

INTERNATIONAL STANDARD



**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 4-4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws**



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
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 corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

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 It also gives information on projects, replaced and withdrawn publications.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 once a month by email.

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: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Currently in preview, click for full version



IEC 62841-4-4

Edition 1.1 2024-10
CONSOLIDATED VERSION

INTERNATIONAL STANDARD



**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 4-4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.140.20

ISBN 978-2-8322-9919-7

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references.....	9
3 Terms and definitions.....	10
4 General requirements.....	18
5 General conditions for the tests.....	18
6 Radiation, toxicity and similar hazards.....	18
7 Classification.....	18
8 Marking and instructions.....	19
9 Protection against access to live parts.....	26
10 Starting.....	26
11 Input and current.....	26
12 Heating.....	27
13 Resistance to heat and fire.....	28
14 Moisture resistance.....	28
15 Resistance to rusting.....	29
16 Overload protection of transformers and associated circuits.....	29
17 Endurance.....	29
18 Abnormal operation.....	30
19 Mechanical hazards.....	32
20 Mechanical strength.....	46
21 Construction.....	54
22 Internal wiring.....	64
23 Components.....	64
24 Supply connection and external flexible cords.....	65
25 Terminals for external conductors.....	67
26 Provision for earthing.....	67
27 Screws and connections.....	67
28 Creepage distances, clearances and distances through insulation.....	67
Annexes.....	72
Annex I (informative) Measurement of noise and vibration emissions.....	72
Annex K (normative) Battery tools and battery packs.....	81
Annex L (normative) Battery tools and battery packs provided with mains connection or non-isolated sources.....	95
Annex AA (normative) Safety signs which may be used on machines.....	100
Annex BB (normative) Thrown objects test for grass trimmers, brush cutters and brush saws.....	111
Annex CC (normative) Impact test for brush cutter and brush saw cutting accessories and grass trimmer cutting means.....	115
Annex DD (informative) Example of a material and construction fulfilling the requirements for an artificial surface.....	116

Annex EE (informative) Summary of characteristics for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws 118
 Bibliography 120

Figure 101 – Example of a brush cutter 12
 Figure 102 – Example of a brush saw 13
 Figure 103 – Examples of grass trimmers 14
 Figure 104 – Example of a lawn edge trimmer 15
 Figure 105 – Example of a lawn trimmer 16
 Figure 106 – Example of a walk-behind trimmer 17
 Figure 107 – Minimum guard coverage, lawn trimmer (see 19.101.1) 34
 Figure 108 – Cross-sectional view of lawn edge trimmer cutting means guard 36
 Figure 109 – Shaft angle measurement 37
 Figure 110 – Lawn edge trimmer guarding when $\theta < 45^\circ$ 38
 Figure 111 – Lawn edge trimmer guarding when $\theta \geq 45^\circ$ 39
 Figure 112 – Measurement of handle gripping length 41
 Figure 113 – Measurement of distance between handles for grass trimmers, brush cutters and brush saws 42
 Figure 114 – Examples of brush cutters and brush saws with different handle and barrier configurations: Measurement of distance to cutting accessory 44
 Figure 115 – Impact test apparatus for handle insulation 49
 Figure 116 – Cutting means guard drop test 50
 Figure 117 – Cutting head strength test 51
 Figure 118 – Cutting accessory guard test 53
 Figure 122 – Application of steel rod when rotated around the handle 57
 Figure 123 – Application of steel rod when applied in the direction perpendicular to the handle axis 57
 Figure 119 – Example of an operator presence sensor 58
 Figure 120 – Lawn trimmer and lawn edge trimmer cutting means measurement 60
 Figure 121 – Test assembly for accessibility of attachment plug blades 66
 Figure I.101 – Microphone positions on the hemisphere (see Table I.101) 72
~~Figure I.102 – Examples of positions of transducers (hand-held machines) 72~~
 Figure I.103 – Examples of positions of transducers (walk-behind machines) 79
 Figure AA.1 – Optional safety sign illustrating – "Wear eye and ear protection" 100
 Figure AA.2 – Optional safety sign illustrating – "Wear eye and head protection" 100
 Figure AA.3 – Optional safety sign illustrating – "Wear eye, ear and head protection" 101
 Figure AA.4 – Safety signs illustrating – "Wear eye protection" 102
 Figure AA.5 – Safety sign illustrating – "Wear ear protection" 103
 Figure AA.6 – Safety sign illustrating – "Do not expose to rain" 103
 Figure AA.7 – Safety signs illustrating – "WARNING – Keep bystanders away" 104
~~Figure AA.8 – Safety signs illustrating – "WARNING – The distance between the machine and bystanders shall be at least 15 m (50 ft)" 105~~
 Figure AA.9 – Safety sign illustrating – "WARNING – Beware of thrown objects" 105
 Figure AA.10 – Safety sign illustrating – "Wear head protection where there is a risk of falling objects" 106

Figure AA.11 – Safety sign illustrating – "Wear hand protection".....	106
Figure AA.12 – Safety sign illustrating – "Wear slip-resistant footwear".....	106
Figure AA.13 – Safety signs illustrating – "WARNING – Beware of blade thrust".....	107
Figure AA.14 – Alternative safety signs illustrating – "WARNING – Beware of blade thrust".....	108
Figure AA.15 – Safety sign illustrating – "Do not use metal blades".....	108
Figure AA.16 – Safety sign illustrating – "WARNING – Remove plug from the mains immediately if the power cord or cable is damaged or cut".....	109
Figure AA.17 – Safety sign illustrating – "WARNING – Disconnect battery before maintenance".....	109
Figure AA.18 – Safety sign illustrating – "WARNING – Remove the disabling device before maintenance".....	109
Figure AA.19 – Safety sign illustrating – "WARNING – Operate the disabling device before maintenance".....	110
Figure BB.1 – Machine position on test stand.....	111
Figure BB.2 – Insertion positions of the test pieces.....	112
Figure BB.3 – Test piece.....	114
Figure CC.1 – Impact test.....	115
Figure DD.1 – Sketch of the measurement surface covered with an artificial surface (not to scale).....	117
Table 2 – Maximum outside surface temperature rises.....	28
Table 4 – Required performance levels.....	31
Table 7 – Switch trigger force.....	54
Table 9 – Pull and torque value.....	67
Table 301 – Pull and torque value.....	67
Table 12 – Minimum creepage distances and clearances.....	69
Table I.101 – Co-ordinates of microphone positions.....	74
Table I.102 – Absorption coefficients.....	75
Table 4 – Required performance levels.....	86
Table K.1 – Minimum creepage distances and clearances between parts of different potential.....	92
Table K.2 – Minimum total sum of creepage distances and clearances to accessible surfaces.....	94
Table 4 – Required performance levels.....	96
Table E.1.1 – Machine categories.....	118

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 4-4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush 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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62841-4-4 edition 1.1 contains the first edition (2020-11) [documents 116/468/FDIS and 116/479/RVD] and its amendment 1 (2024-10) [documents 116/806/FDIS and 116/829/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough

red text. A separate Final version with all changes accepted is available in this publication.

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

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

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

This Part 4-4 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for lawn trimmers, lawnmower trimmers, grass trimmers, brush cutters and brush saws.

Where a particular subclause of Part 1 is not mentioned in this Part 4-4, that subclause applies as far as reasonable. 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.

The terms defined in Clause 3 are printed in **bold typeface**.

Subclauses, notes, tables and figures which are additional to those in Part 1 as well as Annexes of 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 4-4 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 and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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 document 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.

INTRODUCTION

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning prevention of inadvertent starting given in Subclause 21.18.101.

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holders of these patent rights have assured the IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with IEC. Information may be obtained from:

Andreas Stihl AG & Co. KG
Stuttgarter Strasse 80
71332 Waiblingen, Germany

Husqvarna AB
SE-561 82 Huskvarna
Sweden

Robert Bosch GmbH
Postfach 30 02 20
D-70442 Stuttgart, Germany

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

ISO (www.iso.org/patents) and IEC (<http://patents.iec.ch>) maintain on-line data bases of patents relevant to their standards. Users are encouraged to consult the data bases for the most up to date information concerning patents.

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

Part 4-4: Particular requirements for lawn trimmers, lawn edge trimmers, grass trimmers, brush cutters and brush saws

1 Scope

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

Addition:

This document applies to hand-held and **walk-behind lawn trimmers** and **lawn edge trimmers**, used by a standing operator for cutting grass, weeds or similar soft vegetation, and **grass trimmers**, **brush cutters** and **brush saws** used by a standing operator for cutting grass, weeds, brush, bushes, saplings and similar vegetation.

This document does not apply to

- hand-held machines having a mass of 18 kg or greater;
- self-propelled **lawn trimmers** or **lawn edge trimmers**;
- scissors type **lawn trimmers** and **lawn edge trimmers**;
- machines equipped with metallic **cutting accessories** consisting of more than one piece, e.g. pivoting chains or flail blades;
- edgers with rigid and/or metallic cutting devices.

NOTE 101 Freely pivoting non-metallic **cutting elements** are considered not to be rigid cutting devices.

NOTE 102 Edgers with rigid or metal cutting devices will be covered by a future part of IEC 62841-4.

NOTE 103 Annex EE provides an informative summary of characteristics for **lawn trimmers**, **lawn edge trimmers**, **grass trimmers**, **brush cutters** and **brush saws**.

Brush cutters and **brush saws** covered by this document are designed only to be operated with the machine to the right of the operator.

2 Normative references

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

Replacement of undated normative reference for ISO 3744:

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*

Addition:

IEC 60664-3, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*