

Revision of Foot and Leg Protection Standard

Standards are re-examined at regular intervals to ensure that they correspond to the current state of the art. Particularly in the case of Personal Protective Equipment such revision has the goal of constantly improving the protection of wearers in their working environment. The harmonised standard EN 12568 «Foot and leg protectors. Requirements and test methods for toecaps and penetration-resistant inserts» is currently undergoing revision.



Metallic and non-metallic inserts for protection against penetration by sharp and pointed objects are indispensable in occupational, protective, and safety shoes. Both kinds of inserts offer protection against perforation but have different advantages and disadvantages:

- Metallic inserts offer greater resistance to perforation by a sharp object than non-metallic ones because the diameter, geometry, or sharpness of the object play a less important role. However, owing to limitations encountered in footwear manufacture, metallic inserts do not provide protection over the whole area of the outsole.
- Non-metallic inserts can be lighter and more flexible and cover a larger area than metallic ones. However, their perforation resistance can vary more widely according to the diameter, geometry, and sharpness of the object that poses a threat of perforation.

A highly specific choice of insert therefore has to be made for each workplace.

The demands to be met by metallic and non-metallic inserts and how it is to be tested whether these demands are actually met are described in EN 12658. The latest version of this standard dates from 2010. Owing to recent developments in materials, EN 12568:2010 is currently being revised by the responsible committee of technical experts. The committee has decided to publish this standard as an international standard. Thus EN 12568 will become EN ISO 22568 comprising four parts:

- EN ISO 22568 Part 1 - Metallic toecaps
- EN ISO 22568 Part 2 - Non-metallic toecaps
- EN ISO 22568 Part 3 - Metallic anti-perforation inserts
- EN ISO 22568 Part 4 - Non-metallic perforation-resistant inserts

The principal changes in the testing of toecaps are

- a static and dynamic reference test for examining the suitability of plasticine
- a second kind of toecap with greater minimum clearance (considering softer outsole materials, orthopaedic adjustment, etc.)

- in the case of non-metallic protective toecaps it is no longer required to test their impact resistance after exposure to acid and alkali (because they should be incorporated into the shoe in such a way as to prevent contact with acids and alkalis)

The method for testing the perforation resistance of metallic inserts remains unchanged. The nail used for testing has a diameter of 4.5 mm and a conical tip. The lowest of five individual measurements is relevant for the assessment. The minimum requirement is 1,100 N.

A considerable change of the standard could result from the current discussion in the responsible *Technical Committee* (the pan-European expert group which formulates standards for occupational, protective, and safety shoes) about the testing of non-metallic perforation-resistant inserts. The various interest groups are currently working on an appropriate solution.

A so-called roofing nail (see figure right), with a new pyramidal tip and a new diameter of 3.0 mm is to be used as test nail for the testing of non-metallic perforation-resistant inserts.

The mean value of five individual measurements is relevant for the assessment of non-metallic perforation-resistant inserts. PFI is currently testing the suitability of the new test methods for the production of footwear. Several round-robin studies led to the conclusion that the non-metallic insert materials currently available on the market offer better protection against perforation than just a few years ago, according to tests performed on the individual materials. However, it was very surprising to find that the values dropped significantly for no apparent reason – in some cases by up to 20 percent – as soon as the materials were used in shoemaking.

The committee decided to introduce two levels of protection by perforation-resistant non-metallic inserts considering differing hazardous situations at the workplace.

One particular aspect of the determination of the perforation-resistance of non-metallic inserts is changing: Hitherto this has been determined after treatment with acid and alkali. In future it will be determined after treatment with acidic and alkaline perspiration solution.

After extensive consultations, EN ISO 22568 Part 1 to 4 can be put to a final vote. PFI will be sure to keep you updated about the latest developments!

Further questions will gladly be answered by:

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