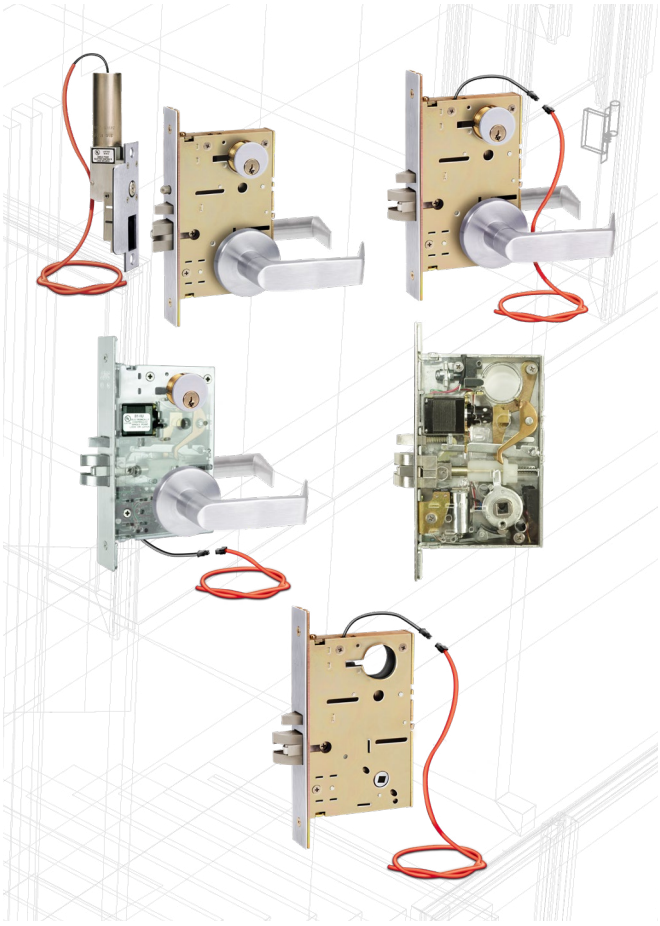
WHITE PAPER

Electrified Mortise Locksets



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CONVENIENCE AND HIGHER SECURITY WHILE COMPLYING WITH FIRE LIFE SAFETY CODE

Electrified mortise locksets are equipped with a solenoid to enable or disable the outside door handle. The latchbolt can be retracted from the secured side simply by turning the handle. On the outside of the door, the handle will not engage the locking mechanism to open unless the solenoid is engaged.

This function ensures that anyone inside can get out simply by turning the handle, but an outside credential must use a key or an electrical means to disable the solenoid and unlock the door. Electrified mortise locks usually have a mechanical override function so that they can be opened by using a key or by turning the handle. Some electrified mortise locks incorporate a motor for retracting the latchbolt, while others may include both a solenoid and motor – depending on the application requirements.

Electrified mortise locksets are well suited for both new and retrofit construction and can be more expensive than electrified cylindrical locksets because they typically provide a higher level of security. Additional features include:

- Compatible with most types of access control
- Available as failsafe or failsecure
- Available in a variety of trim and finish options

History

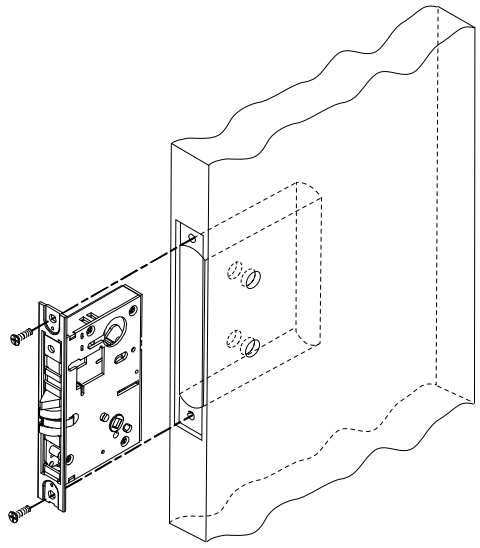
What is a Mortise Lock?

A mortise lock usually combines a latch and deadbolt in one door lock that is installed in the door itself, requiring a pocket or mortise to be cut into the edge of the door for installation. Because the internal locking mechanisms are contained within the door, mortise locks offer increased security and privacy that cannot be easily tampered with or bypassed. With no hardware visible from the outside, the tamper-proof design of mortise locks also provide a better design aesthetic.

Mortise locks have been in use since the mid-18th century and have proven to be one of the most secure locking mechanisms available. Many mortise locks feature a built-in cylinder to be used with a key for extra security.

Over time, mortise locks have evolved to provide passage, privacy, and deadlock functions, allowing installers to set the lock for a specified outcome. As such, they are a popular safety and security solution for a variety of requirements.

Why is it called mortise?



The noun mortise – “a hole or groove in which something is fitted to form a joint” – comes from 13th century Old French “mortaise”, or possibly from Arabic “murtazz”, a past participle of “razza”, meaning to “cut a mortise in”.

Application

Owing to their strength and durability, electrified mortise locks are most often used where security is vital. They may be used on non-fire rated and fire rated wood, mineral core and hollow metal doors. Additionally, SDC’s building code compliant electrified mortise locksets stay latched even when unlocked, maintaining fire door integrity. This basic ability complies with national code requirements for up to 3-hour fire rated doors, including elevator lobby and stairwell doors where electromagnetic locks and electric strikes are not permitted.

Electrified mortise locks eliminate the need for exposed and vulnerable locking devices, such as electric strikes, magnetic locks and remote request-to-exit devices. What’s more, they are ideal for high profile installations that require high security or superior appearance.

Facility applications include: commercial high-rise and industrial buildings, technology centers, healthcare, transportation, government and military facilities, museums and universities.

The Evolution of SDC's Electrified Mortise Locks

With over 50 years of design, manufacturing and operational expertise in electrified mortise locksets, SDC provides a comprehensive series of solenoid controlled and motorized solutions to replace existing mechanical or electrified mortise locksets in commercial, industrial and institutional openings. All feature a grade 1 heavy duty mortise design, our proprietary vandal resistance clutch for reliability and durability, and failsafe or failsecure operation.[1]

All SDC code compliant, electrified mortise locksets stay latched even when unlocked, maintaining fire door integrity and eliminate the need for exposed and vulnerable electric strikes, magnetic locks or request-to-exit devices. Additionally, all SDC mortise locks feature a mortise cylinder* to manually retract the latch.

[1] *7600 Series are failsecure only*
** Key cylinders sold separately*

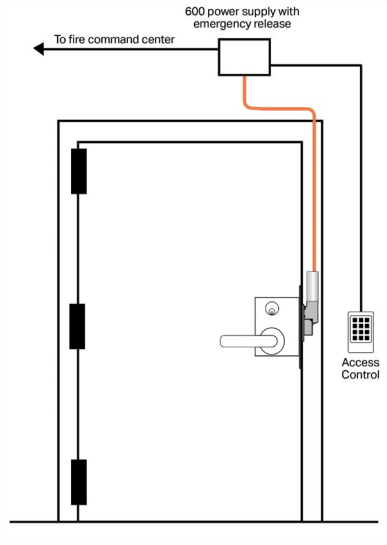
The following is an overview of the major electrified mortise lockset innovations we've introduced since 1973.

SDC HiTower®

7500 Series

Solenoid Frame Actuator Controlled Mortise Locks

The HiTower® is one of two SDC inventions – the other being the FS23M series electric bolt lock – that helped usher in the modern era of electronic access control hardware. In 1973, our founder, Art Geringer, invented and filed the patent for the HiTower® lock, the first frame actuator controlled mortise lockset for stairwell doors. Before HiTower®, updating a mechanical mortise lockset for electronic access control was very costly to retrofit. By placing the actuator and all wires in the frame, electric hinges and factory door prep parts and costs were eliminated - revolutionizing the way high-rise buildings are secured and occupants' safety is protected.



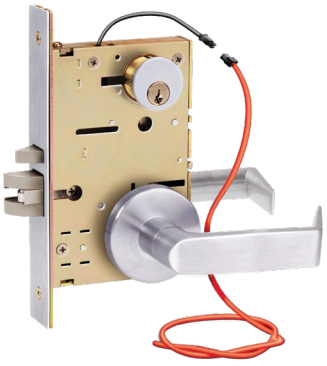
No wires through the door
No electric hinge

SDC Selectric®

7800 Pro Series

Solenoid Controlled Mortise Locks

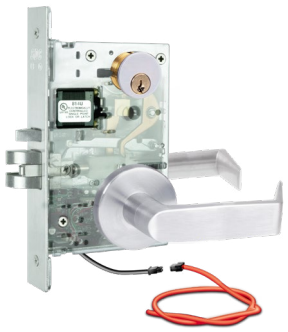
In 1997, SDC introduced the Selectric® 7800 series solenoid controlled mortise locks featuring our proprietary vandal resistant clutch mechanism. These code compliant electric mortise locksets stay latched even when unlocked, maintaining fire door integrity and eliminate the need for exposed and vulnerable electric strikes and magnetic locks or request-to-exit devices. Today, these same feature/benefits have been incorporated into all SDC electrified mortise locksets.



Electrified Mortise Locksets

7600 Series

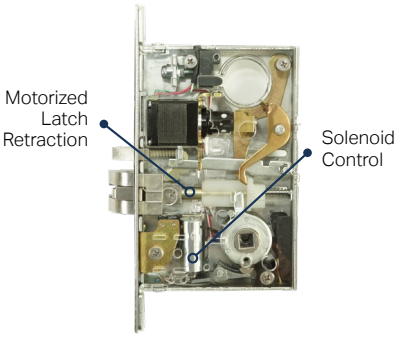
Motorized Latch Retraction Controlled Mortise Locks



Electric solenoids have been used for decades in electrified hardware to operate deadbolts and retract or dog latchbolts. During periods of extended use, solenoids can become quite heated and noticeably sluggish. With advancements in electric motor technology, the use of a motorized electric latch retraction device provides several advantages over solenoids including lower current draw, quieter operation and greater durability over time. In 2018, SDC was one of the first in the industry to offer a MLR controlled mortise lock with the introduction of the 7600 series.

7700 Series

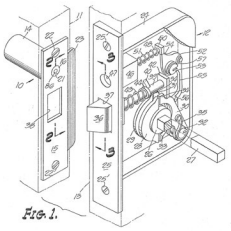
Motorized Latch Retraction & Solenoid Controlled Mortise Locks



Also in 2018, SDC introduced the 7700 Series with both motorized electric latch retraction and a solenoid for mortise lock control – another industry first and still proprietary to SDC. Ideal for automatic door operator applications, the solenoid controls the inside, outside or both door levers. The MLR and solenoid control features combine versatile passage functionality with failsafe or failsecure access control while meeting ADA compliance.

SDC HiTower®

The Grandfather of Electrified Mortise Frame Actuator Controlled Locksets




Los Angeles Times

High-Rise Fire Raises Specter of Real Disaster

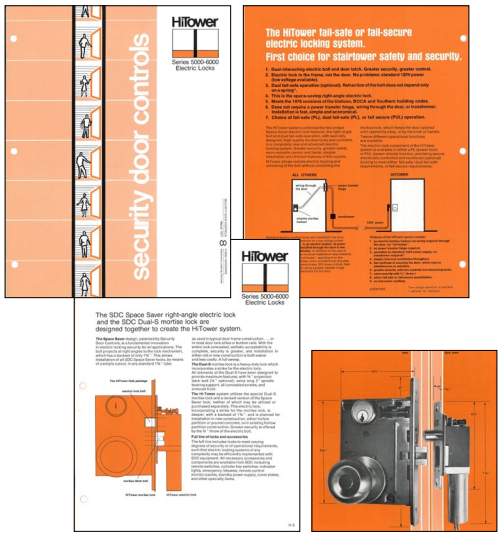
But Flames Are Put Out in Century City Building Without Serious Incident

BY TED THACKREY JR. and ED MEAGHER

Original 1973 HiTower® patent drawing and high-rise building fire story from the LA Times - 11/13/74.

"A giant step forward saving lives in high-rise situations as well as structures has been initiated by the adoption of the 1973 UBC, Section 1807, and the California State Fire Marshals' adoption of an amended form in Title 19.1807."

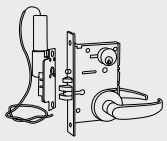
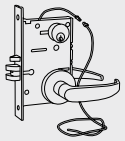
– Art Geringer, SDC Founder –



First HiTower® product brochure from the mid-1970's

SDC's 7500, 7600, 7700, 7800

Series and Specifications Summary

Series	7500	7600	7700	7800
				
Trademark	HiTower®	--------	--------	Selectric®
Type	Mortise, Frame Actuator Control	Mortise, MLR Control	Mortise, MLR & Solenoid Control	Mortise, Solenoid Control
Door Thickness	1¾"	1¾"	1¾"	1¾"
Door Prep	ANSI A156.13	ANSI A156.13	ANSI A156.13	ANSI A156.13
Backset	2¾"	2¾"	2¾"	2¾"
Faceplate	8⅛" x 1⅝" x 7/32"	8⅛" x 1⅝" x 7/32"	8⅛" x 1⅝" x 7/32"	8⅛" x 1⅝" x 7/32"
Case	6" x 4" x 1"	6" x 4" x 1"	6" x 4" x 1"	6" x 4" x 1"
Latchbolt	¾" Throw, Stainless Steel, Anti-Friction	¾" Throw, Stainless Steel, Anti-Friction	¾" Throw, Stainless Steel, Anti-Friction	¾" Throw, Stainless Steel, Anti-Friction
Deadbolt[1]	--------	--------	--------	1" Throw[2]
Deadlatch	Above Latchbolt	Above Latchbolt	Above Latchbolt	Above Latchbolt
Strike	Standard Failsafe Actuator Standard ANSI 4⅞" x 1¼" 1¾" to 2" Frame Face Narrow Failsafe Actuator* 8½" x 1¼" 1¼" to 1½" Frame Face	Standard ANSI 4⅞"	Standard ANSI 4⅞"	Standard ANSI 4⅞"
Weight	7 lbs	7 lbs	7 lbs	7 lbs
Input	115 VAC ± 10% 24 VAC ± 10% 24 VDC ± 10%	24 VDC ± 10%	24 VDC ± 10%	24 VDC ± 10%
Current Draw[2]	200 mA @ 115 VAC 500 mA @ 24 VAC 500 mA @ 24 VDC	620 mA Inrush 160 mA Continuous	620 mA Inrush, 160 mA Continuous (MLR) 300 mA (Solenoid)	600 mA @ 12 VDC 300 mA @ 24 VDC
Monitoring Contacts	SPDT 5 Amps @ 30 VDC Resistive	SPDT 5 Amps @ 30 VDC Resistive	SPDT 5 Amps @ 30 VDC Resistive	SPDT 5 Amps @ 30 VDC Resistive
UL Listed	Yes	Yes	Yes	Yes
Warranty	5 Year	5 Year	5 Year	5 Year

***** *Special narrow strike plate frame prep required, 8½" x 1¼"*

[1] *7870, 7872, 7880 and 7882 models only.*

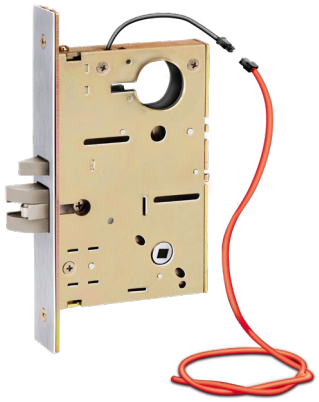
[2] *7700 models utilize an external control board that requires continuous power. Additionally, a power transfer device with a minimum of six conductors is required. (Ten conductors required with options)*

Modification Services and Field Modification Kits

SDC Selectric®

7800 Mod Series

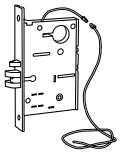
Solenoid Controlled Mortise Locks Modifications



The 7800 Mod series electrifies customer supplied new or existing mechanical brands of mortise locksets. Simply send the brand lockset of your choice to SDC for electrification. Brands compatible for SDC modification include: Schlage, Yale, Falcon, Arrow, Marks, PDQ, Dorma, Corbin Russwin, Sargent, Hager, Best and Cal Royal. Only storeroom function mortise lock chassis can be electrified. A mortise cylinder manually retracts the latch.*

** Key cylinders sold separately*

SDC 7800MOD Series Specifications Summary

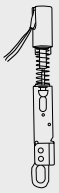
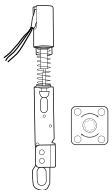
Series	**7800**
	
Trademark	Selectric®
Type	Mortise, Solenoid Control
Input	12/24 VDC ± 10%
Current Draw	600 mA @ 12VDC 300 mA @ 24 VDC
Monitoring Contacts	SPDT 5 Amps @ 30 VDC

SK Series

Schlage L9000 Mortise Lock Field Electrification Kits

SDC's SK series field electrification kits for Schlage L9000 mortise locks allow for fast conversion of existing mechanical locks into electric access controlled locks in the field. Failsafe and failsecure options are easily selected and can be changed in the field to suit any need. Models include the SK-L90 Schlage L9070 field electrification kit and the SK-L90-SC Schlage L9080 field electrification kit, springcage included.

SDC SK Series Specifications Summary

Models	SK-L90	SK-L90-SC
		
Type	Schlage L9070 Field Electrification Kit	Schlage L9070 Field Electrification Kit, Springcage included
Weight	1 lb	1 lb
Input	12/24 VDC ± 10%	12/24 VDC ± 10%
Current Draw	600 mA @ 12VDC 300 mA @ 24 VDC	600 mA @ 12VDC 300 mA @ 24 VDC
Monitoring Contacts	-----	-----

Electrified Locks and Fire Ratings

Installing an electrified lock on a fire-rated door can void the door's fire rating. Use fire-rated locks, like SDC's 7500, 7600, 7700, and 7800, for fire-rated openings. It is important to note that refrotting an electrified lock on a fire-rated door can void the door's fire rating when door core drilling is required for a wire raceway. It is crucial that the lock is installed to allow for a rated door assembly to be re-certified after installation. For recertification, the Warnock Hersey (WH) Mark is the leading fire product safety and performance mark for building and construction products. Manufacturers and AHJs have viewed WH as the preferred mark for fire safety certification. Products bearing the Warnock Hersey certification indicate compliance to relevant building codes, association criteria, and product safety and performance standards.

Using improperly rated locks can void the rating as well as any drilling, cutting, or non-original penetration to the door or frame. On fire doors with ratings of 45 minutes or higher, an electrified lock must be installed so that it does not allow fire or smoke to penetrate. This is accomplished in originally rated assemblies by making sure the wiring is inside ANSI electrical pockets built into the door or frame.

Fire code officials are serious about not allowing fire and smoke to penetrate fire-rated doors. If you are not fully aware on how to retrofit the door with an electrified lockset without voiding the originally rated door assembly, you can potentially cost yourself a lot of money if you get it wrong. You will be responsible for replacing the entire rated assembly, door, and frame. We recommend you pay particular attention to the manufacturer's installation instructions as well as product listings and certifications before proceeding.

(Thanks to Norman Thomas and his book: "Electronic Access Control" from which we restated some of the above content. https://www.sciencedirect.com/book/9780123820280/electronic-access-control)

Door Core Drill Guide

Typically fire rated hollow metal doors will require preparation for wire preps by the door supplier to maintain their fire rating. However, the SDC door core drill fixture kit provides the best method of field wire preparation for fire rated or non-fire-rated particle filled and wood doors to accommodate the installation of electrified locksets, exit devices and hinges while maintaining the door integrity and rating. The installer may call for inspection of fire-rated doors for re-certification when installation is complete.

7000-DKG Laser Guided Wire Raceway Drill Fixture Kit

- The drill fixture allows for drilling from the hinge side without removing the door from the frame
- Will drill at up to 20 degrees from center, up or down.
- Drills in only 4 minutes
- Evacuator drill bit standard

Power Transfer Hinge

Installed in the center hinge position of the door, the PTH series electric hinge provides the concealed and vandal resistant wires required between the door and the frame for the purpose of powering and monitoring the access controlled locks. Choices include a 4-wire hinge for basic applications that may include a request-to-exit output and a 10-wire hinge to accommodate multiple remote lock status outputs, such as door status, latch status, locked status and request-to-exit.

IMPORTANT: It is important to note that when used on fire rated doors, the hinge must be UL10C Listed, and carry the mark (F) located next to the UL symbol. The UL Listed (F), indicates that the hinge is UL Listed for use on up to 3 hour "A" label fire rated doors.

Hinge Configurations

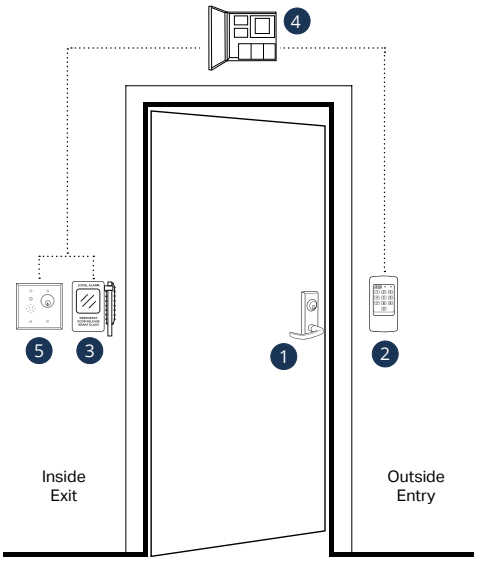
A typical standard weight hinge, size: 4½ x 4½"

For more power transfer devices product information and resources, visit **sdcsecurity.com/power-transfer-devices.htm**

Application Examples

Electrified Mortise Lock Stairwell Access Control

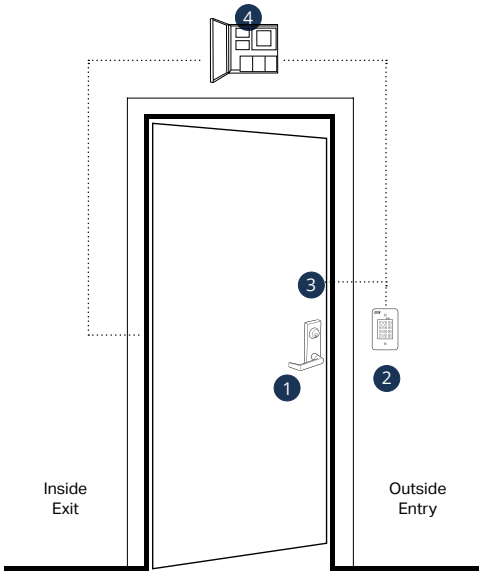
7500 Series HiTower®
Frame Actuator Control



Access & Egress Security Solutions Brochure Page 8

Electrified Mortise Lock Access Control

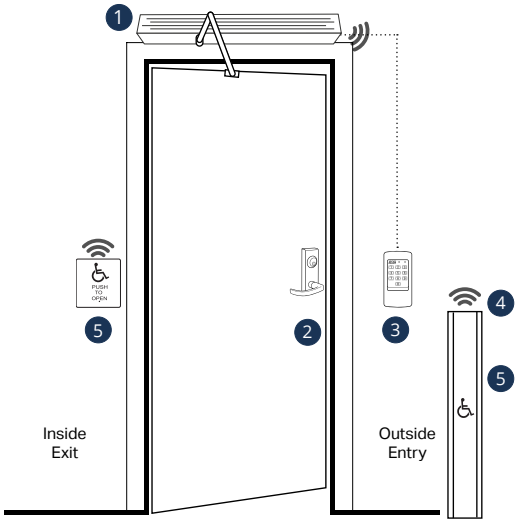
7800 Pro Series
Solenoid Controlled Mortise Locks



Access & Egress Security Solutions Brochure Page 7

Automated Mortise Lock Access Control

7600 Series MLR Control or
7700 Series MLR & Solenoid Control



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Access & Egress Security Solutions Brochure

Download at:
www.sdcsecurity.com/Solutions-Brochure

Listing and Performance Specifications

REQUIRED UL LISTINGS

The UL Listing confirms that the electrified lockset design is electrically safe and has been tested for the purpose the product was intended. All electrified locksets should meet the following applicable UL test requirements.

UL 10C "Positive Pressure Compliant" and Classified in accordance with Uniform Building Code (UBC) "Fire Test for Door Assemblies"

This verifies that the lock does not have negative impact on the integrity of fire rated openings. The description will be found on the official UL Listing Auxiliary Lock document.

ULC-S104 Standard Method for Fire Tests of Door Assemblies

Scope: Fire endurance and hose stream test of door assemblies of various materials and types for use in wall openings to prevent the passage of fire.

Applicable Products: Door and frame assemblies mounted in a wall, including swinging doors, sliding or rolling doors, horizontal slide-type elevator doors, access doors, chute doors, dumbwaiter doors, service-counter doors. Door and frame hardware is also applicable

Canadian Listing: The C preceding the listing symbol indicates that the product is also UL Listed for use in Canada.

The World of Difference Between UL "Listed" and UL "Recognized"

UL's Component Recognition Services covers the testing and evaluation of individual components that are incomplete or restricted in performance capabilities. These components will later be used in complete end-products or systems listed by UL. These recognized components are not intended for separate installation in the field, they are intended for use as components of complete equipment submitted for investigation and subsequent UL Listing.

California State Fire Marshal: CSFM Listed 3774-0324:0108

This listing is required for California installations. The State of California is well known for consistently setting the highest standards for fire life safety in the world.

Note to Distributors and Installers

For a competitive edge, specify and promote the listing and performance attributes of the components you are providing with your installations. Include information on code compliance, city and state listings, performance certification (ANSI/BHMA), specific laboratory listings (UL), service ease and warranty.

A Note to Building Owners

Know and understand the products being installed, or specify a preferred manufacturer yourself. Request that details about product and application code compliance are supplied with the installation bid, such as, city and state compliance, performance certification (ANSI/BHMA), laboratory listings (UL), service ease and warranty. This information may be a deterrent to having an inspector reject an installation today, or even at a later date when NFPA 80 changes take effect. Additionally, non-compliance of components could lead to potential liability should a fire or life safety emergency occur in the facility.