

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 4-3: Particular requirements for pedestrian controlled walk-behind lawnmowers**

**Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 4-3: Exigences particulières pour tondeuses à gazon à conducteur à pied**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2020 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.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
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 It also gives information on projects, replaced and withdrawn publications.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.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries 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

67 000 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.

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.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

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 une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques 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

67 000 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.

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety –
Part 4-3: Particular requirements for pedestrian controlled walk-behind lawnmowers**

**Outils électroportatifs à moteur, outils portables et machines pour jardins et pelouses – Sécurité –
Partie 4-3: Exigences particulières pour tondeuses à gazon à conducteur à pied**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 65.060.70

ISBN 978-2-8322-8896-2

**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

FOREWORD.....	5
1 Scope.....	7
2 Normative references	8
3 Terms and definitions	9
4 General requirements	11
5 General conditions for the tests	11
6 Radiation, toxicity and similar hazards.....	11
7 Classification.....	12
8 Marking and instructions.....	12
9 Protection against access to live parts.....	16
10 Starting	16
11 Input and current	16
12 Heating.....	16
13 Resistance to heat and fire.....	17
14 Moisture resistance	17
15 Resistance to rusting.....	18
16 Overload protection of transformers and associated circuits.....	18
17 Endurance.....	18
18 Abnormal operation	19
19 Mechanical hazards.....	20
20 Mechanical strength	39
21 Construction	41
22 Internal wiring.....	46
23 Components	46
24 Supply connection and external flexible cords	48
25 Terminals for external conductors.....	50
26 Provision for earthing	50
27 Screws and connections.....	50
28 Creepage distances, clearances and distances through insulation.....	50
Annexes	55
Annex I (informative) Measurement of noise and vibration emissions.....	55
Annex K (normative) Battery tools and battery packs	64
Annex L (normative) Battery tools and battery packs provided with mains connection or non-isolated sources.....	80
Annex AA (normative) Safety signs	86
Annex BB (normative) Test enclosure	92
Annex CC (normative) Rotary lawnmower foot protection test.....	101
Annex DD (normative) Lawnmower cutting means stopping time test.....	110
Annex EE (informative) Example of a material and construction for fulfilling the requirements for an artificial surface	112
Bibliography.....	114

Figure 101 – Operator control zones	24
Figure 102 – Handle distance and rear cutting means enclosure for rotary lawnmowers	27
Figure 103 – Example of design for rotary lawnmower front opening	28
Figure 104 – Examples of front opening allowance for rotary lawnmowers	29
Figure 105 – Obstruction test.....	35
Figure 106 – Guarding of cylinder lawnmower cutting means, general	37
Figure 107 – Guarding of cylinder lawnmower cutting means, side coverage	37
Figure 108 – Guarding of cylinder lawnmower cutting means, free and rear discharge	38
Figure 109 – Guarding of cylinder lawnmower cutting means, front discharge	38
Figure 110 – Cylinder lawnmower throw line and handle distance	39
Figure 111 – Impact test fixture for handle insulation	42
Figure 112 – Lawnmower cutting means measurement	46
Figure 113 – Test assembly for accessibility of attachment plug blades	49
Figure I.101 – Microphone positions on the hemisphere (see Table I.101)	56
Figure I.102 – Examples of positions of transducers for lawnmowers	62
Figure K.301 – Examples of separable battery pack connection points and direction of applied force	74
Figure AA.1 – Safety signs illustrating – "WARNING – Beware of thrown objects – keep bystanders away"	86
Figure AA.2 – Safety signs illustrating – "WARNING – Remove plug from mains before maintenance or if cord is damaged"	87
Figure AA.3 – Safety sign illustrating – "WARNING – Keep the supply cord away from the blades"	87
Figure AA.4 – Safety signs illustrating – "WARNING – Keep hands and feet away from the blades"	88
Figure AA.5 – Safety signs illustrating – "WARNING – Disconnect battery before maintenance"	89
Figure AA.6 – Safety signs illustrating – "WARNING – Remove the disabling device before maintenance"	90
Figure AA.7 – Safety signs illustrating – "WARNING – Activate the disabling device before maintenance"	91
Figure AA.8 – Safety sign illustrating – "DANGER – Keep hands and feet away"	91
Figure BB.1 – Test enclosure, construction detail	92
Figure BB.2 – Base detail	93
Figure BB.3 – Example of base, nail plan.....	93
Figure BB.4 – Test enclosure, general view	95
Figure BB.5 – Test enclosure, single spindle rotary lawnmower	96
Figure BB.6 – Test enclosure, multiple spindle rotary lawnmower	97
Figure BB.7 – Fixture for fibreboard penetration test.....	99
Figure CC.1 – Foot probe	102
Figure CC.2 – Areas to be probed for rotary lawnmowers	104
Figure CC.3 – Area to be probed for rotary lawnmowers with movable offset handles	105
Figure CC.4 – Area to be probed for air-cushion lawnmowers with single cutting means	106
Figure CC.5 – Area to be probed for air-cushion lawnmowers with multiple cutting means.....	107
Figure CC.6 – Area to be probed for rotary lawnmowers with single cutting means	108

Figure CC.7 – Area to be probed for rotary lawnmowers with multiple cutting means 109

Figure EE.1 – Sketch of the measurement surface covered with an artificial surface 113

Table 4 – Required performance levels 20

Table 101 – Cutting means stopping time 32

Table 102 – Permissible hits from thrown object test 34

Table 9 – Pull and torque value 50

Table 12 – Minimum creepage distances and clearances 52

Table I.101 – Co-ordinates of microphone positions 58

Table I.102 – Values of the constant a 59

Table I.103 – Absorption coefficients 59

Table 4 – Required performance levels 69

Table 301 – Pull and torque value 76

Table K.1 – Minimum creepage distances and clearances between parts of different potential 78

Table K.2 – Minimum total sum of creepage distances and clearances on accessible surfaces 79

Table 4 – Required performance levels 82

Currently in preview, click buy full version.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY –**Part 4-3: Particular requirements for pedestrian controlled walk-behind lawnmowers**

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 62841-4-3 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
116/467/FDIS	116/478/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 4-3 is to be used in conjunction with the first edition of IEC 62841-1:2014.

This Part 4-3 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for pedestrian controlled walk-behind lawnmowers.

Where a particular subclause of Part 1 is not mentioned in this Part 4-3, that subclause applies as far as reasonable. Where this document 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 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 4-3 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 publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date the publication 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 production 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.

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

Part 4-3: Particular requirements for pedestrian controlled walk-behind lawnmowers

1 Scope

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

Addition:

This document applies to the design of pedestrian controlled walk-behind

– **cylinder lawnmowers;**

and

– **rotary lawnmowers**

equipped with

– metallic **cutting means;** and/or

– rigid non-metallic **cutting means;** and/or

– non-metallic **cutting means** with one or more cutting elements pivotally mounted on a generally circular drive unit, where these cutting elements rely on centrifugal force to achieve cutting, and have a kinetic energy for each single cutting element of greater than 10 J.

NOTE 101 Machines that have non-metallic **cutting means** and a kinetic energy for each single cutting element of less than or equal to 10 J are considered to be lawn trimmers.

This document does not apply to

- robotic lawnmowers;
- remote-controlled lawnmowers;
- flail mowers or flail-type attachments;
- scissors type lawnmowers;
- grassland mowers;
- sickle bar mowers;
- towed/semi-mounted grass-cutting machines;
- scrub-clearing machines;
- lawn trimmers and lawn edge trimmers;
- lawn edgers;
- grass trimmers;
- brush cutters;
- brush saws;
- agricultural mowers;
- trailing seat/sulky units;
- ride-on machines;