UL 62841-3-7

STANDARD FOR SAFETY

Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws

UL Standard for Safety for Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws, UL 62841-3-7

First Edition, Dated February 18, 2021

Summary of Topics

Adoption Of The First Edition Of IEC 62841-3-7, Standard For Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws

This standard is an adoption of IEC 62841-3-7, Edition 1 published June 2020. There are no technical national differences for this standard.

The new requirements are substantially in accordance with Proposal(s) on this subject dated July 15, 2020.

No Text on This Page

CSA Group
CSA C22.2 No. 62841-3-7:21
First Edition
(IEC 62841-3-7:2020, MOD)

Underwriters Laboratories Inc.
UL 62841-3-7
First Edition

Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws

February 18, 2021

This national standard is based on publication IEC 62841-3-7, First Edition (2020).

Approved American National Standard
ANSI

ANSI/UL 62841-3-7-2021

NATIONAL STANDARD OF CANADA
STANDARDS COUNCIL OF CANADA
CONSEIL CANADIEN DES NORMES
NORME NATIONALE DU CANADA

Commitment for Amendments

This standard is issued jointly by the Canadian Standards Association (operating as "CSA Group") and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to CSA Group or UL at anytime. Revisions to this standard will be made only after processing according to the standards development procedures of CSA Group and UL. CSA Group and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

ISBN 978-1-4883-3505-1 © 2021 Canadian Standards Association

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup. org and include "Proposal for change" in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

To purchase CSA Group Standards and related publications, visit CSA Group's Online Store at www.csagroup.org/store/ or call toll-free 1-800-463-6727 or 416-747-4044.

This ANSI/UL Standard for Safety consists of the First Edition. The most recent designation of ANSI/UL 62841-3-7 as an American National Standard (ANSI) occurred on February 18, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

To purchase UL Standards, visit UL's Standards Sales Site at http://www. shopulstandards. com/HowToOrder.aspx or call toll-free 1-888-853-3503.

CONTENTS

Preface

This is the harmonized CSA Group and UL Standard for Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws. It is the First edition of CSA C22.2 No. 62841-3-7 and the First edition of UL 62841-3-7.

This harmonized standard is based on IEC Publication 62841-3-7: First edition, Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws, issued June 2020. IEC 62841-3-7 is copyrighted by the IEC.

This harmonized standard was prepared by CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of the International Harmonization Committee (IHC) for the adoption of the IEC series of standards for Hand-Held, Motor-Operated, and Transportable Tools and Lawn and Garden Machinery UL are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed by the CSA Subcommittee on Safety of Hand-Held Motor-Operated Electric Tools, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee. This standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.

CSA C22.2 No. 62841-3-7 is to be used in conjunction with the First edition of CAN/CSA-C22.2 No. 62841-1. The requirements for transportable wall saws are contained in this Part 3 Standard and CAN/CSA-C22.2 No. 62841-1. Requirements of this Part 3 Standard, where stated, amend the requirements of CAN/CSA-C22.2 No. 62841-1. Where a particular subclause of CAN/CSA-C22.2 No. 62841-1 is not mentioned in CSA C22.2 No. 62841-3-7, the CAN/CSA-C22.2 No. 62841-1 subclause applies.

UL 62841-3-7 is to be used in conjunction with the First edition of UL 62841-1. The requirements for transportable wall saws are contained in this Part 3 Standard and UL 62841-1. Requirements of this Part 3 Standard, where stated, amend the requirements of UL 62841-1. Where a particular subclause of UL 62841-1 is not mentioned in UL 62841-3-7, the UL 62841-1 subclause applies.

Level of harmonization

This standard adopts the IEC text with editorial national differences.

This standard is published as an equivalent standard for CSA Group and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those

recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the CSA Group and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

Reasons for Differences From IEC

National differences from the IEC are being added in order to address safety and regulatory situations present in the US and Canada.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

IEC Copyright

For CSA Group, the text, figures, and tables of International Electrotechnical Commission Publication 62841-3-7, Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws, copyright 2020, are used in this standard with the consent of the International Electrotechnical Commission. The IEC Foreword is not a part of the requirements of this standard but is included for information purposes only.

NATIONAL DIFFERENCES

National Differences from the text of International Electrotechnical Commission (IEC) Publication 62841-3-7, Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery – Safety – Part 3-7: Particular Requirements for Transportable Wall Saws, copyright 2020, are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are National Differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

No Text on This Page

FOREWORD

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY – Part 3-7: Particular requirements for transportable wall saws

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 62841-3-7 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
116/455/FDIS	116/461/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 3-7 is to be used in conjunction with IEC 62841-1:2014.

This Part 3-7 supplements or modifies the corresponding clauses in IEC 62841-1, so as to convert it into the IEC Standard: Particular requirements for transportable wall saws.

Where a particular subclause of Part 1 is not mentioned in this Part 3-7, 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.

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

Subclauses, notes and figures which are additional to those in Part 1 are numbered starting from 101.

A list of all parts of the IEC 62841 series, under the general title *Electric motor-operated handheld 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.

101DV DE *Modification: Add the following to the IEC Foreword:*

The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

102DV DE *Modification: Add the following to the IEC Foreword:*

For this Standard, all references to "Part 1" refer to CAN/CSA-C22.2 No. 62841-1 and UL 62841-1.

ELECTRIC MOTOR-OPERATED HAND-HELD TOOLS, TRANSPORTABLE TOOLS AND LAWN AND GARDEN MACHINERY – SAFETY – Part 3-7: Particular requirements for transportable wall saws

1 Scope

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

Replacement of the third paragraph:

The **rated voltage** is not more than 250 V for single-phase a.c. or d.c. tools, and 480 V for three-phase a.c. tools.

Addition:

This document applies to transportable **wall saws** guided by a **track guiding system** intended for dry cutting or to be connected to a **liquid system** for cutting concrete, stone or similar material by means of a **diamond wheel**. The rated speed of the **diamond wheel** does not exceed a peripheral speed of 100 m/s at **rated capacity**.

This document does not apply to transportable **wall saws** that are intended to be left unattended while performing an operation.

This document does not apply to transportable **wall saws** that employ hydraulic systems.

This document does not apply to hand-held cut-off machines.

NOTE 101 Hand-held cut-off machines will be covered by a future part of IEC 62841-2.

2 Normative references

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

Replacement of normative reference 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*

Replacement of normative reference ISO 11201:

ISO 11201:2010, *Acoustics – Noise emitted by machinery and equipment – Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections*.

Addition:

IEC 61008-1:2010, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – Part 1: General rules*
IEC 61008-1:2010/AMD1:2012
IEC 61008-1:2010/AMD2:2013

IEC 62841-1:2014, *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety – Part 1: General requirements*

ISO 6603-1, *Plastics – Determination of puncture impact behaviour of rigid plastics – Part 1: Non-instrumented impact testing*

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

• IEC Electropedia: available at http://www.electropedia.org/

• ISO Online browsing platform: available at http://www.iso.org/obp

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

3.36 *Addition:*

NOTE 101 to entry: The primary function of a **wall saw** is the operation of the **diamond wheel**.

3.58 *Modification:*
Item g) is not applicable.

3.101
diamond wheel
metal wheel with a continuous or segmented abrasive rim

3.102
flange
collar, disc, or plate between or against which **diamond wheels** are mounted

3.103
rated capacity
maximum intended diameter of the **diamond wheel** to be fitted on the tool as recommended by the manufacturer's instructions

3.104
remote connection
active communication between the tool and **remote control**, either wired or wireless

3.105
remote control
unit with an enclosure separate from the **wall saw** with user controls consisting of at least a **power switch** for attended operation of the **wall saw**

Note 1 to entry: Controlling a **wall saw** with a **remote control** provides improved ergonomics for the operator.

3.106
saw unit
unit on which the **diamond wheel**, the **wheel guard** and the interface to connect it to the **track guiding system** are mounted

3.107
track guiding system
device for guiding the **saw unit** during the cutting operation and which is mounted to the workpiece

3.108
wall saw
tool designed to saw or groove concrete, stone or similar material, consisting of a **saw unit** and a **track guiding system**, which are combined for **normal operation** by a suitable interface and operated with or without a **remote control**

Note 101 to entry: See Figure 101 and Figure 102.

3.109
wheel guard
device which partly encloses the **diamond wheel** and gives protection to the operator

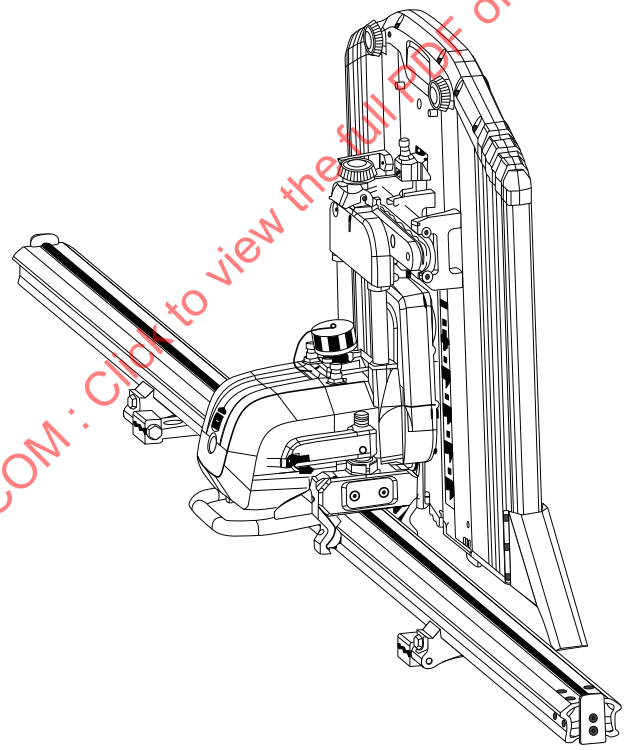

Figure 101

Wall saw

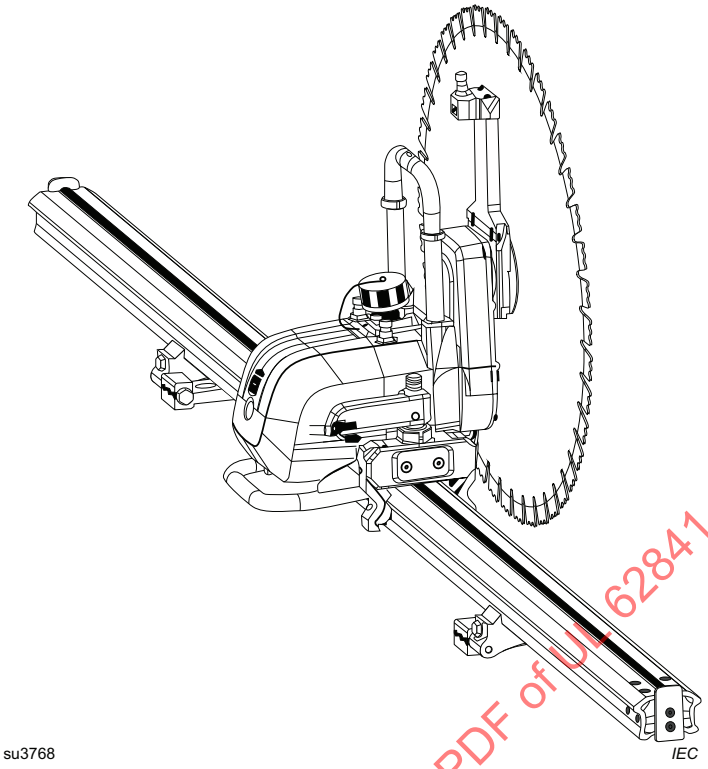

Figure 102

Wall saw with wheel guard removed

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:

5.17 *Addition:*

*The mass of the tool does not include the **track guiding system**, but does include the **wheel guard** and the auxiliary handle, if provided.*

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:

8.1 *Addition:*

– recommended speed for each **diamond wheel** diameter specified in 8.14.2 a) 101);

– **rated capacity**.

8.2 *Addition:*

Wall saws shall also be marked with:

– "⚠ **WARNING** Always wear eye protection" or the symbol ISO 7010-M004-2019-07 or the safety sign in Figure 103:

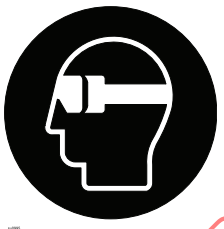

Figure 103

Safety sign illustrating – "WARNING – Always wear eye protection"

The safety sign in Figure 103 may be modified by adding other personal protective equipment, such as ear protection or a dust mask.

8.3 *Replacement of the sixth dash:*

– ">25 kg" on each separable enclosure with a mass above 25 kg.

NOTE 101 Examples of separable enclosures include the **saw unit**, **diamond wheel**, **wheel guard** and power converting or control unit(s), if any.

Addition:

The direction of rotation of the spindle shall be indicated on the tool by an arrow, raised or recessed or by any other means no less visible and indelible.

8.14.1 *Addition:*

The additional safety instructions as specified in 8.14.1.101 shall be given. This information may be printed separately from the "General Power Tool Safety Warnings".

8.14.1.101 **Safety instructions for wall saws**

a) **Operate the power tool by insulated grasping surfaces when performing an operation where the cutting accessory can contact hidden wiring or its own cord.** *A cutting accessory contacting a "live" wire can make exposed metal parts of the power tool "live" and could give the operator an electric shock.*

b) **Wear ear protectors when diamond sawing.** *Exposure to noise can cause hearing loss.*

c) **If the diamond wheel becomes jammed, stop applying feed force and turn off the tool. Investigate and take corrective actions to eliminate the cause of the diamond wheel jamming.** *Continued operation with a jammed diamond wheel could cause loss of control or damage to the wall saw.*

d) **When sawing through the workpiece, ensure to protect persons and the work area on the other side.** *The diamond wheel may protrude through the workpiece.*

e) **Ensure that the method of securing the track guiding system to the workpiece is capable of holding and restraining the machine during use.** *If the workpiece is weak or porous, the anchor(s) can pull out, causing the track guiding system to release from the workpiece.*

8.14.2 a) *Addition:*

101) Information about which **diamond wheels** (type, arbor size, diameter and thickness) can be used with the tool, including the recommended tool speed for each **diamond wheel** diameter;

102) Information on the types of material that may be cut;

103) Instructions on how to mount the **track guiding system** to the workpiece;

104) Instructions on how to assemble the guarding system, dust extraction system or **liquid system**, and the **saw unit** to the **track guiding system**;

8.14.2 b) *Addition:*

101) Instructions on how to use **wheel guards**, such as removing portions of the **wheel guard** for special cutting operations (e.g. flush cutting);

102) Instructions on how to connect a **remote control**;

103) Information about the specific **flanges** to be used with all **diamond wheels** in accordance with 8.14.2 a) 101). Instruction on the mounting of **diamond wheels** and the use of the correct **flanges**;

104) Instructions on how to perform an initial guide cut.

8.14.2 c) *Addition:*

101) Instruction on storage and handling of **diamond wheels**.

Replacement of the NOTE:

NOTE In Europe (EN 62841-3-7), the following additional requirements apply:

Emissions

1) The noise emission, measured in accordance with I.2, as follows:

– A-weighted sound pressure level L_{pA} and its uncertainty K_{pA}, where L_{pA} exceeds 70 dB(A). Where L_{pA} does not exceed 70 dB(A), this fact shall be indicated;

– A-weighted sound power level L_{WA} and its uncertainty K_{WA}, where the A-weighted sound pressure level L_{pA} exceeds 80 dB(A);

– peak C-weighted instantaneous sound pressure value L_{pCpeak}, where this exceeds 63 Pa (130 dB in relation to 20 µPa).

2) Recommendation for the operator to wear hearing protection.

3) The following information:

– that the declared noise emission value(s) have been measured in accordance with a standard test method and may be used for comparing one tool with another;

– that the declared noise emission value(s) may also be used in a preliminary assessment of exposure.

4) A warning:

– that the noise emissions during actual use of the power tool can differ by up to 10 dB compared to the declared values, depending on the **diamond wheel** and working conditions, which should be taken into account when selecting hearing protection; and

– of the need to identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).

8.14.3 *Replacement:*

If information about the mass or weight of the tool is provided, it shall either be the mass specified in 5.17, or it shall be clear which part of the tool the mass refers to.

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.

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:

14.2.1 *Replacement:*

The tool is not connected to the supply.

Tools are turned continuously at approximately 1 r/min through the most unfavourable positions during the test.

The test is performed with any ***remote control*** *connected in accordance with 8.14.2 b) 102).*

Electrical components, covers and other parts, except for cover(s) or cap(s)as specified below, that can be removed without the aid of a tool are removed and subjected, if necessary, to the relevant treatment with the main part.

If cover(s) or cap(s) are used that

– are detachable without the aid of a tool; and

– provide protection for a connection to a ***remote control****;*

the test is repeated with the cover(s) or cap(s) installed as intended to cover the connection(s), provided that the cap(s) or cover(s) remain attached to the ***wall saw*** *when they are removed.*

14.3 *Replacement:*

Liquid systems or spillage of liquid shall not subject the user to an increased risk of electrical shock.

If the tool is rated at least IPX4 in accordance with 14.2, this requirement is deemed to be fulfilled.

Compliance is checked by the following test:

The ***residual current device****, if any, shall be disabled during the test. Electrical components, covers and other parts which can be removed without the aid of a tool are removed, except those fulfilling the test of 21.22.*

The tool is prepared with approximately 1,0 % NaCl solution in the following modes if applicable:

– as described in 8.14.2;

– the liquid container of the tool is completely filled, and a further quantity, equal to 15 % of the capacity of the container, or 0,25 l, whichever is the greater, is poured in steadily over a period of 60 $^{+0}_{-10}$ *s, while the tool is resting in its filling position in accordance with 8.14.2 d);*

– a detachable liquid container is filled completely and mounted and dismounted 10 times on the tool.

In each applicable preparation, the tool is operated at ***rated voltage*** *in each position consistent with the instructions in accordance with 8.14.2 b) for 1 min while monitoring the leakage current as in Clause C.3.*

*For 3-phase **wall saws** with a **rated input** exceeding 3 700 W, during the test the leakage current shall not exceed:*

– 5 mA for a, b and c in Figure C.2 in the closed position;

– 10 mA for the test repeated with each of the switches a, b, c in Figure C.2 open in turn, the other two switches being closed.

*For all other **wall saws**, during the test the leakage current shall not exceed:*

*– 2 mA for a **class II tool**;*

*– 5 mA for a **class I tool**.*

*Following this test, the tool shall meet the electric strength test of D.2 between **live parts** and **accessible parts** after being allowed to dry for 24 h at ambient temperature.*

14.4 *Replacement:*

Liquid systems shall not subject the user to an increased risk of electrical shock by components not capable of withstanding the pressure during operation.

Compliance is checked by the following test.

*The **residual current device**, if any, shall be disabled during the test.*

*The **liquid system** is closed and an approximately 1,0 % NaCl solution at a hydrostatic pressure equal to twice the pressure stated in 8.14.2 d) 1) is applied for 1 h.*

The tool is then placed for 1 min, in all positions consistent with the instructions in accordance with 8.14.2 b) while monitoring the leakage current as in Clause C.2.

*For 3-phase **wall saws** with a **rated input** exceeding 3 700 W, during the test the leakage current shall not exceed:*

– 5 mA for a, b and c in Figure C.2 in the closed position;

– 10 mA for the test repeated with each of the switches a, b, c in Figure C.2 open in turn, the other two switches being closed.

*For all other **wall saws**, during the test the leakage current shall not exceed:*

*– 2 mA for a **class II tool**;*

*– 5 mA for a **class I tool**.*

*Following this test, the tool shall meet the electric strength test of Clause D.2 between **live parts** and **accessible parts** after being allowed to dry for 24 h at ambient temperature.*

14.5 *Replacement:*

Residual current devices used to provide protection from shock in the case of failure of the **liquid system** shall comply with

– IEC 61540:1999; or

– alternatively for 3-phase tools, IEC 61008-1:2010

and shall meet the following requirements a) to c):

a) The **RCD** shall disconnect all mains conductors, but not the earth conductor if provided, when the leakage exceeds

– 10 mA and with a maximum response of 300 ms; or

– alternatively for 3-phase tools, 30 mA with a maximum response time of 300 ms.

NOTE 1 For 3-phase tools, the values are based on specified levels in IEC 61008-1.

Compliance is checked by inspection and by the test of

– 9.9.2 of IEC 61540:1999 for single phase tools; or

– alternatively 9.9.2 in IEC 61008-1:2010 for 3-phase tools.

In addition, during the test, the earthing conductor shall not become disconnected.

b) The **RCD** shall be reliable for its intended use.

Compliance is checked at rated voltage by operating the residual current device under conditions of simulated leakage as in a) above during conditions of locked rotor of the tool for 50 cycles. The residual current device shall operate correctly for all cycles.

c) The **RCD** shall be installed such that it is unlikely to be removed during use or normal maintenance.

This requirement is considered fulfilled if the **residual current device** is fixed to the tool or the power **supply cord** connected to the tool.

Where fitted in the **supply cord**, the **residual current device** shall be provided with **type Y attachment** or **type Z attachment** for connection with the **supply cord** and **interconnection cord**.

Compliance is checked by inspection.

NOTE 2 In Canada, the following conditions apply:

Replacement of the first paragraph:

Residual current devices used to provide protection from shock in the case of failure of the **liquid system** shall comply with

– IEC 61540:1999; or

– alternatively for 3-phase tools, IEC 61008-1:2010 up to 440 V; or

– alternatively for 3-phase tools, CSA C22.2 No. 144 above 440 V;

and shall meet the following requirements a) to c).

NOTE 3 In the United States of America, the following conditions apply:

Replacement of the first paragraph:

Residual current devices used to provide protection from shock in the case of failure of the liquid system shall comply with

– IEC 61540:1999; or

– alternatively for 3-phase tools, IEC 61008-1:2010 up to 440 V; or

– alternatively for 3-phase tools, UL 1053 above 440 V;

and shall meet the following requirements a) to c).

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 *Replacement of the fourth paragraph:*

***Wall saws** are operated for 12 h at a voltage equal to 1,1 times **rated voltage** or the upper limit of the **rated voltage range**, and then for 12 h at a voltage equal to 0,9 times **rated voltage** or the lower limit of the **rated voltage range**. It is not required that the 12 h of operation be continuous. During the test, the tool is placed in three different positions, the operating time, at each test voltage, being approximately 4 h for each position.*

NOTE 101 The change of position is made to prevent abnormal accumulation of carbon dust in any particular place. Examples of the three positions are cutting horizontally, vertically up and vertically down on a vertical wall.

18 Abnormal operation

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

18.8 *Replacement of Table 4 by the following:*

Table 4
Required performance levels

Type and purpose of SCF	Minimum performance level (PL)
Power switch – prevent unwanted switch-on (including **power switches** located on a **remote control**)	Shall be evaluated using the fault conditions of 18.6.1 without the loss of this **SCF**
Power switch – provide desired switch-off (including **power switches** located on a **remote control**)	c
Provide desired direction of rotation when the **diamond wheel** is prevented from loosening under reverse rotation	Not an **SCF**
Provide desired direction of rotation when the **diamond wheel** is not prevented from loosening under reverse rotation	c
Any electronic control to pass the test of 18.3	a
Prevent exceeding thermal limits as in Clause 18	a
Any electronic control to pass the test of 19.103	Not an **SCF**
Any electronic control to limit the force as in 19.104	b
Restart prevention according to 21.18.2.1	c
Prevent starting of any motor drive without a **remote connection** to a **remote control** and stop operation of any motor drive after loss of a **remote connection** to a **remote control** during operation, as in 21.102	c
Prevent self-resetting as required in 23.3, except for circuits that switch off the tool owing to a loss of a **remote connection** on a **remote control**	a
Prevent self-resetting after re-establishing a **remote connection** on a **remote control**, as required in 23.3	c

19 Mechanical hazards

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

19.1 *Replacement of the first paragraph:*

Moving and dangerous parts other than the rotating **diamond wheel** shall be so arranged or enclosed that adequate protection against injury is provided. The guarding of the rotating **diamond wheel** is covered in 19.101.

19.6 This subclause of Part 1 is not applicable.

19.8 This subclause is applicable for wall saws, if provided with:

– wheels; or

– a cart with wheels.

19.101 Diamond wheel guards

Tools shall be provided with a **wheel guard** to protect the user during **normal use** against:

– accidental contact with the cutting section of the **diamond wheel**;

– ejection of debris of the material cut;

– broken segments of the **diamond wheel**;

– liquid used for the cutting operation (if applicable).

The **wheel guard** may be removable without the aid of a tool to facilitate changing the **diamond wheel** or transportation, provided that the locking means for the **wheel guard** remains attached on the **wheel guard** or the **saw unit**.

NOTE 101 In **normal use**, the **wheel guards** of a **wall saw** are always disassembled for transport, during change of working position and for changing the **diamond wheel**. The **wheel guard** is then reassembled for operation each time. In addition, it is typical that the **wheel guard** needs to be disassembled and reassembled several times in order to perform a deep cut.

The **wheel guard**, except as specified below for special cutting operations, shall cover at least 175° of

– the periphery and the motor side;

– the side where the nut and locking flange are located for at least the outer 30 mm of the radius of the smallest **diamond wheel** which may be used with the **wheel guard** in accordance with 8.14.2 a) 101) to cover the cutting section of the **diamond wheel**.

In order to perform special cutting operations (e.g. flush cutting) in accordance with 8.14.2 b) 101),

– a section of the **wheel guard** may be removable or adjustable without the aid of a tool, provided the remaining **wheel guard** coverage is not less than 90°, or a separate **wheel guard** complying with this requirement may be supplied with the tool;

– a side of the **wheel guard** may be removable without the aid of a tool to allow a flush cut close to an adjacent surface, provided the **wheel guard** coverage on the motor side is not impaired, or a separate **wheel guard** complying with this requirement may be supplied with the tool.

Compliance is checked by inspection and by measurement.

19.102 The tool shall be designed to prevent the **diamond wheel** coming loose under **normal use**.

The spindle and **flanges** shall be designed so that they secure and locate the **diamond wheel** to the **wall saw**. At least one of the **flanges** shall be keyed, screwed, shrunk on or otherwise secured to prevent rotation relative to the tool spindle.

Either the direction of the spindle threads shall be such that any clamping device or **diamond wheel** with a threaded hole tends to tighten during cutting, or the **flange** shall have positive locking to the spindle.

Flanges shall have flat clamping surfaces and no sharp edges.

Compliance is checked by inspection.

19.103 **Flanges** shall be designed in such a manner as to achieve an equivalent level of clamping strength to ensure that the **diamond wheel** will not slip during operation.

Compliance is checked by inspection and, if applicable, by the following test.

*If applicable, the tool is adjusted to its setting that results in the maximum stalling torque. The tool is fitted with any diameter **diamond wheel** in accordance with 8.14.2 a) 101), which is compatible with the setting that results in the maximum stalling torque. The **diamond wheel** and **flanges** are mounted in accordance*

*with 8.14.2 b) 103). The tool is then operated at no load. The tool shall come to full speed and then stopped by a stalling device that stops the **diamond wheel** rotation within 1 s. During the test, the **diamond wheel** shall not slip in the **flange** by more than 10°.*

NOTE 101 An example of a method for monitoring **diamond wheel** slippage is the use of a high-speed camera.

19.104 The **track guiding system** shall be provided with end stops to prevent travel of the saw unit beyond the intended travel when subjected to the maximum feeding force.

Compliance is checked by the following test.

*For manually fed **saw units**, the handle of the crank or feed mechanism is subjected to a force of (200 ± 10) N for 1 min.*

*For motor-fed **saw units**, the end stops are subjected to twice the maximum force for 1 min that would be generated from the motor. The force is applied to the end stops as in **normal use**. During this test, limit switches or other means of limiting the travel of the **saw unit** are bypassed. However, **electronic circuits** that limit the applied force are acceptable if they are assessed as providing an **SCF**.*

*The **saw unit** shall not move beyond the end stops.*

20 Mechanical strength

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

20.5 *Replacement:*

Wall saw handles and grasping surfaces, as specified in the instruction manual in accordance with 8.14.2 b) 6), but excluding handles used only for transportation purposes in accordance with 8.14.2 b) 8), shall have adequate mechanical strength in order to provide insulation between the grasping area and the output shaft.

Compliance is checked by the following test.

A separate sample, at the discretion of the manufacturer, is to be subjected to a single impact on each handle and grasping surface in accordance with 20.3.2, followed by an electric strength test in accordance with Clause D.2 using 1 250 V a.c. between the handles and grasping surfaces in contact with foil and the output shaft of the tool.

20.101 The **wheel guard**, as required by 19.101, shall have sufficient mechanical strength to withstand the impact of broken diamond segments.

Except for plastic material other than polycarbonate, the material properties and the minimum thickness of the peripheral part and side part of the **wheel guard** shall be as specified in Table 101.

Table 101
Material properties and minimum thickness of the wheel guard

Material of wheel guard	Ultimate tensile strength N/mm^2	Minimum fracture elongation	Minimum thickness	
			mm	
			Peripheral part	Side part (relevant outer 30 mm per 19.101)
Metal	≥ 380	–	1,25	0,75
Metal	≥ 350 and < 380	–	1,50	1,00
Metal	≥ 200 and < 350	–	2,00	1,50
Metal	≥ 160 and < 200	–	2,50	1,75
Polycarbonate	60	80 %	3,00	2,00

For materials as specified in Table 101, compliance is checked by inspection, by measurement and by either receipt of confirmation of material properties from the material manufacturer or through measurement of samples of the material.

For plastic materials other than polycarbonate, compliance is checked by the following test.

*The periphery of the **wheel guard** is subjected to the puncture resistance test of ISO 6603-1, using 75 % of the maximum kinetic energy of the largest segment of the largest **diamond wheel** that may be used for the **wheel guard** in accordance with 8.14.2 b) 101). The impact apparatus shall not puncture the material.*

NOTE 101 The factor of 75 % is based on braking energy due to the non-perpendicular impact angle.

21 Construction

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

21.15 *Replacement:*

Tools employing **liquid systems** shall be either:

– of **class III construction**; or

– a **class I tool** and provided with a **residual current device** and comply with 14.3, 14.4 and 14.5; or

– a **class I tool** and designed for use in combination with an isolating transformer and comply with 14.3 and 14.4; or

– a **class I tool** that fulfils the requirements of at least IP X3 in accordance with IEC 60529:2013 when it is operating and fulfils the requirements of at least IP X5 in accordance with IEC 60529:2013 when it is not operating. The enclosure shall not be required to be opened during operation or **user maintenance** in accordance with 8.14.2.

Compliance is checked by inspection.

21.18.2.1 *Addition:*

After voltage recovery, following an interruption of the supply, the tool shall not automatically restart.

21.30 This subclause of Part 1 is not applicable.

21.35 This subclause is applicable only for **wall saws** intended for dry cutting.

21.101 Parts of **wall saws** with a **liquid system** that are not protected against the harmful ingress of water in accordance with IEC 60529:2013 with a degree of at least IP X5 shall not be made from polycarbonate or other plastic material with poor resistance to mineral oil or similar hydrocarbons.

NOTE 101 It is common practice to coat **wall saw** surfaces with mineral oil that are exposed to masonry slurry in order to assist with cleaning.

Compliance is checked by inspection and by either receipt of confirmation of material properties from the material manufacturer or through testing of samples of the material.

21.102 If a **remote control** is provided, it may either control the **wall saw** through a wireless connection or by a cable connection.

If a **remote control** can be used with either a wireless connection or a cable connection, only one method and source for controlling the **wall saw** shall be active at one time.

Controls on the **wall saw**, if any, shall override commands from the **remote control**.

A wireless **remote control** shall be paired or have an encrypted signal unique to the tool it is to be used with.

The tool shall not start operation of any motor drive unless a **remote connection** is established between the **wall saw** and the **remote control**.

A **remote connection** shall be able to detect loss of communication between the tool and the **remote control**. When communication is lost for more than 2 s, the tool shall stop operation of all motor drives.

Compliance is checked by inspection.

21.103 While putting the tool into use or during transportation of the tool, moveable parts of the tool that present a risk of shearing, crushing or cutting due to unexpected movement shall be either lockable or removable.

Compliance is checked by inspection.

21.104 If a **wall saw** includes separate power converting or control unit(s), it shall comply with all of the relevant requirements of this document.

If a **wall saw** includes separate power converting or control unit(s), or is provided with a remote control, these devices shall comply with all of the relevant requirements of this standard for

– **hand-held tools**, if the device is hand-held during operation; or

– **transportable tools**, if the device is ground supported.

If a cable connection between the remote control and the **wall saw** is provided, it shall meet the requirements for **interconnection cords**.

Compliance is checked by inspection and by relevant tests.

21.105 Tools equipped with motor-fed **saw units** shall be fitted with an additional control(s), separate from the **power switch**, for

– selecting the direction of travel for the **saw unit** feed motor; and

– turning the **saw unit** feed motor off and on.

The actuating member of this control(s) shall be easily visible and accessible.

Actuation of the **power switch** shall not result in actuation of a **saw unit** feed motor.

Compliance is checked by inspection.

22 Internal wiring

This clause of Part 1 is applicable.

23 Components

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

23.3 *Replacement of the first paragraph:*

Protection devices or circuits that switch off the tool, except for circuits that switch off the tool as described below owing to a loss of a **remote connection** on a **remote control**, shall be of the non-self-resetting type unless the tool is equipped with a **momentary power switch** with no provision for being locked in the "on" position.

For tools provided with a **remote control**, the circuit that switches off the tool after loss of a **remote connection**, as specified in 21.102, shall be of the non-self-resetting type. The resetting action shall be required to take place after the **remote connection** is re-established.

24 Supply connection and external flexible cords

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

24.4 *Replacement:*

Supply cords shall be not lighter than heavy polychloroprene sheathed flexible cable (code designation 60245 IEC 66) or equivalent.

NOTE 1 In Europe (EN 62841-3-7), the following conditions apply:

Supply cords shall be not lighter than heavy polychloroprene or PUR sheathed flexible cord (code designation 60245 IEC 66, H07RN-F or H07BQ-F) or equivalent.

NOTE 2 In the United States of America, the following conditions apply:

Supply cords shall be oil-, weather- and water-resistant hard service cords in accordance with the National Electrical Code, NFPA 70, such as SOOW or STOOW,

The rating of the attachment plugs and **supply cords** shall be equal to or greater than that of the tool.

NOTE 3 In Canada, the following conditions apply:

Supply cords shall be oil-, weather- and water-resistant extra-hard usage cords in accordance with the Canadian Electrical Code, Part 1, such as SOOW or STOOW.

The rating of the attachment plugs and **supply cords** shall be equal to or greater than that of the tool.

Compliance is checked by inspection and by measurement.

24.5 *Replacement of Table 8:*

Table 8
Minimum cross-sectional area and AWG sizes of supply cords

Rated current of the tool A	Nominal cross-sectional area mm^2	AWG size [a]
Up to and including 6	0,75	18
Over 6 up to and including 10	1	
Over 10 up to and including 12	1,5	17
Over 12 up to and including 13		16
Over 13 up to and including 16		14
Over 16 up to and including 18	2,5	
Over 18 up to and including 25		12
Over 25 up to and including 32	4	10
Over 32 up to and including 40	6	8
Over 40 up to and including 63	10	4
[a] AWG stands for American Wire Gauge as defined in ASTM B 258-02		

24.21 *Addition:*

This subclause is not applicable for compliance with 14.2 for **interconnection cords** used for connections to **remote controls** as specified in 14.2.1.

25 Terminals for external conductors

This clause of Part 1 is applicable.

26 Provision for earthing

This clause of Part 1 is applicable.

27 Screws and connections

This clause of Part 1 is applicable.

28 Creepage distances, clearances and distances through insulation

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

28.1 *Replacement of the first paragraph:*

Creepage distances and **clearances** shall not be less than the values in millimetres shown in Table 12. The values specified in the table do not apply to cross-over points of motor windings. For **working voltages** greater than 480 V, the requirements of IEC 60664-1 are applicable.