

भारतीय मानक
Indian Standard

IS 15844 (Part 2) : 2023

खेल के जूते
भाग 2 परफॉरमेंस खेल के लिए जूते

Sports Footwear
Part 2 Performance Sports Footwear

ICS 13.340.50

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June 2023

Price Group 8

Footwear Sectional Committee, CHD 19

FOREWORD

This Indian Standard (Part 2) 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 : 2010 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; and

Part 3 Professional sports footwear.

This part covers the performance requirements of performance sports footwear used for jogging, running including trail running, adventure sport, trekking, climbing etc).

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 addition to this, in this standard, 'Annexure B' has been incorporated regarding pronation and arch type for information.

The composition of the Committee responsible for developing 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 : 2022 'Rules for rounding off numerical values (*second revision*)'.

Indian Standard
SPORTS FOOTWEAR
PART 2 PERFORMANCE SPORTS FOOTWEAR

1 SCOPE

1.1 This standard prescribes the performance requirements of performance sports footwear used for (jogging, running including trail running, adventure sport, trekking, climbing etc).

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

- a) General purpose; and
- b) Professional 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 editions of these standards.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2050 and the following shall apply.

3.1 Toe Spring — Toe spring refers to the degree of upward curvature of the sole under the toes or forefoot (front of the foot). Its purpose is to facilitate forward motion through the front of the shoe.

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

3.3 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.

3.4 Rigid Sole — The soles which do not bend at ball girth and which do not lose shape after application of manual force.

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 test pieces shall be conditioned at $(27 \pm 2)^\circ\text{C}$ and (65 ± 5) percent Relative Humidity (RH).

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 lose shape retention property and shall be flexible.

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

5.4 Sports footwear shall 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. Size of the footwear shall be guided in accordance with IS 1638 but in no case shall be less than value provided in IS 1638.

7 REQUIREMENTS

7.1 Whole Footwear

7.1.1 The toe spring height of the sports footwear shall be minimum 5 mm and shall be measured as per Fig.1.

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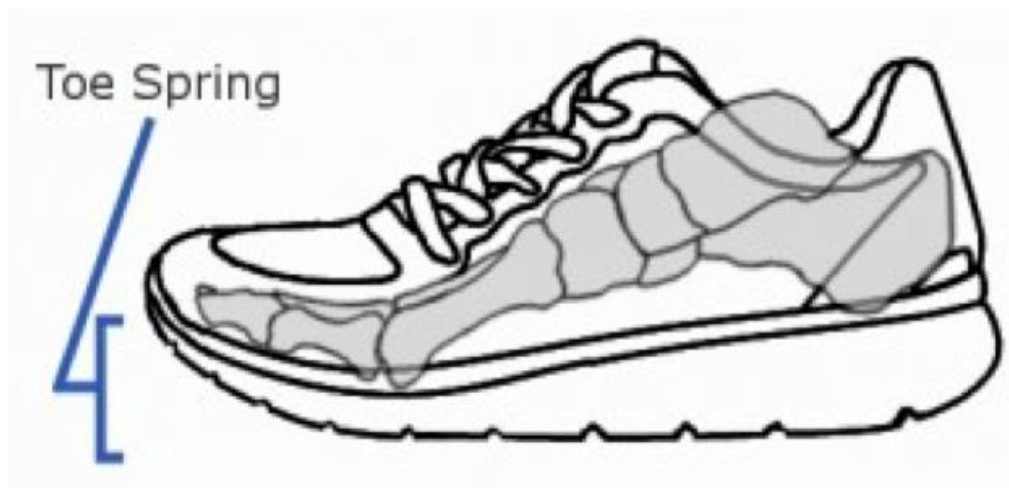


FIG. 1 TOE SPRING

7.1.2 Upper to Mid Sole/Out Sole Bond Performance

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 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.

7.1.3 Upper to Composite Sole Bond Performance
(Applicable only when the sole is composite)

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 out sole 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 2.5 N/mm.

7.1.4 Out Sole to Mid Sole (Multilayer, if present) Bond Performance

When footwear is tested according to method given in Annex C of IS 15844 (Part 1), in case of footwear having multilayer soles, the bond strength of each layer 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 2.5 N/mm.

7.1.5 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.

7.1.6 Complete Shoe Flexing

When footwear is tested in accordance with the method given in ISO 24266 (Method A) at an angle of 45 degrees at 300 000 cycles, no change in upper (for example, crack, thread breakage, fabric broken), sole cracking, bond opening shall occur.

7.1.7 Washability

When footwear is tested in accordance with the method given in ISO 19954 for 30 min at 40 °C, there shall not be any bond opening, coating separation, and grey scale rate shall be minimum 3 grey scale.

7.1.8 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.

7.1.9 Heel Drop

Based on heel drop, shoes are split in four categories. When measured as shown in Fig. 2, it shall meet the requirements of Table 1.

Table 1 Heel-Drop

(Clause 7.1.9)

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

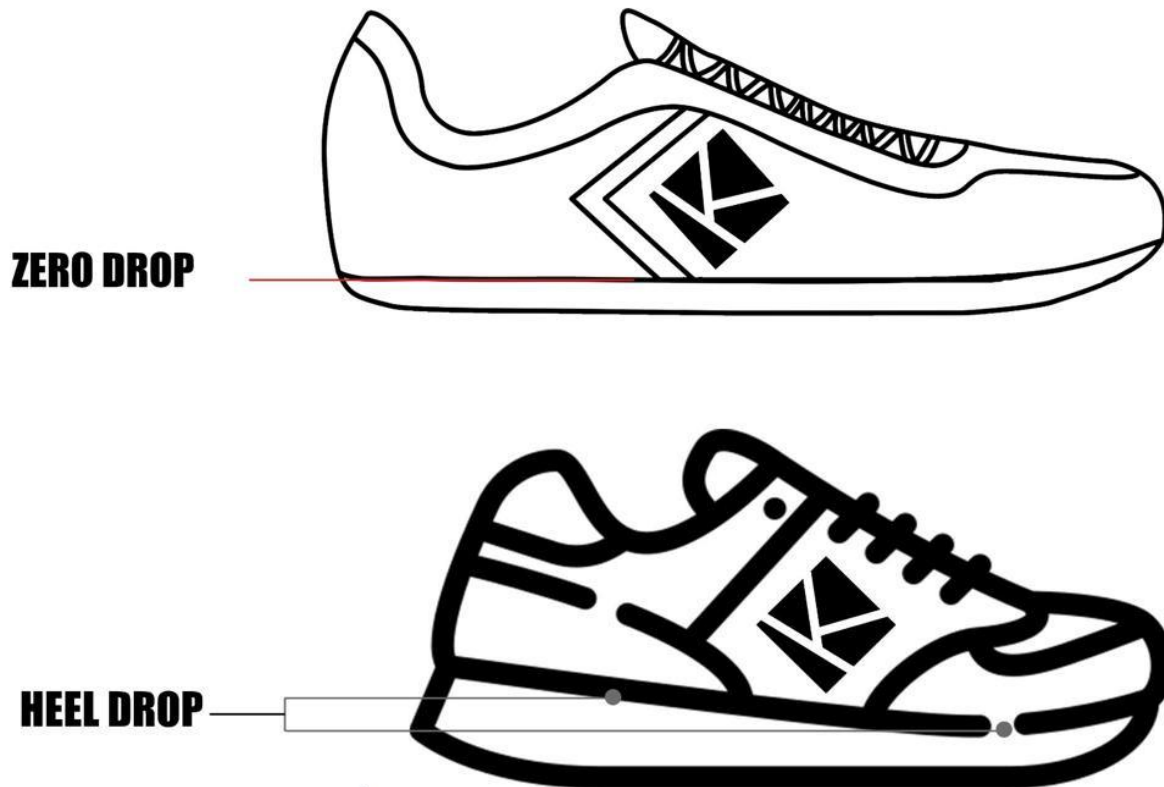


FIG. 2 ILLUSTRATIVE DIAGRAM FOR MEASURING HEEL DROP

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

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/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.

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Table 2 Upper Material – Leather

(Clause 7.2)

Sl No.	Characteristics	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Flexing resistance, <i>Min</i>		
	a) Dry condition	Shall not develop any crack to leather before 1 50 000 cycles	IS 5914 (Part6/Sec1)/ISO 5402-1
	b) Wet condition	Shall not develop any crack to leather before 50 000 cycles	
ii)	Tear strength (average force), N, <i>Min</i> ,	50	IS 5914 (Part 5/Sec 2)/ISO 3377-2
iii)	Colour fastness rubbing (to and fro) grey scale rate, <i>Min</i>		
	a) Dry: (rubbing)	150	IS 6191 (Part 4)/ISO 11640 : 2012
	Rating: (Marring and staining)	3 /4 grey scale	
	b) Wet: (rubbing)	50	
	Rating: (Marring and staining)	3 grey scale	
iv)	a) Water vapour permeability, mg/(cm ² h), <i>Min</i>	2.5	IS 15298 (Part 1)
	b) Water vapour coefficient, mg/cm ² , <i>Min</i>	15	
v)	Stitch tear strength (double hole), N/mm, <i>Min</i>	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 , <i>Min</i>	15	IS 5914 (Part 8)/ISO 3376
viii)	Elongation at break, %	30 - 75	IS 5914 (Part 8)/ISO 3376
ix)	Water penetration and water absorption after 60 Minutes		
	Water absorption %, <i>Max</i>	30	IS 15298 (Part 2)
	Water penetration Gms, <i>Max</i>	0.2	
x)	Abrasion test (for unlined upper)		
	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

(Clause 7.2)

Sl No.	Characteristics	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Breaking strength, N/mm, <i>Min</i>	10.0	Method 1 of IS 7016 (Part 2)/ ISO 1421 : 2016 or ISO 17706
ii)	Elongation at break, percent <i>Min</i> (Average value of 2 direction)	7	Method 1 of IS 7016 (Part 2)/ ISO 1421 : 2016 or ISO 17706
iii)	Tear strength, N, <i>Min</i>	35	IS 15298 (Part 1)
iv)	Strength at needle perforation, N/mm, <i>Min</i>	3.5	Method 'A' of IS 8085 (Part 13)/ ISO 17697
v)	Flexing resistance, no crack/damage to coating/ lamination/ upper material till prescribed cycles, <i>Min</i>		
	a) Dry condition	Shall not develop any crack/damage to coating/lamination /upper material before 1 25 000 cycles	IS 8085 (Part 20)/ISO 17694
	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), <i>Min</i>	0.8	IS 15298 (Part 1)
	b) Water vapour coefficient, mg/cm ² <i>Min</i> (Applicable for textile upper)	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 125 000 flexes	IS 16645/ISO 5423 : 1992

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Table 3 (Concluded)

Sl No.	Characteristics	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
viii)	Colour fastness to light grey scale rate, Rating: (Marring)	4 or more	IS/ISO 105-B02
ix)	Bursting strength, kg/cm ² , <i>Min</i> (Test applicable for knitted fabrics only)	7	IS 1966 (Part 2)/ISO 13938-2 : 2019

Table 4 Lining Material – All Materials

(Clause 7.3)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Tear strength, N, <i>Min</i>	20	IS 15298 (Part 1)
ii)	Abrasion resistance, cycles		
	a) Dry	Shall not develop any hole before 25 600 cycles	IS 15298 (Part 1)
	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, <i>Min</i> Rating: (Staining)	3	IS/ISO 105-X12
iv)	Colour fastness to perspiration (contact method) grey scale rate, <i>Min</i> Rating: (Staining)	3	IS 6191 (Part 6)/ ISO 11641
v)	a) Water vapour permeability, mg/(cm ² h), <i>Min</i>	2.0	IS 15298 (Part 1)
	b) Water vapour coefficient, mg/cm ² , <i>Min</i> (Not applicable on coated fabric)	20.0	

7.4 Insole

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

7.5 In-sock (Sockliner)

In-sock shall have a top layer of absorbent fabric laminated on EVA, latex sponge rubber, PU foam

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or combination thereof. The in-sock used in the sports footwear shall conform to requirement as prescribed in Table 6. Sports footwear shall have removable sockliner.

7.6 Outsole

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

Table 5 Insole – All Materials

(Clause 7.4)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Thickness, mm, <i>Min</i>	1.0	IS 15298 (Part 1)
ii)	Flexing index, <i>Min</i> (Applicable for cellulose board)	2.0	Annex F of IS 15844 (Part 1)
iii)	Abrasion resistance, at 400 cycles,	No surface tearing	IS 15298 (Part 1)
iv)	a) Water absorption, mg/cm ² , <i>Min</i> b) Water desorption, (as a percent of the water absorbed) percent, <i>Min</i>	60 70	IS 15298 (Part 1)

Table 6 In-sock (Sockliner) – All Materials

(Clause 7.5)

Sl No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Thickness, mm, <i>Min</i> (Including foam)	2.5	IS 15298 (Part 1)
ii)	Abrasion resistance, cycles a) Dry condition b) Wet condition (Not applicable, if full in-sock is used)	 Shall not develop any hole before 25 600 cycles Shall not develop any hole before 12 800 cycles	 IS 15298 (Part 1)
iii)	a) Water absorption, mg/cm ² , <i>Min</i> (for insocks which is not water permeable) b) Water desorption, percent <i>Min</i> (Applicable for fabric only)	70 60	IS 15298 (Part 1)
iv)	Heat resistance shrinkage linear, percent, <i>Max</i>	2.0	Annex J of IS 15844 (Part 1)

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Table 7 Outsole – All Materials

(Clause 7.6)

SI No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Abrasion resistance (volume loss), mm ³ , <i>Max</i> ¹		
	a) Cellular sole (Load 5 N)	< 400	IS 3400 (Part 3)/ISO 4649 : 2016
	b) Solid sole (Load 10 N)	≥ 250	
ii)	Flexing resistance (belt method)	No crack at 50 000 flexes	IS 8085 (Part 4)/ISO 16177 : 2012
iii)	Hydrolysis resistance, cut growth after 1 50 000 flexes, in mm, <i>Max</i> (for PU sole only)	4.0	IS 15298 (Part 1)
iv)	Tear strength, N/mm, <i>Min</i>	5.0	IS 15298 (Part 1)
v)	Tensile strength N/mm ² , <i>Min</i>	2.5	IS 3400 (Part 1)/ISO 37 : 2017
vi)	Elongation at break %, <i>Min</i>	180	IS 3400 (Part 1)/ISO 37 : 2017
vii)	Compression set %, <i>Max</i>	55	Annex G of IS 15844 (Part 1)
NOTES			
1 Cellular sole – Sole with density less than 0.90 g/cm ³ density.			
2 Solid sole – Sole with density 0.90 g/cm ³ and above.			

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.

Table 8 Midsole – All Materials

(Clause 7.7)

SI No.	Properties Material	Requirement	Method of Test, Ref to Annex
(1)	(2)	(3)	(4)
i)	Compression set, percent, <i>Max</i>		Annex G of IS 15844 (Part 1)
	For EVA	50	
	For all other material	40	
ii)	Split tear strength, kg/25 mm, <i>Min</i>	2.5	Annex H of IS 15844 (Part 1)
iii)	Heat shrinkage, percent, <i>Max</i>	3.0	Annex J of IS 15844 (Part 1)
iv)	Elongation at break, percent, <i>Min</i>	180	IS 3400 (Part 1)/ISO 37 : 2017

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, <i>Min</i>	50	A-3.2.6
ii)	Resilience, percent, <i>Min</i>	50	A-3.4
iii)	Moisture resistance, percent, <i>Min</i>	60	A-3.5
iv)	a) Initial dry area shape retention, percent, <i>Min</i>	60	A-3.1
	b) Area shape retention after 10th collapse, dry, percent, <i>Min</i>	50	A-3.3
v)	Peel strength, N/mm, <i>Min</i>	0.5	Annex C of IS 15844 (Part 1)

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.

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, <i>Min</i>		
	a) Initial	0.10	IS 8085 (Part 18)/ISO 22777
	b) After 5 000 wear cycles	0.08	
ii)	Shear strength, kPa, <i>Min</i>		
	a) Initial	75	IS 8085 (Part 19)/ISO 22776
	b) After 5 000 wear cycles	65	

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Table 11 Elastic Tape

(Clause 7.10)

SI No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Limit of useful extension, percent, <i>Min</i>	90	IS 8085 (Part 12)/ISO 10765
ii)	Needle strength, N/mm, <i>Min</i>	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)

SI No.	Properties	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Breaking strength of lace, N, <i>Min</i>	250	Annex K of IS 15844 (Part 1)
ii)	Lace tag strength, N, <i>Min</i>	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, <i>Min</i> Rating:	3	IS 6191 (Part 2)/ISO 11642 : 2012
v)	Strength of buckle/ski hook/D-ring, N, <i>Min</i>	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

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

All the components of footwear shall comply with Table 1 of IS 17011 for critical substances. Category I and Category II as specified under 3.6 of IS 17011.

8 MARKING AND PACKING

8.1 Marking

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

- Size; and

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

Each footwear shall be marked with heel drop category as per Table 1.

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 shall 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.

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ANNEX A

(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No./Other Publications</i>	<i>Title</i>	<i>IS No./Other Publications</i>	<i>Title</i>
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light: Xenon arc fading lamp test	IS 7554 : 2009	Toe puff and counter stiffener — Specification (<i>first revision</i>)
IS/ISO 105-X12 : 2016	Textiles — Tests for colour fastness: Part X12 Colour fastness to rubbing (<i>first revision</i>)	IS 8085	Methods of test for footwear:
IS 3400	Methods of test for vulcanized rubber:	(Part 4) : 2019/ISO 16177 : 2012	Resistance to crack initiation and growth — Belt flex method
(Part 1) : 2021/ISO 37 : 2017	Part 1 Tensile stress-strain properties	(Part 12)/ISO 10765 : 2010	Tensile performance of elastic materials (<i>under preparation</i>)
(Part 3) : 2021/ISO 4649 : 2017	Part 3 Abrasion resistance using a rotating cylindrical drum device (<i>third revision</i>)	(Part 13)/ISO 17697 : 2016	Seam strength for uppers lining and insocks (<i>under preparation</i>)
IS 5914 : 1970	Methods of physical testing of leather:	(Part 17) /ISO 22774 : 2004	Abrasion resistance for accessories shoe laces (<i>under preparation</i>)
(Part 5/Sec 2)	Determination of tear load, Section 2 Double edge tear (<i>under preparation</i>)	(Part 18)/ISO 22777 : 2004	Peel strength before and after repeated closing for accessories touch and close fasteners (<i>under preparation</i>)
(Part 6/Sec 1)	Determination of flex resistance, Section 1 Flexometer method (<i>under preparation</i>)	IS 15298 (Part 1) : 2015	Personal protective equipment: Part 1 Test methods for footwear (<i>second revision</i>)
IS 6191 : 1971	Micro-biological colour fastness and microscopical tests for leather:	IS 16645 : 2018/ISO 5423 : 1992	Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use specification
(Part 2) : 2017/ISO 11642 : 2012	Colour fastness to water	IS 17011 : 2018	Chemical requirements for footwear and footwear materials
(Part 4) : 2018/ISO 11640 : 2012	Colour fastness to cycles of to-and-fro rubbing	IS 17098 : 2019/ISO 22775 : 2004	Footwear — Test methods for accessories: Metallic accessories — Corrosion resistance
(Part 6)/ISO 11641 : 2012	Colour fastness to perspiration	IS 8085	Methods of test for footwear:
IS 7016 (Part 2): 2022/ISO 1421 : 2016	Methods of test for coated and treated fabrics: Part 2 Determination of tensile strength and elongation at break (<i>third revision</i>)	(Part 15)/ISO 19954 : 2003	Washability in a domestic washing machine for whole shoe (<i>under preparation</i>)

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<i>IS No./Other Publications</i>	<i>Title</i>	<i>IS No./Other Publications</i>	<i>Title</i>
(Part 16)/ ISO 24266 : 2020	Flexing durability for whole shoe (<i>under preparation</i>)	ISO 17706 : 2003	Footwear — Test methods for uppers — Tensile strength and elongation
(Part 20)/ISO 17694 : 2016	Flex resistance for uppers and lining (<i>under preparation</i>)		

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ANNEX B

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).

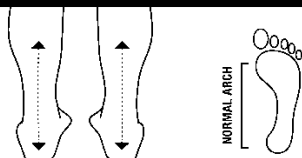
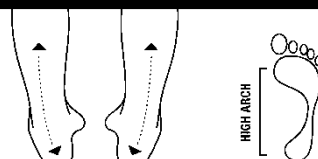
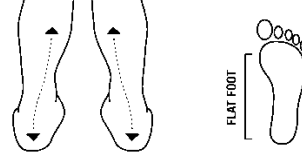
When you walk or run, ideally, you should land on your midfoot. When the center of your foot hits the ground, your weight is equally distributed and impact is evenly absorbed. In addition, your foot

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. (1)	Pronation and Arch Type (2)	Understanding Pronation (3)	Marking (4)
i)	<p>NEUTRAL</p>  <p>The diagram shows a top-down view of a foot with a normal arch. Arrows indicate the foot rolling inward slightly during pronation. A side view shows the foot's profile with a normal arch labeled 'NORMAL ARCH'.</p>	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)	<p>UNDERPRONATION</p>  <p>The diagram shows a top-down view of a foot with a high arch. Arrows indicate the foot rolling outward during supination. A side view shows the foot's profile with a high arch labeled 'HIGH ARCH'.</p>	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)	<p>OVERPRONATION</p>  <p>The diagram shows a top-down view of a foot with a flat foot. Arrows indicate the foot rolling inward excessively during pronation. A side view shows the foot's profile with a flat foot labeled 'FLAT FOOT'.</p>	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. 1(a) and Fig. 1(b) illustrates the 'Traditional Sports Footwear 'D' mm Drop' and 'Zero-Drop Sports Footwear 0 mm Drop'.



**Traditional Sports Footwear
'D' mm Drop**



**Zero-Drop Sports Footwear
0 mm Drop**

FIG. 3 (A)

FIG. 3 (B)

FIG. 3 (A) AND FIG. 3 (B) — MEASURING HEEL DROP

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ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Footwear Sectional Committee, CHD 19

<i>Organization</i>	<i>Representative(s)</i>
In personal capacity (<i>Flat F1, Bhoopathy Apartment, 10, Ethiraj Street, Palipattu, Chennai-600113</i>)	DR B. N. DAS (Chairperson)
Atharva Labs, Noida	APARNA PARVATIKAR SHRI V. B. PARVATIKAR (<i>Alternate</i>)
Bata India Limited, Kolkata	SHRI HITESH KAKKAR SHRI ANOOP SHUKLA (<i>Alternate</i>)
Bihar Rubber Co Ltd, Ranchi	SHRI JAYANTA KUMAR LAHIRI
Bureau of Police Research and Development, Delhi	SHRI JAGIR CHAND
Central Institute for Mining and Fuel Research, Dhanbad	DR J. K. PANDEY
Central Leather Research Institute, Chennai	DR R. MOHAN SHRI SATHYARAJ (<i>Alternate</i>)
Central Reserve Police Force, Ministry of Home Affairs New Delhi	RANDHIR KUMAR JHA SHRI R. K. THAKUR (<i>Alternate</i>)
Confederation of Indian Footwear Industries, New Delhi	SHRI NAND KISHORE
Council for Footwear Leather and Accessories	(CFLA) EXECUTIVE DIRECTOR SHRI RAJEEV SHARMA (<i>Alternate</i>)
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 (<i>Alternate</i>)
Directorate General of Mines Safety, Dhanbad	SHRI SAIFULLAH ANSARI SHRI A. RAJESHWAR RAO (<i>Alternate</i>)
Directorate General of Quality Assurance, Kanpur	SHRI S. CHAKRABORTY SHRI SANJAY VERMA (<i>Alternate</i>)
Footwear Design & Development Institute, Noida	SHRI SHAILENDAR SAXENA SHRI SAROJ KUMAR PANDA (<i>Alternate</i>)
Indian Footwear Components Manufacturers' Association (IFCOMA), Noida	SHRI MANI ALMAL MS RASHMI (<i>Alternate</i>) SHRI S. K. VERMA (<i>Alternate</i>)
Intertek India Private Limited, Gurugram	SHRIMATI RASHMI ASTHANA
Lancer Footwear India Pvt Ltd, New Delhi	SHRI SAURABH GUPTA

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<i>Organization</i>	<i>Representative(s)</i>
Liberty Shoes Ltd, (P U Division), Karnal	SHRI ADESH GUPTA SHRI S. S. LAHIRI (<i>Alternate</i>)
Mangla Plastics	SHRI J. BASAK
M B Rubber Private Limited	SHRI VIPAN MEHTA
MSME Technology Development Centre (PPDC), Meerut	SHRI ADITYA PRAKASH SHARMA SHRI TULARAM BHARTI (<i>Alternate</i>)
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	SHRI G. P. KEDIA
Steel Authority of India Ltd, Bhilai	SHRI V. K. AGARWAL SHRI A. K. SAHA (<i>Alternate</i>)
Top Lasts	SHRI DEEPAK MANCHANDA SHRI ANURAG SHARMA (<i>Alternate</i>)
XO Footwear, Delhi	SHRI NALIN GUPTA SHRI MANOJ KUMAR (<i>Alternate</i>)
BIS Directorate General	SHRI AJAY KUMAR LAL, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (CHEMICAL) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary
MS PREETI PRABHA
SCIENTIST 'C'/DEPUTY DIRECTOR
(CHEMICAL), BIS

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