UL 2305

STANDARD FOR SAFETY

Exhibition Display Units, Fabrication and Installation

UL Standard for Safety for Exhibition Display Units, Fabrication and Installation, UL 2305

First Edition, Dated February 9, 2001

Summary of Topics

The revisions of UL 2305 includes the removal of ANSI information and miscellaneous editorial updates.

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.

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Standard for Exhibition Display Units, Fabrication and Installation

First Edition

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This UL Standard for Safety consists of the First Edition including revisions through June 15, 2018.

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

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INTRODUCTION

1 Scope

1.1 These requirements cover exhibition display unit constructions that are intended for indoor use for the purpose of illuminating, animating, activating, or displaying with respect to temporary expositions, exhibits, show conventions, meetings, or assemblies. These units are intended for temporary construction and display at exposition events. Electrical components and systems shall be used in accordance with the National Electrical Code, NFPA 70 and with the installation requirements of this standard. These requirements also cover portable tradeshow displays, hanging components, and other exhibit assemblies.

1.2 These requirements cover exhibition display units rated 600 volts ac or less.

1.3 These requirements cover light boxes for use with exhibition display units. Electric advertising displays and electric signs are covered by Standard for Electric Signs, UL 48.

1.3.1 These requirements cover under carpet convention center cord sets and assembled on or molded on attachment plugs and cord connectors, rated 250 volts dc or less or 600 volts ac or less, that are intended to supply temporary power from an exhibit facility to an exhibition display unit or to exhibitor equipment and products that are displayed or exhibited within the exhibition display unit, in accordance with 518.3(B) of the National Electrical Code, ANSI/NFPA 70.

1.4 These requirements do not cover products that are displayed or exhibited within the exhibition display unit, such as cars, audio equipment, appliances, or exhibitor equipment.

1.5 These requirements do not cover combustible materials stored within an exhibition display unit, such as promotional pamphlets or giveaways.

1.6 These requirements do not cover the use of the following materials and their interconnecting components used in an exhibition display unit:

a) Natural gas-fired equipment,

b) Cooking equipment,

c) Open flame devices,

d) Exhibits involving processes or materials that present a risk of injury to persons,

e) Pressure vessels,

f) Fossil fuel powered equipment,

g) Hydraulically powered equipment using flammable fluids,

h) Radiation producing devices, including lasers,

i) Flammable liquids, and

j) Compressed air that is determined to be not part of an exhibition display unit.

1.7 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

2 Glossary

For the purpose of this standard the following definitions apply.

2.1 CLASS 1 CIRCUIT – The portion of the wiring system supplied from a source that has a rated output greater than 30 volts rms (42.4 volts peak) and 100 volt-amperes.

2.2 CLASS 2 CIRCUIT – An isolated secondary circuit involving a potential not greater than 30 volt rms (42.4 volts peak) supplied by:

a) An inherently-limited Class 2 transformer;

b) A combination of an isolated transformer secondary winding and a fixed impedance or regulating network, that together comply with the performance requirements for an inherently-limited Class 2 transformer;

c) A dry-cell battery having output characteristics not greater than those of an inherently-limited Class 2 transformer;

d) Any combination of (a), (b), and (c) above that together comply with the performance requirements for an inherently-limited Class 2 transformer; or

e) One or more combinations of a Class 2 transformer and an overcurrent protective device that together comply with the performance requirements for a noninherently-limited Class 2 transformer. A circuit derived from a line-connected circuit by connecting impedance in series with the supply circuit as a means of limiting the voltage and current is not considered to be a Class 2 circuit.

2.3 CLASS 2 TRANSFORMER – An isolation type transformer as specified in the Standard for Low Voltage Transformers Part 1 General Requirements, UL 5085-1 and Low Voltage Transformers Part 3; Class 2 and Class 3 Transformers, UL 5085-3.

2.4 CORD-CHANNEL – A completely enclosed channel intended specifically for the holding and routing of wiring, excluding communication and low-voltage wiring. A cord channel provides mechanical protection for internal wiring.

2.4.1 CONVENTION CENTER CORD SET – A convention center cord set shall be defined as one of the following types:

a) Parallel Type – The cord provided is of the flat, jacketed parallel conductor type for installation under carpet. See Part VII, Convention Center Cord Sets, Attachment Plugs and Cord Connectors (Parallel Type).

b) Booth Stringer Type – The cord provided is jacketed round extra-hard usage Type S intended to supply convenience outlets along the length of a cord set to provide power for lighting and displays for several booth locations. See Part VIII, Convention Center Cord Sets, Attachment Plugs and Cord Connectors (Booth Stringer Type).

2.4.2 CONVENTION CENTER ATTACHMENT PLUG, ASSEMBLED-ON – An attachment plug that is provided unattached to the cord of a convention center cord set. The attachment plug is intended to be assembled onto the cord of a cord set as a line fitting.

2.4.3 CONVENTION CENTER CORD CONNECTOR, ASSEMBLED-ON – A cord connector that is provided unattached to the cord of a convention center cord set. The cord connector is intended to be assembled onto the cord of a cord set as a load fitting.

2.5 DEFLECTION, HORIZONTAL – The measure of horizontal movement of elements of an exhibition display unit resulting from addition and movement of live loads on the unit.

2.6 DEFLECTION, VERTICAL – The measure of vertical movement of elements of an exhibition display unit due to live and dead loads.

2.7 ELEMENT – A part or portion of an exhibition display unit.

2.8 EXHIBITION DISPLAY UNIT – A complete show exhibit or any subcomponent element that is able to be used as a complete stand-alone display.

2.9 EXHIBITION DISPLAY UNIT, CUSTOM DESIGN – A unit with unique construction that is intended for display at a particular exhibition, show, meeting, or assembly. The unique construction is intended to be used for a particular product, service, or organization.

2.10 EXHIBITION DISPLAY UNIT, MOTOR-OPERATED – An exhibition unit provided with a motor.

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2.11 EXHIBITION DISPLAY UNIT, MULTIPLE-STORY – An exhibition unit with two or more stories, with or without a ceiling or covering for the top floor.

2.12 EXHIBITION DISPLAY UNIT, PORTABLE – An exhibition unit that is intended to be moved and is hand carried and set up without tools and/or ladder.

2.13 EXHIBITION DISPLAY UNIT, STATIONARY – An exhibition unit located in a dedicated space, and not normally or easily moved.

2.14 EXHIBITION DISPLAY UNIT, MODULAR-TYPE SYSTEM – A system consisting of individual components that mechanically connect together to form the supporting structure of an exhibition display unit or portion of a unit. Elements of these systems are intended to be used repeatedly in various configurations. A modular system uses a locking means of connection whereby the strength and integrity of the connection is maintained.

2.15 FRAME AND ENCLOSURE (For Moving Parts and Electrical Components) – A frame consisting of parts that provide the structural integrity of a product and provides the means of securing the enclosure to the product. The enclosure refers to that portion of a product that:

a) Renders parts that present a risk of electric shock inaccessible;

b) Reduces the risk of emission of flame or molten material; or

c) Reduces the risk of unintentional contact with internal parts that involve a risk of injury.

2.16 GUYING – To attach a rope, chain, rod, wire, or similar device to a structure to provide reinforced support for the structure.

2.17 HANGING COMPONENT – A fabric structure, graphic, or sign, electrical or nonelectric, that is suspended or supported over the portion or portions of an exhibition display unit located on the floor.

2.18 KIOSK-TYPE STRUCTURE – A free standing element of an exhibition display unit less than 8 feet (2.44 m) in height.

2.19 LEAKAGE CURRENT – Currents, including capacitive coupled currents, that flow through a person upon contact between accessible conductive surfaces of a product and ground or other accessible surfaces of the product.

2.20 LIGHT BOX – A custom-built sign assembled using certified components, or a sign that was certified in accordance with the Standard for Electric Signs, UL 48 that has been modified after certification.

2.21 LOAD, DEAD – The weight of materials of construction incorporated into the unit, such as walls, floors, ceilings, stairways, partitions, finishes, and other similarly incorporated structural components.

2.22 LOAD, LATERAL – The lateral unit forces on elements of an exhibition display unit due to the inertia of the unit and occupants in motion.

2.23 LOAD, LIVE – The load resulting from the occupancy of the unit, not including construction load or environmental loads, such as wind loads or dead loads. Live loads occur because of the movement of people and objects on the unit.

2.24 MARKING – Information provided on or in connection with a product, such as company identification, product designation, ratings, warnings, etc.

2.25 PULL-OUT STRENGTH – The measure of the tensile force or load a vertical element and horizontal element connection maintains before the horizontal element disconnects from the vertical component.

2.26 SLIP RESISTANCE – The measure of the slip force or load a vertical element and horizontal element connection maintains before the horizontal element in the groove of an interconnecting vertical element slips out of the groove.

2.27 STAIR NOSING – The rounded edge of a stair tread that projects over the riser.

2.28 STAIRWAY, CIRCULAR OR CURVED – A stairway having an open circular or curved form in its plan view with uniform section shaped treads attached to and radiating from adjacent supporting structures.

2.29 STAIRWAY, SPIRAL – A stairway having a closed circular form in its plan view with uniform section shaped treads attached to and radiating about a minimum diameter supporting column.

2.30 STAIRWAY, WINDING – A stairway having straight sections connected with sections of radially shaped treads where a change of direction occurs.

2.31 TOWER – A free standing component of an exhibition display unit 8 feet (2.44 m) or greater in height that is separate from, or attached to, the main unit construction. A tower is not intended to be occupied.

3 Components

3.1 Other than as indicated in 3.2, a component of products covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components used in the products covered by this standard.

3.2 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.

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

3.4 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.

3.5 Electromagnetic-interference filters, relocatable power taps, and transient voltage surge suppressors that are used in an exhibition display unit to operate on 50 to 60 hertz power circuits shall comply with, in addition to the applicable requirements in this standard, the applicable requirements in the Standards for Electromagnetic Interference Filters, UL 1283, Standard for Relocatable Power Taps, UL 1363, and Surge Protective Devices, UL 1449, respectively.

4 Units of Measurement

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

4.2 Values of voltage and current are rms values, unless otherwise stated.

5 References

5.1 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.

UL Standards

UL 48
Standard for Electric Signs

UL 67
Standard for Panelboards

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

UL 98
Standard for Enclosed and Dead-Front Switches

UL 153
Standard for Portable Electric Lamps

UL 217
Standard for Smoke Alarms

UL 299
Standard for Dry Chemical Fire Extinguishers

UL 489
Standard for Molded Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures

UL 498
Standard for Attachment Plugs and Receptacles

UL 711
Standard for Rating and Fire Testing of Fire Extinguishers

UL 723
Standard for Test for Surface Burning Characteristics of Building Materials

UL 746A
Standard for Polymeric Materials – Short Term Property Evaluations

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

UL 969
Standard for Marking and Labeling Systems

UL 1004-1
Standard for Rotating Electrical Machines – General Requirements

UL 1004-2
Impedance Protected Motors

UL 1004-3
Thermally Protected Motors

UL 1283
Standards for Electromagnetic Interference Filters

UL 1363
Standard for Relocatable Power Taps

UL 1439
Standard for Test for Sharpness of Edges on Equipment

UL 1449
Standard for Surge Protective Devices

UL 1573
Standard for Stage and Studio Luminaires and Connector Strips

UL 1574
Standard for Track Lighting Systems

UL 5085-1
Standard for Low Voltage Transformers Part 1 General Requirements

UL 5085-3
Standard for Low Voltage Transformers Part 3; Class 2 and Class 3 Transformers

UL 1598
Standard for Luminaires

UL 1975
Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes

UL 2108
Standard for Low Voltage Lighting Systems

ANSI[1] Standards

ANSI C101,
American National Standard for Leakage Current for Appliances

ANSI Z97.1,
Standard Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings

ASTM[2] Standards

ASTM B117,
Standard Practice for Operating Salt Spray (Fog) Apparatus

NEMA[3] Standards

NEMA WD6,
Standard for Wiring Devices – Dimensional Requirements

NFPA[4] Standards

NFPA 10,
Standard for Portable Fire Extinguishers

NFPA 70,
National Electrical Code

NFPA 101,
Life Safety Code

NFPA 701,
Standard Method of Fire Tests for Flame Propagation of Textiles and Films

NFPA 703,
Standard for Fire Retardant Impregnated Wood and Fire Retardant Coatings for Building Materials

[1]American National Standards Institute

[2]American Society for Testing and Materials

[3]National Electrical Manufacturers Association

[4]National Fire Protection Association

PART I – CONSTRUCTION

STRUCTURAL

6 General

6.1 The construction of an exhibition display unit shall comply with the requirements of the Uniform Building Code (UBC), the Americans with Disabilities Act (ADA) Handbook, Chapter 1 as applicable, and with the requirements of this standard.

6.2 For the purpose of evaluating an exhibition display unit for construction and performance, the unit shall not be anchored to the floor of the exhibit facility.

7 Requirements Particular to Glass and Support Brackets

7.1 Glass shall not be less than 0.115 inch (2.92 mm) thick where the length or width of the glass is not greater than 12 inches (305 mm). Glass having a dimension greater than 12 inches shall not be less than 1/8 inch (3.2 mm) thick and the glass shall comply with the following:

a) Be a non-shattering or tempered type that, when broken, complies with the Standard Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings, ANSI Z97.1; and

b) Comply with Glass Panel Tests, Section 38 or Mechanical Strength Tests, Section 42, as applicable.

8 Requirements Particular to Towers 8 Feet (2.44 m) or Greater

8.1 A tower, as specified in 2.31, shall comply with the applicable requirements in this standard and the requirements in this Section.

8.2 Certified engineering calculations, including a height to weight ratio, shall be provided to verify the structural integrity for a load-bearing surface of a tower.

Exception: A height to weight ratio is not required to be provided where other means of support, such as guying, is provided.

8.3 Unless the engineering calculations specified in 8.2 include a height to weight ratio that accounts for a specified number of occupants, a tower shall not be intended for occupancy. Where the engineering calculations for a tower provide for occupancy, the requirements in Sections 11 – 13 shall be applied, as applicable.

8.4 The area within a tower, lower than 8 feet (2.44 m), is able to be used for storage of transient material.

8.5 For the purpose of evaluating a tower for construction and performance, the unit shall not be anchored to the floor of the exhibit facility.

8.6 A tower, as described in 2.31, shall comply with Stability Tests Particular to Towers, Section 40.

9 Requirements Particular to Kiosks

9.1 A kiosk-type structure shall comply with the requirements of this standard as applicable.

10 Requirements Particular to Hanging Components

10.1 General

10.1.1 A hanging component, as described in 2.17, that forms part of the exhibition display unit or as a separate component shall comply with all applicable requirements in this Standard and the requirements in this Section.

10.1.2 Water shall be capable of freely passing through all materials of an overhead fabric structure or the parts of a hanging component such as a sign or graphic.

10.1.3 Certified engineering calculations shall be used to determine the structural integrity of a hanging component.

Exception: This requirement does not apply to a lightweight hanging component, such as a banner, that complies with 10.1.4(a).

10.1.4 A hanging component shall be classed in accordance with the following:

a) Class I: Materials less than 100 pounds (45.4 kg);

b) Class II: Materials greater than 100 pounds and less than 500 pounds (226.8 kg); or

c) Class III: Materials 500 pounds and over.

10.1.5 A Class I hanging component shall be constructed with a minimum of two hanging pick points and one hoisting pick point which, together, shall be capable of supporting 5 times the weight of the component when the component is suspended.

10.1.6 The hanging pick point is the point on a hanging component at which the means for attaching a suspending cable to the component is located. The hoisting pick point is the point at which the cables used to hang a component come together to suspend the component from a suspending means, such as a beam.

10.1.7 A Class II hanging component shall be constructed with a minimum of two hanging pick points. The means for attaching the cable at each pick point shall be capable of supporting 5 times the weight of the component when the component is suspended.

10.1.8 When a Class II hanging component is constructed with more than two hanging pick points, the means for attaching the cable at each pick point shall be capable of supporting the weight of the component when the component is suspended.

10.1.9 When one hoisting pick point is used to suspend a Class II hanging component, the means for suspending the component shall be capable of supporting 5 times the weight of the component when the component is suspended.

10.1.10 A Class III hanging component shall be constructed with a minimum of four hanging pick points. The means for attaching the cable at each pick point shall be capable of supporting 5 times the weight of the component when the component is suspended.

10.1.11 When a Class III hanging component is constructed with more that four hanging pick points, the means for attaching the cable at each pick point shall be capable of supporting the weight of the component when the component is suspended.

Exception: A Class III triangle-shaped hanging component is able to have three hanging pick points when each point is capable of holding 6 times the weight of the component when the component is suspended.

10.1.12 When one hoisting pick point is used to suspend a Class III hanging component, the means for suspending the component shall be capable of supporting 5 times the weight of the component when the component is suspended.

10.1.13 A hanging component shall be suspended within the area that the exhibition display unit occupies. The component shall be suspended a minimum distance in from the front of the exhibition display unit equal to 25 percent of the straight linear distance from the back to front of the unit. The distance on each side of the component, when suspended, shall not be greater than the distance equal to 50 percent of the straight linear distance of the width or length of the unit over which the component is suspended.

10.1.14 A component shall be suspended from load-bearing points of the facility structure designated for such use by the exhibit facility. A hanging component shall not be suspended from piping, sprinklers, or ductwork systems of the exhibit facility.

10.1.15 Cable used to hang components shall be a minimum 1/4 inch multi-stranded type wire rope, guy wire, or aircraft cable.

10.1.16 Tie wire shall not be used to suspend hanging components.

10.1.17 Written instructions and drawings shall be provided with a hanging component that specifies the floor plan for the exhibition display unit, the exact location and height at which the component is to be suspended, and a view of the hanging component that details the assembly steps required to assemble the component as intended.

10.2 Hanging Fabric Ceilings and Canopies

10.2.1 Unsupported hanging fabric ceilings, canopies, and other similar structures shall be limited to Class I as specified in 10.1.4(a).

Exception: When a frame, truss, or similar supporting means is used to support a hanging fabric ceiling, canopy, or similar structure, the structure is able to be Class II or Class III in accordance with 10.1.4(b) and (c).

10.3 Hanging signs

10.3.1 A sign and outline lighting system, feeder circuit, or branch circuit supplying a sign or outline lighting system, shall have an externally operable disconnect means that opens all ungrounded conductors. For a disconnecting means not integral to a sign or outline lighting system, the disconnect means shall be within sight of the exhibition display unit.

Exception: A sign or outline lighting system provided with a flexible cord and attachment plug for connection to the supply circuit is not required to have the specified disconnect means.

11 Requirements Particular to Decks and Multiple-Story Exhibition Display Units

11.1 General

11.1.1 A deck or the first story of a multiple-story exhibition display unit shall have the load-bearing floor surface located 3 feet, 6 inches (1.07 m) or higher above the exhibit facility floor.

11.1.2 The open area below a deck or below the floor of the first story of a multiple-story exhibition display unit shall not be accessible to persons.

Exception No. 1: This requirement does not apply to a deck or exhibition display unit that complies with 11.8.1.

Exception No. 2: This requirement does not apply to qualified personnel servicing the unit.

11.2 Straight stairway

11.2.1 The rise of a straight stair shall not be greater than 7 inches (178 mm) and shall not be less than 4 inches (102 mm).

11.2.2 The tread of a straight stair shall not be less than 11 inches (279 mm). The run shall be measured horizontally between the vertical planes of the furthermost projections of adjacent treads or stair nosing. (See 2.27).

11.2.3 Stair treads shall be of uniform size and shape.

11.2.4 The stair nosing of a straight stair shall not protrude greater than 1-1/2 inches (38.1 mm) beyond the riser.