

Electric Strikes on Fire Doors



From the well-known blog idighardware.com, Lori Greene brings some much-needed clarity to codes.

BY LORI GREENE, AHC/CDC, CCPR

SOMEONE RECENTLY ASKED ME WHY, AFTER GOING TO ARCHITECTURAL school, I decided to become a hardware consultant instead of an architect. Right around graduation, I decided that I couldn't become an architect because the process was way too subjective for me. I like right/wrong, black/white. I like math—you get an answer, and it's right or wrong.

I think that has a lot to do with my interest in the codes. When someone asks me a code question, I can usually go right to the applicable code book and translate what is written there, and there's always the commentary or handbook to give a little extra insight. They're not always black and white, but we can work toward an understanding of the intent even if the language isn't perfect. The AHJ can sometimes be a bit of a wild card, but they are usually open to having a discussion, and most of the time we end up on the same page.

I hate to respond to a question by saying, "Well, that's a grey area..." In those cases, I like to dig around until I can provide a solid interpretation with proof to go along with it. My interpretation isn't official, but at least it's something to refer to and discuss.

In my opinion, the issue of electric strikes on fire doors is not a grey area, but in researching the requirement for someone who needed some evidence, I discovered that the codes are not very specific about it. You need to put all of the pieces together to provide something more than "because I said so."

The question has come up several times in relation to electric strikes on stair doors. According to current codes, most stair doors have to allow reentry back into the building during a fire; therefore, a fail-safe product must be used. With a fail-safe electric strike, cutting the power means that the spring-loaded keeper is the only thing holding the door closed, and that is not enough to be considered positively latched. The pressure from a fire can push the latchbolt right through the keeper, and the open door will allow smoke, heat and gases to compromise the stairwell. I have had several people tell me that the pressure in the stairwell will keep the door latched, but I have never seen a basis for that belief in the codes.

If a door is fire-rated, an electric strike has to be fail-secure to provide positive latching. And a fail-secure electric strike will not provide for stairwell reentry. So in my opinion, electric strikes should not be used on stair doors, but the



These fail-secure strikes have UL labels for fire and burglary, while the fail-safe strikes only have a UL label for burglary.

fail-safe/fail-secure question is not specifically addressed in the code language. You have to look at all of the evidence and come to a conclusion.

The International Building Code (2009) clearly states that stair doors must **“be capable of being unlocked simultaneously without unlatching,”** and the IBC Commentary further clarifies the latching requirement by stating, **“The unlocking of the door must not negate the latching feature, which is essential to the operation of the door as a fire door.”** Read on to find the code excerpt.

NFPA 80-2007 says: **6.4.4.11* Electric strikes shall be permitted to be used in lieu of conventional strikes in single swinging doors and pairs of doors where provided for in the published listings.**

I looked at the UL Building Materials Directory to see if the “published listings” would help clear it up, but I didn’t see anything specific regarding fail safe/fail secure (Ref 1, Ref 2). I found a couple of references in a manufacturer’s catalog:


Fail Safe – FS electric strikes require power to be applied to lock the strike lip. On loss of power, the strike is unlocked. Building codes prohibit the use of fail-safe strikes on labeled openings.

UL listed Burglary Resistant CVXY and Electric Strike for fire doors or frames GXAY (fail secure only).

If you connect the dots, it seems obvious that a fail-safe electric strike won’t meet the latching requirements, and a fail-secure strike won’t meet the reentry requirements, so electric strikes should not be used on stairwell doors. On other fire-rated doors that are not required to unlock upon fire alarm or a signal from the fire command station, a fail-secure electric strike can be used.

Here’s the text from the 2009 IBC and Commentary:

403.5.3 Stairway door operation. Stairway doors other than the exit discharge doors shall be permitted to be locked from the stairway side. Stairway doors that are locked from the stairway side shall be capable of being unlocked simultaneously without unlatching upon a signal from the fire command center.

Commentary: Section 1008.1.9.10 requires that all egress doors for interior stairways be readily openable from both sides. It is often desirable to control movement of people within a building and to provide additional security from external threats. This section permits locking of stairway doors from the stair side when all doors are capable of being simultaneously unlocked. Since high-rise buildings are difficult to evacuate and people are often relocated to another floor level during an emergency, access from the stairway to a floor could be essential in a fire or other emergency. Therefore, all stairway doors that are to be locked from the stairway side must have the capability of being unlocked on a signal from the fire command center. The unlocking of the door must not negate the latching feature, which is essential to the operation of the door as a fire door. Section 403.4.7.2, Item 1, by its reference to Section 403.4.5, requires the locking feature to be connected to the standby power system. When the door is unlocked during an emergency, it should not automatically relock on closure. Electrically powered locks should be designed such that when power to the locking device is interrupted, the lock is released. This is intended to enable doors to be operable from the inside of the stairway, and not locked, if power to the lock is interrupted. The building official should review the emergency release operation of stairway doors to determine that they remain unlocked. 

About the Author: *Lori Greene, AHC/CDC, CCPR, FDAI, is the Manager of Codes & Resources for Ingersoll Rand Security Technologies. She can be reached at lori_greene@irco.com.*

Photo Courtesy of Lori Greene, Ingersoll Rand Security Technologies.