

AAMA/NSA 2100-19

**Specifications for
Sunrooms**

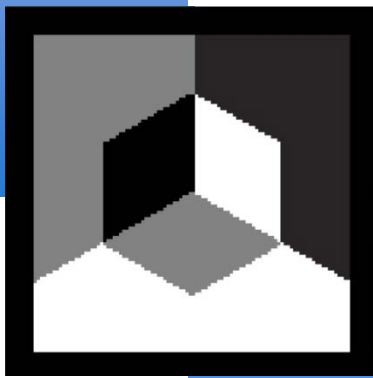




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AAMA / NSA 2100-19



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PREFACE

This specification establishes minimum performance requirements of residential sunrooms (including sunspaces, conservatories, patio enclosures, patio covers, porch enclosures and other related products or structures) and the fenestration products used therein as built from aluminum, fiber reinforced thermosets, vinyl, wood, and/or other alternate materials constructed as a sunroom or extra space on conventionally built structures. The specification consists of eight sections.

SECTION 1 covers scope and administrative details of the application of the specifications.

SECTION 2 contains referenced standards throughout these specifications.

SECTION 3 contains definitions and terminology for the interpretation of various provisions of these specifications.

SECTION 4 defines uses, occupancies and limitations of the types of constructions covered by the specifications, and also includes references to materials typically used in sunroom products. Sunroom categories are outlined by feature and performance requirements.

SECTION 5 defines the minimum performance requirements for sunroom fenestration products.

SECTION 6 contains minimum performance requirements and design criteria for sunrooms.

SECTION 7 contains thermal performance criteria for sunrooms and sunroom fenestration products.

SECTION 8 contains general requirements for sunrooms.

***NOTE 1:** The specifications included herein will refer to other provisions within model building codes, national specifications and other related AAMA and NSA standards, and specifications. No express approval or implied acceptance by any other agency or code entity is meant.*

FOREWORD

Sunrooms are utilized to add recreational space to residential dwelling units. Prior to the publication of this document, there were few specific detailed definitions and requirements for sunrooms, solariums, and screened porches or patio structures in the model building codes.

The lack of definitive specifications and code requirements that specifically address sunrooms has created confusion in the construction community as building officials and industry members alike struggle to apply unrelated code definitions and requirements to sunrooms. The AAMA/NSA 2100 specifications provide definitions and minimum performance criteria for sunrooms and their components. The specifications also include minimum design criteria for various structural loads and other code requirements.

The development of these specifications for sunrooms is an ongoing process. As the sunroom industry develops new product solutions to address consumer demand and code requirements, the specifications will be updated to reflect the consensus between industry and building code requirements.

1.0 SCOPE

1.1 TITLE

These specifications shall be known as “Specifications for Sunrooms,” and are hereinafter referred to as “the specifications.”

1.2 SCOPE

The provisions of these specifications shall apply to the design and construction of residential sunrooms herein defined and described, except as such matters are provided for in applicable ordinances or statutes.

1.3 APPLICATION OF REFERENCES

All references to chapter or section numbers of these specifications shall be construed to refer to such chapter or section unless specifically provided for elsewhere in the specifications.

1.4 SUNROOM

The term sunroom as used in these specifications refers to sunspaces, conservatories, patio enclosures, patio covers, porch enclosures and other related products or structures.

1.5 APPLICABILITY

1.5.1 General

The specifications shall apply to all matters affecting sunrooms deemed to comply with the specifications defined herein. The construction, addition, alteration or repair of such sunrooms shall comply with these specifications by section as specified.

1.5.2 Matters Not Addressed

Any requirements essential to the safety of sunrooms that are not specifically addressed in these specifications or applicable codes and standards adopted in the jurisdiction shall be determined by the building official. The building official shall determine the provisions for permitting approvals, professional services, occupancy, violations and appeals as well as other requirements not expressly included herein. Procedures for these activities shall be set by local code adoption, ordinance or at the discretion of the building official.

2.0 REFERENCED DOCUMENTS

2.1 References to the standards listed below shall be to the edition indicated. Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

2.2 American Architectural Manufacturers Association (AAMA)

AAMA 2502-07, Comparative Analysis Procedure for Window and Door Products

AAMA AG-13, AAMA Glossary

AAMA/WDMA/CSA 101/IS.2/A440-17, North American Fenestration Standard/Specification for Windows, Doors, and Skylights

2.3 American Society of Civil Engineers (ASCE)

ASCE/SEI 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures

2.4 ASTM International (ASTM)

ASTM C177-13, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

ASTM C518-17, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

ASTM E72-15, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

2.5 International Code Council (ICC)

2018 International Building Code (IBC)

2018 International Energy Conservation Code (IECC)

2018 International Residential Code (IRC)

2.8 National Fenestration Rating Council (NFRC)

ANSI/NFRC 100-2017, Procedure for Determining Fenestration Product U-Factors

ANSI/NFRC 200-2017, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

2.9 National Fire Protection Association (NFPA)

NFPA 70-2017, National Electrical Code

3.0 GENERAL DEFINITIONS

3.1 The following words and terms shall, for the purposes of these specifications, have the meanings described below unless otherwise expressly stated. The words have the benefit of interchangeability including plurality, gender and tense. Terms that are not defined here but are defined in applicable codes shall use those definitions as interpreted by the local building official. Please refer to the AAMA Glossary (AG-11) for all definitions except for those appearing below (which apply only to AAMA/ NSA 2100). Terms that are not defined here or in applicable codes or ordinances shall have the normally accepted meaning as implied and defined by the context.

3.2 GENERAL DEFINITIONS

3.2.1 ADDITION, SUNROOM: The construction of a sunroom that is attached to an existing structure.

3.2.2 AIR INFILTRATION: The amount of air that passes between a window sash and frame, a door panel and frame, or the glazing system of fixed windows.

3.2.3 ALTERATION: The modification of the existing structure to accommodate the addition.

3.2.4 BASIC WIND SPEED: A factor used to calculate structural pressures caused by wind acting on a surface or structure, expressed in miles per hour (mph) or kilometers per hour (kph), and based on wind speed maps included in building codes or other related standards.

3.2.5 CONDITIONED SPACE: An area or room within a building being heated or cooled, containing un-insulated ducts, or with a fixed opening directly into an adjacent conditioned space.

3.2.6 COVERING: A surface that provides protection or security by its position over a space, including but not necessarily limited to roofs, roof systems, glazed surfaces, screened panels or other similar assemblies.

3.2.7 DESIGN PRESSURE (DP): A rating that identifies the load, induced by wind and/or static snow, that a product is rated to withstand in its end-up application. Loads induced by static snow are applicable only to unit skylights, roof windows, and TDDs. (Not to be confused with Performance Grade (PG) or Structural Test Pressure (STP)).

3.2.8 FENESTRATION: Openings in the building envelope, such as windows, doors, roof windows, TDDs and unit skylights, designed to permit the passage of air, light, or people.

3.2.9 FENESTRATION PRODUCT: An assembly designed to be installed in a fenestration opening to permit or control the passage of air, water, light, and/or people.

3.2.10 GLAZING, SUNROOM: Translucent, transparent, or opaque material, generally composed of plastic or glass that fills the prepared opening of a fenestration product.

3.2.11 OPAQUE: Preventing light from traveling through and therefore not transparent or translucent.

- 3.2.12 OPENING:** A breach or aperture in a wall or roof surface that is intended to accept a fenestration product or be left open.
- 3.2.13 PATIO COVER:** A one story structure not exceeding 3657 mm (12 ft) in height. Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 2032 mm (6 ft. 8 in) of each wall, measured from the floor.
- 3.2.14 PATIO ENCLOSURE:** A sunroom installed over an exterior surface such as a deck or patio slab.
- 3.2.15 PORCH ENCLOSURE:** A sunroom installed as part of a porch.
- 3.2.16 ROOF, SUNROOM:** The cover over a sunroom structure typically made of solid panel materials, glazed surfaces, screening or other materials and assemblies.
- 3.2.17 SCREEN:** A product used with a window, door, or unit skylight, consisting of mesh wire or plastic material used to keep out insects and not for the purpose of providing security or for the retention of objects or persons from the interior.
- 3.2.18 STRUCTURAL TEST PRESSURE (STP):** The pressure differential applied to a window, door system, TDD or unit skylight. (Not to be confused with design pressure (DP) or Performance Grade (PG)).
- 3.2.19 SUNROOM:** A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls and roof.
- 3.2.20 THERMAL ISOLATION:** Physical and space conditioning separation from conditioned space(s) consisting of existing or new walls, doors and/or windows, where the conditioned space(s) shall be controlled as separate zones for heating and cooling or conditioned by separate equipment.
- 3.2.21 TRANSLUCENT:** A material that permits the passage of light.
- 3.2.22 TRANSPARENT:** A material that permits the passage of light with minimal distortion or scattering, so that objects on the opposite side from the viewer may be clearly seen.
- 3.2.23 UNIT SKYLIGHT:** A complete factory assembled glass- or plastic-glazed fenestration unit consisting of not more than one panel of glass or plastic installed in a sloped or horizontal orientation that allows for natural daylighting, and that is typically fixed (non-operable) or venting (operating).
- 3.2.24 VENTILATION:** The process of supplying and removing air by natural or mechanical means to and from any space.
- 3.2.25 WATER PENETRATION RESISTANCE:** A measurement of the resistance of a fenestration product to the passage of water.
- 3.2.26 WATER PENETRATION RESISTANCE TEST PRESSURE:** The pressure differential applied across a test specimen to determine the water penetration resistance rating.

4.0 SUNROOM CATEGORIES

4.1 The following categories are used to specify differing criteria for sunrooms based on their intended use. Performance specifications vary by sunroom category with stated minimum requirements. The room definitions are intended to provide required features for that classification of sunroom. Additional or optional features added to enhance the performance of the sunroom product are not within the scope of this standard.

4.1.1 Category I

A Thermally Isolated Sunroom with walls that are either open or enclosed with insect screening or 0.5 mm (20 mil) maximum thickness plastic film. The sunroom shall meet the structural requirements as outlined in Section 6.0. The space is defined as a non-habitable, non-conditioned sunroom.

4.1.2 Category II

A Thermally Isolated Sunroom, with enclosed walls, where the openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom shall meet the structural requirements as outlined in Sections 5.0 and 6.0. The space is defined as a non-habitable, non-conditioned sunroom.

4.1.3 Category III

A Thermally Isolated Sunroom, with enclosed walls, where the openings are permitted to be enclosed with translucent or transparent plastic or glass, and the sunroom fenestration complies with additional requirements for air infiltration resistance, and water penetration resistance, as outlined in Sections 5.0 and 6.0. The sunroom shall meet the structural requirements as outlined in Sections 5.0 and 6.0. The space is defined as a non-habitable, non-conditioned sunroom.

4.1.4 Category IV

A Thermally Isolated Sunroom, with enclosed walls, designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom fenestration shall meet the requirements for air infiltration resistance, water penetration resistance, and thermal performance as outlined in Section 7.0., The sunroom shall meet the structural requirements as outlined in Sections 5.0 and 6.0. The space is defined as a non-habitable, conditioned sunroom.

4.1.5 Category V

A Sunroom, with enclosed walls, designed to be heated and/or cooled and open to the main structure. The sunroom fenestration shall meet the requirements for air infiltration resistance, water penetration resistance, and thermal performance as outlined in Section 7.0. The sunroom shall meet the structural requirements as outlined in Sections 5.0 and 6.0. The space is defined as a habitable, conditioned sunroom.

5.0 FENESTRATION PRODUCTS PERFORMANCE SPECIFICATIONS

5.1 SCOPE

Requirements for sunroom fenestration products shall include minimums as established by these specifications. Compliance with the applicable specifications shall be determined as outlined herein.

5.2 STRUCTURAL

5.2.1 Structural Design Pressure

Vertical fenestration products in sunrooms shall be designed in accordance with local building codes as applicable.

Categories II through V shall be subject to minimum structural requirements. The basic wind speed in miles per hour (mph) or kilometers per hour (kph), as determined by the local or regional building official, shall be the basis for calculating applicable design pressure requirements. Sunroom fenestration products shall be rated in pounds per square foot (psf) or Pascals (Pa) positive and negative at the appropriate test pressures.

5.2.2 Non-standard Sizes

Calculations using interpolation or rational analysis to establish performance values of non-tested sizes and/or configurations shall be based on testing completed in accordance with these specifications and analyzed with accepted engineering methods (see AAMA 2502).

5.2.3 Design Pressure Ratings

Sunroom fenestration products in Categories II, III, IV and V shall be rated at a minimum positive and negative design pressure as outlined in Table 5-1 when tested in accordance with ASTM E330.

5.2.4 Minimum Design Pressures

Minimum design pressures for sunroom fenestration products shall be determined in accordance with Table 5-1 below.

Fenestration Product	Sunroom Category				
	I	II	III	IV	V
Minimum Design Pressure Vertical Glazing	N/A	960 Pa (20 psf)	960 Pa (20 psf)	960 Pa (20 psf)	960 Pa (20 psf)
Minimum Design Pressure Unit Skylights	N/A	1440 Pa (30 psf)	1440 Pa (30 psf)	1440 Pa (30 psf)	1440 Pa (30 psf)

Table 5-1
Minimum Design Pressures
(Source: AAMA/WDMA/CSA 101/I.S.2/A440)

6.0 STRUCTURAL REQUIREMENTS AND TESTING

6.1 SCOPE

Structural requirements for sunrooms shall include minimums as established by local building codes as applicable. Structural performance shall be determined as outlined in this section.

6.2 LOADS ON SUNROOM STRUCTURES

6.2.1 Wind Loads

Basic wind speed in miles per hour (mph) or kilometer per hour (kph) shall be determined by local building codes as applicable. Sunrooms, including exposed structures, components, cladding and roof covering, shall be designed to resist the wind loads established in accordance with local building codes as applicable. Wind pressures for the design of Category I sunrooms shall be determined by local building codes as applicable.

Component and Cladding (C&C) pressures shall be used for the design of elements that do not qualify as Main Wind Force Resisting Systems (MWFRS). Examples of components and cladding for vertical wind pressures include roof panels, purlins and connections attaching a roof element to supports. Examples of components and cladding for horizontal wind pressures include enclosure wall panels, mullions, doors, windows and their connections. MWFRS pressures shall be used for the design of elements assigned to provide support and stability for the overall sunroom. Examples for the MWFRS for vertical wind pressures include columns, headers, structural fascias, ledgers and concrete footings. Examples of MWFRS for horizontal wind pressures include the roof as a horizontal diaphragm, shear walls, wall bracing and anchorage to foundations.

6.2.2 Dead Loads

The roof dead load shall be a minimum of 10 kg/m² (2.0 lbf/ft²) or the actual material weight, whichever is greater.

6.2.3 Roof Snow Loads

Ground snow loads shall be determined by the local building official. Unless otherwise permitted by the building official, snow load factors, including drifting, sliding and unbalanced snow as applicable based upon job site conditions, shall be used to determine the total roof snow load in accordance with Section R301 of the IRC, or Chapter 16 of the IBC, whichever is applicable, or local snow load criteria as determined by the local building official.

6.2.4 Roof Live Loads

The roof live load shall be as required by local building codes as applicable.

6.2.5 Seismic Loads

Sunroom structures shall comply with the requirements of ASCE/SEI 7 for the design of earthquake forces. Site specific design parameters shall be defined by ASCE/SEI 7.

Where rational justification of the Response Modification Factor (R) cannot be determined through rational analysis, R may conservatively be set to 1.4 for the purpose of determining the applied seismic forces.

The seismic Importance Factor shall be set to 1.0.

6.2.6 Load Combinations

Load Combinations shall be determined in accordance with Chapter 2 of ASCE/SEI 7 and shall be used for determination of design pressure to be applied to the structural elements of the sunroom.

6.3 STRUCTURAL PERFORMANCE CRITERIA FOR SUNROOM ROOF ASSEMBLIES

6.3.1 Allowable Load

The allowable transverse load capacity of the sunroom roof assembly shall be the lesser of the load at the maximum allowable deflection or the ultimate transverse load divided by a Factor of Safety of 2.0 for bending caused by load combinations which include Roof Live Loads, Wind Loads or Earthquake Loads, 2.5 for bending caused by all other load combinations and 3.0 for Shear caused by all load combinations. The ultimate transverse load capacity of the sunroom roof assembly shall be determined by testing in accordance with ASTM E72 or other approved criteria.

6.3.2 Maximum Deflection

For aluminum structural members or panels used in roofs or walls of sunroom additions or patio covers, not supporting edge of glass or sandwich panels, the total load deflection shall not exceed $L/60$. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed the lesser of 19 mm (3/4 in) or $L/175$ for each glass lite, or $L/60$ for the entire length of the member, whichever is more stringent. For sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed $L/120$.

7.0 THERMAL REQUIREMENTS

7.1 SCOPE

Thermal performance requirements for sunrooms shall include minimums as established by this specification.

7.2 THERMAL PERFORMANCE OF SUNROOM FENESTRATION PRODUCTS

Thermal performance of sunroom roofs, walls and fenestration products in Sunroom Categories IV and V shall be in accordance with the International Energy Conservation Code (IECC), International Residential Code (Energy Section), or local codes as applicable. Compliance with the applicable thermal performance rating requirements shall be determined as outlined in this section.

7.2.1 Fenestration U-factor of the glazed panels shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. The solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer.

7.3 Roof and Wall R-Value: The R-value of opaque roof and wall panels shall be determined in accordance with ASTM C518 or ASTM C177.

8.0 GENERAL REQUIREMENTS FOR SUNROOMS

8.1 SCOPE

General requirements for sunrooms shall include minimums as established by this specification. Local building and fire code agencies have the authority to adopt differing requirements. Where conflict exists between this standard and the requirements of the local authority having jurisdiction, those of the authority having jurisdiction shall prevail.

8.2 FOUNDATIONS

8.2.1 Concrete Foundations

Load bearing walls supporting no more than one floor level and roof in all Sunroom Categories shall be permitted to be supported by a concrete foundation of no less than 200 mm (12 in) in width provided that foundation is supported by a continuous footing that meets the criteria of Section 8.2.3.

8.2.2 Slab on Grade

Where permitted by the local jurisdiction and in areas with a frost line depth of zero as specified by the building official, sunrooms shall be permitted to be supported on a concrete slab on grade provided that the slab is not less than 90 mm (3.5 in) thick, and does not support a concentrated load in excess of 340 kg (750 lbs) per column.

8.2.3 Slab on Grade with Turn-Down Footing

Unless otherwise allowed in this specification, all sunrooms in areas with a frost line depth of zero shall be permitted to be supported on a concrete slab on grade with a turn-down footing. The turn-down footing shall support the bearing walls and load carrying elements of the structure.

All sunrooms in areas with a frost line depth greater than zero shall be permitted to be supported on a concrete slab on grade with a turn-down perimeter footing in accordance with the requirements of the local building code.

8.2.4 Decks Supporting Sunrooms

All Sunroom Categories shall be permitted to be supported on a deck that is constructed in accordance with the requirements of the local building code.

8.3 SITE AND PLAN

Sunrooms shall comply with local code requirements for elevation above grade, setbacks and easements, storm-water retention, and other site issues.

8.4 EXISTING EMERGENCY ESCAPE AND RESCUE OPENINGS

All Sunroom Categories shall comply with the egress, and emergency escape and rescue, opening requirements of the local building code.

EXCEPTION: Category I sunrooms shall be considered outdoor space unless otherwise dictated by the local code.

8.5 LIGHTING

Sunrooms shall comply with code requirements for lighting. Openings required for lighting in adjoining spaces shall be permitted to open into a sunroom. The existing exterior openings in the adjoining space combined with the openings in the sunroom shall provide sufficient lighting for the combined floor area of the sunroom and the adjoining space.

EXCEPTION: Category I sunrooms shall be considered as outdoor space for the purpose of determining natural lighting requirements.

8.6 ELECTRICAL

8.6.1 Exit and Stairway Illumination

All sunrooms shall be provided with stairway and egress illumination as required by local code.

EXCEPTION: Category I sunrooms shall not be required to have exit lighting.

8.6.2 Receptacle Outlets

Receptacle outlets in Category IV and V sunrooms shall be installed in accordance with NFPA 70 Article 314.

EXCEPTION: Category I, II and III sunrooms shall be exempt from requirements for receptacle outlets.

Changes from AAMA/NPEA/NSA 2100-12 to AAMA/NSA 2100-19

- Updated referenced standard editions where needed
- Added reference to unbalanced snow in Section 6.2.3.
- Various editorial changes not affecting the requirements of the standard.



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