Update No. 2
AAMA/WDMA/CSA 101/I.S.2/A440-08
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Title: *NAFS — North American Fenestration Standard/Specification for windows, doors, and skylights* — originally published January 2008

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If you are missing any updates, please contact AAMA, WDMA, or CSA or visit
AAMA — **www.aamanet.org**
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The following revisions have been formally approved and are marked by the symbol delta (Δ) in the margin on the attached replacement pages:

Revised	Clause 6.2.5.2 and Table 27
New	None
Deleted	None

AAMA/WDMA/CSA 101/I.S.2/A440-08 originally consisted of **129 pages** (viii preliminary and 121 text), each dated **January 2008**. It now consists of the following pages:

January 2008	iii–viii, 1–28, 31–74, 77–80, 83–110, and 117–121
May 2008	29, 30, 75, 76, 111, 112, 115, and 116
September 2008	81, 82, 113, and 114

- Update your copy by inserting these revised pages.
- Keep the pages you remove for reference.

6.2.3.4.5 Glazing Exception 4

This Clause shall apply when the glazing material to be qualified is not within the scope of ASTM E 1300 or CAN/CGSB 12.20. Examples include, but are not limited to,

(a) plastic glazing materials;
(b) composite material panels; and
(c) wired safety glass.

Under this exception, a manufacturer shall be permitted to glaze a test specimen with any desired thickness and type of glazing material that is not within the scope of ASTM E 1300 or CAN/CGSB 12.20. When glazed in accordance with this Clause, the test results achieved shall apply to like products of a size equal to or smaller than the tested specimen, provided that the products contain glazing of the exact same material type and of a thickness equal to or greater than that used in the tested specimen. The test results achieved shall not apply to any like products containing a different glazing material, or containing thinner glazing, than that used in the tested specimen.

6.2.3.4.6 Glazing Exception 5

This Clause shall apply to glazing selection for side-hinged exterior door specimens that are to be cycle tested in accordance with Clause 5.3.6.10. Such specimens shall use the heaviest glazing assembly that is to be qualified or shall have sufficient additional weight attached to the glazing to make it equivalent to the heaviest glazing assembly to be qualified. Successful testing of such specimens shall qualify the product when it is of equal or lesser weight.

6.2.3.5 Glazing Qualification 1

Since sealed insulating glass units typically provide significantly more strength and stiffness to sash and frame members than single glazing, products tested with sealed insulating glass units shall not qualify single-glazed products.

Products tested with single glazing shall qualify that product when glazed with insulating glass units, provided that the only change to the product is the glass-retaining members or stops, and provided that the product is not subject to the safety drop test in Clause 5.3.6.7.

6.2.3.6 Glazing Qualification 2

Testing of unglazed door units shall not qualify glazed door units, and testing of glazed door units shall not qualify unglazed door units. Leaves with glazing shall be tested with the largest glazing area to be provided in the door system for which compliance is desired.

6.2.4 Removable multiple glazing panels

RMGPs shall contain glazing that fully conforms to the requirements of primary glazing specified in Clauses 6.2.1 to 6.2.3. If the RMGP is an interior panel and vented to the interior, these requirements shall not apply to the interior panel.

RMGPs may be installed on either the interior side or the exterior side of the primary glazing.

6.2.5 Plastic glazing

6.2.5.1 General

Plastic glazing materials, when used, shall meet all the requirements of this Clause and Clauses 6.2.5.2 to 6.2.5.7.

Products tested with plastic glazing materials shall not qualify glass-glazing materials, nor shall products tested with glass qualify plastic glazing materials.

Safety glazing plastic materials shall conform to ANSI Z97.1 or 16 CFR 1201.

Δ 6.2.5.2 Weatherability

Plastic glazing materials shall either be exposed for five years, at a minimum, in Florida with a southern exposure at a 45° angle, or tested using the operating procedure in ASTM G 155 and augmented in ASTM D 2565. When tested:

(a) apparatus shall be Type A and have a 6.5 kW water-cooled xenon-arc lamp and a light monitoring system;
(b) borosilicate glass inner and outer optical filters shall be used; and
(c) the specimen shall be exposed to a radiant flux of 0.35 W/m^2 at a wavelength of 340 nm for a total of 2900 hours.

6.2.5.3 Light transmittance

After the exposure specified in Clause 6.2.5.2, the plastic glazing material shall not change more than 10% of its original light transmittance value when tested in accordance with ASTM D 1003, and shall be described as follows:

% change = $A - B$

where

A = light transmittance before exposure, %

B = light transmittance after exposure, %

Prior to measurements, samples shall be cleaned in accordance with the plastic manufacturer's published instructions.

6.2.5.4 Impact strength requirements

Plastic glazing material shall be tested before and after exposure in accordance with ASTM D 6110, with the following exceptions:

(a) the specimen shall be tested with the exposed surface in tension;
(b) the specimen shall be exposed and tested in a horizontal position; and
(c) the specimen shall be reduced to 50 mm (2 in) for thin material that can slip through the supports without breaking.

The average of the five specimens shall not result in more than a 25% reduction in impact strength (as measured by the unnotched Charpy test) as a result of the outdoor exposure. If material does not indicate breaking both before and after weathering, it is deemed acceptable.

6.2.5.5 Smoke density requirements

Plastic glazing materials shall be tested in accordance with ASTM E 84 or ASTM D 2843. When tested in accordance with ASTM E 84, the maximum smoke developed index shall be not greater than 450. When tested in accordance with ASTM D 2843, the maximum smoke density rating shall be not greater than 75.

6.2.5.6 Self-ignition temperature requirements

Plastic glazing materials, when tested in accordance with ASTM D 1929, shall have a minimum self-ignition temperature of 343 °C (650°F).

6.2.5.7 Combustibility classification requirements

Plastic glazing materials, when tested in accordance with ASTM D 635, shall meet one of the combustibility classes listed in Table 21.

Table 27 (Continued)

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
Fixed window (continued)	Class AW-PG40-FW	1500 × 2500 (60 × 99)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)				•	•																
Greenhouse window	Class R-PG15-GH	900 x 900 x 300 (36 × 36 x 12)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)				•	•													•			
Hinged rescue window	Class R-PG15-HE	Varies	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)				•	•										•						
Horizontally or vertically pivoted window	Class R-PG15-HP/VP	1100 × 1500 (44 × 60)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)				•	•																
	Class LC-PG25-HP/VP	1200 × 1500 (48 × 60)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)				•	•																
	Class CW-PG30-HP/VP	1200 × 2200 (48 × 87)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)				•	•		•														
	Class AW-PG40-HP/VP	1500 × 2500 (60 × 99)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	0.5 (0.1)				•	•		•		•	•									•		
Horizontal sliding window	Class R-PG15-HS	1600 × 1100 (63 × 44)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)	•			•	•	•															
	Class LC-PG25-HS	1800 × 1400 (71 × 56)	1200 (25.0)	Reported	1800 (37.5)	180 (3.8)	75 (1.6)	1.5 (0.3)	•			•	•	•															
	Class CW-PG30-HS	1800 × 1500 (71 × 60)	1440 (30.0)	*L*/175	2160 (45.0)	220 (4.5)	75 (1.6)	1.5 (0.3)	•			•	•	•															
	Class AW-PG40-HS	2500 × 2000 (99 × 79)	1920 (40.0)	*L*/175	2880 (60.0)	390 (8.0)	300 (6.2)	1.5 (0.3)	•			•	•	•													•		
Hung window — vertical sliding	Class R-PG15-H	1000 × 1600 (40 × 63)	720 (15.0)	Reported	1080 (22.5)	140 (2.9)	75 (1.6)	1.5 (0.3)	•			•	•	•															

(Continued)

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							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	1100 × 1900 (44 × 75)	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 (48 × 95)	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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