

Burn Survivors Support Blog (<http://burnsurvivorssupport.com/blog>)

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Could An “Arc Fault Circuit Interrupter” Have Prevented This Fire?

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National statistics compiled by the Consumer Product Safety Commission show that more than 40,000 fires are caused annually by problems with home wiring. For the last decade, electrical wiring systems have been one of the leading causes of fire deaths, claiming 350 lives per year and costing more than \$650 million in damage.



The owner of this home had a power tool plugged in to charge the battery, and this is where they believe the fire originated. It was just before bedtime, and the residents were getting ready for bed when they noticed smoke coming from the garage. They were able to get out safely, but had this fire started after they had fallen asleep, they may not have been able to escape. As you can see, their home was destroyed, and the home next door was also damaged.

An Arc Fault Circuit Interrupter (AFCI) might have prevented this house fire. Let me go into more detail on how an AFCI works. An arc is a discharge of electric current across a gap. Normal arcing can occur when we pull a plug from an outlet or when a switch is turned on. An “arc fault,” or a hazardous arc, can occur in exposed wires but more commonly in the wiring hidden behind wall surfaces and cords that are damaged or deteriorating. Such conditions can result in a flow of electric current that is erratic, which can cause temperatures to exceed 10,000 degrees F. Such extreme temperatures will not only burn away the insulation on a wire, but it also will solder wires together. AFCIs electronically sense arcing and can tell the difference between a normal arc and an unwanted arc. AFCIs can detect unwanted arcs in a home’s wiring system all the way up to the appliance that is plugged into an outlet, and will “trip” (shut down) a circuit when it detects the problem, thus stopping a potential fire before it has a chance to start.

AFCIs can be installed as a replacement for most conventional circuit breakers in panel boxes and will provide all the protection that conventional circuit breakers provide, in addition to protecting against arc faults. They do NOT replace Ground Fault Circuit Interrupters (GFCIs), which protect people against the risk of electrocution and are required by code to be installed on outlets near water, such as in kitchens and bathrooms. Both AFCIs and GFCIs are needed to provide both kinds of protection

If it was an unwanted arc that caused the house fire pictured above, an AFCI would have detected it and shut down the circuit before a fire had a chance to start. This house was an older home, built in the 1960s with older wiring – a perfect reason for installing this technology. But even new houses will become old someday, and electrical wires can be damaged by nails and screws that are concealed inside walls and ceilings in all homes, both old and new. So all residences can benefit from this technology.

As of January 2002, AFCIs became a requirement in the bedroom circuits of new homes being built according to the National Electrical Code® (NEC), which is a model code. Once a safety measure is in the model code, the battle is only half-won, however: it still needs to be adopted by state and local jurisdictions. But while fire safety advocates have been trying to expand newer editions of the NEC to require AFCIs for all the circuits in a home, they have also been fighting homebuilders to keep the AFCI requirement from being removed from the state and local codes.

Back in 2002, I traveled around the country in defense of AFCIs, and the battle to keep this important fire prevention technology in state codes is ongoing. Why? The homebuilders don't want to put them into the homes they build, because they say that the technology is too costly. It is true that AFCIs cost more than conventional circuit breakers – but to my thinking, an electrical fire in your home is even costlier! (Note that back when smoke alarms first came out, the homebuilders fought them, too - and look at the lives smoke alarms have saved!)

Another point to keep in mind is that codes provide a minimum level of safety, and individual homeowners can make the choice to exceed the code if they so choose. If a homeowner can afford to install AFCIs in all of a home's 15- and 20-amp circuits, then the greater protection may someday save lives and property.

Information for this article was obtained from State Farm Insurance, the U.S. Consumer Product Safety Commission and the National Electrical Manufacturers Association. To learn more about AFCI technology, visit the following websites:

<http://www.cpsc.gov/cpsc/pub/pubs/afci.html> , <http://www.afcisafety.org/>.