



STANDARD FOR SAFETY

Special-Use Switches



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UL Standard for Safety for Special-Use Switches, UL 1054

Seventh Edition, Dated March 18, 2013

Summary of Topics

Revision pages for the Standard for Special-Use Switches, UL 1054 have been issued to make an editorial correction in Table 16.1. No other changes have been made to this standard.

The revisions are substantially in accordance with Proposal(s) on this subject dated January 25, 2013.

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INTRODUCTION

1 Scope

1.1 These requirements cover manually operable and mechanical operable special-use switches and replacement switches:

- a) That are for use on direct current as well as on alternating current or on alternating current only, and
- b) For which the load ratings do not exceed 60 A at 250 V or a lower potential and 30 A or 2 hp at 600 V or a lower potential.

1.2 These requirements cover special-use switches intended for use in devices or appliances which conform with the requirements applicable to such equipment. A special-use switch is intended for factory installation in equipment and is not intended for field installation or field replacement of a similar switch. A vacuum-cleaner-handle switch, a heater switch, a radio or television switch, and a through-cord switch that has more than one on or one off position are examples of special-use switches.

1.3 These requirements cover replacement switches which are intended for field replacement of special-use switches used as part of devices and appliances. Only single or double pole, single or double throw switches are covered. Replacement switches are not for use in safety circuits.

1.4 These requirements do not cover general-use snap switches covered by the Standard for General-Use Snap Switches, UL 20.

1.5 These requirements do not cover through-cord switches with one on and one off position, special-use dimmer switches, or switches constructed so that they can be installed readily in a flush-device box or an outlet-box cover or can otherwise be used in a wiring system that complies with the National Electrical Code, NFPA 70.

2 Glossary

2.1 For the purpose of this standard the following definitions apply.

2.2 **ACTUATING MEMBER** – The part of the operating mechanism that extends outside the body of the switch and is intended to be exposed to contact by the operator.

2.3 **CURRENT-INRUSH FACTOR** – The number by which the normal (steady-state) peak current through a tungsten-filament-lamp load is multiplied to obtain the peak value of the inrush current through the load.

2.4 **PUSH-IN (SCREWLESS) TERMINAL** – A wire terminal that automatically locks a stripped conductor when it is inserted in the terminal.

2.5 **SAFETY CIRCUIT** – A primary or secondary circuit that is relied upon to reduce the risk of fire, electric shock, or injury to persons, or risk of electrical energy or excessive radiation emission, microwave or X-radiation. Examples include an interlock circuit, a circuit that limits leakage current to accessible parts, a circuit that limits the wattage to a limited-energy circuit, or a phase control or other circuit designed to limit temperatures in the end-use equipment to appropriate levels.

2.6 **TELEVISION SWITCH** – A switch intended for use as a supply-circuit control switch in a radio or television-receiving appliance.

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3 Components

3.1 A component of a product covered by this standard shall comply with the requirements for that component, and shall be used in accordance with its recognized rating and other limitations of use. 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 switches covered by this standard; or
- b) Is superseded by a requirement in this standard.

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

3.3 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.

3.4 In the following text, a requirement that applies only to a switch for a specific use, such as in a heating appliance or in a radio or television-receiving appliance, is so identified by a specific reference in that requirement to the use involved. Absence of such specific reference or use of the term switch indicates that the requirement applies to all switches covered by this standard unless the context indicates otherwise.

4 General Requirements for All Switches

4.1 Requirements under this heading apply to all switches covered by this standard. They are supplemented in subsequent sections with requirements applying exclusively to heater switches, television switches, and special-use dimmer switches.

4.2 A switch shall employ materials that are acceptable for the intended use.

CONSTRUCTION

5 Enclosure

5.1 General

5.1.1 A metal enclosure of a switch (such as the shell of a pendant-type switch) shall not be less than 0.013 in (0.33 mm) thick. Thicker metal shall be employed to provide strength and rigidity if the size or shape of the enclosure requires an increased metal thickness.

5.1.2 A switch intended to be exposed to a specific environment shall comply with the applicable requirements in the Standard for Enclosures for Electrical Equipment, UL 50.

5.2 Lining

5.2.1 All conductive material on the inside surface of a part of the enclosure that is removable for wiring shall be lined completely with insulation not less than 1/32 in (0.8 mm) thick. The thickness of the insulation is to be measured by means of a machinist's micrometer caliper having a flat-ended spindle and a rounded anvil.

Exception: The lining of a switch may be less than 1/32 in (0.8 mm) thick if of a material – other than paper or fiber – that has been shown to be acceptable for the application, and may be omitted if there is a spacing of not less than 1/4 in (6.4 mm) between any uninsulated live part and the metal enclosure.

5.2.2 An insulating lining shall be secured so that it will remain in place under conditions of ordinary service and prevent the enclosure from becoming a live part even if a wire inside the switch should become loose or detached from its position.

6 Thermoplastic Materials

6.1 A thermoplastic material used in a switch shall comply with the requirements in Table 6.1.

Exception: A thermoplastic material with a flammability Class of less than V-2 as required in Table 6.1 used in a switch with material that complies with the applicable 3/4-in flame test specified in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C, complies with the requirement.

Table 6.1
Minimum flammability class for a thermoplastic material

Function	Minimum flammability class ^a
Enclosure or support of current-carrying parts	V-2 ^b
A functional part other than an enclosure or support of current-carrying parts	HB ^b
^a The flammability Class is determined at a minimum thickness of 0.8 mm (0.031 in) or the minimum thickness employed in the construction, whichever is greater. ^b In accordance with the applicable requirements in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94.	

7 Nonmetallic Parts

7.1 A nonmetallic material employed either in the actuation mechanism or for the sole support of a current-carrying part of a switch shall have a Relative Thermal Index (RTI) – electrical, or mechanical without impact acceptable for its intended use. The RTI for a material is to be determined in accordance with the Standard for Polymeric Materials – Long Term Property Evaluations, UL 746B, at the minimum thickness employed in the construction. Also, the switch shall comply with Mold Stress, Section 15.1.

Exception: A mold stress test need not be conducted for a material that is intended to be used at a temperature below 50°C (122°F) or below the generic RTI for the material specified in the Standard for Polymeric Materials – Long Term Property Evaluations, UL 746B.

8 Sealing Compound

8.1 Live screwheads or nuts on the underside of a base constructed for surface mounting shall be:

- a) Countersunk not less than 1/8 inch (3.2 mm) in the clear, and covered with a waterproof, insulating sealing compound that has a softening point of 65°C (149°F) or higher; or
- b) Spaced not less than 1/2 in (12.7 mm) through air from the mounting surface and staked, upset, or otherwise reliably prevented from loosening.

8.2 The depth or thickness of sealing compound covering a nut or screwhead shall not be less than 1/16 in (1.6 mm) or 1/8 in (3.2 mm) if the underside of the base is not recessed and may contact the surface upon which the switch is mounted.

8.3 Sulfur is not an acceptable sealing material.

8.4 Determination of the softening point of a sealing compound is to be made in accordance with the Test for Softening Point by Ball-and-Ring Apparatus, ASTM E28.

9 Live Parts

9.1 General

9.1.1 A current-carrying part and a wire-binding nut and a screw shall be of metal and shall have the necessary strength, rigidity, and ampacity to comply with the performance requirements.

9.1.2 A current-carrying part shall be:

- a) Copper or a copper alloy; or
- b) Stainless steel that is resistant to corrosion except for quick-connect terminations, push-in terminals, solder terminals, and parts that are subjected to arcing as shown by the applicable overload and endurance tests.

Exception No. 1: Hermetically sealed switching contacts may be made of corrosion resistant steel alloy.

Exception No. 2: Steel that is protected against corrosion by either zinc plating or the equivalent, may be used for the external buttons or contacts on a mercury-contact switch chamber.

Exception No. 3: Unplated steel may be used for parts wholly within a mercury-contact switch chamber.