SLOVENSKI STANDARD
oSIST prEN ISO 11681-2:2019

01-november-2019

Gozdarski stroji - Zahteve za varnost in preskušanje prenosnih motornih verižnih žag - 2. del: Verižne žage za nego dreves (ISO/DIS 11681-2:2019)

Machinery for forestry - Portable chain-saw safety requirements and testing - Part 2: Chain-saws for tree service (ISO/DIS 11681-2:2019)

Forstmaschinen - Sicherheitstechnische Anforderungen und Prüfungen für tragbare Kettensägen - Teil 2: Kettensägen für die Baumpflege (ISO/DIS 11681-2:2019)

Matériel forestier - Exigences de sécurité et essais des scies à chaîne portatives - Partie 2: Scies à chaîne pour l'élagage des arbres (ISO/DIS 11681-2:2019)

Ta slovenski standard je istoveten z: **prEN ISO 11681-2**

ICS:

65.060.80	Gozdarska oprema	Forestry equipment

oSIST prEN ISO 11681-2:2019 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 11681-2

ISO/TC **23**/SC **17** Secretariat: **SIS**

Voting begins on: **2019-09-11**

Voting terminates on: **2019-12-04**

Machinery for forestry — Portable chain-saw safety requirements and testing —

Part 2: Chain-saws for tree service

Matériel forestier — Exigences de sécurité et essais des scies à chaîne portatives —

Partie 2: Scies à chaîne pour l'élagage des arbres

ICS: 65.060.80

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 11681-2:2019(E)

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Published in Switzerland

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.

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 11681-2 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 17, *Manually portable forest machinery*.

This fourth edition cancels and replaces the third edition (ISO 11681-2:2011), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Normative references

— Kickback (clarification of requirements)

— Throttle control (verification of requirements)

— Fuel line strength and accessibility

— Information for use - Technical data

— Instruction handbook – Safe starting procedure

ISO 11681 consists of the following parts, under the general title *Machinery for forestry — Portable chain-saw safety requirements and testing*:

— *Part 1: Chain-saws for forest service*

— *Part 2: Chain-saws for tree service*

Introduction

This document is a type-C standard as stated in ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

Machinery for forestry — Portable chain-saw safety requirements and testing —

Part 2: Chain-saws for tree service

1 Scope

This part of ISO 11681 gives safety requirements and measures for their verification for the design and construction for tree service of portable, combustion-engine, hand-held chain-saws having a maximum mass — without guide bar and saw chain and with tanks empty — of 4,3 kg, intended to be used, with the right hand on the rear handle and left hand on the front handle, by a trained operator, having read and understood the safety requirements provided in the instruction handbook, for pruning and dismantling standing tree crowns, using the appropriate personal protective equipment (PPE). Methods for the elimination or reduction of hazards arising from the use of these machines and the type of information on safe working practices to be provided by the manufacturer are specified.

This part of ISO 11681 deals with all significant hazards, hazardous situations and hazardous events relevant to these machines when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer.

NOTE See Annex B for a list of significant hazards.

This part of ISO 11681 is applicable to chain-saws manufactured after its date of publication.

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 6531:2017, *Machinery for forestry — Portable chain-saws — Vocabulary*

ISO 6533, *Forestry machinery — Portable chain-saw front hand-guard — Dimensions and clearances*

ISO 6534, *Forestry machinery — Portable chain-saw hand-guards — Mechanical strength*

ISO 6535, *Portable chain-saws — Chain brake performance*

ISO 7293, *Forestry machinery — Portable chain saws — Engine performance and fuel consumption*

ISO 7914:2002, *Forestry machinery — Portable chain-saws — Minimum handle clearance and sizes*

ISO 7915, *Forestry machinery — Portable chain-saws — Determination of handle strength*

ISO 8334, *Forestry machinery — Portable chain-saws — Determination of balance and maximum holding moment*

ISO 9518, *Forestry machinery — Portable chain-saws — Kickback test*

ISO 10726, *Portable chain saws — Chain catcher — Dimensions and mechanical strength*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13772, *Forestry machinery — Portable chain-saws — Non-manually actuated chain brake performance*

ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13849-2, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation*

ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14982:1998, *Agricultural and forestry machinery — Electromagnetic compatibility — Test methods and acceptance criteria*

ISO 22867, *Forestry and gardening machinery — Vibration test code for portable hand-held machines with internal combustion engine — Vibration at the handles*

ISO 22868, *Forestry and gardening machinery — Noise test code for portable hand-held machines with internal combustion engine — Engineering method (Grade 2 accuracy)*

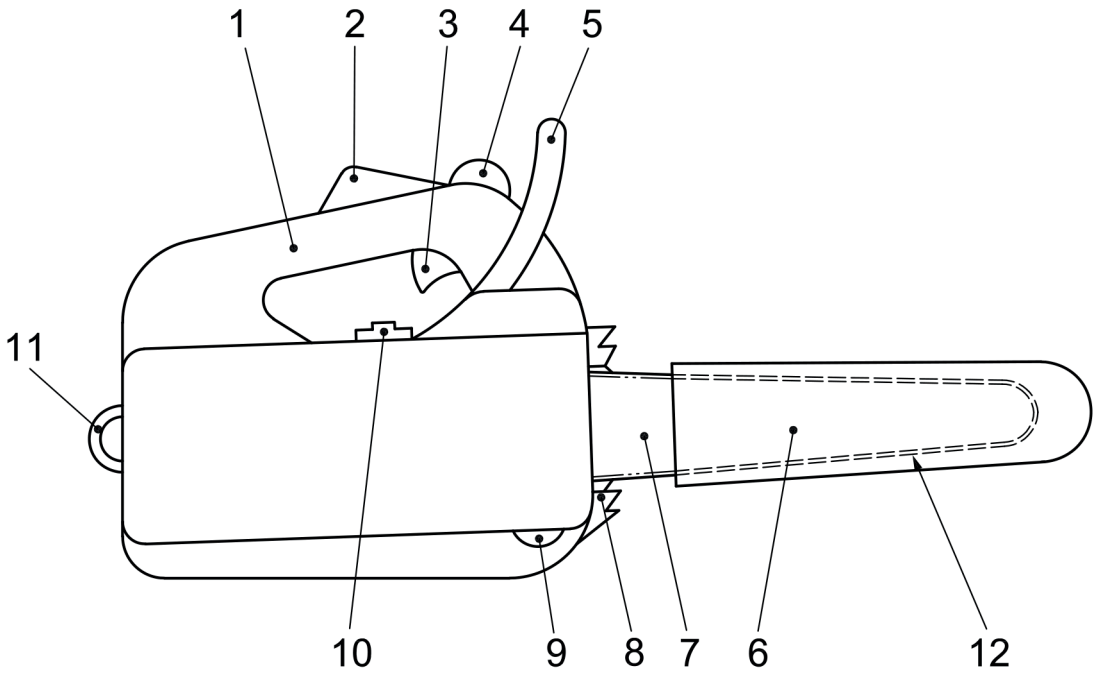
IEC 61032:1997, *Protection of Persons and Equipment by Enclosure – Probes for Verification*

ISO 7010, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6531 and ISO 12100 apply.

Note 1 to entry Figure 1 shows an example of a chain saw within the scope of this part of ISO 11681.



Key

1	rear handle	7	guide bar
2	throttle trigger lock-out	8	spiked bumper
3	throttle trigger	9	chain catcher
4	front handle	10	stopping device
5	front hand guard	11	attachment point
6	guide-bar cover	12	saw chain

Figure 1 — Example of chain-saw

3.1
trained operator
person who has competence and knowledge in

— the use of, and particular hazards associated with using, a chain-saw (for tree service work) manufactured in accordance with the provisions of this part of ISO 11681, and

— the precautions to be taken to limit these hazards, including the wearing of the recommended personal protective equipment (PPE)

4 Safety requirements and/or protective measures

4.1 General

Machines shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of ISO 12100 for relevant but not significant hazards which are not dealt with by this part of ISO 11681.

The safe operation of a chain-saw also depends on the safe environment associated with the use of personal protective equipment (PPE), such as gloves, slip-resistant footwear, and leg, eye, foot, hearing and head protective equipment, as well as safe working procedures (see 5.1).

Except where otherwise specified in this part of ISO 11681, the safety distances specified in ISO 13857:2008, 4.2.4.1 and 4.2.4.3, shall be met.

4.2 Handles

4.2.1 Requirements

Chain-saws shall have a handle for each hand. These handles shall be designed such that

— they can be fully gripped by an operator wearing protective gloves,

— they provide the necessary sureness of grip by their shaping and surface, and

— they conform to the dimensions and clearances given for tree-service chain-saws in ISO 7914 (see also 4.12.1).

The strength of both handles shall comply with ISO 7915.

Chain-saws having a system for isolating machine vibration from the handles shall be designed so that the operator is able to stop the engine in a controlled manner with the engine stopping device (see 4.11), even in the case of failure of the vibration isolation system.

4.2.2 Verification

Dimensions shall be verified by measurement. Strength requirements shall be verified by testing in accordance with ISO 7915. The possibility of stopping the chain-saw engine when a failure has occurred in the vibration isolation system shall be verified by inspection of the design and by functional testing.

4.3 Hand protection

4.3.1 Protection at front handle

4.3.1.1 Requirements

A hand guard shall be fitted in the vicinity of the front handle to protect the operator's fingers and hand from injury through contact with the saw chain.

The dimensions of this front hand guard shall comply with ISO 6533. Its strength shall comply with ISO 6534.

4.3.1.2 Verification

Dimensions shall be verified by measurement. Strength requirements shall be verified by testing in accordance with ISO 6534.

4.3.2 Protection at rear handle

4.3.2.1 Requirements

A guard shall be provided along the length of the right side of the bottom of the rear handle to protect the operator's hand from contact with broken chain.

This guard shall extend from the right edge of the handle for at least 30 mm on the guide bar side (see Figure 2) and at least 100 mm lengthwise from the inner rear part of the handle (see Figure 2).

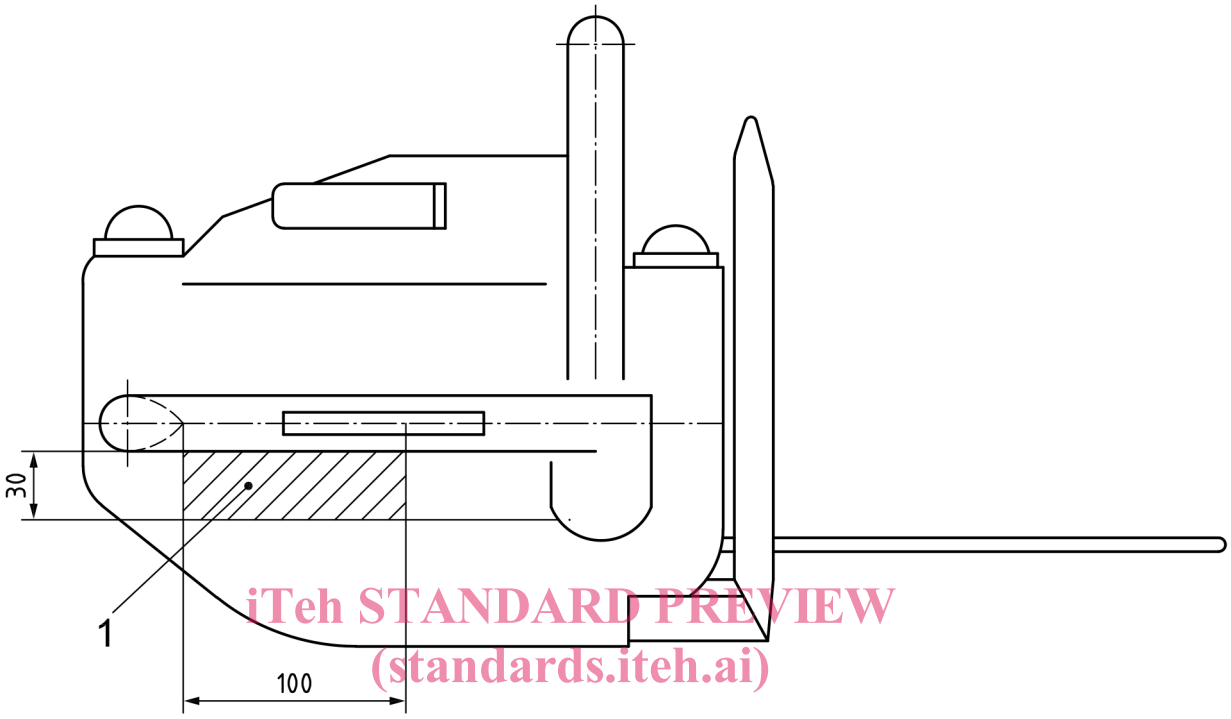
This requirement may also be fulfilled by parts of the machine.

The strength of the rear hand guard shall comply with ISO 6534.

4.3.2.2 Verification

Dimensions shall be verified by measurement. Strength requirements shall be verified by testing in accordance with ISO 6534.

Dimensions in millimetres



Key

1 minimum area covered or guarded to protect hand from broken saw chain

Figure 2 — Minimum dimensions of protection at rear handle

4.4 Balance and holding moment

4.4.1 Requirements

Chain-saws shall be longitudinally balanced to within ±25° between the centreline of the guide bar and the horizontal plane, and laterally balanced to within ±10° between the guide bar plane and the vertical plane.

The maximum holding moment shall not exceed 6 N·m.

The limits shall be met by the shortest and longest applicable guide bars.

4.4.2 Verification

The angles for longitudinal and lateral balance and the holding moment shall be verified by functional testing in accordance with ISO 8334.