

Preventing Arc Fault at the **ROOT CAUSE**

As the Electrical and Fire Safety communities continue to gain momentum toward the fight against arc-fault-induced electrical fires, one thing is for certain: **MORE CAN BE DONE...**

The collective design, development, implementation of the Arc Fault Circuit Interrupter (AFCI) is an excellent first step in the prevention of electrical fires caused by arc faults. The only problem that still remains today is, well, the problem itself.

The National Fire Protection Association (NFPA) describes arcing as an unintentional discharge of electrical current between conductors¹. Arc faults are produced in any part of an electrical circuit where continuity is compromised causing the electrical current to "jump the gap" or arc. Each arc fatigues its surrounding materials such as wire insulation, wood studs, or insulation in the walls of a home, effectively lowering its ignition point over time. Each arc also produces carbon, providing more fuel to burn at a higher temperature.

Arcing may occur in a worn extension cord, or inside the wiring of a refrigerator. One of the most dangerous areas arc faults originate is hidden in the electrical wire behind the wall. Unlike a worn extension cord, it is next-to-impossible to recognize any warning signs behind the wall.

A R C F A U L T S H I D I N G B E H I N D T H E W A L L

HOW IT HAPPENS

Arc fault in a home's electrical is not limited to aging homes built according to outdated codes. Inadvertent damage to electrical wire during construction is a significant risk.

TYPICAL CAUSES OF ARC FAULT DURING CONSTRUCTION:

- 1.** Scraping wire insulation against jagged and abrasive bored stud holes, when electrician is routing the wire.
- 2.** Punctured, pierced, or nicked wire from nails, screws, or drill-bits when installing drywall, or any other fixtures during construction.
- 3.** Over-pinched wire caused by an electrician swinging his hammer just a little too hard when using a wire nail.

THE RISK GOES ON

Once the home is built, every stud containing a wire becomes a risk for arc fault. When there is a need to hang a picture, shelf, mirror, or television mount (using 3^{1/2} inch long bolts), the homeowner is going to choose the most convenient stud(s) to secure their object based on how it looks or functions in the room. The majority do not take wire location into consideration, leaving the fate of the wire up to chance.

BETWEEN 2012-2016, ON AVERAGE, 44,800 HOME FIRES PER YEAR INVOLVED ELECTRICAL FAILURE OR MALFUNCTION.

Of those 44.800 fires each year the **FIRST ITEM IGNITED** was:

- 1st** ELECTRICAL WIRE or CABLE INSULATION **31%** of the time
- 2nd** STRUCTURAL MEMBER or FRAMING **13%** of the time
- 4th** INSULATION within STRUCTURAL AREA **6%** of the time

22,580 HOME FIRES STARTED BEHIND THE WALL EACH YEAR—
GROWING WHILE HIDING FROM DETECTION

THAT CAUSED SERIOUS DAMAGE EACH YEAR:

190 CIVILIAN DEATHS

530 CIVILIAN INJURIES

\$631,000,000 IN DIRECT PROPERTY DAMAGE

¹Source: Home Electrical Fires, National Fire Protection Association(NFPA), Richard Campbell, 2019

Arc Fault Circuit Interrupter

The public and behind-the-scenes support from the Electrical and Fire Safety community was instrumental to the successful implementation of AFCIs. Cutting power to a circuit that is exhibiting symptoms of a dangerous arc fault is an intelligent solution in preventing arc-fault-induced fires, however, THE ARC FAULT STILL EXISTS.

Due to the high-volume of false-positives in the beginning of the AFCI evolution, many times AFCI breakers are replaced with standard breakers to solve for a breaker that is persistently tripping. In reality, they were only treating the problem's symptoms as the root cause of the problem grows more and more dangerous over time **{false positive syndrome}**.

Wire Damage Prevention

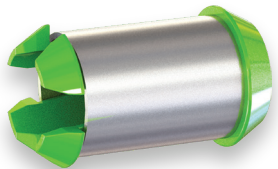
The NEC relies on Electrical Inspectors to identify any raceway holes that were bored too close to the face of the stud. Electricians are then required to fasten a steel plate to the face of the stud, which protects the wire, but also creates imperfections in the drywall. This is a tedious process for inspectors and creates additional costs for electrical contractors to go back and perform non-value added work.

ARC FAULT **ROOT CAUSE** PREVENTION: Wire Damage Protection **{at every stud}**

The **{e^zguard}** is an insulated steel bushing that protects electrical wire & cable from two of the most common **ROOT CAUSES** of arc-fault-induced electrical fires in homes:

1. 360-degree protection from punctures, pierces, & nicks from drill bits, screws, & nails.
2. Smooth-contoured design eases wire-pulling & protects wire from scraping on jagged & abrasive stud holes.

{e^zguard}



LISTED
E510312
UL STANDARD 2239

ARC FAULT
PROTECTION

**INSERT
BY HAND**



**PULLING WIRE
IS MADE EASIER**



**360° PROTECTION
FOREVER**



{e^zguard} INDUSTRY IMPACT

{inspectors



- Line-of-Sight Go/No-Go Inspection
- No more measuring bored holes in wood members
- Spend more time & energy on inspecting other important requirements

{contractors



- Treats {false positive syndrome} by regaining the credibility of ACFI trips
- Reduce Call-Backs for Wire Damage caused by other sub-contractors
- Earn customer's trust by providing value through peace of mind
- Potentially reduce Liability Insurance
- Minimal Cost passes through General Contractor to Homeowner as a significant value added feature

{homeowners



- Peace of Mind knowing I'm protected when drilling into my walls
- Potential Homeowner Insurance Benefits
- Minimal cost increase for exponential safety increase

What's the Value of a Family's Safety?

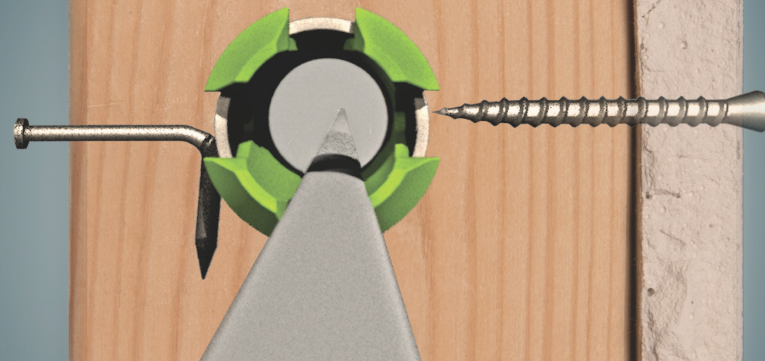
Average Size Home: 2800 SQ FT | Average Price: \$383,900
2800 SQ FT Home will use Approximately 1200 EZ GUARDS
1200 EZ GUARDS @ \$1.25 = \$1500

0.39% MARGINAL COST INCREASE TO FIGHT AGAINST:

22,580 FIRES IGNITING BEHIND THE WALL CAUSING \$631,000,000 IN PROPERTY DAMAGE

MORE IMPORTANTLY, EZ GUARDS CAN BEGIN PREVENTING 190 CIVILIAN DEATHS & 530 CIVILIAN INJURIES EACH YEAR

360° PROTECTION



**ARC FAULT
PROTECTION**