

Residential Tornado Safe Room Doors

Site-built residential safe rooms provide customized solutions for families seeking 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.

Don't Wait Until the Storm!

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.

Owners of existing safe rooms are strongly advised to find out now if their safe room door meets FEMA life-safety protection criteria. For more information, contact the Safe Room Helpline at Saferoom@fema.dhs.gov.

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 tornadoes. There is a common misconception that a steel “storm door” with three locks and three hinges can provide reliable tornado life-safety protection: it cannot. Only door assemblies designed and tested to resist tornadoes can provide reliable life-safety protection for you and your family (see Figure 1).

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 by leading them to believe that the less expensive doors provide an adequate level of tornado protection.

There is no substitute for a tested tornado safe room door assembly! The good news is these tested door assemblies are readily available today.

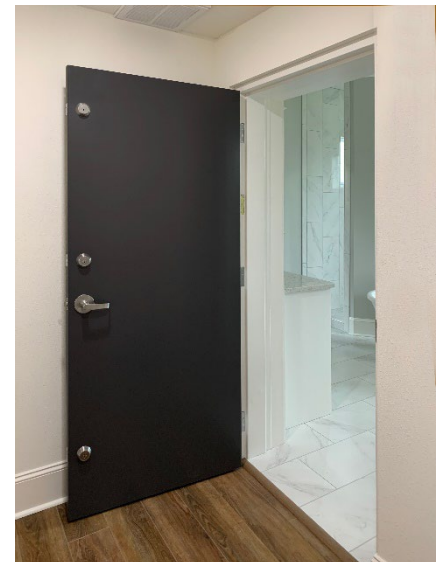


Figure 1: Example of a residential safe room door



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What is the difference between a tested safe room door and a standard door?

For safe room doors to reliably provide life-safety protection during a tornado, they must be rigorously designed, constructed, tested, listed, and labeled. The manufacturers of safe room door assemblies must certify that their products have passed ICC 500 testing to meet or exceed FEMA safe room criteria. ICC 500, *ICC/NSSA Standard for the Design and Construction of Storm Shelters*, is published by the International Code Council® and National Storm Shelter Association®.¹

FEMA does not endorse, approve, certify, or recommend any contractors, individuals, firms, or products. Contractors, individuals, and firms are prohibited from claiming they are, or advertising their products as, “FEMA approved” or “FEMA certified.”

Successful certification of compliance is required to be demonstrated via labels that are attached to approved doors by third-party certification agencies, such as UL (Underwriters Laboratories).² Consumers should verify the door assembly’s compliance with ICC 500 for a tornado wind speed of 250 mph by carefully checking the door’s certification label, which contains information on impact and design pressure performance. Although there is no universal format for safe room door labels, there is a requirement to provide specific performance details, as well as the manufacturer’s third-party listing information for the product. Figure 2 provides an example that contains information on impact and design pressure performance. Note the label shown in this figure references previous editions of ICC 500, which were published in 2014 and 2020, respectively. Label marking requirements in the current edition of ICC 500 include the same basic information, except that new products installed in FEMA-funded safe rooms or storm shelters where ICC 500-2023 is adopted should reference the 2023 edition of ICC 500. FEMA P-361 may also be referenced, although is not required to be listed.

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 ICC 500 is an American National Standard approved by the American National Standards Institute (ANSI). The current edition is formally titled 2023 ANSI/ICC 500, *ICC/NSSA Standard for the Design and Construction of Storm Shelters*, but is referred to in this document as ICC 500.

² The requirements for listing and labeling are provided in ICC 500-2023, Section 306.4.1.1.

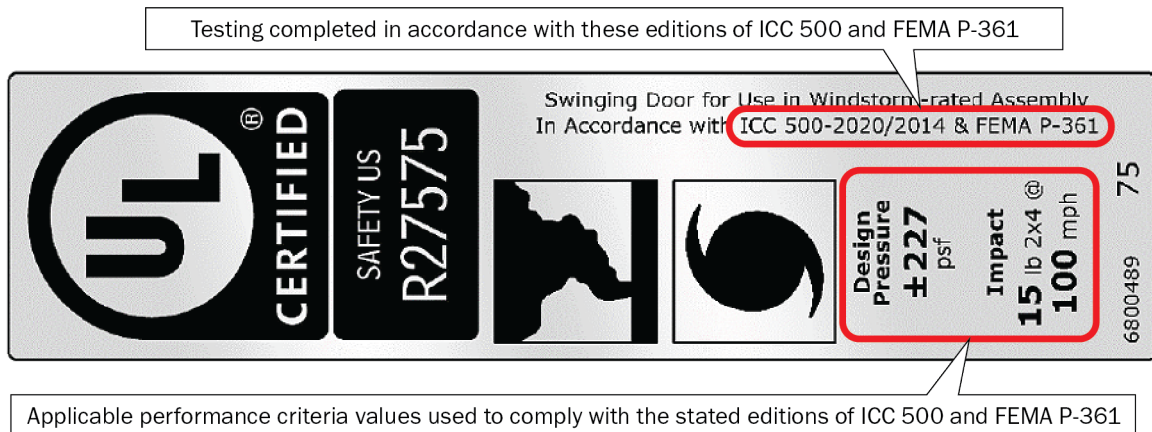


Figure 2: UL tornado safe room door label for a product that has been tested to earlier safe room criteria

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

The door assembly includes the door, hardware (locks and hinges), frame, attachment devices used to anchor the door frame to the surrounding safe room wall, and any additional items deemed critical as determined by the third-party listing agency. Installation instructions should be specific to the actual safe room wall type (e.g., wood-frame, concrete masonry units) of the home. 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. Figure 3 provides examples of doors that failed and passed safe room door testing.

Some suppliers may offer the door and frame without the tested hardware; if substitutions are made, the door may fail during a tornado. Consumers (or their contractors) can prevent failures resulting from the installation of mismatched safe room door assembly components by referencing the third-party certifier’s listing, which identifies all components of the assembly that passed the required testing.

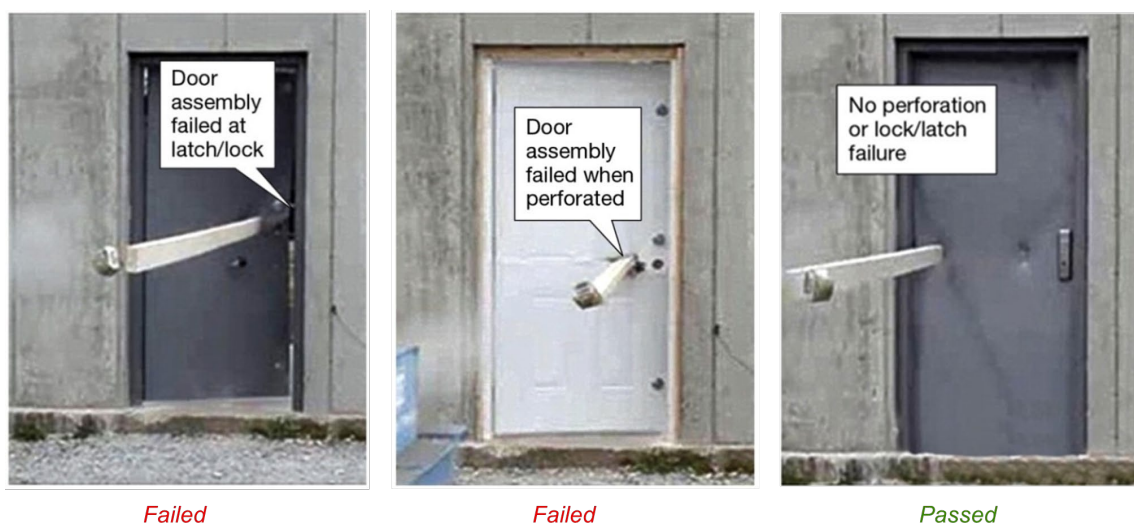


Figure 3: Examples of doors that failed or passed testing

Where can I buy a tested and labeled safe room door?

Tested and labeled safe room 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 component suppliers. Certain third-party certification agencies maintain a list of safe room door assemblies that have passed ICC 500 testing for missile impacts and wind pressures and are labeled to denote compliance. Refer to the “Where can I get more information?” section below for details.

What should I look for or request when selecting my safe room door?

- A permanently attached third-party certification label that shows the product passed ICC 500 testing to meet or exceed current FEMA safe room criteria
- Confirmation that the hardware supplied with your door is identical to the hardware identified in the third-party certifier’s listing

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

What About Community Safe Room Doors?

Refer to FEMA’s *Community Tornado Safe Room Doors: Installation and Maintenance Fact Sheet (2024)* for guidance regarding certification, installation, and maintenance of door assemblies for community tornado safe rooms. To provide reliable life-safety protection against extreme wind events, safe room door assemblies should be certified as compliant with ICC 500, installed as specified by the manufacturer, and regularly maintained by the safe room owner or operator. The *Community Tornado Safe Room Doors: Installation and Maintenance Fact Sheet* contains maintenance information pertinent to owners of residential safe rooms.

Where can I get more information?³

FEMA (Federal Emergency Management Agency), 2024. *Community Tornado Safe Room Doors: Installation and Maintenance*. FEMA Fact Sheet, <https://www.fema.gov/emergency-managers/risk-management/safe-rooms/resources>.

FEMA. 2024. *Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms*, FEMA P-361, Fifth Edition. Download a free copy from <https://www.fema.gov/emergency-managers/risk-management/building-science/safe-rooms/resources>.

FEMA. 2024. *Taking Shelter from the Storm: Building a Safe Room for Your Home*, FEMA P-320. Sixth Edition. Download a free copy from <https://www.fema.gov/emergency-managers/risk-management/safe-rooms/resources>.

ICC/NSSA (International Code Council / National Storm Shelter Association). 2023. *ICC/NSSA Standard for the Design and Construction of Storm Shelters*, ANSI/ICC 500-2023, <https://codes.iccsafe.org/content/ICC5002023P1>.

UL Online Certification Directory:

<https://iq.ulprospector.com/info/>. After registering for a free account, log into “UL Product iQ” directory and enter “ICC 500” under “Start your search” to find products that have passed ICC 500 testing.

Intertek Online Certification Directory:

https://bpdirectory.intertek.com/Pages/DLP_Search.aspx. Under “Standard,” select “ICC-500” from the pull-down menu and click on “Search” for a list of products that have passed testing for the appropriate edition ICC 500.

National Accreditation & Management Institute (NAMI) Online Certification Directory:

https://www.namicertification.com/index.php?option=com_namicert&view=structural&Itemid=115. Under “Performance Class,” select “ICC 500” for compliant products.

If you have additional questions pertaining to FEMA safe room guidance publications, please contact the Safe Room Helpline at Saferoom@fema.dhs.gov.

³ Because not all users are familiar with online certification directories, the names of three agencies that provide free access directories for listed and labeled safe room products have been included. However, the list of companies is not exhaustive. Additionally, this list is not intended to express a preference for those third-party certification agencies or the listed and labeled products by the U.S government, nor is it an endorsement of those third-party certification agencies or the listed and labeled products referenced in their directories.