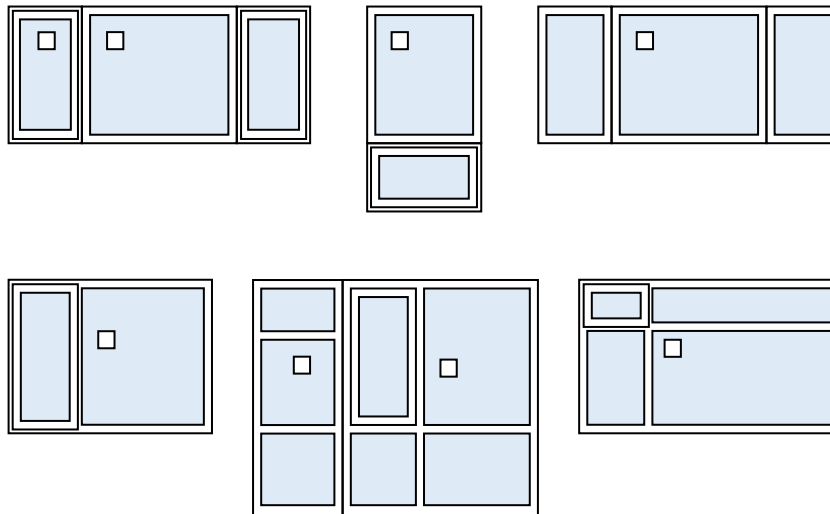


NAFS Labeling Guidelines for Canada



Best practices for labeling of Individual Unit, Composite Unit, Combination Assembly, and Mullion Assembly products tested to NAFS-11 and the Canadian Supplement to NAFS-11

September 2021

Disclaimer

Nothing in this document constitutes legal advice. Material is presented as general guidance and technical information from Fenestration Canada—a not-for-profit organization. Users of this document are advised to consult with a lawyer, accountant, or insurance professional before making any decisions.

Preface and Scope

This guideline document combines the NAFS Labeling Guidelines for Canada published in November 2013 with the Voluntary NAFS Labeling Guidelines for Products with Mullions published in September 2014.

This edition describes best practices for NAFS labeling of fenestration products in Canada for jurisdictions that have adopted the 2015 National Building Code of Canada (NBC) or a provincial building code based on the 2015 NBC. It is issued by Fenestration Canada for the benefit and use of fenestration suppliers, building officials, and other parties involved in specifying or regulating fenestration performance characteristics.

The need to test and rate the performance of products with mullions has not been well understood in some parts of Canada. Consequently, users of this document are urged to recognize that both industry and building officials will need time to understand the testing requirements and to implement appropriate labeling practices.

The term Building Code in this document shall mean the code in effect in a particular federal, provincial, territorial or municipal authority having jurisdiction.

1 Referenced Documents

This document uses the commonly used names/acronyms on the left to refer to the standards on the right:

NAFS, NAFS-11	AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS 2011—North American Fenestration Standard/Specification for windows, doors and skylights
Canadian Supplement	CSA A440S1-17, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS—North American Fenestration Standard/Specification for windows, doors and skylights
AAMA 450	AAMA 450-10, Voluntary Performance Rating Method for Mullied Fenestration Assemblies

2 Definitions

In this document the following terms are used with the meanings they have in the NAFS-11 standard:

Composite unit — a fenestration product consisting of two or more sash, leaves, lites, or sliding door panels within a single frame utilizing an integral mullion.

Combination assembly — an assembly formed by a combination of two or more separate fenestration products whose frames are mullied together utilizing a combination mullion or reinforcing mullion.

Individual unit¹ — a single fixed or operating product.

IP units — inch-pound units, also known as Imperial Units, English Units or US Customary Units. In IP units dimensions are expressed in feet (ft.) and inches (in.) and pressures in pounds per square foot (psf). IP units are permitted to be used to report product performance on NAFS product labels.

Mullion Assembly (MA)² — the functional term for an integral, combination, or reinforcing mullion as a Product Type that can be rated for Class as well as air-water-structural performance. Mullion assemblies can be rated for a particular span and tributary width. There are three types of mullions:

Combination mullion — a horizontal or vertical member formed by joining two or more individual fenestration units together without a mullion stiffener.

Integral mullion — a horizontal or vertical member which is bounded at either end or both ends by crossing frame members.

Reinforcing mullion — a horizontal or vertical member with an added continuous mullion stiffener and joining two or more individual fenestration units along the sides of the mullion stiffener.

Mullion stiffener — an additional reinforcing member used in a reinforcing mullion. Mullion stiffeners carry the entire load or share the load with adjacent framing members.

Mullion tributary area — The maximum area that a specific mullion or divider design, span and anchorage is rated to support under a specific wind load.

Note: “Mullion tributary area” should not be confused with “combination assembly area”.

Mullion tributary width — The maximum distance perpendicular to the mullion used in calculating mullion tributary area, that a specific mullion design, span and anchorage is rated to support under a specific wind load.

3 Laboratory Testing of Fenestration Products

NAFS is clear that the labeled structural-air-water performance ratings of fenestration products must be based on the laboratory tested performance of those products. In the case of windows and doors with mullions, the labeled performance ratings must be based on laboratory testing of products with mullions or the use of methods in AAMA 450. The testing of individual unit products does not qualify mullion assemblies composed of individual units.

When product labeling is unclear or in dispute, a test report from an independent testing laboratory, a certificate of compliance from a third-party certification body, or a report from a registered professional

¹ While this term is not explicitly defined in the standard, this is its meaning in NAFS-11 and in the fenestration industry.

² The Mullion Assembly definitions are taken from AAMA/WDMA/CSA 101/I.S.2/A440-17, North American Fenestration Standard/Specification for windows, doors and skylights (NAFS-17). The Mullion Assembly definitions in NAFS-11 are consistent with those of NAFS-17 but are incomplete.

engineer validating the performance of a fenestration product or mulled fenestration assembly shall be an acceptable substitute.

4 Canadian Labeling Requirements

The Building Code requires fenestration products within the scope of the NAFS standard to also comply with the Canadian Supplement which contains several performance and material requirements not present in NAFS. The Canadian Supplement also contains specific requirements for labeling fenestration products. Clause 6.4 describes the mandatory labeling requirements and is reproduced in full below.

6.4 Markings

6.4.1 Product manufacturer

All fenestration products shall bear a permanent marking indicating the fenestration product manufacturer's identity in a location that is visible when the product is installed.

6.4.2 Performance rating

Performance ratings shall be indicated on a label using primary and secondary designators. The designators shall be in accordance with Clauses 4.4.2 and 4.4.3 of AAMA/WDMA/CSA 101/I.S.2/A440-11 and shall include

- a) positive design pressure, where applicable;
- b) negative design pressure, where applicable;
- c) water penetration resistance test pressure; and
- d) the Canadian air infiltration and exfiltration level.

Notes:

- 1) *Although AAMA/WDMA/CSA 101/I.S.2/A440-11 Clause 4.4.3 states that the secondary designation is optional, this Supplement makes the secondary designator a mandatory requirement in Canada.*
- 2) *Performance rating labels may be non-permanent.*

The requirements of Clause 6.4.1, Product manufacturer are commonly met in a variety of ways, including:

- An etching or marking on the product frame, hardware or glass
- A label that is not intended for removal without destroying or defacing the label and commonly referred to as a "permanent label"

The requirements of Section 6.4.2, Performance rating are commonly met in a variety of ways, including:

- A "temporary" label that is intended for removal after final code inspection
- A "permanent" label that is not intended for removal, but is intended to remain on the product

To comply with the Building Code, products must be labeled according to both 6.4.1 and 6.4.2.

This document focuses on the requirements of Section 6.4.2, Performance rating which can be provided by the manufacturer either on a removable temporary label or a permanent label that is not intended for removal. It summarizes the Canadian fenestration industry recommended best practices for performance rating labels, and provides example labels to guide industry participants.

5 General Labeling Guidelines

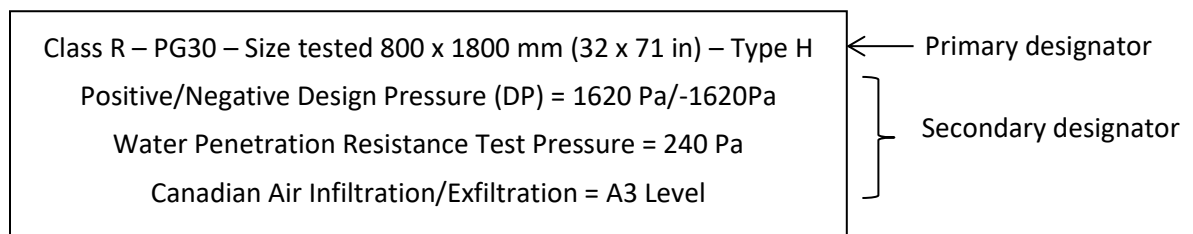
5.1 General Guidelines for Performance Rating Labels

The following guidelines are intended to ensure that all parties responsible for labeling fenestration products for Canadian code compliance provide the appropriate information in a consistent format that complies with both NAFS and the Canadian Supplement, can be easily recognized by code officials, and contains sufficient information for code officials or other inspecting entities to contact the responsible manufacturer in order to verify or validate the information on the label when necessary.

Guideline 1 is mandatory as it merely re-states requirements of the Canadian Supplement and NAFS-11. Guideline 2 is mandatory as the Building Code is specific about the versions of the standards to which conformance is required. The remaining guidelines are recommendations, and it is hoped that over time industry will adopt them. Many manufacturers have begun NAFS product labeling programs prior to this document being issued, and labels that comply with Guidelines 1 and 2 but lack features in guidelines 3 – 10 are no less valid for Canadian code compliance.

Guideline 1 (Mandatory). Performance rating labels shall include both primary and secondary designators, and shall follow NAFS-11 rules for the use of secondary designators

Canadian Supplement Clause 6.4.2 requires labels to display both the primary designator and the full secondary designator. An example of the primary and secondary designator format is shown below:



NAFS-11 Clause 4.4.3.1 has specific requirements for the secondary designator:

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. . . .

The secondary designator consists of up to four lines of text that indicate

- (a) positive design pressure (DP);
- (b) negative design pressure (DP);
- (c) water penetration resistance test pressure; and
- (d) Canadian air infiltration/exfiltration level.

...

Items (a) and (b) shall be permitted to be combined into a single line item that indicates design pressure (DP) +/-.

While NAFS-11 permits any of items (a) to (d) to be included or excluded from the secondary designator, the Canadian Supplement requires all four terms of the secondary designator to be used on Canadian performance rating labels.

Guideline 2 (Mandatory). Performance rating labels shall identify the standards products are to conform to by the Building Code

As the Building Code requires fenestration products within the scope of NAFS-11 to conform to both the 2011 version of NAFS and the 2017 version of the Canadian Supplement, performance rating labels must specifically identify these standards using their proper designations and year of issue:

AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17. The label should not substitute these designations with alternate terms such as "NAFS", "NAFS-11", "Supplement", or "Canadian Supplement" as these alternate terms are not used in the Building Code.

Guideline 3. Performance rating labels should state that products "conform to" NAFS- and the Canadian Supplement

The building code requires fenestration products "to conform" to both NAFS and the Canadian Supplement. Manufacturers are therefore encouraged to state that the product "conforms to" both standards using their proper designations: AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17.

Performance rating labels bearing the mark of a recognized certification agency typically omit the words "conform to" as the certifier's mark addresses conformance.

Guideline 4. Performance rating labels should include the manufacturer's identification by name or traceable certification number, product line/series information, and may at the manufacturer's discretion include operator type

There are several sound reasons for requiring this information to appear on the performance rating label:

- Reduces risk of mislabelling by the manufacturer
- Facilitates investigation/verification of performance claims
- Increases manufacturer's accountability for label contents and accuracy
- Identifies manufacturer when permanent marking is not immediately visible, as can be the case with fixed windows

The manufacturer's name may be that of the product fabricator or the name of the entity permitted to sell the product under a recognized private labeling program.

Guideline 5. The performance rating information should be enclosed within a single lined boundary border to separate and distinguish it from other ratings or labels on the fenestration product in order to make the labels more visible to code officials

The boundary border should enclose the information in items Guidelines 1 – 3 above. The information within the boundary border may be further subdivided with lines. When the Canadian performance rating information appears on a label that also shows conformance to other standards or other versions of NAFS, the manufacturer's name is permitted to appear outside the boundary border.

Guideline 6. The secondary designator should report pressure values in metric units (Pascals) and may also include pressure values in IP units

Design pressure and water penetration resistance test pressure values determined using the Canadian Supplement are reported in Pascals. The secondary designator needs to report these values in Pascals for Canadian code compliance. Performance rating labels may also report the pressure values in IP units in addition to the metric units for jurisdictions where IP values are recognized.

Guideline 7. Performance rating labels are encouraged to use the IP Performance Grade designations

While NAFS allows metric or IP Performance Grade (PG) ratings to be used, manufacturers are encouraged to use the IP Performance Grade ratings in the primary designator.

Guideline 8. Performance rating labels may use abbreviated primary designators as permitted in the United States

All the examples of primary designators in NAFS-11 use the long form of the designator in order to educate users of the standard about the intent of the label. It has been customary however for US certifiers to allow the use of abbreviated primary designators in which the words "Class" and "size tested" are omitted. Abbreviated primary designators shall be permitted, as long as each of the terms in the primary designator is in the correct order, as shown in the following examples

Original NAFS examples for a hung window	Permitted abbreviations
Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in) – H	R-PG30-800x1880 (32x71)-H
Class R – PG30 – Size tested 31.5 x 70.9 in	R-PG30-31.5x70.9 in
Class R – PG1440 (metric) – Size tested 800 x 1800 mm	R-PG30-800x1880
Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in) – Hung	R-PG30-800x1880 (32x71)-Hung
Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in) – Type H	R-PG30-800x1880 (32x71)-Type H

Guideline 9. Performance rating labels should include a "premature removal" caution

In new construction labels must remain on products until final inspection by a code official. In renovations homeowners often need to retain labels for purposes such as energy incentive programs or warranty claim purposes. Manufacturers are encouraged to add text similar to the following to non-permanent performance rating labels:

Remove only after final inspection – Retain label for your records

Guideline 10. Performance rating labels may be permanent or non-permanent

Canadian Supplement Clause 6.4.2 allows performance rating labels to be of a permanent or non-permanent type. Manufacturers who wish to display performance ratings on a permanent label must follow guidelines 1 and 2, and are encouraged to follow the remaining guidelines of this document.

In the US, the NAFS primary designator alone is sufficient to declare a product's performance rating and may be displayed on a permanent or non-permanent label. US-made products that display the primary designator on a permanent label must bear a second performance rating label complying with guidelines 1 and 2 of this document at a minimum, and are encouraged to follow the remaining guidelines as well. It is not permissible to combine a US permanent label with a separate label that contains the secondary designator alone. NAFS-11 permits the secondary designator to be used only together with, and immediately following the primary designator.

5.2 Example Individual Unit Labels

The following label examples illustrate the application of these guidelines. Note that NAFS-11 has examples of both shorter and longer versions of the primary and secondary designators.

1 Example labels for product rated to more than one standard

Competent Windows Builder Line 4000 Hung Window	[Other label content]	
Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17 R-PG30-800 x 1800 mm (32 x 71 in)-H DP: +1680 Pa / -1440 Pa Water Test Pressure: 260 Pa Canadian Air Infiltration/Exfiltration: A3	[Certification agency name and/or logo]	[Certification agency's manufacturer code, and product identification if applicable]
	AAMA/WDMA/CSA 101/I.S.2/A440-11	R-PG30-800 x 1800 mm (32 x 71 in)
	A440S1-17	DP: + 1680 Pa / -1440 Pa Water Resistance: 260 Pa
[Other standards/ratings]	A440S1-17	Air In/Ex A3
	[Other standards]	[Other ratings]

2 Example label where manufacturer's name or identity is indicated elsewhere on the performance rating label

Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17	R-PG30-800 x 1800 mm (32 x 71 in)-H DP: +1680 / -1440 Pa (+35 / -30 psf) Water Test Pressure: 260 Pa (5.25 psf) Canadian Air Infiltration/Exfiltration: A3
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3 Example label where conformity is addressed by the presence of a third party certification mark

AAMA/WDMA/CSA 101/I.S.2/A440-11 A440S1-17	R-PG30-800 x 1800 mm (32 x 71 in) DP: +1680 / -1440 Pa Water Test Pressure: 260 Pa Canadian Air Infiltration/Exfiltration: A3
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4 Example labels for individual unit products rated to NAFS-11 only

Competent Windows Builder Line 4000
 Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in) – Type H
 Positive Design Pressure (DP) = 1680 Pa (35 psf)
 Negative Design Pressure (DP) = 1440 Pa (30 psf)
 Water Penetration Resistance Test Pressure = 260 Pa (5.25 psf)
 Canadian Air Infiltration/Exfiltration = A3 Level

 Conforms to
 AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Competent Windows Builder Line 4000
Class R – PG30 – Size tested 31.5 x 70.9 in
 Positive Design Pressure (DP) = 1680 Pa
 Negative Design Pressure (DP) = 1440 Pa
 Water Penetration Resistance Test Pressure = 260 Pa
 Canadian Air Infiltration/Exfiltration = A3 Level

 Conforms to
 AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Competent Windows Builder Line 4000
 Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in) - Hung
 Design Pressure +1680 / -1440 Pa
 Water Test Pressure: 260 Pa
 Canadian Air Infiltration/Exfiltration: A3

 Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Competent Windows Builder Line 4000 Hung Window
 Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in)
 DP: +1680 / -1440 Pa (+35 / -30 psf)
 Water Test Pressure: 260 Pa (5.25 psf)
 Canadian Air Infiltration/Exfiltration: A3
 Conforms to
 AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Competent Windows Builder Line 4000
Class R – PG30 – Size tested 800 x 1800 mm - H
 Design Pressure: +1680 / -1440 Pa
 Water Test Pressure: 260 Pa
 Canadian Air Infiltration/Exfiltration: A3

 Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Competent Windows Builder Line 4000
R-PG30-800x1800(32x71)-H
 DP: +1680 / -1440 Pa (+35 / -30 psf)
 Water Test Pressure: 260 Pa (5.25 psf)
 Canadian Air Infiltration/Exfiltration: A3
Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17
 Class R – PG30 – Size tested 800 x 1800 mm (32 x 71 in) - Hung
 Design Pressure +1680 / -1440 Pa
 Water Test Pressure: 260 Pa
 Canadian Air Infiltration/Exfiltration: A3

Competent Windows Builder Line 4000
Hung Window

Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17
 R-PG30-800x1800(32x71)
 DP: +1680/-1440 Pa
 Water Test Pressure: 260 Pa (5.25 psf)
 Canadian Air Infiltration/Exfiltration: A3
Competent Windows Builder Line 4000

6 Labeling Guidelines for Products with Mullions

6.1 Application

These guidelines apply to products mullied together with the manufacturer’s involvement. NAFS-11 Clause 4.6.4 states:

4.6.4 Field mulling without manufacturer’s involvement

Windows and doors combined into assemblies consisting of two or more individual units in the field without the manufacturer’s involvement, testing, or evidence of compliance are not covered in this Standard/Specification. Manufacturer’s involvement includes published installation procedures and manufactured parts, such as mullion stiffeners, brackets, and fasteners.

6.2 Example Labels for Products with Mullions

This Clause provides guidance on the number and type of labels permitted to be used with Composite Unit, Combination Assembly and Mullion Assembly fenestration products, and provides examples of labels for the following products.

Tested Product	Label Type
Composite Unit product tested to NAFS	Composite Unit
Combination Assembly product tested to NAFS	Combination Assembly
Combination or reinforcing mullion(s) qualified using AAMA 450	Mullion Assembly

6.2.1 Labeling of Composite Unit Products

Composite Unit products must be labeled with overall performance ratings that are based on testing of complete units with integral mullions, not on individual product tests only with the mullions rated separately, as may be done for Combination Assemblies.

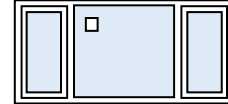
Testing Composite Units with integral mullions qualifies mullions in similar units or assemblies with equal or smaller spans, and equal or smaller tributary widths, and horizontal mullions with equal or smaller supported mass. Each unique intermediate framing member in a composite unit shall be tested in the longest dimension for which compliance is desired. Intermediate framing members which are longer or which are not tested shall not comply. Framing members shall be of identical cross-section to those tested to claim compliance.

Any use of engineering methods must be performed by a registered professional engineer and documented in accordance with the applicable referenced standards.

Example: Composite Unit, Overall Product Performance Label

The example label is for a Casement-Fixed-Casement Composite Unit with two vertical integral mullions. The overall product performance rating is based on testing at a size greater than or equal to the labeled size.

Competent Windows Builder Line 4000
Class R – PG30 – Size tested 2750 x 1525 mm (108 x 60 in)
Positive Design Pressure (DP) = 1680 Pa (35 psf)
Negative Design Pressure (DP) = 1440 Pa (30 psf)
Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)
Canadian Air Infiltration/Exfiltration = A2 Level
Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17



6.2.2 Labeling of Combination Assembly Products

The performance of a Combination Assembly product is determined by testing it as a Combination Assembly or by testing the individual units and rating the mullions according to AAMA 450. (Annex A)

Combination Assembly products can be labeled with performance ratings in one of four ways. The choice of labeling method is at the discretion of the manufacturer or certification entity³.

- **Label Option 1:** Using a single overall performance rating label, in the same manner as a Composite Unit.
- **Label Option 2:** Labeling each individual Unit and Mullion Assembly separately. In this case, the Combination Assembly would have multiple individual labels on it, one for each unique Unit and each unique Mullion Assembly.
- **Label Option 3:** Using a single label to display the performance rating for each unique Unit and each unique Mullion Assembly. This label may optionally show the Overall Rating of the Combination Assembly as the first rating on the label.
- **Label Option 4:** Labeling each individual Unit separately with two ratings: one for the Unit, and the other for the Overall Rating.

³ Four options for labeling the performance of Combination Assembly products are provided to accommodate the needs of large and small manufacturers and existing certification labeling practices.

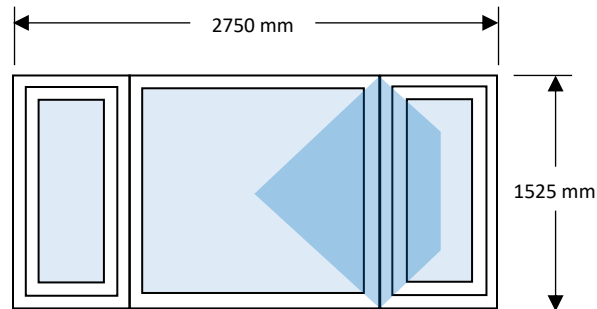
6.2.2.1 Overall Ratings for Combination Assembly Products

The Overall Rating for Building Code Compliance of a Combination Assembly is determined by the lowest Performance Class, Performance Grade, Water Test Pressure, and Air Infiltration/Exfiltration Level of the individual components within the Combination Assembly. When the performance of a Combination Assembly is reported with individual rating labels for each component, the lowest Performance Class, Performance Grade, Water Test Pressure and greatest Air Infiltration/Exfiltration Level of the individual components will be evaluated to determine compliance with the Building Code.

6.2.2.1.1 Combination Assembly Example Window

The example labels that follow are for a Casement-Fixed-Casement Combination Assembly with two vertical mullions, 2750 mm wide x 1525 mm high (~108 x ~60 in). The tributary area of a mullion is the surface area of the window subjected to wind pressure that the mullion supports.

Note: in the illustration below the tributary area of one mullion is shown with dark shading.



The sizes and ratings of the individual units and Mullion Assemblies are shown in Table 1. The lowest rating in each category is underlined and shaded grey. The Overall Rating is therefore: Class R, PG30, 220 Pa Water Test Pressure, and A2 Air Infiltration/Exfiltration Level.

Table 1 - Performance ratings and sizes of individual units for Combination Assembly label examples

Component	Size Tested	Performance Class	Performance Grade	Positive Design Pressure	Negative Design Pressure	Water Test Pressure	Air Infiltration/Exfiltration Level	Rating Document
Casement window	610 mm wide x 1600 mm high	R	PG30	1680 Pa (35 psf)	1440 Pa (30 psf)	290 Pa	A3	NAFS test report
Fixed window	1830 mm wide x 1830 mm high	LC	PG45	2400 Pa (50 psf)	2160 Pa (45 psf)	360 Pa	Fixed	NAFS test report
Mullion Assembly	1830 mm span/1.25 m ²	LC	PG30	2160 Pa (45 psf)	2160 Pa (45 psf)	220 Pa	A2	NAFS test report or AAMA 450 report

6.2.2.2 Combination Assembly Label Examples

The four labeling options are illustrated in the following examples.

Example: Label Option 1—Single Label Reporting Overall Rating Performance

A single label reports the Overall Rating performance of the Combination Assembly. The Overall Rating is the lowest Performance Class, Performance Grade, Water Test Pressure, and Air Infiltration/Exfiltration Level of the individual components within the Combination Assembly. Alternatively, the Overall Rating may be determined by testing the Combination Assembly.

Competent Windows Builder Line 4000

Class R – PG30 – Size Tested 2750 x 1525 mm (108 x 60 in)

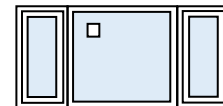
Positive Design Pressure (DP) = 1680 Pa (35 psf)

Negative Design Pressure (DP) = 1440 Pa (30 psf)

Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)

Canadian Air Infiltration/Exfiltration = A2

Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17



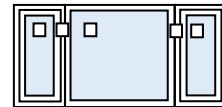
Example: Label Option 2—Separate Product Performance Labels for Individual Units and Mullion Assemblies

Each Individual Unit and Mullion Assembly is individually labeled. The building official would need to study the individual labels to determine the Overall Rating for code compliance by looking for the lowest Performance Class, Performance Grade, Water Test Pressure, and Air Infiltration/Exfiltration Level of the individual components within the Combination Assembly.

Note: The Mullion Assembly MA primary designator shows both inch-pound and SI metric units. Labels may show either inch-pound or SI metric ratings at the manufacturer’s discretion.

Mullion Assembly Label⁴

Competent Windows Builder Line 4000
Class LC – PG30 – MA: Size tested 1830 mm span/1.3 m² (Size tested 72 in. span/13.5 ft²)
Positive Design Pressure (DP) = 2160 Pa (45 psf)
Negative Design Pressure (DP) = 2160 Pa (45 psf)
Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)
Canadian Air Infiltration/Exfiltration = A2
Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17



Individual Unit Label: Casement Window

Competent Windows Builder Line 4000
Class R – PG30 – 610 x 1600 mm (24 x 63 in) – Type C
Positive Design Pressure (DP) = 1680 Pa (35 psf)
Negative Design Pressure (DP) = 1440 Pa (30 psf)
Water Penetration Resistance Test Pressure = 290 Pa (6.00 psf)
Canadian Air Infiltration/Exfiltration = A3
Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

Individual Unit Label: Fixed Window

Competent Windows Builder Line 4000
Class LC – PG45 –1830 x 1830 mm (72 x 72 in) – Type FW
Positive Design Pressure (DP) = 2400 Pa (50 psf)
Negative Design Pressure (DP) = 2160 Pa (45 psf)
Water Penetration Resistance Test Pressure = 360 Pa (7.50 psf)
Canadian Air Infiltration/Exfiltration = Fixed
Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17

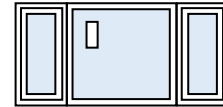
⁴ For information about reporting Mullion Assembly performance, see Annex A of this document.

Example: Label Option 3—Single Label Reporting Individual Component Ratings

A single label reports the performance of each unique Individual Unit and each unique Mullion Assembly. The Overall Rating is the lowest Performance Class, Performance Grade, Water Test Pressure, and Air Infiltration/Exfiltration Level of the individual components within the Combination Assembly. Use of the Overall Rating is optional.

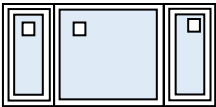
Note: The Mullion Assembly MA primary designator shows both inch-pound and SI metric units. Labels may show either inch-pound or SI metric ratings at the manufacturer’s discretion.

<p>Competent Windows Builder Line 4000</p> <p>Casement Picture Casement</p> <p>Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17</p>
<p>OVERALL RATING</p> <p>Class R – PG30 – Size Tested 2750 x 1525 mm (108 x 60 in)</p> <p>Positive Design Pressure (DP) = 1680 Pa (35 psf)</p> <p>Negative Design Pressure (DP) = 1440 Pa (30 psf)</p> <p>Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)</p> <p>Canadian Air Infiltration/Exfiltration = A2</p>
<p>Class R – PG30 – 610 x 1600 mm (24 x 63 in) – Type C</p> <p>Positive Design Pressure (DP) = 1680 Pa (35 psf)</p> <p>Negative Design Pressure (DP) = 1440 Pa (30 psf)</p> <p>Water Penetration Resistance Test Pressure = 290 Pa (6.00 psf)</p> <p>Canadian Air Infiltration/Exfiltration = A3</p>
<p>Class LC – PG45 –1830 x 1830 mm (72 x 72 in) – Type FW</p> <p>Positive Design Pressure (DP) = 2400 Pa (50 psf)</p> <p>Negative Design Pressure (DP) = 2160 Pa (45 psf)</p> <p>Water Penetration Resistance Test Pressure = 360 Pa (7.50 psf)</p> <p>Canadian Air Infiltration/Exfiltration = Fixed</p>
<p>Class LC – PG30 – MA: Size tested 1830 mm span/1.3 m² (Size tested 72 in. span/13.5 ft²)</p> <p>Positive Design Pressure (DP) = 2160 Pa (45 psf)</p> <p>Negative Design Pressure (DP) = 2160 Pa (45 psf)</p> <p>Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)</p> <p>Canadian Air Infiltration/Exfiltration = A2</p>



Example: Label Option 4—Separate Product Performance Labels that Include Both Individual Unit and Overall Product Performance

Each Unit has an individual label that reports both its individual product rating as well as the Overall Rating. The Overall Rating is the lowest Performance Class, Performance Grade, Water Test Pressure, and Air Infiltration/Exfiltration Level of the Individual Unit or Mullion Assembly within the Combination Assembly.

<p>Competent Windows Builder Line 4000</p> <p>Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17</p>	
<p>Class R – PG30 – 610 x 1600 mm (24 x 63 in) – Type C</p> <p>Positive Design Pressure (DP) = 1680 Pa (35 psf)</p> <p>Negative Design Pressure (DP) = 1440 Pa (30 psf)</p> <p>Water Penetration Resistance Test Pressure = 290 Pa (6.00 psf)</p> <p>Canadian Air Infiltration/Exfiltration = A3</p>	
<p>OVERALL RATING</p> <p>Class R – PG30 – Size Tested 2750 x 1525 mm (108 x 60 in)</p> <p>Positive Design Pressure (DP) = 1680 Pa (35 psf)</p> <p>Negative Design Pressure (DP) = 1440 Pa (30 psf)</p> <p>Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)</p> <p>Canadian Air Infiltration/Exfiltration = A2</p>	

<p>Competent Windows Builder Line 4000</p> <p>Conforms to AAMA/WDMA/CSA 101/I.S.2/A440-11 and A440S1-17</p>
<p>Class LC – PG45 – 1830 x 1830 mm (72 x 72 in) – Type FW</p> <p>Positive Design Pressure (DP) = 2400 Pa (50 psf)</p> <p>Negative Design Pressure (DP) = 2160 Pa (45 psf)</p> <p>Water Penetration Resistance Test Pressure = 360 Pa (7.50 psf)</p> <p>Canadian Air Infiltration/Exfiltration = Fixed</p>
<p>OVERALL RATING</p> <p>Class R – PG30 – Size Tested 2750 x 1525 mm (108 x 60 in)</p> <p>Positive Design Pressure (DP) = 1680 Pa (35 psf)</p> <p>Negative Design Pressure (DP) = 1440 Pa (30 psf)</p> <p>Water Penetration Resistance Test Pressure = 220 Pa (4.50 psf)</p> <p>Canadian Air Infiltration/Exfiltration = A2</p>

Annex A: Mullion Assembly Product Ratings

The NAFS-11 standard allows AAMA 450 to be used to determine Mullion Assembly ratings for both composite unit and combination assembly products. Mullion Assemblies for combination assembly products may also be determined by testing the individual products assembled together as a complete unit, or by testing the individual units separately with mullions qualified using AAMA 450. When a combination assembly is tested as a complete unit, the overall product rating applies to each individual unit and Mullion Assembly it is composed of, and the ratings are valid for the sizes tested.

AAMA 450 ratings are documented in detailed engineering reports supported by air and water lab testing to qualify a Mullion Assembly's structural-air-water performance at various spans and tributary areas. The reports provide the basis for labeling Mullion Assembly performance. According to AAMA 450, the reports must be prepared by registered professional engineers.

While AAMA 450 requires the air and water tightness of Mullion Assemblies to be determined by physical testing, it allows the structural performance to be determined in one of three different ways:

Option 1 – by physical testing of the Mullion Assembly in a Combination Assembly

Option 2 – by a simple beam test of a mullion

Option 3 – by structural calculations

AAMA Technical Interpretation TI-08-01 clarifies that AAMA 450 can be used to rate mullions used to assemble bay, bow, and other 3-dimensional projecting units.

A.1 Application of AAMA 450 to Fenestration Products Sold in Canada

The application of AAMA 450 in Canada must take account of the need to both test and report Mullion Assembly performance attributes in a way that allows them to be rated with Canadian air infiltration/exfiltration levels⁵, positive and negative design pressures, and water penetration resistance test pressure, using gateway or Canadian optional Performance Grades.

Mullions intended for use with R, LC, CW and AW products must also meet the appropriate Class-specific attributes in NAFS (See Table 2 – Class-specific mullion attributes, below). These attributes must be part of the test record and must be documented in the AAMA 450 report in a way that ensures Class-specific properties are not overlooked when a manufacturer wishes to qualify a mullion type for use with products of more than one Performance Class. Combination mullions and reinforcing mullions rated according to option 3 of AAMA 450 shall not exceed a deflection of L/175 when the assembly is evaluated at design pressure (DP), even when used with Class R or LC products.

In manufacturing environments where Mullion Assemblies are labeled individually before products are assembled the NAFS performance rating labels must contain information related to both the Primary Designator attributes (Performance Class, Performance Grade, “size tested” — span and tributary area)

⁵ In Canada, NAFS air leakage is not a simple pass/fail test as in the US. There are two air/infiltration/exfiltration levels for operable products (A2 and A3), and a single level for all classes of fixed glazing (Fixed). The tested mullion air infiltration/exfiltration therefore needs to be recorded and labeled.

as well as Secondary Designator attributes (positive and negative design pressure, water test pressure, Canadian air infiltration/exfiltration level).

Table 2 – Class-specific mullion attributes

Attribute	NAFS-11 Reference	Performance Class			
		R	LC	CW	AW
Test pressure for air infiltration/exfiltration testing	Clause 5.2.2 and 7.2.2	75 Pa (1.6 psf)			300 Pa (6.2 psf)
Minimum water penetration resistance test pressure	Clause 5.3.3.2 or 9.3.3.1	15% DP			20% DP
Water penetration resistance test method	Clause 5.3.3.2 or 9.3.3.1	ASTM E 547			ASTM E 547 and E 331
Tested uniform load deflection at design pressure ⁶	Clause 5.3.3 and 7.3.3	Report Only*		L/175	
Tested permanent deformation at structural test pressure ⁷	Clause 5.3.4.3	0.4%		0.3%	0.2%
* Combination mullions and reinforcing mullions rated according to option 3 of AAMA 450 shall not exceed a deflection of L/175 when the assembly is evaluated at design pressure (DP), even when used with Class R or LC products.					

A.2 Reporting Mullion Assembly Performance in Canada

With respect to the performance of individual Mullion Assemblies, AAMA 450 reports must identify:

- The Performance Classes and Grades for the rated mullions at the spans and tributary areas to which they apply⁸
- The tested or calculated Positive and Negative Design Pressures for the mullions at the spans and tributary areas to which they apply
- The Water Penetration Resistance Test Pressure in Pascals at the spans for which the mullions are qualified
- The Canadian Air Infiltration/Exfiltration Level at the spans for which the mullions are qualified

⁶ If mullion is rated using AAMA 450 Option 1 or Option 2.

⁷ If mullion is rated using AAMA 450 Option 1 or Option 2.

⁸ AAMA 450 requires reporting of tributary area widths only. For NAFS-11 labeling purposes, AAMA 450 reports should also include tributary areas.

On the basis of these properties individual Mullion Assembly ratings must be reported using both primary and secondary designators:

Primary Designator	Performance Class — Performance Grade — MA span/tributary area
Secondary Designator	Positive/Negative Design Pressure in Pascals Water Penetration Resistance Test Pressure in Pascals Canadian Air Infiltration/Exfiltration Level

Annex B: NAFS Mullion Types Illustrated

The NAFS-11 standard illustrates typical integral, combination, and reinforcing mullions in Clause 4.6 Figure 4.9. These illustrations are reproduced here to assist users of this document who may not have access to the standard.

