
Varovalna obleka za uporabnike ročnih verižnih žag - 5. del: Zahteve za ščitnike nog

Protective clothing for users of hand-held chain saws - Part 5: Requirements for leg protectors

Schutzkleidung für die Benutzer von handgeführten Kettensägen - Teil 5: Anforderungen an Beinschutz

Vêtements de protection pour utilisateurs de scies à chaîne tenues à la main - Partie 5: Exigences pour proteges-jambes

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Ta slovenski standard je istoveten z: EN 381-5:1995

ICS:

13.340.50 Varovanje nog in stopal Leg and foot protection

SIST EN 381-5:1996

en

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EUROPEAN STANDARD

EN 381-5

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 1995

ICS 13.340.10

Descriptors: personal protective equipment, work clothing, accident prevention, protective clothing, legs, chain saws, specifications, shock resistance, marking, technical notes

English version

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Anforderungen an Beinschutz

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Ref. No. EN 381-5:1995 E

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets" of which the secretariat is held by DIN.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directive 89/686/EEC.

For relationship with EU Directive[s], see informative Annex ZA, which is an integral part of this standard.

The annex A is informative and contains the selection of design A, B or C.

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of an identical text or by endorsement, at the latest by October 1995, and conflicting national standards shall be withdrawn at the latest by October 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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0 Introduction

This European Standard forms part of a series concerned with personal protective equipment designed to protect against the risks arising from the use of hand-held chain saws.

No personal protective equipment can ensure a 100% protection against cutting from a hand-held chain saw.

Nevertheless, experience has shown that it is possible to design personal protective equipment which offers a certain degree of protection.

Different functional principles may be applied in order to give protection.

These include:

- a) chain slipping: on contact the chain does not cut the material
- b) clogging: fibres are drawn by the chain into the drive sprocket and block chain movement
- c) chain braking: fibres have a high resistance to cutting and absorb rotational energy, thereby reducing the chain speed.

Often more than one principle is applied.

1 Scope

This European Standard defines design and specifies the requirements for leg protectors which offers protection against cutting from a hand-held chain saw including the requirements for identification, marking and information for the user.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 381-2:1995

Protective clothing for users of hand-held chain saws - Part 2: Test method for leg protectors

3 Definitions

For the purpose of this standard the following definitions apply:

3.1 Leg protectors

Any type of protective garment which protects at least the specified protective area to the level of resistance specified within this standard for the leg e.g. trousers, leggings etc.

3.2 Protective material

Material which is designed to protect the wearer against the cutting effect of the hand-held chain saw. This protective material may include the cloth of the garment.

3.3 Protective coverage

The area of the garment which is covered by protective material.

3.4 Specified protective area

The required protective coverage.

4 Designs

4.1 Designs of leg protectors

This standard defines three designs, design A, design B and design C for leg protectors. Design A, design B and design C have different specified protective areas as stated in 4.2, 4.3 and 4.4.

4.2 Design A

4.2.1 Specified protective area for design A

The specified protective area for design A is described under a), b) and c) and is shown on figure 1.

- a) front: The specified protective area fully covers the front of the garment from 50 mm above the lower end of the legs to 200 mm above the crotch. It is allowed to leave out protective material at the fly.
- b) rear, left leg: The specified protective area covers on the outer side of the leg a 50 mm wide strip extending from 50 mm above the lower end of the leg to 200 mm below the crotch and then tapering to zero at a height of 200 mm above the crotch.
- c) rear, right leg: The specified protective area covers on the inner side a 50 mm wide strip from 50 mm from the bottom of the leg to 50 mm below the crotch.

It is allowed to extend the protective coverage, under the condition that the protection level is at least the same as in the specified protective area. There shall be no joins in the protective material within the specified protective area.

4.2.2 Other design requirements for design A

The leg protectors shall have a specified protective area as identified in 4.2.1 and they shall fully enclose both the front and the rear of the users leg from 50 mm below the crotch to the bottom end of the garment legs. The bottom end of each garments leg shall be designed to facilitate easy overlap of protective material with safety footwear worn by the user.

4.3 Design B

4.3.1 Specified protective area for design B

The specified protective area for design B is described under a), b) and c) and is shown on figure 2.

- a) front: The specified protective area fully covers the front of the garment from 50 mm above the lower end of the legs to 200 mm above the crotch. It is allowed to leave out protective material at the fly.
- b) rear, left leg: The specified protective area covers on the inner side of the leg a 50 mm wide strip from 50 mm from the bottom to 50 mm below the crotch. On the outer side of the leg it covers a 50 mm wide strip extending from 50 mm above the lower end of the leg to 200 mm below the crotch and then tapering to zero at a height of 200 mm above the crotch.

- c) rear, right leg: The specified protective area covers on the inner side a 50 mm wide strip from 50 mm from the bottom of the leg to 50 mm below the crotch.

It is allowed to extend the protective coverage, under the condition that the protection level is at least the same as in the specified protective area. There shall be no joins in the protective material within the specified protective area.

4.3.2 Other design requirements for design B

The leg protectors shall have a specified protective area as identified in 4.3.1 and they shall fully enclose both the front and the rear of the users leg from 50 mm below the crotch to the bottom end of the garment legs. The bottom end of each garments leg shall be designed to facilitate easy overlap of protective material with safety footwear worn by the user.

4.4 Design C

4.4.1 Specified protective area for design C

The specified protective area for design C is described under a and b and is shown in figure 3.

- a) front: The specified protective area fully covers the front of the garment from 50 mm above the lower end of the legs to 200 mm above the crotch. It is allowed to leave out protective material at the fly.
- b) rear: The specified protective area fully covers the rear of the garment from 50 mm above the lower end of the legs to 50 mm below the crotch on the inner side of each leg and to the level of the crotch on the outside of each leg.

No more than two joins are allowed in the protective material.

No gaps shall be more than 4 mm wide, and shall run along the leg.

4.4.2 Other design requirements for design C

The bottom end of each garments leg shall be designed to facilitate easy overlap of protective material with chain saw protective footwear worn by the user.

5 Ergonomic considerations

The protective clothing shall be as light weight as possible.

Between crotch and fly a break of 30 mm is allowed, but it is recommended to keep this break as small as possible.

The design shall be without appendages, which could become entangled in the machinery or undergrowth.

Braces shall have a minimum width of 30 mm.

The construction around the knee shall facilitate bending of the leg.

If the leg protectors are leggings they shall be capable of being securely connected in the fly area. For zippers, buttons etc. an opening break of 30 mm is allowed.

6 Requirements

6.1 Dimensional change

The dimensional change as measured in accordance with clause 6 of EN 381-2:1995 shall be less than 6%.

6.2 Protective coverage

The protective coverage measured in accordance with clause 7 of EN 381-2:1995 shall fulfill the requirements given in 4.2 for design A, 4.3 for design B or 4.4 for design C.

6.3 Resistance to saw chain cutting

6.3.1 Classification according to chain speed

Testing according to this standard can be made with the following 3 speeds with classes designated as follows:

class 1 : 20 m/s,
class 2 : 24 m/s and
class 3 : 28 m/s

6.3.2 Requirements to cut resistance

When tested according to clause 8 of EN 381-2:1995 no cut through is allowed in any tested specimen.

6.4 Requirements to attachment of protective padding

The protective material shall be permanently attached to the garment. For A and B it shall be along the edges of the protective padding along the leg. When tested according to clause 9 of EN 381-2:1995 the attachment should resist at least a force of 200 N.

7 Changes of construction

The manufacturer can change the construction above the waist level without retesting the type.

8 Marking

Protective clothing for users of hand-held chain saws shall be durably marked at least with the following information:

- a) Name or trade mark or other means of identification of the manufacturer or legally responsible company.
- b) Designation or style No. (company identification of model)
- c) Design according to clause 4.
- d) Serial number/batch number
- e) Date of manufacture (year and month)
- f) The number EN 381-5
- g) Size designation
- h) Speed classification. This information shall be given outside the frame of the pictogram showing a chain saw, preferably on the bottom of the frame
- i) The sentence "If the protective material is damaged, the garment is to be discarded", or similar.
- j) Washing/cleaning instructions including warnings against incorrect treatment