

Aluminum Wiring in Homes



Aluminum wiring in residential homes carries an increased risk of starting a fire when compared with the much more common copper wiring.

The US Consumer Products Safety Commission (US CPSC) investigated this threat in the 1970s and found that many home fires were caused by overheated connections involving aluminum wiring.

The weakness is not with the wire itself, but rather in the wiring junctions and connections between the aluminum wire and things like light fixtures, switches and outlets. While aluminum is an excellent conductor of electricity, it expands and contracts more than copper and is much more prone to corrosion at connection sites; this can cause increased resistance in connections, which, put simply, means more heat that can lead to fire.

Does Your House Have Aluminum Wiring?

During the 60s and early 70s, it was more economical to wire homes with aluminum than copper. As a result, a number of homes during this time period were wired with aluminum, many of which were “tract”-type homes. The US CPSC estimated that approximately two million homes were wired with aluminum between 1965 and 1974.

The best way to determine if your house has aluminum wiring (and the condition of that wiring) is to hire a professional building inspector or a professional electrician. They can do things like open your electrical panel, inspect plug and fixture connections, or find and inspect electrical junctions. These types of operations, especially when they involve potentially faulty aluminum wiring connections, carry a risk of electric shock, so they should be approached professionally and with extreme caution.



Aluminum Wire Casings

A homeowner may get an indication of whether they have aluminum wiring by looking at the insulating jackets of the wiring in an exposed place such as a crawl space, basement, attic or garage.

Such indications include printed letters such as “KAISER”, “ALCAN”, “ALUMINUM”, “AL/2”, typically appearing every several feet along the wires. The image to the left shows examples of such markings.

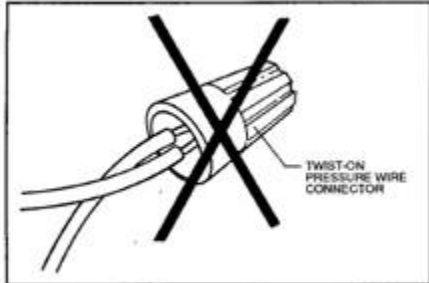
What Should You Do About It?

If you discover your house does have aluminum wiring, one choice is simple; hire a professional electrician. After they perform a thorough examination, you will have three options, according to the CPSC

1. Emergency-only temporary measures
2. Rewiring your house
3. “COPALUM” crimping every connection with copper wire

Some of the symptoms that you are in an emergency situation with aluminum wiring include hot outlet covers, lights that flicker, burning smells, or smoke. If you observe any of these, you should call a professional electrician immediately. The best measure to deal with such an emergency is to decommission the failing connections by turning off the circuit or capping wires. If the connection is essential, in the interim period prior to permanent measures, your electrician

may replace an outlet or switch with a newer unit specifically labeled “for aluminum wiring”. They may also perform a temporary splice of copper to a fixture or outlet, known in the trade as a ‘pig tail’. Note, the CPSC specifically states that such measures are only to be used in a temporary emergency situation.

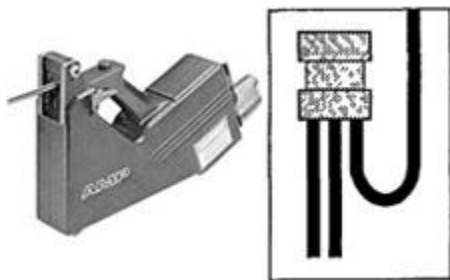


Emergency Measure Only!

The best option is to eliminate all aluminum wiring by rewiring the home with new copper wire. The old aluminum wiring will simply be orphaned. This is a relatively expensive option, depending on the size and complexity of your home, but it is the best and safest option. Any qualified electrician may perform this task.

In some cases, such as in multi-family construction or in single story homes on poured concrete slabs, it may be extremely complex to re-wire a home. In this case, or where economics require a less costly approach, there is another option. This is to crimp short pieces of copper wire to the aluminum at every connection using a specific tool called a COPALUM crimp connector. Then, the copper is fixed to receptacles, switches, appliances, etc. It is a good idea to replace all switches and receptacles at the same time, as these are relatively inexpensive.

The COPALUM crimp connector and associated materials (pictured below) are only manufactured by one company. Originally, that company was AMP, inc., but as a result of mergers and acquisitions, the current company is TYCO. It is important that your electrician uses this specific tool and is certified and trained to do so.



COPALUM Crimper and Connector

Luckily, aluminum wiring is becoming increasingly rare as time passes. Should you encounter this wiring in a home you own or are considering for purchase, it is important to deal with this in a method approved by the US Consumer Products Safety Commission. For more information, see the original publication by USPSC.