**DATE OF INQUIRY:** April, 1985

**PERTINENT SPECIFICATION:** ANSI/AAMA/NWWDA 101/I.S.2-97, "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors"

**SECTION(S) IN QUESTION:** 2.2.9

**INTERPRETATION REQUESTED:** For windows and doors containing ventilators or sash, manufacturers are not permitted to certify and label products which exceeded the width and height of the tested unit for both the frame and ventilator or sash. The "maximum size tested" rule should be evaluated as it applies to fixed windows.

**INTERPRETATION MADE:** ANSI/AAMA/NWWDA 101/I.S.2-97 stipulates performance criteria for fixed type windows in the five grades: Residential, Light Commercial, Commercial, Heavy Commercial and Architectural. Fixed windows are tested for compliance to specified uniform load structural, air infiltration and water resistance requirements.

The minimum test sizes specified are:

| | |
|---|---|
| Residential Grade | 4'-0" x 4'-0" |
| Light Commercial | 4'-6" x 4'-6" |
| Commercial Grade | 5'-0" x 5'-0" |
| Heavy Commercial | 6'-0" x 6'-0" |
| Architectural | 5'-0" x 8'-0" |

A fixed window in a size and performance class other than what was tested can be certified provided:

1. The design is identical in all respects, e.g.: extrusions, glazing system, joinery, fasteners, etc.

2. The maximum Uniform Load Distribution (ULD) of any sides is equal to the uniform load carried by the side divided by the length of the side.

3. The ULD of any member must not exceed the ULD of the corresponding member of the tested fixed window.

4. The uniform load distribution on each member shall be calculated in accordance to "Section 2 – Engineering Design Rules" of the AAMA 103.3-89 Procedural Guide.

5. Air infiltration and water resistance tests must be performed if the test pressures are higher than that for the originally tested unit.

<u>Example #1: Window Tested:</u>

|  | | |
|---|---|---|
| Grade | | Residential |
| Performance Glass | | 15 |
| Size | | 4'-0" x 4'-0" |

<u>Calculate the uniform load distribution:</u>
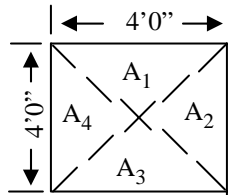


$$A_1 = A_2 = A_3 = A_4 = \frac{1}{2}(4)(2) = 4 \text{ ft}^2$$

$$ULD = A \times W \times \frac{1}{L}$$

Where:
ULD = Uniform Load Distribution, lb. per ft.
A = Area of uniform load carried by member being analyzed (ft²)
W = Structural Test Pressure (psf)
L = Length of member (ft)
ULD = (4) (22.5) (1/4) = 22.5 lb. per ft

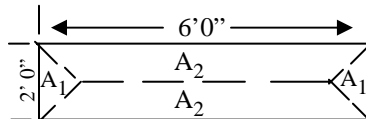A.   Based on the above tested unit, will a 3' 0" x 5'0" fixed unit meet R15?
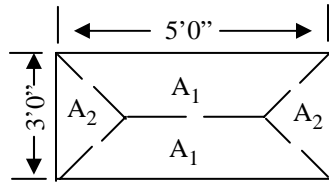


$$3' \text{ Side} - ULD = \left[\frac{1}{2}\right] (3) \left[1\frac{1}{2}\right] (22.5) \times \frac{1}{3} = 16.9 \text{ lb. per ft.}$$

$$5' \text{ Side} - ULD = \left[1\frac{1}{2}\right] \left[3\frac{1}{2}\right] (22.5) \times \frac{1}{5} = 23.6 \text{ lb. per ft. (Exceeds the 22.5 lb. per ft.}$$
of the tested unit)

Therefore, the 3'0" x 5'0" unit cannot be labeled unless it is tested.

B.   Based on the above tested unit, will a 2'0" x 6'0" fixed unit meet R15?



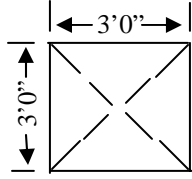$$2' \text{ Side} - ULD = \left[\frac{1}{2}\right] (2) (1) (22.5) \times \frac{1}{2} = 11.3 \text{ lb. per ft.}$$

$$6' \text{ Side} - ULD = (5) (1) (22.5) \times \frac{1}{6} = 18.8 \text{ lb. per ft.}$$

Therefore the 2'0" x 6'0" unit may be labeled as meeting class R15 based on the 4'0" x 4'0" unit tested to class R15.

C.  Based on the above tested unit, will a 3'0" x 3'0" fixed unit meet R20?

$$\text{ULD} = \left[\frac{1}{2}\right] \; (3) \; \left[1\frac{1}{2}\right] \; (30) \; x \left[\frac{1}{3}\right] = 22.5 \text{ lb. per ft.}$$

(22.5 lb. per ft. equals 22.5 lb. per ft. of the tested unit)

Therefore, the 3'0" x 3'0" unit can be labeled as meeting the optional class R20 based on the 4'0" x 4'0" unit tested to class R15.

**REVIEWED/ APPROVED BY:**

| COMMITTEE | COMMENTS / ACTION | STATUS |
|---|---|---|
| **JDMG** | | |
| **WDMA** | Reviewed by NWWDA Standards Maintenance Committee | Approved – 10/97 |
| **AAMA** | Approved by AAMA Technical Policy Planning Committee as AAMA Technical Interpretation #33. | Approved – 11/85 Ed. Revised – 2/94, 1/98 |