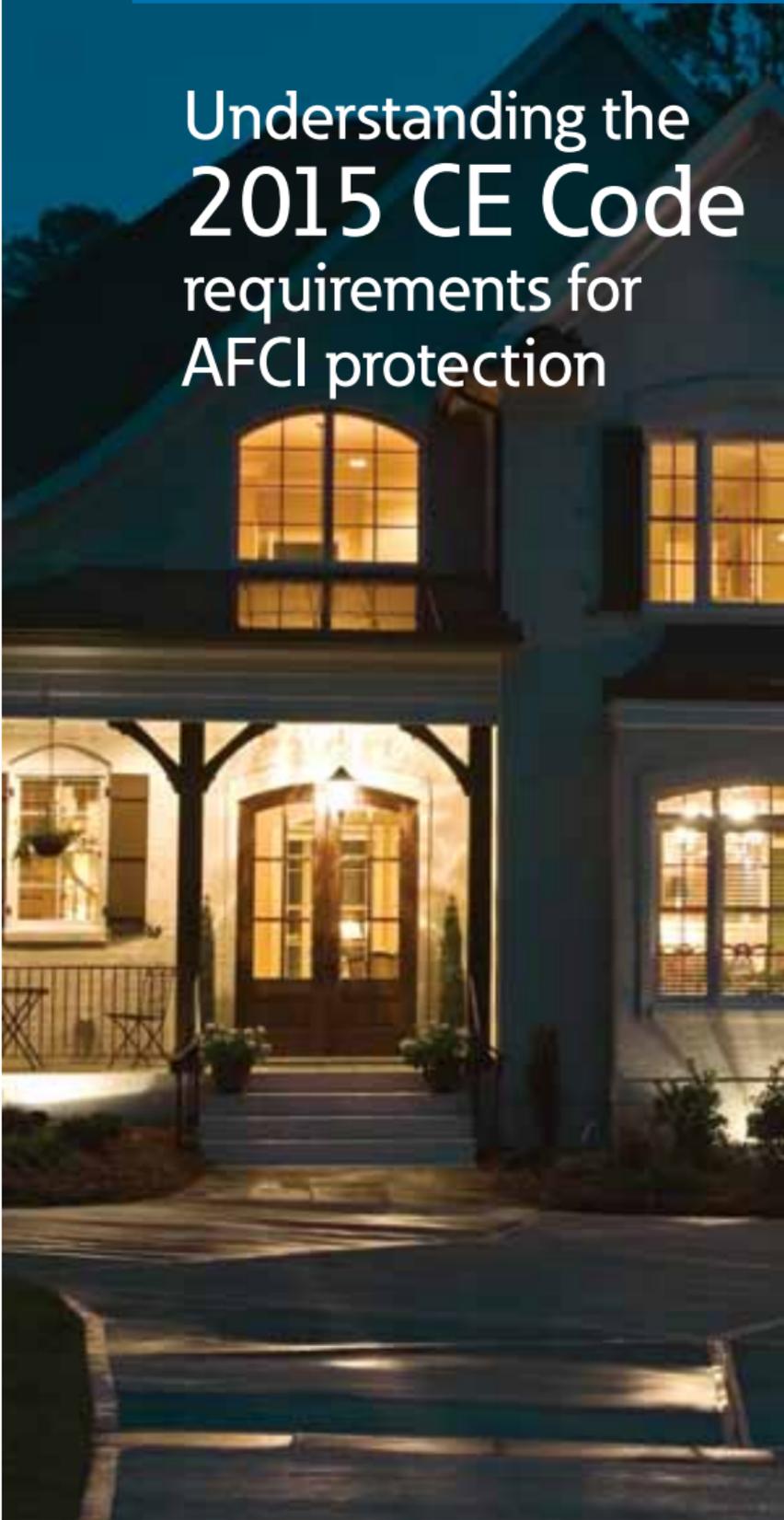


2015 AFCI
code compliant safety

Understanding the 2015 CE Code requirements for AFCI protection



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Understanding the code for code compliant safety

An **arc fault** is an unintended arc created by current flowing through an unplanned path. Arcing creates excessive heat that can easily ignite surrounding material, such as wood framing or insulation, resulting in a hazardous fire.

At a glance

The new Rule 26-724(f) of the 2015 Canadian Electrical Code requires all branch circuits in dwelling units supplying 125V receptacles rated 20A or less to be protected by a Combination-Type arc-fault circuit interrupter (AFCI), except that branch circuits supplying receptacles installed in accordance with Rules 26-710(f) and 26-712(d)(i), (iii), (iv) and (v), and those supplying only one receptacle for the connection of a cord-connected sump pump, are exempt from the requirement for arc-fault protection.

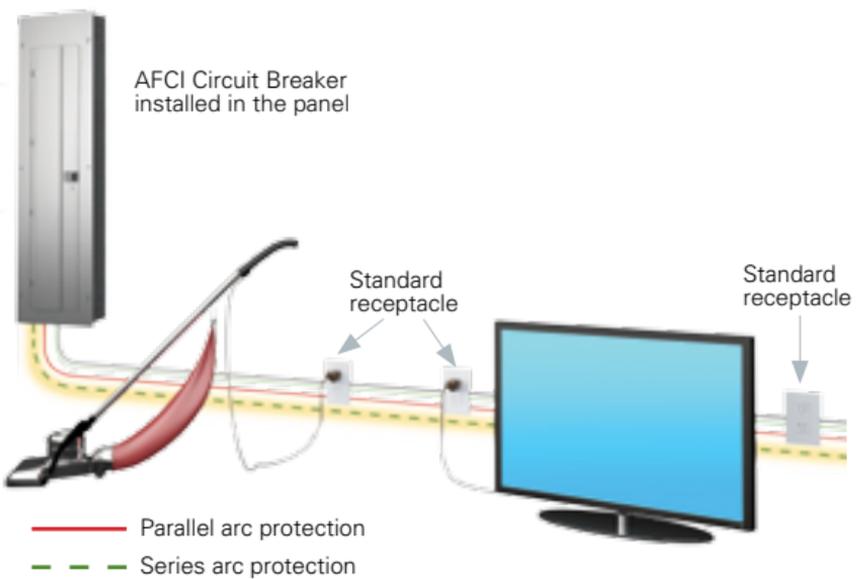
AFCI receptacles are permitted for use by the new Rule 26-724(g), with some restrictions.

Each application has a preferred installation method based on level of protection and practicality.

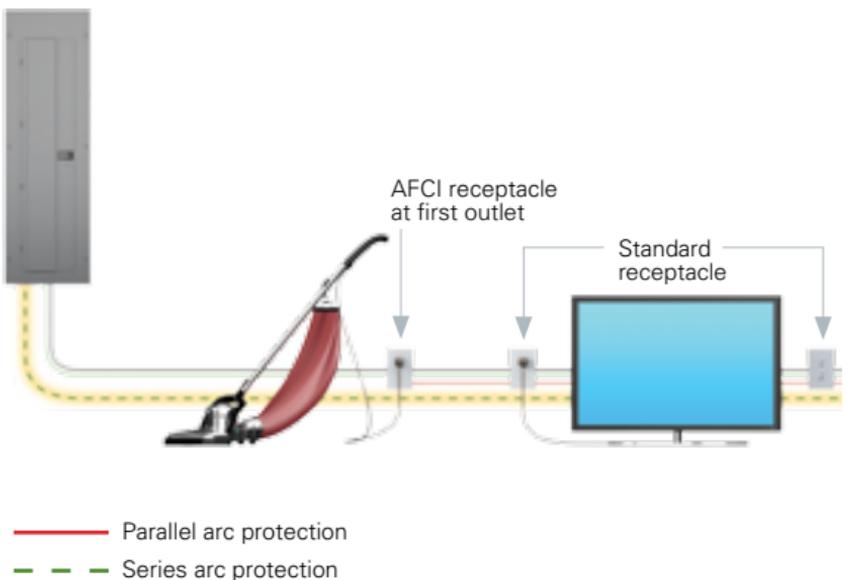


AFCI Protection Options

A **Combination AFCI circuit breaker** protects the entire circuit including connected cords from its origin in the panel for both parallel and series arcs



An **Outlet Branch-Circuit (OBC) AFCI receptacle** can protect all downstream wire and connected cords from both parallel and series arcs, but only protects from series arcs upstream in the home run



For homerun wiring restrictions see the CE Code rule 26.724(g)(ii)

Arc faults could potentially ignite surrounding materials resulting in potentially deadly fires

Typical causes of arc faults

1. Arcing in installed electrical wiring from physical damage such as:

- Wires accidentally punctured by nails or screws
- Cables that are stapled tightly against wall studs
- Animals and vermin chewing through wiring insulation
- Heat, humidity and voltage stress

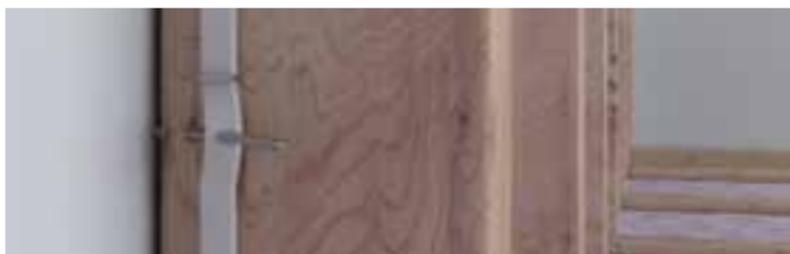
2. Arcing at loose connections or joints in the circuit or at outlets

3. Arcing in appliance or extension cords

- Bent or crimped cords
- Brittle or aged cords
- Cords under or behind furniture



Tight staple can pierce insulation



Inadvertent nails can puncture wire behind wall



Animals can chew through insulation



Electrical cords can be damaged under or behind furniture

Code compliant installations for new construction

Protection Using AFCIs

The [2015 CE Code](#) allows for two methods to protect a circuit using arc-fault technology Rules 26 - 724(f) and (g).

1. Combination AFCI Circuit Breaker

A combination AFCI Circuit Breaker can be used at the panel

Advantage: Protects the entire circuit from the source

Disadvantage: Legacy panels may not accommodate AFCI circuit breakers

2. Conduit, tubing or armoured cable to first AFCI Receptacle

Requires installation of armored cable, or metal raceway, or non-metallic conduit or tubing, for the homerun portion of the branch circuit

Advantage: Allows for local reset in most cases

Disadvantage: Installation of conduit or tubing can be costly, and may be difficult to identify first receptacle in the circuit during remodeling or retrofitting



AFCI circuit breaker and OBC AFCI receptacle

AFCI circuit breakers and/or AFCI receptacles can be used to protect a circuit under various conditions per the 2015 CE Code



Arc-fault technology saves lives

Things you should know

Technological Maturity

Arc-fault technology saves lives and has been an industry standard in new construction for over 15 years. Today's arc-fault technology has been proven through arc-fault circuit breakers and has gone through several iterations to reduce unwanted tripping due to interference from devices or appliances. Arc-fault circuit interrupters have been established as a stable technology which can be used in conjunction with various loads through the home in both AFCI circuit breakers and AFCI receptacles.

Considerations for New Construction

Due to the restrictions of use per the 2015 CE Code, there are considerations to take into account when deciding whether to use an AFCI receptacle or a combination AFCI circuit breaker:

- **Location of the First Receptacle** – The AFCI receptacle must be placed as the first outlet. Care must be taken to ensure this location is easily accessible, it cannot be blocked by any furniture or appliances and the location must make logical sense for the end user should the device need to be reset.
- **Wiring Practices** – The use of AFCI receptacles may require a contractor to change their wiring practices, specifically for circuits that require AFCI protection. A circuit that was typically run from the panel with an AFCI circuit breaker may now need to feed off the AFCI receptacle that is located at the first outlet in a continuous circuit.

The last word

Remember that your local inspection department has the ultimate jurisdiction in the application and use of electrical equipment per the prevailing Electrical Code.



It's clear arc fault protection saves lives by mitigating arcing that could be an ignition source of a fire. The 2015 Code mandates AFCI protection in designated branch circuits in dwelling units and allows for two installation methods. It's important to consider the application and then choose the best installation method to provide the preferred form of protection.

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