



UL 514C

STANDARD FOR SAFETY

Nonmetallic Outlet Boxes, Flush-Device
Boxes, and Covers

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

Fourth Edition, Dated April 8, 2014

Summary of Topics

This revision of ANSI/UL 514C dated August 18, 2020 includes changes needed to accommodate the use of an overmold or overlay material to close small openings in boxes for airseal applications; [19.3A](#), [19.4](#), [34.2.3](#), and [92.1.9](#).

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.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated June 12, 2020.

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APRIL 8, 2014
(Title Page Reprinted: August 18, 2020)



ANSI/UL 514C-2020

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UL 514C

Standard for Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

First Edition – August, 1979
Second Edition – October, 1988
Third Edition – December, 1996

Fourth Edition

April 8, 2014

This ANSI/UL Standard for Safety consists of the Fourth Edition including revisions through August 18, 2020.

The most recent designation of ANSI/UL 514C as an American National Standard (ANSI) occurred on August 18, 2020. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

The Department of Defense (DoD) has adopted UL 514C on August 17, 1989. 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 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 nonmetallic outlet boxes, conduit bodies, flush-device boxes, extension rings, covers, floor boxes, floor nozzles, and concrete boxes to be employed in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements do not cover boxes and covers for use in hazardous locations as defined in the National Electrical Code, NFPA 70.

1.3 These requirements do not cover cabinets and cutout boxes.

2 Terminology

2.1 In the following text, a requirement that applies only to one or more types of box or cover is so identified by a specific reference in that requirement to the type or types of boxes or covers involved. Absence of such reference indicates that the requirement applies to all types of boxes or covers.

3 Glossary

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

3.2 **BAR HANGER** – An adjustable supporting device intended for the support of an outlet box, conduit box, or device box between two structural members in a finished or unfinished structure.

3.3 **BOX EXTENDER** – A component installed in or on a box that is mounted in a finished structure intended to extend the electrical enclosure up to the new finished surface. The box extender rests on the edge of the existing box (fixed depth) or extends into the box (adjustable depth). The flange of the box extender, if provided, rests on the finished surface.

3.4 **CLAMP** – Part of a box intended to secure raceway, tubing, or cable to the box.

3.5 **CONCRETE BOX** – A box intended for support in concrete. It may be constructed to permit end-to-end extension and the application of covers on two sides. It is not intended for installation in a floor.

3.6 **CONDUIT BODY** – A separate part of a raceway system intended to provide access to the interior of the system through one or more removable covers and/or sockets at a junction of two or more sections or at a terminal point. Boxes, such as FS, FD, and larger boxes, and fittings, such as capped elbows and service entrance elbows, are not considered to be conduit bodies.

3.7 **EXTENSION RING** – A ring, which is not required to be round, intended to extend the sides of an outlet box or flush-device box to increase the box depth, volume or both. It is mechanically secured to the box.

3.8 **FLOOR BOX** – A box provided with means for flush mounting in a floor. It is sealed against the entrance of scrub water at the floor level.

3.9 **FLOOR NOZZLE** – An enclosure used on a wiring system, intended primarily as a housing for a receptacle. It is provided with a means, such as a collar, for surface-mounting on a floor, and it may or may not include a stem to support it above the floor level. It is sealed against the entrance of scrub water at the floor level.

3.10 FLUSH-DEVICE BOX – A box provided with ears or flanges with No. 6-32 threaded or unthreaded holes spaced to accept the mounting yoke of a wiring device or devices. This box is provided with a mounting means, and it may or may not include clamps for connection of cable, tubing, or conduit.

3.11 OUTLET BOX – A box used on a wiring system, usually at an outlet. It is provided with means for connection to a wiring system and intended primarily to enclose splices and wiring devices, but may also be acceptable as the support of a fixture/luminaire or other equipment intended for similar installation. This box may or may not be provided with studs or a bar hanger or with clamps for securing cable, tubing, or conduit.

3.12 OUTLET BOX COVER – A cover intended to provide enclosure for the face of a box. The cover may or may not support or be provided with means for support of a wiring device, pendant cord, or the like.

3.13 PARTITION – A barrier used to separate sections of a box.

3.14 RAISED-FLOOR BOX – A floor box intended for use in raised floors, such as in electronic computer/data processing equipment rooms.

4 Units of Measurement

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

4A Normative References

UL 514A
Metallic Outlet Boxes

UL 514B
Conduit, Tubing, and Cable Fittings

BOXES AND COVERS

CONSTRUCTION

5 General

5.1 All boxes and covers

5.1.1 The construction of a box or cover shall provide sufficient strength and rigidity in the finished product to enable the product to resist the rough handling that can be encountered during shipment, installation, and use.

5.1.2 The inner and outer surfaces of a box or cover shall not be subject to peeling, scaling or flaking and shall be smooth and free from blisters, cracks, and other defects. In the case of a molded product, excess flashing shall be removed from the mold line of all interior surfaces so that there are no sharp edges or undue obstructions to the passage of wiring or mating of parts in the intended use of the product.

5.1.3 A partition shall comply with the requirements in Partitions, Section [12](#).

5.1.4 A box intended for use with a partition shall have provision for proper placement of the partition during and after installation.

5.1.5 A box extender shall comply with Box Extenders, Section [28](#).

5.1.6 An outlet box cover constructed to support a flush duplex receptacle shall be provided with more than one securement point for the receptacle.

5.1.7 A cover shall comply with Installation of Receptacles, Section [48](#).

Exception: The face of a receptacle may be located behind a nonmetallic cover provided it complies with all of the following:

a) *The receptacle and cover shall be evaluated as an assembly, including compliance with [48.1](#);*

b) *The assembly shall be evaluated for compliance to requirements in this Standard, and the Standard for Attachment Plugs and Receptacles, UL 498;*

c) *The receptacle and cover shall be permanently attached or uniquely constructed to prevent securement of the cover to any other receptacle; and*

d) *The assembly shall be marked in accordance with [92.6.1](#), and provided with installation instructions in accordance with [93.6](#).*

5.2 Boxes and covers intended for use with nonmetallic-sheathed cable or open wiring

5.2.1 The requirements in Sections [6](#) – [42](#) cover boxes and covers intended for use with nonmetallic sheathed cable or open wiring and boxes with a volume of less than 100 cubic inches (1639 cm³), and multiple-gang flush-device boxes.

5.3 Boxes and covers intended for use with rigid nonmetallic conduit

5.3.1 The requirements in Sections [6](#) – [15](#) and [65](#) – [93](#) cover rigid nonmetallic, such as unplasticized polyvinyl chloride, boxes and covers, including blank covers.

5.3.2 The products covered by the requirements in Sections [6](#) – [15](#) and [65](#) – [93](#) are intended to be joined in the field to rigid nonmetallic conduit.

5.3.3 The nonmetallic products covered by the requirements in Sections [6](#) – [15](#) and [65](#) – [93](#) are considered to be inherently resistant to the corrosive influences of common industrial atmospheres including the vapors and mists of bases, hydrofluoric and chromic acids, and chromic acids, and pickling and plating baths. Resistance to specific reagents is covered in Resistance to Specific Reagents, Section [85](#) and in [92.3.1](#) and [92.3.2](#).

5.3.4 The outlet boxes covered by the requirements in Sections [6](#) – [15](#) and [65](#) – [93](#) have an interior volume of 100 cubic inches (1639 cm³) or less and are intended to provide access to wiring during installation of the wiring. They are also intended to enclose splices, taps, and wiring devices. From one to four unthreaded conduit-connection sockets are provided integrally with a PVC box, or the box is blank.

5.3.5 The conduit bodies covered by the requirements in Sections [6](#) – [15](#) and [65](#) – [93](#) are pull boxes intended for use with nonmetallic conduit to enclose splices and taps and to support wiring devices not involving the generation of heat – for example, lampholders are not acceptable – mounted on cover plates. Blank covers are to be provided with the bodies. From one to four unthreaded conduit-connections sockets are to be provided integrally with the body.

5.3.6 The flush-device boxes covered by the requirements in Sections [6](#) – [15](#) and [65](#) – [93](#) have an interior volume of 100 cubic inches (1639 cm³) or less. Flush-device boxes made of PVC material are

intended for use with nonmetallic conduit for the support of wiring devices not involving the generation of heat – for example, lampholders are not acceptable – with the wiring devices mounted directly in the box rather than on the cover but can also be used as junction and conduit bodies. Flush-device boxes may be provided with blank covers or flush-device cover plates. At least one unthreaded conduit-connection socket or knockout is provided integrally with a PVC box, or the box is blank.

5.3.7 A flush-device box that is not multi-gang, a junction box, or an outlet box, the interior of which is larger in volume than 100 cubic inches (1639 cm³), is covered as a junction or pull box under the requirements in the Standard for Enclosures for Electrical Equipment, UL 50.

5.4 Nonmetallic outlet box covers for use in damp and wet locations

5.4.1 An outlet box cover intended for use in damp or wet locations shall comply with the applicable requirements in Sections [44](#) – [60](#) when installed as intended and shall be marked in accordance with [92.4.1](#) – [92.4.4](#).

Exception No. 1: An outlet box cover intended for use in a wet location with the cover closed is not required to comply with the requirements in [52.3.1](#) and [52.3.3](#).

Exception No. 2: An outlet box cover intended for use in a damp location is not required to comply with the requirements in [52.2.1](#) – [52.3.3](#).

5.5 Boxes and covers intended for use with electrical nonmetallic tubing

5.5.1 The products covered by the requirements in Sections [6](#) – [43](#) and [61](#) – [64](#) are boxes and covers intended for use with electrical nonmetallic tubing.

6 Protection Against Corrosion

6.1 All surfaces of all attached metal parts of a box, including screws, shall be protected against corrosion unless the metal is inherently resistant to corrosion.

Exception: The cut edges, punched holes, and the threaded surfaces of tapped holes of a part formed from galvanized stock do not need additional protection.

6.2 The thickness of the coating on a screw is not specified, but the presence of a coating is to be determined by visual inspection.

6.3 The thickness of a zinc coating on the exposed surface of a permanently attached ferrous metal mounting bracket or a clamp shall not be less than specified in [Table 6.1](#).

Table 6.1
Thickness of coating

Material	Minimum thickness of coating inch [millimeter (mm)]			
	Intended for assembly			
	Outside of box		Inside of box	
Sheet steel	0.0005	(0.013)	0.00015	(0.0038)
Cast iron, including malleable iron	0.00015	(0.0038)	0.00015	(0.0038)

7 Assembly

7.1 Except as noted in [7.2](#), an assembly screw shall not have fewer than the number of threads per inch of the American National Coarse-Thread Series, in accordance with the diameter of the screw, unless it is found by investigation that the screw is not likely to abrade conductor insulation, and that the assembly is not adversely affected by vibration.

7.2 An assembly screw used to secure a cover to a box shall not have a fewer than the number of threads per inch specified in the American National Coarse-Thread Series for the diameter of the screw.

7.3 An outlet box intended to support a fixture/luminaire, but not intended to support a ceiling-suspended fan, may or may not be provided with two or more steel No. 8-32 cover retaining or fixture/luminaire support screws, and shall be provided with threaded or unthreaded holes for No. 8-32 screws.

7.4 An outlet box intended to support a fixture/luminaire, and also intended to support a ceiling-suspended fan, shall comply with Ceiling-Suspended Fan Support, Section [11](#).

7.5 Metal that is part of or provided with an outlet box and with which a wire or cable may make contact shall be located or protected so that contact with the part by a person or by metal outside the box will be prevented.

Exception: A grounding strap or plate may contact wires within an outlet box provided the construction complies with the requirements in [26.1](#).

7.6 So that contact between a supporting eyelet, nail, rivet, or screw and conductors within a box will be prevented as required by [25.3](#), a hole in a box that may be used for an eyelet nail, rivet, or screw shall be located in a recess, designed so that there will be a spacing of not less than 1/32 inch (0.8 mm) between the plane of the top of the recess and the head of the largest eyelet, nail, rivet, or screw that is provided with the box. If a screw or nail is not provided with the box, this spacing shall be measured:

- a) Using the largest round-head screw, specified in [Table 7.1](#), that can be inserted in a hole that is not chamfered, or
- b) Using the largest flat-head screw that can be inserted in a hole that is chamfered.

Table 7.1
Supporting screw hole dimensions

Nominal screw size	Maximum diameter of threads		Minimum dimensions of recess, inch (mm)			
	inch (mm)		Diameter		Depth	
6	0.138	(3.51)	1/4	(6.4)	4/32	(3.2)
8	0.164	(4.17)	19/64	(7.5)	9/64	(3.6)
10	0.190	(4.83)	11/32	(8.7)	5/32	(4.0)
12	0.216	(5.49)	25/64	(9.9)	11/64	(4.4)

7.7 An assembly screw that can be tightened with a screwdriver is to be tightened with the torque specified in [Table 7.2](#).