

भारतीय मानक

अस्तर वाले व बिना अस्तर के रबड़ के जूते रसायन
प्रतिरोधी — विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

LINED OR UNLINED RUBBER BOOTS
RESISTANT TO CHEMICALS — SPECIFICATION

(*First Revision*)

UDC 685·315·4 : 620·179·111·5

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (First 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.

This standard was first published in 1992. The chemical resistant boots are extensively worn by the employees who work on shop floor of chemical plants and other similar industries. The technical committee responsible for formulation of this standard recommended that footwear used in contact with chemicals should be washed with water daily after use. In case of exposure of such footwear to chemicals, other than those specified in this standard, advice of the footwear manufacturer may be sought for suitability for use.

In the preparation of this standard, considerable assistance has been derived from the following International Standards issued by International Organization for Standardization (ISO), Geneva and is thankfully acknowledged:

- ISO 2023 : 1973 Lined industrial rubber footwear;
- ISO 3910 : 1983 Rubber boots, unlined, moulded; and
- ISO 6111 : 1982 Rubber footwear — Lined or unlined rubber industrial boots with chemical resistance.

In order to adopt the latest international practices and quality of the product accepted internationally, the committee decided to harmonize this standard with ISO 6111 : 1982 issued by ISO. For general requirements a reference has been made to IS 5557 : 1995 'Lined industrial and safety rubber boots — Specification (*second revision*)' which is harmonized with ISO 2023 : 1973 and IS 13995 : 1995 'Unlined moulded rubber boots — Specification'.

The committee decided not to include the requirement of abrasion index (which has been specified in ISO 2023 : 1973) as the tensile properties prescribed for such boots will indirectly ensure desired resistance to abrasion.

The following requirements have been modified, in line with the corresponding International Standard:

- a) Thickness of components; and
- b) Hardness.

This standard is now technically equivalent with ISO 6111 : 1982.

The 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

LINED OR UNLINED RUBBER BOOTS RESISTANT TO CHEMICALS — SPECIFICATION

(*First Revision*)

1 SCOPE

This standard prescribes requirements and methods of sampling and test for rubber boots, lined or unlined, for chemicals and its allied industries/plants.

2 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 MATERIALS

4.1 The chemical resistant lined boots shall be made with materials prescribed in **5.1** of IS 5557 : 1995. Chemical resistant unlined boots shall be made with materials prescribed in **4.1** of IS 13995 : 1995.

5 REQUIREMENTS

5.1 Shape and Design — The lined and unlined boots shall be made to the style, shape and design as prescribed in **6.1.1** of IS 5557 : 1995 and **5.2** of IS 13995 : 1995 respectively.

5.2 The lined and unlined boots shall conform to the requirement prescribed in **6.1** of IS 5557 : 1995 and **5.2** of IS 13995 : 1995 respectively.

5.3 Resistance to Specified Chemicals

The boots shall pass the test for resistance to

chemicals when tested in accordance with the method given in Annex B.

6 MARKING AND PACKING

6.1 Marking

The following particulars shall be marked inside of each boot:

- a) Name of the manufacturer or his trade-mark, if any;
- b) Size No.;
- c) Batch No.;
- d) 'For Men' or 'For Women';
- e) The words 'Resistance to chemicals'; and
- f) Month and year of manufacture.

6.1.1 BIS Certification Marking

The product may also be marked with Standard Mark.

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

6.2 Packing

Each boot may be wrapped in tissue paper and packed as agreed to between the purchaser and the supplier.

7 SAMPLING

7.1 The method of sampling drawing representative samples of the boots and the criteria of conformity shall be prescribed in IS 6368 : 1971.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
252 : 1991	Specification for caustic soda, pure and technical (<i>third revision</i>)	(Part 2) : 1980	Hardness (<i>first revision</i>)
265 : 1993	Specification for hydrochloric acid (<i>fourth revision</i>)	5557 : 1995	Lined industrial and safety rubber boots — Specification (<i>second revision</i>)
266 : 1993	Specification for sulphuric acid (<i>third revision</i>)		
2050 : 1991	Glossary of terms relating to footwear (<i>first revision</i>)	6368 : 1971	Method of sampling of rubber and rubber combination footwear
3400	Methods of test for vulcanized rubbers:		
(Part 1) : 1987	Tensile stress-strain properties (<i>second revision</i>)	13995 : 1995	Unlined moulded rubber boots — Specification

ANNEX B

(Clause 5.3)

METHOD OF TEST FOR RESISTANCE TO CHEMICALS

B-1 PROCEDURE

B-1.1 The test pieces cut from the boots shall be tested for tensile strength and elongation at break in accordance with the test methods prescribed in IS 3400 (Part 1) : 1987, hardness in accordance with IS 3400 (Part 2) : 1980 and mass before and after treatment specified in **B-1.2**. Where it is necessary to use different test pieces, such as for tensile strength, those tested after the treatment shall be from the same area of the same boot as those tested without being submitted to the treatment.

B-1.2 The test pieces taken from boots selected as sample shall then be immersed suitably for a period of 72 ± 2 h at $27 \pm 2^\circ\text{C}$ and 65 ± 5 percent relative humidity in the following reagents which shall be technically pure:

- Sulphuric acid — 3.7 k mol of 30 percent, m/m (*see* IS 266 : 1993)
- Hydrochloric acid — 6.0 k mol of 20 percent, m/m (*see* IS 265 : 1993)
- Sodium hydroxide — 6.1 k mol of 20 percent, m/m (*see* IS 252 : 1991)

NOTE — Separate test pieces shall be used for each reagent as mentioned above.

B-1.3 After immersion for the specified period, the test pieces shall be tested for tensile strength and elongation at break in accordance with the test methods prescribed in IS 3400 (Part 1) : 1987, hardness in accordance with IS 3400 (Part 2) : 1980 and mass. When the results are compared with those from test pieces which have not undergone the treatment:

- The decrease in tensile strength shall not exceed 15 percent of the initial value;
- The change in elongation at break shall not exceed 20 percent of the initial value;
- The change in mass of any test piece shall not exceed 2 percent of the initial value; and
- The increase in hardness shall not exceed 10 IRHD.

B-1.4 For the footwear to comply with the values prescribed in this standard, the requirements of **B-1.3** (a), (b), (c) and (d) shall be met for each of the three reagents specified in **B-1.2**.

ANNEX E**(Foreword)****COMMITTEE COMPOSITION****Footwear Sectional Committee, CHD 019**

<i>Chairman</i>	<i>Representing</i>
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<i>Members</i>	
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SHRI M. P. BAJPAI	Tannery & Footwear Corporation of India Ltd, Kanpur
SHRI K. K. HAJELA (<i>Alternate</i>)	
SHRI A. BANDYOPADHYAY	Ministry of Defence (R&D), Kanpur
SHRI B. B. DAS (<i>Alternate</i>)	
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SHRI S. BANERJEE (<i>Alternate</i>)	
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SHRI R. S. BALASUBRAMANIAN	Export Inspection Council of India, Madras
SHRI A. K. BASU (<i>Alternate</i>)	
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SHRI J. CHAKRABORTI	Standing Committee for Safety in Steel Industry, Durgapur
SHRI SHIB KUMAR (<i>Alternate</i>)	
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SHRI D. DASS (<i>Alternate</i>)	
SHRI S. GUHA	Indian Leather Technologists Association, Calcutta
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SHRI GAUTAM GUPTA	Ministry of Defence (DGQA), New Delhi
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(*Continued on page 4*)

(Continued from page 3)

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