COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION
DASMA TECHNICAL DATA SHEET
#194

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PSF versus MPH in Door Specifications

As with all other exterior building components, doors are sold by their strength rating and not by the weather conditions. Thus, garage doors are rated to withstand up to specific wind pressures in pounds per square foot (PSF) and are not sold by wind speed in miles per hour (MPH). This Technical Data Sheet will explain why wind pressure ratings are applicable.

ASCE 7 is Used to Determine Wind Pressure Using Wind Speed

ASCE 7, Minimum Design Loads for Buildings and Other Structures provides:

- A means to determine the required wind speed for a specific address.
- The computation methods for converting that wind speed to wind pressures (positive and negative). The equation involves squaring the wind speed in MPH from the appropriate risk-based map and multiplying it by a topographical factor, a building "exposure" factor, a surface pressure factor, and a conversion faction to obtain the wind pressure in PSF>

The conversion of wind speed to wind pressures is a complex process requiring a significant amount of information about the specific building and the terrain surrounding the building site, which cannot be known or observed by the garage door manufacturer. This process is not just knowing the address of the building. ASCE 7 could require different wind pressures for doors on four different buildings at the same intersection of streets.

Factors that must be taken into account include:

1. Mean roof height of the building.
2. Slope of the building roof.
3. Nearby wooded areas and buildings, may qualify to reduce wind pressures because they help block the wind.
4. A nearby hill, which may accelerate the wind and increase the pressures required.
5. A nearby large body of water, which allows the wind to speed up.
6. The "importance" of the building. A hospital or fire station that requires a higher "factor of safety" than commercial or residential buildings.
7. The size of the "component". Small windows require higher wind pressures than entry doors, which are higher than larger garage doors.
8. The location of the door within the wall, particularly how close the door is to the corner of the building.

These items must be evaluated for each job site because the conversion of wind speed to wind pressures may require someone to actually visit and view the construction site. Because of this, local codes generally require that a design professional (often designated as the "Engineer of Record") resolve the site-specific requirements. Once the design professional computes the conversion of wind speed to wind pressures for the exterior building components (e.g., windows, entry doors, garage doors), then suppliers can be contacted to provide appropriate products.

How Manufacturers Determine Which Products to Supply

Manufacturers collect knowledge of wind pressure requirements throughout the areas of the United States they do business where wind requirements are enforced, and rate and make available compliant products accordingly. DASMA Technical Data Sheet #155 (showing wind pressures for common applications) used with wind maps in model codes such as the International Residential Code (IRC) and the International Building Code (IBC) provides help to garage door and rolling door manufacturers toward product offerings. They then supply compliant products that have been tested to either ANSI/DASMA 108, ASTM E330, or Miami-Dade TAS 202.

Why Wind Design Pressures and Test Pressures Cannot Be Converted into MPH Wind Speeds

Test pressures cannot be converted into "equivalent" MPH wind speeds because such pressures need to be compared with the PSF requirement calculated in accordance with ASCE 7. Wind design pressures cannot be converted into "equivalent" MPH wind speeds because the 8 factors listed above would lead to confusion on rating a particular door model for a specific MPH.