

UL 2239

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Hardware for the Support of Conduit, Tubing, and Cable

UL 2239-2004

Underwriters Laboratories Inc. (UL)
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Northbrook, IL 60062-2096

UL Standard for Safety for Hardware for the Support of Conduit, Tubing, and Cable, UL 2239

First Edition, Dated February 16, 2004

Summary of Topics

This first edition of the Standard for Hardware for the Support of Conduit, Tubing, and Cable, UL 2239, is harmonized with CSA as a result of UL's Bulletins on this subject dated May 7, 2003 and December 10, 2003. The title page reflects the February 2, 2004 ANSI recognition of this new edition of the Standard.

The following table lists the future effective dates with the corresponding item.

Future Effective Date	References
February 16, 2005	Entire standard

The new and revised requirements are substantially in accordance with UL's Bulletin(s) on this subject dated May 7, 2003 and December 10, 2003. The bulletin(s) is now obsolete and may be discarded.

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.

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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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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

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This Standard consists of pages dated as shown in the following checklist:

Page	Date
1-48	February 16, 2004



Canadian Standards Association
CSA C22.2 No. 18.4-04
First Edition



Underwriters Laboratories Inc.
UL 2239
First Edition

Hardware for the Support of Conduit, Tubing, and Cable

February 16, 2004



ANSI/UL 2239-2004

Commitment for Amendments

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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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.

The most recent designation of ANSI/UL 2239 as an American National Standard (ANSI) occurred on February 2, 2004. The ANSI approval for this standard does not include the Cover Page, Transmittal Pages, Title Page, Preface, or Forewords.

This ANSI/UL Standard for Safety, which consists of the First edition is under continuous maintenance, whereby each revision is ANSI approved upon publication. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Written comments are to be sent to the UL-Northbrook Standards Department, 333 Pfingsten Road, Northbrook, IL 60062.

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Preface

This is the common CSA and UL standard for *Hardware for the Support of Conduit, Tubing, and Cable*. It is the first edition of CSA C22.2 No. 18.4 and the first edition of UL 2239. This edition of CSA C22.2 No. 18.4 supersedes the requirements of CSA C22.2 No. 18, published in 1998, for products covered in this standard, as indicated in the scope of this standard.

This common standard was prepared by the Canadian Standards Association (CSA) and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Subcommittee for Conduit and Cable Hardware, of the Council on the Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA), are gratefully acknowledged.

This standard was reviewed by the CSA Subcommittee on C22.2 No. 18, under the jurisdiction of the CSA Technical Committee on Wiring Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This standard will be submitted to the Standards Council of Canada (SCC) for approval as a National Standard of Canada.

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 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.

Level of Harmonization

This standard uses the IEC format but is not based on, nor is it to be considered equivalent to, an IEC standard. 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.

Reasons for differences from IEC

The THSC investigated and found no existing IEC standards or work programs covering the scope of the products in this standard.

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.

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 February 16, 2005 all products Listed by UL must comply with the requirements in this standard.

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

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Foreword (CSA)

The Canadian Standards Association (CSA) develops standards under the name Canadian Standards Association, and provides certification and testing under the name CSA International. CSA International 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 necessary 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 International Operating Procedures. Products that 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 laws or regulations.

Testing techniques, test procedures, and instrumentation frequently must be prescribed by CSA International in addition to the technical requirements contained in Standards of CSA. In addition to markings specified in the Standard, CSA International 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 or in connection with the test is furnished by the manufacturer or the Association.

Manufacturers should note that, in the event of the failure of CSA International 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 CSA Certification, please address your inquiry to Applications and Customer Service, CSA International, 178 Rexdale Boulevard, Toronto, Ontario, Canada 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 which conflict with specific requirements of the Standard cannot be judged to comply with the Standard. A product employing materials or having forms of construction not addressed by this Standard may be examined and tested according to the intent of the requirements and, if found to meet the intent of this Standard, 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.

Hardware for the Support of Conduit, Tubing, and Cable

1 Scope

1.1 These requirements cover hardware for the support of conduit, tubing, and cable, such as HANGERS, STAPLES, STRAPS, and similar devices for installation in accordance with the National Electrical Code, NFPA 70, and the Canadian Electrical Code (CEC), Part I.

1.2 These requirements also cover STANDOFFS for nonmetallic-sheathed cable and PROTECTOR PLATES.

1.3 These requirements do not cover hardware for use with surface raceway, wireway, or busway systems, sprinkler systems, and other piping systems used for fire protection service, hardware for use with lighting fixtures, or hardware for grounding and bonding applications.

1.4 These requirements do not cover:

- a) Hardware intended to support boxes (see UL 514A or CSA C22.2 No. 18.1),
- b) Conduit and cable fittings (see UL 514B or CSA C22.2 No. 18.3),
- c) Reducing washers (see UL 514B or CSA C22.2 No. 18.3),
- d) Pulling grips for cable or cord (see UL 514B or CSA C22.2 No. 18.3),
- e) Cable ties (see UL 1565 or CSA C22.2 No. 18.5), or
- f) Positioning devices (see UL 1565 or CSA C22.2 No. 18.5).

2 Normative References

2.1 Products covered by this standard shall comply with the reference installation codes and standard as appropriate for the country where the product is to be used. When the product is intended for use in more than one country, the product shall comply with the installation codes and standards for all countries where it is intended to be used.

2.2 For undated reference to standards, such reference shall be considered to refer to the latest edition and all amendments to that edition up to the time when this standard was approved. For dated reference to standards, such reference shall be considered to refer to the dated edition and all amendments published up to the time the standard was approved.

CSA Standards

C22.1-02

Canadian Electrical Code, Part 1

C22.2 No. 0.15-01

Adhesive Labels

CAN/CSA-C22.2 No. 0.17-00

Evaluation of Properties of Polymeric Materials

C22.2 No. 18.1-04
Metallic Outlet Boxes

C22.2 No. 18.3-04
Conduit, Tubing, and Cable Fittings

C22.2 No. 18.5-02
Positioning Devices

UL Standards

UL 94
Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

UL 514A
Metallic Outlet Boxes

UL 514B
Conduit, Tubing, and Cable Fittings

UL 969
Marking and Labeling Systems

UL 1565
Positioning Devices

ASTM¹ Standards

ASTM B 117-97
Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM D 1654-92 (2000)
Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

ASTM F 1137-00
Standard Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners

ASTM G 151-00
Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

ASTM G 153-00a^{§1}
Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

IEC² Standard

IEC 60695-11-10 (1999-03)
Fire Hazard Testing Part 11-10: Test Flames-50W Horizontal and Vertical Flame Test Methods

ISO³ Standard

ISO 4892-2:1994

Plastics-Methods of exposure to laboratory light source – Part 2: Xenon-arc sources

NFPA⁴ Standard

NFPA 70-2002

National Electrical Code

¹American Society for Testing and Materials

²International Electrotechnical Commission

³International Organization for Standardization

⁴National Fire Protection Association

3 Definitions

3.1 For the purpose of this standard, the following definitions apply. Terms used throughout this standard which have been defined in this Clause are in small roman capital type font.

3.2 **AIR-HANDLING SPACE:** A duct or plenum used for environmental air and other spaces used for environmental air, such as above hung ceilings or below raised floors. This does not include plenums used for the removal of dust, loose stock, or vapor, or for ventilation of commercial-type cooking equipment.

3.3 **BEAM CLAMP:** A **HARDWARE DEVICE** intended for use in conjunction with a beam.

Note: For the purpose of this standard, a flange, purlin, or other similar mounting surface is considered to be a beam.

3.4 **ELASTOMER:** Rubber or any polymer other than a thermoplastic **ELASTOMER** that has properties similar to those of rubber.

3.5 **HANGER:** A **HARDWARE DEVICE** intended to support conduit, cable, or tubing from a building structure or other structural support assemblies.

3.6 **HARDWARE DEVICE:** A means for supporting conduit, cable, or tubing from, or securing in place conduit, cable, or tubing to, a building structure or other structural support assemblies.

3.7 **LOAD RATING:** A maximum static load as identified by the manufacturer, in kg (lb), intended for a **HARDWARE DEVICE**.

3.8 **PROTECTOR PLATE:** A means to provide protection for cables or tubing from nails or screws in concealed installations.

3.9 **STANDOFF:** In Canada, a nonmetallic means provided to prevent direct contact of nonmetallic-sheathed cable with metal studs when installed in parallel with the stud.

In the United States, **STANDOFFS** for nonmetallic-sheathed cable are not recognized.

3.10 **STAPLE:** A **HARDWARE DEVICE**, other than a **STRAP**, that is typically hammer- or tool-driven, intended to secure conduit, cable, or tubing to a building structure, such as to a wooden stud.

3.11 **STRAP:** A **HARDWARE DEVICE**, other than a **STAPLE**, that is intended to secure conduit, cable, or tubing to a building structure or other support assembly.

4 General Requirements

4.1 Except as indicated in Clause 4.2, a component of a product covered by this standard shall comply with the requirement for that component. A component shall comply with the Canadian Standards Association or the Underwriters Laboratories Inc. standard as appropriate for the country where the product is to be used.

4.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

4.3 A component shall be used in accordance with its rating established for the intended conditions of use.

4.4 The values given in SI (metric) units are mandatory. Any other values given are for information only.

4.5 In this standard, a requirement that applies only to one or more types of hardware is so identified by a specific reference in that requirement to the type or types of hardware involved. Absence of such reference indicates that the requirement applies to all types of hardware unless the context indicates otherwise.

5 Construction

5.1 General

5.1.1 A **HARDWARE DEVICE** intended for assembly to conduit, cable, or tubing shall be constructed so that the device complies with the assembly test in Clause 6.2.

5.1.2 A **HARDWARE DEVICE** for use with more than one type or size of product shall comply with the appropriate requirements for each type or size of product when installed as intended.

5.1.3 A **HARDWARE DEVICE** having a **LOAD RATING** declared by the manufacturer shall comply with the applicable requirements in Clauses 7 – 9 and shall be marked in accordance with Clause 10.

5.1.4 A **HARDWARE DEVICE** intended for a specific condition of installation or for use with a specific wiring system shall be provided with instructions in accordance with Clause 11.