

Protective clothing for users of hand-held chainsaws —

Part 7: Requirements for chainsaw protective gloves

The European Standard EN 381-7:1999 has the status of a
British Standard

ICS 13.340.40

National foreword

This British Standard is the English language version of EN 381-7:1999.

The UK participation in its preparation was entrusted by Technical Committee PH/3, Protective clothing, to Subcommittee PH/3/5, Clothing for protection against chainsaws, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Summary of pages

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English version

Protective clothing for users of hand-held chainsaws – Part 7: Requirements for chainsaw protective gloves

Vêtements de protection pour utilisateurs de scies à chaîne
tenues à la main – Partie 7: Exigences pour les gants de
protection contre les scies à chaîne

Schutzkleidung für Benutzer von handgeführten
Kettensägen – Teil 7: Anforderungen an Schutzhandschuhe
für Kettensägen

This European Standard was approved by CEN on 19 May 1999.

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Foreword

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

The European Standards for "Protective clothing for users of hand held chainsaws" are the following:

EN 381-1	Protective clothing for users of hand held chainsaws - Part 1: Test rig for testing resistance to cutting by a chainsaw
EN 381-2	... - Part 2: Test rig for leg protection
EN 381-3	... - Part 3: Test methods for footwear
EN 381-4	... - Part 4: Test method for chainsaw protective gloves
EN 381-5	... - Part 5: Requirements for leg protectors
EN 381-7	... - Part 7: Requirements for chainsaw protective gloves
EN 381-8	... - Part 8: Test methods for chainsaw protective gaiters
EN 381-9...	- Part 9: Requirements for chainsaw protective gaiters

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of an identical text or by endorsement, at the latest by January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of 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.

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 chainsaws. As far as is known all chainsaws are designed for right handed use and therefore all protective clothing designs and requirements have assumed right handed use. Protection can not be adequate for left handed use.

No protective equipment can ensure 100% protection against cutting by a hand-held chainsaw.

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

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

These include:

- chain slipping: on contact the chain does not cut the material;
- clogging: fibres are drawn with the chain into the drive sprocket and block chain movement;
- 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 specifies the requirements for gloves for resistance to cutting by a chainsaw when assessed by the test method described in EN 381-4. The requirements are also given for marking and for the provision of information to be supplied by the manufacturer including criteria for the selection of appropriate gloves, and instructions for use.

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 amendments or revision. For undated references the latest edition of the publication referred to applies.

EN 381-4:1999	Protective clothing for users of hand-held chainsaw - Part 4: Test method for chainsaw protective gloves
EN 381-5:1995	Protective clothing for users of hand-held chainsaw - Part 5: Requirements for leg protectors
EN 420:1994	General requirements for gloves
EN 388:1994	Protective gloves against mechanical risks

3 Definitions

For the purposes of this European Standard, the following definitions shall apply:

3.1 chainsaw protective glove

any product which protects a hand against cutting by a hand-held chainsaw.

3.2 cuff

the portion of a glove which covers the wrist.

3.3 metacarpus

the part of the hand between the wrist and the fingers.

3.4 five-finger glove

any glove covering both the back and the palm of the hand and wrist, and having separate individual fingers and thumb.

3.5 mitt

any glove covering both the back and the palm of the hand and wrist, and having a separate thumb and a common covering for the fingers.

3.6 one-finger mitt

any glove covering both the back and palm of the hand and wrist, and having a separate thumb and a separate forefinger and a common covering for the remaining fingers.

3.7 protective material

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

3.8 protective coverage

the area of the glove which is covered by protective material.

3.9 specified protective area

the required protective coverage.

4 Designs

4.1 Designs of gloves

This standard defines two designs of chainsaw protective gloves, design A and design B. Design A and design B have different specified protective areas as defined in 4.2 and 4.3.

4.2 Design A

4.2.1 Description of design A

Design A applies to fivefinger gloves without chainsaw protection in the fingers or thumb.

4.2.2 Specified protective area for design A - Left hand gloves

The specified protective area is shown in figure 1. It is the back of the metacarpus.

The minimum length of the protective material across the minimum required width of protective material in size 9 gloves shall be 120 mm. The distal edge of the protective material shall be not more than 8 mm from the crotches between digits 2 and 3, 3 and 4, or 4 and 5. The minimum width of the protective material throughout a length equal to the minimum required length of protective material for size 9 gloves shall be a 110 mm. The minimum lengths and widths of protective material in other sizes of gloves shall be calculated from the hand lengths and widths in table 1 of EN 420:1994. The dimensions shall be measured on one glove from each pre-treatment in accordance with clause 6 of EN 381-4:1999.

4.2.3 Protective coverage for design A - Right hand gloves

No protective coverage is required. If protection is offered, however, then it shall at least equal that specified for the left hand.

4.3 Design B

4.3.1 Description of design B

Design B is protective gloves or mitts with specific chainsaw protection as in design A and on the backs of the fingers, but not on the thumb.

4.3.2 Specified protective area for design B - Left hand gloves

The specified protective area is shown in figure 2 and is the entire back of the hand including the backs of all fingers, but excluding the thumb.

The minimum length of protective material across the minimum required width of protective material in size 9 gloves shall be 190 mm. The minimum width of protective material throughout a length equal to the minimum required length of protective material for size 9 gloves shall be 110 mm. The minimum lengths and widths for protective material in other sizes of gloves shall be calculated from the hand lengths and widths in table 1 of EN 420:1994. The dimensions shall be measured on one glove from each pre-treatment in accordance with clause 6 of EN 381-4:1999.

4.3.3 Protective coverage for design B - Right hand gloves

No protective coverage is required. If protection is offered, however, then the coverage shall at least equal that specified for the left hand.

4.4 Attachment of protective material

Where the glove is not made entirely of protective material, all the protective materials used shall be sewn or otherwise permanently attached to the remainder of the glove.

5 Performance requirements

5.1 General

All chainsaw protective gloves shall conform to the requirements of EN 420, shown in table 1.

Table 1: General requirements

Subclauses in EN 420:1994	Mandatory	Optional
4.1 Design principle	X	
4.2 Glove construction	X	
4.3 High visibility gloves		X
4.4 Innocuousness	X	
4.5 Cleaning		X
5.1 Sizing	X	
5.2 Dexterity		X
5.3 Water vapour transmission and absorption		X

5.2 Protection against general mechanical risks

Both left and right hand gloves shall conform to the following requirements taken from EN 388:1994, modified as noted.

Table 2: Performance requirements - Mechanical risks.

Test	Test method	Minimum requirement (Performance level) table 1 of EN 388:1994
Abrasion resistance	6.1 of EN 388:1994	2 ¹⁾
Blade cut resistance	6.2 of EN 388:1994	1
Tear resistance	6.3 of EN 388:1994	2
Puncture resistance	6.4 of EN 388:1994	2
¹⁾ The abrasion test is only carried out on material taken from the outer layer(s) of the glove; <u>not</u> on the chainsaw protective material.		

5.3 Protection against chainsaw cutting

5.3.1 Classification according to chain speed

Protection against chainsaw cutting shall be assessed in accordance with clauses 7 and 8 of EN 381-4:1999 with one of the following chainsaw speed classes designated as follows:

- class 0 : 16 m/s
- class 1 : 20 m/s
- class 2 : 24 m/s and
- class 3 : 28 m/s

5.3.2 Requirements for cut resistance

When tested according to clause 8 of EN 381-4:1999 no cut through is allowed in any tested specimen.

5.4 Ergonomic requirements

When tested according to clause 9 of EN 381-4:1999 the grip factor shall be bigger than 80.

6 Marking

Protective gloves for users of hand-held chainsaws 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 number (company identification of model);
- c) design according to clause 4;
- d) the number EN 381-7;
- e) size designation according to EN 420;
- f) speed classification. This information shall be given outside the frame of the pictogram showing a chain saw, preferably on the bottom of the frame.

7 Information supplied by the manufacturer

Chainsaw protective gloves shall be supplied with an unambiguous instruction, in the language(s) of the country of destination. The instruction shall contain at least the following information:

- name, address and telephone number of manufacturer/importer;
- type designation or style number;
- figure showing the protective coverage applicable to any left hand glove and to the related right hand glove when applicable, with the related class;
- cleaning instructions;
- size designation according to EN 420;
- criteria for discarding the garment;
- the text "Does not offer protection against all risks of cutting by a hand-held chainsaw" or similar;
- the text "The chainsaw shall be used correctly using both hands according to the instructions from the chainsaw manufacturer";
- the information given in the marking;
- instructions for correct use;

- instructions about repair of the garment especially pointing out that the protective material cannot be repaired;
- instruction that the protective area and material shall not be altered in any way and that once cut into, the garment should be discarded;
- instruction that the colour and other specifications shall be as for clothing (see clause 9 of EN 381-5: 1995).

8 Pictogram

Chainsaw protective gloves fulfilling this standard shall be marked with the pictogram shown in figure 3. The pictogram shall either be printed on the outside of the glove or, if incorporated as part of a label, this shall be sewn to the inside of the glove.

It shall have minimum size 30 mm × 30 mm.

In cases where only one glove of a pair offers chainsaw protection, only that glove which offers the protection shall carry the pictogram.

ANNEX A (informative)

Selection of design A or design B

A.1 General

Owing to its larger protective area design B will inevitably give a greater degree of chainsaw protection than design A and should therefore be the normal choice where chainsaw resistance is the prime requirement. However, in applications where finger dexterity is an important consideration, then design A can be appropriate. Factors to be considered include:

A.2 Nature of work to be done

Selection :

- a) how much of the working day will be spent with a chainsaw in hand?
- b) what other work is to be performed?
- c) how important is it to have:
 - good grip ?
 - good manual dexterity ?
 - good tactile perception ?
- d) is there a need for the glove to have a separate finger to control the throttle? Do any other fingers require individual coverage?
- e) what other protection is the glove required to give?

A.3 Nature of external conditions

Selection :

In what weather/climatic conditions are the gloves likely to be worn (e.g. wet, dry, cold, warm, etc.)?

Note that wet conditions can impair grip, whilst cold temperatures in combination with exposure to vibration can increase the risk of vibration white finger.

A.4 Compatibility between hand and glove

The chainsaws currently used are normally designed to be held by two hands. The designs are asymmetrical and can only be used safely in a right handed manner with the left hand holding the front handle and the right hand on the rear handle and controlling the power delivery to the chain. All the specifications for protective clothing in this series of standards assume the chainsaw is held in this right handed manner. To obtain the protection from their PPE that is intended, left handed users shall work in a right handed stance and hold the chainsaw in a right handed manner.

Accident statistics show the risk of injury to the hands is mainly to the left hand. Therefore this standard only requires protective material to be provided in the left glove. In the eventuality that left handed chainsaws are used the protection will be required in the right hand glove.

The optional requirements for right hand gloves are provided because in future chainsaws can be available for left handed use.

Before using a pair of chainsaw protective gloves, prospective wearers should check that, under the anticipated work conditions, the gloves are well-fitting, and that work can be performed without the gloves causing a risk to safety and health.

They should check that either the gloves are sufficiently well fitting to be easily retained on the hand during normal use, or that they are fitted with wrist fasteners or similar to prevent the gloves unintentionally slipping off the hands.

When making these checks, important points to consider include:

what is the size of your own hand? Note particularly:

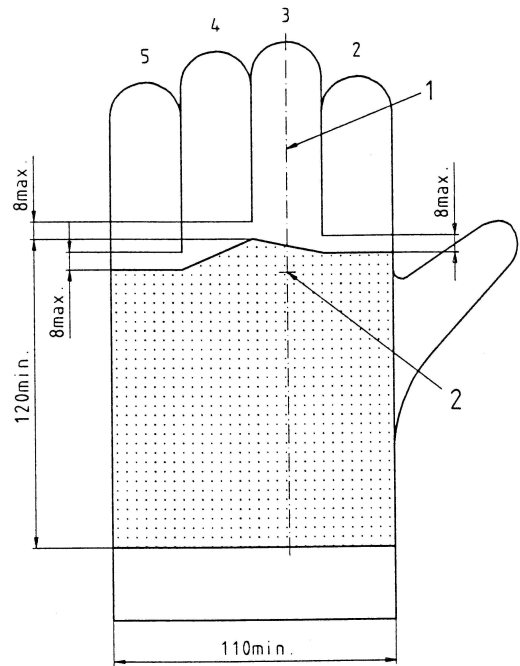
- a) Girth (circumference) of hand. If the glove size selected is too big, then the glove can tend to twist around the hand;
- b) Length of fingers. Glove fingers which are either too long or too short can both give rise to poor grip. Too short fingers can also impair blood circulation;

c) Overall length of hand. Gloves which are too long can impair hand movements.

Be aware that the hand can be closed around the handle of the saw for prolonged periods, and hence the glove should not be too stiff, nor too thick in the palm.

They should check also that, when gripping, the material of the palm does not flex in such a way as to impair grip.

Dimensions in millimetres



- 1 line of the longest length
- 2 mid point of the line of the longest length

Figure 1: Design A - Specified protective area lefthand glove (back uppermost)

Dimensions in millimetres

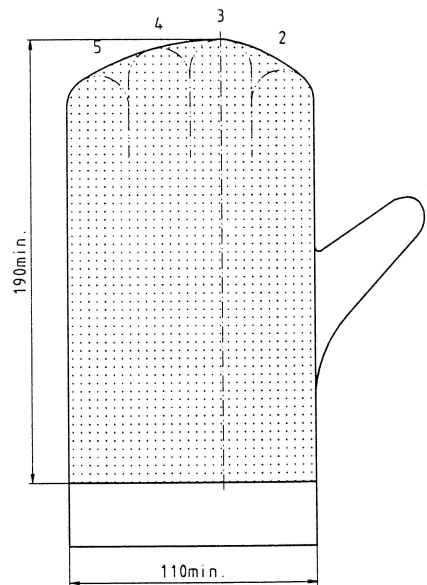
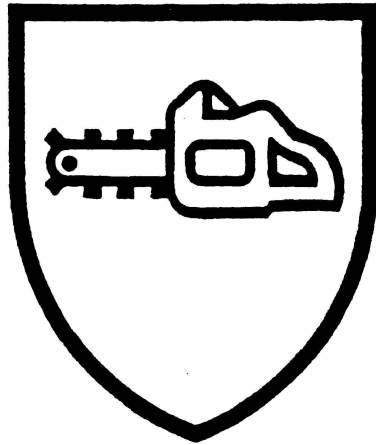


Figure 2: Design B - Protective area lefthand glove or mitt (back uppermost)



X – class of protection

Figure 3: Pictogram

Annex ZA (informative)

Clauses of this European Standard addressing essential requirements or other provisions of EU Directives

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.

WARNING : Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this European Standard.

The following clauses of this European Standard are likely to support requirements of Directive 89/686/EEC, Annex II:

EU-Directive 89/686/EEC, Annex II		clauses of this European Standard
1.1	Design principles	
1.1.1	Ergonomics	5.4
1.1.2	Levels and classes of protection	4 and 5
1.2	Innocuousness of PPE	5.1
1.3	Comfort and efficiency	5.1
1.4	Information supplied by the manufacturer	7
2.2	PPE 'enclosing' the parts of the body to be protected	5
2.12	PPE bearing one or more identification or recognition marks directly or indirectly relating to health and safety	6 and 8
3.3	Protection against physical injury	5.2 and 5.3

Compliance with the clauses of this European Standard provides one means of conforming with the specific essential requirements of the Directive concerned and associated EFTA regulations.

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