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February 20, 1997

Revision pages for

Standard for

Particular Requirements for Battery-Operated Drills

UL 745-4-1, First Edition

Attached to this distribution notice is a reprinted title page for the First edition of UL 745-4-1.

As indicated on the title page (page 1 and 2), 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 text of this ANSI/UL Standard.

Revised and/or additional pages may be issued from time to time.

With the inclusion of the accompanying material, the standard consists of pages dated as shown in the following checklist:

Page	Date
1, 2	March 23, 1995 (Reprinted: February 20, 1997)
3, 4	March 23, 1995
5, 6	February 20, 1997
7 - 16	March 23, 1995

Canadian Standards Association
CAN/CSA-C22.2 No. 745-4-1
First Edition



Underwriters Laboratories Inc.
UL 745-4-1
First Edition



Particular Requirements for Battery-Operated Drills

March 23, 1995

(Title Page Reprinted: February 20, 1997)

Approved
by
Standards Council
of Canada



 *American National Standard*
ANSI/UL 745-4-1-1996

Commitment for Amendments

This Standard is issued jointly by Canadian Standards Association and Underwriters Laboratories Incorporated. Amendments to this Standard will be made only after processing according to the Standards writing procedures by both Canadian Standards Association and Underwriters Laboratories Incorporated.

Approval as an American National Standard (ANSI) covers the numbered paragraphs on pages dated March 23, 1995. These pages should not be discarded when revised or additional pages are issued if it is desired to retain the ANSI approved text.

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Preface

This is the common CSA and UL Standard for portable battery-operated drills. It is the first edition of CSA Standard C22.2 No. 745-4-1 *Safety of portable battery-operated tools Part 4: Particular requirements for drills* and UL 745-4-1 *Safety of portable battery-operated tools Part 4: Particular requirements for drills*. It is written in SI (metric) units.

This Standard was prepared by Canadian Standards Association and Underwriters Laboratories Inc. This common CSA and UL Standard is based on IEC Publication 745-2-1 (1989) *Part 2: Particular requirements for drills*.

Where a particular clause of the general requirements Standard is not mentioned in this Standard, the clause applies as far as is reasonable. Where this edition states *addition*, *modification*, or *replacement*, the relevant requirement, test specification, or explanatory matter in the general requirements Standard should be adapted accordingly.

If the functions of a tool are covered by different particular Standards, the relevant particular requirements Standard is applied to each function separately, so far as is reasonable. If applicable, the influence of one function on the other is taken into account.

This Standard was reviewed by the CSA Subcommittee on Portable Electric Tools of the Technical Committee on Consumer and Commercial Products under the jurisdiction of the Standards Steering Committee on the Canadian Electrical Code, Part II, and was formally approved by these Committees.

This Standard was processed and reviewed in accordance with the method of development, revision and implementation of UL Standards for safety.

This Standard has been approved by the Standards Council of Canada as a National Standard of Canada and has been approved by the American National Standards Institute (ANSI) as an American National Standard.

March 23, 1995

UL Effective Date

As of June 1, 2007, all products Listed or Recognized by UL must comply with the requirements in this Standard.

Between June 1, 2002 and June 1, 2007, new product submittals to UL must be evaluated under all requirements in this standard.

Between March 23, 1995 and June 1, 2002, new product submittals to UL may 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 seventh edition of UL 45.

CSA Effective Date

The effective date for CSA will be announced through a *CSA Certification Notice*.

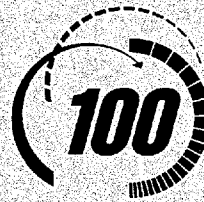
Note: *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

Standard for Safety

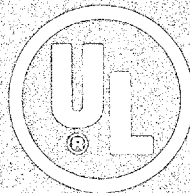
UL 745-4-1

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Particular Requirements for Battery-Operated Drills



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UL Standards for Safety are developed under a procedure which provides for participation and comment from the affected public as well as industry. The procedure takes into consideration a survey of known existing standards and the needs and opinions of a wide variety of interests concerned with the subject matter of the standard. Thus manufacturers, consumers, individuals associated with consumer-oriented organizations, academicians, government officials, industrial and commercial users, inspection authorities, insurance interests and others provide input to UL in the formulating of UL Standards for Safety, to keep them consonant with social and technological advances.

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March 23, 1995

Standard for

Particular Requirements for Battery-Operated Drills

UL 745-4-1, First Edition

Accompanying this transmittal notice is a copy of the First edition of UL 745-4-1.

THIS EDITION OF THE STANDARD BECOMES EFFECTIVE JUNE 1, 2002 FOR NEW PRODUCT SUBMITTALS AND JUNE 1, 2007 FOR ALL PRODUCTS LISTED OR RECOGNIZED BY UL.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this standard unless the applicant specifically requests that the product be judged under the current requirements. However, should the applicant elect this option, it should be noted that compliance with all the requirements in this standard will be required as a condition of continued Listing, Recognition, and Follow-Up Services after the effective date and understanding of this should be signified in writing.

The requirements in this standard are substantially in accordance with UL's bulletin on this subject dated July 25, 1994. This bulletin is now obsolete and may be discarded.

Revised and/or additional pages may be issued from time to time.

Canadian Standards Association
CAN/CSA-C22.2 No. 745-4-1
First Edition



Underwriters Laboratories Inc.
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If the functions of a tool are covered by different particular Standards, the relevant particular requirements Standard is applied to each function separately, so far as is reasonable. If applicable, the influence of one function on the other is taken into account.

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This Standard will be submitted to the Standards Council of Canada for publication as a National Standard of Canada and to the American National Standards Institute (ANSI) for publication as an American National Standard.

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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.*

Foreword (CSA)

Certification organizations, as accredited by the Standards Council of Canada, have their own criteria procedures for certification services. The following paragraphs define CSA Certification policies.

The Canadian Standards Association provides certification services for manufacturers who, under license from CSA, wish to use the appropriate registered CSA Marks on certain products of their manufacture to indicate conformity with CSA Standards.

CSA Certification for a number of products is provided in the interest of maintaining agreed-upon standards of quality, performance, interchangeability and/or safety, as appropriate. Where applicable, certification may form the basis for acceptance by inspection authorities responsible for enforcement of regulations. Where feasible, programs will be developed for additional products for which certification is desired by producers, consumers or other interests.

In performing its functions in accordance with its objectives, CSA does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of the Association represent its professional judgement given with due consideration to the necessity limitations of practical operation and state of the art at the time the Standard is processed.

Products in substantial accord with this Standard but which exhibit a minor difference or a new feature may be deemed to meet the Standard providing the feature or difference is found acceptable utilizing appropriate CSA Certification Division Operating Procedures. Products which comply with this Standard shall not be certified if they are found to have additional features which are inconsistent with the intent of this Standard. Products shall not be certifiable if they are discovered to contravene applicable Federal laws or regulations.

Testing techniques, test procedures and instrumentation frequently must be prescribed by the CSA Certification Division in addition to the technical requirements contained in Standards of CSA. In addition to markings specified in the Standard the CSA Certification and Testing Division may require special cautions, markings and instructions that are not specified by the Standard.

Some tests required by CSA Standards may be inherently hazardous. The Association neither assumes nor accepts any responsibility for any injury or damage that may occur during or as the result of tests, wherever performed, whether performed in whole or in part by the manufacturer or the Association, and whether or not any equipment, facility or personnel for in connection with the test is furnished by the manufacturer or the Association.

Manufacturers should note that, in the event of the failure of the CSA Certification and Testing Division to resolve an issue arising from the interpretation of requirements, there is an appeal procedure: the complainant should submit the matter, in writing, to the Secretary of the Canadian Standards Association.

If this Standard is to be used in obtaining CSA Certification please remember, when making application for certification, to request all current Amendments, Bulletins, Notices and Technical Information Letters that may be applicable and for which there may be a nominal charge. For such information or for further information concerning details about CSA Certification please address your inquiry to the Applications and Records Section, Canadian Standards Association, 178 Rexdale Boulevard, Rexdale (Toronto), Ontario M9W 1R3.

Foreword (UL)

- A. This Standard contains basic requirements for products covered by Underwriters Laboratories Inc. (UL) under its Follow-Up Service for this category within the limitations given below and in the Scope section of this Standard. These requirements are based upon sound engineering principles, research, records of tests and field experience, and an appreciation of the problems of manufacture, installation, and use derived from consultation with and information obtained from manufacturers, users, inspection authorities, and others having specialized experience. They are subject to revision as further experience and investigation may show is necessary or desirable.
- B. The observance of the requirements of this Standard by a manufacturer is one of the conditions of the continued coverage of the manufacturer's product.
- C. A product which complies with the text of this Standard will not necessarily be judged to comply with the Standard if, when examined and tested, it is found to have other features which impair the level of safety contemplated by these requirements.
- D. A product employing materials or having forms of construction differing from those detailed in the requirements of this Standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be judged to comply with the Standard.
- E. UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of UL represent its professional judgment given with due consideration to the necessary limitations of practical operation and state of the art at the time the Standard is processed. UL shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. UL shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of or reliance upon this Standard.
- F. Many tests required by the Standards of UL are inherently hazardous and adequate safeguards for personnel and property shall be employed in conducting such tests.

1. Scope

This clause of Part 3 is applicable, except as follows:

1.1 *Modification:*

The term "tools" is replaced with "drills and impact drills."

2. Definitions

This clause of Part 3 is applicable, except as follows:

Additional definitions:

2.2.101 Drill denotes a tool specifically designed to make holes in various materials such as metal, plastics, wood, etc.

It is designed to rotate, normally in a clockwise direction, at one or more speeds.

2.2.102 **Impact drill** denotes a drill specially designed to make holes in concrete, stone and other similar materials. It is similar, in appearance and construction, to a drill, but has a built-in percussion system which gives an axial percussion movement to the rotating output spindle.

It may have a device for rendering the percussion system inoperative, so that it may be used as a conventional drill.

The impact energy is influenced by the force applied by the operator.

An impact drill is normally designed to rotate, in a clockwise direction, at one or more speeds.

3. General requirement

This clause of Part 3 is applicable.

4. General notes on tests

This clause of Part 3 is applicable, except as follows:

4.7 *Replacement:*

For drills which have both a mechanical means of setting different ranges of speed and an electronic means of setting the speed within a given range, the mechanical device is adjusted to the lowest range possible, and the electronic device is adjusted to the highest setting within the given range.

5. Rating

This clause of Part 3 is applicable.

6. Reserved

7. Marking

This clause of Part 3 is applicable, except as follows:

7.1 Addition:

In addition, drills shall be marked with:

- maximum diameter, in millimeters, of the borer for drilling steel having a tensile strength of 390 N/mm², unless otherwise specified.

8. Protection against electric shock

This clause of Part 3 is applicable.

9. Reserved

10. Reserved

11. Heating

This clause of Part 3 is applicable.

12. Reserved

13. Reserved

14. Reserved

15. Electric strength

This clause of Part 3 is applicable.

16. Reserved

17. Abnormal operation

This clause of Part 3 is applicable.

18. Mechanical hazards

This clause of Part 3 is applicable.

18.1 Addition:

Chuck keys shall be so designed that they drop easily out of position when released; they shall not be fixed to the tool by means of a chain, string, or similar means.

Compliance is checked by inspection and by a manual test.

The key is inserted into the chuck, and without tightening, the drill is turned so that the key is facing down. The key must fall out.

19. Mechanical strength

This clause of Part 3 is applicable.

20. Construction

This clause of Part 3 is applicable, except as follows:

Additional sub-clause:

20.101 Drills which are marked for use with drill-borers having a diameter exceeding 16 mm for drilling steel or which are fitted with a chuck marked for use with such drill-borers, shall have side handles or shall have provision for fixing a side handle, in addition to the normal handle.

Compliance is checked by inspection.

20.18.101 A switch lock-on device on drills or hammer drills shall be located outside the grasping area or so designed that it is not likely to be unintentionally locked on by the user's hand during intended left or right-handed operation.

Compliance is checked by inspection or by a manual test.

A switch with a lock-on button located in a recess within the grasping area shall not be actuated by a straight-edge utensil when the utensil is made to pass back and forth across the device in any direction.

The straight-edge utensil is to be of any convenient length sufficient to bridge the surface of the lock-on device and any surface adjacent to the lock-on device.

21. Internal wiring

This clause of Part 3 is applicable.

22. Components

This clause of Part 3 is applicable, except as follows.

22.3 Addition:

This sub-clause does not apply if the drill is equipped with a momentary switch with no provision for being locked in the on position.

23. Supply connection and external flexible cables and cords

This clause of Part 3 is applicable.

24. Reserved

25. Reserved

26. Reserved

27. Clearances

This clause of Part 3 is applicable.

28. Resistance to heat, fire and tracking

This clause of Part 3 is applicable.

29. Resistance to rusting

This clause of Part 3 is applicable.

30. Reserved**31. Instructions**

This clause of Part 3 is applicable, except as follows:

Additional Specific Safety Rule:

31.3.101 Hold tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring. Contact with a "live" wire will also make exposed metal parts of the tool "live" and shock the operator.

Appendix A - Thermal cut-outs and overload releases

This appendix of Part 3 is applicable.

Appendix B - Reserved

This appendix of Part 3 is applicable.

Appendix C - Reserved

This appendix of Part 3 is applicable.

Appendix D - Reserved

This appendix of Part 3 is applicable.

Appendix E - Reference standards

This appendix of Part 3 is applicable.

Appendix F - Attachments and accessories

This appendix of Part 3 is applicable.

Appendix G - Sequence of tests

This appendix of Part 3 is applicable.

Appendix H - Translations

Advisory Note: In Canada there are two official languages; therefore it is necessary to have CAUTION, WARNING, and DANGER markings in both English and French on those products to be sold or used in Canada. Following is a list of acceptable French translations of the markings specified in this Standard.

This appendix of Part 1 is applicable except as follows:

H1 Translations

Following is a list of acceptable French translations of the instructions specified in this Standard.

H1.2 Instructions

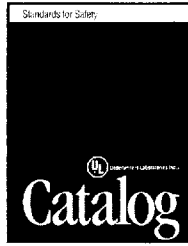
31. Instructions

L'article correspondant du chapitre 3 s'applique, sauf pour ce qui suit :

Règle de sécurité particulière supplémentaire :

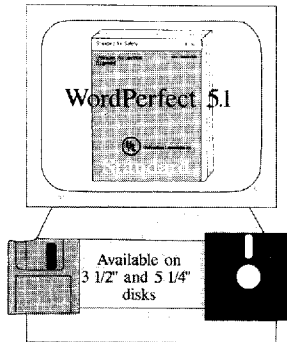
31.3.101 Tenez l'outil par ses surfaces de prise isolées pendant toute opération où l'outil de coupe pourrait venir en contact avec un câblage dissimulé. En cas de contact avec un conducteur sous tension, les pièces métalliques à découvert de l'outil transmettraient un choc électrique à l'utilisateur.

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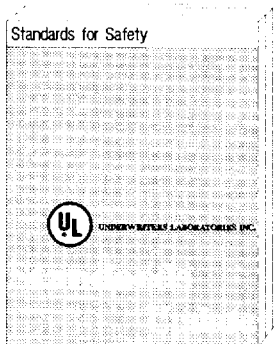
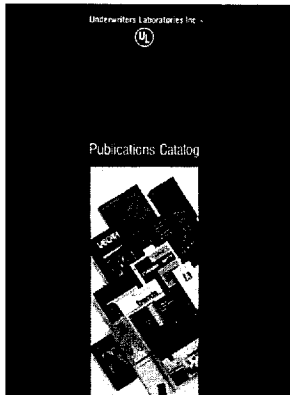


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Publications Catalog

The variety of publications and product services described in this catalog may surprise some people who only think of UL as a symbol on the back of a television or electric coffee maker. Gas appliances, roofing materials, industrial trucks, boats, burglar alarms, computers, lightning protection components, fire extinguishers — these are just a handful of the thousands of products that fall within the scope of UL's testing for public safety. Brochures for international services, consumer information and films, product directories, and inspection guides are among the 70-plus publications described in the catalog.



Standards Update

Published quarterly, the UL Standards Update contains the latest information on UL's Standards for Safety, proposed standards, outlines of investigation, and Standards-on-Diskette. The Update also includes information on revisions, bulletins, UL test equipment, upcoming effective dates, and UL/CSA and International harmonization activities. The cost of the Update is \$75 which includes shipping by regular First Class mail.

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