भारतीय मानक
Indian Standard

IS 17012 : 2018

पॉल्यूरेथीन — रबर तले वाले उच्च टखने के टैक्टिकल जूते — विशिष्ट

High Ankle Tactical Boots with PU — Rubber Sole — Specification

ICS 13.340.50; 61.060

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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.

Be it gruelling marches, operations during heat or rain, or facing obstacles in day to day work, our armed forces rely on tactical boots to keep their feet protected and comfortable. Feet are the mobilizing device of human body. If feet are not given proper support and care, it is difficult to be on the move and to execute duty. Rightly constructed and designed tactical boots are mandatory for best performance of armed forces.

This standard prescribes constructional and performance requirements of high ankle tactical boots with PU-rubber sole which are to be used by paramilitary forces/police forces. This standard is being developed under the scope of Make in India 1.0.

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

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

HIGH ANKLE TACTICAL BOOTS WITH PU — RUBBER SOLE — SPECIFICATION

1 SCOPE

1.1 This standard prescribes requirements, methods of sampling, and tests for high ankle tactical boots with polyurethane (PU) mid sole and rubber outsole. These boots are meant for use by paramilitary forces/police forces.

1.2 The boots described in this standard are made from chrome tanned barton printed leather upper, whereas the toe and counter are to be made of smooth leather. The boots are manufactured with cleated rubber outsole with anti-slip design.

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 the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 2050 and **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.

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 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 most of the times.

4 PHYSICAL REQUIREMENTS

4.1 General

The tactical boots shall conform to the physical requirements given in Table 1.

Table 1 Physical Requirements for Tactical Boots

(*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
Whole footwear	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
	Slip resistance	**4.5.4**	X
	Electrical resistance (antistatic)	**4.5.5**	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

Table 1 (*Concluded*)

Requirement		Subclause	Test on Finished Footwear/Material
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
Lining material	Vamp and quarter lining	**4.7.1**	I
	Counter and tongue lining	**4.7.2**	I
	Tear strength	**4.7.3**	X
	Abrasion resistance	**4.7.4**	X
	Water vapour permeability and coefficient	**4.7.5**	X
Toe puff and counter stiffener	Material and thickness	**4.8**	O
Insole	Material	**4.9.1**	I
	Thickness	**4.9.1**	O
	Abrasion resistance	**4.9.2**	O
	Water absorption and desorption	**4.9.3**	O
Insocks	Material	**4.10.1**	I
	Dimensions	**4.10**	X
	Abrasion resistance	**4.10.2**	X
	Water absorption and desorption	**4.10.3**	X
Collar	Material	**4.11.1**	I
	Thickness	**4.11.1**	X
	Tear strength	**4.11.2**	O
Tongue	Material	**4.12.1**	I
	Thickness	**4.12.1**	X
	Tear strength	**4.12.2**	X
Closing thread	Breaking load	**4.13**	O
Outsole	Material	**4.14.1**	I
	Thickness	**4.14.2**	X
	Moulded density	**4.14.3**	X
	Tear strength	**4.14.4**	O
	Abrasion resistance	**4.14.5**	X
	Sole hardness	**4.14.6**	X
	Ageing test	**4.14.7**	X
	Flexing resistance	**4.14.8**	X
	Resistance to hot contact	**4.14.9**	X
D rings and hooks	Material	**4.15**	I
Laces	Material	**4.16.1**	I
	Breaking load and tag retention	**4.16.2**	X
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 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 is the same which has been used for footwear.		
I	Identification by visual and tactile examination.		
NOTE — Whenever possible, test pieces shall be taken from finished footwear.			

4.2 Design

The design of the boots shall conform to design C 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.

4.3.2 *Weight*

The maximum weight of a pair of boots of size 8 shall be 1 300 g with an increase or decrease of 50 g with 1 unit increase or decrease in size, respectively.

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 2.

Table 2 Height of the Upper

(*Clause* 4.4)

Sl No.	Shoe Size	Height
(1)	(2)	(3)
i)	4	167 ± 2 mm
ii)	5-6	174 ± 2 mm
iii)	7-8	180 ± 2 mm
iv)	9-10	187 ± 2 mm
v)	11-12	194 ± 2 mm

4.5 Properties of Whole Footwear

4.5.1 *Construction*

The boots shall be made of PU midsole and vulcanized rubber outsole by direct moulding process with strobel stitching.

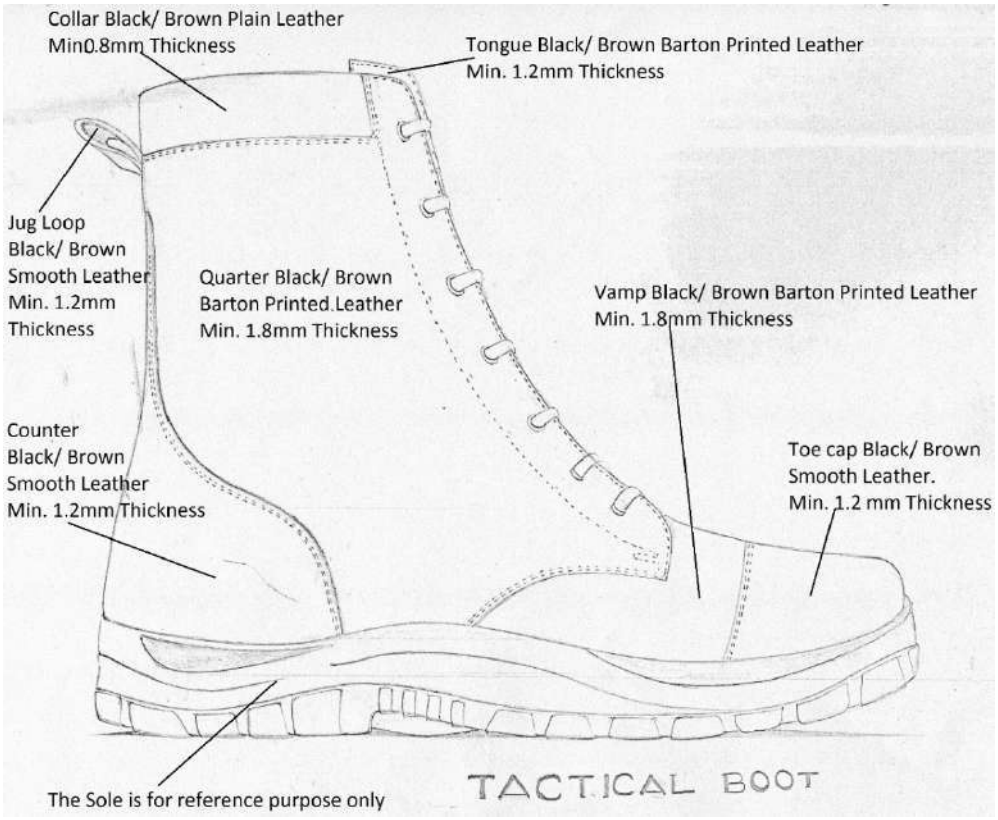

FIG. 1 HIGH ANKLE TACTICAL BOOT

4.5.2 *Ergonomic Feature*

The boots shall be considered to satisfy the ergonomic requirements if the questionnaire given in **5.1** of IS 15298 (Part 1), is completed and all answers are positive.

However, if the boots meet the criteria specified in **8.4.1.4** 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 boots shall be subjected to adhesion tests. The testing shall be done at least 24 h after manufacture.

4.5.3.1 *Upper-outsole bond strength*

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

4.5.3.2 *Interlayer bond strength*

The bond between the midsole and the outer sole shall be not less than 4.0 N/mm, unless there is tearing of the sole, in which case the bond strength shall be not 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).

4.5.5 *Electrical Resistance (Antistatic)*

When tested in accordance with **5.10** of IS 15298 (Part 1), after conditioning in a dry and wet atmosphere, the electrical resistance shall not be less than 100 kΩ and shall not be greater than 1 000 MΩ in each case.

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. However, the resistance performance may reduce 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 footwear shall satisfy the requirement given 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 footwear shall satisfy the requirement given 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*

4.6.1.1 The vamp and quarter portion of the upper shall be made of black/brown barton printed leather of minimum thickness 1.8 mm. No split leather shall be used.

4.6.1.2 The toe, jug loop and outside counter portion shall be made of black/brown smooth leather of minimum thickness 1.2 mm.

4.6.1.3 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 **6.3** of IS 15298 (Part 1), the leather upper shall meet the requirement given in **5.4.3** vide Table 10 in IS 15298 (Part 4).

4.6.3 *Water Vapour Permeability and Coefficient*

When tested in accordance with **6.6** and **6.8** of IS 15298 (Part 1), the water vapour permeability shall not be less than 0.8 mg/(cm^2.h) and the water vapour coefficient shall not be less than 15 mg/cm^2.

4.6.4 *Water Penetration and Water Absorption*

When tested in accordance with **6.13** of IS 15298 (Part 1), the water penetration (expressed as mass increase of the absorbent cloth after 60 min) shall not be higher than 0.2 g and the water absorption shall not be higher than 30 percent.

4.7 Lining Material

4.7.1 *Vamp and QuarterLlining*

It shall be made from textile (non-woven).

4.7.2 *Counter and Tongue Lining*

It shall be made from materials such as leather or coated fabric or textile (woven or non-woven). If leather is used as the lining material, it shall meet the requirements prescribed in IS 3840, in addition to the requirements for lining material prescribed in this standard. 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.

4.7.3 *Tear Strength*

When the lining is tested in accordance with **6.3** of IS 15298 (Part 1), it shall satisfy the requirements prescribed in **5.5.1** vide Table 13 of IS 15298 (Part 4).

4.7.4 *Abrasion Resistance*

When tested in accordance with **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.

4.7.5 *Water Vapour Permeability and Coefficient*

4.7.5.1 When tested in accordance with **6.6** of IS 15298 (Part 1), the water vapour permeability shall not be less than 2.0 mg/(cm^2.h).

4.7.5.2 When tested in accordance with **6.8** of IS 15298 (Part 1), the water vapour coefficient shall not be less than 20 mg/cm^2.

4.8 Toe Puff and Counter Stiffener

The toe puff and counter stiffener shall be made of thermoplastic material with minimum thickness of 1.6 mm.

4.9 Insole

4.9.1 *Material*

The insole shall be made of non-woven cloth of minimum thickness 2.0 mm for strobel construction.

4.9.2 *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)].

4.9.3 *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/cm^2 and the water desorption shall be not less than 80 percent of the water absorbed.

4.10 In-socks

One pair of detachable in-socks 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 boots. The radius of the inner arc concave surface is 7.5 – 9.0 mm and radius of outer arc is 8.5 – 10.0 mm. At rear heel portion, the radius of the inner arc concave surface is 13.5 – 15.0 mm and radius of outer arc is 13.0 – 15.0 mm.

4.10.1 *Material*

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

4.10.2 *Abrasion Resistance*

When in-socks 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.

4.10.3 *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/cm^2 and the water desorption shall be not less than 80 percent of the water absorbed.

4.11 Collar

4.11.1 *Material*

The collar shall be made of plain leather of minimum thickness 0.8 mm with PU foam of 15 ± 2 mm thickness and 0.3 – 0.4 g/cm^3 density.

4.11.2 *Tear Strength*

When determined in accordance with **6.3** of IS 15298 (Part 1), the minimum tear strength of the collar shall be 30 N.

4.12 Tongue

4.12.1 *Material*

The tongue shall be made of black/brown barton printed leather of minimum thickness 1.2 mm, laminated with non-woven textile fabric (minimum 130 GSM). No split leather shall be used.

4.12.2 *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.

4.13 Closing Thread

The sewing thread used for upper closing shall be 6 ply nylon with minimum breaking load of 40 N when tested according to the method described in IS 4910 (Part 3).

4.14 Outsole

4.14.1 *Material*

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

4.14.2 *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 sole shall satisfy the energy absorption test prescribed in **4.5.8**.

4.14.3 *Sole Density*

The density of the direct moulded PU midsole shall be 0.40 – 0.50 g/cm^3 when measured as per method given in Annex A of IS 6664; and the rubber outsole density

shall be maximum 1.2 g/cm^3, when measured as per method A of IS 3400 (Part 9).

4.14.4 *Tear Strength*

When tested in accordance with **8.2** of IS 15298 (Part 1), the tear strength shall not be less than:

a) 5 kN/m for midsole

b) 8 kN/m for outsole

4.14.5 *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 mm^3.

4.14.6 *Sole Hardness*

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

4.14.7 *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 ± 1ºC for 24 h in accordance with IS 3400 (Part 4).

4.14.8 *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.

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.

4.14.9 *Resistance to Hot Contact*

When tested in accordance with **8.7** of IS 15298 (Part 1), the outsole shall not melt and shall not develop any cracks when bent around the mandrel.

4.15 D-rings and Hooks

The boots shall have 5 D-rings on each quarter facing and 4 hooks on the top. The D-rings and hooks shall be made of black/brown enamelled brass.

4.16 Laces

4.16.1 *Material*

The laces shall be round black/brown nylon with minimum length of 120 cm.

4.16.2 *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 ADDITIONAL REQUIREMENTS

Additional requirements given in Table 3 may be incorporated in the tactical boots depending upon the risks to be encountered at workplace. If the requirements have been incorporated, the boots shall be marked with the corresponding symbol.

Table 3 Additional Requirements for Tactical Boots

(*Clause* 6)

	Requirement	Subclause	Symbol
Outsole	Resistance to fuel oil	6.1	FO

6.1 Resistance to Fuel Oil

6.1.1 When tested in accordance with **8.6.1** of IS 15298 (Part 1), the increase in volume shall not be greater than 12 percent.

6.1.2 If, after testing in accordance with **8.6.1** of IS 15298 (Part 1), the test piece shrinks by more than 1 percent in volume or increases in hardness by more than 10 Shore A, a further test piece shall be taken and tested in accordance with the method prescribed in **8.6.2** of IS 15298 (Part 1), and the cut growth shall not be greater than 6 mm before 150 000 cycles.

7 SAMPLING

7.1 Scale of Sampling

7.1.1 Samples shall be selected and examined from each lot for ascertaining the conformity of the footwear to the requirements of given specification.

7.1.2 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.

7.1.3 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 2 and 3 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 and Col 3 of Table 4, and so on.

7.2 Methods of Selecting Footwear

7.2.1 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.

7.2.2 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 r^{th} 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.

7.2.3 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.

7.2.3.1 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.

7.3 Number of Tests and Criteria for Conformity

7.3.1 *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.

7.3.1.1 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) The toe reinforcement omitted or not cemented properly to the vamp;
j) Missing or defective D rings and hooks;
k) Crooked imitation stitches and broken stitches; and
m) Substandard lace.

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

(*Clause* 7.1.3)

Sl No.	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)*			*(m)*
(1)	(2)	(3)	(4)	(5)	(6)
i)	up to 50	8	0	0	3
ii)	51 to 90	13	0	1	3
iii)	91 to 150	20	0	1	3
iv)	151 to 280	32	1	2	5
v)	281 to 500	50	1	3	5
vi)	501 to 1 200	80	2	5	5
vii)	1 201 to 3 200	125	3	7	8
viii)	3 201 to 10 000	200	5	10	8
ix)	10 001 to 20 000	315	7	14	10

7.3.1.2 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 D rings and hooks;
d) Illegible marking on the insole/insocks; and
e) Slight variation in height of quarter and leg.

7.3.1.3 *Inspection for major defects*

The sample size for this examination is given in Co1 3 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 Co1 4 of Table 4 if the lot is to be accepted.

7.3.1.4 *Inspection for minor defects*

The lot which passes the test under **7.3.1.3** shall be subjected to scrutiny for minor defects. The sample size is the same as in **7.3.1.3**. These sample pairs may be drawn from among those found satisfactory under **7.3.1.3** 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 5 of Table 4.

7.3.1.5 The lot shall be declared to conform to the requirements for visual and tactile characteristics if **7.3.1.3** and **7.3.1.4** 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.

7.3.1.6 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.

7.3.2 *Dimensional Characteristics*

The lot which has been found satisfactory as in **7.3.1** 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 Co1 3 of Table 4. These pairs shall be taken at random and tested for dimensional characteristics. If the number of pairs failing to satisfy the requirements for these characteristics is less than or equal to the corresponding number given in co1 4 of Table 4, the lot shall be declared to have met the requirements for these characteristics, otherwise not.

7.3.3 *Physical and Destructive Tests*

7.3.3.1 *Tests for physical requirements*

The lot found satisfactory for dimensional characteristics (*see* **7.3.2**) 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 **7.3.2**. The number of pairs to be selected is prescribed in Co1 6 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.

7.3.3.2 *Tests for chemical requirements*

The lot which has been found satisfactory as per **7.3.3.1** 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 those already tested and found satisfactory for **7.3.2**. These two pairs shall then be opened up and tested for chemical requirements of footwear 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.

7.3.3.3 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.

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

a) Leather for upper andcollar:
   1) 1 piece of 30 cm × 30 cm (minimum size)
   2) 1 piece of 15 cm × 15 cm (minimum size)
b) Insole material: 3 pieces of minimum size 15 cm × 15 cm
c) Closing thread (5 m)
d) Outsole material: 2 pieces slab of minimum size 15 cm × 15 cm of thickness between 1.8 to 2.8 mm, but preferably 2.0 ± 0.2 mm.
e) 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.

7.4 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 **7.3**.

8 MARKING

8.1 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),
e) Number and year of the standard, based upon which the boots are produced, and
f) Any other statutory marking.

8.2 BIS Certification Marking

The shoes may also be marked with the Standard Mark.

8.2.1 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.

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

9 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

IS No.	*Title*
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 (*third revision*)
3840 : 2011	Lining leather — Specification
4910 (Part 3) : 1989	Tyre yarns, cords and tyre cord warp sheets made from man-made fibres — Methods of test: Part 3 Load and elongation characteristics
5677 : 1986	Specification for shoe upper leather for direct moulding process
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 (*second revision*)
15298 (Part 4) : 2017	Personal protective equipment: Part 4 Occupational footwear
15844 : 2010	Sports footwear — Specification
17011 : 2018	Chemical requirements for footwear and footwear faterials

ANNEX B

(*Foreword*)

BIBLIOGRAPHY

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

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Footwear Sectional Committee, CHD 19

Organization	*Representative(s)*
CSIR – Central Leather Research Institute	Dr B. N. Das (***Chairman***) Dr R. Mohan (*Alternate*)
Ambuja Cements, Mumbai	Shri Piyush B. Jain
Arvind Footwear Pvt. Ltd., Ahemdabad	Shri Dilip Borkar
Bihar Rubber Co. Ltd., Ranchi	Shri J. Basak
Border Security Force	Shri Prem Vishwas
Bureau of Police Research and Development, Delhi	Shri Krishna Kant Sinha
Central Reserve Police Force, Ministry of Home Affairs, New Delhi	Shri Randhir Kumar Jha
Coast Guard HQ, New Delhi	Shri Brajesh Patel
Defence Institute of Physiology and Allied Sciences, DRDO	Dr Madhusudan Pal
Directorate General of Factory Advice Service & Labour Institute, Ministry of Labour & Employment	Dr Brij Mohan
Directorate General of Quality Assurance, Kanpur	Shri S. Chakraborty
Dye General Aeronautical Quality Assurance (DGAQA), New Delhi	Shri Satyanand Swain
Footwear Design & Development Institute, Noida	Shri Shailender Saxena Shri Navendu Shekhar (*Alternate* I) Shri Bhanu Pratap Sahni (*Alternate* II) Shri Saroj Kumar Panda (*Alternate* III)
Footwear (Klick) India Pvt. Ltd	Shri Saurabh Gupta
In personal capacity	Aditya Prakash Sharma
Liberty Shoes Ltd., (P.U. Division), Karnal	Shri S. S. Lahiri
Pinza Footwear Pvt. Ltd.	Shri Prem Mehani
Prolific Engineers	Shri G. P. Kedia
Rapid Action Force, New Delhi	Shri A. K. Singh Shri Harish Chandra (*Alternate*)
XO Footwear, Delhi	Shri Nalin Gupta Shri Manoj Kumar (*Alternate*)
BIS Directorate General	Shri U. K. Das, Sc & H (CHD) Representing Director General (*Ex-officio*)

Member Secretary

Km. Kreeti Das
Scientist 'B' (CHD), BIS

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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