

## Shelter from the storm

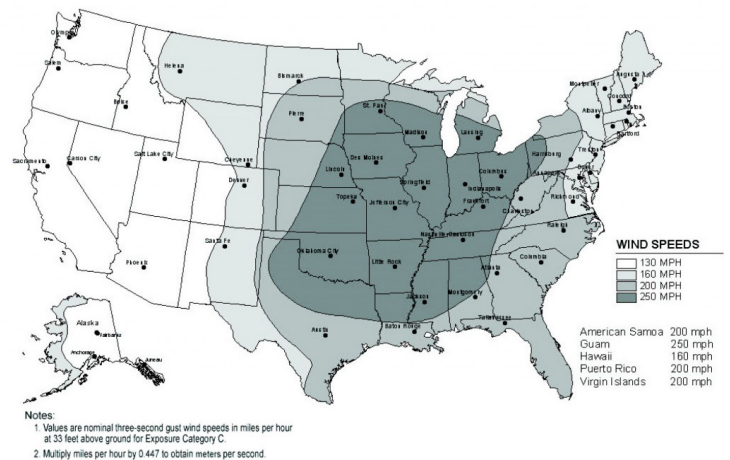
2017 is shaping up to be a record-breaking year for tornadoes and severe weather. In just the first six months, nearly 1,000 tornadoes swept across the country, according to the National Oceanic Atmospheric Administration's National Weather Service. States like Georgia, Texas and Missouri have experienced the most severe weather, reporting more than 330 tornados since January, while 38 states have experienced at least one.

Even with an alarming number of severe weather incidents, preparedness has kept a majority of people safe when disaster struck. Tornado shelters are common throughout Tornado Alley, the central United States region that is often hit by storms. Since 2009, the International Building Code (IBC) has included standards for these shelters. However, it wasn't until the 2015 edition that it required certain buildings in tornado-prone areas to take additional precautionary measures. Previously, that was mandated by state or local jurisdiction.

"New K-12 facilities with occupant loads of 50 or more, as well as critical emergency operations are among the structures that are now expected to include a storm shelter if they reside in a 250 mph wind speed zone," says Allegion's manager of codes and resources, Lori Greene, DAHC/CDC, CCPR, FDAI, FDHI. "There are 23 states where at least a portion of the state is susceptible to these high winds."

Critical emergency operations include public safety facilities like 911 call stations and fire, rescue, ambulance and police stations. The 2015 IBC requires these facilities to have a storm shelter built in accordance with the International Code Council standards (ICC 500-2014).

Additionally, storm shelters need to follow fire-rating requirements. According to section 601 of ICC 500, non-residential tornado shelters must be separated from other building areas by fire barriers and horizontal assemblies with a minimum fire-resistance rating of two hours.



### Understanding the codes

#### ICC 500

To offer supreme safety, tornado-resistant doors must comply with the most stringent life safety testing standards developed by the International Code Council (ICC) and National Storm Shelter Association (NSSA). ICC/NSSA Standard for the Design and Construction of Storm Shelters (ICC 500) is recognized by the International Building Code (IBC) as the governing standard for the design, construction and testing of storm shelters. It includes test requirements that simulate a 250 mph ground speed tornado, including the impact force of building materials propelled at 100 mph.

#### FEMA 361

The tornado guidelines in the United States were established by the Federal Emergency Management Agency (FEMA). FEMA 361 provides guidelines for community storm shelters with an occupant load of 16 or more. FEMA 320 pertains to residential safe rooms. Community safe rooms must be designed to meet stringent requirements, so it is important to consider both FEMA 361 and ICC 500 when constructing a building in one of the at-risk areas.

### Safety starts at the door

Steelcraft® is leading — and lighting — the way to safer storm shelters. It recently introduced the [Paladin™ Glass Light Series for tornado doors](#), the first and only fire-rated

tornado light for hollow metal doors. The patent-pending design allows natural light to enter the room and adds to the overall aesthetics of the door. It also addresses the liability concerns associated with a lack of visibility when using traditional flush tornado-rated doors.

“Without options to provide anything but flush tornado doors in the past, architects and school administrators had their hands tied in providing tornado doors in their shelters,” says Ken Richied, Allegion product manager for hollow metal. “They were forced to forgo desired natural light as well as critical visibility into classrooms. Recent code changes require the aggregate of the building occupancy to be housed by the storm shelter, and may even require space for the community to shelter from storms. Many school shelters have moved from smaller classrooms to large gymnasiums or entire wings of school buildings, which has increased the need for glass lights.”

As with any approved and labeled tornado door assembly, The Paladin Glass Light Series is designed to withstand multiple direct impacts of a 15-pound 2x4 propelled at 100 mph, as required by the ICC 500-2014 and FEMA 320/361 standards. Paladin tornado doors are tested to provide protection against the most powerful EF5 tornadoes with wind speeds up to 250 mph. For ADA-compliant applications, a narrow light is available in place of the vision light. Additionally, the 90 minute fire rating is ITS/WHI Intertek labeled and Steel Door Institute (SDI) certified.

[Take a look at SDI's testing video.](#)

### Beyond the door

Storm shelters have to meet the highest standards, and that means all products must be tornado-rated. Allegion offers [complete door solutions to ensure protection from wind and impact](#). The Paladin Glass Light Series is compatible with the following approved hardware:

### Schlage® LM9300 MultiPoint Lock

The LM9300 Series is part of a three-point locking system designed for tornado, hurricane or high-security applications. Latches at the top, side and bottom of the door provide protection from high wind speeds and 15-pound projectile impacts up to 100 mph when paired with a Steelcraft Paladin tornado-resistant door.

All three latches engage when the door is shut and retract simply by rotating the lever, providing superior protection with familiar operation. Available in six functions and with 30 lever designs, the LM9300 Series can easily integrate into any application and suite with other Schlage locks, as well as Von Duprin® exit devices.

### Von Duprin® windstorm panic hardware

Windstorm qualified exit devices are operationally and aesthetically identical to a standard exit device, but are specifically designed to the same wind and impact standards as the other tornado-rated products. The WS98/9957 is used with single door applications and the WS98/9927 is used with pair door applications. 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 tornados.

The Paladin Glass Light Series offers proven windstorm resistance to keep people safe when severe weather strikes. Contact an architectural hardware consultant for more information on designing storm shelters.

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Allegion has a team of more than 150 specification writers located around the world who would be happy to assist on your next project. [Contact an Allegion specification writer](#), or check out the [iDig Hardware blog](#) for information and updates on door hardware codes.

## 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](http://www.allegion.com).

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