



UL 60745-2-4

STANDARD FOR SAFETY

Hand-Held Motor-Operated Electric Tools – Safety
– Part 2-4: Particular Requirements for Sanders
and Polishers Other Than Disk Type

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UL Standard for Safety for Hand-Held Motor-Operated Electric Tools – Safety – Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type, UL 60745-2-4

Second Edition, Dated March 26, 2004

Summary of Topics

The revisions dated November 7, 2018 are being issued to reaffirm approval of UL 60745-2-4 as an American National Standard. No changes in requirements are involved.

As noted in the Commitment for Amendments statement located on the back side of the title page, UL and CSA are committed to updating this harmonized standard jointly. However, the revision pages dated November 7, 2018 will not be jointly issued by UL and CSA as these revision pages address UL ANSI approval dates only.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The requirements are substantially in accordance with Proposal(s) on this subject dated September 7, 2018.

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Second Edition
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Underwriters Laboratories Inc.
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Hand-Held Motor-Operated Electric Tools – Safety – Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type

March 26, 2004

(Title Page Reprinted November 7, 2018)

This national standard is based on publication IEC 60745-2-4, Second Edition (2003).

This amendment is an adoption of IEC Amendment 1(2008) to publication IEC 60745-2-4, Second Edition (2005).



ANSI/UL 60745-2-4-2009 (R2018)



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.

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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. The technical content of the IEC and ISO publications is kept under constant review by IEC and ISO. To submit a proposal for change, please send the following information to inquires@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.

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This ANSI/UL Standard for Safety consists of the Second Edition including revisions through November 7, 2018. The most recent designation of ANSI/UL 60745-2-4 as a Reaffirmed American National Standard (ANS) occurred on November 7, 2018. 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.

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CONTENTS

Preface	5
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FOREWORD	10
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1 Scope	13
2 Normative references	13
3 Terms and Definitions	13
4 General requirements	13
5 General conditions for the tests	13
6 Void	14
7 Classification	14
8 Marking and instructions	14
9 Protection against access to live parts	14
10 Starting	14
11 Input and current	14
12 Heating	14
13 Leakage current	14
14 Moisture resistance	14
15 Electric strength	14
16 Overload protection of transformers and associated circuits	15
17 Endurance	15
18 Abnormal operation	15
19 Mechanical hazards	15
20 Mechanical strength	15
21 Construction	15
22 Internal wiring	15
23 Components	15
24 Supply connection and external flexible cords	16
25 Terminals for external conductors	16
26 Provision for earthing	16
27 Screws and connections	16
28 Creepage distances, clearances and distances through insulation	16
29 Resistance to heat, fire and tracking	16
30 Resistance to rusting	16
31 Radiation, toxicity and similar hazards	16

Annexes

Annex K – (normative) – Battery Tool and Battery Packs

Annex L – (normative) – Battery Tools and Battery Packs Provided with Mains Connection or Non-Isolated Sources

Bibliography

No Text on This Page

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Preface

This is the common CSA and UL standard for hand-held motor-operated electric tools. It is the second edition of CAN/CSA-C22.2 No. 60745-2-4 and the second edition of UL 60745-2-4. This standard is based on IEC 60745-2-4, second edition.

The first edition of this standard was designated CAN/CSA-C22.2 No. 745-2-4/UL 745-2-4. This Standard CAN/CSA-C22.2 No. 60745-2-4/UL 60745-2-4, second edition, supersedes:

- a) the first edition CAN/CSA-C22.2 No. 745-2-4/UL 745-2-4 published in 1995; and
- b) CAN/CSA-C22.2 No. 745-4-4/UL 745-4-4, (requirements for battery tools and battery packs are now incorporated into the requirements of CAN/CSA-C22.2 No. 60745-2-4, second edition, and UL 60745-2-4, second edition).

The standard number has been aligned to correspond with the equivalent IEC 60745-2-4 standard.

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

This standard was reviewed by the CSA Subcommittee on Portable 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 and has been approved by the American National Standards Institute (ANSI) as an American National Standard.

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.

A UL standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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

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.

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.

General

The previous version of CAN CSA C22.2 No. 60745-2-4-04/UL 60745-2-4 included a national difference to IEC Clause 8.12.1. The national difference was deleted in this version of CAN CSA C22.2 No. 60745-2-4-04/UL 60745-2-4.

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.

National Differences from the text of the International Electrotechnical Commission (IEC) publication 60745-2-4 (Hand-Held Motor-Operated Electric Tools – Safety – Part 2-4: Particular Requirements for Sanders and Polishers Other Than Disk Type) are indicated by the following notation:

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**.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY – PART 2-4: PARTICULAR REQUIREMENTS FOR SANDERS AND POLISHERS OTHER THAN DISK TYPE

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.

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 a

5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.

6) All users should ensure that they have the latest edition of this publication.

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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.

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 60745-2-4 has been prepared by sub-committee 61F: Safety of hand-held motor-operated electric tools, of IEC technical committee 61: Safety of household and similar electrical appliances.

Main changes include Clause 3: Definitions, introducing detailed definitions for the tools in the scope of this part 2, and Clause 17: Endurance, with clearer specifications. Subclause 20.101 has been removed, as requirements for tools with water supply are now covered by Part 1.

This consolidated version of IEC 60745-2-4 consists of the second edition (2002) [documents 61F/462/FDIS and 61F/486/RVD] and its amendment 1 (2008) [documents 61F/733/FDIS and 61F/753/RVD].

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

The French version of this standard has not been voted upon.

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

This Part 2-4 is to be used in conjunction with the third edition of IEC 60745-1: Safety of hand-held motor-operated electric tools – Part 1: General requirements. When this standard states “addition”, “modification” or replacement”, the relevant text in Part 1 is to be adapted accordingly.

With amendment 1, this Part 2 is established on the basis of the fourth edition (2006) of IEC 60745-1, Hand-held motor-operated electric tools – Safety – Part 1: General requirements.

Main changes include editorial modifications to match with the fourth edition of IEC 60745-1, addition of a new safety warning to Clause 8: Marking and instructions, and clarifications in Annex K.

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

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

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

IEC 60745 consists of the following parts, under the general title *Hand-held motor-operated electric tools – Safety*:

Part 1: General requirements

Part 2-1: Particular requirements for drills and impact drills

Part 2-2: Particular requirements for screwdrivers and impact wrenches

Part 2-3: Particular requirements for grinders, polishers and disk-type sanders

Part 2-4: Particular requirements for sanders and polishers other than disk type

Part 2-5: Particular requirements for circular saws and circular knives

Part 2-6: Particular requirements for hammers

Part 2-7: Particular requirements for spray guns for non-flammable liquids

Part 2-8: Particular requirements for shears and nibblers

Part 2-9: Particular requirements for tappers

Part 2-11: Particular requirements for reciprocating saws (jig and sabre saws)

Part 2-12: Particular requirements for concrete vibrators

Part 2-13: Particular requirements for chain saws

Part 2-14: Particular requirements for planers

Part 2-15: Particular requirements for hedge trimmers and grass shears

Part 2-16: Particular requirements for tackers

Part 2-17: Particular requirements for routers and trimmers

Part 2-18: Particular requirements for strapping tools

Part 2-19: Particular requirements for jointers

Part 2-20: Particular requirements for band saws

Part 2-21: Particular requirements for drain cleaners

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

HAND-HELD MOTOR-OPERATED ELECTRIC TOOLS – SAFETY –

PART 2-4: PARTICULAR REQUIREMENTS FOR SANDERS AND

POLISHERS OTHER THAN DISK TYPE

1 Scope

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

Addition:

1.1 This standard applies to sanders and polishers with the exception of all types of disc-type tools, which are covered by IEC 60745-2-3.

Tools covered by this standard include but are not limited to belt sanders, reciprocating sanders or polishers, orbital sanders or polishers, and random orbit sanders or polishers.

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 sander: tool intended to remove surface material using an abrasive medium

3.102 polisher: tool equipped with a disk or pad intended for polishing

3.103 belt sander: sander equipped with an endless abrasive belt

3.104 orbital sander or polisher (oscillating sander or polisher): sander or polisher equipped with a plate, which performs an orbital oscillating motion parallel to the work surface

3.105 random orbit sander or polisher: sander or polisher equipped with a plate positioned eccentrically on the driving spindle which can rotate freely around its axis parallel to the work surface

3.106 reciprocating sander or polisher: sander or polisher equipped with a plate which performs a reciprocating motion parallel to the work surface

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

For belt sanders, the direction of rotation of the belt shall be indicated on the tool by an arrow, raised or sunk, or by any other means no less visible and indelible.

8.12.1.1 Addition:

- **Hold power tool by insulated gripping surfaces, because the belt may contact its own cord.** *Cutting a "live" wire may make exposed metal parts of the tool "live" and could give the operator an electric shock.*

NOTE The above safety warning applies only to belt sanders and may be omitted for other types of sanders.

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 Leakage current

This clause of part 1 is applicable.

14 Moisture resistance

This clause of part 1 is applicable.

15 Electric strength

This clause of part 1 is applicable.