

**BY SANDRA FLEISHMAN**  
THE WASHINGTON POST

WASHINGTON - David Hannemann and his wife were aware when they bought their Ellicott City, Md., home 18 years ago that it had aluminum electrical wiring, a known fire hazard.

But they waited until this February to make the fix that has long been recommended by the Consumer Product Safety Commission.

It wasn't the safety consideration that made them act. It was their belief that insurance companies will soon crack down on people who own homes such as theirs, wired in part with aluminum rather than copper.

"My wife worked in insurance, and she suggested we'd better do it," said Hannemann, a federal employee in Washington. The underwriter at his wife's former agency "told her he wouldn't write the line anymore" unless a house had been repaired as the CPSC recommends, Hannemann said.

About 2 million U.S. houses are believed to have been built with aluminum branch-circuit wiring, which for three decades has been a widely publicized fire hazard. The CPSC is more anxious than ever because Americans are loading up on high-tech appliances and products that draw more current. That's exacerbating the basic problem of overloaded circuits, which can result in overheated plugs and outlets that catch fire.

Insurers say they haven't moved industry-wide to limit coverage of aluminum-wired houses or to require the recommended fixes. Some local real estate and insurance agents say, however, that they're seeing signs that insurers are taking a harder look at such houses, especially if other red flags pop up during home inspections and appraisals.

Officials at Nationwide Mutual Insurance Co., State Farm Insurance Co. and Allstate Insurance Co., for example, say aluminum wiring could trigger a requirement for an electrical inspection before a policy is issued. Two local Nationwide agents last week were blunter, saying they wouldn't write a policy on an aluminum-wired house unless their underwriter cleared it based on additional information.

The discovery of aluminum wiring during a recent home inspection played a considerable role in killing one \$800,000 sale in Bethesda, Md., said W.C. & A.N. Miller agent Liz Smith.

Her clients were already nervous about spending that much money, she said. When the wiring was found during the home inspection and the would-be buyers learned that replacing it would cost \$15,000 to \$25,000 while the CPSC-approved repair would cost \$5,000, they became more rattled. After phone calls to local insurance agents suggested other possible hurdles, the buyers bolted.

The CPSC has been warning since the early 1970s that houses built or renovated from 1965 to 1973 with aluminum branch-circuit wiring are a fire risk.

Branch-circuit wires are those that distribute electricity to each room from the service panel. In other words, they're the wires that run to lights, switches and most outlets. They're much smaller

versions of the heavier, high-voltage aluminum wires that typically run to the house from the street or that run inside the house from the service panel to major appliances.

Builders started substituting aluminum for copper branch wiring in houses in the mid-1960s when copper prices soared. In addition to the 2 million houses that the CPSC estimates were built or modified with aluminum during the eight years when it was the cheaper alternative to copper, other houses built or updated later might have some of the material because it remained on dealers' shelves.

The percentage of houses involved, though, is small - there are about 107 million housing units in the United States.

The CPSC started raising alarms after a 1974 fire in Hampton Bays, N.Y., in which two people died. Fire officials blamed the fire on a faulty aluminum wire connector at an outlet.

Numerous complaints from homeowners about overheated outlets and switches led to a commission research project. The research showed that houses wired with aluminum wire made before 1972 are 55 times more likely to have one or more connections reach "fire hazard conditions" than is a home wired with copper. Modified wire, switches and outlets that were made after 1972 still didn't pass muster, according to the federal agency.

The problem, the researchers said, is not the wire or the insulating cable, but the connections where the splices are.

"That is where the burnouts occur," said Jesse Aronstein, a longtime CPSC research consultant.

The CPSC tried to get the material recalled, but lost in court, Aronstein said. The commission was able only to conduct a public-information campaign, warning homeowners of potential danger.

The product, however, sank under the weight of the criticism, Aronstein said.

"By the mid-'70s electricians would have had to be crazy or desperate to put it in" because of the publicity, he said. "Basically it died by its own reputation."

Agency officials say that what's upsetting is that many homeowners still don't recognize the hazard. Although the agency estimates that "tens of thousands" of homeowners have heeded its advice and installed a specific repair system called a COPALUM crimp connector, many more have not.

Statistics on fires caused by aluminum wiring aren't kept, but the possibility still frightens federal officials and consumer advocates. An estimated 40,000 electrical fires of all kinds occur in houses each year, causing about \$2 billion in property damage and killing three people each day, the agency said.

Scott Wolfson said his agency's fears about consumer inaction have grown recently because the COPALUM system's manufacturer had at one point indicated it might drop the product at the end of this year.

While electricians over the years have recommended different devices to address the problem, Wolfson said the COPALUM system remains the only repair CPSC endorses.

The system sounds like a combination of copper and aluminum - and it is. The product attaches a copper wire to the aluminum wire

leading to each junction box using a crimping power tool that applies about 10,000 pounds of force.

The "cold weld" that's formed as a result is "a permanent bond that eliminates electrical arcing or glowing connections and creates a safer electrical connection at outlets, switches, lights, circuit breakers and panelboard terminals," the CPSC said.

Other connectors and devices made by other manufacturers are cheaper, but the CPSC says they're not as reliable. That includes "pigtailling" repairs that use twist-on connectors and CO/ALR switches and outlets marketed specifically to handle aluminum wire. "Some 'pigtailling' repairs made with twist-on connectors may be even more prone to failure than the original wire connection," the CPSC's consumer booklet says.

The COPALUM connectors, which have to be installed at every junction box in a house, cost about \$35 to \$62 per junction, according to local authorized installers. The average single-family house has about 100 junction boxes.

The CPSC would be happiest if homeowners eliminated all the aluminum wiring, and replaced it with copper. But the regulators recognize that the cost of doing so is considered prohibitive in most cases.

Because the national electrical code requires that aluminum wire be stapled every few feet inside the drywall, it can't just be pulled out and replaced, said Brian Smith, owner of All Things Electric in Dickerson, Md. Replacing the wiring means not only a hefty price tag for the electrical work but also thousands more for new drywall.

Tyco Electronics Corp. of Harrisburg, Pa., keeps lists by state of electricians that it trains to use its special COPALUM connectors. COPALUM is the only repair system for aluminum wiring approved by the Consumer Product Safety Commission. To find nearby authorized providers, call (800) 522-6752.