SS 513-2:2024
ISO 20344:2021, IDT
(ICS 13.340.50)

SINGAPORE STANDARD

Specification for personal protective equipment – Footwear

– Part 2 : Test methods for footwear

[ISO title: Personal protective equipment – Test methods for footwear]

Singapore Standards Council

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National Foreword

This Singapore Standard was prepared by the Working Group on Protective Footwear set up by the Technical Committee on Personal Safety and Health under the purview of the Safety and Quality Standards Committee.

This standard is a revision of SS 513-2:2013. It is an identical adoption of ISO 20344:2021, “Personal protective equipment – test methods for footwear”, including the amendment to this edition, ISO 20344:2021/Amd 1:2024 (found immediately after the standard), published by the International Organization for Standardization.

The revised SS 513 consists of the following two parts, under the general title “Specification for personal protective equipment – Footwear”:

– Part 1 : Safety footwear (identical adoption of ISO 20345:2021)

– Part 2 : Test methods for footwear (identical adoption of ISO 20344:2021)

SS 513-1 is intended to be read in conjunction with SS 513-2.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. *Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as “mature standards”. Mature standards will not be subject to further review, unless there are requests to review such standards.*

2. *An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore and the Singapore Standards Council shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR. Although care has been taken to draft this standard, users are also advised to ensure that they apply the information after due diligence.*

3. *Compliance with a SS or TR does not exempt users from any legal obligations.*

INTERNATIONAL STANDARD

ISO 20344

Third edition
2021-10

Personal protective equipment — Test methods for footwear

Équipement de protection individuelle — Méthodes d'essai pour les chaussures

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 94 *Personal safety – Personal protective equipment*, Subcommittee SC 3, *Footwear*.

This second edition cancels and replaces the first edition (ISO 20344:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

— for each test same organisation (1 principle 2 test equipment’s 3 sampling and conditioning 4 test method 5 test report);

— systematic inclusion of a clause test report in all the test methods;

— changes in Table 1, minimum number of samples and test pieces;

— 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…);

— all reference standards are dated in Clause 2;

— new standards are taken into account (ISO 17075-1and ISO 17075-2, ISO 22568-1 to ISO 22568-4);

— conditioning changed from 48 h to 24 h in 4.2;

— slip resistance, New test condition in 5.14;

— non-metallic perforation resistant insert, reference to the new ISO 22568-4 in 5.10;

— new drawing for impact test in 5.4;

— new detection of water resistance in 5.18.4;

— new detection of water resistance in 5.19.4;

— clarification in the position and the dimension of the ankle protection in 5.21.2;

— new tests for scuff caps, in 5.24;

— new tests for seam strength in 5.25;

— determination of the area for non-water vapour permeable material in 6.2.3;

— new measurement of cleats height in the waist area in 8.2.4;

— new Annex A with new drawings of footwear degradations;

— new Annex B added with new system of sizing;

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

INTERNATIONAL STANDARD **ISO 20344:2021(E)**

Personal protective equipment — Test methods for footwear

1 Scope

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies.

ISO 34-1:2015, *Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces*

ISO 1817:2015, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 3290-1:2014, *Rolling bearings — Balls — Part 1: Steel balls*

ISO 3376:2020, *Leather — Physical and mechanical tests — Determination of tensile strength and percentage elongation*

ISO 3377-2:2016, *Leather — Physical and mechanical tests — Determination of tear load — Part 2: Double edge tear*

ISO 4045:2018, *Leather — Chemical tests — Determination of pH and difference figure*

ISO 4643:1992, *Moulded plastics footwear — Lined or unlined poly(vinyl chloride) boots for general industrial use — Specification*

ISO 4649:2017, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 4674-1:2016, *Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods*

ISO 5403-1:2011, *Leather — Determination of water resistance of flexible leather — Part 1: Repeated linear compression (penetrometer)*

ISO 5423:1992, *Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use — Specification*

ISO 6487:2015, *Road vehicles – Measurement techniques in impact tests - instrumentation*

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*

ISO 11640:2018, *Leather — Tests for colour fastness — Colour fastness to cycles of to-and-fro rubbing*

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*

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 17697:2016, *Footwear — Test methods for uppers, lining and insocks — Seam strength*

ISO 17707:2005, *Footwear — Test methods for outsoles — Flex resistance*

ISO 17075-1:2017, *Leather — Chemical determination of chromium(VI) content in leather — Part 1: Colorimetric method*

ISO 17075-2:2017, *Leather — Chemical determination of chromium(VI) content in leather — Part 2: Chromatographic method*

ISO 20345:2021, *Personal protective equipment — Safety footwear*

ISO 20346:2021, *Personal protective equipment —Protective footwear*

ISO 20347:2021, *Personal protective equipment — Occupational footwear*

ISO 22568-1:2019, *Foot and leg protectors — Requirements and test methods for footwear components — Part 1: Metallic toecaps*

ISO 22568-2:2019, *Foot and leg protectors — Requirements and test methods for footwear component — Part 2: Non-metallic toecaps*

ISO 22568-3:2019, *Foot and leg protectors — Requirements and test methods for footwear components — Part 3: Metallic perforation resistant inserts*

ISO 22568-4:2021, *Foot and leg protectors — Requirements and test methods for footwear components — Part 4: Non-metallic perforation resistant inserts*

ISO 22649:2016, *Footwear — Test methods for insoles and insocks — Water absorption and desorption*

ISO 23529:2016, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

ISO 23388:2018, *Protective gloves against mechanical risks*