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AFCI and Home Safety

Join the movement to make
homes safer

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We all want to live in homes protected from fires caused by electrical arcs.

Following is a collection of information and resources to explain AFCIs and their effect on Home Safety.

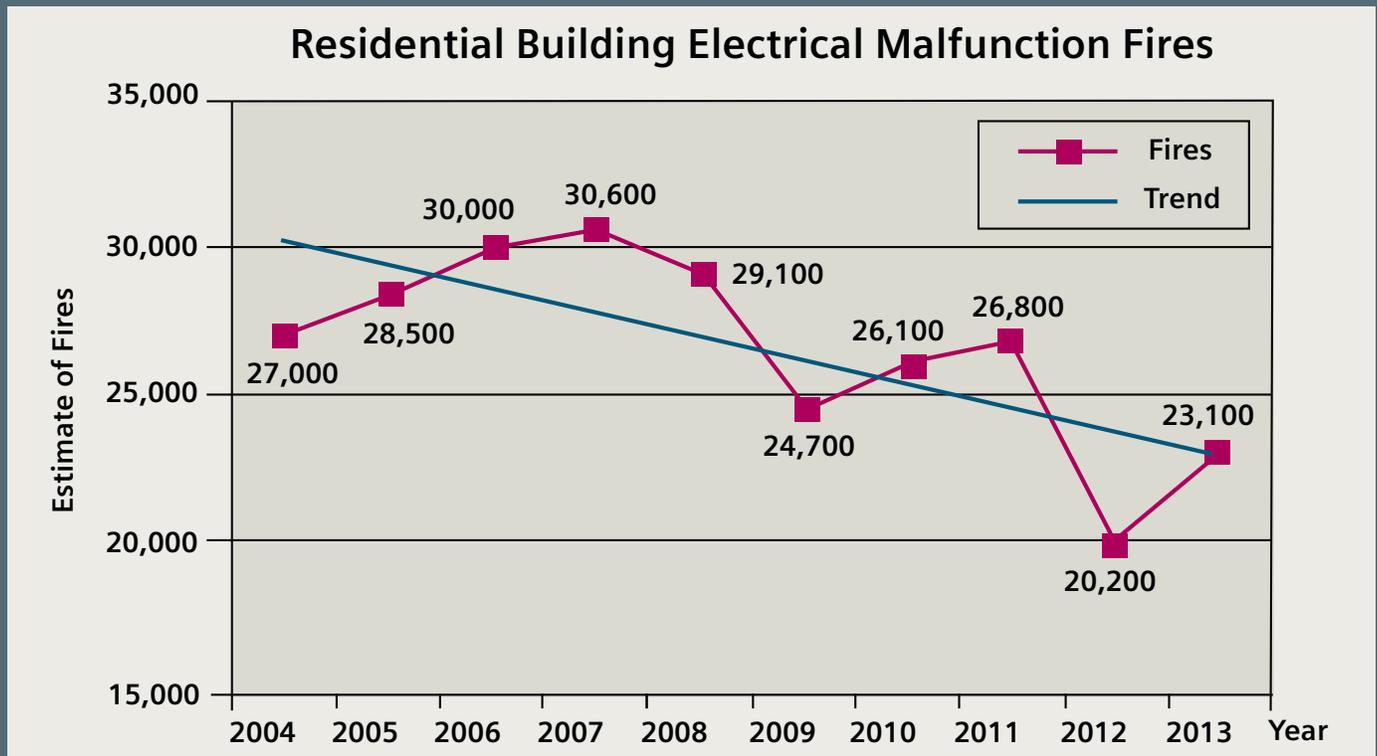
Technology exists to help mitigate the effects of arcing and sparking in our electrical systems. Arc Fault Circuit Interrupters (AFCIs) are devices that alleviate the effects of arcing faults to protect homes against the dangers of electrical fires. Determining the cause of an AFCI trip can be confusing and time-consuming, but the innovative trip indicators and the Siemens exclusive Intelli-arc Diagnostic Tool offer help in the troubleshooting process. This is a technology that has a goal of stopping fires before they begin and can be leveraged in new and existing homes to mitigate the effects of the arcs and sparks that can cause electrical fires.

Background information:

NFPA reported 47,700 home fires involved some type of electrical failure or malfunction in 2011. Those fires resulted in 418 deaths, 1,570 injuries, and \$1.4 billion direct property damage. However, the CPSC estimates more than 50% of electrical fires that occur every year could be prevented by AFCIs.

The U.S. Department of Housing and Urban Development's Healthy Homes Report listed the absence of AFCIs among the primary residential hazards associated with burns and fire-related injuries.

Given these staggering statistics, here are some simple steps which will help you to assure Safety for all.



Preventative measures (for contractors)

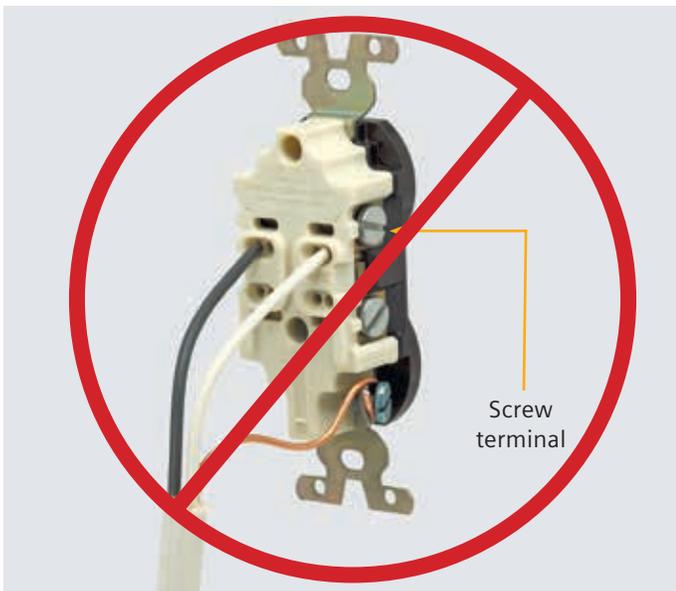
- Ensure light bulbs are tight in socket
- Wire receptacles around the screw
- Devices in the home should be UL and FCC Part 15 compliant
- Route wires in strategic areas so homeowners and other trades are less likely to pierce through a wire



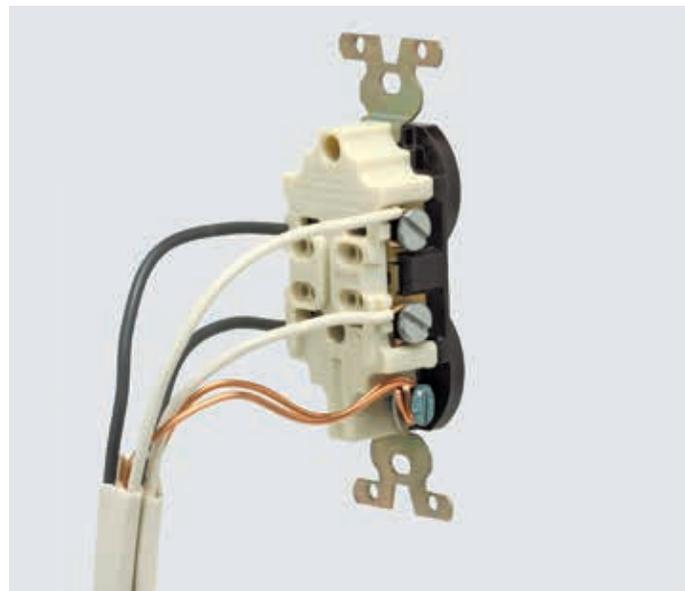
50 to 75 percent of all electrical fires in the United States are caused by arc fault conditions



Example of line-to-ground arc fault (nail puncturing NM-B wire)



Inserting wire into the pressure slots on the back of the receptacle is not the best method



Wrapping wire around the screws located on sides of the receptacle is the best method

Preventative measures (homeowners)

- Ensure light bulbs are tight in socket
- Protect electronics on surge protectors
- Do not put furniture on or push furniture up against electrical wires
- Devices in the home should be UL and FCC Part 15 compliant
- Do not overload a circuit



Be careful not to overload a circuit



Damaged/bent cords can cause arcs



Light bulbs should make a complete connection with the socket



Surge suppressors will not only protect the homeowners' electronics, but also decrease the "noise" emitted from electronics

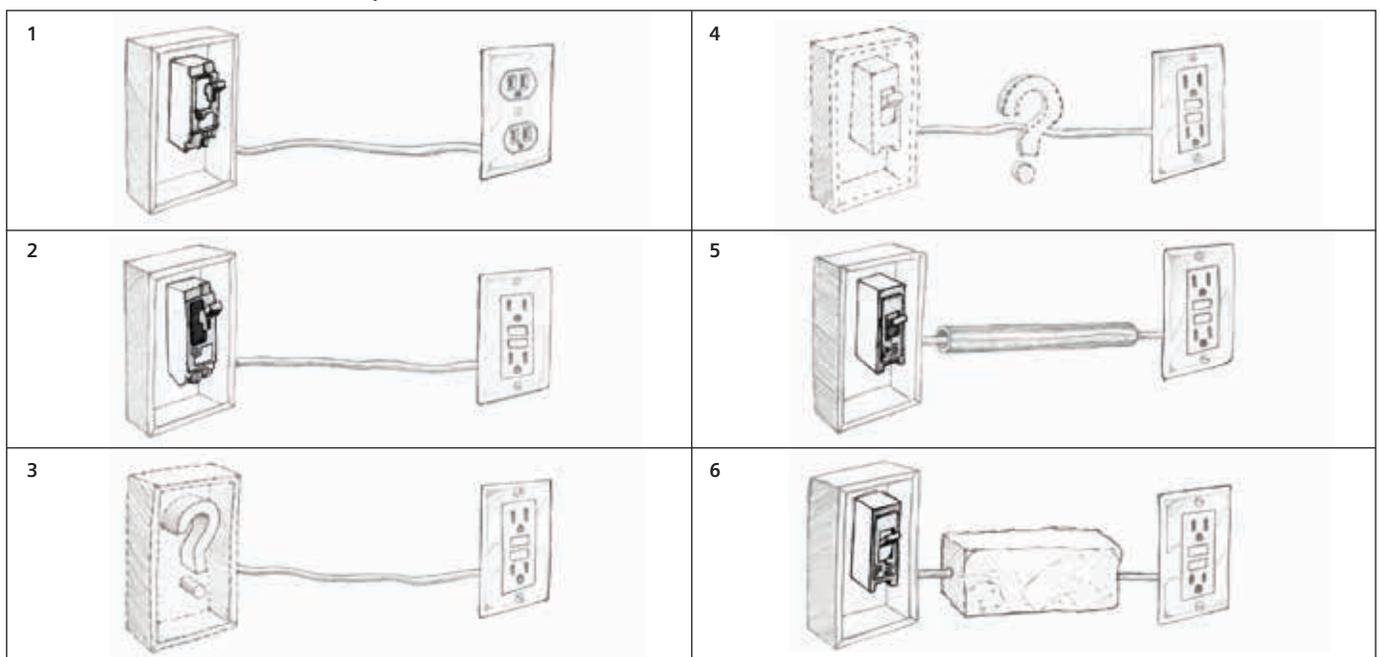
NEC 2014 and 2017

AFCI installation comparison

NEC 2014 and 2017 National Electric Code, 210.12(A), describes Arc-Fault Circuit Interrupter Protection installation requirements. The NEC reads as follows: Dwelling Units. All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets or devices installed in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas, or similar rooms or areas shall be protected by any of the means described in 210.12(A)(1) through (6).

	Scenario description	Additional requirements	vs. 2011 NEC	Considerations
1	Listed combination type AFCI	None	Same	<ul style="list-style-type: none"> Protects entire circuit (incl. lighting) No limitations or restrictions
2	Listed branch/feeder type AFCI + listed outlet branch circuit type AFCI	<ul style="list-style-type: none"> OBC-AFCI installed at 1st outlet box 1st outlet box marked 	New	<ul style="list-style-type: none"> Receptacle must be on line side of any protected lighting circuits
3	Listed supplemental arc protection circuit breaker + listed outlet branch circuit type AFCI	<ul style="list-style-type: none"> OBC-AFCI installed at 1st outlet box Branch circuit continuous wiring to OBC-AFCI Branch circuit max wire lengths (50'-14AWG, 70'-12AWG) 1st outlet box marked 	New	<ul style="list-style-type: none"> "Supplemental arc protection circuit breakers" not commercially available Wire length limitations Receptacle must be on line side of any protected lighting circuits
4	Listed outlet branch circuit type AFCI + listed branch circuit over current protective device	<ul style="list-style-type: none"> OBC-AFCI installed at 1st outlet box Branch circuit continuous wiring to OBC-AFCI Branch circuit max wire lengths (50'-14AWG, 70'-12AWG) 1st outlet box marked CB & OBC-AFCI listed as "System Combination" 	New	<ul style="list-style-type: none"> "System Combination" listing requirements yet to be developed Difficulty ensuring compliance to "System Combination" requirements Wire length limitations Receptacle must be on line side of any protected lighting circuits
5	Listed outlet branch circuit type AFCI	<ul style="list-style-type: none"> OBC-AFCI installed at 1st outlet box Branch circuit in metallic conduit / armored cable install per 250.118 Metal outlet and junction boxes 	Same	<ul style="list-style-type: none"> Atypical, costly installation requirements
6	Listed outlet branch circuit type AFCI	<ul style="list-style-type: none"> OBC-AFCI installed at 1st outlet box Branch circuit in conduit encased in concrete 	Same	<ul style="list-style-type: none"> Atypical, costly installation requirements

Below illustrations show the 6 options for AFCI installation.



Additional Resources:

- Siemens Technical Support: 1-800-333-7421
- www.afcisafety.org
- UL AFCI training – FREE!: Go to www.afcisafety.org and click on the link for professionals and go to free UL Training Course
- White papers, videos and brochures available for download and viewing at afcisafety.org
- usa.siemens.com/afci
- usa.siemens.com/wholehousesafety

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Siemens Industry, Inc.
5400 Triangle Parkway
Norcross, GA 30092

For more information, please contact
our Customer Support Center.

Phone: 1-800-241-4453

E-mail: info.us@siemens.com

usa.siemens.com/afci

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