



Residential Tornado Safe Room Doors

Residential safe rooms are becoming more popular as families seek protection from violent tornadoes. Like any other room, safe rooms must be accessed through an opening or door. Just as the walls and roof of a safe room are designed and built to protect against extreme winds and wind-borne debris, so must the safe room door.

When careful selection and installation of the safe room door assembly is overlooked, the safe room door opening can leave occupants at great risk of injury or death during tornadoes.

Not all doors are the same

Steel doors commonly used in residential and commercial construction cannot withstand the impact of the wind-borne debris, or "missiles," that a tornado can propel, and their failure has resulted in serious injury and even death during



Residential safe room door (Moore, OK, 2013)

tornadoes. There is a common misconception that a steel "storm door" with three locks and three hinges can provide tornado life-safety protection: it cannot. Only door assemblies designed and tested to resist tornadoes can provide life-safety protection for you and your family.

Consumers need to be sure the door they are buying is part of a tested tornado safe room door assembly, as some door suppliers offer non-tested "storm door" assemblies for use in safe rooms. Sometimes door suppliers market levels of safety with corresponding pricing ("good," "better," "best"). Such terminology can give consumers

a false sense of security that the less expensive doors provide an adequate level of tornado protection. **In reality, there is no substitute for a tested tornado safe room door assembly!**

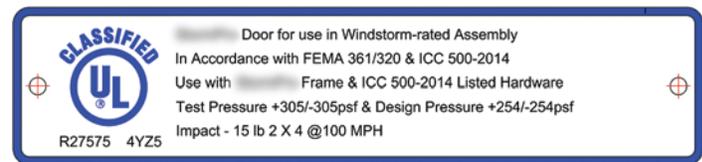
The good news is these door assemblies are readily available today.

What is different about a tested safe room door versus a standard door?

For safe room doors to reliably provide life-safety protection during a tornado, they must be rigorously designed, constructed, and tested. FEMA does not certify products, but the manufacturer(s) of safe room door assemblies must certify their products have passed ICC 500 testing to meet or exceed FEMA safe room criteria. Consumers should request documentation from the supplier and/or installer to verify the door assembly's

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compliance with the most current versions of FEMA's safe room publications¹ (FEMA P-361 and FEMA P-320) or ICC 500² for a tornado wind speed of 250 mph. One method of demonstrating compliance is through labeling by third parties, such as UL (Underwriters Laboratories).



UL tornado safe room door label

In addition to having passed required testing for tornado missile impact and pressure, the door assembly should be easily locked and unlocked so that access to and from the safe room is quick and easy.

- 1 FEMA P-361, *Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms* and FEMA P-320, *Taking Shelter from the Storm: Building a Safe Room for Your Home or Small Business*. FEMA Publications provide criteria based on code recommendations and post-disaster field observations, but do not regulate or set standards in building codes. The most current versions can be found at links provided under "Resources" section at end of Fact Sheet.
- 2 ICC 500, *ICC/NSSA Standard for the Design and Construction of Storm Shelters*. The most current version can be found at link provided under "Resources" section at end of Fact Sheet.

Why is installing the complete tested door assembly in its entirety so important?

The door assembly includes the door, hardware (locks and hinges), frame, and attachment devices used to anchor the door frame to the surrounding safe room wall. Installation instructions should be specific to the actual safe room wall type (e.g., wood-frame, concrete masonry units (CMUs)) of the home or small business. The entire safe room door assembly must have passed the required testing exactly as it is to be installed in the safe room to make sure it will withstand the required tornado wind pressures and debris impacts.

Some suppliers may offer the door and frame without the tested hardware; if substitutions are made, the door may fail during a tornado.

Where can you buy a tested safe room door?

Tested door assemblies are typically not available off the shelf in most home improvement stores, but can be purchased through commercial building product suppliers or safe room/storm shelter component suppliers. Texas Tech University testing facility and UL maintain a list of safe room doors (product names and suppliers) that have passed testing. Refer to the “Resources” below for information.

What should you request when selecting your safe room door?

- The test certification document or UL label that shows the product passed ICC 500 testing to meet or exceed FEMA safe room criteria
- Confirmation that the hardware supplied with your door is identical to the hardware used during testing

When it is time to install your safe room, make sure to contact your local building department for permitting and inspection guidelines.

Resources

- More information on testing protocol and a list of safe room products that have passed testing at Texas Tech University may be found at <http://www.depts.ttu.edu/nwi/research/DebrisImpact/index.php>.
- The UL Online Certification Directory may be found at <http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.html>.
 - After linking, enter ‘zhla’ in the UL Category field and ‘ICC 500’ in the Keyword field for safe room-tested products.
- A free copy of FEMA P-361 can be downloaded or ordered from <http://www.fema.gov/media-library/assets/documents/3140>.
- A free copy of FEMA P-320 can be downloaded or ordered from <http://www.fema.gov/media-library/assets/documents/2009>.
- A copy of ICC 500 can be purchased and subsequently downloaded from <http://shop.iccsafe.org/standards/icc-standards.html?p=1>.
- If you have additional questions pertaining to FEMA safe room guidance publications, you may contact the Safe Room Helpline at Saferoom@fema.dhs.gov.



Tornado safe room impact test results: Door assembly failed at latch/lock



Tornado safe room impact test results: Door assembly failed when perforated



Tornado safe room impact test results: Door assembly passed; no perforation or latch/lock failure