

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

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 22568-4:2021 sisaldab Euroopa standardi EN ISO 22568-4:2021 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 22568-4:2021 consists of the English text of the European standard EN ISO 22568-4:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 22.12.2021.	Date of Availability of the European standard is 22.12.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 13.340.50

**Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele**

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis- ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autoriõiguse kaitse kohta, võtke palun ühendust Eesti Standardimis- ja Akrediteerimiskeskusega: Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

**The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation**

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about standards copyright protection, please contact the Estonian Centre for Standardisation and Accreditation: Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

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

Protecteurs du pied et de la jambe - Exigences et  
méthodes d'essais pour les composants de chaussure -  
Partie 4: Inserts anti-perforation non métalliques (ISO  
22568-4:2021)

Fuß- und Beinschutz - Anforderungen und  
Prüfverfahren für Schuhkomponenten - Teil 4:  
Nichtmetallische Einlagen mit Widerstand gegen  
Durchstich (ISO 22568-4:2021)

This European Standard was approved by CEN on 12 October 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

This document (EN ISO 22568-4:2021) has been prepared by Technical Committee ISO/TC 94 "Personal safety -- Personal protective equipment" in collaboration with Technical Committee CEN/TC 161 "Foot and leg protectors" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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

This document supersedes EN ISO 22568-4:2019.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 22568-4:2021 has been approved by CEN as EN ISO 22568-4:2021 without any modification.

# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Requirements for non-metallic perforation resistant inserts</b>	<b>2</b>
4.1 General	2
4.2 Resistance to perforation	2
4.3 Flexing resistance	3
4.4 Stability against ageing and environmental influence	3
4.5 Electrical resistance	3
<b>5 Test methods for the non-metallic perforation tests</b>	<b>3</b>
5.1 Determination of perforation resistance	3
5.1.1 Method PL: with conical nail 4,5 mm diameter	3
5.1.2 Method PS: with conical nail 3,0 mm diameter	3
5.2 Determination of flexing resistance	3
5.2.1 Apparatus	3
5.2.2 Sampling	4
5.2.3 Test procedure	5
5.2.4 Results	5
5.2.5 Test report	5
5.3 Test methods for the assessment non-metallic perforation resistant inserts in critical environment	6
5.3.1 Sampling	6
5.3.2 Effect of high temperature	6
5.3.3 Effect of acid sweat	6
5.3.4 Effect of alkali sweat	6
5.3.5 Effect of fuel oil	6
5.3.6 Results	6
5.3.7 Test report	6
5.4 Determination of the electrical resistance	7
5.4.1 Testing procedure	7
5.4.2 Test report	7
<b>6 Marking</b>	<b>8</b>
<b>Annex A (normative) Method PL: perforation resistance with the conical nail 4,5 mm diameter</b>	<b>9</b>
<b>Annex B (normative) Method PS: Perforation resistance with the conical nail 3,0 mm diameter</b>	<b>13</b>
<b>Bibliography</b>	<b>18</b>

## 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 3, *Foot protection*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 161, *Foot and leg protectors*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 22568-4:2019), which has been technically revised

The main changes are as follows:

- [Table 2](#), changes in the type names from X and Y to PL and PS, new requirements (“tent effect” and minimum value of 950 N);
- new nail, see [Figure B.1](#) (conical shape instead of pyramidal);
- new definition in [3.2](#);
- [Figure B.3](#) new dimension of the nail;
- Annex C and the reference material have been deleted.

A list of all parts in the ISO 22568 series can be found on the ISO website.

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](http://www.iso.org/members.html).

## Introduction

ISO 20345, ISO 20346 and ISO 20347 are related to safety, protective and occupational footwear which define the performance and required properties of the footwear. On introducing these standards all national standards relating to perforation resistant inserts were withdrawn leaving the manufacturers of these items with no means of demonstrating the performance of their products. This document has been prepared to allow manufacturers to demonstrate the type of the perforation resistant inserts before being inserted into the footwear.

Non-metallic perforation resistant inserts and materials complying with the requirements of this document are suitable components of “PPE footwear”.

# Foot and leg protectors — Requirements and test methods for footwear components —

## Part 4:

## Non-metallic perforation resistant inserts

### 1 Scope

This document specifies requirements and test methods for the non-metallic inserts with resistance against mechanical perforation, intended to function as components of PPE footwear (e.g. as described by ISO 20345, ISO 20346 and ISO 20347).

### 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. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 105-E04:2013, *Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration*

ISO 20344, *Personal protective equipment — Test methods for footwear*

ISO 20345, *Personal protective equipment — Safety footwear*

ISO 20346, *Personal protective equipment — Protective footwear*

ISO 20347, *Personal protective equipment — Occupational footwear*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20345, ISO 20346 and ISO 20347 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1

##### **non-metallic perforation resistant insert**

non-metallic footwear component placed (or intended to be placed) in the sole complex or used as an insole simultaneously in order to provide protection against perforation

#### 3.2

##### **“tent effect”**

separation between the layers of the test piece during the testing procedure, some layers are perforated other not giving, the aspect of the tent to the test piece

Note 1 to entry: The procedure is given in [Annex A](#).