StormWATCH PROTECTION

ANDERSEN WINDOWS & DOORS

400 SERIES PRODUCT PERFORMANCE

PERFORMANCE STANDARDS

The Window and Door Manufacturers Association (WDMA), the American Architectural Manufacturers Association (AAMA) and the Canadian Standards Association (CSA) jointly release the North American Fenestration Standard/Specification for Windows, Doors and Skylights (NAFS-11) where "-11" refers to the most recent publication year of 2011. NAFS is also referred to as AAMA/WDMA/CSA 101/I.S.2/A440, which is how the International Code Council (ICC) lists this standard in the 2012, 2015 and 2018 International Residential Code (IRC) and International Building Code (IBC) as the means to indicate the window, door or skylights design pressure rating used to determine compliance to the jobsite design pressure requirements.

A product only achieves a "Performance Grade" or "PG" rating when it complies with all of the NAFS performance requirements such as ease of operation, air infiltration resistance, resistance to water penetration and resistance to forced entry, etc. A "Design Pressure Rating" or "DP" rating only depicts the design and structural load performance.

Performance Classes

The NAFS Standard/Specification defines requirements for four performance classes. Performance classes are designated R, LC, CW and AW. This classification system provides for several levels of performance. Product selection is always based on the performance and building code requirements of the particular project.

Elements of Performance Grade (PG) Designations

In order to qualify for a given performance grade (PG), test specimens need to pass all required performance tests for the following, in addition to all required auxiliary (durability) and applicable material/component tests (not shown here) for the applicable product type and desired performance class:

(a) Operating force (if applicable): Maximum operating force varies by product type and performance class.

(b) Air leakage resistance: Tested in accordance with ASTM E283 at a test pressure of 1.57 psf. Allowable air infiltration for R, LC and CW class designations is 0.3 cubic feet per minute per square foot of frame (cfm/ft^2).

(c) Water penetration resistance: Tested in accordance with ASTM E547 with the specified test pressure applied per NAFS-11. Test consists of four cycles. Each cycle consists of five minutes with pressure applied and one minute with the pressure released, during which the water spray is continuously applied. Water spray shall be uniformly applied at a constant rate of 5 U.S. gal/ft^2 · hr.

(d) Uniform load deflection test: Tested in accordance with ASTM E330 for both positive and negative pressure (pressure defined by NAFS-11) with the load maintained for a period of 10 seconds. The test specimen shall be evaluated for deflection during each load for permanent damage after each load and for any effects on the normal operation of the specimen. *Starting with the 2008 version of NAFS, design pressure (DP) will only represent the "uniform load deflection test."*

(e) Uniform load structural test: Tested in accordance with ASTM E330 for both positive and negative pressure (pressure defined by NAFS-11) with the load maintained for a period of 10 seconds. After loads are removed, there shall be no permanent deformation in excess of 0.4% of its span and no damage to the unit which would make it inoperable.

(f) Forced-entry resistance (if applicable): Tested in accordance with ASTM F588 (windows), F476 (swinging doors) and F842 (sliding doors) at a performance level 10 rating.

Performance Grades (PG) & Corresponding Test Pressures (psf)

Performance Class/ Performance Grade		Air Infiltration Test Pressure		Maximum Allowable Air Infiltration/ Exfiltration Rate		Water Penetration Resistance Test Pressure		Design Pressure		Structural Test Pressure	
R	LC	Pa	psf	L/s·m^2	cfm/ft^2	Pa	psf	Pa	psf	Pa	psf
15	-	75	1.57	1.5	0.30	140	2.92	720	15.04	1080	22.56
20	-	75	1.57	1.5	0.30	150	3.13	960	20.05	1440	30.08
25	25	75	1.57	1.5	0.30	180	3.76	1200	25.06	1800	37.59
30	30	75	1.57	1.5	0.30	220	4.59	1440	30.08	2160	45.11
35	35	75	1.57	1.5	0.30	260	5.43	1680	35.09	2520	52.63
40	40	75	1.57	1.5	0.30	290	6.06	1920	40.10	2880	60.15
45	45	75	1.57	1.5	0.30	330	6.89	2160	45.11	3240	67.67
50	50	75	1.57	1.5	0.30	360	7.52	2400	50.13	3600	75.19
55	55	75	1.57	1.5	0.30	400	8.35	2640	55.14	3960	82.71
60	60	75	1.57	1.5	0.30	440	9.19	2880	60.15	4320	90.23
65	65	75	1.57	1.5	0.30	470	9.82	3120	65.16	4680	97.74
70	70	75	1.57	1.5	0.30	510	10.65	3360	70.18	5040	105.26
75	75	75	1.57	1.5	0.30	540	11.28	3600	75.19	5400	112.78
80	80	75	1.57	1.5	0.30	580	12.11	3840	80.20	5760	120.30
85	85	75	1.57	1.5	0.30	580	12.11	4080	85.21	6120	127.82
90	90	75	1.57	1.5	0.30	580	12.11	4320	90.23	6480	135.34
95	95	75	1.57	1.5	0.30	580	12.11	4560	95.24	6840	142.86
100	100	75	1.57	1.5	0.30	580	12.11	4800	100.25	7200	150.38

HALLMARK CERTIFICATION

The Window and Door Manufacturers Association (WDMA)-sponsored Hallmark Certification Program provides manufacturers with certification to the AAMA/WDMA/CSA 101/I.S.2/A440-11 Standard and is designed to provide builders, architects, specifiers and consumers with an easily recognizable means of identifying products that have been manufactured and tested in accordance with NAFS (AAMA/WDMA/CSA 101/I.S.2/A440) industry standards and other applicable performance standards. Conformance is determined by periodic in-plant inspections by a third-party administrator. Inspections include auditing licensee quality control procedures and processes and a review to confirm products are manufactured in accordance with the appropriate performance standards. Periodic testing of representative product constructions and components by an independent testing laboratory is also required. When all of the program requirements are met, the licensee is authorized to use the WDMA Hallmark registered logo on their certification label as a means of identifying products and their performance ratings.

Products successfully obtaining Hallmark Certification will be labeled with a three-part code, which includes performance class, performance grade and size tested. In addition to this mandatory requirement, you are allowed to list the design pressure on a separate line.

WINDOW & DOOR MANUFACTURERS ASSOCIATION WDMA Hallmark Certified www.wdma.com	**Andersen Corporation** **400 Series Casement Window with Stormwatch® Protection** Manufacturer stipulates certification as indicated below.
STANDARD	**RATING**
AAMA/WDMA/CSA 101/I.S.2/A440-11	CLASS LC(1) – PG70(2) – Size Tested 31.5 x 71.9 in.(3) DP+70/-70(4)
AAMA/WDMA/CSA 101/I.S.2/A440-08	CLASS LC(1) – PG70(2) – Size Tested 31.5 x 71.9 in.(3) DP+70/-70(4)

(1) – Performance Class

(2) – Performance Grade

(3) – Size Tested

(4) – Design Pressure

In the example above, the performance class is LC, the performance grade (PG) is 70 pounds per square foot (psf) and the size tested is 31.5" x 71.9". What this means to the specifier is, based on the performance grade chart, the laboratory-tested air infiltration was less than 0.3 cfm/ft^2 (test pressure is always 1.57 psf and the allowable airflow is 0.3 cfm/ft^2), the product tested successfully resisted a laboratory water penetration test at a test pressure of 10.65 psf, the product tested successfully withstood a laboratory positive test pressure of 105 psf and a laboratory negative test pressure of 105 psf and the product tested passed the laboratory requirements for operational force and forced-entry resistance. Based on this test, all products of the same design that are smaller than the tested size can be labeled with this product performance rating.

IMPORTANT

Building codes prescribe design pressure based on a variety of criteria (i.e. windspeed zone, building height, building type, jobsite exposure, etc.). Design pressures derived from Performance Grade (PG) test requirements should be used to determine compliance to building code required design pressures. Structural test pressures, which are tested at 1.5 times the design pressure, should **not** be used for determining design pressure code compliance. In the example above, a PG 70 performance grade rating, which passes a 70 psf design pressure, should be used for determining code compliance, not the structural test pressure of 105 psf.

If you need further details about how Andersen® products perform to this standard, contact your Andersen supplier.

If you need further information about the AAMA/WDMA/CSA 101/I.S.2/A440-11 standard or the Hallmark Certification Program, please contact: WDMA, 330 N. Wabash Avenue Suite 2000, Chicago, IL 60611 Phone: 312-673-4828 Web: wdma.com

Where designated, Andersen products are tested, certified and labeled to the requirements of the Hallmark Certification Program. Actual performance may vary based on variations in manufacturing, shipping, installation, environmental conditions and conditions of use.

Performance Grade, Air Infiltration and Sound Transmission Ratings

400 Series Windows and Performance Grade (PG) Upgrades — Low-E4® Impact-Resistant Glass Types

For current performance information, please visit andersenwindows.com.

Andersen® Product	AAMA/WDMA/CSA 101/IS2/A440 Performance Grade (PG)	+/- Corresponding Design Pressure (DP)	TAS 201, 202, 203	Standard Glass Sound Transmission Class (STC)	Standard Glass Outdoor/Indoor Transmission Class (OITC)	Air Infiltration CFM/FT²
Casement & Awning						
Casement	Class LC-PG70 Size Tested 31.5" x 71.9"	70/70	–	30	26	< 0.2
Casement, PG Upgrade	Class LC-PG70 Size Tested 31.5" x 71.9"	70/70	–	26	22	< 0.2
Awning	Class LC-PG60 Size Tested 59.8" x 31.5"	60/65	–	–	–	< 0.2
Awning, PG Upgrade	Class LC-PG60 Size Tested 59.8" x 31.5"	60/65	–	26	21	< 0.2
Casement/Awning Picture	Class LC-PG70 Size Tested 71.5" x 59.9"	70/70	–	35	30	< 0.2
Tilt-Wash Double-Hung						
Tilt-Wash Double-Hung	Class LC-PG50 Size Tested 45.6" x 76.9"	50/65	–	–	–	< 0.2
Tilt-Wash Double-Hung, PG Upgrade	Class LC-PG50 Size Tested 45.6" x 76.9"	50/50	–	29	24	< 0.2
Tilt-Wash Transom	Class LC-PG50 Size Tested 75.3" x 39.3"	50/65	–	33	28	< 0.2
Tilt-Wash Picture	Class LC-PG50 Size Tested 67.3" x 76.9"	50/65	–	34	28	< 0.2
Specialty						
Half Circle, Oval	Class LC-PG70 Size Tested 71.5" x 59.9"	70/70	–	–	–	< 0.2
Springline™	Class LC-PG70 Size Tested 96.0" x 72.1"	70/70	–	35	29	< 0.2
Flexiframe®	Class LC-PG70 Size Tested 144.0" x 63.4"	70/70	–	35	29	< 0.2
Complementary Specialty (> 36 and <= 50 sq. ft.)	Class LC-PG70 Size Tested 60.0" x 120.0"	70/80	70/80	37	31	< 0.2
Complementary Specialty (> 15 and <= 36 sq. ft.)	Class LC-PG70 Size Tested 54.0" x 96.0"	70/70	70/70	36	31	< 0.2
Complementary Specialty (<= 15 sq. ft.)	Class LC-PG70 Size Tested 36.0" x 60.0"	70/70	70/70	35	30	< 0.2

Performance Grade, Air Infiltration and Sound Transmission Ratings

400 Series Windows — Monolithic Impact-Resistant Glass Types

For current performance information, please visit andersenwindows.com.

Andersen® Product	AAMA/WDMA/CSA 101/IS2/A440 Performance Grade (PG)	+/- Corresponding Design Pressure (DP)	TAS 201, 202, 203	Standard Glass Sound Transmission Class (STC)	Standard Glass Outdoor/Indoor Transmission Class (OITC)	Air Infiltration CFM/FT²
Casement & Awning						
Casement (**CW**25)	Class LC-PG70 Size Tested 56.5" x 59.9"	70/70	60/64	34	29	< 0.2
Casement (**CW**35)	Class LC-PG70 Size Tested 71.9" x 59.9"	70/70	60/64	34	29	< 0.2
Casement (**CXW**145)	Class LC-PG70 Size Tested 35.9" x 52.8"	70/70	60/65	34	29	< 0.2
Casement (**CX**16)	Class LC-PG70 Size Tested 31.5" x 71.9"	70/70	50/65	34	29	< 0.2
Casement Transom (**CTR**32410)	Class LC-PG70 Size Tested 84" x 12"	70/75	–	37	34	< 0.2
Awning (**A**313)	Class LC-PG60 Size Tested 35.9" x 71.9"	60/65	–	34	31	< 0.2
Awning (**AX**3251)	Class LC-PG60 Size Tested 84.6" x 31.5"	60/65	–	34	31	< 0.2
Awning (**AX**51)	–	–	60/65	34	31	< 0.2
Casement/Awning Picture	Class LC-PG60 Size Tested 59.9" x 71.9"	70/70	67/82	37	34	< 0.2
Tilt-Wash Double-Hung						
Tilt-Wash Double-Hung (3862)	Class LC-PG50 Size Tested 45.8" x 76.9"	50/65	–	–	–	< 0.2
Specialty						
Half Circle	–	–	67/82	–	–	< 0.2
Springline™	–	–	67/70	36	32	< 0.2
Flexiframe®	–	–	67/71	36	32	< 0.2
Complementary Specialty (> 36 and <= 50 sq. ft.)	Class LC-PG70 Size Tested 60.0" x 120.0"	70/80	70/80	–	–	< 0.2
Complementary Specialty (> 15 and <= 36 sq. ft.)	Class LC-PG70 Size Tested 54.0" x 96.0"	70/70	70/70	–	–	< 0.2
Complementary Specialty (<= 15 sq. ft.)	Class LC-PG70 Size Tested 36.0" x 60.0"	70/70	70/70	–	–	< 0.2

- "Performance Grade (PG)" ratings may vary from tested performance rating for larger or smaller units of a particular type.
- "Sound Transmission Class (STC)" & "Outdoor/Indoor Transmission Class (OITC)" ratings are for individual units based on independent tests and represent entire unit. Higher STC/OITC values may be available with other glazings.
- This data is accurate as of January 2021. Due to ongoing product changes, updated test results or new industry standards, this data may change over time.
- Where designated, Andersen products are certified and labeled to the requirements of the Hallmark Certification Program. Actual performance may vary based on variations in manufacturing, shipping, installation, environmental conditions and conditions of use.
- Contact your Andersen supplier or go to andersenwindows.com for more information.
- All impact-resistant glass units tested to Large Missile D, Wind Zone 4 and High Velocity Hurricane Zone (HVHZ) requirements of Florida.