

Key-Operated Locks



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

ONE OF THE CARDINAL RULES OF DOORS IN A MEANS OF EGRESS IS THAT the lock or latch must allow free egress without the use of any key, tool, special knowledge, or effort. The *International Building Code* (IBC) and NFPA 101, *Life Safety Code*, contain exceptions to this requirement for free egress, such as:

- The locking of detention/correctional occupancies
- The use of a nightlatch or security device on a residential dwelling unit
- Automatic flush bolts on a pair of doors when there is no doorknob or surface-mounted hardware on the inactive leaf
- Fire door hardware that is disabled after reaching the minimum elevated temperature defined by the fire test procedure

There is an additional exception in both of these codes for the use of a key-operated lock, which is typically a deadbolt with a key cylinder on both sides of the door.

In the 2012 edition of the IBC, these exceptions are covered in [Section 1008.1.9.3](#), Locks and Latches. Several criteria must be met to allow the use of a key-operated lock on the egress side of the door:

- The use group must be one of the following:
 - Assembly occupancy with an occupant load of 300 people or fewer
 - Business, Factory, Mercantile, or Storage occupancy
 - A place of religious worship
- Key-operated locks are limited to the main exterior door or doors in these occupancy types. Because only the main exterior door is allowed to have a key-operated lock, employees who are in the building when it is locked are expected to have access to other exits that do not require the use of a key.
- The locking device must be readily distinguishable as locked; often the lock will have an indicator that reads “open” or “locked.”
- Signage on the egress side of the door or adjacent to the door must state: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The letters on the sign must be at least 1" high on a contrasting background. This signage serves as a reminder to employees but also advises the public that the door must be unlocked when they are present.
- A building official may revoke the use of a key-operated lock for due cause.

The 2012 edition of NFPA 101 addresses key-operated locks in [Section 7.2.1.5.5](#). This section is slightly different from the IBC requirements; for jurisdictions where both codes are used, a blend of the most stringent requirements may be necessary.

- Key-operated locks on the egress side of a door are limited to exterior door assemblies, where allowed by the occupancy chapters (see below for specifics).
- When a key-operated lock is installed, a readily visible, durable sign must be located on or adjacent to the door, reading: THIS DOOR TO REMAIN UNLOCKED WHEN THE BUILDING IS OCCUPIED. The letters on the sign must be at least 1" high on a contrasting background.

- The lock must be readily distinguishable as locked, typically with an indicator that reads “open” or “locked.”
- A key must be readily available to all occupants inside the building when it is locked.
- An Authority Having Jurisdiction (AHJ) may revoke these provisions for cause.

According to NFPA 101, a building is “occupied” when it is open for general occupancy or open to the public, or when it is occupied by more than 10 people. Otherwise, the building is considered “unoccupied.” The code recognizes that there may be custodians or security personnel inside the building when it is locked. These occupants are generally familiar with the facility, and they must have access to keys as required by the code. It is not the intent of the code to allow people to be locked inside of a building without a means of egress, even if the number of occupants is 10 or fewer.

The occupancy chapters that allow the use of key-operated locks are as follows:

For Assembly occupancies (12/13.2.2.2.4), key-operated locks are limited to a single door or a single pair of doors that serve as the main exit, and the occupant load may not be more than 500 for new facilities and 600 for existing ones. Key-operated locks for Assembly occupancies have to be deadbolt locks that do not automatically latch, because NFPA 101 requires latching devices for these facilities to be released by panic hardware or fire exit hardware when the load of the Assembly occupancy is 100 occupants or more.

In Mercantile occupancies (36/37.2.2.2.2) and Business occupancies (38/39.2.2.2.2), key-operated locks are permitted only on principal entrance/exit doors. These are doors that the AHJ can reasonably expect to be unlocked in order for the facility to do business. For these occupancy types, NFPA 101 does not state a limit on how many principal entrance/exit doors may have key-operated locks; for example, on a fast-food restaurant that has more than one principal entrance/exit, the AHJ may allow key-operated locks on both of the principal entrance/exit doors.

One question that often arises is whether another type of deadbolt would be acceptable—either a deadbolt with a key on the exterior and a thumbturn on the interior, or a classroom function deadbolt (the thumbturn can retract the bolt to unlock the door but cannot project it to lock the door). The biggest factor in that determination is whether the deadbolt is being used as an alternative to panic hardware. Panic hardware is typically required for Assembly and Educational occupancies¹


with an occupant load of 50 or more (2006 IBC or later) or 100 or more (NFPA 101 and the 2003 IBC).

If panic hardware is required, the codes allow the use of key-operated locks as an alternative for *some* Assembly occupancies (see above). For these occupancies, the code is specific: either panic hardware is required, or a key-operated lock may be used if all of the criteria are met. In this situation, the code does not allow any other type of lock.

For doors that do not require panic hardware, the code does not restrict the use of a deadbolt with a thumbturn as long as the hardware meets the requirements for operating hardware:

- If the door is on an accessible route, the hardware shall not require tight grasping, tight pinching, or twisting of the wrist to operate. The code is not prescriptive with regard to the size/shape of thumbturns, but many code officials use the side of their palm or the tip of a pencil to determine whether a thumbturn requires tight grasping, tight pinching, or twisting of the wrist to operate. Many manufacturers offer thumbturns that meet these requirements.
- Operating hardware must be installed a minimum of 34" and a maximum of 48" above the finished floor. The IBC allows locks used only for security purposes and not for normal operation to be mounted at any height. NFPA 101 allows existing security devices to be mounted up to 60" above the floor. Consult codes for exceptions related to swimming pool doors.
- The unlatching of any door leaf must not require more than one operation. Consult codes for exceptions related to manual and automatic flush bolts, residential dwelling units, and detention facilities.

If a deadbolt is of a design that meets all of these criteria, and the door is not a fire door that requires an active latchbolt for positive latching, then the code would not prohibit the use of these deadbolts as long as the occupancy type/load does not mandate panic hardware.

As always, local code requirements may vary from the national codes referenced here, and the Authority Having Jurisdiction has the final say. This article is based on my research and interpretation of the codes and may differ from the interpretations of others. 

Endnote

1. There are additional requirements for panic hardware on High Hazard occupancies in both codes, and NFPA 101 also requires panic hardware on Day Care occupancies.

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