JORDAN
CONSULTANTS, LLC
50 BRIAR HOLLOW LANE • SUITE 235W • HOUSTON, TEXAS 77027
TELEPHONE 713.366.0320 • FAX 713.589.5493
WWW.JORDANCONSULTANTS.COM

AAMA A440-08 North American Fenestration Standard/Specification for Windows, Doors, and Skylights

	R	LC	CW	AW
Recommended Common Use	One- and two-family dwellings	Low- and mid-rise multifamily dwellings and other buildings where larger sizes and higher loading requirements are expected	Low- and mid-rise buildings where larger sizes, higher loading requirements, limits on deflection and heavier use are expected	High-rise and mid-rise buildings to meet increased loading requirements and limits on deflection and in buildings where frequent and extreme use of the fenestration products is expected
Minimum Test Size	48 by 48 inches	56 by 56 inches	60 by 60 inches	60 by 99 inches
Design Pressure				
Minimum	15 psf	25 psf	30 psf	40 psf
Maximum	100 psf	100 psf	100 psf	No Limit
Structural Test Pressure (150% of Design Pressure)				
Minimum	22.5 psf	37.5 psf	45 psf	60 psf
Maximum	150 psf	150 psf	150 psf	150% of DP
Limit on Deflection	No	No	L/175	L/175
Permanent Deformation	0.4%	0.4%	0.3%	0.2%
Air Infiltration	Not more than 0.3 cfm per sq. ft tested at 1.6 lbf per sq. ft.	Not more than 0.3 cfm per sq. ft tested at 1.6 lbf per sq. ft.	Not more than 0.3 cfm per sq. ft tested at 1.6 lbf per sq. ft.	Not more than 0.1 cfm per sq. ft. tested at 6.2 lbf per sq. ft.
Water Penetration testing	15% of Design Pressure; 2.9 psf min. / 12 psf max	15% of Design Pressure; 12 psf max	15% of Design Pressure; 12 psf max	20% of Design Pressure; 12 psf max
Life Cycle Testing Required	No	No	No	Yes

Notes: AAMA440-05 used five different performance classes: R, LC, C, HC, and AW. During the development of the 08 standard the C and HC classifications were dropped, and the CW class was added.

Minimum design pressures and sizes are also described as “gateway” requirements for each Performance Class. Optional Performance Grades are set by design pressures that increase in increments of 5.

Each Performance Class is tested for air leakage, water penetration resistance, and structural characteristics under uniform loading, and forced entry. There are optional standards testing condensation resistance, thermal performance, acoustical performance, and impact performance.

Chart above applies primarily to “fixed” windows. AAMA A440-08 recognizes a number of different types of window operation including awning, casement, horizontal sliding, single-hung, and double-hung. Testing requirement may vary slightly depending on operation.

A window unit specified for a particular Performance Class and Grade that is larger than the minimum test size will not necessarily pass the testing requirements. For example, if LC-PG40 window is specified for window units that are 60 inches wide by 72 inches tall, products that are certified as meeting the requirement for LC-PG40 may have only been tested in the required 56- by 56- inch size. Because window manufacturers do test their units in larger sizes than the minimum, see if test results can be obtained for units in larger sizes than the minimum.

Requirements apply to windows with the following types of frame materials: aluminum, steel, wood, vinyl, cellular PVC. fiberglass, cellulosic composite materials, fiber-reinforced PVC, and ABS-framed members.

 © 2012

Does Performance Class make a difference? Consider the following examples for different class windows with the same Design Pressure:

Example 1: A specification for an R-PG60 window would specify an "R" Class unit which requires that the unit tested to a design pressure of 60 psf with a structural design pressure of 90 psf. For the minimum test size of 48 by 48 inches,

1. Deflection: No limit on deflection
2. Allowable Maximum Permanent Deformation: 0.19 inch (along 48 inch length).
3. Air Infiltration: Maximum total of 4.8 cfm under a total pressure of 25.6 lbf.
4. Water Penetration Testing: Conducted at total pressure of 144 psf.

Example 2: A specification for a CW-PG60 window would specify an "CW" Class unit which requires that the unit tested to a design pressure of 60 psf with a structural design pressure of 90 psf. For the minimum test size of 60 by 60 inches,

1. Deflection: 0.34-inch (along 60-inch length).
2. Allowable Maximum Permanent Deformation: 0.18 inch along 60-inch length.
3. Air Infiltration: Maximum total of 7.5 cfm under a pressure of 40 lbf.
4. Water Penetration Testing: Conducted at total pressure of 225 psf.

Example 3: A specification for an AW-PG60 window would specify an "AW" Class unit which requires that the unit tested to a design pressure of 60 psf with a structural design pressure of 90 psf. For the minimum test size of 60 by 99 inches,

1. Deflection: 0.57-inch (along 99-inch length) and 0.34-inch (along 60-inch length).
2. Allowable Maximum Permanent Deformation: 0.20 inch (along 99-inch length) and 0.12-inch (along 60-inch length).
3. Air Infiltration: Maximum total of 4.13 cfm under a pressure of 255.8 lbf.
4. Water Penetration Testing: Conducted at total pressure of 495 psf.

Although each of these windows has the same Performance Grade of 60 (design pressure of 60 psf and structural design pressure of 90 psf), the testing is increasingly rigorous as the minimum size tested increases. The R Class window has no deflection limits while the CW and AW Class units have limitations on deflection. Note that the AW Class window permits less air infiltration under greater total pressure for a window that is more than 1-1/2 times the area. Note also that the pressure per sq. in. required for water penetration testing is more than 3-1/2 times greater for the AW Class window than for the R Class window.

Request design calculations from a qualified structural engineer to verify the design pressures required. The positive and negative wind pressure will depend on the wind speed, the building exposure, the building height, location of the window on the face of the building, and the type of occupancy. Negative pressures may be greater than positive pressures. The Performance Class should be the greater of the positive or negative wind pressure rounded up to the next 5 lbs. (e.g., 30, 35, 40, 45, etc.). The building owner's insurer may require the use of even higher wind pressures.

© 2012