HIGH PERFORMANCE DOOR DIVISION
DASMA TECHNICAL DATA SHEET
#459

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Wind on High Performance 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, 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 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 door?
DASMA has a helpful Technical Data Sheet (#155), and the DASMA web site has a wind load calculator that can estimate the wind load requirements on your door. However, the building department having authority in your area is the sole and final determiner of the wind load requirements for your 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 door. Positive pressures are loads that try to push your door into the building, and negative pressures try to pull the door out of the building. Whether push or suction occurs on a door is dependent on wind direction and the direction the door faces.

6. What if the door size is other than what is shown on the TDS-155 wind load chart?
Either use the values for the next smaller 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.

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

8. What does impact rated mean?
Impact rated refers to doors and 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.

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

10. Does building layout configuration affect design wind pressure?
Yes. The least wall dimensional length of the structure affects design wind pressure.

11. Why can't the industry just supply a 100 MPH door?
Wind speed is not the defining factor in determining the capability of a structure or component's performance in the event of a high wind occurrence. It is the amount of wind pressure that the wind is capable of producing at a given wind speed.

12. 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.

13. 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. Wind speed is only one of several factors, including terrain and building geometry, used to determine design pressure.

14. What is the difference between design pressure, design load and test load?
Design pressure is the site-specific pressure for which a door is required to be rated. Design load is the pressure for which a door is rated. For a proposed door to be considered adequate, the design load should exceed the design pressure. Test load is the highest pressure a door must sustain during a pressure test such as ANSI/DASMA 108, and is 1.5 times the design load.

15. Are door manufacturers and installers responsible for the supporting structure's ability to resist loads applied via wind loads on doors?

The installing company is responsible to determine that mounting surfaces conform to the door manufacturer's product approval. 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.

16. Do the High Winds Load Guides apply to retrofitted doors?

The authority having jurisdiction determines the source for applicable wind load provisions to doors including retrofitted 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.

17. What is the difference between fastest mile wind speed and three-second peak gust wind speed?

The gust speed is the highest sustained gust over a three second period of time. The fastest mile speed is the highest sustained speed over a longer period. Gust is typically 20%-25% higher than fastest mile. Model building codes have converted to three-second peak gust wind speeds because that means of measurement is now commonly used at wind speed reporting stations across the U.S.

18. Why do the DASMA Wind Load Guides have pressures different from wind load tables in the International Building Code or the International Residential Code?

The Codes show pressures based on different Wind Zones on a wall. High performance doors are assumed to be located in more than one Wind Zone, and thus a "weighted average" method is used to calculate wind loads for DASMA wind load guides.

19. How do we determine the wind load on a door if the door is in two different building wind zones?

By using a concept known as "weighted average", which is a function of the door area in each zone.

20. What are the common Exposure categories for high performance doors?

Exposures C and D are the common categories in codes and standards. Exposure C is associated with a site condition either containing an adjacent open field extending at least 1500' from the structure in question or within a mile of the hurricane oceanline. Exposure D is associated with a site condition within a 1/4 mile of a body of water greater than one mile across.

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 -- 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. In ASCE 7-10 the wind speed maps are based on USD loads; the resulting design wind pressures may be converted to ASD loads by multiplying by 0.6. All of the standard test methods for doors are based on ASD loads.

22. Does door high cycle design affect door wind performance?
The necessary reinforcement and hardware to increase door cycle design would either have no effect on, or actually add to, door wind pressure performance and windborne debris performance.

23. Does door operating speed affect door wind performance?
The necessary reinforcement and hardware to increase door speed design would either have no effect on, or actually add to, door wind pressure performance and windborne debris performance.

24. Does breakaway design affect door wind performance?
This is dependent on whether the manufacturer has designed the door to breakaway locally or as a unit, and if it is designed to breakaway due to the force of equipment versus the force of water (storm surge/flooding.) The manufacturer should be contacted on any limitations associated with door wind performance, including wind pressure and windborne debris resistance, when breakaway design is incorporated.

25. Can any aspect of designing a door for low maintenance affect its wind performance?
The surface related aspects of doors should have no effect. The mechanical aspects may actually add to door wind pressure performance and windborne debris performance.

26. Are there any materials used in high performance doors that may require special wind design attention?
All materials should be expected to withstand design wind pressures, but some materials may be more conductive to windborne debris resistance than others. Materials to use are at the discretion of manufacturers, who would test them for compliance