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भारतीय मानक मसौदा

रबर तले के कैनवस जूते — विशिष्टि

(IS 3735 का तीसरा पुनरीक्षण)

Draft Indian Standard

**CANVAS SHOES, RUBBER
SOLE — SPECIFICATION**

(Third Revision of IS 3735)

ICS 61.060

Footwear Sectional Committee, CHD 19

Last Date for Comments: **27 January 2025**

FOREWORD

(Formal clause will be added later)

Canvas shoes are extensively used in games and sports, physical training and other general purposes. These are also known as PT shoes.

This standard was first published in 1966 and subsequently revised in 1984, and in 1996. This revision has been taken up in order to bring out the standard in latest style and format of the Indian Standards.

In this revision, following changes have been done:

- The amendment no. 1, 2, 3, 4 and 5 have been incorporated; and
- Relevant clauses and the references have been updated.

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 '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.

Draft Indian Standard

CANVAS SHOES, RUBBER SOLE — SPECIFICATION

1 SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for canvas shoes having rubber sole and heel, required for general use, games, sports and physical training.

1.1.1 Canvas shoes with rubber sole shall be of two types namely, Type 1 and Type 2.

2 REFERENCES

The Indian 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 indicated in Annex A.

3 TERMINOLOGY

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

4 REQUIRMENTS

4.1 Material

4.1.1 Upper

The upper shall consist of cotton, manmade or blended canvas conforming to the requirement given in SI No. (i) of Table 1 as an overlay and cotton drill conforming to the requirements given in SI No. (ii) of Table 1, as an inner layer of lining. The two fabrics shall be firmly adhered together with rubber compound. The shade of canvas upper used may be white or brown or any other shade as agreed between the purchaser and the supplier or as per need and design.

4.1.1.1 Colour fastness

The dyed fabrics prescribed in **4.1.1** shall be fast to daylight and mechanical washing. Fastness to daylight shall be of rating 4 or better for Type 1 and 2/3 or better for Type 2, when tested in accordance with IS/ISO 105-B01 or IS/ISO 105-B02. However, in case of dispute the method prescribed in IS/ISO 105-B01 shall be considered as referee method.

4.1.1.2 Fastness to mechanical washing (mild) shall be of rating 4 or better for Type 1 and 2/3 or better for Type 2, when tested in accordance with IS/ISO 105-C10.

4.1.2 Cotton, manmade or blended shall be used as binding material.

4.1.2.1 It is recommended that the colour of the tape match the shade of the upper. Coloured cotton tapes shall have fastness to day light of rating 3 or better for Type 1 and 2 or better for Type 2 when tested in accordance with IS/ISO 105 -B01. It shall also have fastness to mechanical washing of rating 3 or better for Type 1 and recommended as 2 or better for Type 2 when tested in accordance with IS/ISO 105-C10. In case black tapes are used the same shall be free from sulphur dyes for Type 1 only, when tested in accordance with Annex B.

Table 1 Requirements for Over Layer and Inner Layer Fabric

(Clause 4.1.1)

Sl No	Material	Characteristic	Requirement		Method of Test, Ref to
			Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)
a)	Overlayer	Breaking load in N, <i>Min</i>			
		a) Warp	1 000	300	IS 1969 (Part 1)
		b) Weft	900	200	
		c) Ends/dm	250 ± 5	—	IS 1963
		d) Picks/dm	180 ± 13	—	
b)	Inner layer	Breaking load in N, <i>Min</i>			
		a) Warp	1 000	200	IS 1969 (Part 1)
		b) Weft	550	120	
		c) Ends/dm	390 ± 10	—	IS 1963
		d) Picks/dm	195 ± 5	—	

4.1.3 Eyelets

Eyelets made of brass, steel plastic or aluminium shall be used. It is recommended that eyelets of size (collar diameter) 7.5 mm and wall thickness 0.30 mm may be used.

4.1.4 Laces

The shoes shall be provided with laces which may be braided or non-braided. it is recommended that the colour of the laces match shade of the upper. The length of the lace may be as per design and need and shall have the breaking strength of not less than 250 N for Type 1 and 200 N for Type 2 when tested between 18 cm grips in accordance with Annex K of IS 15844 (Part 1). In case the laces are black, the same shall pass the test for freedom from sulphur dyes when tested in accordance with Annex B. The two ends of the lace shall be provided with suitable metal or plastic tips.

4.1.5 Rubber Components

The rubber components shall conform to the requirements given in Table 2, when tested from finished shoes.

NOTES

- 1) While cutting the test pieces from the made-up shoes, adequate care shall be taken so that minimum fraying at the edges are occurred. However, in case it is not possible to cut the test pieces from the made-up boots then Test pieces may also be taken from standard vulcanized test sheet prepared from the same rubber compound provided:
 - a) The difference between the density as measured from sample drawn directly from finished boots and between the sample taken from the standard vulcanized test sheet, shall not differ by more than ± 0.05 g/cc, and
 - b) The ash content does not differ by more than ± 0.50 percent when tested from the sample taken directly from the finished boots and that from standard vulcanized test sheet.
- 2) Reading from 30 IRHD to 95 IRHD are approximately the same as those of the shore durometer, Type A.

4.1.5.1 The pattern and design of rubber soles may be as agreed to between the purchaser and the supplier.

4.1.5.2 Ageing

Shoes shall be aged at $70\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ for 168 h for Type 1 and $50\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ for 72 h for Type 2, on completion of which the pieces taken from the shoes shall conform to the physical requirements prescribed in Table 3. None of the rubber components of the shoes shall show any sign of tackiness or crack developed after ageing. When examined visually.

4.2 Shape and Design

4.2.1 The shoes may be made according to design and pattern as agreed to between the purchaser and the supplier. The size and fittings of the shoes are recommended to be guided in accordance with IS 1638.

Table 2 Physical Requirements for Rubber Components

(Clause 4.1.5)

SI No.	Characteristic	Foxing		Outer Sole and Heel		Method of Test, Ref to
		Type 1	Type 2	Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Relative density, <i>Max</i>	1.4	—	1.2	—	Annex C of IS 10702
ii)	Hardness, shore A	—	—	60 ± 5	60 ± 10	IS 3400 (Part 2/Sec 4)
iii)	Flexing resistance, (number of cycles):					
	a) Initial crack, <i>Min</i>	—	—	60 000	10 000	
	b) Cut growth percent, <i>Max</i>	—	—	600 at the end of 150 000 cycles	600 at the end of 20 000 cycles	IS 3400 (Part 16)
iv)	Change in initial hardness after accelerated ageing for 24 h at $100\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$	—	—	+ 5 - 2	+10 -5	IS 3400 (Part 4) and IS 3400 (Part 2/Sec 2)
v)	Tensile strength in MPa, <i>Min</i>	—	—	10.5	6.0	IS 3400 (Part 1)
vi)	Elongation at break, in percent <i>Min</i>	—	—	250	200	IS 3400 (Part 1)

Table 3 Change in Physical Requirement for Rubber Soles After Ageing

(Clause 4.1.5.2)

SI No.	Characteristic	Requirement (Change in Percent of Original Value)		Method of Test, Ref to
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)

i)	Tensile Strength	+5 -25	+10 -35	IS 3400 (Part 1)
ii)	Elongation at break	+5 -25	+10 -35	IS 3400 (Part 1)

4.2.2 The recommended design of canvas shoes is shown in Fig. 1.

4.3 Construction

4.3.1 The upper may be stitched on a lock stitch machine and it is recommended that the number of stitches be 30 to 40 per decimeter.

4.3.2 For Type 1, the back seam may be reinforced with a strip /counter of canvas upper material.

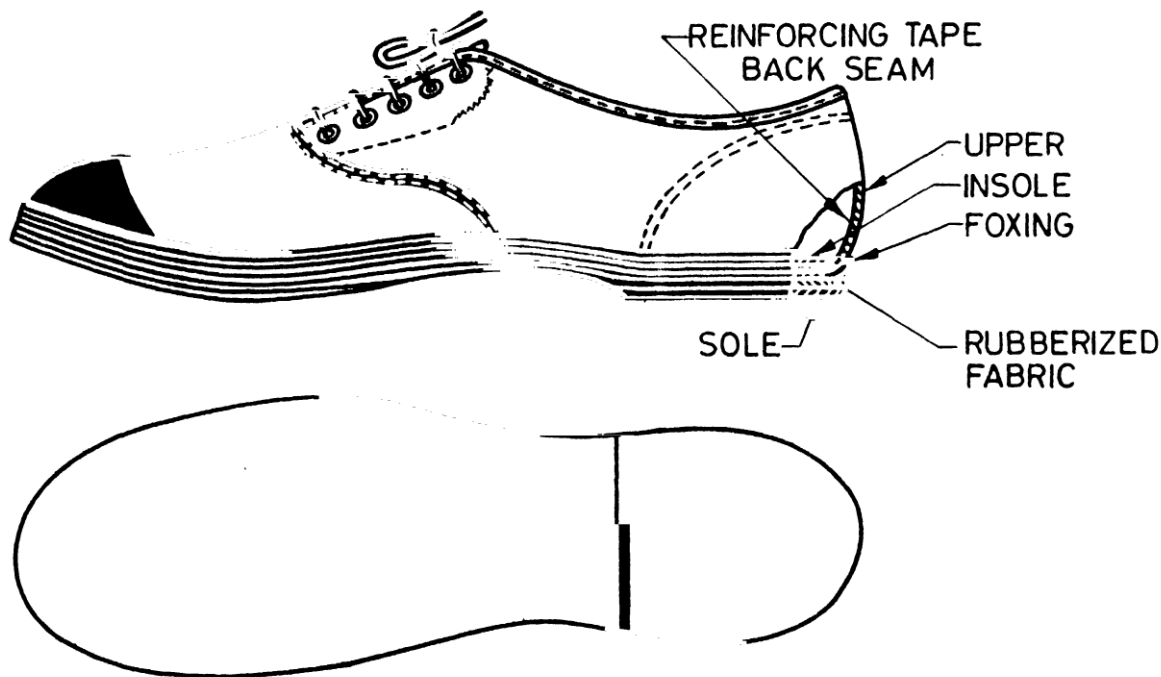


FIG. 1 CANVAS SHOES, RUBBER SOLE

4.3.3 The counter may be stitched at the back, set from bottom of lining and bound flat on top edge with dyed/scoured biding material cut in bias and formed as a tape. The number of stitches is recommended to be 30 to 40 per decimeter. The counter binding shall meet the binding of the upper at the centre to top edge of the heel. The edges of quarter may be bound with dyed cotton binding material or matching to the colour of the upper, cut in bias and formed as a tape.

4.3.4 The vantp shall be strengthened with a rubber toe-cap (see Fig. 1).

4.3.5 An appropriate number of properly clenched eyelets shall be fitted in each shoe.

4.3.6 The shoes shall be free from folds, wrinkles blisters, embedded foreign matters and excessive surface markings. In appearance, general workmanship, the sample will be similar to approved sample of the buyer. Any other aspect, not defined, and as arises out the requirement of the buyer, the same will be construed as required for incorporation in this standard, in conformity to approved sample.

4.3.7 The soles shall be of even substance and of one layer only.

4.3.8 A rubber foxing shall be fixed all round the sole and heel. The foxing shall not be less than 18 mm wide for Type 1 and 14 mm wide for Type 2. The colour shall may be as agreed to between the purchaser and the supplier.

4.4 Adhesion Test

From the upper foxing portion where it is adhered to the canvas cut a strip of $8.0 \text{ mm} \pm 0.5 \text{ mm}$ width along with the length of the sole at the waist portion and of sufficient length to permit separation over a length of at least 75 mm. Carry out the test on two test pieces in accordance with IS 3400 (Part 5) or the Static Dead Load Method as given in Annex C. The individual adhesion value noted/recorded shall not be less than 8N (0.8 kgf) for Type 1 and not less than 4N (0.4 kgf) for Type 2 for each of the test pieces.

NOTE — Manual recording may also be done in absence of the machine with auto recording devices.'

4.5 Consolidation Test

From the quarter, cut a strip of $25.0 \pm 0.5 \text{ mm}$ width along the length of the shoe and of sufficient length to permit separation over a length of 75 mm. Carry out the test on two test pieces in accordance with IS 3400 (Part 5) or Static Dead Load Method as given in Annex C. The individual adhesion value for consolidation test shall not be less than 30N (3.0 kgf) for Type 1 and not less than 3N (0.3kgf) for Type 2.

NOTE — Manual recording may also be done in absence of the machine with auto recording devices.

4.6 Mass

The mass of one pair of finished shoes of Type 1 and Type 2 of size 8 shall not exceed 750 g. An increase or decrease of 25 g for each bigger or smaller size recommended.

5 PACKING AND MARKING

5.1 Packing

The shoes may be wrapped in tissue paper and packed in cardboard cartons. Cardboard cartons may further be packed in wooden cases in upright position. Each package may contain shoes of same size only.

5.2 Marking

The shoes shall be marked legible with the following:

- a) Size;
- b) Type; and
- c) Identification of the source of manufacturer or brand name.

5.2.1 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.

6 SAMPLING AND CRITERIA OF CONFORMITY

For the purpose of ascertaining the conformity of shoes in a consignment to this specification the scale of sampling and criteria for conformity shall be as prescribed in IS 6368.

ANNEX A

(Clause 2)

LIST OF REFFERED STANDARDS

<i>IS / ISO No.</i>	<i>Title</i>
IS/ ISO 105 B01: 2014	Textiles – Tests for colour fastness – Part B01 Colour fastness to light: Daylight
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 C10: 2006	Textiles – Tests for colour fastness Part C10 Colour fastness to washing with soap or soap and soda
IS 1638: 1969	Specification for sizes and fitting of footwear (<i>first Revision</i>)
IS 1963: 1981	Methods for determination of threads per unit length in woven fabrics (<i>second revision</i>)
IS 1969 (Part 1): 2018 ISO 13934-1:2013	Textiles – Tensile properties of fabrics – Part 1 Determination of maximum force and elongation at maximum force using the strip method (<i>fourth revision</i>)
IS 2050: 1991	Glossary of terms & relating to footwear (<i>first revision</i>)
IS 3400	Methods of test for vulcanized rubber
Part 1: 2021 / ISO 37: 2017	Tensile stress-strain properties
Part 2	Determination of hardness
Sec 2:2018/ ISO 48-2:2018	Hardness between 10 IRHD and 100 IRHD (<i>fifth revision</i>)
Sec 4:2022/ ISO 48-4:2018	Indentation hardness by durometer method (shore hardness) (<i>second revision</i>)
Part 4: 2012/ ISO 188: 2011	Accelerated ageing and heat resistance (<i>third revision</i>)
Part 5: 2022/ ISO 36:2020	Adhesion of rubbers to textile fabrics (<i>fourth revision</i>)
Part 16: 1974	Measurement of cut growth of rubber by the use of the ross flexing machine
Part 23/Sec 2: 2018/ ISO 7619-2: 2010	Rubber - Determination of indentation hardness by means of pocket hardness meters Section 2 IRHD pocket meter method (<i>first revision</i>)
IS 6368: 1971	Methods for sampling of rubber and rubber combination footwear
IS 10702: 2023	Hawai Chappal-Specification (<i>third revision</i>)
IS 15844 (Part 1): 2023	Sports footwear Part 1 General Purpose (<i>first revision</i>)

ANNEX B

(Clause 4.1.2.1 and 4.1.4)

METHOD FOR DETECTION OF SULPHUR DYES IN BLACK COLOURED LACES

B-1 PROCEDURE

B-1.1 Boil the laces in alkaline hydrosulphite solution for one min. If the shade is reduced to pale brown or yellow colour and on oxidation restored to the original colour, sulphur dyes shall be suspected to be present.

B-1.2 For confirmation, boil the laces in acid stannous chloride solution in a test tube covered with a piece of filter paper moistened with lead acetate. A blackish/brown stain with metallic lustre confirms the presence of sulphur dyes.

ANNEX C

(Clause 4.4 and 4.5)

STATIC DEAD LOAD METHOD FOR ADHESION AND CONSOLIDATION TEST

C-1 STATIC DEAD LOAD METHOD

C-1.1 APPARATUS

The apparatus required for the adhesion test by the static mass method consists of a supporting frame, testing clamps, mandrels, calibrated weights, and weight carriers. The supporting frame shall be of such design that clamps for strip specimens hang on it vertically and mandrels for rings specimens are supported on it horizontally. The frame shall have sufficient height to permit the weight carrier to be suspended from the test specimens by means of clamps and shall hang freely during the progress of the test, provision shall also be made to support the mandrels so that they revolve freely with minimum friction. Suitable apparatus is shown in Fig. 2.

C-1.2 Calibration of Apparatus

Calibrate the weights annually.

C-1.3 Cutting Tool

Maintain the cutting tool carefully so that the edge is sharp enough to avoid leaving ragged edges and pulling outside threads from the fabric.

C-2 Procedure

C-2.1 Strip Test Piece (see Fig. 2)

Separate the parts of the strip to be tested by hand at one end of the strip specimen and at a sufficient distance to permit the jaws of the testing clamp to be attached. Suspend the strip on the spike of the vertical frame or board and attach the ply to be separated, to the grip. Attach the loaded scale pan to the grip through a light spring. The total mass of the grip, spring, loaded scale pan and attachments shall be taken as the applied load. Obtain either the load required to cause separation of 25 mm/min graphically by selecting various loads or for a known or specified load, determine the rate of separation. Repeat the procedure on the separate plies from the face ply to the centre ply. Test the second specimen contacting with the back ply and proceeding again to the centre ply.

NOTE — Precautions shall be taken during the test to prevent side threads from pulling out and interfering with the test result. Where this occurs excessively due to the threads not being parallel to the edge of the strip, the test piece shall be discarded and a fresh one prepared.

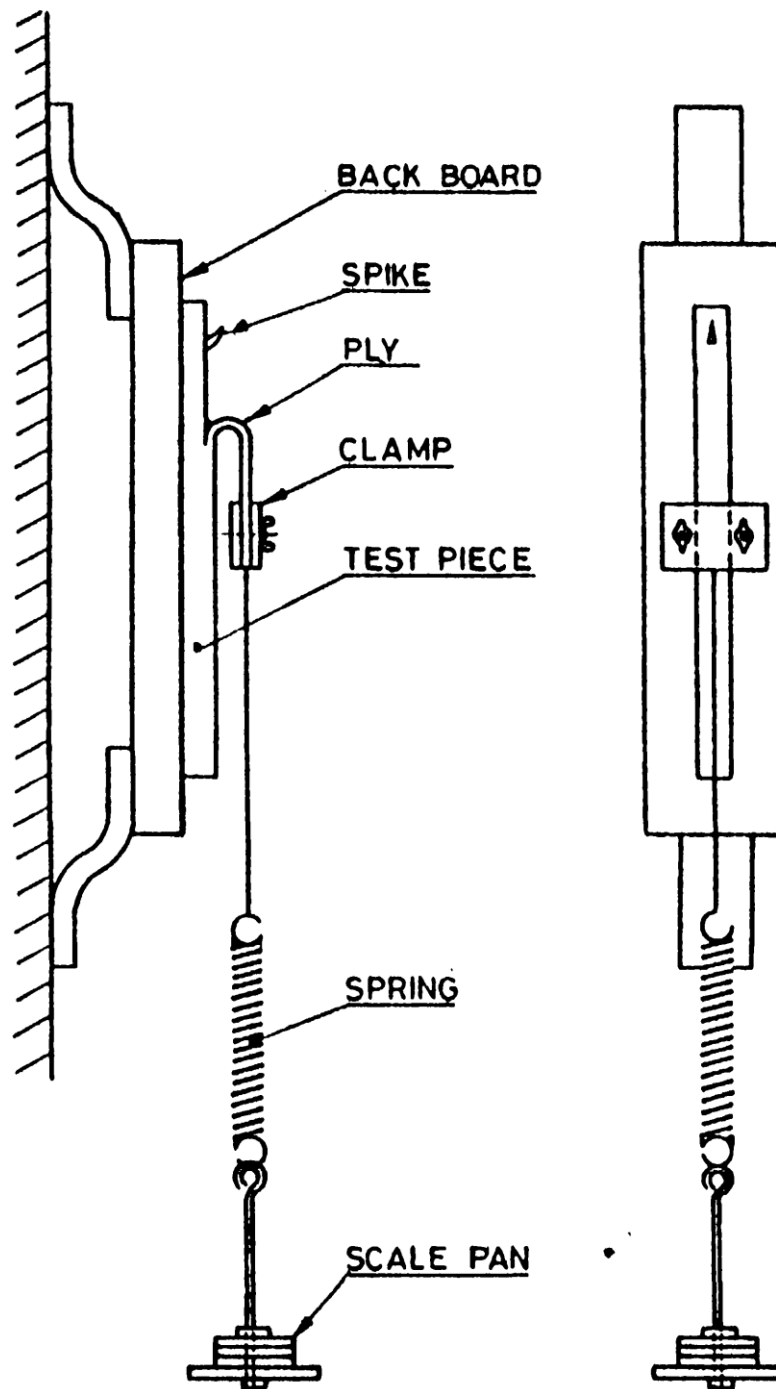


FIG. 2 APPARATUS FOR STATIC LOAD METHOD ON STRIP TEST PIECE

C-2.2 Expression of Results

Express the result as average force in kilo newtons per metre width required to cause a separation of the plies at 25 mm/min or obtain the rate of separation at a known or specified load.

C-3 REPORT

The report shall include the following:

- a) Adhesion value, that is median, range, statistical minimum, observed minimum, observed maximum;
- b) The type of specimen and thickness of specimen;
- c) All observations and recorded data on which the results are based;
- d) Date of manufacture or vulcanization of rubber; if known;
- e) Date of test;
- f) Statement of the method used (Dead load/ Static mass or dynamic on constant traverse); and
- g) Temperature of the test and its duration, and temperature and relative humidity of conditioning