

Aluminum Electrical Wiring Hazard Summary

Aluminum Wiring in Residential Properties: Hazards & Remedies



Solid conductor aluminum branch circuit wiring in Residential Properties: Hazards & Remedies

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This page summarizes information provided at the Aluminum Electrical Wiring Hazards Website - at the online encyclopedia InspectAPedia.com[®].

<http://inspectapedia.com/aluminum/aluminum.htm>

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What is the Aluminum Wiring Hazard?

[Aluminum electrical wiring](#), used in some homes from the mid 1960's to the early 1970's, is a potential fire hazard. According to the U.S. Consumer Product Safety Commission, fires and even deaths have been reported to have been caused by this hazard. Problems due to expansion can cause overheating at connections between the wire and devices (switches and outlets) or at splices.

CPSC research shows that "homes wired with aluminum wire manufactured before 1972 are 55 times more likely to have one or more connections reach "Fire Hazard Conditions" than are homes wired with copper.

"Post 1972" aluminum wire is also a concern. Introduction of the aluminum wire "alloys" in 1972 time frame did not solve most of the connection failure problems. Aluminum wiring is still permitted and used for certain applications, including residential service entrance wiring and single-purpose higher amperage circuits such as 240V air conditioning or electric range circuits.

How do I Reduce the Risk of Aluminum Electrical Wiring?

As of the current date of this page, only two remedies (1 - Discontinued Use and 2.1.- COPALUM, below) have been recommended by the CPSC.

1. **Discontinued use** of the aluminum circuit or,
2. **Pigtailing:** less costly, the addition of copper connecting "pigtail" wires between the aluminum wire and the wired device (receptacle, switch, or other device). The pigtail connection must be made using
 1. **The COPALUM connector**, a special connector and special crimping tool licensed by the AMP Corporation.
 2. **The AlumiConn™** aluminum to copper lug connectors [*New in 2006, U.L. Listed, 2007 completed independent testing*] available from King Innovation. Results of independent testing indicate that this product "... **is predicted to have a high probability of failure-free long-term safe performance, PROVIDED THAT THE SETSCREWS ARE CAREFULLY TIGHTENED TO THE MANUFACTURER'S RECOMMENDATION**". We anticipate that the [AlumiCon™](#) connector will be recommended soon by the US CPSC as an alternative to the COPALUM.
3. Emergency *temporary* repairs necessary to keep an essential circuit in service might be possible following other procedures described by the CPSC.


More Information about Aluminum Wiring Hazards

- [ALUMINUM WIRING INFORMATION WEBSITE](http://inspectapedia.com/aluminum/aluminum.htm) - <http://inspectapedia.com/aluminum/aluminum.htm> - the aluminum wiring home page
- [RECOGNIZING ALUMINUM WIRING](http://inspectapedia.com/aluminum/recogniz.htm) - <http://inspectapedia.com/aluminum/recogniz.htm> - how to recognize aluminum electrical wiring in buildings
- [REDUCING THE FIRE HAZARDS in Aluminum-Wired Homes](http://inspectapedia.com/aluminum/alreduce.htm) - <http://inspectapedia.com/aluminum/alreduce.htm> - methods, research, experience, expert sources. This document answers most technical questions about the hazards and remedies of aluminum electrical wiring. UPDATED 3/5/2003
- ["IS YOUR ALUMINUM WIRING SAFE?"](http://inspectapedia.com/aluminum/alsafety.htm) - <http://inspectapedia.com/aluminum/alsafety.htm> - article discussing safety claims made without looking at the wiring, J. Aronstein, 11/21/95
- [ALUMINUM WIRING REPAIR ELECTRICIANS](http://inspectapedia.com/aluminum/ElectriciansListAluminum.htm) - <http://inspectapedia.com/aluminum/ElectriciansListAluminum.htm> - Certified, Experienced Electricians Offering Aluminum Wire Repair Services
- [HOW TO REDUCE THE RISK of ALUMINUM WIRING](http://inspectapedia.com/aluminum/AluReduceRisk.htm) - <http://inspectapedia.com/aluminum/AluReduceRisk.htm> - details of how to repair aluminum wiring
- ["REPAIRING ALUMINUM WIRING"](http://inspectapedia.com/aluminum/awrepair.htm) - <http://inspectapedia.com/aluminum/awrepair.htm> - Consumer Product Safety Commission Booklet CPSC#516
- AMP COPALUM™ CONNECTOR - this connector works, is rated for aluminum conductors of

all types, and has performed spotlessly for more than 25 years

- 1 May 2003 - U.S. CPSC announced that Tyco Electronics Corp. will continue offering the COPALUM connector repair system until at least 2005 - for details see [the Tyco Press Release](#) - <http://www.cpsc.gov/cpsc/pub/prerel/prhtml03/03120.html>
- [AMP Corporation](#) - <http://www.amp.com/> Harrisburg PA 17105 800-522-6752 - CPSC's recommended COPALUM aluminum-copper retrofit - US Customer Support 800-522-6752 [See the TYCO announcement above]
- AMP Canada Product Information Department, 905-470-4425 the COPALUM connector line is available in Canada; they do not appear to have a contractor training/certification program such as is (at least in a few places) available in the USA.
- [AMP COPALUM Connectors & Equipment](#) - <http://connect.amp.com/AMP/bin/AMP.Connect?M=CINF&C=10914&N=3&RQS=C~10914^M~FEAT> - available from [Tyco Electronics](#) - <http://www.tycoelectronics.com/>
- [AlumiConn™](#) - <http://www.AICopStore.com> - provides information on obtaining the AlumiConn™ aluminum wiring connector.

- [NOT-Recommended Repair Products](#) - <http://inspectapedia.com/aluminum/AluminumOther.htm> - here are products and methods sold but not recommended for repair of aluminum electrical wiring:

-  [Ideal-65™ Twister](#) - <http://InspectAPedia.com/aluminum/ideal65.htm> - field failures & lab studies show that this connector does not perform adequately - purple twist-on connector sold for aluminum wire repair
 - "Analysis of field failures of aluminum-copper pigtail splices made with twist-on connectors", Aronstein, J., Poughkeepsie, NY, USA; Electrical Contacts, 1999, Proceedings of the Forty-Fifth IEEE Holm Conference: 1999, page(s): 87-93 reports a study of failures among 4,531 connectors used in 102 apartments within one year of installation using normal, proper workmanship and typical aluminum branch circuit wiring.
Abstract: ... On the basis of the field failures in combination with previously reported laboratory studies it is concluded that the connector is not suitable for permanent use with aluminum wire residential wiring systems
 - [CPSC reiterates unsuitability of twist-on connectors \(Including the Ideal No. 65\)](#) - <http://inspectapedia.com/aluminum/twistcpsc.htm> - for aluminum wiring in residences.
- A [special installation method](#) for aluminum wire pigtail splicing repairs (special procedures using the 3-M Scotchlok™ connector) was previously described using special procedures but this method is now considered obsolete given the options and products listed above

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