



UL 2577

STANDARD FOR SAFETY

Suspended Ceiling Grid Low Voltage Systems and Equipment

UL Standard for Safety for Suspended Ceiling Grid Low Voltage Systems and Equipment, UL 2577

First Edition, Dated February 7, 2013

Summary of Topics

This is the First Edition of the Joint UL/ULC Standard for Suspended Ceiling Grid Low Voltage Systems and Equipment, UL 2577/ULC-S2577. There are national differences only where standards (U.S. vs. Canadian) are referenced. However, the body of the standard is technically identical for Canada and the U.S.

The new requirements are substantially in accordance with Proposal(s) on this subject dated October 12, 2012 and December 21, 2012.

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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 2577 as an American National Standard (ANSI) occurred on February 7, 2013. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), an informative Annex, or the Preface.

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Preface

This is the common UL and ULC Standard for Suspended Ceiling Grid Low Voltage Systems and Equipment. It is the First edition of both CAN/ULC-S2577 and ANSI/UL 2577.

This Joint Standard was prepared by Underwriters Laboratories Inc., ULC Standards, and the Technical Committee on Solid State Lighting (TCSSL). The standard was formally approved by the UL/ULC Technical Committee on Solid State Lighting (TCSSL). The efforts and support of the Technical Committee are gratefully acknowledged.

Only metric SI units of measurement are used in this Standard. If a value for measurement is followed by a value in other units in parentheses, the second value may be approximate. The first stated value is the requirement.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Annex A and Annex B, both identified as normative, form a mandatory part of this Standard. Annex C is an informative (non-mandatory) part of this Standard and is not part of the ANSI approved 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.*

Level of Harmonization

This Standard is published as an identical standard between UL and ULC Standards. An identical standard is a standard that is the same in technical content except for conflicts in Codes and Governmental Regulations. Presentation shall be word for word except for editorial changes.

Interpretations

The interpretation by the SDO of an identical or equivalent standard shall be based on the literal text to determine compliance with the standard in accordance with the procedural rules of the SDO. If more than one interpretation of the literal text has been identified, a revision shall be proposed as soon as possible to each of the SDOs to more accurately reflect the intent.

UL Effective Date

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

INTRODUCTION

1 Scope

1.1 These requirements cover suspended ceiling grid low voltage systems and equipment intended for installation and use in accordance with the:

In Canada:

Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, CSA C22.1,

In the United States:

National Electrical Code (NEC), ANSI/NFPA 70.

1.2 The suspended ceiling grid low voltage systems covered by this standard are intended to be installed as a suspended ceiling grid that provides mechanical support for the ceiling tiles and provides electrical connections between the low voltage power supply and the low voltage equipment. The low voltage system consists of the following components:

- a) An isolating type low voltage power supply with output(s) operating at 30 V (42.4 V peak) or less and not exceeding Class 2 power limits,
- b) A grid rail power distribution system to provide power from the Class 2 power supply to one or more pieces of Class 2 powered equipment, and
- c) Class 2 powered equipment that is electrically connected to the suspended ceiling grid low voltage system.

1.3 The suspended ceiling grid low voltage system is intended to be permanently connected, for indoor dry locations, and installed in accordance with the following requirements:

In Canada:

Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, CSA C22.1, and the National Building Code of Canada.

In the United States:

National Electrical Code (NEC), ANSI/NFPA 70, the International Building Code (IBC), and the International Mechanical Code (IMC).

This standard also covers suspended ceiling grid low voltage systems intended for use in air-handling spaces.

1.4 This standard does not address any supplemental or alternative requirements for suspended ceiling grid low voltage systems intended for use in:

In Canada:

- a) Hazardous locations as specified in the Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, CSA C22.1;
- b) General patient care areas or critical patient care areas as defined by Section 24 of the Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, CSA C22.1; or
- c) Emergency systems as defined by Section 46 of the Canadian Electrical Code, Part I, Safety Standard for Electrical Installations, CSA C22.1.

In the United States:

- a) Hazardous locations as specified in the National Electrical Code (NEC), ANSI/NFPA 70;
- b) General patient care areas or critical patient care areas as defined by Article 517 of the National Electrical Code (NEC), ANSI/NFPA 70; or
- c) Emergency systems as defined by Article 700 of the National Electrical Code (NEC), ANSI/NFPA 70.

1.5 This standard does not evaluate the suspended ceiling grid low voltage system for seismic requirements in accordance with the:

In Canada:

National Building Code of Canada.

In the United States:

International Building Code (IBC).

1.6 This standard does not evaluate the suspended ceiling grid low voltage systems for fire resistance.

2 Components

2.1 Except as indicated in 2.2, 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 used in the products covered by this standard.

2.2 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.

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

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3.2 Unless otherwise indicated, all voltage and current values mentioned in this standard are root-mean-square (rms).

4 Undated References

4.1 See Annex B for a list of publications referenced in this standard. Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

5 Glossary

5.1 For the purpose of this standard, the following definitions shall apply.

5.2 **BUS BAR** – A non-insulated conductor electrically connected to the source of supply and physically supported by an insulator. The bus bar provides a power rail for connection of the low voltage equipment.

5.3 **BUS BAR SUPPORT** – An insulator that runs the length of a section of suspended ceiling grid bus rail and serves to support the bus bars and to isolate them from the suspended grid rail.

5.4 **CONNECTOR** – A generic term used to refer to an electro-mechanical fitting:

a) **Power Feed Connector** – An electro-mechanical connector used to connect either the output from the Class 2 power supply to a power distribution cable, or directly to the bus bar, or from the power distribution cable to the bus bar.

b) **Load Connector** – An electro-mechanical connector used to tap power from the bus bar to the low voltage equipment. The load connector may be located above the ceiling grid plane, inline with the ceiling grid plane, or below the ceiling grid plane. A load connector may also be used to mechanically support the low voltage equipment.

5.5 **GRID BUS RAIL** – A combination of the bus bar, bus bar support and the structural suspended ceiling grid system.

5.6 **INVERSE POLARITY PROTECTION** – A system that prevents two interconnected Class 2 power supplies, when connected positive to negative, from allowing current to flow from one power source into the second power source.

5.7 **MANUFACTURER** – The organization responsible for producing or distributing the product.

5.8 MOUNTING MEANS – Hardware (such as screws or clips) provided for mechanically securing low voltage equipment to the suspended ceiling grid low voltage system, or for mounting the grid to the building structure.

5.9 POWER SUPPLY – A Class 2 power unit connected between the branch circuit power distribution system and the suspended ceiling grid low voltage system.

5.10 RAIL – The structural support for the suspended ceiling grid system typically forming the ceiling grid supporting the ceiling grid tiles, bus bars, and low voltage equipment.

5.11 SUSPENDED CEILING GRID – A system that serves as a support for the grid bus rails. It may also support other low voltage equipment such as cables, luminaires, and similar equipment.

5.12 TERMINAL, WIRE-BINDING SCREW – A terminal in which a single conductor is clamped directly under the head of the screw when it is tightened. The single conductor is either bent around the screw in a 3/4 loop or is otherwise retained by interference fit.

MECHANICAL CONSTRUCTION

6 General

6.1 The suspended ceiling grid low voltage system shall consist of one or more pieces formed and constructed to make the system readily distinguishable from electrical conduit, electrical metallic tubing and electrical nonmetallic tubing.

6.2 The suspended ceiling grid low voltage system shall be formed and assembled so that it has the strength and rigidity required to resist the abuses to which it is subjected, without resulting in a risk of fire, electric shock, or injury to persons, due to total or partial collapse with resulting reduction of spacings, loosening or displacement of parts or other serious defects.

7 Assembly and Mounting

7.1 Provision shall be made for attaching the suspended ceiling grid low voltage system to the building structure. Such means shall provide for securing the system in accordance with the installation and operation instructions. Refer to the Installation and Operating Instructions, Section 38.

7.2 The grid rail system shall be provided with a means to mechanically secure powered rails to each other if it is intended that powered rails may be interconnected to distribute power.

7.3 A suspended ceiling grid low voltage system designed to be secured to the mounting surface by hanging wires, screws or bolts adjacent to any electrical conductor or connector shall not result in damage to the conductors or connectors. Trial installation in accordance with the installation instructions shall be used to determine compliance with this requirement.

7.4 Mounting hardware such as screws or bolts shall either be packaged with the suspended ceiling grid low voltage system; or the installation instructions shall specify the types of acceptable mounting fasteners and systems to be used. Refer to 38.1.3(d).

8 Metal Components

8.1 The suspended ceiling grid low voltage system shall have a smooth finish free from defects such as projections, sharp edges, burrs or fins likely to damage conductors or connectors when installed as intended, or to constitute a risk of injury to persons during normal maintenance and use.

8.2 Iron and steel parts shall be protected against corrosion by enameling, galvanizing, plating, powder coating or other equivalent means, when corrosion of such parts results in a risk of fire, electric shock, or injury to persons.

Exception: This requirement does not apply to minor parts of iron or steel, such as washers, screws, or similar parts, edges, punched holes, and spot welds in prefinished steel, enclosed steel pipe, hanger locations for painting or plating in ferrous metals.

8.3 Copper, aluminum, and alloys of copper and aluminum, stainless steel, and similar materials having inherent resistance to atmospheric corrosion may be used without additional corrosion protection.

9 Polymeric Enclosure and Insulation Materials

9.1 General

9.1.1 All parts that act as the electrical insulation, support of uninsulated live parts or as an enclosure shall be made of an insulating material intended for the particular application and shall comply with the requirements in this section. Hard rubber materials shall not be employed.

9.1.2 A molded polymeric assembly used for electrical insulation, support of uninsulated live parts or as an enclosure of live parts shall be fabricated in accordance with the Standard for Polymeric Materials – Fabricated Parts, UL 746D.

Exception No. 1: A polymeric material that is fabricated in the location where final assembly takes place and where no blending or compounding operations are involved is not required to comply with this requirement.

Exception No. 2: Assemblies that are integral to components previously evaluated and found suitable for the application in accordance with the standard covering that component need not be separately verified as conforming to the Standard for Polymeric Materials – Fabricated Parts, UL 746D.

9.2 Flammability

9.2.1 A polymeric material used as an enclosure of live parts shall have a flame class rating of V-0 or 5VA in accordance with the requirements of the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94. A polymeric material used for electrical insulation or for support of uninsulated live parts shall have a flame class rating of V-0, 5VA, or VTM-0. The flame class rating of the material shall be judged at the minimum thickness employed at the walls and barriers that are critical to the functioning of the electrical insulation, support of uninsulated live parts or as the enclosure of live parts.

9.3 Relative Thermal Index (RTI)

9.3.1 A polymeric material used for electrical insulation, support of uninsulated live parts or as the enclosure of live parts shall possess a mechanical with impact and electrical temperature index of at least that measured on the part during the normal temperature test when evaluated in accordance with:

In Canada:

Standard for Evaluation of Properties of Polymeric Materials, CAN/CSA-C22.2 No. 0.17;

In the United States:

Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

Exception: When the temperature measured during the normal temperature test is less than 50°C (122°F) the polymeric material is not required to comply with 9.3.1.

9.4 Electrical properties

9.4.1 A polymeric material used for electrical insulation, support of uninsulated live parts or as the enclosure of live parts shall have a comparative tracking index (CTI) rating of 100 V or greater or a performance level class of at least 4 when evaluated in accordance with:

In Canada:

Standard for Evaluation of Properties of Polymeric Materials, CAN/CSA-C22.2 No. 0.17;

In the United States:

Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

10 System Flammability

10.1 Grid rails with nonmetallic components shall comply with the System Flammability Test – Grid Rails, Section 28.

10.2 Discrete components with nonmetallic enclosures or nonmetallic enclosure parts, including supply and load connectors, intended to be installed in air-handling spaces and marked “Suitable for Use in Air-Handling Spaces,” or equivalent, as indicated in 37.3.1, shall comply with the System Flammability Test – Discrete Components Located In Air-Handling Spaces, Section 29. The sample set for the test of 29.3 shall include any nonmetallic mating parts or appendages that will physically engage the discrete component and are anticipated to be within the 1.86 m² (20 ft²) noted in 29.3.

10.3 The installation instructions shall contain the information on the components of the system as required in 38.1.3(f).

11 Adhesives

11.1 Parts of a suspended ceiling grid low voltage system and its accessories secured by adhesives and relied upon for structural integrity or securement of a component within the system shall be subjected to the specialized applications adhesives requirements in the Standard for Polymeric Material – Use in Electrical Equipment Evaluations, UL 746C.