भारतीय मानक

Indian Standard

IS 17043 (Part 2) : 2024

जूते — विशिष्टि

भाग 2 सामान्य प्रयोजन के लिए जूते

Shoes — Specification

Part 2 Shoes for General Purpose

ICS 13.340.50; 61.060

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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.

This standard was originally published in 2018 and prescribed constructional and performance requirements of derby shoes which are generally used by armed forces/police forces for daily wear and for marching purposes.

Realizing the need of standard on different types of casual shoes in the country, the Footwear Sectional Committee decided to revise the existing standard IS 17043 : 2018. The standard has been revised keeping in line with the recent technological developments that have taken place in the field and is published in following two parts, based on the uses of shoes:

Part 1 Shoes for services

Part 2 Shoes for general purpose

The purpose of this division was to have separate specifications for shoes used in different contexts, ensuring that each type is well-defined and catered to its specific requirements.

This standard that is, (Part 2) covers general purpose shoes which are the shoes used for formal, semi-formal, casual and other general purposes.

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

The shoes primarily used by the services are covered under a separate standard IS 17043 (Part 1). For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SHOES — SPECIFICATION

PART 2 SHOES FOR GENERAL PURPOSE

1 SCOPE

1.1 This standard prescribed the requirements, method of testing and sampling for general purpose shoes.

1.2 This standard does not cover shoes for services which are covered under separate standard IS 17043 (Part 1).

1.3 This standard does not cover shoes that are covered under other published standards for shoes for specific purposes for example, safety shoes, occupational footwear, sports footwear etc.

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 Indian 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 below along with definitions of terms, symbols, and units given in IS 2050 shall apply.

3.1 General Purpose — General purpose shoes are the shoes used for formal, semi-formal, casual and other general purposes.

3.2 Services — Service shoes are the shoes used by military/paramilitary/police and other security forces.

4 CATEGORY AND TYPE

The shoes for general purpose shall be of the following two categories bases on their usage:

a) For kids (standard English sizes as per IS 1638 for infants and children); and
b) For adults (for all other sizes as per IS 1638).

Further, the shoes for general purpose for adults shall be of two types namely, Type 1 and Type 2.

5 REQUIREMENTS

5.1 Shape and Design

Shape and design of the formal and casual shoe may be of any design as agreed between manufacturer and purchaser.

5.2 Construction

The shoes may be made in fully moulded construction or string lasted or strobel stitched or assembled or through lasting operation or any other construction as required as per design and style. It may also have single or multiple layer at bottom sole.

5.3 Material

5.3.1 Thickness of the upper/lining/stiffeners/ bottom sole/mid sole and other components of the shoe may be as agreed between manufacture and purchaser.

5.3.2 Edge binding, if required may be used.

5.3.3 Thread for stitching purposes may be synthetic.

5.4 Requirement for Shoes for General Purpose

The shoes shall conform to requirement as specified in Table 1 wherever as applicable.

Table 1 Complete Product Performance for All Types of Shoes for General Shoes

(*Clause* 5.4)

Sl No.	Characteristics	Requirement			Methods of Test, as per	
		For Kids (2)	For Adults			
			Type 1	Type 2	Annex	IS
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Bond strength, N/mm, *Min* Upper to outsole, N/mm, *Min* (Not applicable for stitched down construction)	1.0 1.0 for material tear	3.5 2.5 for material tear	1.5 1.0 for material tear	–	IS 15844 (Part 1) Annex C

Table 1 (*Continued*)

Sl No.	Characteristics	Requirement			Methods of Test, as per	
		For Kids (2)	For Adults			
			Type 1	Type 2	Annex	IS
(1)	(2)	(3)	(4)	(5)	(6)	(7)
ii)	Inter layer bond strength,= N/mm, *Min* Midsole to outsole, N/mm, *Min* (applicable only for multilayer sole)	1.0 1.0 for material tear	3.0 2.0 for material tear	1.5 1.0 for material tear	–	IS 15844 (Part 1) Annex C
iii)	Whole shoe flexing, flexes (not applicable for rigid plastic sole and heel height above 50 mm shoe which is not able to flex or bend at forepart)	At an angle of 45 degrees at 30 000 cycles, no change in upper (for example, crack, thread breakage, fabric broken), sole cracking, bond opening shall occur	At an angle of 45 degrees at 100 000 cycles, no change in upper (for example, crack, thread breakage, fabric broken), sole cracking, bond opening shall occur	At an angle of 45 degrees at 60 000 cycles, no change in upper (for example, crack, thread breakage, fabric broken), sole cracking, bond opening shall occur	–	IS 8085 (Part 16) Method A
iv)	Water proofness on complete shoe, (applicable only if water proof shoes is claimed)	for 10 000 cycles, No seepage of water inside the flexing area	for 25 000 cycles, No seepage of water inside the flexing area	for 10 000 cycles, No seepage of water inside the flexing area	Annex B	–
v)	Slip resistance, Cof(1), *Min* dry and wet* (quarry tile) (not applicable for leather sole)	0.2	0.3	0.2	–	IS 15844 (Part 1) Annex E
vi)	Attachment strength of strap and buckle/D-ring N, (if, present and functional)	35	125	60	–	IS 6721 Annex D
vii)	Attachment strength of strap and velcro , N, *Min* (if, present and functional)	40	100	60	–	IS 6721 Annex D
viii)	Strength of eyelet attachment, N, *Min* (if, present and functional)	60	200	80	Annex C	–
ix)	Heel pull off strength, N, *Min* (applicable for heel height 50 mm and above attached separately to the shoe)	300	500	300	–	IS 8085 (Part 10)
x)	Top piece attachment strength, N, *Min* (applicable if top piece is present and attached separately)	50	120	80	–	ISO 19958
xi)	Seam strength, N/mm, *Min*	–	10	–	–	IS 8085 (Part 13) Method B
xii)	Whole shoe topline strength, N, *Min* (applicable to only court shoe with high heel shoes above 50 mm)	–	500	–	Annex D	–

Table 1 (*Concluded*)

Sl No.	Characteristics	Requirement			Methods of Test, as per	
		For Kids [2]	For Adults			
			Type 1	Type 2	Annex	IS
(1)	(2)	(3)	(4)	(5)	(6)	(7)
xiii)	Abrasion resistance (volume loss), mm^3				–	–
	a) Cellular sole (at 5 N force), *Max*	1 000	500	1 000		
	b) Solid sole (at 10 N force), *Max*	500	300	500		
	*(definition of solid and cellular sole to added)					
	c) Abrasion resistance, mm/kcs, *Max* (for leather sole only)	–	7	–		
(xiv)	Chemical requirements[3]	All the components of shoes which are in direct contact of foot shall comply with Table 1 of IS 17011 for critical substances Category I and Category II as specified under **3.6** of IS 17011.	All the components of shoes which are in direct contact of foot shall comply with Table 1 of IS 17011 for critical substances Category I and Category II as specified under **3.6** of IS 17011.	All the components of shoes which are in direct contact of foot shall comply with Table 1 of IS 17011 for critical substances Category I and Category II as specified under **3.6** of IS 17011.	Table 1 of IS 17011.	–
(xv)	Lead content (as Pb) ppm, *Max* (applicable only for PVC)	2	2	–	–	IS 12240 (Part 5)
xvi)	Hydrolysis resistance[4] cut growth at 150 000 flexes, mm, *Max* (applicable for PU sole only) (not applicable for rigid sole)	6.0	6.0	6.0	–	IS 15298 (Part 1)

6 OPTIONAL REQUIREMENTS FOR COMPONENTS

The tests for the various components used in the manufacture of general shoes as given in the Table 2 to Table 18 except Table 3, Table 5 and Table 11 shall be optional and may be tested. The characteristics to be tested and the requirements specified against them are given for guidance purpose only.

6.1 Upper

6.1.1 The upper may be made up of any type of natural or synthetic material or combinations thereof. The upper of the shoe made from leather material may conform to the requirement as specified in Table 2.

6.1.2 In addition to **6.1.1**, based on the claims made by the manufacturer, the upper of shoe made from the leather material shall meet the optional requirement as specified in Table 3.

[1] This test shall be carried out for both Condition A (forward heel slip) and Condition B: (backward forepart slip)at both dry and wet condition and in all cases shall meet the values as prescribed in Sl No. (v) of Table 1.
[2] In case of infants sizes, only chemical requirements as specified as Sl No. (xiv) shall be tested.
[3] In case of Type 2, this test shall be kept in abeyance till 31st December 2024.
[4] To be tested within the best before date, if declared by the manufacturer.

Table 2 Upper Material Leather

(*Clause* 6.1.1)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Tear trength, *N* a) Skin (goat/sheep), *Min* b) Hide (bovine), *Min* c) Split leather/vegetable tanned leather, *Min*	-	 20 70 50	-	IS 5914 (Part 5/Sec 2)/ ISO 3377-2
ii)	Flexing resistance, flexes a) Dry 75 000 flexes b) Wet 50 000 flexes	-	 No crack No crack and salt spue	-	IS 5914 (Part 6/Sec1)
iii)	Colour fastness to rubbing (marring/staining) a) Dry 150 rubs b) Wet 50 rubs	-	Gray scale rate Grade 3 Grade 3	-	ISO 11640 : 2012
iv)	Colour fastness to water (contact method- multi fabrics)	-	Gray scale rate Grade 3	-	ISO 11642
v)	Water vapour permeability,mg/cm^2/h, *Min* Water vapour coefficient,mg/cm^2, *Min*	-	0.8 15	-	IS 15298 (Part 1)
vi)	Stitch tear strength, N/mm, *Min*	-	35	-	IS 5914 - LP 8
vii)	Abrasion resistance a) Dry 51 200 cycles b) Wet 25 600 cycles (applicable for unlined upper)	-	 No hole formed No hole formed	-	IS 15298 (Part 1)

Table 3 Additional Requirements Based on the Claims of the Manufacturer

(*Clause* 6.1.2)

Sl No.	Characteristics	Requirement	Methods of Test, as per IS
		Type 1	
(1)	(2)	(3)	(4)
i)	Colour fastness to light, Marring, *Min*	Gray scale rate 4	IS/ISO 105 B02
ii)	Water resistance, a) Water absorption, percent, *Max* b) Water transmission, g, *Max*	 30 02	IS 15298 (Part 1)
iii)	Flexing resistance, flexes at (-) 5 °C 25 000 flexes (applicable only cold region)	No crack and fat spue	IS 5914 (Part 6/Sec1)

6.1.3 The upper of the shoe made from non-leather material may conform to the requirement as specified in Table 4.

6.1.4 In addition to **6.1.3**, based on the claims made by the manufacturer, the upper of shoe made from the leather material shall meet the optional requirement as specified in Table 5.

Table 4 Upper Material-Non Leather (Coated Fabric and Textile)

(*Clause* 6.1.3)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Breaking strength, N/mm, *Min*	-	7.0	-	ISO 17706
	Elongation at break, percent, *Min*		7.0		
ii)	Tear Strength, N, *Min*	-	30	-	IS 7016 (Part 3/Sec 1) Method B
iii)	Strength at needle perforation, N/mm, *Min*	-	3.5	-	IS 8085 (Part13) Method A
iv)	Flexing resistance, Flexes a) Dry 100 000 flexes b) Wet 50 000 flexes c) At (-) 5 °C 25 000 flexes (applicable only for cold region)	-	 No crack No crack No crack	-	IS 8085 (Part 20)
v)	Water vapour permeability (WVP), mg/cm^2/h, *Min*	-	0.8	-	IS 15298 (Part 1)
	Water vapour coefficient (WVC), mg/cm^2, *Min* (Applicable only for non-laminated textile)		15		
vi)	Hydrolysis resistance (After ageing at 70 ºC and 95 percent relative humidity for 7 days) (Applicable for PU coated material)	-	No crack at 100 000 flexes	-	IS 5914 (Part 6/ Sec 1)
vii)	Abrasion resistance a) Dry 51 200 cycles b) Wet 25 600 cycles (applicable for unlined upper)	-	 No hole formed No hole formed	-	IS 15298 (Part 1)

Table 5 Additional Requirements Based on the Claims of the Manufacturer

(*Clause* 6.1.4)

Sl No.	Characteristics	Requirement	Methods of Test, as per IS
		For Adults	
		Type 1	
(1)	(2)	(3)	(4)
i)	Colour fastness to light, Marring, *Min*	Gray scale rate *Min* 4	IS/ISO 105 B02

Table 5 (*Concluded*)

Sl No.	Characteristics	Requirement	Methods of Test, as per IS
		For Adults	
		Type 1	
(1)	(2)	(3)	(4)
ii)	Flexing resistance, flexes at (-) 5 ºC, s 25 000 flexes (Applicable only cold region)	No crack and fat spue formation	IS 8085 (Part 20)

6.2 Lining

Lining, if used may be made up of any type of natural or synthetic material or combinations thereof. It may or may not be sandwiched with foam. Lining material, if used in the shoes may conform to the requirement as specified in the Table 6.

Table 6 Lining for All Materials

(*Clause* 6.2)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Tear strength, N, *Min*	-	15	-	IS 7016 (Part 3/Sec 1) Method B
ii)	Abrasion resistance a) For vamp and quarter 1) Dry at 25,600 cycles 2) Wet 12,800 cycles b) For heel 1) Dry at 51,200 cycles 2) Wet 25,600 cycles	-	No hole formation	-	IS 15298 (Part 1)
iii)	Colour fastness rubbing (crocking) a) Dry 10 rubs b) Wet 10 rubs	-	Gray scale rate *Min* Grade 3 *Min* Grade 3	-	IS/ISO 105 X12
iv)	Colour fastness to perspiration (contact method- staining)	-	Gray scale rate *Min* Grade 3	-	IS 6191 (Part 6)
v)	Water vapour permeability, $mg/cm^2/h$, *Min* (applicable only for textile and leather lining)	-	2.0	-	IS 15298 (Part 1)
	Water vapour coefficient, mg/cm^2, *Min* (applicable only for textile and leather lining)	-	20	-	

6.3 Insole

Insole, if used may be made up of any type of natural or synthetic material or combinations thereof. The insole, if used in shoes may conform to requirements as specified in Table 7.

Table 7 Requirements for Insole

(*Clause* 6.3)

Sl No.	Characteristics	Requirement			Method of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Flexing index, *Min* (cellulose and leather board)	-	2.0	-	IS 15844 (Part 1) Annex F
ii)	Abrasion resistance at 400 cycles	-	No surface tearing	-	IS 15298 (Part 1)
iii)	Water absorption, mg/cm^2, *Min* Water desorption, percent, *Min*	-	60 70	-	IS 15298 (Part 1)

6.4 In-Sock

Insock, if used may be made up of any type of natural or synthetic material or combinations thereof. The in-sock used may conform to requirement as specified in Table 8. In-sock may be cushioned with foam to give comfort to the wearer.

Table 8 Requirement for In-sock

(*Clause* 6.4)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Thickness, mm, *Min*	-	0.5	-	ISO 2589
ii)	Abrasion resistance	-		-	IS 15298 (Part 1)
	a) Dry at 25 600 cycles		No hole formed		
	b) Wet at 12 800 cycles		No hole formed		
iii)	Water absorption, mg/cm^2, *Min*	-	60	-	IS 15298 (Part 1)
	Water desorption, percent, *Min*		70		

6.5 Outsole

6.5.1 *Outsole Other than Leather*

Outsole may be made up of any type of natural or synthetic material or combinations thereof. The bottom sole may be solid or cellular in structure. The outsole used in the shoes may conform to requirement as specified in the Table 9.

Table 9 Outsole – Other Than Leather

(*Clause* 6.5.1)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Flexing resistance (belt method) At 30 000 flexes (90 mm Mandrel)	-	No crack	-	IS 8085 (Part 4)
	or				
	Bennewart method, cut growth at the end of 30 000 cycles, mm, *Max* (not applicable for rigid plastic sole which is not able to flex or bend at forepart)	-	6.0		IS 15844 (Part 1) Annex D
ii)	Hydrolysis resistance, cut growth at 150 000 flexes, mm, *Max* (applicable for PU sole only)	-	6.0	-	IS 15298 (Part 1)
iii)	Compression set, percent, *Max* (applicable for cellular sole only)	-	50	-	IS 15844 (Part 1) Annex G

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.

6.5.2 *Leather Outsole*

6.5.2.1 The leather outsole used in the shoes may conform to requirement as specified in the Table 10.

Table 10 Out Sole-Leather Used in Shoes

(*Clause* 6.5.2.1)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Grain crack index, *Min*	-	16	-	ISO 3378
ii)	Density, g/cm^3, *Min*	-	0.90	-	IS 5914 (Part 4)
iii)	Abrasion resistance, mm/kcs, *Max*	-	7.0	-	IS 6721 Annex B

6.5.2.2 The leather outsole shall also confirm to the following additional requirements as specified in Table 11, in case of manufacturer declaring it as a water-resistant leather outsole.

Table 11 Additional Requirements based on the Claims of the Manufacturer for Water-Resistance Leather Sole

(*Clause* 6.5.2.2)

Sl No.	Characteristics	Requirement	Methods of Test, as per IS
		For Adults	
		Type 1	
(1)	(2)	(3)	(6)
i)	Water resistance, (dynamic method)		ISO 5404
	a) No water penetration, *Min*	30	
	b) Water absorption, percent, *Max*	25	

6.5.2.3 The rubber or polymeric top-lifts, if used separately, may meet the requirements as specified in Table 12.

Table 12 Applicable for Rubber or Polymeric Top-Lifts

(*Clause* 6.5.2.3)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Hardness, *Min*	-	Shore A 85	-	IS 5676
ii)	Density, g/cm^3, *Max*	-	1.3	-	IS 10702 Annex C
iii)	Abrasion resistance (volume loss), mm^3, *Max*	-	150	-	IS 3400 (Part 3)

Table 12 (*Concluded*)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
iv)	Bond Strength between Rubber top-lift and adjacent material, N/mm, *Min*	-	4	-	IS 15844 (Part 1) Annex C

6.6 Mid Sole

Midsole (if used) may be made up of any type of natural or synthetic material or combinations thereof. The bottom sole may be solid or cellular in structure. The midsole, if used in the shoes may conform to requirement as specified in the Table 13.

Table 13 Requirements for Midsole

(*Clause* 6.6)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Heat shrinkage, percent, *Max*	-	3.0	-	IS 15844 (Part 1) Annex J
ii)	Split tear strength, kg/25 mm, *Min*	-	3.0	-	IS 15844 (Part 1) Annex H
iii)	Compression set, percent, *Max* (applicable for cellular sole only)	-	50	-	IS 15844 (Part 1) Annex G

6.7 Toe and Counter Stiffener

Toe and counter stiffeners, if used may be made of solvent or thermoplastic or any type natural or synthetic material. The toe and counter stiffener, if used in the shoes may conform to requirement as specified in the Table 14.

Table 14 Toe and Counter Stiffener

(*Clause* 6.7)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Hardness, N a) Filmic, b) Other than filmic, *Min*	-	5 to 30 30	-	IS 7554 Annex **A-3.2**
ii)	Resilience, percent a) Filmic, *Min* b) Other than filmic, *Min*	-	 60 50	-	IS 7554 Annex **A-3.4**
iii)	Moisture resistance, percent a) Filmic, *Min* b) Other than filmic, *Min*	-	 60 50	-	IS 7554 Annex **A-3.5**

Table 14 (*Concluded*)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
iv)	Area shape retention, percent			-	
	a) Initial, *Min*	-	60		IS 7554 Annex **A-3.1**
	b) After 10 collapsing load, *Min*	-	50		IS 7554 Annex **A-3.3**
v)	Adhesion strength, N/mm	-	0.5	-	IS 15844 (Part 1)

6.8 Velcro Fastener

The Velcro fastener, if used in the shoes may conform to requirement as specified in the Table 15.

Table 15 Requirement for Velcro Fastener

(*Clause* 6.8)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Peel strength, N/mm	-		-	IS 8085 (Part 18)
	a) Initial, *Min*		1.0		
	b) After 5 000 wear cycles, *Min*		0.08		
ii)	a) Shear strength, kPa	-	75	-	IS 8085 (Part 19)
	b) Initial, *Min*		65		
	After 5 000 wear cycles, *Min*				

6.9 Elastic Tape

The elastic tape, if used in the shoes may conform to requirement as specified in the Table 16.

Table 16 Requirements for Elastic Tape

(*Clause* 6.9)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Limit of useful extension, percent, *Min*	-	90	-	IS 8085 (Part 12)
ii)	Needle strength, N/mm, *Min*	-	3.5	-	IS 8085 (Part 13) Method A

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

The fasteners for gripping (not for decorative purpose), if used in the shoes may conform to requirement as prescribed in Table 17.

Table 17 Fasteners (Lace/ Buckle/Eyelet/D-Ring/Ski-Hook/Metal trims)

(*Clause* 6.10)

Sl No.	Characteristics	Requirement			Methods of Test, as per IS
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Lace breaking strength, N, *Min*	-	200	-	IS 15844 (Part 1) Annex K
ii)	Lace tag strength, N, *Min*	-	120	-	IS 15844 (Part 1) Annex L
iii)	Lace to lace abrasion resistance, cycles	-	No breakage before 5 000 cycles	-	IS 8085 (Part 17)
iv)	Colour fastness to water for lace contact method-staining Gray scale rate , *Min*	-	Scale 3	-	IS 6191 (Part 2)
v)	Corrosion resistance (applicable for all including decorative metal part)	-	Not worse than slight uniform change	-	IS 17098

6.11 Zipper

The fasteners zipper, if used in the shoes may conform to requirement as specified in Table 18.

Table 18 Requirements for Zipper

(*Clause* 6.11)

Sl No.	Characteristics	Requirement			Methods of Test
		For Kids	For Adults		
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Fatigue resistance, cycles, *Min*	-	1 000 cycles	ISO 10751	ISO 10751
ii)	Security of puller attachment strength, N, *Min*	-	250	-	ISO 10734
iii)	Lateral load, N, *Min*	-	400	-	ISO 10764
iv)	End attachment strength, N, *Min* a) Top stop b) Bottom stop c) Stringer to stringer	-	135	-	ISO 10750

7 SAMPLING AND CONDITIONING

7.1 Wherever, possible test pieces shall be taken from the whole shoes unless otherwise stated. If it is not possible to obtain test pieces from shoes large enough to comply with tests requirements, then samples may be taken from the raw material from which the component has been manufactured. However, this should be recorded in the test records.

7.2 All test shall be conditioned at (27 ± 2) °C and (65 ± 5) percent relative humidity (RH) for 24 hours.

8 MARKING AND PACKING

8.1 Marking

8.1.1 The shoes shall be marked legibly with the following:

a) Size;
b) Type;
c) Identification of the source of manufacturer or brand name;
d) WP to be marked in case water proofness test is claimed;
e) CF 4 to be marked in case colour fastness to light test is claimed;
f) WR to be marked in case water resistance test is claimed; and
g) CR to be marked in case flexing resistance for cold region is claimed.

8.1.2 *BIS Certification Marking*

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 license for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8.2 Packing

The shoes 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, and type, best before date, identification of the source of manufacture and batch number and any other marking if so desired.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
IS/ISO 105	Textiles — Tests for colour fastness:
B02 : 2014	Colour fastness to artificial light: Xenon arc fading lamp test
X12 : 2016	Colour fastness to rubbing (*first revision*)
IS 579 : 2017	Vegetable tanned sole leather — Specification (*fourth revision*)
IS 1638 : 1969	Specification for sizes and fitting of footwear (*first revision*)
IS 2050 : 1991	Glossary of terms relating to footwear (*first revision*)
IS 3400 (Part 3) : 2021/ISO 4649 : 2017	Methods of test for vulcanized rubbers: Part 3 Abrasion resistance using a rotating cylindrical drum device (*third revision*)
IS 5676 : 1995	Moulded solid rubber soles and heels — Specification (*second revision*)
IS 5914 : 1970	Methods of physical testing of leather:
(Part 4) : 2023/ ISO 2420 : 2017	Determination of apparent density and mass per unit area
(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
(Part 7) : 2023/ ISO 3378 : 2002	Determination of resistance to grain cracking and grain crack index
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 6721 : 2023	Sandal and slippers — Specification (*first revision*)
IS 7016 (Part 3/Sec 1) : 2022/ISO 4674-1 : 2016	Methods of test for rubber or plastics coated fabrics: Part 3 Determination of tear resistance, Section 1 Constant rate of tear methods (*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 10) : 2023/ ISO 22650 : 2018	Heel attachment for whole shoe
(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 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

IS No.	*Title*
(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 10702 : 2023	Hawai chappal — Specification (*third revision*)
IS 12240 (Part 5) : 1988	Methods of test for polyvinyl chloride boots: Part 5 Determination of lead content
IS 15298 (Part 1) : 2015/ ISO 20344 : 2011	Personal protective equipment: Part 1 Test methods for footwear (*second revision*)
IS 15844 (Part 1) : 2023	Sports footwear: Part 1 General purpose (*first revision*)
IS 17011 : 2018	Chemical requirements for footwear and footwear materials
IS 17043 : 2018	Derby shoes — Specification
IS 17098 : 2019/ ISO 22775 : 2004	Footwear — Test methods for accessories: metallic accessories — Corrosion resistance
ISO 2589 : 2016	Leather — Physical and mechanical tests — Determination of thickness
ISO 5404 : 2011	Leather — Physical test methods — Determination of water resistance of heavy leathers
ISO 10734 : 2016	Footwear — Test method for slide fasteners — Strength of slide fastener pullers
ISO 10750 : 2015	Footwear — Test method for slide fasteners — Attachment strength of end stops
ISO 10751 : 2016	Footwear — Test methods for slide fasteners — Resistance to repeated opening and closing
ISO 10764 : 2016	Footwear — Test methods for slide fasteners — Lateral strength
ISO 17706 : 2003	Footwear — Test methods for uppers — Tensile strength and elongation
ISO 19958 : 2004	Footwear — Test methods for heels and top pieces — Top piece retention strength

ANNEX B

WATER RESISTANCE ON COMPLETE SHOE

(*Table* 1, *Clause* 5.4)

B-1 Scope

To assess the resistance to water penetration of completed footwear during flexing. The method is applicable to water proof footwear.

B-2 Principle

The footwear specimen is placed in a tray of water and is repeatedly flexed about its natural flexing line by a machine. After a predetermined time or number of flexes the footwear is subjectively assessed for signs of water penetration. The level of the water in the tray, the number of flexes or the time between assessments, and the angle through which the footwear is flexed, are all determined by the type of footwear being tested.

B-3 Apparatus and Materials

B-3.1 A flexing machine firmly clamping any type of footwear at the heel and toe. A number of toe clamps will be necessary to ensure all sizes of footwear can be clamped securely.

B-3.2 A device such as a tray for maintaining a constant amount of water around the footwear.

B-3.3 A suitable equipment for flexing the footwear about its flexing line, so that the forepart of the footwear is constantly in the water and the back part is lifted in and out of the water at a rate of 140 ± 10 cycles per minute through a range of flexing angles. The equipment shall be capable of recording either the number of flexes or the duration of the test provided the speed of the machine is constant and known.

B-3.4 Absorbent paper such as tissue and deionized water.

B-4 Preparation of Test Specimen

One half pair (one shoe) of completed whole footwear.

It should be ensured that the footwear is completely dry before the test is started.

B-5 Procedure

B-5.1 Store the footwear in a standard controlled environment of 25 °C ± 2 °C and 65 ± 5 % relative humidity for 48 hours.

B-5.2 Draw a line down the length of the insole of the footwear from the centre of the heel towards the centre of the toe cap. Measure, to the nearest millimetre, along the line drawn as shown in Fig. 1, the appropriate distance from the heel as given in Table 19, and mark this point as 'A'. This corresponds to the typical position of the ball joint of a wearer's foot.

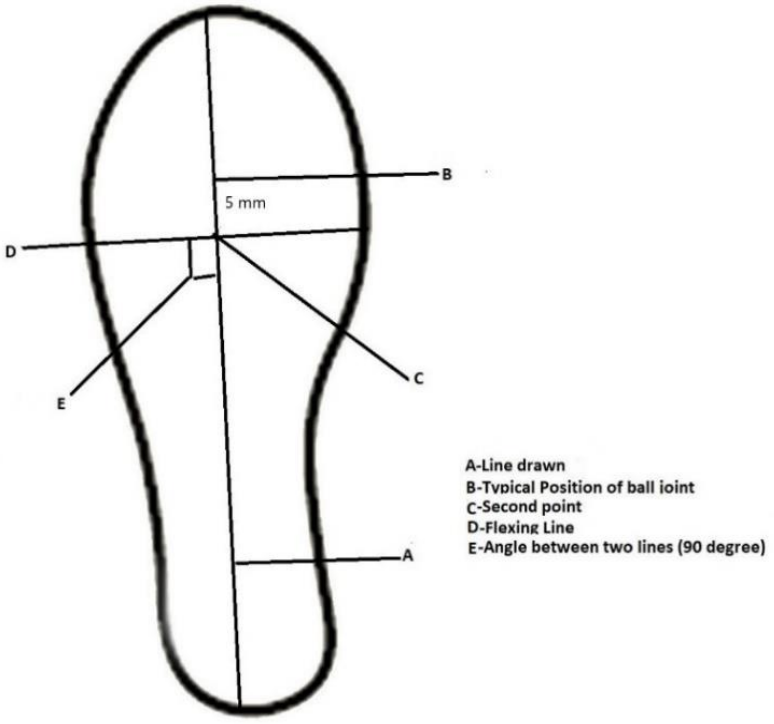

FIG. 1 MARKING ON INSOLE

B-5.3 Mark a second point 'B' on the line drawn in **B-5.2**, which is 5 ± 1 mm closer to the heel. The point marked 'B' is a typical position of ball joint as shown in Fig. 1.

Table 19 Average Distance from the Heel End of the Insole to the Ball Joint Position of the Foot

(*Clause* B-5.2)

Sl No.	Size	Children's Footwear	Size	Men's and Women's Footwear
(1)	(2)	(3)	(4)	(5)
i)	9	114	1	143
ii)	10	120	2	149
iii)	11	126	3	155
iv)	12	131	4	160
v)	13	137	5	166
vi)			6	172
vii)			7	178
viii)			8	184
ix)			9	189
x)			10	195
xi)			11	201
xii)			12	207

B-5.4 Draw a line 'C' across the width of the insole, and at 90° to the line marked as 'E' as shown in Fig. 1, intersecting the line down the length of the insole. This is regarded as the flexing line marked as 'D' of the footwear.

B-5.5 Set the flexing machine to flex the footwear through an angle similar to that as experienced during normal walking as recommended in Table 20. Secure the footwear into the flexing machine so that it is flexed about the linedrawn as 'C' in Fig. 1.

Table 20 Recommended Flexing Angle for the Footwear

(*Clause* B-5.5)

Sl No.	Footwear Type	Suggested Flexing Angle
(1)	(2)	(3)
i)	Men and women shoe	Depends on the flexibility of the footwear the angle can be chosen from minimum angle of 20° and a maximum angle of 45°.

B-5.6 Set the water level so that its height relative to the footwear is as recommended inTable 21, when the footwear is in the flexed position.

Table 21 Recommended Level of Water for the Footwear

(*Clause* B-5.6)

Sl No.	Footwear Type	Suggested Water Level
(1)	(2)	(3)
i)	Footwear claiming to be water-resistant	5 mm above feather line if possible or Up to feather line at upper and sole joint position

B-5.7 Run the machine until the first inspection point is reached (that is, 750 cycles). Record the number of flexes completed.

B-5.8 Remove the test specimen from the machine and inspect it for water penetration. If no obvious water penetration has occurred, use absorbent paper to determine if and where water penetration has occurred. If dampness has occurred, record the total area as 0, < 300 mm^2 or > 300 mm^2.

B-5.9 Repeat the procedure until the area of penetration is > 300mm^2 or until the total number of required flexes has been completed. Record the final extent of water penetration and the total number of flexing cycles.

B-5.10 If any penetration has occurred record the extent and position of the moisture. A report diagram as shown in Fig. 2 may be suitable.

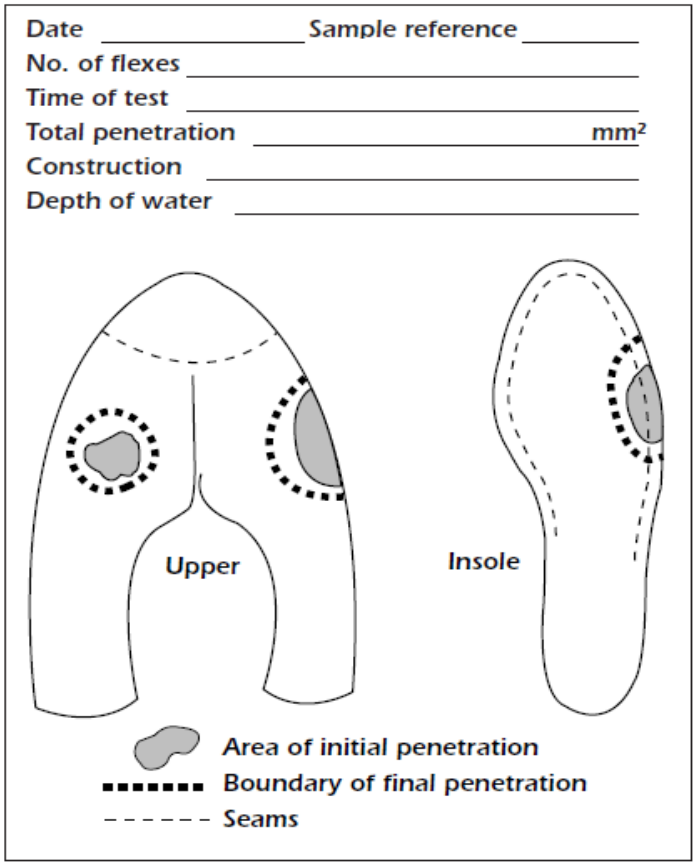

FIG. 2 TYPICAL REPORT SHEET

B-6 Test Report

The test report shall include the information on the following points:

a) A description of the footwear tested;
b) The depth of water used;
c) The angle at the footwear is flexed;
d) The number of flexing cycles as recorded; and
e) The corresponding water penetration as recorded.

ANNEX C

STRENGTH OF EYELET ATTACHMENT

(*Table* 1, *Clause* 5.4)

C-1 SCOPE

To determine the strength of attachment of an eyelet to its base material. It is applicable to all types of eyelets.

C-2 PRINCIPLE

A piece of footwear facing or other material including the eyelet is clamped in a tensile testing machine and a long, thin conical plunger is inserted

into the eyelet from the reverse side of thematerial. An increasing force is applied until the plunger detaches the eyelet from the base material. The maximum force is recorded as a measure of the strength of attachment of the eyelet.

C-3 APPARATUS

C-3.1 A tensile testing machine with a jaw separation rate of 100 mm/min ± 10 mm/min. Usually, a force in range 0 N to 500 N will suitable for the eyelet. The capability of measuring the force to an accuracy of better than 2 percent.

C-3.2 A compression cage as shown in Fig. 3 is used with the tensile testing machine, with a vertically mounted, thin conical plunger capable of fitting into eyelets of various sizes. A plunger of length approximately 70 mm with diameter tapering from 10 mm to 3 mm is generally suitable. A hole in the lower platform, through which the plunger can pass, for clamping the test specimen and positioning it aligned with the plunger and the hole in the platform.

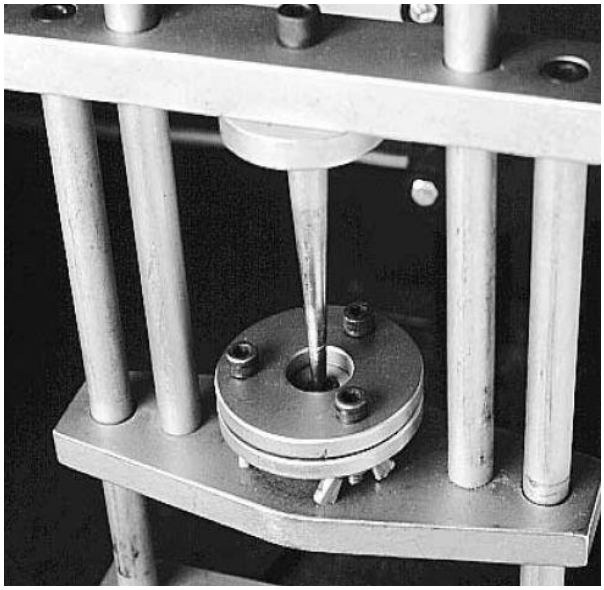

FIG. 3 COMPRESSION GAUGE

C-4 PREPARATION OF TEST SPECIMEN

C-4.1 Cut at least three sections of footwear facing or other material with the eyelet centered.

C-4.2 It is recommended that each section is circular with at least 20 mm ± 5 mm of material at all points around the eyelet. In order to accommodate the material border, it may be necessary to remove eyelets adjacent to the one to be tested. The test specimens do not need to be conditioned before testing.

C-5 PROCEDURE

C-5.1 Fit the compression cage as shown in Fig. 3 to the tensile testing machine. Clamp the test specimens centrally over the hole in the platform of the compression cage as shown in Fig 4A and 4B.

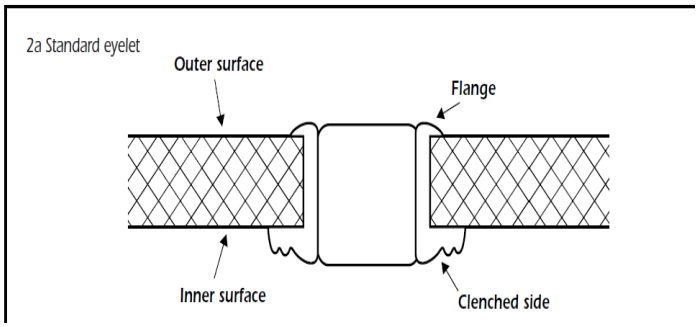

FIG. 4A STANDARD EYELET, WITH THE CLENCHED SIDE FACING TOWARDS THE CONICAL PLUNGER.

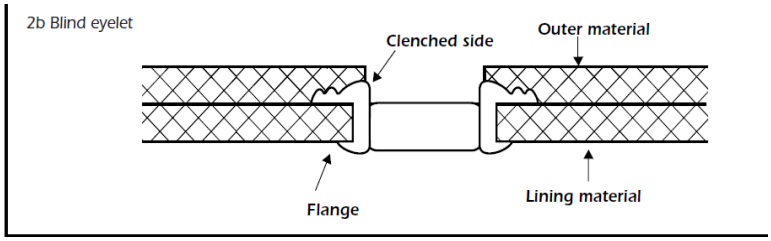

FIG 4B BLIND EYELET, WITH THE FLANGED SIDE FACING TOWARDS THE PLUNGER.

C-5.2 Operate the tensile testing machine so that the plunger is inserted into the eyelet a rate of 100 mm/min ± 10 mm/min. Record the maximum force in N, required to detach the eyelet from its base material or damage the assembly without complete detachment. Stop the tensile testing machine and return the plunger to its starting position. Repeat the procedure for the remaining test specimens.

C-5.3 Calculate the arithmetic mean of the values of the maximum force as the attachment strength of the eyelets.

C-6 TEST REPORT

The test report shall include the information on the following points:

a) A description of the eyelets;
b) The attachment strength of eyelet as recorded; and
c) Any deviations from standard test method.

ANNEX D

WHOLE SHOE TOP-LINE STRENGTH

(*Table* 1, *Clause* 5.4)

D-1 SCOPE

To determine the breaking force and extension at break of whole shoe top-lines. The method is mainly applicable to bagged top-lines for mainly ladies pump/court shoe and cannot be used with top-lines which are broken by a lacing gap or elastic gusset insert.

FIG. 5 TENSILE TESTING MACHINE

D-2 PRINCIPLE

The top-line is cut from a test shoe and placed around two cylindrical bollards fitted to the jaws of a tensile testing machine. The top-line as shown in Fig. 5 is extended until it breaks or other failure occurs. The maximum force at which failure occurs is measured.

D-3 APPARATUS AND MATERIAL

D-3.1 A tensile testing machine with a jaw separation rate of 10 mm/min ± 1 mm/min as shown in Fig. 1. Cylindrical bollard test jaws, have a diameter of 55 mm ± 5 mm and depth of 35 mm. These test jaws are mounted parallel so that their axes are aligned at 90° with the axis of the tensile testing machine with a force range 1 KN, will be suitable for the for the whole shoe top-line strength. The capability of measuring the force to an accuracy of better than 2 percent.

D-3.2 A narrow tape measure or device for measuring the length of the top-line to the nearest 2 mm.

D-4 PREPARATION OF TEST SPECIMEN

D-4.1 If possible test both shoes of a pair, for all the seams which run down from the top-line to the bottom of the upper. Mark a point 20 mm ± 2 mm below the top-line and 10 mm ± 2 mm to the right of the seam as X.

D-4.2 A point 20 mm ± 2 mm below the top-line and 10 mm ± 2 mm to the left of the seam as Y. Mark lines, as shown in Fig. 6, which are parallel to each seam, starting from each point and stopping at the feather line at the bottom of the upper.

D-4.3 Mark a line which is parallel to the top-line starting from each point X and stopping at the point Y on the next seam. Mark lines AB just above and parallel to the feather line for 10 mm either side of each seam as shown in Fig. 6.

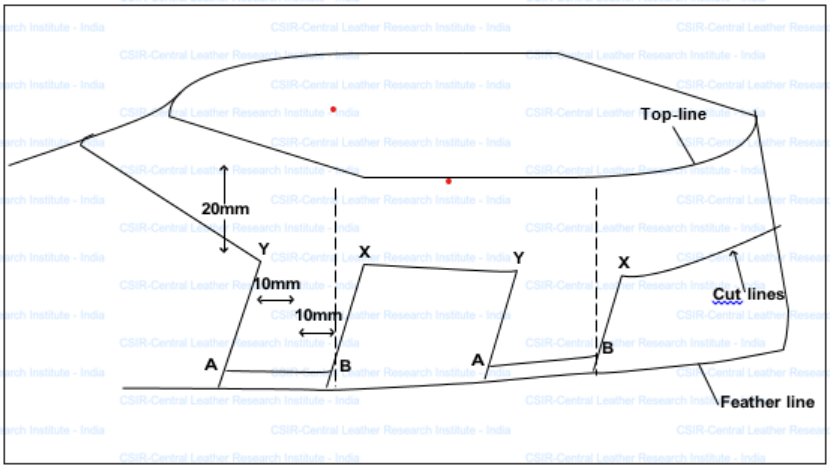

FIG. 6 CUTTING OF TEST SPECIMEN FROM UPPER

D-4.4 Use a sharp hand knife to cut along the lines. The top-line assembly should now lift away from the rest of the shoe, and will subsequently be referred to as a test specimen. If any fastening straps or trims are still attached to the test specimen then cut these off, if they could interfere with the test.

D-4.5 Store the test specimens in an environment conditions with temperature 27 °C ± 2 °C and 65 percent ± 5 percent relative humidity for at least 24 hours prior to test. Carry out the test. Test report shall contain the details of the environment conditions, at which condition is done.

D-5 Procedure

D-5.1 Use the device to measure the length of the top edge of the top-line and record this as [L] in mm to the nearest 2 mm.

D-5.2 Adjust the jaw separation of the tensile testing machine so that a test specimen will easily fit between the two bollards test jaws without being stretched. For bollards test jaws of diameter 55 mm the distance between their centres should be approximately be (0.5 × [L]) – 100.

D-5.3 Fit a test specimen over the two bollards with the heel end aligned with one of the bollards and turn on the recording system of the tensile testing machine. Operate the tensile testing machine so that the jaws separate at a rate of 10 mm/min ± 1mm/min. When the test specimen is just taut and the heel end is in full contact with the bollard, mark the jaw separation on the force, this will usually occur at a force of between 10 N and 30 N.

D-5.4 to operate the tensile testing machine watching both the force measurement and the test specimen. Stop the machine at the first sign of

damage, from either visible damage to the specimen or a drop in the force reading. Examine the test specimen record the maximum force obtained in Newton's to the nearest 1 N. Repeat the procedure for any remaining test specimens. Calculate the arithmetic mean of the maximum forces recorded.

D-6 TEST REPORT

The test report shall include the information on the following points:

a) A description of the top-line construction and test specimens;
b) The mean maximum force; and
c) Any deviations from this test method.

ANNEX E

(*Foreword*)

COMMITTEE COMPOSITION

Footwear Sectional Committee, CHD 19

Organization	*Representative(s)*
In Personal Capacity, Chennai (*Flat F 1, 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*)
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Liberty Shoes Limited (P.U. Division), Karnal	SHRI SHRI S. S. LAHIRI SHRI ADESH GUPTA (*Alternate*)
Mangla Plastic Industries, Bahadurgarh	SHRI ANIL KUMAR MANGLA
Mb Rubber Private Limited, Delhi	SHRI VIPAN MEHTA
Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade, New Delhi	SHRI NAND LAL
MSME Technology Development Centre (PPDC), Meerut	SHRI ADITYA PRAKASH SHARMA SHRI TULARAM BHARTI (*Alternate*)

Organization	*Representative(s)*
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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 (CHEMICAL), BIS

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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