



Home Tips®



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Aluminum Wiring?

Problems With Aluminum Wiring

From the 1940s through the mid-1970s, the United States experienced unprecedented suburban sprawl. As growing communities expanded, so did the need for electrical wiring components for electrical systems. However, in the mid-1960s



through 1975, the shortage and expense of copper wire pushed contractors to find more cost-effective, alternative wiring methods.

The copper crisis increased the demand for aluminum wire. With increased usage, new research soon arrived on the negative effects that aluminum electrical systems have at the connection points in branch circuits. Overheating in connections and wire splices was identified as the cause of home fires in several instances.

In 1974, the U.S. Consumer Product and Safety Commission (CPSC) concluded that risks associated with aluminum wire systems presented "an unreasonable risk of injury or death." This led to further investigation on fire and safety hazards associated with aluminum wire electrical systems.

Research findings from *The Report of the Commission of Inquiry on Aluminum Building Wire* concluded that there are



many different factors that possibly affect the contact resistance of aluminum wiring, including thermal expansion disparity and creep. At connection points, aluminum "expands and contracts three times the rate of copper," which is explained by Jim Lardear in his article "The Problem of Aging Electrical Wiring."

In each circumstance that these temperature disparities occur, space is created that allows air to oxidize any exposed aluminum wire. When oxidation and corrosion build up from temperature differences, they cause increased resistance and overheating along the circuit. This is one of the major culprits that may lead to hazardous arcs and glowing connections, furthering the risk of home fires.

The CPSC has found that 10 percent of home fires start in electrical distribution systems. In many of these situations,

