

Decoded Series

- Class 1 – Introduction to Codes + Accessibility Requirements
- Class 2 – Fire Door Assemblies
- Class 3 – Egress and Life Safety
- **Class 4 – Codes for Electrified Hardware**

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Allegion, Manager – Codes & Resources

Decoded 4 – Codes for Electrified Hardware

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Session 4 – Codes for Electrified Hardware

1. Electric Latch Retraction Fire Exit Hardware
2. Electromagnetic Lock
3. Fail Safe Lock or Panic Hardware Trim
4. Fail Secure Lock or Panic Hardware Trim
5. Fail Safe or Fail Secure Electric Strike
6. Delayed Egress Lock
7. Controlled Egress Lock
8. Exit Alarm



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Fail Safe vs. Fail Secure Electrified Locks and Electrified Exit Device Trim



Access-side lever is unlocked upon loss of power

Lock is latched



Both typically allow free egress



Access-side lever is locked upon loss of power

Lock is latched

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Fail Safe vs. Fail Secure
Electric Strikes

- Fail Safe
 - No power - keeper is free
 - Latch can be pulled through keeper
- Fail Secure
 - No power - keeper is secure
 - Latch is captured behind keeper
- Both types typically allow free egress.
- Electric strikes used on fire doors must be fail secure.



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What would you specify?
Door 101 - Fine Dining

- Needs new doors due to 20-minute fire rating
- Restaurant manager doesn't want latching due to noise & inconvenience
- No locking required
- 1 door to swing into kitchen, 1 door to swing out
- Which code-compliant product should we use to provide positive latching?

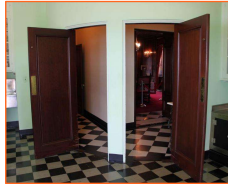


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Electric Latch Retraction Panic Hardware / Fire Exit Hardware

- Apply Power: Latch Retracts
Latch can be held retracted electrically
- Remove Power: Latch Projects
Latch must project upon fire alarm for fire rated doors so doors are latched to deter smoke and flames - refer to NFPA 80
- EL/QEL may also be used to release latch for automatic doors (latch may be held back indefinitely and fire alarm can initiate latching)



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Coordinate auto operator actuators with the access control system!

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What would you specify?
Door 101 - Fine Dining



- 4 components of a circuit:
 - Load
 - Switch
 - Power Supply
 - Conductors



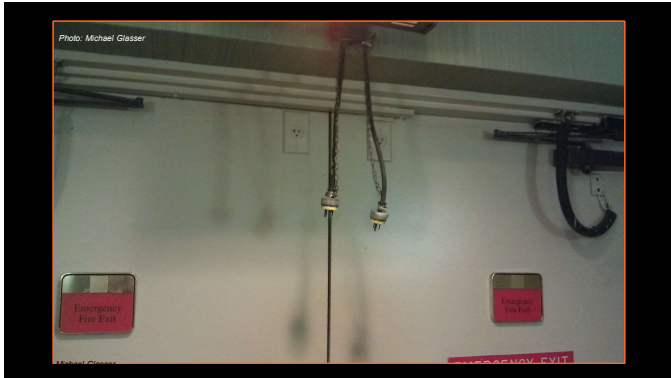
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Don't forget your conductors...

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What would you specify?
Door 102 - Existing All Glass Doors

- No stiles or rails
- Access control system will lock/unlock door on a time schedule
- Free egress is required
- Which code-compliant product should be used?



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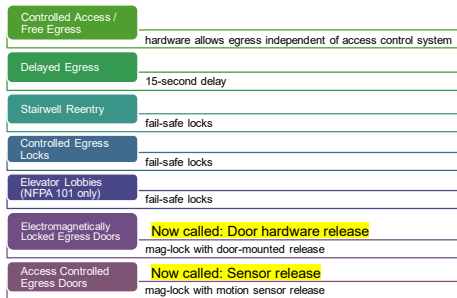
Access-Controlled Egress Doors
Sensor Release of Electrically Locked Egress Doors

- Used to control and monitor access
- Must also allow egress
- Typically an electromagnetic lock, access control reader, and required release devices
- A door with a powerbolt may also be released by a sensor



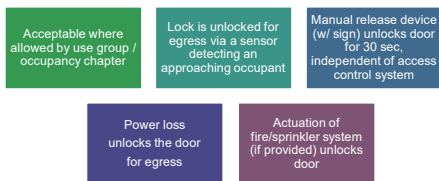
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Not all doors with access control are Access-Controlled Egress Doors!



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Access-Controlled Egress Doors
Now called Sensor Release of Electrically Locked Egress Doors



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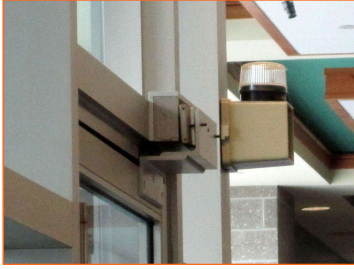


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Mag-locks can be an option for gates, but you may need a code modification for the release devices.

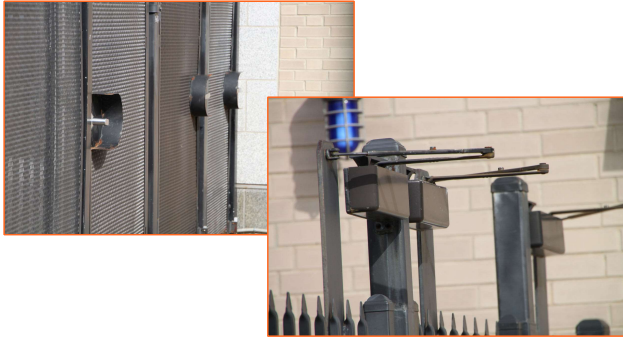
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TJ Bracket



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Is battery backup allowed?

Codes require sensor-release locks to unlock upon loss of power, but "loss of power" is not defined.

Is this referring to loss of normal building power?

Can the lock be powered by the emergency generator along with the rest of the building?

NFPA 72 Interpretation:
If the fire alarm system & mag-locks are on the same back-up power, this would meet the intent of the code.

We do not recommend specifying separate battery back-up in the power supply for the locks.

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What would you specify?
Door 103 – No Sensor

- Free egress is required.
- A motion sensor won't work because it will be accidentally actuated by the room's occupants.
- Door has very narrow stiles.
- What's the best option?



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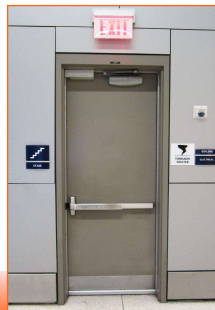
Mag-Lock with Door-Mounted Release (RX Switch)

IBC

- 2009-2015 editions: Electromagnetically Locked Egress Doors
- 2018+: Door hardware release of electrically locked egress doors

NFPA 101

- 2009/2012/2015 editions: Electrically Controlled Egress Door Assemblies
- 2018+: Door hardware release of electrically locked egress door assemblies

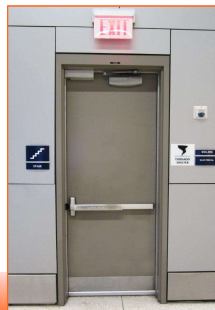


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Mag-Lock with Door-Mounted Release (RX Switch)

- Release device affixed to door leaf
- Obvious means of operation in direction of egress
- Operable with one hand
- Interrupts power supply and unlocks door
- Loss of power unlocks door
- No requirement for fire alarm release or auxiliary push button



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Direct-Hold Mag-Locks vs Shear Locks



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Interlocks (AKA man-traps), which often involve mag-locks, are not currently addressed in the IBC or NFPA 101.



Photo: American Clean Rooms

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What would you specify?
Door 104 - Library Egress

- Library emergency exit
- Librarian wants to lock door and only allow egress if there is a fire alarm.
- Code is **NFPA 101**
- **Given that we're using NFPA 101, what's the best product application?**



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Photo: University of Arizona

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Delayed Egress Locks

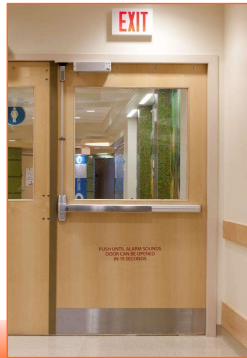


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Delayed Egress Locks

- Designed to delay egress to prevent unauthorized use of the door
- Must allow egress for life safety



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Delayed Egress Locks (NFPA 101)

Some occupancy chapters have restrictions on the use of delayed egress locks for example:

- New & Existing Assembly Occupancies:
Delayed-egress locks complying with 7.2.1.6.1 shall be permitted on doors other than main entrance/exit doors
- Lodging or Rooming Houses:
Delayed-egress locks complying with 7.2.1.6.1 permitted, provided that not more than one such device is located in any one escape path
- New & Existing Residential Board & Care Occupancies:
Delayed-egress locks complying with 7.2.1.6.1 permitted on exterior doors only

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What would you specify?
Door 104 - Library Egress

- Library emergency exit
- Librarian wants to lock door & only allow egress if there is a fire alarm.
- Code is **NFPA 104**
- Code is the **IBC**.



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Decoded 4 – Codes for Electrified Hardware Photo: University of Arizona

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Allowed in all occupancies except Assembly, Educational, and High Hazard (the 2018 IBC and subsequent editions include 2 exceptions)	One delay per egress path (except I-2 / I-3 use groups)
IBC Delayed Egress	
15 lbs. applied for 1 sec. (2012 and prior) or 3 sec. (2015+) begins 15-second timer (30-sec. if approved by AHJ)	BOCA option (automatic rearm) is not required for IBC compliance

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Delayed Egress Locks – IBC Changes

- 2018 IBC and subsequent editions
 - Previous editions of the IBC do not allow delayed egress in assembly or educational
 - NFPA 101 has fewer limitations
- Classroom doors serving less than 50 occupants
- Secondary exits from courtrooms
 - building must have sprinkler system



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Sometimes an alarm is the most secure solution you can offer.



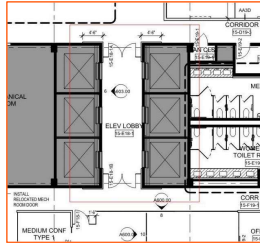
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What would you specify?
Door 105 - Elevator Lobby

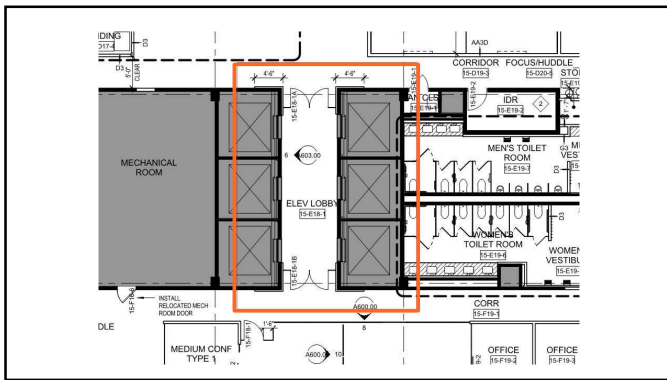
- Means of egress from the elevator lobby is through the tenant space
- How can you provide security from the elevator lobby into the tenant space?



The answer depends on the code being used:
IBC or NFPA 101

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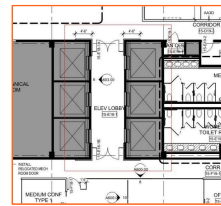
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What would you specify?
Door 105 - Elevator Lobby

- Means of egress from the elevator lobby is through the tenant space
- How can you provide security from the elevator lobby into the tenant space?



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Elevator Lobby Egress

IBC

"Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code."

This will change in the 2024 edition of the IBC with the addition of a section similar to NFPA 101. →

NFPA 101 (2009+)

Elevator Lobby Exit Access Door
Assemblies Locking

- Fail safe lock—unlocks on fire alarm & power failure
- Must be allowed by occupancy chapter
- Lock listed per UL 294 Access Control System Units
- Two-way communication system in elevator lobby
- Some state codes also have modifications for elevator lobby doors

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What would you specify? Door 106 - Memory Care Unit

- The health care facility needs to secure the doors on the egress side
- Code is the 2018 IBC or 2018 NFPA 101



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Controlled Egress Lock

- Must have fire protection/detection/sprinkler system (refer to code for specifics)
- Doors unlock upon activation of sprinkler/fire alarm and loss of power controlling lock
- Capability of remote unlock
- One controlled egress lock max. before entering an exit
- Procedures must be part of emergency planning and preparedness
- All clinical staff carry keys/code/credentials to operate locks
- Emergency lighting at the door
- Protective needs (maternity, pediatrics, emergency, dementia) vs. security measures (detention, forensics)

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What would you specify?
Door 107 - Stair Door

- High-rise multi-tenant building
- Card readers wanted on stair side
- Code is the IBC
- We need a product that meets requirements for fire door assemblies and stairwell reentry



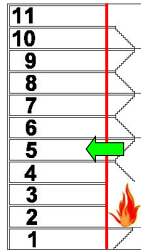
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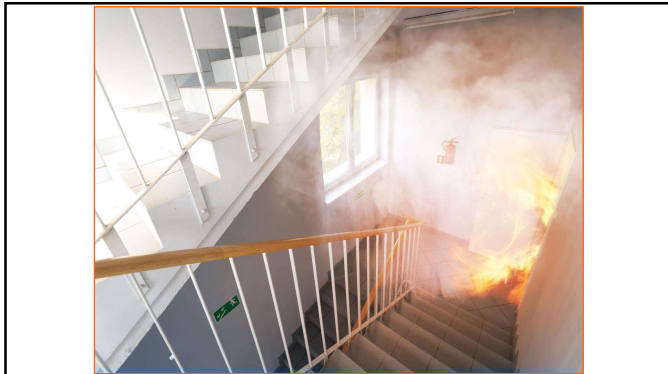
Stairwell Reentry

- Stairwell doors are often locked to prevent entry to restricted floors.
- During a fire, occupants must be able to move from the stairwell onto floors through doors that are normally locked.



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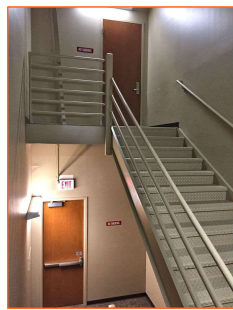
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Stairway Doors - IBC

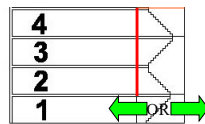
- Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
- Interior stairway means of egress doors must be openable from both sides without a key or special knowledge or effort (passage sets), or
 - Stair doors must be unlocked without unlatching by a signal from the fire command center
- In high-rise buildings, stairway communication system is required



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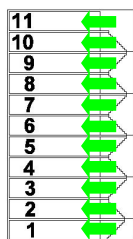
- The 2003 edition of the IBC allowed stairs serving not more than four stories to have mechanical locksets on the stair side of doors other than the stair discharge.
- Later editions require electrified locks controlled remotely, even on stairs serving 4 stories or less.



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Free Access



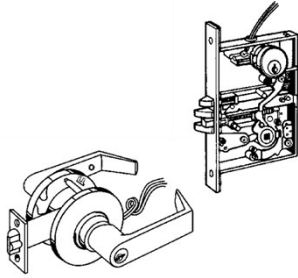
Unlock Remotely



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Electrified Locks

- Fail safe locks or fail safe trim for fire exit hardware required for stairwell reentry
- Fail safe electric strikes may **not** be used because they are not listed for use on a fire door



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What would you specify? Door 107 - Stair Door

- Replacing existing stair doors
- High-rise building
- Multi-tenant
- Card readers on stair side
- ~~Code is the IBC~~
- Code is NFPA 101, selected reentry is an option

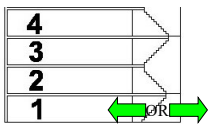


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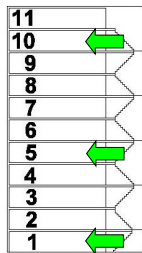
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NFPA 101 - Stairwell Reentry

- NFPA 101 allows stairs serving not more than four stories to have mechanical locksets on the stair side of doors other than the stair discharge.



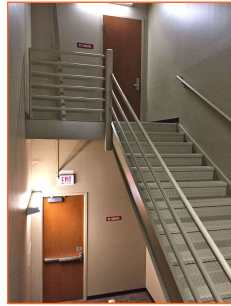
- Selected reentry allows mechanical locking of some doors
- Selected reentry is not covered in the IBC



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Selected Reentry

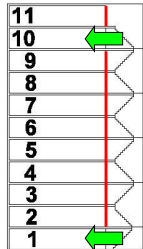
- **NFPA 101** - Door assemblies on stair enclosures shall be permitted to be equipped with hardware that prevents re-entry into the interior of the building, provided that the following criteria are met:



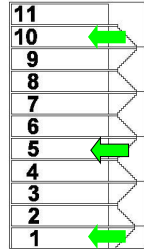
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- (1) There shall be not less than two levels where it is possible to leave the stair enclosure to access another exit.

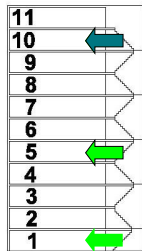


- (2) There shall be not more than four stories intervening between stories where it is possible to leave the stair enclosure to access another exit.



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- (3) Re-entry shall be possible on the top story or next-to-top story served by the stair enclosure, and such story shall allow access to another exit.



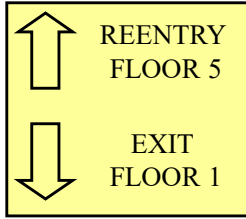
- (4) Door assemblies allowing re-entry shall be identified as such on the stair side of the door leaf.

**REENTRY
PERMITTED
ON THIS
FLOOR.**

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(5) Door assemblies not allowing re-entry shall be provided with a sign on the stair side indicating the location of the nearest door opening, in each direction of travel, that allows re-entry or exit.

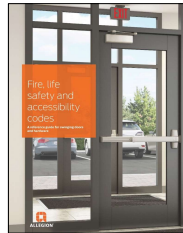


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For more information, visit iDigHardware.com



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