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

**Part 3:
Metallic perforation resistant inserts**

iTeh STANDARD PREVIEW
*Protecteurs du pied et de la jambe — Exigences et méthodes d'essais
pour les composants de chaussure —
(standards.iteh.ai)
Partie 3: Inserts anti-perforation métalliques*

[ISO 22568-3:2019](https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019)

<https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019>



iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 22568-3:2019

<https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

| | Page |
|---|-----------|
| Foreword..... | iv |
| Introduction..... | v |
| 1 Scope..... | 1 |
| 2 Normative references..... | 1 |
| 3 Terms and definitions..... | 1 |
| 4 Requirements for metallic perforation resistant insert..... | 1 |
| 4.1 General..... | 1 |
| 4.2 Resistance to nail perforation..... | 2 |
| 4.3 Flexing resistance..... | 2 |
| 4.4 Corrosion resistance..... | 3 |
| 5 Test methods for the metallic perforation resistant inserts..... | 3 |
| 5.1 Determination of perforation resistance..... | 3 |
| 5.1.1 Apparatus..... | 3 |
| 5.1.2 Test sample..... | 4 |
| 5.1.3 Test procedure..... | 4 |
| 5.1.4 Test report..... | 6 |
| 5.2 Determination of flexing resistance..... | 6 |
| 5.2.1 Apparatus..... | 6 |
| 5.2.2 Sampling..... | 6 |
| 5.2.3 Test procedure..... | 6 |
| 5.2.4 Results..... | 7 |
| 5.2.5 Test report..... | 8 |
| 5.3 Determination of corrosion resistance..... | 8 |
| 5.3.1 Preliminary examination..... | 8 |
| 5.3.2 Test procedure..... | 8 |
| 5.3.3 Test report..... | 9 |
| 6 Marking..... | 9 |
| Bibliography..... | 10 |

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).

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).

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, *Foot protection*. ISO 22568-3:2019

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.

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 metallic 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 performance level of the metallic perforation resistant inserts before being inserted into the footwear.

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 22568-3:2019](https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019)

<https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 22568-3:2019

<https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019>

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

Part 3: Metallic perforation resistant inserts

1 Scope

This document specifies requirements and test methods for the metallic perforation resistant 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 20345, *Personal protective equipment — Safety footwear*

ISO 20346, *Personal protective equipment — Protective footwear*

ISO 20347, *Personal protective equipment — Occupational footwear*

<https://standards.iteh.ai/catalog/standards/sist/035b28b4-e45b-4656-b9e4-aaef88e8fc9e/iso-22568-3-2019>

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.

3.1

metallic perforation resistant insert

metallic footwear component placed (or intended to be placed) in the sole complex in order to provide protection against mechanical perforation

4 Requirements for metallic perforation resistant insert

4.1 General

Perforation resistant material shall be tested in accordance with this document, even in an unshaped status, if it is intended to be cut and/or shaped by the footwear or sole manufacturer. When shaped inserts are tested in accordance with this document, their suitability to fit into footwear is not assured, because the dimensional conformity to the footwear depends on the individual shape of each model of footwear.

For each of the required measurements performed in accordance with this document, a corresponding estimate of the uncertainty of measurement should be evaluated. One of the following approaches shall be used:

- statistical method, e.g. that given in ISO 5725-2[1];
- mathematical method, e.g. that given in ISO/IEC Guide 98-3[2];

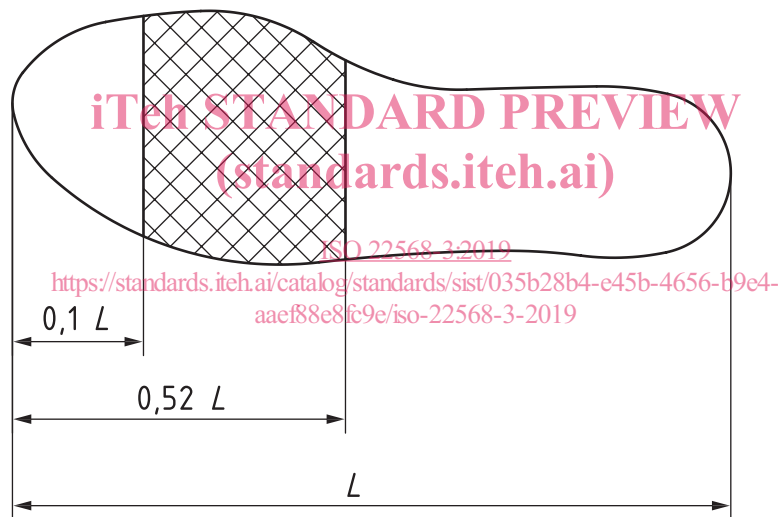
- uncertainty and conformity assessment as given in ISO/IEC Guide 98-4[3];
- JCGM 100:2008[4].

Table 1 — Summary of requirements and number of samples

| Property | Subclause | Number of samples |
|--------------------------------|----------------------|--|
| Resistance to nail perforation | 4.2. | Metallic material: 1 sample Ready -shaped inserts: 1 sample |
| Flexing resistance | 4.3 | Metallic plate: 1 sample Ready -shaped inserts: 2 different sizes |
| Corrosion resistance | 4.4 | Metallic plate: 1 sample Ready -shaped inserts: 1 sample |

NOTE 2 For details, see [4.2](#) to [4.4](#).

Metal perforation resistant inserts can be flat or bended in order to better fit the individual boot design. For the needs of their positioning in the footwear, the presence of up to 3 holes in one insert is allowed, each of them with a diameter of not more than 3 mm. However, no holes are allowed in the area between 10 % and 52 % of the overall length of the insert, measured from its top (see [Figure 1](#)).



Key

L overall length of the metal insert

Figure 1 — Designation of the area of metal perforation resistant inserts in which no holes are permitted

4.2 Resistance to nail perforation

When the metallic perforation resistant inserts are tested in accordance with the applicable method described in [5.1](#), all the results reported as described in [5.1.3](#) shall be equal or greater than 1 100 N.

4.3 Flexing resistance

When tested in accordance with the method described in [5.2](#), the metallic perforation resistant inserts shall exhibit no visible signs of cracking, disintegration or delamination after having been subjected to 1×10^6 (one million) flexion cycles.

4.4 Corrosion resistance

Both before and after testing in accordance with the method described in 5.3, the metallic perforation resistant inserts shall exhibit not more than three areas of corrosion, none of which shall measure more than 2 mm in any direction.

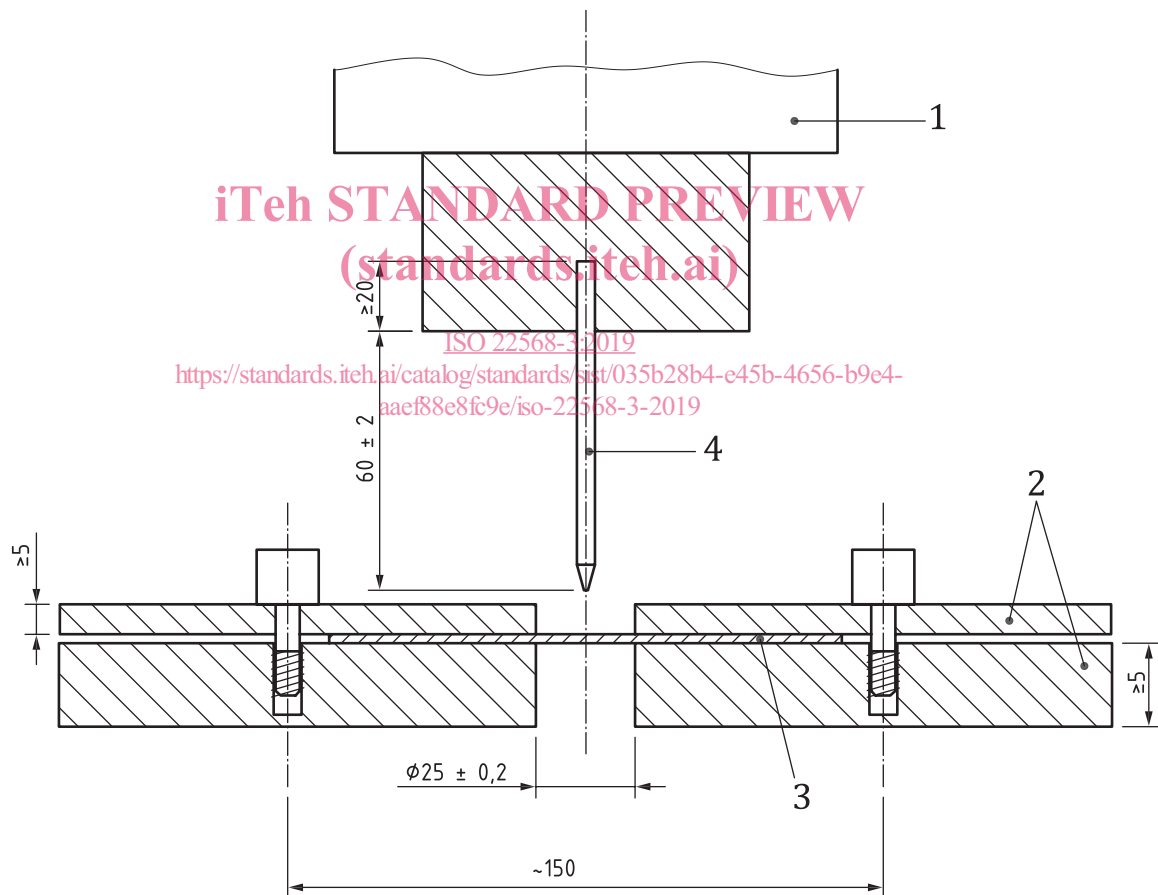
5 Test methods for the metallic perforation resistant inserts

5.1 Determination of perforation resistance

5.1.1 Apparatus

5.1.1.1 Test equipment, capable of measuring a compressive force up to at least 2 000 N, fitted with a pressure plate (5.1.1.2), in which a test nail (5.1.1.3) is fixed, and a parallel plate with a circular opening of diameter $(25 \pm 0,2)$ mm. The axes of this opening and the test nail shall be coincident (see Figure 2).

Dimensions in millimetres



Key

- | | | | |
|---|-----------------|---|------------|
| 1 | pressure platen | 3 | test piece |
| 2 | plates | 4 | nail |

Figure 2 — Apparatus for perforation resistance test of metallic perforation resistant insert (example)