भारतीय मानक **IS 15844 (Part 3) : 2024**

Indian Standard

खेल के जूते

भाग 3 पेशेवर खेल के लिए जूते

Sports Footwear

Part 3 Professional Sports Footwear

ICS 13.040.20

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January 2024 **Price Group 9**

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.

Realizing the growing demand and use of sports footwear in the country and the potentiality of the development, the Footwear Sectional Committee decided to formulate a standard on the product.

The Committee, while reviewing IS 15844 decided to revise the standard keeping in line with the recent development that has taken place in the field and publish this standard in three parts based on the uses of sports footwear:

Part 1 General purpose

Part 2 Performance sports footwear

Part 3 Professional sports footwear

This part covers the performance requirements of professional sports footwear.

Generally, to qualify the sports shoes as light weigh shoe, a pair of sports shoe may not weigh more than 300 g for men and 275 g for women.

In this standard, 'Annex B' has been incorporated regarding pronation and arch type for information. General details for different types of professional sports footwear is given at Annex C.

The composition of the Committee responsible for 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*)'.

Indian Standard

SPORTS FOOTWEAR

PART 3 PROFESSIONAL SPORTS FOOTWEAR

1 SCOPE

1.1 This standard prescribes the performance requirements of professional sports footwear.

1.2 This standard does not cover the performance requirement for following:

a) General purpose; and

b) Performance sports footwear.

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 revisions and parties to agreements based on this 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 definitions given in IS 2050 and the following shall apply.

3.1 Composite Sole — is a multilayer sole and may be made out of multiple materials.

3.2 Heel to Toe Drop — Heel to toe drop (Heel Drop) is the difference in height between heel and forefoot in an athletic shoe. It is also called shoe drop, shoe offset, heel differential, toe drop, pitch, and gradient. It is measured in millimeters, going from 0 mm to 15 mm in sports footwear.

3.3 Rigid Sole — The soles which do not bend at ball girth and which do not loose shape after application of manual force. If the manufacturer declares a sole as rigid sole, the flexing test shall not be applicable for footwear whose angle under the applied force is lower than 45° from the horizontal, when tested for rigidity test as per IS 15298 (Part 1).

3.4 Cleated Soles — Soles which have spikes or studs.

3.5 Plated Sole — Soles that incorporates some sort of propulsive plate to assist with stride action.

4 SAMPLING AND CONDITIONING

4.1 Wherever, possible test pieces shall be taken from the whole footwear unless otherwise stated.

4.2 If it is not possible to obtain test pieces from footwear large enough to comply with tests requirements, then samples may be taken from the material from which the component has been manufactured. However, this should be reported in the test report.

4.3 All tests pieces shall be conditioned at (27 ± 2) ºC and (65 ± 5) percent relative humidity (RH) for 48 hours in standard atmospheric conditions.

5 DESIGN

5.1 Sports footwear shall be such that it would bend easily and shall retain its original shape after release of force.

5.2 Sports footwear shall be reinforced suitably at counter with reinforcement such that it does not loose shape retention property.

5.3 Sole design should be such that it has adequate skid resistance.

5.4 Sports footwear may have enough cushioning and foam lining and padded collar may be used.

6 SIZE AND FITTINGS

The sports footwear manufactured in accordance with this standard may be made in all sizes as per IS 1638.

7 REQUIREMENTS

7.1 Whole Footwear

7.1.1 *Upper to Mid Sole/Out Sole, Upper to Composite Sole* (*Applicable Only When the Sole is Composite*) *and Out Sole to Mid Sole* (*Multilayer, if Present*), *Bond Performance*

For cellular material, when footwear is tested according to method given in Annex C of IS 15844 (Part 1), the bond strength between upper to mid sole or upper to outsole or outsole to midsole shall be not less than 3.0 N/mm, unless there is tearing of the material, in which case the bond strength shall be not less than 2.0 N/mm.

For solid material, when footwear is tested according to method given in Annex C of IS 15844 (Part 1), the bond strength between upper to mid sole or upper to out sole or out sole to mid sole shall be not less than 3.5 N/mm, unless there is tearing of the material, in which case the bond strength shall be not less than 3.0 N/mm.

NOTES

1 Cellular Material — Material with density less than 0.90 g/cm^3 density.

2 Solid Material — Material with density 0.90 g/cm^3 and above.

3 Outsole to midsole (multilayer, if present) is not applicable for composite sole.

7.1.2 *Energy Absorption at Seat Region*

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

When tested in accordance with the method given in IS 15298 (Part 1), the energy absorption of the seat region shall not be less than 10 J for the soles without midsole

NOTE — Not applicable for plated sole/cleated sole.

7.1.3 *Complete Shoe Flexing*

When footwear with carbon plates is tested in accordance with the method given in ISO 24266 (Method A) at an angle of 45 degrees at 70 000 cycles, no change in upper (for example, crack, thread breakage, fabric broken), sole cracking, bond opening shall occur.

When footwear without carbon plates is tested in accordance with the method given in ISO 24266 (Method A) at an angle of 45 degrees at 150 000 cycles, no change in upper (for example, crack, thread breakage, fabric broken), sole cracking, bond opening shall occur.

7.1.4 *Washability*

When footwear is tested in accordance with the method given in IS 8085 (Part 15)/ISO 19954, there shall not be any bond opening, coating separation, and grey scale rate shall be minimum 3.

7.1.5 *Slip Resistance*

When tested in accordance with the method given in Annex E of IS 15844 (Part 1) the coefficient of friction shall not be less than 0.30 in both dry and wet condition on clay tiles.

NOTE — Not applicable for soles for plated and cleated.

7.1.6 *Heel Drop*

When measured as shown in Fig. 1, the heel drop shall be categorized as per Table 1.

Table 1 Heel Drop

(*Clause* 7.1.6 *and* 8.3)

Sl No.	Category	Heel Drop (mm)	Marking
(1)	(2)	(3)	(4)
i)	Zero drop	(0 mm)	D0
ii)	Low drop	(1 mm to 4 mm)	D 1 to 4
iii)	Mid drop	(5 mm to 9 mm)	D 5 to 9
iv)	High drop	(10+ mm)	D 10+

The heel drop of the sports footwear shall be marked on the packaging.

7.2 Upper

The upper of sports footwear made of leather material shall conform to the requirements as specified in Table 2, whereas upper of sports footwear made of coated fabric and fully moulded/textile or combinations thereof shall conform to the requirements as specified in Table 3.

7.3 Lining

The lining material, if used in the sports footwear shall conform to requirement as prescribed in Table 4.

7.4 Insole

The insole, if used in sports footwear shall conform to requirement as prescribed in Table 5.

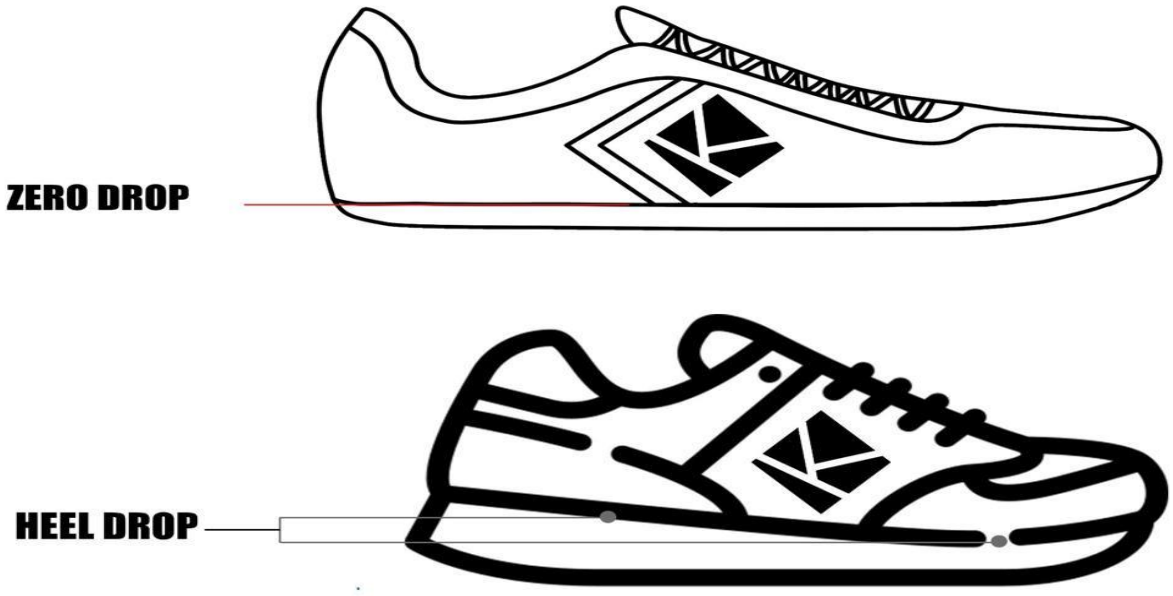


FIG. 1 ILLUSRATIVE DIAGRAM FOR MEASURING HEEL DROP

Table 2 Upper Material — Leather

(*Clause* 7.2)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Flexing resistance, *Min* a) Dry condition b) Wet condition	 Shall not develop any crack to leather before 1 50 000 cycles Shall not develop any crack to leather before 50 000 cycles	IS 5914 (Part 6/Sec1)/ISO 5402-1 or IS 8085 (Part 20)/ISO 17694
ii)	Tear strength (average force), N, *Min*	50	IS 5914 (Part 5/Sec 2)/ISO 3377-2
iii)	Colour fastness rubbing (to and fro) grey scale rate, *Min* a) Dry: Rubbing Rating: (Marring and staining) b) Wet: Rubbing Rating: (Marring and staining)	 150 3/4 grey scale 50 3 grey scale	IS 6191 (Part 4)/ISO 11640

Table 2 (*Concluded*)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
iv)	a) Water vapour permeability, mg/(cm^2 h), *Min*	2.5	IS 15298 (Part 1)
	b) Water vapour coefficient, mg/cm^2, *Min*	15	
	(not applicable to water proof/water repellent leather)		
v)	Stitch tear strength (double hole), N/mm, *Min*	50	LP 8 of IS 5914
vi)	Colour fastness to light grey scale rate, Rating: (Marring)	4 or more	IS/ISO 105-B02
vii)	Tensile strength N/mm^2, *Min*	15	IS 5914 (Part 8)/ISO 3376
viii)	Elongation at break, percent	30 to 75	IS 5914 (Part 8)/ISO 3376
ix)	Abrasion test		
	a) Dry	Shall not develop any hole before 51 200 cycles	IS 15298 (Part 1)
	b) Wet	Shall not develop any hole before 25 600 cycles	

Table 3 Upper Material — Coated Fabric/Textile or Combinations thereof (Type I Coated Fabric and Fully Moulded, Type II Textile)

(*Clause* 7.2)

Sl No.	Characteristic	Requirements		Method of Test, Ref to
		Type I	Type II	
(1)	(2)	(3)	(4)	(5)
i)	Breaking strength, N/mm, Min	10.0	6.0	Method 1 of IS 7016 (Part 2)/ ISO 1421
ii)	Elongation at break, percent, *Min* (average value of 2 direction)	7.0		Method 1 of IS 7016 (Part 2)/ ISO 1421 or ISO 17706
iii)	Tear strength, N, *Min*	35.0	25.0	IS 15298 (Part 1)
iv)	Strength at needle perforation, N/mm, *Min*	3.5		Method 'A' of IS 8085 (Part 13)/ISO 17697

Table 3 (*Concluded*)

Sl No.	Characteristic	Requirements		Method of Test, Ref to
		Type I	Type II	
(1)	(2)	(3)	(4)	(5)
v)	Flexing resistance, no crack/damage to coating/lamination/upper material till prescribed cycles, *Min*			IS 8085 (Part 20)/ISO 17694
	a) Dry condition	Shall not develop any crack/damage to coating/lamination/upper material before 1 25 000 cycles		
	b) Wet condition	Shall not develop any crack/damage to coating/lamination/upper material before 50 000 cycles		
vi)	a) Water vapour permeability, mg/(cm^2 h), *Min*	NA	0.8	IS 15298 (Part 1)
	b) Water vapour coefficient, mg/cm^2, *Min* (not applicable for coated fabric)	NA	15.0	
vii)	Hydrolysis resistance (after ageing at 70 °C and 95 percent RH for 7 days) (applicable for PU coated material)	No crack at 100 000 flexes		IS 15298 (Part 1)
viii)	Colour fastness to light grey scale rate, Rating: (Marring)	4 or more		IS/ISO 105-B02
ix)	Bursting strength, kg/cm^2, *Min* (test applicable for knitted fabrics only)	7		IS 1966 (Part 2)/ISO 13938-2

Table 4 Lining Material — All Materials (Type I Coated Fabric and Type II Textile)

(*Clause* 7.3)

Sl No.	Characteristics	Requirements		Method of Test, Ref to
		Type I	Type II	
(1)	(2)	(3)	(4)	(5)
i)	Tear strength, N, *Min*	15	20	IS 15298 (Part 1)
ii)	Abrasion resistance, cycles			IS 15298 (Part 1)
	a) Dry	Shall not develop any hole before 25 600 cycles		
	b) Wet	Shall not develop any hole before 12 800 cycles		
iii)	Colour fastness to rubbing (crocking), grey scale rate with 10 rubs on dry or wet, *Min* Rating: (Staining)	3		IS/ISO 105-X12
iv)	Colour fastness to perspiration (contact method) grey scale rate, *Min* Rating: (Staining)	3		IS 6191 (Part 6)/ISO 11641
v)	a) Water vapour permeability, mg/(cm^2 h), *Min*	NA	2.0	IS 15298 (Part 1)
	b) Water vapour coefficient, mg/cm^2, *Min*	NA	20.0	

Table 5 Insole – All Materials

(*Clause* 7.4)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Flexing index, *Min* (applicable for cellulose board)	2.0	Annex F of IS 15844 (Part 1)
ii)	Abrasion resistance, at 400 cycles,	No surface tearing	IS 15298 (Part 1)
iii)	a) Water absorption, mg/cm^2, *Min* b) Water desorption, (as a percent of the water absorbed) percent, *Min* (applicable for cellulose board)	40 70	IS 15298 (Part 1)

7.5 In-Sock (Sockliner)

In-sock, if used shall have a top layer of absorbent fabric laminated on EVA, latex sponge rubber, PU foam or combination thereof. The in-sock used in the sports footwear shall conform to requirement as prescribed in Table 6. Sports footwear may have removable or non-removable in sock.

7.6 Outsole

The outsole used in the sports footwear shall conform to requirement as prescribed in Table 7.

7.7 Midsole

The midsole, if used in the sports footwear shall conform to requirement as prescribed in Table 8.

7.8 Counter Stiffener

The counter stiffener, if used in the sports footwear shall conform to requirement as prescribed in Table 9.

7.9 Velcro Fastener

The velcro fastener, if used in the sports footwear shall conform to requirement as prescribed in Table 10.

7.10 Elastic Tape

The elastic tape, if used in the sports footwear shall conform to requirement as prescribed in Table 11.

7.11 Fasteners (Lace/Buckle/Eyelet/D-Ring/ Ski-Hook/Metal Trims)

The fasteners for gripping (not for decorative purpose), if used in the sports footwear shall conform to requirement as prescribed in Table 12. The spike/studs, if used in in the sports footwear shall conform to requirement as prescribed in Table 13.

Table 6 In-Sock (Sockliner) — All Materials

(*Clause* 7.5)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Abrasion resistance, cycles		IS 15298 (Part 1)
	a) Dry condition	Shall not develop any hole before 25 600 cycles	
	b) Wet condition	Shall not develop any hole before 12,800 cycles	
ii)	a) Water absorption, mg/cm^2, *Min* (not applicable for EVA)	70	IS 15298 (Part 1)
	b) Water desorption, percent *Min*	60	
iii)	Heat resistance shrinkage linear, percent, *Max*	2.0	Annex J of IS 15844 (Part 1)

Table 7 Outsole — All Materials

(*Clause* 7.6)

Sl No.	Properties	Requirements				Test Method
		Rubber	PVC	TPU	All Other Materials	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Abrasion resistance (volume loss), mm^3, *Max*	150	200	90	250	IS 3400 (Part 3)/ ISO 4649
ii)	Flexing resistance a) Bennewart Method or b) Ross flexing method	Maximum cut growth of 4 mm at 30 000 flexes At 1 50 000 cycle, cut growth shall not exceed 300 percent				ISO 17707 Annex C and Annex E of IS 16645/ISO 5423
iii)	Hydrolysis resistance, cut growth after 1 50 000 flexes, in mm, *Max* (for PU sole only)	N.A			4.0	IS 15298 (Part 1)
iv)	Tear strength, N/mm, *Min*	12	35	45	7	IS 15298 (Part1)
v)	Tensile strength N/mm^2, *Min*	3.5	15	12	2.5	IS 3400 (Part 1)/ ISO 37
vi)	Elongation at break percent, *Min*	250	230	400	180	IS 3400 (Part 1)/ ISO 37
vii)	Compression set percent, *Max* (Only for cellular sole)	40			40	Annex of IS 15844 (Part 1)

Table 8 Midsole – All Materials

(*Clause* 7.7)

Sl No.	Properties Material	Requirement	Method of Test, Ref to Annex
(1)	(2)	(3)	(4)
i)	Compression set, percent, *Max* a) For EVA b) For all other material	 50 40	Annex G of IS 15844 (Part 1)
ii)	Split tear strength, kg/25 mm, *Min*	2.5	Annex H of IS 15844 (Part 1)
iii)	Heat shrinkage, percent, *Max*	3.0	Annex J of IS 15844 (Part 1)
iv)	Elongation at break, percent, *Min*	180	IS 3400 (Part 1)/ISO 37

Table 9 Counter Stiffener

(*Clause* 7.8)

Sl No.	Properties	Requirement	Method of Test, Ref to Annex of IS 7554
(1)	(2)	(3)	(4)
i)	First dry collapsing load, hardness, N, *Min*	50	**A-3.2.6**
ii)	Resilience, percent, *Min*	50	**A-3.4**
iii)	Moisture resistance, percent, *Min*	60	**A-3.5**
iv)	a) Initial dry area shape retention, percent, *Min* b) Area shape retention after 10th collapse, dry, percent, *Min*	60 50	**A-3.1** **A-3.3**
v)	Peel strength, N/nm, *Min*	0.5	Annex C of IS 15844 (Part 1)

Table 10 Velcro Fastener

(*Clause* 7.9)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Peel strength, N/mm, *Min* a) Initial b) After 5 000 wear cycles	 0.10 0.08	IS 8085 (Part 18)/ISO 22777
ii)	Shear strength, kPa, *Min* a) Initial b) After 5 000 wear cycles	 75 65	IS 8085 (Part 19)/ISO 22776

Table 11 Elastic Tape

(*Clause* 7.10)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Limit of useful extension, percent, *Min*	90	IS 8085 (Part 12)/ISO 10765
ii)	Needle strength, N/mm, *Min*	3.5	Method 'A' of IS 8085 (Part 13)/ISO 17697

Table 12 Fasteners (Lace/Buckle/Eyelet/D-Ring/Ski-Hook/Metal Trims)

(*Clause* 7.11)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Breaking strength of lace, N, *Min*	250	Annex K of IS 15844 (Part 1)
ii)	Lace tag strength, N, *Min*	120	Annex L of IS 15844 (Part 1)
iii)	Lace to lace abrasion, cycles	No breakage before 8 000 cycles	IS 8085 (Part 17)/ISO 22774
iv)	Colour fastness to water (for lace) (Contact method) Grey scale rate, *Min* Rating:	3	IS 6191 (Part 2)/ISO 11642 or IS/ISO 105-E01
v)	Strength of buckle/ski hook/D-ring, N, *Min*	250	Annex M of IS 15844 (Part 1)
vi)	Corrosion resistance (applicable for all including decorative metal part)	Not worse than slight uniform change	IS 17098 (Both Method 1 and Method 2)

Table 13 Spike/ Studs, if Used (Applicable on Removable Spikes/Studs)

(*Clause* 7.11)

Sl No.	Properties	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Corrosion resistance (applicable for metallic spikes)	Not worse than slight uniform change	IS 17098 (Both Method 1 and Method 2)

7.12 Chemical Requirement on Complete Product for All Types of Sports Shoe

7.12.1 All the components of sports shoe which are in direct contact of foot shall comply with Table 1 of IS 17011 for critical substances Category 1 and Category 2 as specified under **3.6** of IS 17011.

7.12.2 When PVC is present in sports shoe, the shoe shall be tested for lead content. Lead content (as Pb) shall not be more than 2 ppm when tested in accordance with the method prescribed in IS 12240 (Part 5).

8 MARKING AND PACKING

8.1 Marking

The sports footwear shall be marked legibly and indelibly with the following:

a) Size; and

b) Identification of the source of manufacturer or brand name.

8.2 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.

8.3 Packing

The sports footwear may be packed as agreed to between the purchaser and the manufacturer. Each individual package shall contain shoes of one size only and may be marked with the name of the item, size, colour, type, identification of the source of manufacture and batch number and any other marking if so desired. Each footwear shall be marked with heel drop category as per Table 1 on packing.

ANNEX A

(*Clause 2*)

LIST OF REFERRED STANDARDS

IS No./Other Standards	*Title*
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light : Xenon arc fading lamp test
IS/ISO 105-X12 : 2016	Textiles — Tests for colour fastness: Part X12 Colour fastness to rubbing (*first revision*)
IS 3400	Methods of test for vulcanized rubbers:
(Part 1) : 2021/ ISO 37 : 2017	Tensile stress-strain properties (*fourth revision*)
(Part 3) : 2021/ ISO 4649 : 2017	Abrasion resistance using a rotating cylindrical drum device (*third revision*)
IS 5914	Methods of physical testing of leather:
(Part 5/Sec 2) : 2023/ISO 3377-2 : 2016	Determination of tear load, Section 2 Double edge tear
(Part 6/Sec 1) : 2023/ISO 5402-1 : 2022	Determination of flex resistance, Section 1 Flexometer method
IS 6191	Methods of micro-biological, colour fastness and microscopical tests for leather:
(Part 2) : 2017/ ISO 11642 : 2012	Colour fastness to water
(Part 4) : 2018/ ISO 11640 : 2012	Colour fastness to cycles of to-and-fro rubbing
(Part 6) : 2023/ ISO 11641 : 2012	Colour fastness to perspiration
IS 7016 (Part 2) : 2022/ISO 1421 :	Methods of test for rubber or plastics coated fabrics: Part 2 Determination of tensile strength and elongation at break (*third revision*)
IS 7554 : 2009	Toe puff and counter stiffener — Specification (*first revision*)
IS 8085	Methods of test for footwear:
(Part 4) : 2019/ ISO 16177 : 2012	Resistance to crack initiation and growth — Belt flex method
(Part 12) : 2023/ ISO 10765 : 2010	Tensile performance of elastic materials
(Part 13) : 2023/ ISO 17697 : 2016	Seam strength for uppers lining and insocks
(Part 15) : 2023/ ISO 19954 : 2003	Washability in a domestic washing machine for whole shoe
(Part 16) : 2023/ ISO 24266 : 2020	Flexing durability for whole shoe
(Part 17) : 2023/ ISO 22774 : 2004	Abrasion resistance for accessories shoe laces
(Part 18) : 2023/ ISO 22777 : 2004	Peel strength before and after repeated closing for accessories touch and close fasteners
(Part 19) : 2023/ ISO 22776 : 2004	Shear strength before and after repeated closing for accessories touch and close fasteners
(Part 20) : 2023/ ISO 17694 : 2016	Flex resistance for uppers and lining
IS 15298 (Part 1) : 2015/ISO 20344 : 2011	Personal protective equipment: Part 1 Test methods for footwear (*second revision*)
IS 16645 : 2018/ ISO 5423 : 1992	Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use — Specification

IS No./Other Standards	*Title*
IS 17011 : 2018	Chemical requirements for footwear and footwear materials
IS 17098 : 2019/ ISO 22775 : 2004	Footwear — Test methods for accessories: Metallic accessories — Corrosion resistance
ISO 17706 : 2003	Footwear — Test methods for uppers — Tensile strength and elongation

ANNEX B

(*Foreword*)

PRONATION AND HEEL DROP

B-1 PRONATION AND ARCH TYPE

There are three primary arch types: normal (neutral) arches, high arches and low arch or flat feet.

Pronation is part of the natural movement of the human body and refers to the way your foot rolls inward for impact distribution upon landing.

When a manufacturer is offering sports shoes for pronation (high arch or flat foot), it shall be suitably marked as per Table 14 (pronation).

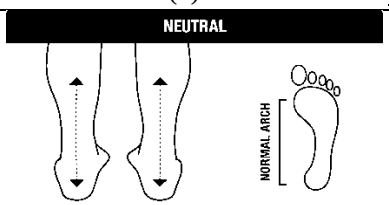
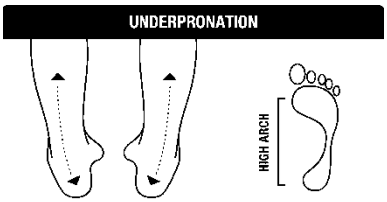
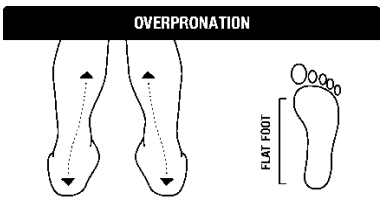
When you walk or run, ideally, you should land on your midfoot. When the center of your foot hits the ground, your weight is equally distributed and impact is evenly absorbed. In addition, your foot will roll slightly inward, naturally flattening the arch of your foot. This is known as neutral pronation. This small degree of pronation is an intrinsic part of our foot's design and allows it to function as a natural spring. In fact, a "neutral" foot pronates slightly inward by up to 15 percent. This helps us jump, run and walk with a bounce in our step.

Problems can occur when the ankle over-or under-pronates by anything more than 15 percent.

Manufacturer may design shoes with pronation in mind and offer shoes suitable for over-or under pronation. These shoes shall be marked suitably as under.

Table 14 Pronation

(*Clause* B-1)

Sl No.	Pronation and Arch Type	Understanding Pronation	Marking
(1)	(2)	(3)	(4)
i)		A "neutral" foot pronates slightly inward by up to 15 percent. Foot lands on outside of the heel, then rolls inward (pronates) to absorb shock and support body weight.	NA
ii)		An underpronated or supination foot happens when an ankle rolls outward (or supinates) more than it should, resulting in increased weight distribution on the outer edge of the foot. Outer side of the heel hits the ground at an increased angle with little or no normal pronation, causing a large transmission of shock through the lower leg. Shoes for high arch should be with more cushion and flexibility. Shoes should have additional cushioning at midsole, outside of the shoe and in the heel.	HA
iii)		An overpronated foot occurs when the ankle rolls inward (or pronates) more than it should, resulting in increased weight distribution on the inner edge of the foot. Foot lands on outside of heel, then rolls inward (pronates) excessively, transferring weight to inner edge instead of ball of the foot. Shoes for low arch or flat foot should be with stability or motion control with extra cushioning. Should be with medial support that is, firmer material in the midsole.	LA

B-2 HEEL DROP

The heel drop of a shoe represents the difference in height between the heel and forefoot, measured in millimeters. The greater the drop, the steeper the angle between heel and forefoot. For example, when barefoot, the heel and forefoot touch the ground at the same level: drop is 0. At the other end of the scale, when wearing high heels, the drop is much greater. The drop primarily affects how your foot strikes the ground. Heel drop is important because the height of heel versus the height of the ball of foot can impact the stride of the wearer. Fig. 2 (A) and Fig. 2 (B) illustrates the 'Traditional Sports Footwear 'D' mm Drop' and 'Zero-Drop Sports Footwear 0 mm Drop'.

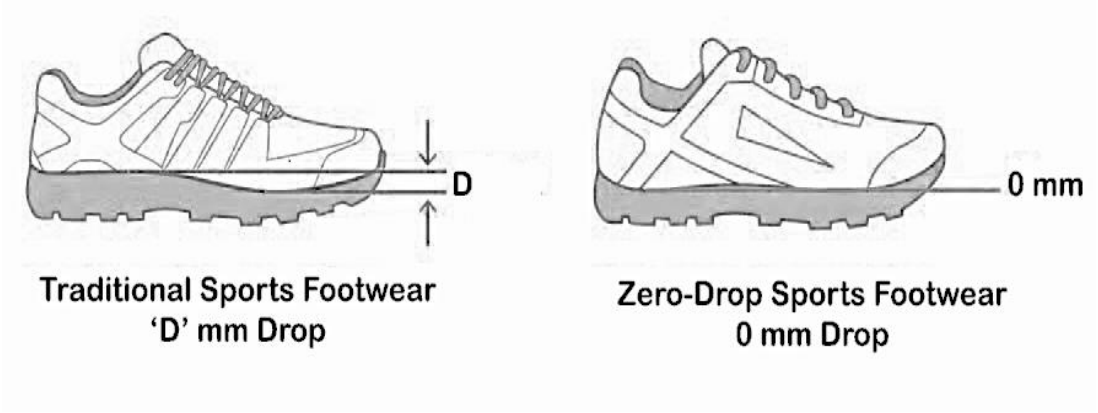


FIG. 2 (A) FIG. 2 (B)

FIG. 2 (A) AND FIG. 2 (B) — MEASURING HEEL DROP

ANNEX C

(*Foreword*)

GENERAL DETAILS FOR DIFFERENT TYPES OF PROFESSIONAL SPORTS FOOTWEAR

Football Shoes/Turf Shoes	*Badminton/Court Shoes*	*Basketball Shoes*	*Cricket Shoes*	*Track and Field Athletic Shoes*
a) Most of football shoes are notorious for their extremely narrow fit, tight toe box, and inflexible sole. The reasons behind the narrow toe-box is in order to assist in changing direction of player foot, which in turn ensures that player toes don't slip. or move around. b) Generally football player prefer their shoes to fit much more snug than running shoes. This is because athletes tend to prefer a more sensitive touch on the ball. c) **Turf Football Shoes** — Turf football shoes has a larger number of closely positioned, short rubber studs on a flat style	a) **Lasting** — Generally professional sports shoes are made by 3 types of lasting. b) **Slip Lasting** — The upper is stitched with insole and glued directly to the midsole/outsole. c) **Board Lasting** — The upper is attached to the bottom of a flexible board, which is then fixed in the midsole/outsole. d) **Partial/Combination Lasting** — This is where slip and board lasting are both used within the shoe. e) **Badminton/Court Shoes** — are specifically designed for the footwork and movement in badminton. Anti-slip and wear-resistant rubber makes the perfect	a) Basketball shoes are specially designed to provide good ankle support and excellent traction on the court. b) Basketball places significant and spontaneous forces upon the feet, ankles and lowers legs of the player, the game place a premium on instant acceleration and deceleration, lateral movement and jumping ability. For these reasons. c) Basketball shoe must be constructed with the combined features of ankle support, cushioning to absorb shock, flexibility and stability.	a) Cricket shoes are designed in generally three types for different playing positions. b) **Fielding Shoes** — Generally known as "all rounder's". These are made with fielders' in mind, but can be used by other playes as they tend to be lighter than shoes made for a specific purpose. c) **Bowling Shoes** — These shoes are generally full spikes between 2 and 4 heel spikes and between 5 and 7 forefoot spikes. The spikes provide good traction and help to player keep their balance when bowling or playing on pitches. d) **Batting Shoes** — These shoes are generally half spikes as it provides the right amount of traction for both	a) Track and field spikes shoes are constructed with less materials to keep weight down. The less weight on athlete feet, keep help become faster. b) **Fitting** — For Track and field shoes the most important thing to keep in mind is comfort and fit. c) **Sprinting, Jumping and Throwing** — Spikes/shoes should fit like a glove. There should be minimal open space inside of the shoes. When moving at faster speeds, athlete do not want his foot sliding around inside of the shoes. athlete toes should not be jammed up against the end, but close to it.

Table (*Continued*)

Football Shoes/Turf Shoes	*Badminton/Court Shoes*	*Basketball Shoes*	*Cricket Shoes*	*Track and Field Athletic Shoes*
soleplate. The purpose of these studs is to evenly distribute pressure across the foot to ensure joint comfort, while giving you better balance on a surface that doesn't offer as much grip.	material for the soles of badminton shoes, while the midfoot part requires excellent shock-absorption and resilience. f) **Ventilation** — During badminton match, player walk a lot and get warm or even hot. Player body will generate its own natural heat and will want to get rid of it through his feet. well ventilated shoes allow this heat to evaporate and player feet remain dry. The result is less chance of blisters, more comfort and less sweaty feet. Therefore, always look at the materials used or ventilation methods applied. g) **Non-Marking Outsole** — Badminton/court shoes shall be non marking shoes. Non marking shoe are basically those with soles that do not cause scuff marks on the surface of the indoor courts. These are rubber sole shoes, made to ensure they do not		running and playing shots. In this, spikes will be present only in the front with zero at the back end of the sole.	d) **Distance Spikes** — can have a little more room on the inside but not as much as athlete daily trainers/ practice shoes. The extra room will provide space needed for additional swelling. Athlete will not be moving as quickly and comfort will become more of a factor during longer races. e) **Types of Spikes** — Spikes comes in different shapes, designs and lengths and it can be replaceable. f) **Pyramid Spikes** — The most versatile type of spike, 1/4” (6 mm) pyramids spikes are the most widely accepted on all tracks. g) **Needle** — Needle spikes give traction on all type tracks. 3/16" (5 mm) is the ideal size, any larger and they tend to stick into the track when you lift your foot.

Table (*Concluded*)

Football Shoes/Turf Shoes	*Badminton/Court Shoes*	*Basketball Shoes*	*Cricket Shoes*	*Track and Field Athletic Shoes*
	leave sole impressions on the modern synthetic/ wooden surfaces.			h) **Christmas (X-mas) Tree** — also called Compression spikes. These look like a Christmas tree and are used for rubber and tartan surfaces. Use in place of longer needle spikes to avoid "sticking". j) **Studs** — also called "blanks". They have no spike on them. They are used for cross country and sometimes asphalt to keep dirt out of the screw-in holes.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Footwear Sectional Committee, CHD 19

Organization	*Representative(s)*
In Personal Capacity, Chennai (*Flat F1, Bhoopathy Apartment, 10, Ethiraj Street, Palipattu, Chennai – 600113*)	DR B. N. DAS **(*Chairperson*)**
Agra Footwear Manufacturers and Exporters Chamber (AFMEC), Agra	SHRI PURAN DAWAR SHRI SHYAM BANSAL (*Alternate*)
Atharva Laboratories Private Limited, Noida	MS APARNA PARVATIKAR SHRI J. BASAK (*Alternate*)
Bata India Limited, Kolkata	SHRI HITESH KAKKAR SHRI GOVINDARAJU (*Alternate*)
Central Reserve Police Force, New Delhi	SHRI D. P. UPADHYAY SHRI SANJEEV KUMAR SINGH (*Alternate*)
Confederation of Indian Footwear Industries, New Delhi	SHRI RAJ KUMAR GUPTA SHRI V. NOUSHAD (*Alternate*)
Council for Leather Exports, Chennai	SHRI SANJAY LEEKHA SHRI R. SELVAM (*Alternate*)
CSIR – Central Institute for Mining and Fuel Research, Dhanbad	DR J. K. PANDEY
CSIR – Central Leather Research Institute, Chennai	DR R. MOHAN DR MAHESH KUMAR J. (*Alternate*)
Defence Research and Development Organization, Defence Institute of Physiology and Allied Science, New Delhi	DR MADHUSUDAN PAL
Directorate General Factory Advice Service and Labour Institutes, Mumbai	DR BRIJ MOHAN SHRIMATI M. K. MANDRE (*Alternate*)
Directorate General of Mines Safety, Dhanbad	SHRI SAIFULLAH ANSARI SHRI A. RAJESHWAR RAO (*Alternate*)
Directorate General of Quality Assurance, Ministry of Defence, Kanpur	SHRI S. CHAKRABORTY SHRI SANJAY VERMA (*Alternate*)
Footwear Design and Development Institute, Noida	SHRI SHAILENDAR SAXENA SHRI SAROJ KUMAR PANDA (*Alternate*)
Indian Footwear Components Manufacturers Association, Noida	SHRI SANJAY GUPTA SHRI SHARAD KANT VERMA (*Alternate*)

Organization	*Representative(s)*
Laghu Udyog Bharati, New Delhi	SHRI JATINDER PAUL CHUGH SHRI AMIT SANCHETI (*Alternate*)
Lancer Footwear India Private Limited, New Delhi	SHRI SAURABH GUPTA
Liberty Shoes Limited (P.U. Division), Karnal	SHRI ADESH GUPTA SHRI SHRI S. S. LAHIRI (*Alternate*)
Mangla Plastic Industries, Bahadurgarh	SHRI ANIL KUMAR MANGLA
MB Rubber Private Limited, Delhi	SHRI VIPAN MEHTA
MSME Technology Development Centre (PPDC), Meerut	SHRI ADITYA PRAKASH SHARMA SHRI TULARAM BHARTI (*Alternate*)
Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade, New Delhi	SHRI NAND LAL
Pinza Footwear, New Delhi	SHRI PREM MEHANI
Prolific Engineers, Noida	SHRI G. P. KEDIA
SGS India Private Limited, Gurugram	SHRI P. VENKATESAN SHRI K. PACHAIYAPPAN (*Alternate*)
Top Lasts, Agra	SHRI DEEPAK MANCHANDA SHRI ANURAG SHARMA (*Alternate*)
Xo Footwear Private Limited, Delhi	SHRI NALIN GUPTA SHRI MANOJ KUMAR (*Alternate*)
BIS Directorate General	SHRI AJAY KUMAR LAL, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (CHEMICAL) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
MS PREETI PRABHA
SCIENTIST 'C'/DEPUTY DIRECTOR
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