Safety Codes Council

Alberta Municipal Affairs

SAFETY TIPS

Aluminum wiring in residential installations

Homes constructed between the mid 1960's until the late 1970's could have aluminum wiring.

Minor fires have occurred when electrical devices such as switches and receptacles (plugs) that were designed for use with copper wiring were installed on aluminum wiring.

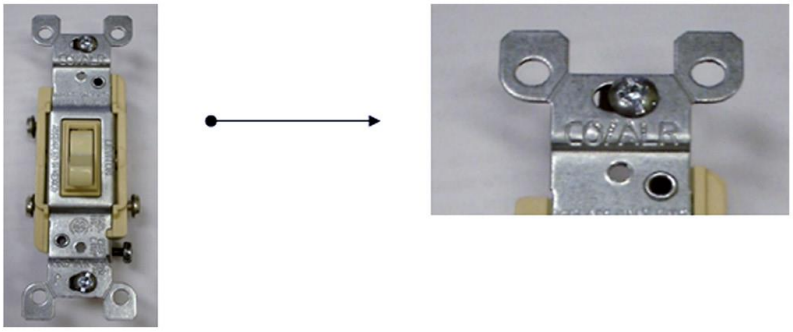
Because aluminum wire is softer and exhibits different electrical characteristics than copper wiring, special attention is necessary to ensure that appropriate devices are being used. As with all wiring, aluminum is safe provided proper connections and terminations are made without damaging the wire and with approved materials installed in accordance with the Canadian Electrical Code and the manufacturer instructions.

To determine whether your house is wired with aluminum wiring, look for the "AL" mark on the overall jacket of your wire in places where the wire is exposed (near the electrical panel, between joists in unfinished basement ceilings). If wiring jackets are not accessible you can remove a device from a de-energized circuit and check the wire colour (not insulation colour). If the wire colour is silver not copper, you can conclude that your wiring is aluminum.

Required Markings for Devices used with Aluminum Wiring

Replacement receptacles and switches must be installed in compliance with the Canadian Electrical Code Part 1 (CE Code) and marked as per the following table.

Electrical Device	Required Marking
Receptacle (rated 20 amps or less)	"CO/ALR" or "AL–CU"
Receptacle (rated greater than 20 amps)	"AL–CU" Or "CU–AL"
Switch (rated 20 amps or less)	"CO/ALR"
Wire Connectors [intended for use with combinations of either an aluminum conductor(s), a copper conductor(s), or both]	"AL–CU" Or "CU–AL"
Luminaire (Lighting fixture or lampholder) or Electric Heater	No required marking, however approved wire nuts are required.



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Termination of Aluminum Conductors

The CE Code requires the connection of aluminum conductors to wirings devices having wire binding terminal screws, about which the conductors can be looped under the head of the screw, to be made by forming the conductor in a clockwise direction around the screw into three-fourths of a complete loop and only forming the conductor in a clockwise direction around the screw into three-fourths of a complete loop and only one conductor shall be connected to any one screw.

Devices with “push-in” terminations shall not be used with aluminum conductors.

An alternative to using copper/aluminum approved devices is to connect a copper wire “pigtail” between the aluminum conductor and the device connection screw of a device approved for copper only connections. Pig tailing also applies to the bond conductor, which is often overlooked. The wire connector used for the pigtail joint shall be marked as per the above table.

Aluminum conductors are softer than copper and care must be taken that they are not nicked, cut, or crushed during termination. Nicks, cuts, or crush spots at terminations result in a weak point that may eventually lead to the breakage of the conductor or a hot spot.

The code also requires that a joint compound be used with stranded aluminum conductor connections; it is recommended that bare ends of solid aluminum conductors be coated with approved joint compound as well. Note: The compound is conductive and should be used sparingly and any excess compound should be removed.

Where pig tailing is used, the code must be considered with respect to the minimum volume of box required to contain the existing as well as the new conductors and connections. Where there is not enough room in the existing outlet box, a surface mounted extension box may be required.

Additional Considerations

It is highly recommended the homeowner hire a Certified Electrician who is knowledgeable in the special techniques required for working with and repairing aluminum wiring.