UL 20

STANDARD FOR SAFETY

General-Use Snap Switches

UL Standard for Safety for General-Use Snap Switches, UL 20

Fourteenth Edition, Dated July 20, 2018

Summary of Topics

This revision of ANSI/UL 20 dated May 31, 2023 includes the following changes in requirements:

– Field Replacement Actuator; Clause 4.9A, 5.2.10, Clause 5.32, 7.1.15, 7.1.16, Figure 10

– Revised Marking for Products with USB Type Outlets; SA12.1

– Spring Action Clamp Terminal; 2.19A, Clause 4.7A, Clause 5.20A, Table 14A, 7.2.2A

– Separable Terminal Assembly Construction; 1.1, 1.8A, 2.6A, 2.13, 4.5.3.19A, 4.5.3.19B, Annex C

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

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated August 12, 2022 and February 24, 2023.

No Text on This Page

Association of Standardization and Certification
NMX-J-005-ANCE-2018
First Edition

CSA Group
CAN/CSA-C22.2 No. 111-18
Fifth Edition

ULSE Inc.
UL 20
Fourteenth Edition

General-Use Snap Switches

July 20, 2018

(Title Page Reprinted: May 31, 2023)

ANSI/UL 20-2023

Commitment for Amendments

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

ISBN 978-1-4883-1315-8 © 2018 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 Fourteenth Edition including revisions through May 31, 2023. The most recent designation of ANSI/UL 20 as an American National Standard (ANSI) occurred on May 31, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

The Department of Defense (DoD) has adopted UL 20 on December 4, 1981. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

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

For information on ULSE Standards, visit http://www.shopulstandards.com, call toll free 1-888-853-3503 or email us at ClientService@shopULStandards.com.

CONTENTS

Preface **7**

1 Scope 9
2 Definitions 10
3 General 11
3.1 Components 11
3.2 Units of Measurement 12
3.3 Reference Publications 12
4 Construction 15
4.1 Enclosure 15
4.2 Lining 16
4.3 Bushings and Strain Relief 17
4.4 Bases and Bodies 17
4.5 Current-Carrying Parts 19
4.6 Separable Jumper Connector for Separable Terminals 23
4.7 Separable Terminal Assembly 24
4.7A Spring Action Clamp Terminals 24
4.8 Insulating Material 24
4.9 Actuating Members 25
4.9A Field Replacement Actuator 25
4.10 Creepage Distances, Clearances, and Distances Through Sealing Compounds 25
4.11 Assembly 27
4.12 Provision for Grounding 28
5 Testing 29
5.1 General 29
5.2 Test Sequence 30
5.3 Tungsten-Filament-Lamp Load Characteristics 37
5.4 Assembly Test 38
5.5 Test Conditions 39
5.6 Overload Test 40
5.7 Endurance Test 42
5.8 Temperature Test 43
5.9 Dielectric Voltage-Withstand Test 44
5.10 Security of Switch Leads Test 45
5.11 Push-In Terminal Tests 45
5.12 Effect of Heat on Actuating Members Test 46
5.13 Switching Mechanism Test 46
5.14 Strain-Relief Test 48
5.15 Fault Current Test 48
5.16 Crushing Test 49
5.17 Resistance to Heat Test 49
5.18 Door Switch Assembly Test 49
5.19 Retention of Tab Connection Test 49
5.20 Separable Connector Pull Test 49
5.20A Spring Action Clamp Terminal Pull Test 50
5.21 Mold Stress Relief Test 51
5.22 Separable Terminal Assembly Humidity Conditioning Followed By Dielectric Test 51
5.23 Short Circuit Withstand Test 51
5.24 Latching Mechanism Test 52
5.25 Abnormal Overload Test 52
5.26 Temperature Test 53
5.27 Continuity Impedance Test 54
5.28 Bonding (Fault Current) Test 54

5.29 Mounting Yoke Resistance Test 55
5.30 Combination Wire Binding/Pressure-Type Terminal Assembly Test 55
5.31 Inrush Current 56
5.32 Field Replacement Actuator 57
6 Ratings 58
7 Markings 59
7.1 General 59
7.2 Supplementary Markings 61
7.3 Location 63
7.4 Tungsten 64
7.5 AC-Only Identification 64
7.6 Switch Termination Restrictions 64
7.7 For Use with Electronic Ballasts 66
8 Self-Contained Switches for Use Without a Separate Outlet Box 67
8.1 General 67
8.2 Construction 67
8.3 Performance Testing 69
8.4 Markings and Instructions 74

SUPPLEMENT SA – AC ONLY FLUSH SWITCH WITH INTEGRAL POWER SUPPLY WITH CLASS 2 OUTPUT CONNECTORS

INTRODUCTION

SA1 Scope 83
SA2 Glossary 83

CONSTRUCTION

SA3 General 83
SA4 Polymeric Enclosure 84
SA5 Spacings 84
SA6 Terminals and Leads 84

PERFORMANCE

SA7 Temperature Test 84
SA8 Class 2 Output Power Supply 88
SA9 Assembly Test 88
SA10 Installation Instructions 89
SA11 User Instructions 89
SA12 Markings 89

ANNEX A (Normative) Standards for Components

A1 Component Standards 90

Annex B (Informative) Canadian Requirements for CO/ALR Switches

B1 General 92
B2 Heat Cycling with Wire Disturbance 93
B3 Heat Cycling with Vibration 94
B4 Environmental 95
B5 Stripping Torque 96

Annex C (Informative) French Translations and Markings

No Text on This Page

Preface

This is the harmonized ANCE, CSA Group, and ULSE standard for General-Use Snap Switches. It is the first edition of NMX-J-005-ANCE, fifth edition of CAN/CSA-C22.2 No. 111, and the fourteenth edition of UL 20. This edition of CAN/CSA-C22.2 No. 111 supersedes the previous edition(s) published on May 10, 2010. This edition of UL 20 supersedes the previous edition(s) published on May 10, 2010. This harmonized standard has been jointly revised on May 31, 2023. For this purpose, CSA Group and ULSE are issuing revision pages dated May 31, 2023, and ANCE is issuing a new edition dated May 31, 2023.

This harmonized standard was prepared by the Association of Standardization and Certification, (ANCE), CSA Group and ULSE Inc. (ULSE). The efforts and support of the NEMA (National Electrical Manufacturers Association), EFC (Electro-Federation of Canada), and the CANENA Technical Harmonization Committee for Snap Switches, THSC 23-B, are gratefully acknowledged.

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

The present Mexican standard was developed by the CT 23 Electrical Accessories (Wiring Devices) from the Comite de Normalizacion de la Asociacion de Normalizacion y Certificacion, A.C., CONANCE, with the collaboration of the Wiring Devices manufacturers and users.

This standard was reviewed by the CSA Integrated Committee on Wiring Devices for Household and General Use, 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 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.

Level of Harmonization

This standard is published as an equivalent standard for ANCE, CSA Group and ULSE.

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 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.

No Text on This Page

1 Scope

1.1 The requirements of this Standard apply to manually operated, general-use snap switches and modular switch assembly for connection to copper (Cu) or copper-clad conductors used in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, or the Canadian Electrical Code (CE Code), Part I, and intended to be permanently connected in accordance with the NEC and the CE Code, Part I. In Canada, requirements for switches for connection to aluminum (Al) conductors used in accordance with the CE Code, Part I, and intended for connection to wiring systems recognized by the CE Code, Part I, are covered in Annex B.

1.2 This Standard applies to ac/dc rated switches for which the load ratings do not exceed 60 A at 250 V or less, 30 A at 251 V – 600 V, and 2 hp at 125 V – 600 V or less. This Standard also covers ac-only rated switches for which the load ratings do not exceed 30 A at 347 VAC or less.

1.3 This Standard applies to switches constructed to be installed readily in a flush device box or on an outlet-box cover and intended for connection to branch-circuit wiring.

1.4 This Standard applies to pendant and through-cord switches intended for field installation on flexible cord and provided with one "on" and one "off" position.

1.5 This Standard applies to switches intended for surface mounting and provided with a separable base and cover for connection to exposed wiring consisting of nonmetallic sheathed cable or open wiring on insulators (knob and tube).

1.6 This Standard applies to self-contained switches intended for flush mounting without a separate outlet box and for connection to branch-circuit wiring consisting of one or more non-metallic sheathed cables containing copper conductors.

1.7 This Standard applies to ac/dc fixture switches intended to be installed in fixtures to control incandescent lighting or fans for connection to branch-circuit wiring.

1.8 This Standard also applies to single-pole, momentary-contact door switches constructed to be installed readily in a special-purpose device box or on an outlet-box cover for connection to branch-circuit wiring.

1.8A A modular switch assembly is considered to be a general-use AC only flush switch.

1.9 This Standard does not apply to:

a) Clock operated switches specified in the Standard for Clock-Operated Switches, UL 917, and CSA Standard C22.2 No. 177;

b) Dimmer switches specified in the Standard for Solid-State Dimming Controls, UL 1472, and CSA Standard C22.2 No. 184.1;

c) Industrial control equipment specified in the Standard for Industrial Control Equipment, UL 508, and CSA Standard C22.2 No. 14;

d) Solid-state, single-phase motor speed controls specified in the Standard for Solid-State Fan Speed Controls, UL 1917, and CSA Standard C22.2 No. 156;

e) Special-use and ac-only fixture switches specified in the Standard for Switches for Appliances – Part 1: General Requirements, UL 61058-1, and CSA Standard C22.2 No. 55; and

f) Switches for use in hazardous locations specified in the Standard for Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations, UL 1203, and CSA Standard C22.2 No. 159.

1.10 For switches intended for connection to branch-circuit wiring containing aluminum conductors, refer to the Standard for Receptacles and Switches Intended for Use with Aluminum Wire, UL 1567, or to Annex B.

In Mexico, this Clause is not applicable. The use of aluminum conductors from 0.824 mm^2 (18 AWG) to 8.37 mm^2 (8 AWG) is prohibited.

2 Definitions

2.1 The following definitions apply in this Standard:

2.2 CLEARANCES – Through-air spacing.

2.3 CREEPAGE DISTANCES (CREEPAGE) – Over-surface spacings.

2.4 DOOR SWITCH – A single-pole, momentary contact switch with a push-button actuator, provided with an outlet-box and cover. It is intended for installation in door jambs to control lighting fixtures, typically in a closet.

2.5 FIXTURE SWITCH – A switch installed in the enclosure of a fixture such as a luminaire, a fan, or the like.

2.6 FLUSH SWITCH – A switch provided with a mounting yoke or integral flush device cover plate and intended for installation in or on an outlet box intended to control a branch circuit.

2.6A MODULAR SWITCH ASSEMBLY – A device consisting of a separable terminal assembly and switch.

2.7 PENDANT SWITCH – A switch intended to be installed at the end of a flexible cord for use in branch-circuit pendant applications.

2.8 SELF-CONTAINED SWITCH – A switch intended for flush mounting without a separate outlet box for connection to one or more nonmetallic sheathed cables containing copper conductors.

2.9 SEPARABLE JUMPER CONNECTOR – Consists of shorted pins or tabs located within the body of the connector. It is intended to mate with a special purpose connector during an electrical installation to simulate an installed switch on a separable terminal assembly for the purpose of verifying circuit integrity.

2.10 SINGLE POLE, 3-WAY, 4-WAY, OR 2 POLE SWITCHES – Is intended to be supplied by a single branch circuit and to control a single set of loads. The circuit and loads can be connected line-to-neutral (e.g., 120V ac, 277V ac) or line-to-line (e.g., 208V ac, 240V ac). See Figure 9 for details.

2.11 SURFACE SWITCH – A switch provided with a separable base and cover primarily intended for branch-circuit installation on exposed wiring consisting of open wiring on insulators or nonmetallic sheathed cable.

2.12 SYNTHETIC LOAD – The use of a combination of resistances and capacitances instead of tungsten-filament-lamps as a load.

2.13 TERMINAL ASSEMBLY, SEPARABLE – A two-piece terminal assembly provided with an integral mechanical latching mechanism(s). Consists of permanently attached pins or tabs located on the body of the switch which are capable of receiving a special purpose connector or back plate connector with leads or wiring terminals for connection to the branch circuit conductors. May be one of the constructions described below:

a) A back plate connector that is secured to the device box; or

b) A special-purpose connector that is installed into a device box.

2.14 TERMINAL, COMBINATION WIRE BINDING/PRESSURE-TYPE – A wire binding screw with an integrally machined pressure ring. Pressure ring terminals accept both single and multiple conductors that are captured under the machine formed pressure ring. These terminals may be wired with a single conductor using the conventional 3/4 loop around the wire-binding screw.

2.15 TERMINAL, INSULATION DISPLACEMENT – A terminal having a contacting member that forces the conductor insulation aside and presses against the side of the conductor to make contact.

2.16 TERMINAL, PIN-TYPE – A terminal having a contact pin that punctures the conductor insulation to contact the current-carrying conductor.

2.17 TERMINAL, PRESSURE-WIRE – A terminal where the conductor is clamped under a pressure plate or saddle by one or more screws or nuts.

2.18 TERMINAL, PUSH-IN – A terminal where the stripped end of a conductor is pushed into the terminal and the clamping pressure is maintained by a spring mechanism, without the use of screws.

2.19 TERMINAL, SET-SCREW – A terminal where the clamping pressure is applied by the end of the screw bearing directly on the conductor.

2.19A TERMINAL, SPRING ACTION CLAMP – A terminal where the stripped end of a conductor is inserted into the terminal and a manually operated integral lever enables clamping pressure to a spring mechanism, without the use of screws.

2.20 TERMINAL, WIRE-BINDING SCREW – A terminal in which the conductor is bent around the screw and is clamped directly under the head of the screw when it is tightened.

2.21 THROUGH-CORD SWITCH – A switch intended to be installed along the length of flexible cord such as for use in power-supply cords or cord sets.

2.22 TWO- OR THREE-CIRCUIT SWITCHES – Consists of a two- or three-pole switch, respectively, intended to be supplied by multiple single-phase branch circuits and to control multiple sets of single-phase loads, each of no more than 120 V ac line-to neutral or 240 V ac line to line, and no more than 240 V ac between circuits; see 7.2.4. See Figure 9 for details.

3 General

3.1 Components

In Mexico, Clauses 3.1.1 – 3.1.4 are not applicable.

3.1.1 Except as indicated in Clause 3.1.2, a component of a product covered by this Standard shall comply with the requirements for that component. See Annex A for a list of Standards covering

components generally used in the products covered by this Standard. A component shall comply with the CSA Group or the Underwriters Laboratories Inc., standards as appropriate for the country where the product is to be used.

3.1.2 A component need not comply with a specific requirement that:

a) Involves a feature or characteristic not needed in the application of the component in the product covered by this Standard; or

b) Is superseded by a requirement in this Standard.

3.1.3 A component shall be used in accordance with its ratings for the intended conditions of use.

3.1.4 Specific components are accepted as being incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as temperatures not exceeding specified limits, and shall be used only under those specified conditions for which they have been investigated.

3.2 Units of Measurement

3.2.1 The values given in SI (metric) units shall be normative, except for AWG conductor sizes. Any other values given are for information purposes only.

3.3 Reference Publications

3.3.1 Where reference is made to any Standards, such reference shall be considered to refer to the latest editions and revisions thereto available at the time of printing, unless otherwise specified.

ANCE Standards

NOM-001-SEDE
Standard for Electrical Installations

NMX-J-023/1-ANCE
Metallic Outlet Boxes Part 1: Specifications and Test Methods

NMX-J-235/1-ANCE
Enclosures for Electrical Equipment, Non-environmental Considerations

NMX-J-235/2-ANCE
Enclosures for Electrical Equipment, Environmental Considerations

NMX-J-574-ANCE
Method for the Determination of the Proof and the Comparative Tracking Indices of Solid Insulating Materials

ANSI Standards

ANSI C82.11
Lamp Ballasts – High Frequency Fluorescent Lamp Ballasts

ANSI C82.14
Lamp Ballasts – Low-Frequency Square Wave Electronic Ballasts for Metal Halide Lamps

CSA Standards

C22.1
Canadian Electrical Code, Part I

CAN/CSA C22.2 No. 0
General Requirements – Canadian Electrical Code, Part II

CAN/CSA C22.2 No. 0.17
Evaluation of Properties of Polymeric Materials

C22.2 No. 14
Industrial Control Equipment

C22.2 No. 18.1
Metallic Outlet Boxes

C22.2 No. 18.2
Outlet Boxes, Conduit Boxes, and Fittings

C22.2 No. 42
General Use Receptacles, Attachment Plugs, and Similar Wiring Devices

C22.2 No. 42.1
Cover Plates for Flush-Mounted Wiring Devices

C22.2 No. 55
Special Use Switches

C22.2 No. 65
Wire Connectors

C22.2 No. 94.1
Enclosures for Electrical Equipment, Non-environmental Considerations

C22.2 No. 94.2
Enclosures for Electrical Equipment, Environmental Considerations

C22.2 No. 156
Solid-State Speed Controls

C22.2 No. 159
Attachment Plugs, Receptacles, and Similar Wiring Devices for Use in Hazardous Locations: Class I, Groups A, B, C, and D; Class II, Group G, in Coal or Coke Dust, and in Gaseous Mines

CAN/CSA C22.2 No. 177
Clock-Operated Switches

C22.2 No. 184.1
Solid State Dimming Controls

NEMA Standards

ANSI/NEMA WD6
Wiring Devices – Dimensional Specifications

NEMA 410
Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts

UL Standards

UL 50
Enclosures for Electrical Equipment, Non-Environmental Considerations

UL 50E
Enclosures for Electrical Equipment, Environmental Considerations

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

UL 486E
Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors

UL 498
Attachment Plugs and Receptacles

UL 508
Industrial Control Equipment

UL 514A
Metallic Outlet Boxes

UL 514C
Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

UL 514D
Cover Plates for Flush-Mounted Wiring Devices

UL 746A
Polymeric Materials – Short Term Property Evaluations

UL 746C
Polymeric Materials – Use in Electrical Equipment Evaluations

UL 917
Clock-Operated Switches

UL 1203
Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations

UL 1310
Class 2 Power Units

UL 1472
Solid-State Dimming Controls (Bi-National CSA C22.2 No. 184.1-96)

UL 1567
Receptacles and Switches Intended for Use with Aluminum Wire

UL 1917
Solid-State Fan Speed Controls

UL 61058-1
Switches for Appliances – Part 1: General Requirements

3.3.2 Where reference is made to the following publications not under the jurisdiction of UL or of the CSA Steering Committee on the Canadian Electrical Code, Part II, such reference shall be considered to refer to the edition listed below:

ASTM Standard (American Society for Testing and Materials)

E28-99
Test Methods for Softening Point of Resins Derived from Naval Stores by Ring-and-Ball Apparatus

National Fire Protection Association (NFPA)

NFPA 70
National Electrical Code

3.3.3 In Canada, general requirements applicable to these products are provided in CAN/CSA C22.2 No. 0.

4 Construction

4.1 Enclosure

4.1.1 Switches shall be provided with complete enclosures that house all live parts, except that switches designed to be installed in device boxes or cut-out boxes or intended specifically for use in devices where they will be so enclosed as to prevent the exposure of live parts to accidental contact, need not be provided with such enclosures.

4.1.2 A key-operated switch shall be constructed so that a 0.5 mm (0.02 inch) diameter rigid steel wire cannot be inserted into the key slot so as to contact live electrical parts.

4.1.3 A metal enclosure of a switch (such as the cover of a surface-type switch or the shell of a fixture or pendant-type switch) shall be not less than 0.33 mm (0.013 inch) thick. Heavier metal shall be employed to provide strength and rigidity if the switch is rated more than 5 A, 250 V; 10 A, 125 V; or if the size or shape of the enclosure warrants such increased metal thickness.

In Mexico, the following applies: A metal enclosure of a switch (such as a cover of a surface-type switch or the shell of a fixture or pendant-type switch) shall have the mechanical strength to enable it to comply with the specifications and test methods listed in this Standard.

4.1.4 A nipple (male or female) through which wires can pass shall have not less than five full, clean-cut threads of standard pitch as indicated in Table 1. The wireway provided by the nipple shall be free from burrs, fins, sharp edges, and the like that can damage wiring.

Table 1
Threading for nipples

(see Clause 4.1.4)

Pipe trade size, inch	Threading per inch
1/8	27 threads
1/4	18
3/8	18
1/2	14
3/4	14

4.1.5 A nipple that is not integral with the body of a switch shall be secured to prevent turning relative to the enclosure, and to provide mechanical strength equivalent to that of a unit piece.

4.1.6 A female nipple in a fixture-type switch shall be provided with a No. 8 – 40 setscrew.

Note: The setscrew may be omitted in the nipple of a fixture-type switch if the nipple is of the 1/2 inch or larger pipe size, has a tapered thread, and is intended to be tightened with a wrench.

4.1.7 A threaded nipple for attachment to rigid metal conduit of the 1/2 inch or larger trade size shall be provided with a positive end stop for the conduit and a bushing, or an equivalent smooth, well-rounded surface, to prevent damage to wiring that enters the switch enclosure from the conduit.

Note: Providing a positive end stop and bushing shall not be required for a hole tapped for rigid metal conduit in the wall of an outlet box or equivalent enclosure that is provided with a switch.

4.1.8 A switch intended to be exposed to a specific environment shall comply with the requirements of the Standards for Enclosures for Electrical Equipment, Non-Environmental Considerations, UL 50, Enclosures for Electrical Equipment, Environmental Considerations, UL 50E, CSA C22.2. No. 94.1, Enclosures for Electrical Equipment, Non-environmental Considerations, C22.2. No. 94.2, Enclosures for Electrical Equipment, Environmental Considerations, or NMX-J-235/1 ANCE, Enclosures for Electrical Equipment, Non-Environmental Considerations and NMX-J-235/2-ANCE, Enclosures for Electrical Equipment, Environmental Considerations.

4.1.9 A through-cord switch shall be provided with two distinct holes to accept and pass through the intended flexible cord. If a through-cord type switch is provided with one hole and provisions such as a knock out, the device is considered to be a pendant switch

4.1.10 A door switch shall be provided with an outlet box and cover plate. The outlet box and cover plate shall comply with the performance requirements of either the Standard for Metallic Outlet Boxes, UL 514A or NMX-J-023/1-ANCE, or the Standard for Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers, UL 514C, as appropriate, or Metallic Outlet Boxes, C22.2 No. 18.1 and Outlet Boxes, Conduit Boxes, and Fittings, C22.2 No. 18.2.

4.2 Lining

4.2.1 If a part of the enclosure of a switch is removable for wiring and is wholly or partly of conductive material, the inside surface of all such conductive material shall be lined completely with insulation not less than 0.71 mm (0.028 inch) thick.

Note: The lining of a fixture switch may be less than 0.71 mm (0.028 inch) thick but not less than 0.33 mm (0.013 inch) thick.