

NFPA Document Proposal Form

NOTE: All Proposals must be received by 5:00 pm EST/EDST on the published Proposal Closing Date.

For further information on the standards-making process, please contact the Codes and Standards Administration at 617-984-7249 or visit www.nfpa.org/codes.

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Please indicate organization represented (if any) _____

1. (a) NFPA Document Title National Electrical Code International Electrical Code Series NFPA No. & Year NFPA 70: NEC 2011

(b) Section/Paragraph 210.12 Arc-Fault Circuit-Interrupter Protection

2. Proposal Recommends (check one): new text revised text deleted text

3. Proposal (include proposed new or revised wording, or identification of wording to be deleted): [Note: Proposed text should be in legislative format; i.e., use underscore to denote wording to be inserted (inserted wording) and strike-through to denote wording to be deleted (~~deleted wording~~).]

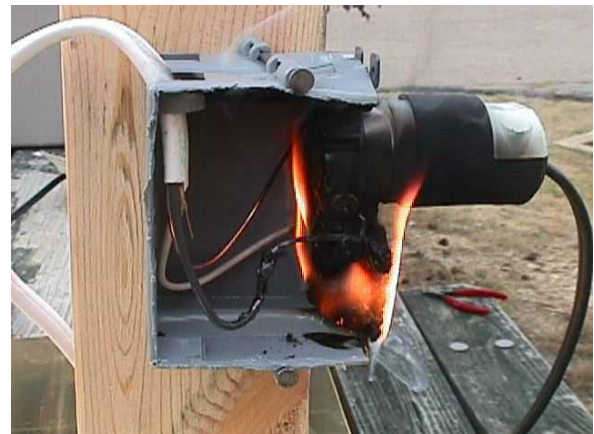
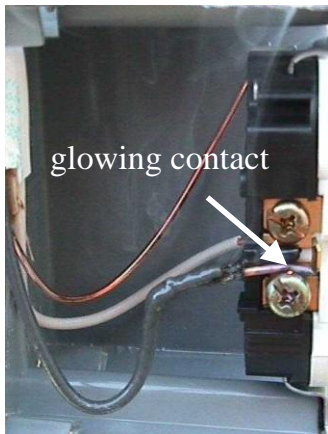
210.12 Arc-Fault Circuit-Interrupter Protection.

(A) Dwelling Units: All 125-volt, single-phase, 15- and 20- ampere branch circuits supplying outlets installed in dwelling unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, or similar rooms or areas shall be protected by a listed arc-fault circuit interrupter combination-type, which includes earth leakage protection (30mA trip sensitivity), installed to provide protection of the branch circuit.

4. Statement of Problem and Substantiation for Proposal: (Note: State the problem that would be resolved by your recommendation; give the specific reason for your Proposal, including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

The Problem:

It has been recognized by UL that combining AF and GF protection can be effective in mitigating the fire hazard resulting from a "glowing contact". In fact today it is the only UL proposed solution to this recognized home fire hazard. See photos below of a burning modern receptacle with a glowing contact. The plastic once ignited, will not extinguish in the presence of a glowing contact. These types of fires are "behind the wall" and thus are especially dangerous. By the time a room smoke detector can respond, a major fire may have been started.



Substantiation:

Please refer to web site <http://www.CombinationAFCI.com>.

A paper titled "COMBINATION AFCIs: WHAT THEY WILL AND WILL NOT DO" is available on web site.

From the Summary of 1995 UL/CPSC study:

"...Arc-fault detection appears to be a very promising technology especially when added to residential branch-circuit breakers and combined with other proven technologies, such as ground-fault protection..."

From the 2001 UL report on glowing contacts(see www.mikeholt.com/htmlnews/afci/ULreportonterminals.pdf):

"...By virtue of this worse case configuration, it was demonstrated that a Branch/feeder AFCI incorporating ground fault protection (30mA trip) is capable of terminating a glowing connection ...".*

From a JUNE 23rd 2005 live glowing contact demonstration at UL Chicago headquarters in front of UL, NEMA wiring device and circuit protection manufacturers, and others.

At this UL 1699 STP meeting UL gave me an opportunity to realistically demonstrate the need for a ground fault test; I conducted a simple glowing contact test for all to see. Test was conducted on a UL lab bench. I plugged a 60W lamp (0.5A) load into a new duplex receptacle, turned the lamp on, and then jiggled a loose receptacle wire connection until a glowing contact formed. This took about a minute. Once established the contact was stable, the lamp burned steady with no indication of a problem, while the receptacle plastic near the connection melted and dripped. The plastic wire insulation on the glowing conductor also melted. For about thirty minutes the STP members stood around the bench, observed the glowing contact, and discussed the problem. The value of combining AF and GF protection was obvious to all, no one questioned that.

The following day, after the glowing contact demonstration, a vote was taken to add a 30mA ground fault test to UL1699, the AFCI Standard. The proposal failed to reach the required 2/3 "FOR" votes for passage by a single vote, UL voted against adding the requirement.

UL's vote to block inclusion of a GF test in UL1699 was surprising and disappointing based on their earlier written comments. While no one has questioned the value of adding AF and GF protection, both UL and some NEMA members have blocked adding this to UL1699. This despite the fact that this is the only recognized means to mitigate the effect of a glowing contact.

My former company's early AFC's were dual Listed, see UL labels on an early AFCI circuit breaker. These breakers provided the UL recommended dual protection. I believe all of today's Branch/feeder AFCIs provide 30mA, though not required. I also believe newer Combination AFCIs don't.

The only way to insure AFCI manufacturers add 30mA to their AFCIs is to add it as a requirement in 210.12 Arc-Fault Circuit-Interrupter Protection.



AFCI with 30mA Earth Leakage Protection



Close-up of Label with 30mA reference

5. Copyright Assignment

- (a) I am the author of the text or other material (such as illustrations, graphs) proposed in the Proposal.
- (b) Some or all of the text or other material proposed in this Proposal was not authored by me. Its source is as follows: (please identify which material and provide complete information on its source)

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Signature (Required)

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11/1/2011