

# Electrical Wiring

## - Facts & Info -

### Aluminum Wiring

Aluminum wiring installed in habitational occupancies built between 1965 and 1972 is considered “old technology” aluminum wiring. According to the U.S. Consumer Product Safety Commission (CPSC), homes with aluminum wiring manufactured before 1972 are 55 times more likely to have one or more electrical connections reach “Fire Hazard Conditions” than a home wired with copper.

There are two acceptable methods of correcting this condition:

1. Re-wire the home with a new copper wire branch circuit system.
2. Repair the existing aluminum wire circuit with a COPALUM parallel splice connector.



Two unacceptable repair methods (these methods are often recommended by electricians, but are not considered acceptable by the CPSC staff):

1. “Pigtailing”
2. Installing CO/ALR switches and outlets

Aluminum wire is normally a useful conductor of electricity and has been widely used in recent years especially for wiring dwellings and mobile homes or trailers. Most of the problems related to aluminum wiring seem to arise from:

- ❑ Use of fittings, receptacles and other equipment approved only for use with copper wiring and not intended for use where aluminum is installed, and
- ❑ Damage to the wiring during installation. Aluminum wiring is more readily compressed than copper.

Use of equipment not approved for use with aluminum wire leads to oxidation at the connections between the wire and the equipment. The aluminum oxide residue forms a layer of insulation between the wire and the equipment. This insulation leads to an increase of resistance at these connections which produce heat. As the oxidation develops, heat rises and a fire may/could result.

The common problem with aluminum wiring occurs as the aluminum wire is screwed to a wall receptacle or switch plate and becomes loose due to expansion and contraction caused by the flow or non-flow of electric current. This is called ‘cold flow’ characteristic of aluminum metal. This produces an illumination oxidation layer as it breathes. Oxide, being an insulator of high resistance, produces enormous heat that deteriorates the contact and eventually breaks down. Copper, on the other hand, does not have cold flow properties.

The federal government’s Consumer Products Safety Commission (CPSC), has investigated fire incidents where aluminum wiring appears to be a factor in the cause. The CPSC discourages the use of aluminum for power distribution at low voltage circuits such as 110 volts, 120 volts, 220 volts and 480 volts.

Aluminum wiring in homes and mobile homes, etc., could generally be found in homes built, rooms added, and circuits rewired or updated between 1965 and 1974.

The ERIE’s risk management opinion and recommendation on aluminum wiring is:

- ❑ Remove and rewire the structure with copper wiring.
- ❑ Replace all wall outlets and wall switch receptacles with those marked as CO/ALR. The ERIE will accept this as a temporary solution, for up to two years, and; within two years, make all corrections to the aluminum wiring system by replacing all switches, wall outlets and light fixture connections via use of the COPALUM method.