

Receptacles and Stranded Conductors

Q I was always told that you could not use stranded conductors on receptacles and switches without crimping a spade terminal onto the stranded conductor and then securing the spade terminal onto the device screw terminals. Are receptacles and switches Listed for use with stranded conductors? Are they Listed for use with spade terminals?

A UL Listed receptacles are evaluated for use with solid and stranded conductors; however, they are not Listed for use with spade terminals. Receptacles are Listed under the product category Receptacles for Plugs and Attachment Plugs (RTRT) located on page 295 in the 2008 UL White Book and (RTRT7) on page 434 in the 2008 Canadian White Book. The Guide Information for (RTRT) and (RTRT7) states under the heading of Terminals, “Terminals of the wire-binding screw, setscrew, or screw-actuated back wired clamping types are suitable for use with both solid and stranded building wires. Screwless terminal connectors of the conductor push-in type (also known as “push-in-terminals”) are restricted to 15 A branch circuits and are for connection with 14 AWG solid copper wire only.” They are not intended for use with aluminum or copper-clad aluminum wire, 14 AWG stranded copper wire, or 12 AWG solid or stranded copper wire.

General use switches are Listed for use with only solid conductors unless otherwise indicated in their installation instructions. UL Lists general use switches for mounting in device boxes under the category of Switches, Flush (WMUZ), which falls under the main category and Guide Information of General Use Snap Switches (WJQR), located on pages 348 and 347 respectively in the 2008 UL White Book. Their Canadian counterparts (WJQR7) and (WMUZ7) are located on pages 497 and 498 of the 2008 Canadian White Book. The Guide Information for (WJQR) and (WJQR7) is silent on the solid and stranded issue in the 2008 White Books, however, the Guide Information for those categories will be clarified in the 2009 White Books.

Neither receptacles nor switches are evaluated for ter-

minating a spade terminal under any of the terminals on these types of wiring devices. While this may be a common practice in the electrical trade when using stranded conductors, this would be a violation of *NEC* 110.3(B) as these wiring devices are not Listed for that application.

The Guide Information for the product categories discussed above can also be accessed on UL’s Online Certification Directory at www.ul.com/database and by entering the four or five digit category code in the Category Code search field.

Q It is common to see three runs of 14/2 NM cable run into a receptacle box with two conductors on the side terminals and the third tapped into a back terminal. This is used to avoid a larger box size because of the splice. Are receptacles that are provided with more than one set of terminals Listed for tapping off more than one circuit, utilizing both the side and back wiring terminals?

A The short answer is yes for receptacles Listed for the U.S. market and no to receptacles Listed for the Canadian market. This is due to the difference in certification requirements between the two countries. Receptacles evaluated to UL 498, The Standard for Receptacles for Plugs and Attachment Plugs requires receptacles to be tested using the side terminal and rear terminals on the receptacles concurrently, where the Canadian Standard, CSA C22.2 No. 42-M1984, General Use Receptacles, Attachment Plugs and Similar Devices does not address testing for this application. Receptacles for the U.S. market are Listed under the product category Receptacles for Plugs and Attachment Plugs (RTRT) located on page 295 in the 2008 UL White Book.

The Guide Information for (RTRT) states single and duplex receptacles rated 15 and 20 A that are provided with more than one set of terminals for the connection of line and neutral conductors have been investigated to feed branch-circuit conductors connected to other outlets on a multi-outlet branch circuit, as follows:

- Back wire (screw actuated clamp type) terminations

with multiple wire access holes used concurrently to terminate more than one conductor

- Side wire (binding screw) terminals used concurrently with their respective push-in (screwless) terminations to terminate more than one conductor

Single and duplex receptacles rated 15 and 20 A that are provided with more than one set of terminals for the connection of line and neutral conductors have not been investigated to feed branch-circuit conductors connected to other outlets on a multi-outlet branch circuit, as follows:

- Side wire (binding screw) terminal with its associated back wire (screw actuated clamp type) terminal
- Multiple conductors under a single binding screw
- Multiple conductors in a single back wire hole

Receptacles for the Canadian market are Listed under the product category Receptacles for Plugs and Attachment Plugs Certified for Canada (RTRT7) located on page 434 in the 2008 Canadian White Book. The Guide Information for (RTRT7) addresses this issue as follows: Single and duplex receptacles rated 15 amp and 20 amp that are provided with more than one set of terminals for the connection of line and neutral conductors may be used to feed a single set of branch-circuit conductors connected to other receptacles on a multi-outlet branch circuit. These devices have not been tested for tapping off more than one circuit

from the receptacle by utilizing both the side-wiring and back-wiring terminals on an outlet.

The Guide Information for the product categories discussed above can also be accessed on UL's Online Certification Directory at www.ul.com/database and by entering the four or five digit category code in the Category Code search field.

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Please send us questions you may have that are of general interest, and we will have UL engineers answer them in a future issue. If space does not permit answering all questions, we'll see that you get an answer by letter.

**Send your questions to:
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