Windstorm solutions

For the harshest environmental conditions

When safety is as important as security™

Severe weather takes a tremendous toll in the United States. From 2011-2013, there were over 3,500 tornadoes resulting in 678 deaths in the US[1]. Between 2010-2012, 89 hurricanes or tropical storms resulted in 586 deaths and over $108 billion in damages[2].

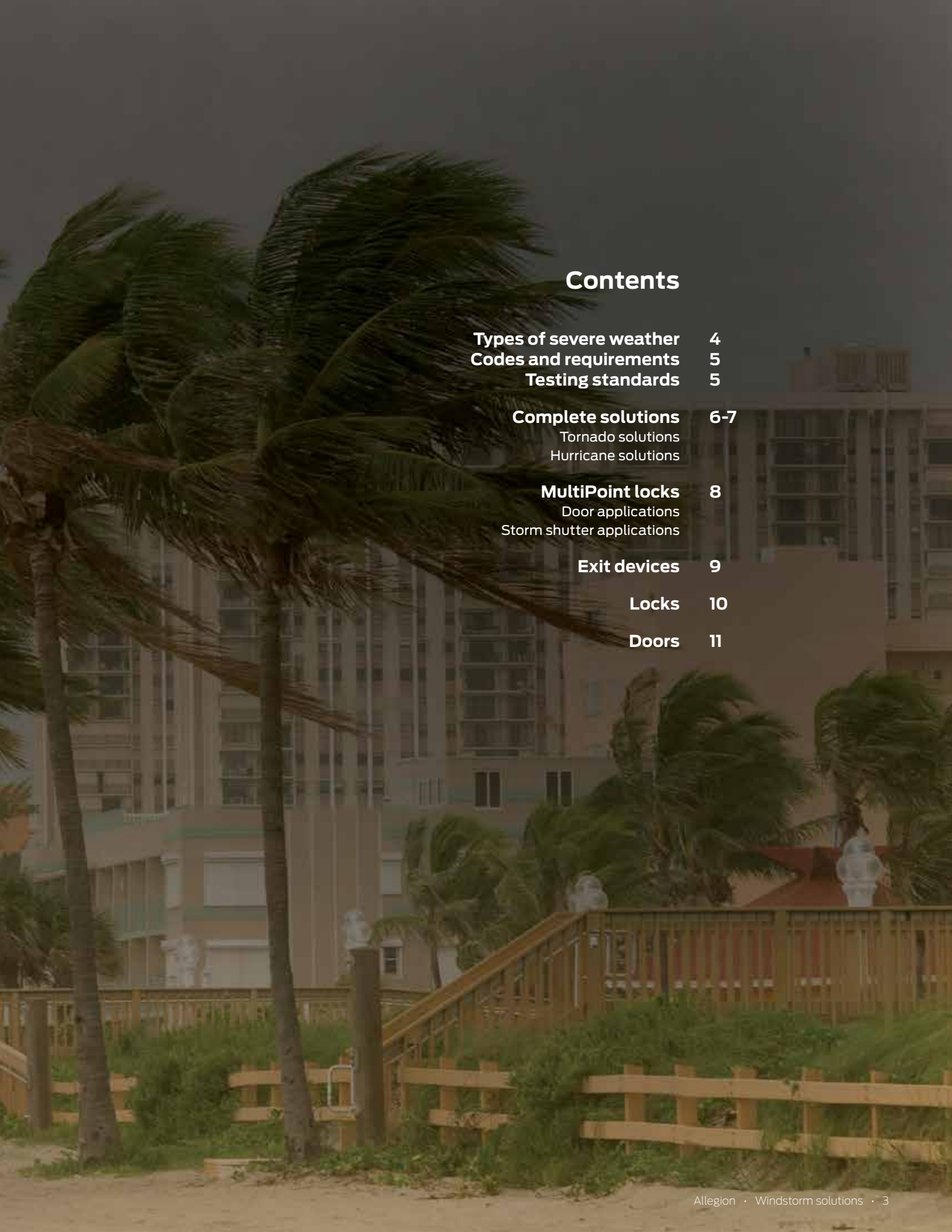
This brochure is intended as an introduction to severe weather codes and guidelines in the United States, and as an overview of Allegion severe weather solutions. Requirements and details vary state to state so please contact your local Allegion representative to discuss the appropriate solution for your needs or call 877-671-7011 to get connected with someone in your area.

References

1. http://www.spc.noaa.gov/climo/online/monthly/newm.html
2. http://www.wunderground.com/hurricane/hurrarchive.asp

Be sure to ask your local Allegion representative about windstorm solutions and building codes for your area. To learn more visit www.allegion.com/us.

QuietSolutions | **Custom**Décor | High**Security**and**Safety** | **Environmental**Solutions | **Flexible**Configurations



Contents

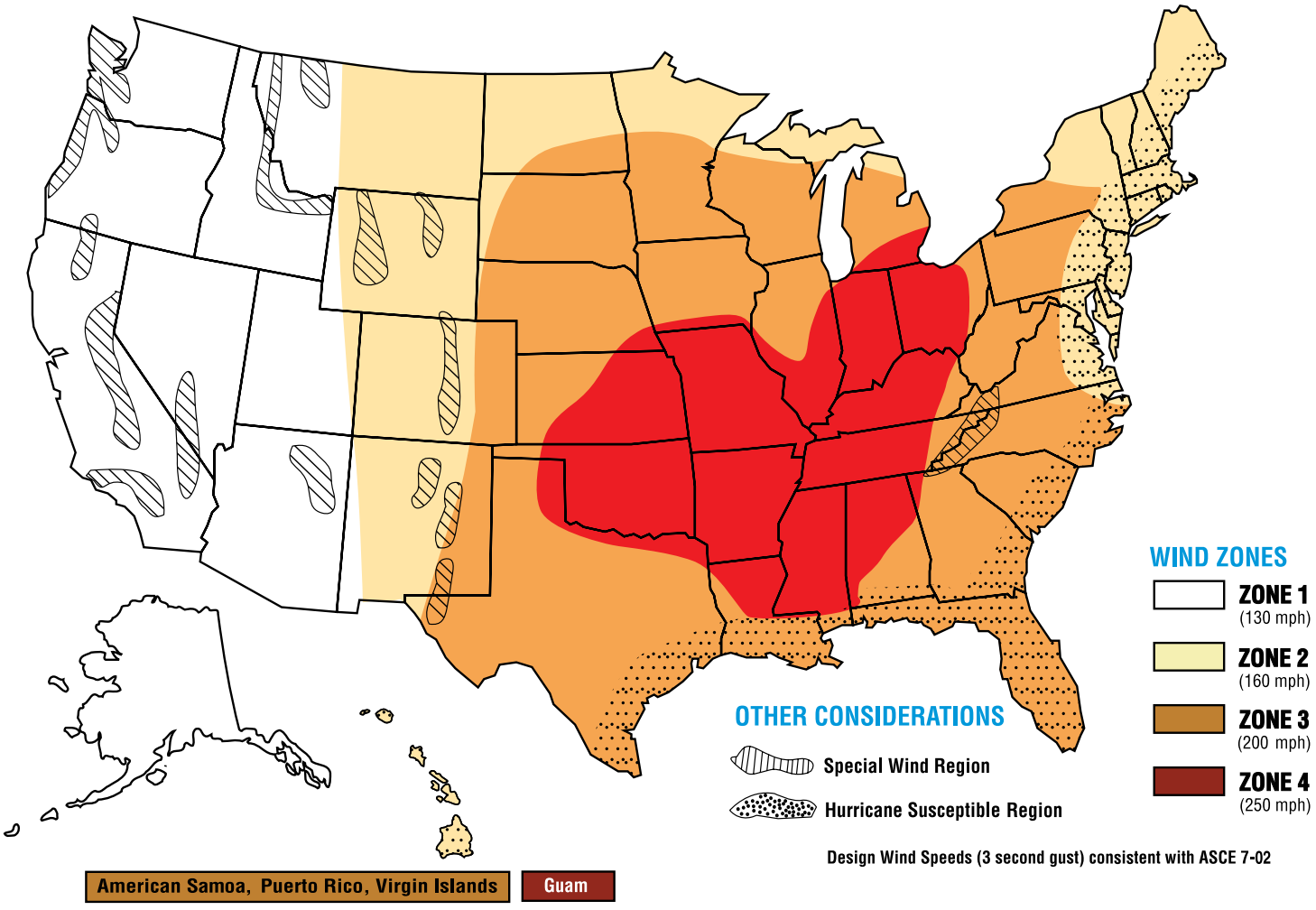
Types of severe weather

Tornado

Tornado resistant openings are designed to protect occupants during short periods of high-velocity winds. The strongest tornadoes produce wind speeds up to 250 mph and dangerous projectile debris. Tornado devices are specially designed and tested to withstand these conditions. Most tornadoes in the United States occur in the Midwest, Central and Southeastern states. The primary guidelines and standards concerning tornado applications are FEMA 361, FEMA 320 and ICC 500.

Hurricane

Hurricane resistant openings are designed to withstand storm conditions for long periods of time while maintaining the structural and functional integrity of the opening. The primary function is to not only prevent debris and wind from penetrating the assembly but also to continue functioning after the storm. Florida was the first state to develop hurricane codes. As a result, the requirements set by the Florida Building Codes may be adopted by jurisdictions in other states where hurricane protection is a necessity.



Note: Always reference local codes for specific jurisdiction requirements.

Codes and requirements

Tornado guidelines and standards
The tornado guidelines used in the United States were established by the Federal Emergency Management Agency (FEMA) after a series of devastating tornadoes in the 1990s. Today, the FEMA 320/361 guidelines and ICC 500 test standards are the principle governing documents for tornado protection.

FEMA 320, FEMA 361 (guidelines):
Both FEMA 320 and FEMA 361 provide guidelines for tornado resistant structures. The difference is that FEMA 320 pertains to residential safe rooms (occupancy <16 people) whereas FEMA 361 is for community storm shelters (occupancy ≥ 16 people). All products in this catalog identified as FEMA compliant are held to the more stringent FEMA 361 standard and can be used in both residential and community applications.
For more information, visit www.FEMA.gov.

ICC 500 (testing standard):
ICC 500 is the general testing standard for community and residential storm shelters that provide a safe refuge from storms that produce high winds, hurricanes, and tornadoes. While the design guidelines are contained within FEMA 320/FEMA 361, the testing standards are contained within ICC 500. All tornado assemblies listed within this document are tested at the highest level of ICC 500, and have passed all tests deemed necessary to withstand windspeeds up to 250 mph and 15 lb projectile impacts at 100 mph, the equivalent of an EF5 tornado. For more information, visit www.iccsafe.org.

Hurricane codes
Miami-Dade County in Florida was the first to certify products for Hurricane resistant structures. Subsequently the Florida Building Code enacted all the requirements for Hurricane resistance and now has standards equivalent to, and in some cases in excess of, the Miami-Dade County requirements. Because of their leadership in hurricane codes, many states reference the requirements set forth in the Florida Building Code, whereas some states have developed their own requirements. Texas, for example, developed their standard in cooperation with the Texas Department of Insurance. The intent of this brochure is to provide a general guideline for severe weather – always work with your local SSC representative for the specific requirements in your state.

Florida building code (FBC) TAS 201, 202, 203 (wind & impact zone (HVHZ)):
Exterior door assemblies certified for installation within the Florida High Velocity Hurricane Zone (coastal region of the state) are subject to specific tests for both wind speed and flying debris called out in the TAS protocols of the Florida Building Code. Impact, structural, and cyclic tests must be conducted on full assemblies (i.e. lock or exit device and door) as part of the standard.

ANSI-ASTM E330 (wind only (non-impact zone)):
Exterior door assemblies certified for installation in non-impact regions (typically inland regions) are tested for structural integrity in accordance with ASTM E330 for Wind-Only applications. These doors are subject to a structural test load equal to 1.5 times their actual design pressure rating, and must remain operable with no breakage of glazing panels.

Full building support

with wind and impact-resistant locks, MultiPoint locks, exit devices, and doors

Tornado solutions

All tornado solutions meet FEMA 320/361 guidelines and are tested to standards for the most powerful EF5 tornadoes, providing protection from windspeeds up to 250 mph and 15 lb projectile impacts at 100 mph. Because of the extreme requirements, all tornado solutions are tested as complete assemblies (e.g., lock or exit device along with a Steelcraft Paladin™ door and frame). Two different tornado solutions are available:

MultiPoint locks: MultiPoint locks are three-point locking systems that secure the door at three points – top, bottom, and traditional center latch location. Operating just like traditional locks, MultiPoint locks are ideally suited for classrooms, storerooms, community rooms, or dedicated storm shelters. MultiPoint locks can also be used as "storm shutters" to secure window openings from the inside, protecting occupants from glass and flying debris.

Windstorm exit devices: Tornado- and windstorm-qualified exit devices are operationally and aesthetically identical to a standard exit device, but are specially designed to the same wind and impact standards as the MultiPoint lock and can withstand the most powerful tornadoes.

Hurricane solutions

The appropriate hurricane solution depends on the specific requirements for the application zone. There are two different hurricane zones:*

Hurricane wind & impact (HVHZ*): Coastal regions take the brunt of hurricanes, with threats from both wind and flying debris. Hurricane wind & impact devices are tested to meet or exceed all windstorm risk categories. Furthermore, the Schlage LM9300 MultiPoint locks and Von Duprin WS98/9927 Exit Devices meet the additional Florida Building Code Enhanced Hurricane Protection Area (EHPA) requirements, providing additional protection against projectile impacts.

Hurricane wind-only: Inland regions have lower hurricane requirements, with only high wind pressure posing a threat. All Von Duprin exit devices and most Schlage locks, when paired with select Steelcraft doors, are approved for wind-only applications.

* Please note that the terminology used in this brochure - wind & impact, wind-only - is general terminology and the exact verbiage used in a specific state may differ (example: Florida refers to its wind & impact region as a "High Velocity Hurricane Zone"[HVHZ]).

Schlage, Von Duprin and Steelcraft have combined to offer a complete solution

specifically designed for severe weather

Locks, MultiPoint locks, exit devices and doors offer safety and security from tornadoes and/or hurricanes, complying with the most stringent testing standards. Tornado solutions meet the most stringent FEMA 361/FEMA 320/ICC 500 requirements, withstanding 250 mph windspeeds and 15 lb projectile impacts at 100 mph. Hurricane solutions are likewise tested to meet wind-only or wind & impact requirements for inland or coastal regions.

	Schlage MultiPoint locks	**Von Duprin exit devices**	**Schlage locks**	**Steelcraft Doors**
Door swing	Inswing (single and pairs) Outswing (single and pairs)	Outswing only	Outswing only (L9400 Series approved inswing/outswing)	
Application	Single or pair doors, storm shutters	Single or pair doors	Single or pair doors	
Tornado	LM9300 Series	Von Duprin WS98/9927, 237* (pair doors), WS98/9957 (single doors)	Not applicable for tornado applications	Paladin (PW)
Hurricane Wind & Impact	LM9300 Series (Compatible with H Series door only)	33A/35A Series, 88 Series, 98/99 Series, WS98/9927, XP98/99 Rim, 2670	AL, D, and ND Series cylindrical locks, L Series mortise locks, B600/700/800 Series deadbolts, AD/CO Series electronic locks	Hurricane (H) Hurricane Embossed (HE)
Hurricane Wind-only (non-impact)	Not required for hurricane wind-only applications	All Von Duprin exit devices	A, AL, D, and ND Series cylindrical locks, L Series mortise locks, B600/700/800 Series deadbolts, AD/CO Series electronic locks	Steel reinforced (B) Embossed (CE) Honeycomb core (L) Mineral board core (T)

* Von Duprin 237 is a Lever x Lever 2 point latching product, not an exit device.

MultiPoint locks

SCHLAGE

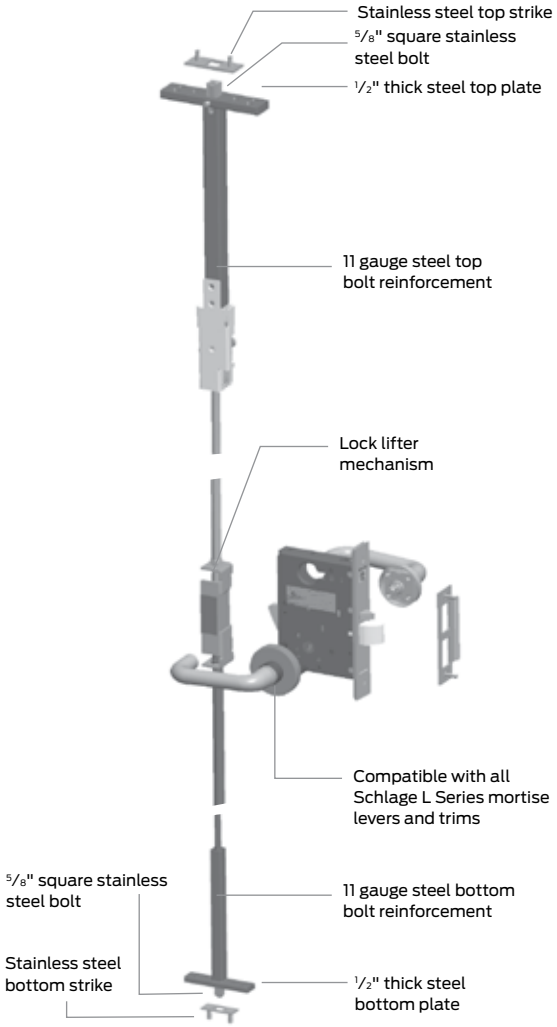
Storm shelter applications

Schlage MultiPoint locks secure the door at three points – top, bottom, and the traditional center latch location – resulting in an assembly that is exceptionally strong and can withstand tremendous abuse. When the Schlage MultiPoint lock is paired with a Steelcraft Paladin tornado door it can withstand the most severe EF5 class tornadoes, with windspeeds up to 250 mph and 15 lb projectile impacts at 100 mph.

The MultiPoint lock utilizes a unique mortise lock that interfaces with top and bottom latches contained within the door. Rotating the handle retracts all three latches; closing the door automatically engages all three latches and immediately secures the door. From a user perspective, operation is identical to a standard door.

The Schlage MultiPoint lock offers the following advantages:

- Multiple available functions for applications in schools, assisted living/healthcare, government, or corporate campuses
- Availability of both traditional key access locks and advanced electronic access solutions that can be suited together to solve all levels of your security needs
- A full range of Schlage levers, trim and finish options
- Vertical rods pre-assembled and factory aligned in the door for ease of installation



Storm shutter applications

In the event of a tornado, all openings to a shelter must be secured – including the windows. For that reason, the MultiPoint lock is available in a shutter configuration. The storm shutter utilizes a 4-sided frame that mounts against a window from the inside of the shelter to protect the occupants from flying glass and debris.


Storm shutter

Hurricane protection

The Schlage MultiPoint lock, when paired with a Steelcraft H hurricane door, meets the Florida Building Code Enhanced Hurricane Protection Area (EHPA) standard.

Available functions

Passage	Exit	Office/entry	Classroom	Classroom security	Storeroom
LM9310	LM9325	LM9350 LMV9350†	LM9370 LMV9370†	LM9371 LMV9371†	LM9380 LMV9380†

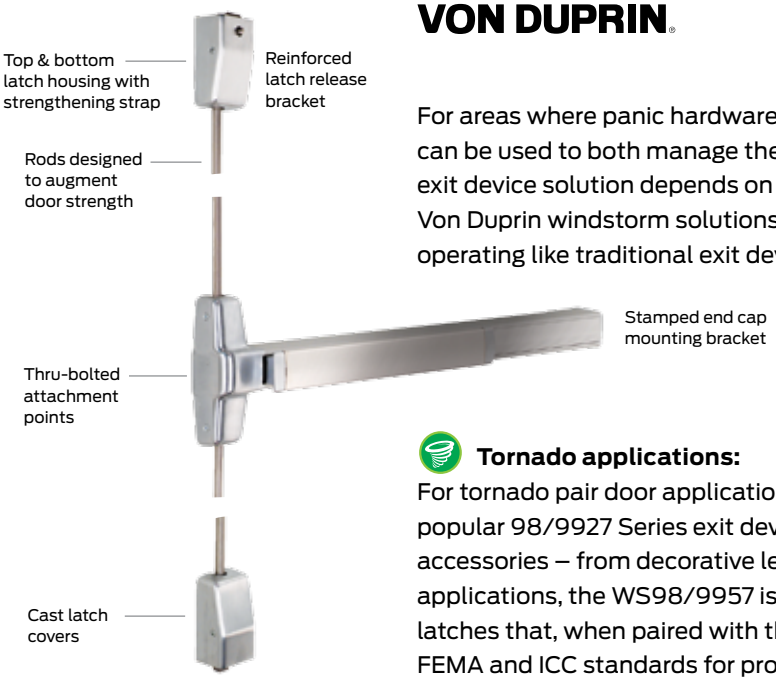
	Schlage MultiPoint lock	Steelcraft door/shutter*	UL fire rating
Tornado	Any LM/LMV 9300 Series†	Paladin (PW)	Available
Hurricane Wind & Impact	Any LM/LMV 9300 Series†	Hurricane (H)	Available

* Door includes Vertical rod system; see data sheet for ordering information.

† Denotes VandlGard® option that allows the exterior lever to rotate fully down when locked, preventing damage to internal lock components caused by excessive force in trying to gain access.

Exit devices

VON DUPRIN®



Note: The WS98/9927 Series exit device when paired with a Steelcraft H or HE Series door, meets the Florida standard for Enhanced Hurricane Protection Area.

For areas where panic hardware is required by code for expedited egress, exit devices can be used to both manage the area and provide safety during storms. The exact exit device solution depends on the requirements of that particular application. All Von Duprin windstorm solutions provide the necessary storm protection while operating like traditional exit devices.

Tornado applications:

For tornado pair door applications, the WS98/9927 exit device is based on the popular 98/9927 Series exit device, with the full complement of features and accessories – from decorative levers to electrified functions. For single tornado door applications, the WS98/9957 is used. Both devices utilize reinforced rods and latches that, when paired with the Steelcraft Paladin door, meet the most stringent FEMA and ICC standards for protection during tornadoes – withstanding 250 mph windspeeds and 15 lb projectile impacts at 100 mph. For Lever by Lever applications (levers on both inside and outside of door), the Von Duprin 237 is also rated to the same FEMA and ICC standards for tornado protection when used with a Steelcraft Paladin door.

Hurricane wind & impact applications:

For coastal regions requiring protection from both debris and high winds resulting from hurricanes, multiple Von Duprin exit devices can be utilized when paired with a Steelcraft Hurricane H or HE Series embossed door. The following solutions – when used with the Steelcraft H or HE Series door – meet the wind & impact requirements set forth in the Florida Building Code:

33A/35A Series	Narrow stile pushbar exit device
88 Series	Crossbar exit device
98/99 Series	Wide stile pushbar exit device
WS98/9927	Windstorm-rated 98/9927
XP98/99 Rim	Heavy-duty 98/99 Series rim device
2670	Guard-X® exit alarm lock

Hurricane wind-only applications:

For inland regions where risk of damage due to debris impact is not as severe, all Von Duprin exit devices can be utilized with select Steelcraft doors for wind-only applications. Details of the relevant Steelcraft door models can be found on page 11 of this brochure.

	Von Duprin exit device	Steelcraft door	UL fire rating*
Tornado	WS98/9927, 237	Paladin (PW)	Available (pair doors only)
	WS98/9957	Paladin (PW)	Available (single-door only)
Hurricane wind & impact	33A/35A Series, 88 Series, 98/99 Series, WS98/9927, XP98/99 Rim, 2670	Hurricane (H) Hurricane Embossed (HE)	Available (except 2670)
Hurricane wind-only	All Von Duprin exit devices	B, L, CE, T	Available (most models)

* Available UL rating varies by exit device model, features, and door type; please review specific details for your particular model.

Locks

SCHLAGE

Locks for hurricane applications

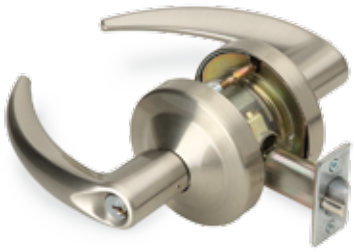
Most Schlage commercial locksets can be utilized in either wind-only or wind & impact applications when paired with the appropriate Steelcraft rated door.

Approved Schlage locksets

Type	Description
Mortise	L Series (Grade 1 levers/knobs)
Cylindrical	ND Series (Grade 1 levers)
	D Series (Grade 1 knobs)
	AL Series (Grade 2 levers)
	A Series (Grade 2 knobs)
Deadbolts	B600/700/800 Series (Grade 1)
Electronic	AD Series (networked and standalone)
	CO Series (standalone)

Note: Wind & impact applications may require a specific door frame strike available through Allegion.
As with any windstorm and code related items, please discuss with your local SSC representative.

B600/700/800 Series deadbolt



ND Series cylindrical lock

L Series mortise lock

AL Series cylindrical lock

D Series cylindrical lock

AD/CO electronic lock

	Schlage lockset*	Steelcraft door	UL fire rating*
Hurricane wind & impact	AD, AL, B600/700/800, CO, D, ND, L	H, HE	Available
Hurricane wind-only	A, AD, AL, B600/700/800, CO, D, ND, L	B, CE, L, T	Available

* May require a specific strike for wind & impact rating. Please discuss with your local SSC representative.

* Available UL rating varies by lock model, features, and door type; please review specific details for your particular model.

Doors

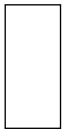
STEELCRAFT

Whether you're in a coastal area subject to hurricane-force storms, or in one of the many areas across the country at risk for tornadoes, Steelcraft has a tough, dependable door system that can take whatever nature dishes out. Our tornado- and hurricane-rated doors are built to exact standards that ensure tough protection when it's needed most.

Tornado

Paladin (PW):
Specifically designed for tornadoes, Paladin doors have a specially designed steel-stiffened core. When paired with the Schlage LM9300 MultiPoint lock, Von Duprin WS98/9927 or WS98/9957 exit device, or Von Duprin 237 Lever x Lever solution, the assembly withstands 250 mph windspeeds and multiple 15 lb projectile impacts at 100 mph.

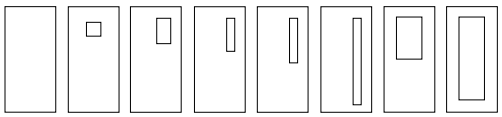
Available elevations



F

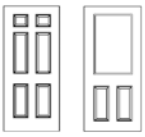
Hurricane wind & impact

Hurricane flush (H):
Specifically designed for Wind & Impact hurricane zones, Hurricane doors are specially designed to withstand the high winds and flying debris associated with hurricanes. Multiple core options are available for improved thermal performance or for additional steel reinforcements. The MultiPoint Lock is only compatible with F elevations.



F V N5 N4 N3 LNL G FG

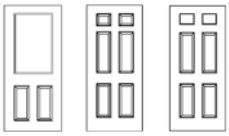
Hurricane Embossed (HE):
Embossed version of the H Series door. Not compatible with the Schlage MultiPoint lock.



E6 E2G

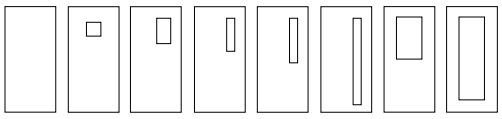
Hurricane wind-only

CE Series embossed door:
Designed to meet the architectural requirements for embossed doors, the CE Series combines the features and benefits of polystyrene core laminated construction with the strength and structural stability of steel.



E2G E6 E4 TL (two glass lights)

L Series door:
Steelcrafts most popular door, the L Series comes standard with a kraft cell honeycomb core for increased structural integrity while reducing overall weight. Available with a polystyrene core for enhanced thermal performance or polyurethane core for extreme thermal performance.



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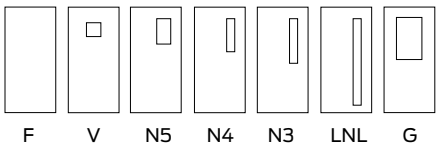
B Series door:
With steel reinforcement, the B Series flush door provides a more secure entry.



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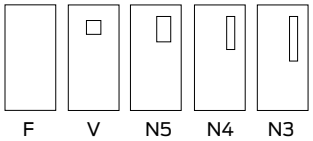
T Series door:
With a mineral board core, T Series doors are designed to meet the architectural requirements for temperature rise rated doors.



F V N5 N4 N3

About Allegion

Allegion (NYSE: ALLE) is a global pioneer in safety and security, with leading brands like CISA®, Interflex®, LCN®, Schlage®, SimonsVoss® and Von Duprin®. Focusing on security around the door and adjacent areas, Allegion produces a range of solutions for homes, businesses, schools and other institutions. Allegion is a $2 billion company, with products sold in almost 130 countries.

For more, visit **www.allegion.com**

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