairs, not less than 15 cases shall be chosen. If it is decided to open 20 cases, then 4 pairs shall be picked up from different parts of each of the 20 cases, so as to give a total of 80 pairs as specified against the lot of 1 200 in Table 4.

Table 4 Scale of Sampling and Permissible Number of Defectives for Tests on Whole Footwear

(Clause 6.1.3)

No. of Footwear Pairs in the Lot	Sample Size	Permissible No. of Defective Pairs for Major Defects	Permissible No. of Defective Pairs for Minor Defects	Samples Size for Physical and Destructive Tests
(N)	(n)	(3)	(4)	(m)
(1)	(2)	(3)	(4)	(5)
up to 50	8	0	0	3
51 to 90	13	0	1	3
91 to 150	20	0	1	3
151 to 280	32	1	2	5
281 to 500	50	1	3	5
501 to 1200	80	2	5	5
1201 to 3200	125	3	7	8
3201 to 10000	200	5	10	8
10001 to 20000	315	7	14	10

6.3 Number of Tests and Criteria for Conformity

6.3.1 Visual and Tactile Examination

The lot shall be first subjected to detailed visual and tactile examination. The defects usually observed on such examination have been broadly divided into two classes, namely, major defects and minor defects. The list of major and minor defects is given below. It is not exhaustive but covers those which are commonly met with during inspection.

6.3.1.1 Major defects commonly observed during visual inspection of finished footwear:

- a) Difference in shape, design and colour;
- b) Incorrect size/wrong size packing/odd pairing;
- c) Distortion of shape;
- d) Faulty joining and adhesion of sole, insole and upper;
- e) Insole cut short;
- f) Under gauge or over gauge components;
- g) Excessive pitting or air pocket or bulging of the sole or any other component;
- h) Missing or defective eyelets;
- j) Crooked imitation stitches and broken stitches; and
- k) Substandard lace.

6.3.1.2 Minor defects commonly observed during visual inspection of finished footwear:

- a) Stains and dirt in lining and insole/insocks;
- b) Stiffeners not centrally placed;
- c) Slight variation in positioning of eyelets;
- d) Illegible marking on the insole/insocks; and
- e) Slight variation in height of quarter and leg.

6.3.1.3 Inspection for major defects

The sample size for this examination is given in col 2 of Table 4. All the selected footwear pairs shall be examined for major defects. Defective footwear under this clause shall be one which contains one or more of major defects and it may or may not show minor defects. A pair is termed defective if one or both of the constituent footwear are defective. The number of defective footwear pairs shall not exceed the permissible number given in col 3 of Table 4 if the lot is to be accepted.

6.3.1.4. Inspection for minor defects

The lot which passes the test under **6.3.1.3** shall be subjected to scrutiny for minor defects. The sample size is the same as in **6.3.1.3**. These sample pairs may be drawn from among those found satisfactory under **6.3.1.3** along with the required number of fresh pairs to give the prescribed sample size. Under this clause

defective footwear may contain one or more of minor defects but shall not show any major defect. A pair is termed defective if one or both of the constituent footwear are defective. The number of defective pairs found on this examination shall not exceed the permissible number given in col 4 of Table 4.

6.3.1.5 The lot shall be declared to conform to the requirements for visual and tactile characteristics if **6.3.1.3** and **6.3.1.4** are satisfied. If however, the number of defective pairs exceeds the permissible number, the lot shall be deemed as not conforming to the requirements for these characteristics.

6.3.1.6. In case of those lots which have been found unsatisfactory for visual and tactile characteristics, all footwear pairs in the lot may be inspected and defective ones replaced.

6.3.2 Dimensional Characteristics

The lot which has been found satisfactory as in **6.3.1** shall next be tested for dimensional characteristics (**4.2** to **4.4**) without opening up of the footwear. The sample size for this examination is given in col 2 of Table 4. These sample pairs may be drawn from among those found satisfactory under **6.3.1.4** along with the required number of fresh pairs to give the prescribed sample size. If the number of pairs failing to satisfy the requirements for these characteristics is less than or equal to the corresponding number given in col 3 of Table 4, the lot shall be declared to have met the requirements for these characteristics, otherwise not.

6.3.3 Physical and Destructive Tests

6.3.3.1 Tests for physical requirements

The lot found satisfactory for dimensional characteristics (*see 6.3.2*) shall be next tested for physical characteristics given in Table 1. For this purpose the pairs shall be selected at random from the samples which have been tested and found satisfactory for **6.3.2**. The no. of pairs to be selected is prescribed in col 5 of Table 4. These pairs shall be opened up and subjected to required physical tests. The lot shall be declared as satisfactory with respect to these characteristics if all the sample pairs pass the prescribed tests.

6.3.3.2 Tests for chemical requirements

The lot which has been found satisfactory as per **6.3.3.1** shall be finally tested for chemical properties of the components by opening up of the footwear. For this purpose, two pairs shall be drawn at random from the samples already tested and found satisfactory for **6.3.2**. These two pairs shall then be opened up and tested for chemical requirements of the components as specified in 5. For chemical analysis, the test samples may be prepared by mixing the cuttings from both the units in a pair. The lot shall be declared to have satisfied the requirements for these characteristics if both the sample pairs are found satisfactory.

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6.3.3.3 Sometimes it is not possible to carry out tests by taking component from the finished footwear. In those cases, the component sample has to be collected from the manufacturer/supplier. Table 1 gives a list of requirements to be tested and on which part the tests are to be carried out.

6.3.3.4 For tests to be carried out on material sample (designated by O in Table 1), following sampling plan is to be followed:

- a) Insole material : 3 pieces of minimum size 15 cm × 15 cm;
- b) Closing thread (5 m);
- c) Outsole material : 2 pieces slab of minimum size 15 cm x 15 cm of thickness between 1.8 to 2.8 mm, but preferably 2.0 ± 0.2 mm; and
- d) Midsole material : 2 pieces slab of minimum size 10 cm × 10 cm of thickness between 1.8 to 2.8 mm, but preferably 2.0 ± 0.2 mm.

6.4 The lot shall be deemed as conforming to the standard if it satisfies the requirements of the visual, tactile, dimensional, physical and chemical characteristics as given in **6.3**.

7 MARKING

7.1 Each boot shall be permanently marked with the following:

- a) Size,
- b) Manufacturer's name and brand,
- c) Year and month of manufacture,
- d) Shelf life (1 year from month of manufacture),
- d) Number and year of the standard, based upon which the boots are produced, and

- e) Any other statutory marking.

7.2 BIS Certification Marking

The shoes may also be marked with the Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations made thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7.3 All markings shall be made inside of tongue or at top outer face of the boot so that least damage is done during working.

8 INFORMATION TO BE SUPPLIED

Each pair of boot shall be supplied with the following information in Hindi and English:

- a) Name and full address of manufacturer;
- b) Details of customer care service provider;
- c) Instruction for storage and maintenance;
- d) Drying procedure for wet boots and proper cleaning of boots;
- e) Time period for obsolescence;
- f) Wherever applicable, declaration to be made stating footwear is not for use in fire hazard/ explosion prone areas and in hot contact areas; and
- g) The footwear is not a GREEN footwear and not bio-degradable.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>
1638 : 1969	Sizes and fitting of footwear
1969 (Part 1) : 2009	Textiles — Tensile properties of fabrics — Determination of maximum force and elongation at maximum force: Part 1 Strip method
1969 (Part 2) : 2010	Textiles — Tensile properties of fabrics — Determination of maximum force and elongation at maximum force: Part 2 Grab method
2050 : 1991	Glossary of terms relating to footwear
3400 (Part 2) : 2014	Methods of test for vulcanized rubber: Part 2 Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)
3400 (Part 4) : 2012	Methods of test for vulcanized rubbers: Part 4 Accelerated ageing and heat resistance
3400 (Part 9) : 2014	Methods of test for vulcanized rubber: Part 9 Rubber, vulcanized or thermoplastic — Determination of density (<i>third revision</i>)
3840 : 2011	Lining leather
4910 (Part 3) : 1989	Tyre yarns, cords and tyre cord warpsheets made from man-made fibres — Methods of test: Part 3 Load and elongation characteristics
5041 : 1978	Specification for footwear and stationery eyelets (<i>first revision</i>)
5677 : 1986	Shoe upper leather for direct moulding processes
6664 : 1992	Rubber microcellular sheets for soles and heels — Specification
13360 (Part 5/Sec 11) : 2013	Plastics — Methods of testing: Part 5 Mechanical properties, Section 11 Determination of indentation hardness of plastics by means of durometer (shore hardness)
15298 (Part 1) : 2015	Personal protective equipment: Part 1 Test methods for footwear (<i>second revision</i>)
15298 (Part 4) : 2017	Personal protective equipment: Part 4 Occupational footwear
15844 : 2010	Sports footwear — Specification
17011 : 2018	Footwear — Critical substances potentially present in footwear and footwear materials

IS 17043 : 2018

ANNEX B

(Clause 4.14)

PULL OUT TEST FOR EYELETS

B-1 This method is used for the determination of the strength of eyelet attachment to the footwear upper.

B-2 PRINCIPLE

A piece of footwear facing containing the eyelet is clamped in a universal tensile testing machine and a long, thin conical plunger is inserted into the eyelet from the reverse side of the facing. Force is applied until the plunger detaches the eyelet from the base material. The force at which the eyelet detaches is recorded as the pull out force of the eyelet.

B-3 APPARATUS

B-3.1 Tensile testing machine capable of measuring 1 kN force to an accuracy of 2 percent, and capable of moving its jaws at a rate of 100 ± 10 mm/min (see Fig B.1).

B-3.2 Compression jig (see Fig. B-2) to be fitted with the tensile testing machine such that the conical plunger is vertical. The conical plunger should be capable of fitting into eyelets of various sizes. A plunger of length approximately 80 mm with the diameter tapering from 12 to 3 mm is generally suitable. A hole is provided on the lower platform of the jig. The test specimen can be positioned and clamped such that the eyelet aligns with the hole and the plunger can pass through the eyelet and the hole.

B-3.3 Sharp knife is used for preparation of specimen.

B-4 PREPARATION OF TEST SPECIMENS

Use the knife to cut at least three sections of footwear facing such that the eyelet is at the centre. It is recommended that each section is circular with at least 23 ± 5 mm of material at all points around the eyelet. In order to ensure these dimensions, it may be necessary to remove the eyelet adjacent to the one to be tested. Conditioning of test specimen is not required and test can be conducted at room temperature.

B-5 PROCEDURE

Fit the compression jig on the universal tensile testing machine. Clamp the test specimen on the platform of the jig such that the eyelet is aligned with the hole. For standard eyelets, the clenched side shall face the plunger and for blind eyelets, the flanged side shall face the plunger (see Fig. B-3). Operate the universal tensile testing machine so that the plunger is inserted into the eyelet at a rate of 100 ± 10 mm/min. Record the force in N required to detach the eyelet from its base material or damage the assembly without complete detachment. Stop the tensile testing machine and return the plunger to its starting position. Repeat the procedure for all test specimens. Calculate the arithmetic mean of the values as the pull out force of the eyelets.

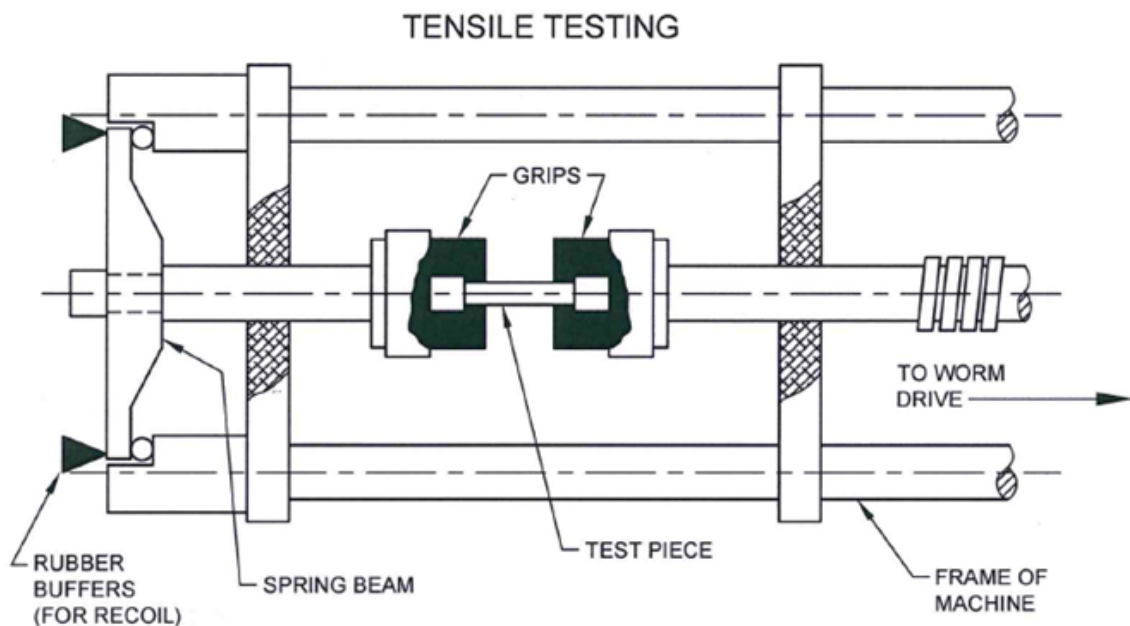


FIG. B-1 SCHEMATIC DIAGRAM OF TENSILE TESTING MACHINE

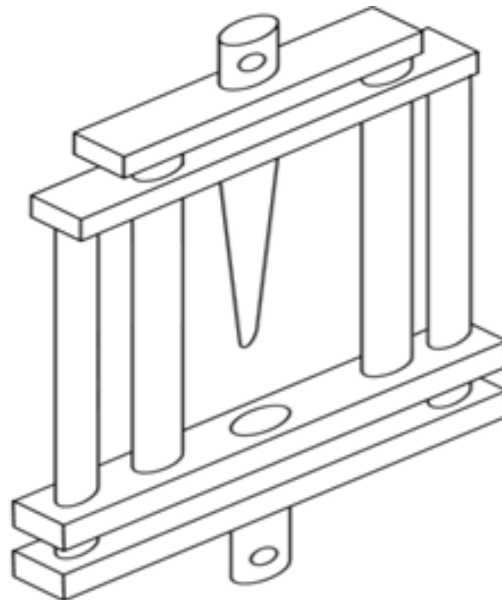


FIG. B-2 COMPRESSION JIG WITH CONICAL PLUNGER AND HOLE ON THE PLATFORM

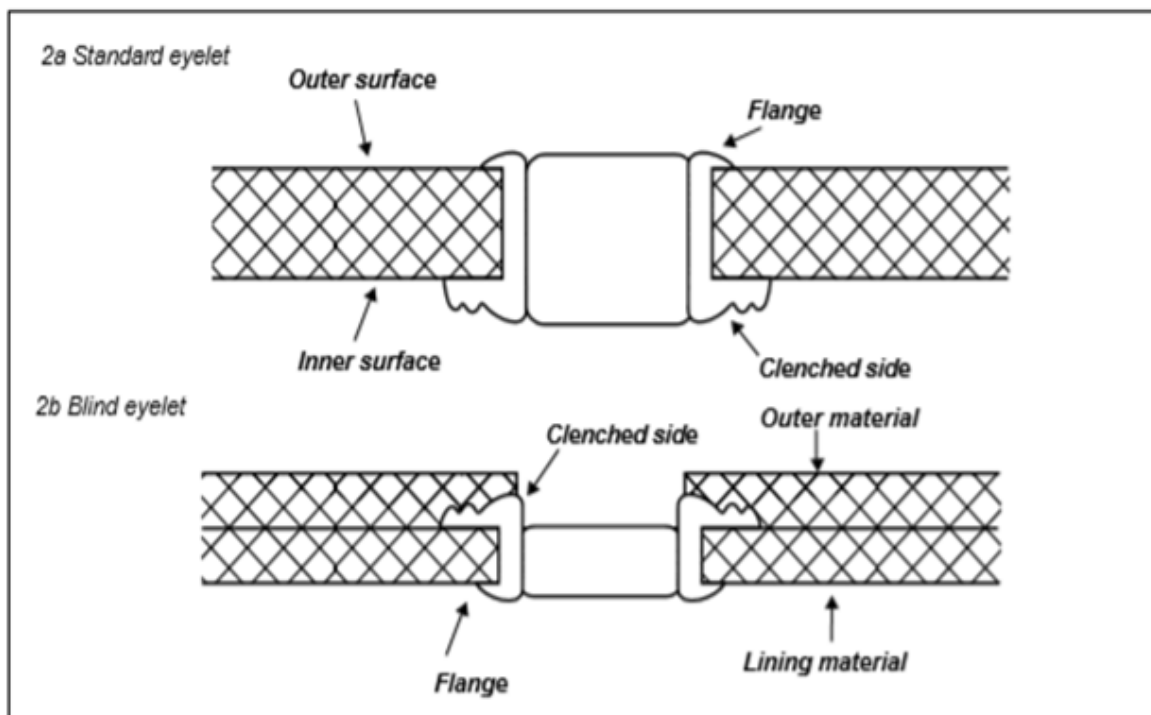


FIG. B-3 TYPES OF EYELETS AND THEIR ATTACHMENT TO FOOTWEAR

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ANNEX C

(Clause 4.14)

COLOUR PEEL OFF TEST FOR EYELETS

C-1 This method is used for the determination of resistance to change in colour of eyelets during the course of use of shoes.

C-2 PRINCIPLE

The shoe lace is threaded through the eyelet and bent to a fixed acute angle at the point of contact with eyelet. The lace is then held under a standard tension while it is repeatedly drawn back and forth through the eyelet.

C-3 APPARATUS

C-3.1 A test machine with one or more test stations (*see* Fig. C-1). Each test station should have the following:

C-3.1.1 A moveable clamp which has a means of firmly holding one end of the metal strip.

C-3.1.2 A stationary clamp which is mounted in the same horizontal plane as the moveable clamp (**C-3.1.1**) and is capable of holding one end of the shoe lace. The stationary clamp should be $280 \text{ mm} \pm 50 \text{ mm}$ from the moveable clamp when the clamps are at their minimum separation, this distance will subsequently be referred to as **D**.

C-3.1.3 A tensioning device with a method of holding the other end of shoe lace at a point $35 \text{ mm} \pm 5 \text{ mm}$ to one side of, and in the same horizontal plane as, the stationary clamp and applying a tensioning force of

$2.45 \text{ N} \pm 0.03 \text{ N}$ (*see* Fig. C-1). This can be achieved by passing the shoe lace over a pulley and suspending a mass of $250 \text{ g} \pm 3 \text{ g}$ from its end.

C-3.1.4 A means of moving the moveable clamp with a simple harmonic reciprocating motion through a distance of $35 \text{ mm} \pm 2 \text{ mm}$ and back to the original starting position at a rate of 60 ± 6 cycles per minute.

C-3.1.5 A mechanical/electrical means for counting the number of cycles.

C-4 MATERIALS

C-4.1 Shoe lace from the footwear.

C-4.2 Sample of shoe facing having the eyelet to be tested.

C-5 CONDITIONING

Store the shoe lace and eyelet sample in standard atmospheric conditions, that is, $27 \pm 2^\circ\text{C}$ and 65 ± 5 percent relative humidity for at least 48 h before testing and carry out the test in this atmosphere.

C-6 PROCEDURE

C-6.1 Fix the shoe sample having eyelet (**C-4.2**) to one end of the metal strip such that the relative orientation

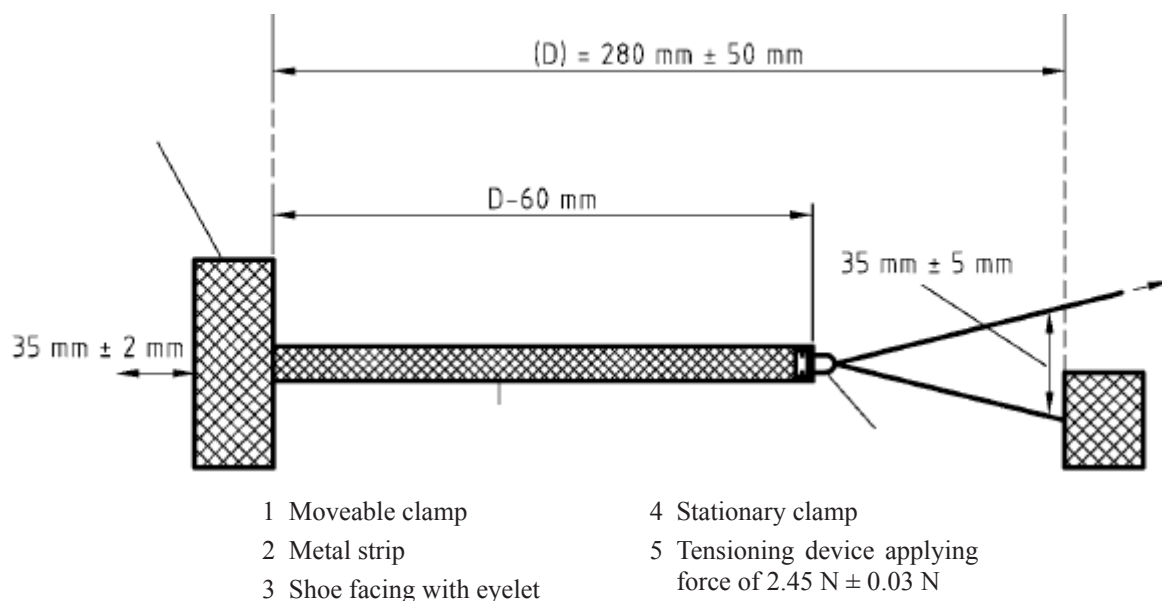


FIG. C-1 SCHEMATIC DIAGRAM OF TESTING MACHINE

between the eyelet and the metal strip is the same as the orientation between the eyelet and shoe facing.

C-6.2 Clamp the other end of the metal strip into the moveable clamp so that the eyelet is approximately 60 mm away from the moveable clamp.

C-6.3 Secure one end of the shoe lace (**C-4.1**) to the stationary clamp (**C-3.1.2**).

C-6.4 Thread the free end of the lace through the eyelet secured to the moveable clamp.

C-6.5 Apply a tensioning force of $2.45 \text{ N} \pm 0.03 \text{ N}$ to the free end of the lace (*see* **C-3.1.3**) and start the test machine.

C-6.6 Carry out the test for the required number of cycles.

C-6.7 Observe the eyelet for any change in colour.

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ANNEX D

(*Foreword*)

BIBLIOGRAPHY

- 1) IS 4905 : 2015 Random sampling and randomization procedures (*first revision*)

ANNEX E

(Foreword)

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Amendments Issued Since Publication

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