



UL 1678

STANDARD FOR SAFETY

Household, Commercial, and
Institutional-Use Carts, Stands and
Entertainment Centers for Use with
Audio and/or Video Equipment

UL Standard for Safety for Household, Commercial, and Institutional-Use Carts, Stands and Entertainment Centers for Use with Audio and/or Video Equipment, UL 1678

Sixth Edition, Dated June 18, 2019

Summary of Topics

This revision of ANSI/UL 1678 dated November 7, 2023 includes the clarification of the Appurtenance Stability Test; [16.1.4](#).

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 revised requirements are substantially in accordance with Proposal(s) on this subject dated July 7, 2023 and October 6, 2023.

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UL 1678

Standard for Household, Commercial, and Institutional-Use Carts, Stands and Entertainment Centers for Use with Audio and/or Video Equipment

The First, Second, and Third Editions were titled Standard for Household, Commercial, and Professional-Use Carts and Stands.

The Fourth Edition was titled Standard for Household, Commercial, and Professional-Use Carts and Stands for Use with Audio/Video Equipment.

Prior to the Fifth Edition of UL 1678, the requirements for Tall Institutional Carts were included in the Standard for Tall Institutional Carts for Use with Audio-, Video-, and Television-Type Equipment, UL 1667.

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June 18, 2019

This ANSI/UL Standard for Safety consists of the Sixth Edition including revisions through November 7, 2023.

The most recent designation of ANSI/UL 1678 as an American National Standard (ANSI) occurred on November 7, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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>.

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INTRODUCTION

1 Scope

1.1 These requirements apply to household, commercial, and institutional-use carts, stands and entertainment centers intended to provide a surface for the support or attachment of audio and/or video equipment.

1.2 These requirements also apply to tall institutional-use carts and stands intended to provide a surface for the support of audio and/or video equipment that have a support bracket or shelf that is more than 39.4 inches (1 m) above the floor and are intended for use in schools, institutions, hospitals or similar locations where children or persons with diminished capacity are likely to move them or may be asked to move them.

1.3 A furnishing intended to support audio and/or video equipment shall be evaluated in accordance with one of the following:

a) If the audio and/or video support system is not motorized and an entertainment center or a stand with or without casters or wheels, this standard applies;

b) If the audio and/or video support system is intended to be mounted to walls, ceilings or another part of a building structure as the primary support means (it is not touching the floor), the Standard for Wall and Ceiling Mounts and Accessories, UL 2442, applies;

c) If a cart, stand or support surface is supplied with the audio or video equipment by the manufacturer of the audio or video equipment, the requirements contained in the audio or video component standard apply. The Standard for Audio, Video and Similar Electronic Apparatus, UL 60065, the Standard for Information Technology Equipment – Safety, UL 60950-1, or the Standard for Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements, UL 62368-1, as applicable to the product, applies.

d) Information Technology and Communications Equipment Cabinets, Enclosure and Rack Systems are investigated to the Standard for Information Technology Equipment – Safety – Part 1, UL 60950-1 or Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements, UL 62368-1.

1.4 These requirements do not apply to any electrical circuitry integral to or provided with a cart, stand or entertainment center.

2 Glossary

2.1 For the purposes of this standard, the following definitions apply.

2.2 **ACCESSORY** – An optional part that interfaces with the basic cart, stand or entertainment center and is intended to be attached by the user or installer. Subassemblies field assembled to form the basic cart, stand or entertainment center are not accessories.

2.3 **APPURTENANCE** – Objects on a cart, stand or entertainment center such as a door, drawer, or a sliding work surface.

2.4 **CART** – A stand provided with casters, wheels, or rollers intended to make it easily mobile.

2.5 **CRT** – Cathode Ray Tube. A vacuum tube containing an electron gun used to create images on the screen.

2.6 DEDICATED STORAGE AREA – An area of a cart, stand or entertainment center intended to accommodate specific articles such as storage media: tapes, CDs, DVDs, and flash drives.

2.7 DESIGNATED LOAD – The maximum weight specified by the manufacturer that the cart, stand or entertainment center is intended to accommodate.

2.8 ENTERTAINMENT CENTER – A furnishing intended to support a television and the associated audio equipment; also provided with doors, drawers or shelves.

2.9 HANDLE – A feature that is specifically intended to facilitate carrying, transporting, lifting or movement of the total product. Features such as drawer pulls, knobs on drawers or doors, decorative moldings and shelf edges are not considered to be handles.

2.10 INSTITUTIONAL AREAS – Include but are not limited to health care facilities, old age convalescent board and care homes, college dormitories, schools, residence halls, jails, prisons, nursing care homes, public auditoriums, hotels and motels.

2.10A LIVE PART – Any part where current is flowing.

2.11 MAXIMUM ANTICIPATED LOAD – A test weight that is based on the usable volume of a compartment.

2.12 MOUNTING SURFACE – A surface that is a part of the cart, stand or entertainment center used for securing a flat panel video display (television) to the cart, stand or entertainment center. Flat panel video displays are connected to the mounting system or bracket with hardware and fasteners. Mounting surfaces may be fixed position or adjustable to various angles and heights.

2.13 NORMAL USE – Those operations performed by the user to utilize a fully assembled cart or stand, with or without equipment and accessory loads installed.

2.14 ORDINARY TOOLS – Tools which are normally expected to be available to the user, such as, flat-bladed and cross-recessed head (Phillips-type) screwdrivers, hammers, nut drivers, and pliers.

2.15 RACK – A type of framework designed to mount or secure audio, video and ITE equipment.

2.16 RESIDENCE (HOUSEHOLD) – A place where people live such as a house or apartment. The terms "household" and "residence" are equivalent.

2.17 SIMULATED TELEVISION LOAD –

A test fixture intended to simulate a video display or television (as used within this Standard, the terms television, TV, and video display are equivalent).

a) [Figure 16.1](#) – The fixture depicted simulates all technology televisions, monitors or video displays that are free standing and that will rest on a television shelf.

b) [Figure 16.2](#) – The fixture depicted simulates flat panel video display television technology and is used for testing when the television is intended to be secured to a mounting bracket provided with the cart, stand or entertainment center.

2.18 STAND – A structure on or in which audio and/or video equipment and accessories are intended to be placed, contained, or mounted for support.

2.19 SUPPORTING SURFACE – Any surface (shelf, drawer, or similar surface) that is intended to support equipment or an accessory that is used with equipment (records, tapes, digital discs, headphones, and similar products).

2.20 TALL INSTITUTIONAL CART –

a) A cart where the television or apparatus supporting surface is more than 39.4 inches (1 m) above the floor and the cart is recommended by the manufacturer to be used in institutional areas where children, or people with diminished capacity are likely to move or may be asked to move the cart; or

b) A cart where the television when mounted to the mounting surface of the cart places the center line of the television surface more than 39.4 inches (1 m) above the floor and the cart is recommended by the manufacturer to be used in institutional areas where children, or people with diminished capacity are likely to move or may be asked to move the cart.

2.21 TELEVISION – Cathode Ray Tube (CRT), Monitor or Video Display – LED, LCD, OLED, Plasma or similar equipment intended to provide a visible image or information to the user.

2.22 TELEVISION SHELF – A horizontal or sloping surface specifically identified in the use and care instructions for the placement and support of a television.

2.23 USER ASSEMBLY – Any mechanical assembly of the cart, stand or entertainment center, performed by the user.

2.24 UTILIZATION EQUIPMENT – Equipment that utilizes energy for electronic, electromechanical, heating, lighting or similar purposes.

3 Components

3.1 Except as indicated in [3.2](#), a component of a product covered by this standard shall comply with the requirements for that component.

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 An adhesively applied marking that is required to be permanent shall comply with the Standard for Marking and Labeling Systems, UL 969.

3.6 Polymeric materials required to meet flammability requirements shall comply with the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94.

3.7 Receptacle outlets provided on a cart, stand or entertainment center shall comply with the Standard for Relocatable Power Taps, UL 1363, or the Standard for Furniture Power Distribution Units, UL 962A, and shall be mounted in accordance with the installation instructions.

4 Units of Measurement

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

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.

CONSTRUCTION

6 General

6.1 A cart, stand or entertainment center shall be constructed so that:

- a) User assembly and normal use do not result in a risk of fire, electric shock, or injury to persons; and
- b) The materials and components are used within their mechanical, electrical, and temperature limits.

6.2 A mounting system used with a cart, stand or entertainment center that is intended to support a video display with a weight greater than 15 lbs (6.8 Kg) shall be constructed to prevent the video display from being inadvertently dislodged or removed from the mounting system. Gravity shall not be the sole means of securement for the video display.

7 Corrosion Protection

7.1 Ferrous metal parts shall be protected against corrosion by galvanizing, plating, painting, powder coating, enameling, or other equivalent means when the corrosion of such parts is likely to result in a risk of fire, electric shock or injury to persons.

8 Sharp Edges

8.1 Sharp edges shall not be accessible during user assembly or normal use. An accessible edge shall be smooth and well rounded to reduce the risk of a cut-type injury when contacted during user assembly or normal use. Compliance shall be determined in accordance with the Standard for Test for Sharpness of Edges on Equipment, UL 1439.

9 Securement of Supported Equipment

9.1 General-Use Carts

9.1.1 Supporting surfaces of a cart which are located more than 39.4 inches (1 m) above the floor shall be provided with a means to restrict equipment from sliding off the surface. A minimum 1/8-inch (3.2-mm) high lip or rail on the sides of the supporting surface or the equivalent obstruction meets the intent of the requirement.

Exception: A supporting surface that is intended for use with equipment that is secured to it (that is, with bolts, screws, straps, or other securement means) is not required to comply with [9.1.1](#). The assembly of the equipment to the supporting surface shall be in accordance with the Use and Care Instructions, Section [25](#).

9.1.2 The means for securing an electrical product shall be such that it does not present a risk of injury or electric shock.

9.2 Tall Institutional Carts

9.2.1 Supporting surfaces on a tall institutional cart which are located more than 39.4 inches (1 m) above the floor shall be provided with a mechanical means for securing equipment in accordance with [9.2.2](#).

9.2.2 Acceptable means for securement in accordance with [9.2.1](#) include screws, straps and similar securement means. The assembly of the equipment to the supporting surface shall comply with the Use and Care Instructions, Section [25](#).

9.3 Multiple Video Display Surfaces

9.3.1 A cart, stand or entertainment center provided with two or more mounting surfaces for video displays shall be provided with use and care instructions specifying the order in which the video displays is to be installed; unless installation in any order does not cause the product to become unstable. The product shall be tested for stability in accordance with [16.7.1](#).

9.3.2 A cart, stand, or entertainment center provided with two or more mounting surfaces for video displays shall specify both the maximum and minimum weight of the equipment or maximum weight and allowable percent difference to be supported if equipment that is less than the maximum weight when mounted will cause the product to become unstable. The product shall be tested for stability in accordance with [16.7.2](#).

9.3.3 A cart, stand, or entertainment center provided with two or more mounting surfaces where removal of one or more pieces of video displays could cause the product to become unstable shall be permanently marked as specified in [24.11](#).

10 Ventilation

10.1 Each enclosed area of a cart, stand or entertainment center intended to accommodate electrical utilization equipment shall be provided with natural convection openings or a mechanical ventilation system for the equipment installed within the enclosed area. Installation and use instructions shall be used to determine the intended use of an enclosed area.

11 Materials

11.1 Flammability

11.1.1 Polymeric or similar material used in the construction of a cart, stand, or entertainment center that is used as an enclosure or support for live parts shall have a minimum flammability classification of HB. The flammability classification is to be determined by tests specified in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94. A material classified using 1/8-inch (3.2-mm) thick bar specimens is able to be employed in thicknesses less than 1/8 inch in the cart, stand or entertainment center.

11.2 Polymeric load supporting parts

11.2.1 A polymeric part of the cart, stand or entertainment center shall not be used as the only attachment method for securing the weight of the video displays equipment to the cart stand or entertainment center.

11.2.2 A polymeric part may be used as a bushing, bearing, spacer, or other part provided that when removed from the product the product will not release the weight of the video displays equipment as specified in Loading Tests, Section [17](#). The part does not need to be removed for the tests specified in Section [17](#) if by inspection it can be determined that the polymeric part is not required to support the weight load of the video displays equipment.

Exception: Wheels and casters that comply with Tip Stability, Section [16](#), Loading Tests, Section [17](#), and Wheel, Roller, or Caster Securement Test, Section [21](#), are acceptable.

12 User Assembly

12.1 A cart, stand or entertainment center intended to be user assembled shall comply with the following:

- a) The assembly shall be accomplished by the user with ordinary tools or with tools supplied with the cart, stand or entertainment center.
- b) All parts such as screws, bolts, and similar parts that are required to complete the assembly shall be provided.
- c) Assembly instructions shall be provided. The instructions shall not cause the user to commit an act that in itself might result in a risk of fire, electric shock, or injury to persons.

13 Wheels, Rollers and Casters

13.1 The attachment of a wheel, roller, or caster to the cart shall comply with the Wheel, Roller, or Caster Securement Test, Section [21](#).

13.2 A tall institutional cart shall be provided with casters having a minimum diameter of 4 inches (101.6 mm).

PERFORMANCE

14 General

14.1 A cart, stand or entertainment center shall be assembled in accordance with the manufacturer's instructions. The Use and Care Instructions, Section [25](#), are to be used as a reference during the examination and tests of a cart, stand or entertainment center.

14.2 As specified in each test procedure, each shelf, drawer or supporting surface shall be loaded in accordance with [Table 14.1](#).

Table 14.1
Supporting Surface Loading Parameters

Surface type	Load
Television shelf or mounting surface	Fully loaded with the manufacturer's specified weight.
Other supporting surface	Fully loaded with the manufacturer's specified weight.
Dedicated storage area	Fully loaded with the manufacturer's specified weight.
Tall institutional cart designated load	A "designated load" is to be either the maximum weight specified by the manufacturer that the tall institutional cart is intended to accommodate, or the value determined using the following equation, whichever is greater: $W = 0.015V$ (416V) in which: W is the weight in pounds (kg), and V is the useable volume of the compartment in cubic inches (cubic meters). If the height of the compartment exceeds 7.5 inches (19.1 cm), a value of 7.5 inches (19.1 cm) is to be used in computing the volume.
Tall institutional cart maximum anticipated load	A "maximum anticipated load" is to be used to represent the worst case equipment loading when the use of a supporting surface is not specified and is not limited. The weight of the maximum anticipated load is to be computed by the following formula: $W = 0.03V$ (832V) in which: W is the weight in pounds (kg), and V is the useable volume of the compartment in cubic inches (cubic meters). If the height of the compartment exceeds 7.5 inches (19.1 cm), a value of 7.5 inches (19.1 cm) is to be used in computing the volume.

15 Temperature Stability Test

15.1 A cart, stand or entertainment center employing polymeric materials (non-decorative) that provide structural support of the stand assembly or restraint for equipment shall comply with the stability and loading tests after the environmental conditioning specified in [15.2](#).

15.2 An unloaded cart, stand or entertainment center is to be placed in a full-draft circulating-air oven. The air temperature within the oven is to be maintained at 70°C (158°F) for 7 hours.

16 Tip Stability Test

16.1 General

16.1.1 Section [16.2](#) applies to a cart or stand intended to support or store audio and/or video equipment other than a television or having other general storage. When a cart or stand incorporates a support surface (television shelf) or a mounting surface for a television, Section [16.4](#) applies. When a cart, stand or entertainment center incorporates support for audio and/or video equipment or general storage and a support surface or a mounting surface for a television, both Sections [16.2](#) and [16.3](#) apply.

16.1.2 A cart, stand or entertainment center supplied with a system to anchor the product to a structure shall comply with these requirements without the anchoring or securement system installed.

16.1.3 A test platform or floor larger than the cart, stand or entertainment center shall be used and shall be level ± 0.2 degrees. The incline plane shall then be placed on or attached to the test platform.

16.1.4 When situated on the test platform in accordance with [16.1.3](#), an unloaded cart, stand, or entertainment center shall not tip with any combination of drawers, doors, or shelves opened or closed, as permitted by normal operation of the furnishing.

16.2 Carts or Stands Intended to Support or Store Audio and/or Video Equipment Other Than a Television or Having Other General Storage

16.2.1 A cart or stand shall not tip over when placed at the center of a plane inclined to make an angle of 10 ± 0.2 degrees with the horizontal. The test shall be repeated with any side of the cart, stand or entertainment center oriented toward the bottom of the incline plane.

Exception: If a stand is permanently marked as indicated in [24.6](#) to indicate that a side of the unit is to be placed against a wall or other fixed structure, the marked side is not to be oriented toward the bottom of the incline plane.

16.2.2 The test shall be conducted with all of the following:

- a) The legs, wheels, casters, or similar means of support, arranged in the position most likely to result in tip-over and blocked so that the cart or stand does not slide on the inclined plane. The thickness of the mechanism employed to block casters or wheels shall be a maximum of $1/8^{\text{th}}$ the diameter of the caster or wheel.
- b) All doors, drawers and other movable or adjustable parts shall be positioned as they will normally be used. Doors which must be open to view a television or to remotely operate components shall be in the open position. Doors, drawers, and shelves that are intended for accessories such as tapes, headphones, digital discs, and similar accessories are to be secured closed so as not to open when placed on the incline plane.
- c) Each of the remaining supporting surfaces not specified in [16.2.2\(b\)](#) shall be loaded as described in [Table 14.1](#), or unloaded, whichever is most likely to result in tip over.

16.2.3 When loading shelves and drawers, the load is to be centered front to back and side to side on the surface and evenly distributed across the surface under test.

16.2.4 When a supporting surface is provided with a means to secure a product (such as straps, screws or similar securement means), the securement means and any use and care instructions are to be used when positioning the load. The load is to be placed within the confines of the securement means in the position most likely to result in tip over.

16.3 Carts, Stands and Entertainment Centers Having a Support Surface or Mounting Surface for a Television

16.3.1 A cart, stand or entertainment center intended for use with a television shall not tip over when placed at the center of a plane inclined to make an angle of 10 ± 0.2 degrees with the horizontal and loaded as specified in [Table 14.1](#). Also refer to Section [16.2](#) when other storage and support surfaces are provided. The surface intended to support a television shall be loaded with the simulated television load described in [16.3.4](#). If the manufacturer specifies a television weight range, then the test is to be conducted with the heaviest weight television unless a lower weight television is determined to cause the cart, stand or entertainment center to be less stable.

16.3.2 Except as described in [16.3.3](#), when a simulated television load as described in [16.3.4](#) is used on a television shelf, it is to be oriented within the confines of the useable television shelf in the position most likely to result in tip-over. The recommended television shelf is to be specified in the Use and Care Instructions, Section [25](#).

16.3.3 When a television shelf or mounting surface is provided with a means to secure the television to the supporting surface with straps, screws or similar securement means, the use and care instructions are to be used when positioning the load. The load is to be placed within the confines of the securement means in the position most likely to result in tip over.