COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION
DASMA TECHNICAL DATA SHEET
#168

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Wind on Garage Doors: Frequently Asked Questions

1. **Does orientation of the door, i.e. front-facing vs. side-facing, affect design wind pressure?**
   No. Door size, least horizontal dimension of the building, mean roof height of the building, garage door distances from corners, and other factors affect design wind pressure.

2. **Does the compass direction the door faces affect design wind pressure?**
   No. Worst-case winds directly toward and away from garage door are considered in wind load design. Winds may come from any direction during a storm, particularly a hurricane with its large circular pattern of wind.

3. **How do I know what the wind pressure requirements are for my garage door?**
   The DASMA website has a helpful Technical Data Sheet, TDS 155, and a wind load calculator that can estimate the wind load requirements on your garage door. However, the building department having authority in your area is the sole and final determiner of the wind load requirements for your garage door. Always check with either a county or a local municipality building official for specific requirements.

4. **What high wind events are covered?**
   Primarily hurricanes, thunderstorms and other such events are considered high wind events. Winds up to a certain level in tornadic events are covered in some locations.

5. **Why are positive and negative wind load values required?**
   In a high wind event, both positive and negative pressures are generated on the garage door. Positive pressures try to push your garage door into the building, and negative pressures try to pull the door out of the building.

6. **Why are design pressures higher for a double story house, versus a single story house?**
Wind generally moves faster at higher distances above ground, and wind pressure increases with building height. This effect can result in higher design pressures for double story houses.

7. **What if the door size is other than what is shown on the chart in TDS 155?**
Either use the values for the next smaller garage door size shown in the DASMA wind load guide or use the DASMA wind load calculator found at the DASMA web site. If a more precise analysis is needed, contact a qualified design professional such as a registered Professional Engineer or Architect.

8. **What effect does garage door glazing have on design wind pressures?**
The pressure requirements do not change just because the garage door has glazing. Documents submitted for wind pressure compliance approval typically require that the glazing type and extent (e.g. number of glazed sections) be specified.

9. **What does impact rated mean?**
Impact rated refers to garage doors and garage door glazing that are successfully evaluated according to cyclic and impact test procedures such as those in ANSI/DASMA 115. Check with the local building department to see if you are in a windborne debris region.

10. **Who validates product testing?**
An independent firm/testing agency, or an independent Professional Engineer, that certifies both the test report and equipment used.

11. **Does house layout configuration affect design wind pressure?**
Yes. The least wall dimensional length of the structure affects design wind pressure.

12. **Why can't the industry supply a door based only on a wind speed?**
Wind speed is only one of many variables in determining wind load requirements. Other factors include:

    a. exposure category
    b. enclosure category
    c. topography
    d. elevation above sea level
    e. door location on building
    f. door size
    g. what building code is in force.
    h. mean roof height
    i. building geometry
    j. roof pitch

13. **What is the difference between wind speed and wind pressure?**
Wind pressure represents the force exerted by wind. It is calculated starting with wind speed, but is greatly dependent on a number of factors related to the structure configuration and site location. It is not enough to say a product will meet a given wind speed alone. See Question #12.

14. **Why is wind pressure better than wind speed when specifying doors?**
Since doors are tested to pressures, not wind speeds, using pressure allows the manufacturer to correctly specify a door.

15. **What is the difference between design pressure, design load, and test load?**
Design pressure, a.k.a. design load, can refer to the site-specific pressure determined by the architect or Authority Having Jurisdiction, for which a door is required to be rated. Design pressure can also refer to the wind pressure capability of a door determined by the door manufacturer, which is also called the design wind pressure rating. Test load is the highest pressure a door must sustain during a pressure test such as ANSI/DASMA 108, and is commonly 1.5 times the design load.

16. **Are garage door manufacturers and installers responsible for the supporting structure's ability to resist loads applied via wind loads on garage doors?**
No. The supporting structure to which the jambs are attached is the general contractor's responsibility. If the installing company has reason to believe that the supporting structure is not adequate, they should resolve those doubts with the general contractor, architect, or building official.

17. **Do the DASMA Winds Load Guides apply to retrofitted doors?**
The authority having jurisdiction determines the source for applicable wind load provisions to garage doors including retrofitted garage doors. Additional requirements may be imposed by insurers in the interest of loss mitigation. When retrofitting a door, it is prudent to contact insurance companies to determine if there are mitigation discounts that may influence door selection.

18. **What is the difference between ultimate design wind speed, fastest mile wind speed and 3-second gust wind speed?**
The ***ultimate design wind speed*** *(V_{ult})* is a term used in building codes, e.g., the International Residential Code and the Florida Building Code, to refer to the ***3-second gust wind speed*** in a given region. This speed represents the fastest gust sustained for 3 seconds per location as recorded in meteorological data. The ***fastest mile wind speed*** is the highest average wind speed measured over the time it takes one mile of air to pass a given point. It is lower than the 3-second gust speed.

Model building codes no longer use fastest mile; they have converted to 3-second gust because that means of measurement is commonly used at weather stations across the U.S.

19. **Why do the DASMA Garage Door Wind Load Guides have pressures different from wind load tables in the International Building Code or the International Residential Code?**
The DASMA Guides use specified door sizes and mean roof heights. Also, the Codes show pressures based on different Wind Zones on a wall. Garage doors are assumed to be located in more than one Wind Zone, and thus a "weighted average" method is used, in which the wind load is a function of the door area in each zone.

20. **What are the common Exposure categories?**
Exposures B, C and D are the common categories in codes and standards. Exposure B is associated with urban and suburban areas, wooded areas, or other terrain with closely spaced obstructions such as single-family dwellings. Exposure C is associated with open terrain with few obstructions. Exposure D is associated with flat, unobstructed areas and water surfaces. A given wind speed produces the least pressure in Exposure B due to the obstructions, and the most in Exposure D, due to the lack of obstructions. See DASMA TDS 193 for more details.

21. **What is the difference between a wind load based on ultimate strength design versus allowable stress design**?
A wind load based on Ultimate Strength Design (USD) – a.k.a. Strength Design, or Load Resistance Factor Design (LRFD) – is intended to represent the load at which component failure occurs. A wind load based on Allowable Stress Design (ASD) is intended to represent the load at which continued service and operability occur. Thus, ASD loads are considerably lower than USD loads. The document most frequently cited in the model building codes for wind load and other structural requirements is ASCE 7, *Minimum Design Loads for Buildings and Other Structures*, published by the American Society of Civil Engineers (ASCE). In ASCE 7-10 and subsequent editions, the wind speed maps are based on USD loads; the resulting design velocity pressures may be converted to ASD loads by multiplying by 0.6. All of the standard test methods for garage doors are based on ASD loads.