



SLOVENSKI STANDARD

SIST EN 14404-2:2024

01-oktober-2024

Nadomešča:

SIST EN 14404:2005+A1:2010

**Osebna varovalna oprema - Ščitniki za kolena za delo v klečečem položaju - 2. del:
Zahteve za ščitnike kolen, ki se nosijo (tip 1)**

Personal protective equipment - Knee protectors for work in the kneeling position - Part 2: Requirements for wearable knee protectors (type 1)

Persönliche Schutzausrüstung - Knieschutz für Arbeiten in kniender Haltung - Teil 2: Anforderungen an tragbare Knieschützer (Typ 1)

Équipements de protection individuelle - Protecteurs de genoux pour le travail à genoux - Partie 2 : Exigences relatives aux protecteurs de genoux portables (type 1)

Ta slovenski standard je istoveten z: EN 14404-2:2024

<https://standards.iteh.ai/catalog/standards/sist/34c234e0-8597-4f6e-9a70-fabb26d35f99/sist-en-14404-2-2024>

ICS:

13.340.50 Varovanje nog in stopal Leg and foot protection

SIST EN 14404-2:2024

en,fr,de

EUROPEAN STANDARD

EN 14404-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2024

ICS 13.340.50

Supersedes EN 14404:2004+A1:2010

English Version

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an tragbare Knieschützer (Typ 1)

This European Standard was approved by CEN on 20 June 2022.

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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 14404-2:2024) has been prepared by Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and life jackets", the secretariat of which is held by DIN.

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 November 2024 and conflicting national standards shall be withdrawn at the latest by November 2024.

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, together with EN 14404-1 and EN 14404-3 to EN 14404-6, will supersede EN 14404:2004+A1:2010.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

EN 14404 "Personal protective equipment — Knee protectors for work in the kneeling position" is split into 6 parts:

- Part 1: Test methods;
- Part 2: Requirements for wearable knee protectors (type 1);
- Part 3: Requirements for the individual combination of knee pads and garments (type 2);
- Part 4: Requirements for the combination of interoperable knee pads and garments (type 2);
- Part 5: Requirements for knee mats (type 3);
- Part 6: Requirements for kneeling systems (type 4).

With the splitting of the standard, the following changes were made:

- definition of the protection zone;
- new combination of interoperable knee pads with interoperable garments (EN 14404-4);
- a bend test for interoperable knee pad was introduced;
- normative references were updated, further normative references are included;
- the cleaning of garments was taken into account;
- an uneven test surface and test was introduced;
- no more "UNISIZE" size; adjustment of size designation;
- additional markings were added.

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Any feedback and questions on this document should be directed to the users' national standards body. 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, Türkiye and the United Kingdom.

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Introduction

Kneeling is a frequently occurring working position, but one which is problematic from an occupational health viewpoint. Without knee protectors, workers can suffer immediate injuries from hard surfaces and small stones and similar objects lying on the surfaces. However, no knee protector can ensure that workers will not suffer medical complications if they are required to kneel for long periods.

It is important that knee protectors do not compromise venous drainage in the leg while kneeling or standing up. Therefore, it is important that it is easy for workers to change position and to stand up to re-establish a normal blood circulation at frequent intervals while wearing knee protectors.

Work in a kneeling position involves the risk of chronic diseases such as prepatellar bursitis and cartilage injuries caused by continuous pressure on the knees. Knee protection is therefore recommended for all work in the kneeling position. The protection should distribute forces evenly and prevent small hard objects on the ground causing injuries. Many workers have pre-existing damage to their knees, particularly to their cartilages from sports injuries and from previous work. These injuries will be made worse by further kneeling. Wearing knee protectors cannot correct existing damage but should slow down further damaging effects.

Work in a kneeling position can expose the skin of the shins, knees and thighs to toxic and corrosive materials normally kept off the body while walking and standing by waterproof or water-resistant footwear. Knee protectors and trousers for use with such wet materials and particularly wet cement, should take this into account and provide adequate protection.

For working in a kneeling position, four types of knee protectors exist:

- wearable knee protectors (type 1),
- knee pads in combination with garments (type 2),
- knee mats (type 3), and
- kneeling systems (type 4).

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EN 14404-2:2024 (E)

1 Scope

This document specifies requirements for wearable knee protectors (type 1) and performance levels for use when working in kneeling position in order to reduce injuries to the knees caused by continuous pressure and penetration. Requirements for the marking of wearable knee protectors and the information to be supplied by the manufacturer are given. Where protection against additional hazards is claimed, performance requirements from other standards are applicable.

This document does not apply to knee protectors that are medical devices or are intended for sports and motorcycles.

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.

EN 14404-1:2024, *Personal protective equipment - Knee protectors for work in the kneeling position - Part 1: Test methods*

EN ISO 13688:2013, *Protective clothing - General requirements (ISO 13688:2013)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology 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

wearable knee protector (type 1) personal protective equipment which protects the knee independent from other garments and is worn on the leg

3.2

restraint

part of the knee protector which keeps this fixed in position on the leg

3.3

zone of protection

area of the wearable knee protector that is intended to provide the user with protection of patellar and infrapatellar areas against continuous pressure and penetration

4 Performance levels of knee protectors

The performance level of knee protectors is only specified by the penetration resistance and the force distribution.

4 performance levels are specified. The tests for the performance levels are described in 4.4 and 4.5 of EN 14404-1:2024.

- **Level 0:** knee protectors providing no protection against penetration and with a force distribution less than 30 N when tested on flat even surface.

- **Level 1:** knee protectors providing protection against penetration at a force of at least 100 N and with a force distribution less than 30 N when tested on flat even surface.
- **Level 1U:** knee protectors providing protection against penetration at a force of at least 100 N and a force distribution less than 30 N when tested on uneven surface.
- **Level 2:** knee protectors providing protection against penetration at a force of at least 250 N and with a force distribution less than 30 N when tested on uneven surface.

5 Requirements

5.1 Summary of the requirements

A summary of the requirements and the tests applicable are given in Table 1.

Table 1 — Summary of requirements for wearable knee protectors (type 1) and the tests applicable

Clause number	Subject	Level				Clauses describing the tests applicable
		0	1	1U	2	
5.2	General requirements	X	X	X	X	EN 14404-1:2024, 4.1 and 4.2
5.2	Innocuousness	X	X	X	X	EN 14404-1:2024, 4.3.1 EN ISO 13688:2013, 4.2
5.3	Products for testing	X	X	X	X	5.3
5.4.1	Orientation of the wearable knee protector Vertical alignment	X	X	X	X	5.4.1
5.4.2	Orientation of the wearable knee protector Knee, left/right	X	X	X	X	5.4.2
5.5.1.1	Size designation	X	X	X	X	5.5.1.1
5.5.1.2	Dimension of the protective zone	X	X	X	X	EN 14404-1:2024, 4.3.2
5.5.2	Penetration resistance (Performance levels 1, 1U and 2)	n.a.	X	X	X	EN 14404-1:2024, 4.4
5.5.3.1	Force distribution on a flat even surface	X	X	n.a.	n.a.	EN 14404-1:2024, 4.5.2.1
5.5.3.2	Force distribution on an uneven surface	n.a.	n.a.	X	X	EN 14404-1:2024, 4.5.2.2
5.5.4	Peak transmitted force	X	X	X	X	EN 14404-1:2024, 4.6.2
5.5.5.1	General requirements for restraint	X	X	X	X	EN 14404-1:2024, 4.7.1 and 4.11
5.5.5.2	Restraint by straps or equivalent system	X	X	X	X	EN 14404-1:2024, 4.7.1 and 4.11
5.6	Optional requirement for water resistance	X	X	X	X	EN 14404-1:2024, 4.8.1
5.7.1	Comfort during use on a flat even surface	X	X	n.a.	n.a.	EN 14404-1:2024, 4.10.1
5.7.2	Comfort during use on an uneven surface	n.a.	n.a.	X	X	EN 14404-1:2024, 4.10.2
5.7.3	Compliance of straps	X	X	X	X	EN 14404-1:2024, 4.11
6	Marking	X	X	X	X	Clause 6
7	Manufacturer information	X	X	X	X	Clause 7

n.a.: non-applicable

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5.2 General requirements

Wearable knee protectors shall be safe to use and fit for their intended application specified by the manufacturer.

They shall be designed and manufactured to provide protection when used according to the information supplied by the manufacturer, without endangering the user.

There shall not be hard or sharp edges, seams, buckles or other items on the inner surfaces (especially within the zone of protection) of the products that could harm the user during normal use. Visual and tactile examination shall be made according to EN 14404-1:2024, 4.3.1.

Wearable knee protectors shall meet the innocuousness requirements of EN ISO 13688:2013, 4.2. Construction materials and incorporated substances shall not harm those being in or coming into contact with them.

5.3 Products for testing

The manufacturer shall submit complete and ready-to-use 8 pairs of wearable knee protectors for testing, at least one pair shall be supplied of each size that is placed on the market. The manufacturer shall provide the documents and data required for the testing.

5.4 Orientation of the wearable knee protector

5.4.1 Vertical alignment

When a differentiation is necessary to indicate the vertical alignment, the marking below (Figure 1) shall be used on the side facing the knee and pointing upwards.



Figure 1 — Graphical symbol - Indication for vertical alignment

5.4.2 Identification of left and right wearable knee protectors

When a differentiation is necessary to indicate the side of the body (left/right) the following marking (Figure 2 and Figure 3) shall be used respectively for the left knee and for the right knee.

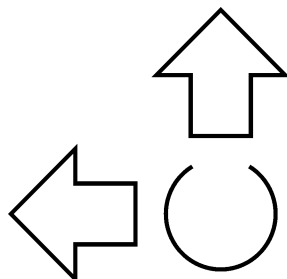


Figure 2 — Graphical symbol -Marking of left knee side at which the wearable knee protector is to be worn