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NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights

EXCERPT EDITION

Product Designations (Product Types, Performance Classes & Grades), and Gateway Performance Requirements

Note: Excerpt Editions do not reflect Updates that were issued after the initial publication of the Standard/Specification. Updates may be obtained from the Publication Store located on our website (www.aamanet.org).

4 General requirements

4.1 General

This voluntary Standard/Specification covers requirements for single and dual windows, single and dual side-hinged door systems, sliding doors, tubular daylighting devices (TDDs), and unit skylights for new construction and replacement applications. All products rated in accordance with this Standard/ Specification shall conform to all the requirements of this Standard/Specification. All products covered by this Standard/Specification shall be installed in full accordance with the manufacturer's documented instructions.

4.2 Gateway performance requirements

4.2.1 General

Each product type has a defined "gateway" set of primary requirements for the applicable product type before entry into the performance class is permitted (see Table 1). Gateway performance requirements are the minimum allowable performance levels that a gateway test specimen shall achieve in order for a product to be rated with a particular performance class (R, LC, CW, or AW). The gateway test specimen size shall be equal to or larger than the specified gateway test size, in both height and width, as specified in Table 27, unless the product is being qualified for Performance Class R in accordance with Clause 9. Typically, the minimum allowable performance levels and the gateway size change as the performance class changes. All gateway test specimens shall achieve certain minimum performance grades (PG) with corresponding performance levels for air leakage resistance, water penetration resistance, uniform load, and, where required, forced-entry resistance and operating force. Also, all gateway test specimens shall achieve certain additional minimum performance levels for auxiliary (durability) and material tests specific to the product operator type. See Clause 5 for additional details.

Product performance class	Minimum performance grade (PG)	Minimum design pressure (DP), Pa (psf)	Minimum structural test pressure (STP), Pa (psf)	Minimum water resistance test pressure, Pa (psf)
Windows and doors				
R	15	720 (15.0)	1080 (22.5)	140 (2.90)
LC	25	1200 (25.0)	1800 (37.5)	180 (3.75)
CW	30	1440 (30.0)	2160 (45.0)	220 (4.50)
AW	40	1920 (40.0)	2880 (60.0)	390 (8.00)
Unit skylights, tubular daylighting devices, and roof windows				
R	15	720 (15.0)	1440 (30.0)	140 (2.90)
CW	30	1440 (30.0)	2880 (60.0)	220 (4.5)

TABLE 1 - GATEWAY REQUIREMENTS

4.2.2 Alternative minimum test sizes for Performance Class R products (optional)

Clause 9 provides an option whereby a product is permitted to enter Performance Class R via the testing of a specimen that is smaller than the gateway test size specified in Table 27, provided that the minimum performance grade (PG) for the test specimen is correspondingly increased. This option shall apply only to Class R products. This option shall not apply to products rated to any other performance class.

Note: *The user should not confuse this option with the option of testing smaller specimens to achieve optional performance grades (PG), as specified in Clause 4.3.2. During testing to achieve optional performance grades (PG), testing of smaller specimens is permitted only after all gateway requirements have been met. In contrast, the option specified in this Clause permits a product to enter Performance Class R via the testing of a specimen with a reduced size compared to the gateway test size requirements specified in Table 27.*

4.4 Product designations

4.4.1 General

A primary designator shall be used to designate products included in this Standard/Specification. An optional secondary designator shall be permitted if desired. The use of a secondary designator, or any portion thereof, shall only be permitted in conjunction with the primary designator and shall be preceded by the primary designator. All written presentations of any secondary designator, or any portion thereof, in any manner, shall have a text size not larger than that of the primary designator. For the purpose of compliance with this Standard/Specification, all written presentations shall include, but not be limited to, the following:

(a) product labels;
(b) technical literature;
(c) web-based or other electronic publications; and
(d) advertising.

4.4.2 Primary designator

4.4.2.1 General

The primary designator in this Standard/Specification is a three- or four-part code, which includes performance class, performance grade (PG), maximum size tested to achieve this rating, and (optionally) product type. When used, the product type shall be presented in full or represented by abbreviations as shown in Figures 2 to 4. The abbreviations shall be as indicated in Table 5.

An asterisk (*) added to the primary designator indicates that the tested specimen size was smaller, in either width or height, than the gateway test size specified in Table 27 for the product type and performance class. An asterisk shall be added to the primary designator when a smaller specimen was tested to achieve an optional performance grade (PG) as specified in Clause 4.3.2 or the alternative minimum test size option was used as specified in Clause 9. An example of asterisk use is shown in Figure 3.

Hung Window — Downsized:
Class R — PG30 — Size tested 800 × 1800 mm* (32 × 71 in*)
Class R — PG30 — Size tested 31.5 × 70.9 in*
Class R — PG1440 (metric) — Size tested 800 × 1800 mm*

For all designators, there is an option to add the product type at the end of the designator at the manufacturer’s discretion.

Examples:
Class R — PG30: Size tested 800 × 1800 mm* (32 × 71 in*) — Hung
or
Class R — PG30: Size tested 800 × 1800 mm* (32 × 71 in*) — Type H

Legend:

Class R	— performance class (see Clauses 0.2.1 and 4.4.2.3)
PG30	— performance grade (PG) (inch-pound) (see Clauses 0.2.3 and 4.4.2.4)
PG1440 (metric)	— performance grade (PG) (metric) (see Clauses 0.2.3 and 4.4.2.4)
Size tested 800 × 1800 mm	— maximum size tested (metric) (see Clause 4.4.2.5)
Size tested 31.5 × 70.9 in	— maximum size tested (imperial) (see Clause 4.4.2.5)
*	— Test specimen size is smaller than gateway test size
Hung or Type H	— product type (see Clause 4.4.2.2)

Figure 3 - Primary designator (Example 2)
(See Clause 4.4.2.1.)

The characters “LW” shown in the product type in Figure 4 indicate limited water penetration resistance. LW ratings shall only be permitted for side-hinged door systems, and shall not be permitted for any other product types. Side-hinged doors claiming a limited water (LW) rating shall include the characters “LW” in the designator as shown in Figure 4. Also, LW ratings shall only be permitted where the representative test specimen has successfully passed a water penetration resistance test at a pressure differential of 0 Pa (0.0 psf) or higher, but less than the minimum test pressure required for the indicated performance class and performance grade (PG). If the test specimen is not successfully tested to a water penetration resistance test pressure equal to or greater than 0 Pa (0.0 psf), then that side-hinged door system shall not be considered in compliance with this Standard/Specification. An example is shown in Figure 4.

Limited Water Side-Hinged Door:
Class R — PG40 — Size tested 900 × 2000 mm (36 × 79 in) — LW
Class R — PG40 — Size tested 35.4 × 78.7 in — LW
Class R — PG1920 (metric) — Size tested 900 × 2000 mm — LW

For all designators, there is an option to add “SHD” at the end of the designator at the manufacturer’s discretion.

Examples:
Class R — PG40 — Size tested 900 × 2000 mm (36 × 79 in) — Limited Water Side-Hinged Door
or
Class R — PG40 — Size tested 900 × 2000 mm (36 × 79 in) — Type LW SHD

Legend:

Class R	— performance class (see Clauses 0.2.1 and 4.4.2.3)
PG1920 (metric)	— performance grade (PG) (metric) (see Clauses 0.2.3 and 4.4.2.4)
PG40	— performance grade (PG) (imperial) (see Clauses 0.2.3 and 4.4.2.4)
Size tested 900 × 2000 mm	— maximum size tested (metric) (see Clause 4.4.2.5)
Size tested 35.4 × 78.7 in	— maximum size tested (imperial) (see Clause 4.4.2.5)
LW SHD	— Limited Water Side-Hinged Door — product type (see Clause 4.4.2.2)

Figure 4 - Primary designator (Example 3)
(See Clause 4.4.2.1.)

Products that have been tested as dual windows as specified in Clause 4.5 shall have the code “DW” added to their product designation after the product type. An example of a product designation for a dual window would be “LC — PG25 1800 × 1500 HS-DW”. Products that have been tested as dual doors as specified in Clause 4.5 shall have the code DD added to their product designation after the product type. An example of a product designation for a dual door would be “LC — PG25 1000 × 2100-SHD-DD”.

4.4.2.2 Product type

Product type designations shall be as specified in Table 5 for the window, door, TDD, and unit skylight product types covered in this Standard/Specification. The depictions in Figure 5 are general in nature and are not all-inclusive.

Table 5 – Product Types
(See Clauses 4.4.2.1, 4.4.2.2, 8.1, and 8.3.2)

AP	=	Awning, hopper, projected window	LW SHD	=	Limited water side-hinged door
ATD	=	Architectural terrace door	RW	=	Roof window
BW	=	Basement window	SD	=	Sliding door
C	=	Casement window	SHD	=	Side-hinged door
DASHD	=	Dual-action side-hinged door	SHW	=	Side-hinged (inswinging) window
DAW	=	Dual-action window	SKG	=	Unit skylight — glass glazed
FD	=	Fixed door	SKP	=	Unit skylight — plastic glazed
FW	=	Fixed window	SLT	=	Side lite
GH	=	Greenhouse window	SP	=	Specialty product
H	=	Hung window	TA	=	Tropical awning window
HE	=	Hinged rescue window	TDD	=	Tubular daylighting device
HP	=	Horizontally pivoted window	TH	=	Top-hinged window
HS	=	Horizontal sliding window	TR	=	Transom
J	=	Jalousie window	VP	=	Vertically pivoted window
JA	=	Jal-awning window	VS	=	Vertical sliding window
LW DASHD	=	Limited water dual-action side-hinged door			

4.4.2.3 Performance class

Products included in this Standard/Specification shall be classified according to one or more of the four performance classes (R, LC, CW, and AW) as described in Clause 0.2.1 and Table 1. A single product may qualify for multiple performance classes provided that all requirements are met for each performance class.

Product type	Product designation	Minimum test size, mm (in)	Minimum design pressure (DP), Pa (lbf/ft^2)	Deflection at design pressure (DP), mm (in)	Minimum structural pressure (STP), Pa (lbf/ft^2)	Minimum water pressure, Pa (lbf/ft^2)	Air leakage resistance		Operating force test	Force to latch test	Deadbolt force test	Forced-entry resistance test	Thermoplastic corner weld test	Deglazing test	Sash/leaf torsion test	Sash vertical deflection test	Sash/leaf concentrated load test on latch rail	Vertical concentrated load test	Vertical concentrated load test on intermediate frame rails	Distributed load test	Stabilizing arm load test	Hold-open arm/stay bar test	Hinge test	Awning, hopper, projected hardware load test	Safety drop test	Unit dead load test	Life cycle testing	Operation/cycling performance	Vertical loading resistance
							Pa (lbf/ft^2)	L/s•m^2 (cfm/ft^2)	5.3.1.1	5.3.1.2.1	5.3.1.2.2	5.3.5	5.3.6.2	5.3.6.3	5.3.6.4.2	5.3.6.4.3	5.3.6.4.4	5.3.6.4.5	5.3.6.5	5.3.6.6.2	5.3.6.6.3	5.3.6.6.4	5.3.6.6.5	5.3.6.6.6	5.3.6.7	5.3.6.8	5.3.6.9	5.3.6.10	5.3.6.11
Architectural terrace door	Class AW-PG40-ATW	1200 × 2430 (48 × 96)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)		•	•	•	•													•	•	•
Awning, hopper, projected window	Class R-PG15-AP	1200 × 400 (48 × 16)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)	•			•	•											•				
	Class LC-PG-25-AP	1200 × 800 (48 × 32)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)	•			•	•											•				
	Class CW-PG30-AP	1200 × 800 (48 × 32)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)	•			•	•											•				
	Class AW-PG40-AP	1500 × 900 (60 × 36)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)	•			•	•		•		•		•									
Basement window	Class R-PG15-BW	800 × 360 (32 × 14)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)				•	•															
Casement window	Class R-PG15-C	600 × 1500 (24 × 60)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)	•			•	•			•				•								
	Class LC-PG25-C	800 × 1500 (32 × 60)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)	•			•	•			•				•								
	Class CW-PG30-C	800 × 1500 (32 × 60)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)	•			•	•			•				•								
	Class AW-PG40-C	900 × 1500 (36 × 60)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)	•			•	•		•	•				•						•		
Dual-action side-hinged door	Class R-PG15-DASHD	900 × 2000 (36 × 79)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)		•	•	•	•				•			•							•	•

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Table 27 (Continued)

TABLE 27 GATEWAY PERFORMANCE REQUIREMENTS

Product type	Product designation	Minimum test size, mm (in)	Minimum design pressure (DP), Pa (lbf/ft^2)	Deflection at design pressure (DP), mm (in)	Minimum structural pressure (STP), Pa (lbf/ft^2)	Minimum water pressure, Pa (lbf/ft^2)	Air leakage resistance		Operating force test	Force to latch test	Deadbolt force test	Forced-entry resistance test	Thermoplastic corner weld test	Deglazing test	Sash/leaf torsion test	Sash vertical deflection test	Sash/leaf concentrated load test on latch rail	Vertical concentrated load test	Vertical concentrated load test on intermediate frame rails	Distributed load test	Stabilizing arm load test	Hold-open arm/stay bar test	Hinge test	Awning, hopper, projected hardware load test	Safety drop test	Unit dead load test	Life cycle testing	Operation/cycling performance	Vertical loading resistance
							Pa (lbf/ft^2)	L/s•m^2 (cfm/ft^2)	5.3.1.1	5.3.1.2.1	5.3.1.2.2	5.3.5	5.3.6.2	5.3.6.3	5.3.6.4.2	5.3.6.4.3	5.3.6.4.4	5.3.6.4.5	5.3.6.5	5.3.6.6.2	5.3.6.6.3	5.3.6.6.4	5.3.6.6.5	5.3.6.6.6	5.3.6.7	5.3.6.8	5.3.6.9	5.3.6.10	5.3.6.11
Hung window — vertical sliding (continued)	Class LC-PG25-H	1000 × 1600 (40 × 63)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)	•			•	•	•															
	Class CW-PG30-H	1400 × 2300 (56 × 91)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)	•			•	•	•															
	Class AW-PG40-H	1500 × 2500 (60 × 99)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	1.5 (0.3)	•			•	•	•															
Jal-awning window	Class R-PG15-JA	1400 × 1600 (56 × 63)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)				•	•																
Jalousie window	Class R-PG15-J	900 × 1200 (36 × 48)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	6.0 (1.2)				•	•																
Non-hung window — vertical sliding	Class R-PG15-VS	1000 × 1600 (40 × 63)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)	•			•	•	•											•				
	Class LC-PG25-VS	1100 × 1900 (44 × 75)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)	•			•	•	•											•				
	Class CW-PG30-VS	1400 × 2300 (56 × 91)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)	•			•	•	•											•				
Side-hinged door	Class R-PG15-SHD	900 × 2000 (36 × 79)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)		•	•	•	•															•	•
	Class LC-PG25-SHD	900 × 2100 (36 × 83)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)		•	•	•	•															•	•
	Class CW-PG30-SHD	1000 × 2100 (40 × 83)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)		•	•	•	•															•	•
	Class AW-PG40-SHD	1200 × 2400 (40 × 83)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)		•	•	•	•															•	•
Side-hinged window	Class AW-PG40-SHW	1200 × 1800 (48 × 71)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)				•	•														•		

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Table 27 (Continued)

TABLE 27 GATEWAY PERFORMANCE REQUIREMENTS

The following significant changes from the previous edition of this Standard/Specification have been made:

(a) reduction of the number of window and door performance classes from five to four by elimination of Classes C and HC and addition of a new class identified as CW;
(b) introduction of an option whereby a product is permitted to enter Performance Class R by testing of a specimen of an alternative minimum test size smaller than the gateway test size specified in Table 27, provided that the minimum performance grade (PG) is correspondingly increased (see Clause 9 for details);
(c) addition of tubular daylighting devices (TDDs);
(d) revision of the pressure caps for the R and LC classes;
(e) clarification of the meaning of and difference between design pressure (DP) and performance grade (PG); and
(f) revision of the primary designators for design pressure (DP), performance grade (PG), and size tested.

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