IEC 62841-4-1

Edition 1.0 2017-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 4-1: Particular requirements for chain saws

Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité – Partie 4-1: Exigences particulières pour les scies à chaîne

IEC 62841-4-1:2017-10(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms, containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue
Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org
Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

IEC 62841-4-1

Edition 1.0 2017-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 4-1: Particular requirements for chain saws

Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 4-1: Exigences particulières pour les scies à chaîne

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.140.20

ISBN 978-2-8322-4754-9

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 4-1: Particular requirements for chain saws

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62841-4-1 has been prepared by IEC technical committee 116: Safety of motor-operated electric tools.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
116/339/FDIS	116/344/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 4-1 is to be used in conjunction with the first edition of IEC 62841-1 (2014).

This Part 4-1 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for chain saws.

Where a particular subclause of Part 1 is not mentioned in this Part 4-1, that subclause applies as far as relevant. Where this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

The following print types are used:

– requirements: in roman type;
– *test specifications: in italic type;*
– notes: in small roman type;
– **terms defined in Clause 3: in bold typeface.**

Subclauses, notes, tables and figures which are additional to those in Part 1, except as described for Annex K and Annex L below, are numbered starting from 101.

Subclauses, notes, tables and figures in Annex K and Annex L which are additional to those in the main body of this Part 4-1 as well as Annex K and Annex L of Part 1 are numbered starting from 301.

A list of all parts of the IEC 62841 series, under the general title: *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –

Part 4-1: Particular requirements for chain saws

1 Scope

This clause of Part 1 is applicable, except as follows:

Addition:

This standard applies to **chain saws** for cutting wood and designed for use by one person. This standard does not cover **chain saws** designed for use in conjunction with a guide-plate and riving knife or in any other way such as with a support or as a stationary or transportable machine.

This standard does not apply to

– **chain saws** for tree service as defined in ISO 11681-2; or

– pole-mounted pruners.

NOTE 101 Pole-mounted pruners will be covered by a future part of IEC 62841.

The **chain saws** covered by this standard are designed only to be operated with the right hand on the **rear handle** and the left hand on the **front handle**.

2 Normative references

This clause of Part 1 is applicable, except as follows:

Addition:

IEC 61672-1, *Electroacoustics – Sound level meters – Part 1: Specifications*

ISO 354:2003, *Acoustics – Measurement of sound absorption in a reverberation room*

ISO 3744:2010, *Acoustics – Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane*

ISO 6533:2012, *Forestry machinery – Portable chain-saw front hand-guard – Dimensions and clearances*

ISO 6534:2007, *Forestry machinery – Portable chain-saw hand-guards – Mechanical strength*

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

ISO 7915:1991, *Forestry machinery – Portable chain-saws – Determination of handle strength*

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

ISO 10726:1992, *Portable chain-saws – Chain catcher – Dimensions and mechanical strength*

ISO 11681-2:2011, *Machinery for forestry – Portable chain-saw safety requirements and testing – Part 2: Chain-saws for tree service*

ISO 13772:2009, *Forestry machinery – Portable chain saws – Non-manually actuated chain brake performance*

ISO 17080:2005, *Manually portable agricultural and forestry machines and powered lawn and garden equipment – Design principles for single-panel product safety labels*

ISO 22868:2011, *Forestry and gardening machinery – Noise test code for portable hand-held machines with internal combustion engine – Engineering method (Grade 2 accuracy)*

3 Terms and definitions

This clause of Part 1 is applicable, except as follows:

3.101
bar tip guard
shield that prevents contact with the **saw chain** at the tip of the **guide bar**

3.102
chain brake
function or device for stopping the **saw chain** activated manually or non-manually when **kickback** occurs

3.102.1
manually activated chain brake
braking function triggered by the hand of the operator

3.102.2
non-manually activated chain brake
braking function triggered by **kickback** motion independent of operator activation

3.103
chain catcher
device for restraining the **saw chain** if it breaks or derails (see Figure 101)

3.104
chain saw
machine designed to cut wood with a **saw chain** and consisting of an integrated unit of handles, motor, **guide bar** and **saw chain**, designed to be supported with two hands (see Figure 101)

3.105
cutting length
approximate effective length of cut of the **chain saw**

Note 1 to entry: The method for determining **cutting length** is specified in 21.101.

3.106
drive sprocket
chain drive wheel with teeth

3.107
front hand guard
guard between the **front handle** and the **saw chain** for protecting the hand from injuries if the hand slips off the handle (see Figure 101)

3.108
front handle
support handle located at or towards the front of the machine (see Figure 101)

3.109
guide bar
attachment that supports and guides the **saw chain** (see Figure 101)

3.110
kickback
rapid upward and/or backward motion of the **chain saw** which can occur when the moving **saw chain** contacts an object such as a log or branch near the tip of the **guide bar** or when the wood closes in and pinches the moving **saw chain**

3.111
maximum speed
highest **saw chain** speed attainable under all conditions of **normal use**, including no-load

3.112
operator presence sensor
device to detect the presence of an operator's hand

3.113
rear hand guard
extension on the lower part of the **rear handle** for protecting the hand from the **saw chain** if it breaks or derails (see Figure 101)

3.114
rear handle
support handle located towards the rear of the machine (see Figure 101)

3.115
saw chain
attachment, serving as a cutting tool, consisting of drive links and cutters (see Figure 101 and Figure 108)

3.116
spiked bumper
device, fitted in front of the **guide bar** mounting point, acting as a pivot when in contact with a tree or log (see Figure 101 and Figure 102)

4 General requirements

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable, except as follows:

5.14 *Addition:*

*For tests carried out at any percentage of **rated input** or **rated current**, except for no-load, the **saw chain** and the **guide bar** may be removed and the **chain saw** loaded by means of a brake.*

5.17 *Addition:*

*The mass of the machine includes the heaviest **guide bar** and **saw chain** combination in accordance with 8.14.2 c) 101) as well as the lubrication tank, if any, filled to the maximum specified level, but excludes the **guide bar** cover.*

5.101 *For tests that are performed at **maximum speed** and no-load, the manufacturer may need to provide special hardware and/or software.*

6 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

7 Classification

This clause of Part 1 is applicable.

8 Marking and instructions

This clause of Part 1 is applicable, except as follows:

8.2 *Addition:*

Chain saws shall be marked with safety information which shall be written in one of the official languages of the country in which the machine is to be sold or marked with the appropriate symbol:

– “Wear eye protection” or a relevant safety sign of ISO 7010 or the safety sign specified in Annex AA;

– “Wear ear protection”, a relevant safety sign of ISO 7010 or the safety sign specified in Annex AA. This marking may be omitted if the measured sound pressure level at the operator’s ear in accordance with Annex I does not exceed 85 dB(A).

A combination of ISO safety signs, such as eye, ear, dust and head protection, is allowed. In addition, a combination of safety signs as specified in Annex AA is allowed.

– “Do not expose to rain” or the safety sign specified in Annex AA, unless the **chain saw** has a degree of protection of at least IPX4.

– "Beware of chain saw kickback and avoid contact with bar tip”, or A.1.3 of ISO 17080:2005.

– “Always use chain saw two-handed” or A.3.1 of ISO 17080:2005.

For mains supplied machines:

“Remove plug from the mains immediately if the cable is damaged or cut” or the safety sign specified in Annex AA.

8.3 *Addition:*

Chain saws shall be marked with the following:

– specified nominal **guide bar** size or size range;

NOTE 101 The nominal **guide bar** size is not necessarily the same as the **cutting length**.

– identification of the direction of rotation of the **saw chain** by a legible and durable mark on the body of the machine. This may be located under the **drive sprocket** cover.

8.14.1 *Addition:*

The additional safety instructions as specified in 8.14.1.101 shall be given. This part may be printed separately from the “General Machine Safety Warnings”.

8.14.1.101 Safety instructions for chain saws

1) **General chain saw safety warnings:**

a) **Keep all parts of the body away from the saw chain when the chain saw is operating. Before you start the chain saw, make sure the saw chain is not contacting anything.** *A moment of inattention while operating chain saws may cause entanglement of your clothing or body with the saw chain.*

b) **Always hold the chain saw with your right hand on the rear handle and your left hand on the front handle.** *Holding the chain saw with a reversed hand configuration increases the risk of personal injury and should never be done*.

c) **Hold the chain saw by insulated gripping surfaces only, because the saw chain may contact hidden wiring or its own cord.** *Saw chains contacting a "live" wire may make exposed metal parts of the chain saw "live" and could give the operator an electric shock.*

d) **Wear eye protection. Further protective equipment for hearing, head, hands, legs and feet is recommended.** *Adequate protective equipment will reduce personal injury from flying debris or accidental contact with the saw chain.*

e) **Do not operate a chain saw in a tree, on a ladder, from a rooftop, or any unstable support.** *Operation of a chain saw in this manner could result in serious personal injury.*

f) **Always keep proper footing and operate the chain saw only when standing on fixed, secure and level surface.** *Slippery or unstable surfaces may cause a loss of balance or control of the chain saw.*

g) **When cutting a limb that is under tension, be alert for spring back.** *When the tension in the wood fibres is released, the spring loaded limb may strike the operator and/or throw the chain saw out of control.*

h) **Use extreme caution when cutting brush and saplings.** *The slender material may catch the saw chain and be whipped toward you or pull you off balance.*

i) **Carry the chain saw by the front handle with the chain saw switched off and away from your body. When transporting or storing the chain saw, always fit the guide bar cover**. *Proper handling of the chain saw will reduce the likelihood of accidental contact with the moving saw chain.*

j) **Follow instructions for lubricating, chain tensioning and changing the bar and chain.** *Improperly tensioned or lubricated chain may either break or increase the chance for kickback.*

k) **Cut wood only. Do not use chain saw for purposes not intended. For example: do not use chain saw for cutting metal, plastic, masonry or non-wood building materials.** *Use of the chain saw for operations different than intended could result in a hazardous situation.*

l) **Do not attempt to fell a tree until you have an understanding of the risks and how to avoid them.** *Serious injury could occur to the operator or bystanders while felling a tree.*

NOTE The above warning is omitted for **chain saws** that are not suitable for tree felling as specified by the manufacturer. See 8.14.2 b) 104).

m) **This chain saw is not intended for tree felling.** *Use of the chain saw for operations different than intended could result in serious injury to the operator or bystanders*.

NOTE The above warning is omitted for **chain saws** that are suitable for tree felling.

2) **Causes and operator prevention of kickback:**

Kickback may occur when the nose or tip of the guide bar touches an object, or when the wood closes in and pinches the saw chain in the cut.

Tip contact in some cases may cause a sudden reverse reaction, kicking the guide bar up and back towards the operator.

Pinching the saw chain along the top of the guide bar may push the guide bar rapidly back towards the operator.

Either of these reactions may cause you to lose control of the saw which could result in serious personal injury. Do not rely exclusively upon the safety devices built into your saw. As a chain saw user, you should take several steps to keep your cutting jobs free from accident or injury.

Kickback is the result of chain saw misuse and/or incorrect operating procedures or conditions and can be avoided by taking proper precautions as given below:

a) **Maintain a firm grip, with thumbs and fingers encircling the chain saw handles, with both hands on the saw and position your body and arm to allow you to resist kickback forces.** *Kickback forces can be controlled by the operator, if proper precautions are taken. Do not let go of the chain saw.*

NOTE Figure 103 may be used as an illustration in the instruction manual for holding the machine properly.

b) **Do not overreach and do not cut above shoulder height.** *This helps prevent unintended tip contact and enables better control of the chain saw in unexpected situations.*

c) **Only use replacement guide bars and saw chains specified by the manufacturer.** *Incorrect replacement guide bars and saw chains may cause chain breakage and/or kickback.*

d) **Follow the manufacturer's sharpening and maintenance instructions for the saw chain.** *Decreasing the depth gauge height can lead to increased kickback.*

8.14.2 a) *Addition:*

101) Explanation of **chain saw** safety devices;

102) Instructions for properly installing and adjusting the **guide bar** and **saw chain**;

103) Instruction for selection and use of protective equipment for eyes, ears, head, hands, legs and feet, as applicable.

8.14.2 b) *Addition:*

101) Recommendation for the use of a **residual current device** with a tripping current of 30 mA or less;

102) Statement to position the cord so that it will not be caught on branches and the like, during cutting;

103) Recommendation that the first-time user should, as a minimum, practise cutting logs on a saw-horse or cradle;

104) Information that the **chain saw** is not suitable for tree felling, if applicable;

105) Instructions to explain the proper techniques for basic felling, limbing, and cross-cutting. Examples for the required instructions are given in Clause BB.1 to BB.5. If the **chain saw** is not suitable for tree felling as specified by the manufacturer, then instructions for felling techniques may be omitted;

106) If applicable, instruction on the use of a manual lubrication control;

107) If applicable, instruction not to operate the **chain saw** without lubrication and to replenish it in due time before the container is empty;

108) Instruction to use only recommended lubricants;

109) Information on the **maximum speed** of the **saw chain**, or if the **maximum speed** of the **saw chain** is less than 20 m/s, this may be stated.

8.14.2 c) *Addition:*

101) Information on recommended **guide bar** and **saw chain** combination(s) that can be used and that maintains compliance with this standard;

102) Instructions on sharpening and maintenance of the **saw chain** and/or a recommendation to have sharpening and maintenance of the **saw chain** performed by authorised service centres.

8.14.3 *Replacement:*

If information about the mass or weight of the machine is provided, it shall be the mass of the machine without the **saw chain, guide bar**, **guide bar** cover, oil and optional **accessories**.

Compliance is checked by inspection.

9 Protection against access to live parts

This clause of Part 1 is applicable.

10 Starting

This clause of Part 1 is applicable.

11 Input and current

This clause of Part 1 is applicable.

12 Heating

This clause of Part 1 is applicable, except as follows:

12.2.1 *Replacement:*

The load conditions for the heating test of 12.2 are as follows:

The machine is operated with a torque load applied such that rated input or rated current is drawn. The machine is operated for 30 min. During this period, the torque load is adjusted as necessary to maintain rated input or rated current.

13 Resistance to heat and fire

This clause of Part 1 is applicable.

14 Moisture resistance

This clause of Part 1 is applicable, except as follows:

Addition:

NOTE 101 **Saw chain** lubrication tanks and lubrication systems intended for use with oil as specified in 8.14.2 are not considered to be **liquid systems**.

14.2.1 *Replacement:*

The machine is not connected to the supply.

The machine is placed in its normal rest position on a perforated turntable. The turntable is then turned continuously at approximately 1 rev/min during the test.

*Electrical components, covers and other **detachable parts** are removed and subjected, if necessary, to the relevant treatment with the main part. Movable covers that are non-**detachable parts** and are not self-restoring are placed in the most unfavourable position.*

NOTE Examples of self-restoring covers include those that are spring loaded or close by gravity.

14.3 This subclause of Part 1 is not applicable for **saw chain** lubrication tanks and lubrication systems intended for use with oil as specified in 8.14.2.

15 Resistance to rusting

This clause of Part 1 is applicable.

16 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

17 Endurance

This clause of Part 1 is applicable, except as follows:

17.2 *Modification:*

This subclause is applicable as for **hand-held tools**. The **saw chain** is removed for the endurance test.

18 Abnormal operation

This clause of Part 1 is applicable, except as follows:

18.3 *Replacement:*

*Machines incorporating a series motor are operated without the **saw chain** at a voltage equal to 1,3 times* **rated voltage** *for 1 min at no-load.*

During the test, parts shall not be ejected from the machine. After this test, the machine need not be capable of further use.

An additional device incorporated in the machine to limit the speed may operate during the test.

18.5 *Modification:*

The requirements for tools other than **lawn and garden machinery** are applicable.