INTERNATIONAL STANDARD

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Second edition
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Protective clothing for users of hand-held chainsaws —

Part 5: Performance requirements and test methods for protective gaiters

Vêtements de protection pour utilisateurs de scies à chaîne tenues à la main —
Partie 5: Exigences de performance et méthodes d'essai pour guêtres de protection

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Contents

Page

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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 162, *Protective clothing including hand and arm protection and lifejackets*, in collaboration with ISO Technical Committee TC 94, *Personal safety — Personal protective equipment*, Subcommittee SC 13, *Protective clothing*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 11393-5:2001), which has been technically revised. The whole document and the Scope have been revised. The main changes compared to the previous edition are as follows:

— in the Introduction, the term "hand-held chainsaws primarily constructed for cutting wood" has been added;

— the normative references have been updated;

— terms and definitions have been added;

— a conjunction of the gaiter to a defined boot for test purposes has become mandatory;

— requirements and test methods for ergonomic properties, twisting resistance, the strength of the attachment system and innocuousness have been added;

— requirements for protective coverage have been changed;

— class 0 has been deleted from the requirements to cut resistance;

— the pre-treatment procedure has been revised.

A list of all parts in the ISO 11393 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

This document forms part of a series concerned with personal protective equipment (PPE) designed to protect against the risks arising from the use of hand-held chainsaws primarily constructed for cutting wood.

No PPE can ensure a 100 % protection against cutting from a hand-held chainsaw. Nevertheless, experience has shown that it is possible to design PPE that 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.

Protective clothing for users of hand-held chainsaws —

Part 5: Performance requirements and test methods for protective gaiters

1 Scope

This document specifies requirements and test methods for assessing the resistance to cutting of gaiters by hand-held chainsaws and other properties. It includes a requirement and a test method for assessing the strength of underfoot straps of gaiters.

This document is applicable to gaiters used in conjunction with safety footwear with a steel toecap conforming to ISO 20345 design "C" or "D". These gaiters are designed to be used only in association with a defined model of footwear and tested together.

NOTE These products are intended, but are not limited, to be used in combination with a defined model of orthopaedic footwear.

This document does not apply to gaiters intended for use in situations where there is a significant risk of tripping, such as tree climbing or in forests.

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 7000, *Graphical symbols for use on equipment — Registered symbols*

ISO 11393-1, *Protective clothing for users of hand-held chainsaws — Part 1: Test rig driven by a flywheel for testing resistance to cutting by a chainsaw*

ISO 11393-2:2018, *Protective clothing for users of hand-held chainsaws — Part 2: Performance requirements and test methods for leg protectors*

ISO 11393-3:2018, *Protective clothing for users of hand-held chainsaws — Part 3: Test methods for footwear*

ISO 13688:2013, *Protective clothing — General requirements*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
attachment system
system comprised of an underfoot strap and closing mechanism

3.2
cut-through
any visible change on the underside of the innermost layer of the test sample caused by the saw chain

3.3
defined boot
type of boot (article) on which the tests for *gaiters* (3.5) are performed and for which the test results are valid

3.4
foot protector
any product that protects the foot and the lower part of the leg (or any part of this area) against cutting by a hand-held chainsaw

3.5
gaiter
removable covering footwear intended to protect the front part of the foot, ankle and lower leg against cutting by a hand-held chainsaw

3.6
orthopaedic footwear
safety boots produced in series, where each item is adapted to fit an individual user, or safety boots produced as a single unit to accommodate the special needs of an individual user

3.7
protective material
material that is designed to protect the wearer against the cutting effect of a hand-held chainsaw

4 Requirements

4.1 General

Different upper designs of the same type of the defined boots (with the same outsole and last) are covered by these tests.

4.2 Fasteners

4.2.1 General

Force transmitting fasteners of the gaiters shall not be of the touch and close type.

4.2.2 Attachment system

When tested according to the procedure described in 6.2, each attachment system shall not fail at a force below 250 N.

4.2.3 Twisting resistance of the gaiter

When tested according to the procedure described in 6.3, the maximum twisting after relieving the load shall be ≤ 10 mm in the direction of the force.

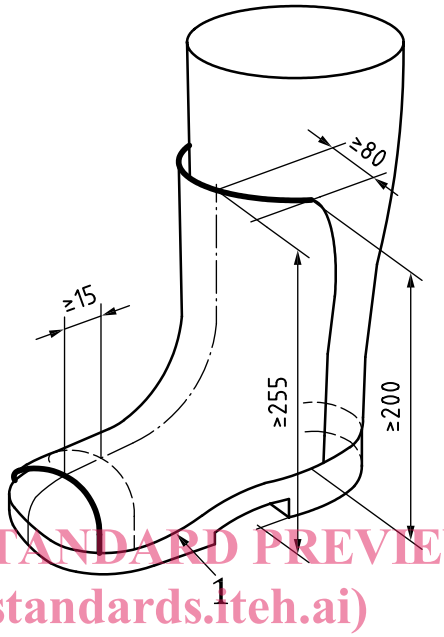
4.3 Innocuousness

Protective gaiters shall not adversely affect the health or hygiene of the user. The materials shall not release or degrade to release substances generally known to be toxic, carcinogenic, mutagenic, toxic to reproduction or otherwise harmful in the foreseeable conditions of normal use. The specific innocuousness requirements of ISO 13688:2013, 4.2, shall be met.

4.4 Specified protective area

The protective material of the gaiter shall at least cover the area of the defined boot shown in Figure 1, taking care that the front part of the gaiter shall cover the back part of the toecap with an overlap of at least 15 mm. Measure the distance between the two lines at the rear side of the toecap and the front end of the protective material of the gaiter, applied according to 6.3.4.

Dimensions in millimetres



Key

1 feather edge

Figure 1 — Specified protective area

4.5 Classification according to chain speed

The classification shall be made with the following three speeds:

— class of protection 1: 20 m/s ± 0,2 m/s;

— class of protection 2: 24 m/s ± 0,2 m/s;

— class of protection 3: 28 m/s ± 0,2 m/s.

4.6 Cut resistance

When the associated footwear and gaiter system is tested according to 6.1, no cut-through shall occur.

4.7 Ergonomics

The gaiters should be as lightweight as possible. They shall be designed to minimize restriction on movement while wearing them. When tested according to 6.4, the average score shall be 2 or less. When tested according to 6.4, all adjustment systems shall not become incorrectly adjusted without the user's knowledge.