SLOVENSKI STANDARD
oSIST prEN ISO 11393-6:2017

01-februar-2017

Varovalna obleka za uporabnike ročnih verižnih žag - 6. del: Preskusne metode in zahtevane lastnosti za ščitnike zgornjega dela telesa (ISO/DIS 11393-6:2016)

Protective clothing for users of hand-held chain-saws - Part 6: Test methods and performance requirements for upper body protectors (ISO/DIS 11393-6:2016)

Schutzkleidung für die Benutzer handgeführter Kettensägen - Teil 6: Prüfverfahren und Leistungsanforderungen für Oberkörperschutzmittel (ISO/DIS 11393-6:2016)

Vêtements de protection pour utilisateurs de scies à chaîne tenues à la main - Partie 6: Méthodes d'essai et exigences pour vestes de protection (ISO/DIS 11393-6:2016)

Ta slovenski standard je istoveten z: **prEN ISO 11393-6**

ICS:

13.340.10	Varovalna obleka	Protective clothing

oSIST prEN ISO 11393-6:2017 **en**

DRAFT INTERNATIONAL STANDARD
ISO/DIS 11393-6

ISO/TC **94**/SC **13** Secretariat: **SNV**

Voting begins on:
2016-12-15

Voting terminates on:
2017-03-08

Protective clothing for users of hand-held chain-saws —

Part 6:
Test methods and performance requirements for upper body protectors

Vêtements de protection pour utilisateurs de scies à chaîne tenues à la main —

Partie 6: Méthodes d'essai et exigences pour vestes de protection

ICS: 13.340.10

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 11393-6:2016(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Performance Requirements **2**
4.1 General 2
4.2 Innocuousness 2
4.3 Ergonomic requirements 3
4.4 Specified minimum protective area for upper body protectors 3
4.4.1 General 3
4.4.2 Designs of jackets 3
4.4.3 Front Design A 3
4.4.4 Front Design B 4
4.4.5 Back design A and B 5
4.4.6 Collar (optional) 6
4.4.7 Fastenings/joins 6
4.5 Dimensional change 6
4.6 Resistance to chain-saw cutting 6
4.7 Requirements for attachment of protective padding and strength of closures 7

5 Classification according to chain speed **7**

6 Test methods **7**
6.1 General 7
6.2 Cleaning 7
6.3 Number of test specimens 7
6.4 Sizes of test specimens 8

7 Testing for dimensional change **8**

8 Checking of protective coverage **8**

9 Testing of resistance to cutting **9**
9.1 Purpose of testing 9
9.2 Test specimens 9
9.3 Marking of positions for cutting 9
9.3.1 Test position on shoulder 9
9.3.2 Test position on the sleeve 10
9.3.3 Test positions if there are seams in the protective material 10
9.4 Test mounts 11
9.4.1 Shoulder test mount 11
9.4.2 Sleeve test mount 12
9.5 Apparatus 12
9.6 Mounting of test specimens 13
9.6.1 Shoulder test 13
9.6.2 Sleeve test 14
9.7 Test procedure 14
9.7.1 Positions of cuts 14
9.7.2 Number of cuts 15
9.7.3 Chain speed 15

10 Testing of attachment of protective material **15**
10.1 General 15
10.2 Test specimens 15
10.3 Apparatus 15

10.4 Test procedure 15
11 Ergonomic testing 16
11.1 Ergonomic assessment 16
11.2 Test for surface conditions 16
11.3 Procedures 16
12 Test report 17
13 Marking 17
14 Information to be supplied by the manufacturer 18
15 Pictogram 19
Annex A (informative) **Chain-saw use and the selection of appropriate upper body protectors 21**
Annex B (informative) **Significant changes between this document and the previous edition of ISO 11393-6:2007, 04 ..... 23**
Annex ZA (informative) **Relationship between this European Standard and the Essential Requirements of EU Directive 89/686/EEC 24**
Bibliography 26

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 11393-6 was prepared by Technical Committee ISO/TC 94, *Personal safety — Protective clothing and equipment*, Subcommittee SC 13, *Protective clothing*.

ISO 11393 consists of the following parts, under the general title *Protective clothing for users of hand-held chain-saws*:

— *Part 1: Test rig driven by a flywheel for testing resistance to cutting by a chain-saw*

— *Part 2: Test methods and performance requirements for leg protectors*

— *Part 3: Test methods for footwear*

— *Part 4: Test methods and performance requirements for protective gloves*

— *Part 5: Test methods and performance requirements for protective gaiters*

— *Part 6: Test methods and performance requirements for upper body protectors*

Introduction

This part of ISO 11393 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 primarily constructed for cutting wood.

Accidents occur due to a number of complex reasons, but a common factor is incorrect use of the chain-saw. The importance of correct training and proper use of a chain-saw in preventing accidents cannot be underestimated.

All parts of the upper body have been shown to be at risk when using a chain-saw.

In this part of ISO 11393, specifications for the protective coverage and performance of the upper body protectors are given. 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 that offers a certain degree of protection.

Different functional principles may be applied in order to give protection, such as:

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 in chain-saw protective clothing. Upper body protectors meeting this part of ISO 11393 are meant to be used whilst working off the ground, and where risk assessment shows that there is a significant risk to be cut by the moving chain on the upper part of the body such as when working from a sky lift and carrying out tree surgery.

Protective clothing for users of hand-held chain-saws —

Part 6: Test methods and performance requirements for upper body protectors

1 Scope

This part of ISO 11393 specifies requirements for the protection offered by upper body protectors against cutting by a hand-held chain-saw.

It also specifies the procedures for sampling and pre-treatment of upper body protectors, the measurement of the protective coverage, the apparatus and test methods for assessing resistance to cutting, and the practical performance test for evaluating ergonomic properties.

2 Normative references

The following referenced documents are indispensable for the application 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 13935-2:2014, *Textiles — Seam tensile properties of fabrics and made-up textile articles — Part 2: Determination of maximum force to seam rupture using the grab method*

ISO 11092, *Textiles — Physiological effects — Measurement of thermal and water-vapour resistance under steady-state conditions (sweating guarded-hotplate test)*

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

ISO 11393-3, *Protective clothing for users of hand-held chain-saws — 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.

3.1
upper body protector
any type of protective garment, which protects at least the specified area to the level of resistance to cutting by a chain-saw specified within this part of ISO 11393 for the upper part of the body, e.g. jacket

3.2
front
of an upper body protector⟩ part of a garment covering the forward 50 % of the upper body circumference

3.3
rear
of an upper body protector⟩ part of a garment covering the backside 50 % of the upper body circumference

Note 1 to entry: Depending upon design and construction, and due to many layers of protective material, it can be difficult to establish the division between the front and the rear of an upper body protector. It is nevertheless of great importance to establish this before pre-treatment and testing.

3.4
top of shoulder
top of shoulder as shown in Figure 1

3.5
protective material
material which is designed to protect the wearer against the cutting effect of a hand-held chain-saw

Note 1 to entry: This protective material may include the cloth of the garment.

3.6
unit of protective material
cut out piece or panel of protective material consisting of all the fabric or other layers that constitute the protective material that go into the construction of a garment

Note 1 to entry: A unit has no seams or joins within it. Units can be joined together to provide the complete protective coverage required, before insertion and attachment to garments, but such units retain their individuality for testing purposes.

3.7
protective coverage
area of the garment which consists of protective material

3.8
specified protective area
required protective coverage defined in this part of ISO 11393

3.9
Cut through
term describing that a saw chain has damaged and/or perforated the innermost layer of the test sample. Damage in the innermost layer to the skin means that a hole is cut into this material or a few yarns are visible hit by the saw

3.10
Joins
A Join in protective area is a place or line where two or more parts of the protective insert are connected or fastened together e.g. by seams or zippers

4 Performance Requirements

4.1 General

Upper body protectors for chain-saw users shall meet an overall requirement that they are safe and fit for the purpose. They shall meet requirements listed in 4.2 to 4.7.

4.2 Innocuousness

Upper body protectors for chain-saw users shall be designed and manufactured to provide protection when used in accordance with the manufacturer's instructions, without endangering the user or others. Construction materials and incorporated substances shall meet the innocuousness requirements in ISO 13688. They shall not endanger those coming into contact with them. The names and concentrations

of all substances contained in the product, which are generally known to cause allergies or sensitization, shall be listed in the information supplied by the manufacturer. When tested in accordance with Clause 11.2 upper body protectors for chain-saw users shall be free of hard or sharp components and rough surfaces that could cause abrasion, bruising, irritation, punctures or cuts to a user coming into contact with them. The manufacturer shall give guidance on the safe destruction and disposal of the products and of any hazards that can arise during mechanically disrupting or incinerating the product.

4.3 Ergonomic requirements

The protective clothing should be as lightweight as possible.

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

The construction around the sleeve shall facilitate bending and lifting the arm.

The protective garments shall be designed to minimize discomfort and restriction while wearing them. When tested in accordance with 11.3, the average score of all series and all movements shall be less than 1.5.

4.4 Specified minimum protective area for upper body protectors

4.4.1 General

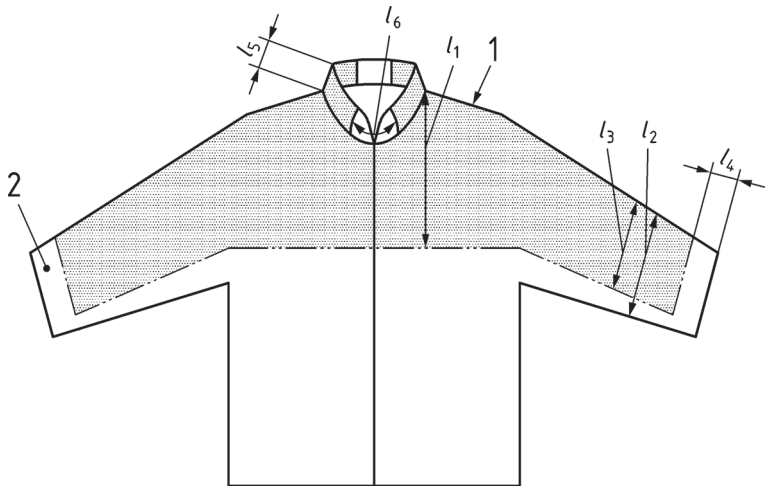
The protective coverage shall be measured in accordance with Clause 8.

4.4.2 Designs of jackets

Two different designs of jackets may be manufactured. Design A jackets are protected at the shoulder and the arms. Design B jackets have additional protection against hand held chainsaws in the front of the torso.

4.4.3 Front Design A

The specified protective area shall cover the front of the garment from the top of the shoulder downwards for a distance equivalent to at least 25 % of the chest girth of the largest intended user as given in the marking. The protective area shall include the upper 80 % of the surface of the front of the sleeve down to within 70 mm of the lower edge of the cuff of the sleeve. See Figure 1.



Key

1 top of shoulder
2 cuff
l_1 minimum height of protective coverage at the front of the garment
l_2 width of sleeve
l_3 width of protective coverage on the front of the sleeve (minimum 80 % of l_2)
l_4 unprotected length including cuff less than 70 mm
l_5 height of protective coverage in collar, minimum of 30 mm
l_6 gap in the protective coverage in the collar, maximum of 80 mm
shaded area is protective material

Figure 1 — Specified protective area of design A: front of garment

4.4.4 Front Design B

The specified protective area shall cover the front of the garment from the top of the shoulder downwards to a distance of a maximum of 50 mm from the bottom of the hem. It shall cover the front half of the circumference of the jacket minus 50 mm on left and right side. The protective area shall include the upper 80 % of the surface of the front of the sleeve down to within 70 mm of the lower edge of the cuff of the sleeve. See Figure 2.