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IS 5676 (1995): Moulded solid rubber soles and heels [CHD **19:** Footwear]



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Indian Standard

MOULDED SOLID RUBBER SOLES AND HEELS – SPECIFICATION

(Second Revision)

ICS 685.312.122.6

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BUREAU OF INDIAN STANDARDS MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG NEW DELHI 110002

October 1995

Price Group 4

FOREWORD

This Indian Standard (Second Revision) 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.

Moulded solid rubber soles and heels are used for making boots/shoes for heavy duty purposes with leather upper or rubber upper. Such soles and heels are made by moulding and are available in the market as unit soles and heels ready for use in such footwear. The soles have been classified based on their uses with different types of footwear.

This standard was originally published in 1970 and was subsequently revised in 1987. In this revision the requirements for thickness of soles and heels, hardness and cut growth have been modified in view of the feedback obtained from the industry.

Additional requirements for tensile strength, elongation at break, compression set and change of tensile properties after ageing have been also incorporated in this standard and the requirement of abrasion index has been dropped from this standard.

Composition of the committee responsible for formulation of this standard is given at Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard MOULDED SOLID RUBBER SOLES AND HEELS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes requirements, and methods of sampling and test for rubber full soles with or without heels and heels sold as finished products.

2 NORMATIVE REFERENCES

The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this Indian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions, and parties to agreements based on this Indian Standard are encouraged to investigate the possibility of applying the most recent editions of the Indian Standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2050 : 1991 shall apply.

4 TYPES

Moulded solid rubber soles and heels shall be of the following two types:

Type 1 — For use with leather shoes

Type 2 — For use with rubber or rubber combination shoes

5 REQUIREMENTS

5.1 General

The solid rubber soles shall be either moulded or vulcanized. The finished rubber shall be homogeneous and free from cracks, pores, excessive surface marking caused due to dirty moulds and sulphur blooms. The surface shall be free from blemishes and defects. The cured spew and moulding flashes shall be neatly trimmed as far as possible.

5.2 Design

The rubber soles and heels shall have anti-slip design. The soles and heels shall be cleated or non-cleated with steppled or other background pattern as agreed to between the purchaser and the manufacturer. Some of the popular designs of rubber soles and heels (bottom view) are shown in Fig. 1 to 3 (for Type 1) and Fig. 4 and Fig. 5 (for Type 2) for guidance to the manufacturer.

5.3 Construction

The provision for nail holes in Type 1 heels shall be provided subject to agreement between the purchaser and the supplier.

5.3.1 In case holes are provided the nail holes and washer of nail holes in heels shall be suitably spaced so that the heels shall be securely attached to the boot or shoe. There shall be neither less than 7 holes nor more than 11 holes along the edge of the heel and between



NOTE - This illustration is diagrammatic only and not intended to illustrate details of design.





NOTE — This illustration is diagrammatic only and not intended to illustrate details of design. FIG. 2 MOULDED SOLD RUBBER SOLE CLEATED DESIGN (TRACTION PATTERN), TYPE 1



NOTE — This illustration is diagrammatic only and not intended to illustrate details of design. FIG. 3 MOULDED SOLID RUBBER SOLE CLEATED DESIGN (STEPPLED PATTERN), TYPE 1



NOTE - This illustration is diagrammatic only and not intended to illustrate details of design.

FIG. 4 MOULDED SOLID SOLE CLEATED DESIGN (STUD PATTERN), TYPE 2



NOTE — This illustration is diagrammatic only and not intended to illustrate details of design.

FIG. 5 MOULDED SOLID RUBBER SOLE CLEATED DESIGN (RIPPLE PATTERN), TYPE 2

the cleats where cleats exist, situated at a distance of approximately 20 mm in the same cleat. Each nail hole shall have a suitable steel washer approximately midway between the two surfaces as agreed to between the supplier and the purchaser.

5.4 Size

The size of the soles and heels (see IS 1638 : 1969) shall be as agreed to between the purchaser and the supplier.

5.5 Thickness

For cleated or any other design as agreed to between the purchaser and the supplier, the minimum thickness of sole shall be as given in Table 1.

5.6 Channel

The soles of Type 1 may be with or without an open channel as agreed to between the purchaser and the supplier.

5.6.1 Type 1 soles having an open channel shall have a depth and width of 1.5 ± 0.5 mm and not more than 3 mm respectively.

5.7 Physical Requirements

The material shall comply with physical requirements given in Table 2.

6 MARKING AND PACKING

6.1 Marking

Each sole and heel shall be marked with the following particulars:

- a) The name of the manufacturer or recognized trade-mark, if any;
- b) Size number of the footwear for which it is intended; and

c) Batch/code number.

6.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

6.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6.3 Packing

The material shall be packed as agreed to between the purchaser and the supplier. Each package shall contain soles and heels of one particular size only.

7 SAMPLING

7.1 For the purpose of ascertaining the conformity of soles and heels in a consignment to this standard, the scale of sampling, and criteria for conformity shall be as prescribed in Annex B.

8 TEST METHODS

8.1 Unless otherwise agreed to between the purchaser and the supplier all tests shall be carried out within 3 months from the date of receipt of the material by the purchaser.

8.2 Test pieces for physical tests shall be prepared, where possible directly from tLe representative samples selected in accordance with 7.1 except in the case of small heels, when suitable sheets of the material of the same composition and vulcanized under identical conditions as the article, shall be provided by the manufacturer.

SI No.	Item	Point at Which the Thickness	Thickness in mm, Min	
		is to be Measured	Type 1	Type 2
(1)	(2)	(3)	(4)	(5)
i)	Sole	Forepart at tread with cleat	10.5	10.0
ii)	Sole	At waist without cleat	4.0	3.0
iii)	Heel	With cleat	24.0	15.0
iv)	Heel	Without cleat	16.0	7.0

Table 1 Thickness of Soles and Heels (Clause 5.5)

Table 2 Physical Requirements for Soles and Heels

(Clause 5.7)

SI No.	Characteristic	Requi	rement	Method of Test, Ref to IS
		Type 1	Type 2	
(1)	(2)	(3)	(4)	(5)
i)	Relative density, Max	1.2	1.2	3400 (Part 9) : 1978
·ii)	Hardness (see Note 1) IRHD	70 ± 5	60 ± 5	3400 (Part 2): 1980
iii)	Tensile strength, MPa, Min	10.5	10.5	3400 (Part 1): 1987
iv)	Elongation at break, percent, Min	300	300	3400 (Part 1) : 1987
v)	Flexing resistance (see Note 2):			3400 (Part 16):1974
-	a) Number of cycles for initial crack, <i>Min</i>	60 000	60 000	
	b) Cut growth at the end of 1 50 000 cycles, percent, Max	600	600	
vi)	Change in initial hardness	+5	+5	3400 (Part 4) : 1987
·	IRHD after ageing at 100 ± 1°C for 24 h	-2	-2	and 3400 (Part 2) : 1980
vii)	Change in tensile strength after	+5	+5	3400 (Part 1): 1987
,	ageing at $70 \pm 1^{\circ}$ C for 168 h, percent, <i>Max</i>	-25	-25	
viii)	Change in elongation at break	+5	+5	3400 (Part 1): 1987
	after ageing at 70 ± 1°C for 168 h, percent	-25	-25	• •
ix)	Compression set, percent, Max	20	20	3400 (Part 10) : 1977

NOTES

1 Readings from 30 to 95 (IRHD) are approximately the same as those of the Shore durometer, Type A.

2 If heels are compounded from same mix of soles, then it may not be tested for SI No. (v).

8.3 All physical tests shall be carried out as specified in col 5 of Table 2.

8.4 Measurement of Thickness

8.4.1 Full Soles

Measure the thickness at any point along the edge of the sole, excluding any raised or sunk pattern which covers a minor portion of the surface area of the forepart or any thickening at the toe. Measure the substance from the top of the pattern with steppled or any other background pattern not exceeding 0.5 mm in depth.

8.4.2 Heels

Measure the substance at the back of the heel including the chevrons or protuberances at that point but excluding nail holes, if provided around and disregarding any recess on the reverse side of the heel.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title	
1638 : 1969	Specification for sizes and fittings of footweat (first revision)	(Part 4) : 1987	Accelerated ageing (second revision)	
2050 : 1991	Glossary of terms relating to foot-	(Part 9) : 1978	Density (first revision)	
3400	wear (first revision) Methods of test for vulcanized	(Part 10) : 1977	Compression set at constant strain	
3400	rubbers:		(<i>Just revision</i>) Measurement of cut growth of rub-	
(Part 1): 1987	Tensile strees-strain properties (second revision)	(ber by the use of the ross flexing machine	
(Part 2) : 1980	Hardness (first revision)	4905 : 1968	Methods of random sampling	

ANNEX B

(Clause 7.1)

SAMPLING OF RUBBER SOLES AND HEELS

B-1 SCALE OF SAMPLING

B-1.1 Lot

All rubber soles or heels in a consignment belonging to the same size, design and batch or code of manufacture shall constitute a lot.

B-1.2 Samples shall be selected and examined from each lot separately for ascertaining the conformity of the material to the requirement of the specification.

B-1.3 The number of rubber soles or heels to be selected from any lot shall depend on the size of the lot and shall be in accordance with col 2 and 3 of Table 3.

B-1.3.1 The rubber soles and heels shall be selected at random from the lot. In order to ensure the randomness of selection, some random number tables as agreed to

between the purchaser and the manufacturer shall be used. For random selection procedure, IS 4905 : 1968 may be followed.

B-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

B-2.1 Visual Characteristics

All the soles or heels drawn under B-1.3 shall be first examined for the pattern and finish as given in 5.1, 5.2 and 5.3. If the number of samples failing to satisfy any one or more of the requirements is less than or equal to the corresponding permissible number of defectives given in col 4 of Table 3, the lot shall be declared to have satisfied the requirements for these characteristics, otherwise not.

B-2.2 Thickness and Other Dimensional Characteristics

The lot, which has been found satisfactory under **B-2.1**, shall be examined for dimensional requirements. For this purpose, the number of samples to be chosen from among those selected under **B-2.1**, is given in col 5 of Table 3. If the number of defectives found under this test is less than or equal to the permissible number given in col 6 of Table 3, the lot shall be considered to have satisfied the dimensional requirements, otherwise not.

B-2.3 Physical Requirements

The lot accepted under B-2.1 and B-2.2 shall be examined for physical requirements. For this purpose test pieces shall be taken from samples or from specially prepared test sheets required in 8.2. For each physical requirement, two samples shall be taken for physical tests if the lot size is 1 000 and below and three samples if it is above 1 000. There shall be no failures, if the lot is to be accepted under this clause.

Table 3 Scale of Sampling and Permissible Number of Defectives

SI No.	Number of Rubber Soles or Heels in	Visual Characteristic		Dimensional Characteristic	
	the Lot	Sample Size	Permissible Number of Defectives	Sample Size	Permissible Number of Defectives
(1)	(2)	(3)	(4)	(5)	(6)
i)	Up to 500	13	1	6	0
ii)	501 to 1 000	20	1	10	1
iii)	1 001 " 3 000	32	2	16	1
iv)	3 001 " 5 000	50	3	25	2
V)	5 001 and above	80	5	40	3

(Clause B-1.3)

ANNEX C

(Foreword)

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