COMMERCIAL & RESIDENTIAL GARAGE DOOR DIVISION
DASMA TECHNICAL DATA SHEET
#155k

Door & Access Systems Manufacturers Association International
1300 Sumner Avenue
Cleveland, Ohio 44115-2851
Phone: 216-241-7333 • Fax: 216-241-0105
E-mail: dasma@dasma.com

# Garage Door and Commercial Door Wind Load Guide
## Based on ASCE 7-98, ASCE 7-02 and ASCE 7-05

DASMA (the Door & Access Systems Manufacturers Association) has created a ***GARAGE DOOR WIND LOAD GUIDE*** based on ASCE 7-98, ASCE 7-02* and ASCE 7-05* wind load requirements. The guide is intended to be used by code officials, engineers, architects, builders, owners, insurance companies and other interested parties. The Wind Load Guide also references a DASMA test procedure (ANSI/DASMA 108) which may be used by manufacturers to determine structural load performance of a garage door.

The guide is published by the Commercial & Residential Garage Door Division of DASMA which represents an estimated 95% of all sectional garage doors sold in the United States. The Division's Technical Committee, the best technical talent in the garage door industry, developed these tables based on the latest civil engineering and building code criteria.

ASCE 7-98, 7-02 and 7-05 use basic wind speed[1], exposure categories[2], importance factor[3], mean roof height[4], door area, door location on the building[5] and wind directionality factor[6] to figure wind loads on garage doors. This guide covers the most common scenarios.

The DASMA members believe the ***DASMA GARAGE DOOR WIND LOAD GUIDE*** will improve understanding of the issues related to garage doors and wind loads. DASMA continues to monitor developments regarding wind loads and the building codes in general, and continues to develop solutions to problems which affect the garage door industry. Please contact DASMA with any questions or comments.

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* Wind load provisions are technically equivalent to those in ASCE 7-98
[1]Ref: Figs 6-1, 6-1a, 6-1b, 6-1c, Pages 32-36. Basic wind speed map.
[2] Ref: Table 6-5, Page 59. Velocity Pressure Exposure Coefficients.
[3] Ref: Table 6-1, Page 54. Importance factors.
[4] Ref: Table 6-5, Page 59. Velocity Pressure Exposure Coefficients.
[5] Ref: Fig. 6-8, Page 52. External Pressure Coefficients, along with Table 6-7, Page 61, Internal Pressure Coefficients
[6] Ref: Table 6-6, Page 60. Wind Directionality Factor.

# GARAGE DOOR WIND LOAD GUIDE

## BASED ON ASCE 7-98, ASCE 7-02 AND ASCE 7-05, EXPOSURE B

| Mean Roof Height | Door Size | 85 MPH | 90 MPH | 100 MPH | 110 MPH | 120 MPH | 130 MPH | 140 MPH | 150 MPH |
|---|---|---|---|---|---|---|---|---|---|
| 15 Feet Single Story | Single | **11.4** | **12.8** | **15.8** | **19.1** | **22.8** | **26.7** | **31.0** | **35.6** |
| | *9' x 7'* | -12.9 | -14.5 | -17.9 | -21.6 | -25.8 | -30.2 | -35.1 | -40.2 |
| | Double | **10.9** | **12.3** | **15.2** | **18.3** | **21.8** | **25.6** | **29.7** | **34.1** |
| | *16' x 7'* | -12.2 | -13.7 | -16.9 | -20.4 | -24.3 | -28.5 | -33.1 | -38.0 |
| 25 Feet Double Story | Single | **11.4** | **12.8** | **15.8** | **19.1** | **22.8** | **26.7** | **31.0** | **35.6** |
| | *9' x 7'* | -12.9 | -14.5 | -17.9 | -21.6 | -25.8 | -30.2 | -35.1 | -40.2 |
| | Double | **10.9** | **12.3** | **15.2** | **18.3** | **21.8** | **25.6** | **29.7** | **34.1** |
| | *16' x 7'* | -12.2 | -13.7 | -16.9 | -20.4 | -24.3 | -28.5 | -33.1 | -38.0 |

Design pressures above are in Pounds per Square Foot (PSF)

Testing, if required by local authority, may be performed to ASTM E-330, or preferably ANSI/DASMA 108, with acceptance criteria in accordance with ANSI/DASMA 108.

Test conditions:

1. Garage doors shall be tested to both negative and positive pressures. Doors shall be installed simulating normal conditions (i.e., top roller in track radius, other rollers in tracks, all hinges in place, reinforcing hardware in place)
2. Test durations for each test direction shall be as follows:
   A. 10 seconds at design pressure.
   B. 10 seconds at 1.5 times the design pressure.

Standard engineering principles may be used to interpolate or extrapolate test results to door sizes not specifically tested. Doors shall include a manufacturer's label certifying compliance to specific load.

This guide is provided for reference purposes only. In all cases the local building authority is the sole and final determiner of the structural and safety requirements, and suitability of the garage door.

Notes:

- Basic Wind Speeds above are three second peak-gust values
- Negative pressures assume door has 2 feet of width in building's end zone.
- Garage doors evaluated as attached to enclosed buildings with a Use Factor of 1.0.
- Doors larger than 100 square feet should use the 16 x 7 loads. Doors less than 100 square feet may be interpolated.
- Garage doors evaluated as Components and Cladding
- Installation details vary. Consult manufacturer's instructions.
- For buildings representing a substantial hazard to human life in the event of failure, or buildings designated as "essential facilities", tabulated wind load values are to be multiplied by a factor of 1.15.

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# GARAGE DOOR WIND LOAD GUIDE

## BASED ON ASCE 7-98, ASCE 7-02 AND ASCE 7-05, EXPOSURE C

| Mean Roof Height | Door Size | 85 MPH | 90 MPH | 100 MPH | 110 MPH | 120 MPH | 130 MPH | 140 MPH | 150 MPH |
|---|---|---|---|---|---|---|---|---|---|
| 15 Feet Single Story | Single | **13.9** | **15.6** | **19.2** | **23.2** | **27.7** | **32.5** | **37.7** | **43.2** |
| | *9' x 7'* | -15.7 | -17.6 | -21.7 | -26.3 | -31.3 | -36.7 | -42.6 | -48.9 |
| | Double | **13.3** | **14.9** | **18.4** | **22.3** | **26.5** | **31.1** | **36.1** | **41.4** |
| | *16' x 7'* | -14.8 | -16.6 | -20.5 | -24.8 | -29.5 | -34.7 | -40.2 | -46.2 |
| 25 Feet Double Story | Single | **15.4** | **17.2** | **21.2** | **25.7** | **30.6** | **35.9** | **41.6** | **47.8** |
| | *9' x 7'* | -17.4 | -19.5 | -24.0 | -29.1 | -34.6 | -40.6 | -47.1 | -54.0 |
| | Double | **14.7** | **16.5** | **20.3** | **24.6** | **29.3** | **34.4** | **39.9** | **45.8** |
| | *16' x 7'* | -16.4 | -18.4 | -22.7 | -27.4 | -32.7 | -38.3 | -44.5 | -51.0 |

Design pressures above are in Pounds per Square Foot (PSF)

Testing, if required by local authority, may be performed to ASTM E-330, or preferably ANSI/DASMA 108, with acceptance criteria in accordance with ANSI/DASMA 108.

Test conditions:

1. Garage doors shall be tested to both negative and positive pressures. Doors shall be installed simulating normal conditions (i.e., top roller in track radius, other rollers in tracks, all hinges in place, reinforcing hardware in place)
2. Test durations for each test direction shall be as follows:
   A. 10 seconds at design pressure.
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Standard engineering principles may be used to interpolate or extrapolate test results to door sizes not specifically tested. Doors shall include a manufacturer's label certifying compliance to specific load.

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Notes:

- Basic Wind Speeds above are three second peak-gust values
- Negative pressures assume door has 2 feet of width in building's end zone.
- Garage doors evaluated as attached to enclosed buildings with a Use Factor of 1.0.
- Doors larger than 100 square feet should use the 16 x 7 loads. Doors less than 100 square feet may be interpolated.
- Garage doors evaluated as Components and Cladding
- Installation details vary. Consult manufacturer's instructions.
- For buildings representing a substantial hazard to human life in the event of failure, or buildings designated as "essential facilities", tabulated wind load values are to be multiplied by a factor of 1.15.

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# GARAGE DOOR WIND LOAD GUIDE

## BASED ON ASCE 7-98, ASCE 7-02 AND ASCE 7-05, EXPOSURE D

| Mean Roof Height | Door Size | 85 MPH | 90 MPH | 100 MPH | 110 MPH | 120 MPH | 130 MPH | 140 MPH | 150 MPH |
|---|---|---|---|---|---|---|---|---|---|
| 15 Feet Single Story | Single | **16.8** | **18.9** | **23.3** | **28.2** | **33.5** | **39.3** | **45.6** | **52.4** |
| | *9' x 7'* | -19.0 | -21.3 | -26.3 | -31.8 | -37.9 | -44.5 | -51.6 | -59.2 |
| | Double | **16.1** | **18.1** | **22.3** | **27.0** | **32.1** | **37.7** | **43.7** | **50.2** |
| | *16' x 7'* | -18.0 | -20.1 | -24.9 | -30.1 | -35.8 | -42.0 | -48.7 | -55.9 |
| 25 Feet Double Story | Single | **18.3** | **20.5** | **25.3** | **30.6** | **36.5** | **42.8** | **49.6** | **57.0** |
| | *9' x 7'* | -20.7 | -23.2 | -28.6 | -34.6 | -41.2 | -48.4 | -56.1 | -64.4 |
| | Double | **17.5** | **19.6** | **24.2** | **29.3** | **34.9** | **41.0** | **47.5** | **54.5** |
| | *16' x 7'* | -19.5 | -21.9 | -27.0 | -32.7 | -38.9 | -45.7 | -53.0 | -60.8 |

Design pressures above are in Pounds per Square Foot (PSF)

Testing, if required by local authority, may be performed to ASTM E-330, or preferably ANSI/DASMA 108, with acceptance criteria in accordance with ANSI/DASMA 108.

Test conditions:

1. Garage doors shall be tested to both negative and positive pressures. Doors shall be installed simulating normal conditions (i.e., top roller in track radius, other rollers in tracks, all hinges in place, reinforcing hardware in place)
2. Test durations for each test direction shall be as follows:
   A. 10 seconds at design pressure.
   B. 10 seconds at 1.5 times the design pressure.

Standard engineering principles may be used to interpolate or extrapolate test results to door sizes not specifically tested. Doors shall include a manufacturer's label certifying compliance to specific load.

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Notes:

- Basic Wind Speeds above are three second peak-gust values
- Negative pressures assume door has 2 feet of width in building's end zone.
- Garage doors evaluated as attached to enclosed buildings with a Use Factor of 1.0.
- Doors larger than 100 square feet should use the 16 x 7 loads. Doors less than 100 square feet may be interpolated.
- Garage doors evaluated as Components and Cladding
- Installation details vary. Consult manufacturer's instructions.
- For buildings representing a substantial hazard to human life in the event of failure, or buildings designated as "essential facilities", tabulated wind load values are to be multiplied by a factor of 1.15.

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# COMMERCIAL DOOR WIND LOAD GUIDE

## BASED ON ASCE 7-98, ASCE 7-02 AND ASCE 7-05, EXPOSURE B

| Mean Roof Height | Door Size | 85 MPH | 90 MPH | 100 MPH | 110 MPH | 120 MPH | 130 MPH | 140 MPH | 150 MPH |
|---|---|---|---|---|---|---|---|---|---|
| 15 Feet | *8' x 8'* | **10.5** | **11.7** | **14.5** | **17.5** | **20.9** | **24.5** | **28.4** | **32.6** |
| | | -11.9 | -13.3 | -16.4 | -19.9 | -23.6 | -27.7 | -32.2 | -36.9 |
| | *10' x 10'* | **10.1** | **11.4** | **14.0** | **17.0** | **20.2** | **23.7** | **27.5** | **31.6** |
| | | -11.4 | -12.7 | -15.7 | -19.0 | -22.7 | -26.6 | -30.8 | -35.4 |
| | *14' x 14'* | **10.0** | **10.8** | **13.3** | **16.1** | **19.2** | **22.5** | **26.1** | **30.0** |
| | | -10.7 | -12.0 | -14.8 | -17.9 | -21.4 | -25.1 | -29.1 | -33.4 |
| 25 Feet | *8' x 8'* | **10.5** | **11.7** | **14.5** | **17.5** | **20.9** | **24.5** | **28.4** | **32.6** |
| | | -11.9 | -13.3 | -16.4 | -19.9 | -23.6 | -27.7 | -32.2 | -36.9 |
| | *10' x 10'* | **10.1** | **11.4** | **14.0** | **17.0** | **20.2** | **23.7** | **27.5** | **31.6** |
| | | -11.4 | -12.7 | -15.7 | -19.0 | -22.7 | -26.6 | -30.8 | -35.4 |
| | *14' x 14'* | **10.0** | **10.8** | **13.3** | **16.1** | **19.2** | **22.5** | **26.1** | **30.0** |
| | | -10.7 | -12.0 | -14.8 | -17.9 | -21.4 | -25.1 | -29.1 | -33.4 |

Design pressures above are in Pounds per Square Foot (PSF)

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   A. 10 seconds at design pressure.
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Notes:

- Basic wind speeds above are three-second peak-gust values.
- Negative pressures assume door has 2 feet of width in building's end zone.
- Doors evaluated as attached to enclosed buildings with a Use Factor of 1.0.
- Buildings evaluated as having roof slopes less than 10 degrees.
- Doors larger than 196 square feet should use the 14 x 14 loads. Doors less than 196 square feet may be interpolated.
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# COMMERCIAL DOOR WIND LOAD GUIDE

## BASED ON ASCE 7-98, ASCE 7-02 AND ASCE 7-05, EXPOSURE C

| Mean Roof Height | Door Size | 85 MPH | 90 MPH | 100 MPH | 110 MPH | 120 MPH | 130 MPH | 140 MPH | 150 MPH |
|---|---|---|---|---|---|---|---|---|---|
| 15 Feet | *8' x 8'* | **12.7** | **14.3** | **17.6** | **21.3** | **25.4** | **29.8** | **34.5** | **39.6** |
| | | -14.4 | -16.1 | -19.9 | -24.1 | -28.7 | -33.7 | -39.1 | -44.8 |
| | *10' x 10'* | **12.3** | **13.8** | **17.0** | **20.6** | **24.5** | **28.8** | **33.4** | **38.3** |
| | | -13.8 | -15.5 | -19.1 | -23.1 | -27.5 | -32.3 | -37.5 | -43.0 |
| | *14' x 14'* | **11.7** | **13.1** | **16.2** | **19.6** | **23.3** | **27.3** | **31.7** | **36.4** |
| | | -13.0 | -14.6 | -18.0 | -21.8 | -25.9 | -30.4 | -35.3 | -40.5 |
| 25 Feet | *8' x 8'* | **14.1** | **15.8** | **19.5** | **23.6** | **28.0** | **32.9** | **38.2** | **43.8** |
| | | -15.9 | -17.8 | -22.0 | -26.7 | -31.7 | -37.2 | -43.2 | -49.6 |
| | *10' x 10'* | **13.6** | **15.3** | **18.8** | **22.8** | **27.1** | **31.8** | **36.9** | **42.4** |
| | | -15.3 | -17.1 | -21.1 | -25.6 | -30.4 | -35.7 | -41.4 | -47.6 |
| | *14' x 14'* | **12.9** | **14.5** | **17.9** | **21.6** | **25.8** | **30.2** | **35.1** | **40.3** |
| | | -14.4 | -16.1 | -19.9 | -24.1 | -28.7 | -33.7 | -39.0 | -44.8 |

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# COMMERCIAL DOOR WIND LOAD GUIDE

## BASED ON ASCE 7-98, ASCE 7-02 AND ASCE 7-05, EXPOSURE D

| Mean Roof Height | Door Size | 85 MPH | 90 MPH | 100 MPH | 110 MPH | 120 MPH | 130 MPH | 140 MPH | 150 MPH |
|---|---|---|---|---|---|---|---|---|---|
| 15 Feet | *8' x 8'* | **15.4** | **17.3** | **21.3** | **25.8** | **30.7** | **36.1** | **41.8** | **48.0** |
| | | -17.4 | -19.6 | -24.1 | -29.2 | -34.8 | -40.8 | -47.3 | -54.3 |
| | *10' x 10'* | **14.9** | **16.7** | **20.6** | **25.0** | **29.7** | **34.9** | **40.5** | **46.4** |
| | | -16.7 | -18.8 | -23.2 | -28.0 | -33.3 | -39.1 | -45.4 | -52.1 |
| | *14' x 14'* | **14.2** | **15.9** | **19.6** | **23.7** | **28.2** | **33.1** | **38.4** | **44.1** |
| | | -15.8 | -17.7 | -21.8 | -26.4 | -31.4 | -36.9 | -42.8 | -49.1 |
| 25 Feet | *8' x 8'* | **16.8** | **18.8** | **23.2** | **28.1** | **33.4** | **39.2** | **45.5** | **52.2** |
| | | -19.0 | -21.3 | -26.3 | -31.8 | -37.8 | -44.5 | -51.5 | -59.1 |
| | *10' x 10'* | **16.2** | **18.2** | **22.4** | **27.2** | **32.3** | **37.9** | **44.0** | **50.5** |
| | | -18.2 | -20.4 | -25.2 | -30.5 | -36.3 | -42.6 | -49.4 | -56.7 |
| | *14' x 14'* | **15.4** | **17.3** | **21.3** | **25.8** | **30.7** | **36.0** | **41.8** | **48.0** |
| | | -17.1 | -19.2 | -23.7 | -28.7 | -34.2 | -40.1 | -46.5 | -53.4 |

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