

UL 60745-2-5

Hand-Held Motor-Operated Electric Tools – Safety – Part 2-5: Particular Requirements for Circular Saws

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UL Standard for Safety for Hand-Held Motor-Operated Electric Tools – Safety – Part 2-5: Particular Requirements for Circular Saws, UL 60745-2-5

Fourth Edition, Dated July 31, 2007

Summary of Topics

Adoption of the Fourth Edition of IEC 60745-2-5, Hand-Held Motor-Operated Electrical Tools – Safety – Part 2-5: Particular Requirements for Circular Saws, as the Fourth Edition of UL 60745-2-5, includes the following changes: a) Modification of Clause 8.1 to delete text regarding the danger, warning, and caution statements and the exception regarding circular saws; b) Modification of Clause 8.12.101.1(a) to add the term DANGER to item (a) and add a warning symbol; c) Clarification of lower guard operation when making special cuts; d) Addition of Clause 19.3 to specify that Clause 19.3 of the part 1 does not apply; d) Modification of Clause 19.101.2.1 to clarify measurement points for proximity and height restrictions for a viewing aperture; e) Modification of Clause 19.101.2.3 to specify criteria for measuring the distance between the guide plate and upper guard to determine compliance with the requirement; f) Addition to Annex K to eliminate reference to power cords for the instruction manual; g) Addition of Annex M to specify requirements for supports, work stands, or table saws for use with hand-held motor operated circular saws; h) Modification of Clause AA.19.104 to clarify that the test performed on the riving knife to determine the level of displacement is to be performed in both directions.

Future Effective Dates	References
June 1, 2010	Entire Standard

The requirements are substantially in accordance with UL's Proposal(s) on this subject dated January 19, 2007 and March 30, 2007.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ul.com/ulforeword.html>

The master for this Standard at UL's Northbrook Office is the official document insofar as it relates to a UL service and the compliance of a product with respect to the requirements for that product and service, or if there are questions regarding the accuracy of this Standard.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the preface. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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Page	Date
1-56	July 31, 2007

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Underwriters Laboratories Inc.
UL 60745-2-5
Fourth Edition

Hand-Held Motor-Operated Electric Tools – Safety – Part 2-5: Particular Requirements for Circular Saws

July 31, 2007

This national standard is based on publication IEC 60745-2-5, Fourth Edition (2006).



ANSI/UL 60745-2-5-2007

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

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The most recent designation of ANSI/UL 60745-2-5 as an American National Standard (ANSI) occurred on July 31, 2007. The ANSI approval for this standard does not include the Cover Page, Transmittal Pages, or the Title Page.

This ANSI/UL Standard for Safety, which consists of the fourth edition, is under continuous maintenance, whereby each revision is ANSI approved upon publication.

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Preface

This is the common CSA and UL standard for Hand-Held Motor-Operated Electric Tools – Safety – Part 2-5: Particular Requirements for Circular Saws. It is the third edition of CAN/CSA-C22.2 No. 60745-2-5 and the fourth edition of UL 60745-2-5. This standard is based on IEC 60745-2-5, fourth edition.

This standard (CAN/CSA-C22.2 No. 60745-2-5, third edition and UL 60745-2-5, fourth edition) supersedes the second edition of CAN/CSA-C22.2 No. 60745-2-5 and the third edition of UL 60745-2-5, published in 2004.

This common standard was prepared by the Canadian Standards Association (CSA) and Underwriters Laboratories Inc. (UL).

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 approved as a National Standard of Canada by the Standards Council of Canada (SCC).

This standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

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

Level of harmonization

This standard adopts the IEC text with national differences. This standard is published as an equivalent standard for CSA 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 and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

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 literal interpretation 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.

CSA effective date

The effective date for CSA International will be announced through CSA Informs or a CSA certification notice.

UL effective date

As of June 1, 2010, all products Listed or Recognized by UL must comply with the requirements in this Standard.

Between July 31, 2007 and June 1, 2010, new product submittals to UL must be evaluated under all requirements in this Standard or, if requested in writing, evaluated under presently effective requirements only.

The presently effective requirements are contained in the third edition of UL 60745-2-5.

A UL effective date is one established by Underwriters Laboratories Inc. and is not part of the ANSI approved standard.

General

The text, figures and tables of IEC 60745-2-5 are used in this standard with the consent of the International Electrotechnical Commission.

The IEC Foreword and Introduction are not a part of the requirements of this standard but are included for information purposes only.

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NATIONAL DIFFERENCES

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.

In the CSA and UL publications of this standard, National Differences from the text of International Electrotechnical Commission (IEC) Publication 60745-2-5, Safety Requirements for Hand-Held Motor-Operated Electrical Tools – Safety – Part 2-5: Particular Requirements for Circular Saws, copyright 2006 are indicated by notations (differences) and are presented in bold text. The national difference type is included in the body.

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 based on **safety practices**. These are differences for IEC requirements that may be acceptable, but adopting the IEC requirements would require considerable retesting or redesign on the manufacturer's part.

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**.

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

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HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY – Part 2-5: Particular requirements for circular 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 nongovernmental 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.

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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.

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International Standard IEC 60745-2-5 has been prepared by subcommittee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electrical appliances.

This fourth edition cancels and replaces the third edition published in 2003, of which it constitutes a technical revision. Main changes include: Clause 19: Mechanical hazards, clarifications in respect to the guarding, editorial modifications in Annex AA, the addition of Annex M, Safety of working stands for operation with hand-held motor-operated electric tools and editorial modifications to match with the fourth edition of IEC 60745-1.

The text of this standard is based on the following documents:

FDIS	Report on voting
61F/643/FDIS	61F/644/RVD

Full information on the voting for the approval of this 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 2-5 is to be used in conjunction with the latest edition of IEC 60745-1, *Hand-held motor-operated electric tools – Safety – Part 1: General requirements*, and its amendments. It was established on the basis of the fourth edition (2006) of that standard.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to IEC 60745-1.

This part 2 supplements or modifies the corresponding clauses of IEC 60745-1, so as to convert that publication into the IEC standard: Safety for circular saws.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- additional annexes are lettered AA, BB, etc.

NOTE 3 In this standard, the following print types are used:

- requirements: in roman type;
- test specifications: in italic type;
- notes: in smaller roman type.

A list of all parts of IEC 60745 series, under the general title *Hand-held motor-operated electric tools – Safety*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site 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.

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HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY – Part 2-5: particular requirements for CIRCULAR SAWS

1 Scope

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

1.1 Addition:

This standard applies to all types of circular saws. Circular saws hereinafter will be referred to as saws. This standard does not have particular requirements for saws used with abrasive wheels.

2 Normative references

This clause of part 1 is applicable.

3 Terms and Definitions

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

Additional definitions:

3.101 circular saw: tool intended for cutting various materials with a rotating toothed blade

3.102 cutting edge zone: the outer 20% of the blade's radius

3.103 guide plate: the part of the saw resting on the material to be cut (see Figure 113)

3.104 lower guard: movable blade-covering device which, in the closed or rest position is generally situated below the guide plate

3.105 upper guard: fixed and/or movable cover of the blade situated above the guide plate

3.106 riving knife: metal part placed in the plane of the saw blade with the intent of preventing the workpiece from closing on the rear part of the saw blade

3.107 saw with outer pendulum guard: saw having a lower guard which swings outside the upper guard (see Figure 101)

3.108 saw with inner pendulum guard: saw having a lower guard which swings inside the upper guard (see Figure 102)

3.109 saw with tow guard: saw having a lower guard which slides along the upper guard (see Figure 103)

3.110 kickback: sudden reaction to a pinched, bound or misaligned saw blade, causing an uncontrolled saw to lift up and out of the workpiece

3.111 plunge type saw: saw having only an upper guard into which the saw blade retracts when not in use (see Figure 104)

4 General requirements

This clause of part 1 is applicable.

5 General conditions for the tests

This clause of part 1 is applicable.

6 Void

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:

Saws shall be marked with:

- direction of rotation, indicated on the tool by an arrow, raised or recessed or by any other means no less visible and indelible;
- rated no-load speed of the output spindle;
- recommended blade diameter.

8.12.2

a) Addition:

101) Instructions not to use any abrasive wheels

102) For saws with riving knife the instruction shall include the following:

Instructions to ensure that the riving knife is adjusted so that the distance between the riving knife and the rim of the blade is not more than 5 mm, and the rim of the blade does not extend more than 5 mm beyond the lowest edge of the riving knife.

b) Addition:

101) Instructions for the blade changing procedure

8.12.1.101 The following additional safety instructions shall be given. If in English they shall be verbatim and in the following order as applicable and equivalent in any other language. This part may be printed separately from the General Safety Instructions.

All notes are not to be printed, they are information for the designer of the manual.

8.12.1.101.1 Safety instructions for all saws

a) **⚠ DANGER: Keep hands away from cutting area and the blade. Keep your second hand on auxiliary handle, or motor housing. If both hands are holding the saw, they cannot be cut by the blade.**

NOTE: For circular saws with 140 mm or smaller diameter blades, the "Keep your second hand on auxiliary handle, or motor housing" may be omitted.

b) **Do not reach underneath the workpiece.** *The guard cannot protect you from the blade below the workpiece.*

c) **Adjust the cutting depth to the thickness of the workpiece.** *Less than a full tooth of the blade teeth should be visible below the workpiece.*

d) **Never hold piece being cut in your hands or across your leg. Secure the workpiece to a stable platform.** *It is important to support the work properly to minimize body exposure, blade binding, or loss of control.*

e) **Hold power tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord.** *Contact with a "live" wire will also make exposed metal parts of the power tool "live" and shock the operator.*

f) **When ripping always use a rip fence or straight edge guide.** *This improves the accuracy of cut and reduces the chance of blade binding.*

g) **Always use blades with correct size and shape (diamond versus round) of arbour holes.** *Blades that do not match the mounting hardware of the saw will run eccentrically, causing loss of control.*

h) **Never use damaged or incorrect blade washers or bolt.** *The blade washers and bolt were specially designed for your saw, for optimum performance and safety of operation.*

8.12.1.101.2 Further safety instructions for all saws

Causes and Operator Prevention of Kickback:

- Kickback is a sudden reaction to a pinched, bound or misaligned saw blade, causing an uncontrolled saw to lift up and out of the workpiece toward the operator;
- When the blade is pinched or bound tightly by the kerf closing down, the blade stalls and the motor reaction drives the unit rapidly back toward the operator;
- If the blade becomes twisted or misaligned in the cut, the teeth at the back edge of the blade can dig into the top surface of the wood causing the blade to climb out of the kerf and jump back toward the operator.

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

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