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भारतीय मानक मसौदा
निजी सुरक्षा उपकरण
भाग 1 फुटवियर की परीक्षण पद्धतियाँ
(तीसरा पुनरीक्षण)

Draft Indian Standard
Personal Protective Equipment
Part 1 Test Methods for Footwear
(Third Revision)

(ICS 13.340.50)

Footwear Sectional Committee, CHD 19**Last Date for Comments: 14-04-2024**

Footwear Sectional Committee, CHD 19

NATIONAL FOREWORD*(Formal clause shall be added later)*

This document specifies methods for testing footwear designed as personal protective equipment.

This Indian Standard is published in several parts. The other parts in this series are:

- Part 2 Safety Footwear
- Part 3 Protective footwear
- Part 4 Occupational footwear
- Part 5 Additional requirements and test methods
- Part 6 Additional specifications for safety footwear
- Part 7 Additional specifications for protective footwear
- Part 8 Additional specification for occupational footwear

This standard was originally published in 2002 which was identical to ISO 8782-1: 1998 .The standard was revised in 2011 by adopting ISO 20344:2004 which was revision of ISO 8782-1.The standard was subsequently revised in 2015 to adopt the latest version of ISO 20344.

This third revision has been undertaken to adopt the latest version of ISO 20344:2021 along with amendment no. 1, published in 2024 . During this revision, following changes have been made:

- i. For each test same organization (1 principle 2 test equipment's 3 sampling and conditioning 4 test method 5 test report);

- ii. Systematic inclusion of a clause test report in all the test methods;
- iii. Changes in Table 1, minimum number of samples and test pieces;
- iv. Several tests are not described anymore in this standard but in the corresponding standard, reference is made to specific standards (ISO 22649, ISO 11640, ISO 17707, etc...);
- v. All reference standards are dated in clause 2;
- vi. New standards are taken into account (ISO 17075-1 and ISO 17075-2, ISO 22568-1 to ISO 22568-4);
- vii. Conditioning changed from 48 h to 24 h in 4.2;
- viii. Slip resistance, new test condition in 5.14;
- ix. Non-metallic perforation resistant insert, reference to the new ISO 22568-4 in 5.10;
- x. New drawing for impact test in 5.4;
- xi. New detection of water resistance in 5.18.4;
- xii. New detection of water resistance in 5.19.4;
- xiii. Clarification in the position and the dimension of the ankle protection in 5.21.2;
- xiv. New tests for scuff caps, in 5.24;
- xv. New tests for seam strength in 5.25;
- xvi. Determination of the area for non-water vapour permeable material in 6.2.3;
- xvii. New measurement of cleats height in the waist area in 8.2.4;
- xviii. New Annex A with new drawings of footwear degradations; and
- xix. New Annex B added with new system of sizing;

Subsequently, ISO has published an amendment no. 1 to this standard, which has been adopted with the revised version. In this amendment, following changes have been made:

- i. Clause 4.2, 5.1.2, 5.1.3, 5.2.4.3, 5.5.3.3, 5.7.4, 5.10.4.1, 5.10.5, 5.11.3, 5.12.3, 5.15.4, 5.18.1, 5.18.4.2, 5.18.5, 5.19.4.2.7, 5.19.5, 5.20.1.4.3, 5.21.3, 5.22.3, 5.22.4.3, 6.2.3.1, 6.2.3.2, 6.5.2.2.1.2, 6.5.3, 6.6.4, 6.10.3, 6.12.4.3, 6.12.5, 7.3.2.3, 7.3.4.1.1, 7.3.4.3, 8.4.3 has been modified;
- ii. Figure 1 has been changed;
- iii. Table 1 and Table 2 has been modified.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions and terminologies are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker in the International Standard, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their places, are given below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 1817:2015, Rubber, vulcanized or thermoplastic — Determination of the effect of liquids	IS 3400 (Part 6) : 2018 Methods of Test for Vulcanized Rubbers Part 6 Determination of the Effect of Liquids (<i>fourth revision</i>)	Identical with ISO 1817:2015

ISO 3290-1:2014, Rolling bearings — Balls — Part 1:Steel balls	IS 2898 (Part 1) : 2019 Rolling Bearings — Balls — Part 1 Steel Balls (<i>second revision</i>)	Identical with ISO 3290-1 : 2014
ISO 4045:2018, Leather — Chemical tests — Determination of pH and difference figure	IS 582 (Part 9) : 2022 Methods of Chemical Testing of Leathers Part 9 Determination of pH and Difference Figure	Identical with ISO 4045:2018
ISO 4649: 2017, Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device	IS 3400 (Part 3) : 2021 Methods of Testfor Vulcanized Rubber Part 3Abrasion Resistance using aRotating Cylindrical Drum Device (<i>third revision</i>)	Identical with ISO 4649:2017
ISO 4674-1:2016, Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods	IS 7016 (Part 3/Sec 1) : 2022 Methods of test for coated and treated fabrics part 3 determination of tear resistance section 1 constant rate of tear methods (<i>second revision</i>)	Identical with ISO 4674-1:2016
ISO 5423: 1992, Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use — Specification	IS 16645 : 2018 Moulded Plastics Footwear — Lined or Unlined Polyurethane Boots for General Industrial use — Specification	Identical with ISO 5423:1992
ISO 7500-1:2018, Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force measuring system	IS 1828 (Part 1) : 2022 Metallic Materials — Calibration and Verification of Static Uniaxial Testing Machines Part 1 Tension/Compression Testing Machines — Calibration and Verification of the force measuring System (<i>fifth revision</i>)	Identical with ISO 7500-1 : 2018
ISO 11640: 2012, Leather — Tests for colour fastness — Colour fastness to cycles of to- and-fro rubbing	IS 6191 (Part 4) : 2018 Methods of Micro-Biological, Colour Fastness and Microscopical Tests for Leather Part 4 Colour Fastness to Cycles of to-and- fro Rubbing	Identical with ISO 11640 : 2012

ISO 12947-1: 1998 + Cor. 1:2002, Textiles — Determination of the abrasion resistance of fabrics by the Martindale method — Part 1 Martindale abrasion testing apparatus	IS 12673 (Part 1) : 2014 Textiles — Determination of the Abrasion Resistance of Fabrics by the Martindale Method Part 1 Martindale Abrasion Testing Apparatus (<i>first revision</i>)	Identical with ISO 12947-1: 1998
ISO 17075 – 1:2017, Leather — Chemical determination of chromium(VI) content in leather — Part 1: Colorimetric method	IS 582 (Part 11/Sec 1):2023 Methods of chemical testing of leather part 11 determination of chromium(vi) content in leather section 1: colorimetric method	Identical with ISO 17075:2017
ISO 17075-2:2017, Leather — Chemical determination of chromium(VI) content in leather — Part 2: Chromatographic method	IS 582 (Part 11/Sec 2) : 2022 Methods of Chemical Testing of Leather Part 11 Determination of Chromium (VI) Content in Leather Section 2 Chromatographic method	Identical with ISO 17075-2:2017
ISO 20345:2021, Personal protective equipment — Safety footwear	Doc. No. : CHD/19/19012 IS 15298 (Part 2) : 20XX/ ISO 20345: 2021 Personal protective equipment — Safety footwear	Identical with ISO 20345:2021
ISO 20346:2021, Personal protective equipment - Protective footwear	Doc. No. : CHD/19/19015 IS 15298 (Part 3) : 20XX/ ISO 20346: 2021 Personal protective equipment — Protective footwear	Identical with ISO 20346:2021
ISO 20347:2021, Personal protective equipment — Occupational footwear	Doc. No. CHD/19/19016 IS 15298 (Part 4) : 20XX/ ISO 20347: 2021 Personal protective equipment — Occupational footwear	Identical with ISO 20347:2021
ISO 22568-2:2019, Foot and leg protectors — Requirements and test methods for footwear component — Part 2: Non-metallic toecaps	IS 5852 (Part 2) : 2019 Toe Caps for Protection of Feet — Specification Part 2 Non Metallic Toe Caps	Identical with ISO 22568-2:2019

ISO 22568-3:2019, Foot and leg protectors — Requirements and test methods for footwear components — Part 3: Metallic perforation resistant inserts	IS 17275 (Part 1) : 2019 Perforation Resistant Inserts for Protection of Feet — Specification Part 1 Metallic Perforation Resistant Inserts	Identical with ISO 22568-3:2019
ISO 22568-4:2021, Foot and leg protectors — Requirements and test methods for footwear components — Part 4: Non-metallic perforation resistant inserts	IS 17275 (Part 2) : 2019 Perforation Resistant Inserts for Protection of Feet — Specification Part 2 Non Metallic Perforation Resistant Inserts	Identical with ISO 22568-4:2019
ISO 23529:2016, Rubber — General procedures for preparing and conditioning test pieces for physical test methods	IS 13867 : 2021 Rubber — General Procedures for Preparing and Conditioning Test Pieces for Physical Test Methods (<i>first revision</i>)	Identical with ISO 23529:2016
ISO 23388:2018, Protective gloves against mechanical risks	IS 6994 (Part 6) : 2021 Protection of Arms and Hands Part 6 Protective Gloves against Mechanical Risks	Identical with ISO 23388:2018

ISO 3377-2:2016, Leather — Physical and mechanical tests — Determination of tear load — Part 2: Double edge tear	IS 5914(Part 5/Sec 2) : 2023 Methods of Physical Testing of Leather Part 5 Determination of tear load Section 2 Double edge tear	Identical with ISO 3377-2:2016
ISO 17697:2016, Footwear — Test methods for uppers, lining and insoles — Seam strength	IS 8085 (Part 13) : 2023 Methods of Test for Footwear Part 13 Seam strength for uppers lining and insoles	Identical with ISO 17697:2016
ISO 34-1:2015, Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces	IS 3400 (Part 12) : 2022 Methods of test for vulcanized rubbers: Part 12 Tear strength-crescent test piece First Revision	Identical with ISO 34-1:2015
ISO 3376:2020 Leather — Physical and mechanical tests — Determination of tensile strength and percentage elongation	IS 5914 (Part 8) : 2023 Methods of physical testing of leather part 8 determination of tensile strength and percentage elongation	Identical with 3376:2020

The technical committee has reviewed the provisions of the following International Standards referred in this standard and has decided that they are acceptable for use in conjunction with this standard:

<i>International Standard</i>	<i>Title</i>
ISO 4643 : 1992	Moulded plastics footwear — Lined or unlined poly (vinylchloride) boots for general industrial use – Specification
ISO 5403-1:2011	Leather — Determination of water resistance of flexible leather — Part 1: Repeated linear compression (penetrometer)
ISO 6487: 2015	Road vehicles – Measurement techniques in impact tests - instrumentation
ISO 13287: 2019	Personal protective equipment — Footwear — Test method for slip resistance
ISO 14268:2012	Leather — Physical and mechanical tests — Determination of water vapour permeability

ISO 17707:2005	Footwear — Test methods for outsoles — Flex resistance
ISO 22568-1:2019	Foot and leg protectors — Requirements and test methods for footwear components — Part 1: Metallic toecaps
ISO 22649:2016	Footwear — Test methods for insoles and insocks — Water absorption and desorption

Conditioning and test atmospheres stipulated in this standard may not be applicable to tropical/subtropical countries like India. The applicable Standard Atmospheric Conditions (SAC) for Indian conditions are $27 \pm 2^{\circ}$ C and 65 ± 5 percent relative humidity and may be observed while using this standard.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'.