



NAIMA 202[®] Standard

**For Flexible Fiber Glass
Insulation to be Laminated
for Use in Metal Buildings**

For Flexible Fiber Glass Insulation to be Laminated for Use in Metal Buildings

A standard product specification for manufacturers, designers, and users of Metal Building Insulation Systems.

1.0 | Scope

1.1 This specification covers the classification, composition, and the physical properties of flexible fiber glass insulation designed to be further processed (laminated) and intended for use in the walls and roofs of manufactured metal buildings.

1.2 The insulation is further designed to provide the capability of obtaining thermal resistance (R-values) after processing to be equivalent to those nominal values printed on the product as specified in paragraph 6.1.

1.3 For insulation to be certified for R-value after lamination, use the NIA Certified Faced Insulation Standard.

1.4 The R-values in this specification are for the insulation only and do not include the effects of facings, air film surface resistances, compression of insulation at the framing members of the building, conductance through metal fasteners, and other parallel heat transfer paths due to design or installation techniques.

2.0 | Applicable Documents

2.1 ASTM Standards

C167	Test Methods for Thickness and Density of Blanket or Batt Thermal Insulation
C168	Terminology Relating to Thermal Insulation
C177	Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
C390	Practice for Sampling and Acceptance of Thermal Insulation Lots
C653	Guide for Determination of the Thermal Resistance of Low-Density Blanket-Type Mineral Fiber Insulation
C665	Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing

C991	Specification for Flexible Fibrous Glass Insulation for Metal Buildings
C1104	Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation
C1304	Test Method for Assessing the Odor Emission of Thermal Insulation Materials
C1338	Test Method for Determining Fungi Resistance of Insulation Materials and Facings
E84	Standard Test Method for Surface Burning Characteristics of Building Materials

2.2 Other Standards

- NIA Certified Faced Insulation Standard: Thermal Standard For Flexible Faced Insulation Used in Metal Buildings.
- UL 723 Test Method for Surface Burning Characteristics of Building Materials
- CAN/ULC-S102 Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

3.0 | Classification

3.1 The flexible insulation is furnished as glass processed from the molten state into fibrous form, bonded with a thermosetting resin, and formed into a resilient flexible blanket.

4.0 | Terminology

4.1 Definitions of terms relating to insulation, ASTM C168, shall be considered as applying to the terms in this standard.

5.0 | Ordering Information

5.1 Material shall be ordered by specifying thermal resistance (R-value), length, and width.

NAIMA 202® Certified Fiber Glass Metal Building Insulation is designed to be laminated and is intended for use in the walls and roofs of manufactured buildings.

6.0 | Physical Requirements

6.1 The thermal resistance of the insulation at 75°F (24°C) mean temperature shall be determined in accordance with ASTM C653. Use thermal conductivity tests per ASTM C177 or C518 with a temperature differential of 40 to 50°F (4 to 10°C), thickness recoveries determined in accordance with paragraph 9.3, and densities determined in accordance with paragraph 9.4.

Note: Below is a list of the most common nominal R-value products available:

R-10 °F·ft²·h/Btu (1.8 °K/W·m)	R-11 °F·ft²·h/Btu (1.9 °K/W·m)	R-13 °F·ft²·h/Btu (2.3 °K/W·m)
R-16 °F·ft²·h/Btu (2.8 °K/W·m)	R-19 °F·ft²·h/Btu (3.3 °K/W·m)	R-25 °F·ft²·h/Btu (4.4 °K/W·m)
R-30 °F·ft²·h/Btu (5.3 °K/W·m)		

6.1.1 Thermal Resistance Tolerance – The R-value, determined from the average of a three roll sample, shall not be less than 103% of the nominal R-value for each inspection. Also, the running average of the most recent four quarterly inspection periods shall equal or exceed the requirements in Table 1.

TABLE 1: MINIMUM R-VALUE TOLERANCE TABLE

Inspection Number (Three rolls per inspection)	Minimum Percentage of Nominal R-value	Minimal R-value, nominal						
		R-10	R-11	R-13	R-16	R-19	R-25	R-30
1	103.0	10.3	11.3	13.4	16.5	19.6	25.8	30.9
2	104.6	10.5	11.5	13.6	16.7	19.9	26.2	31.4
3	105.3	10.5	11.6	13.7	16.9	20.0	26.3	31.6
4	105.7	10.6	11.6	13.7	16.9	20.1	26.4	31.7
∞	108.4	10.8	11.9	14.1	17.3	20.6	27.1	32.5



NAIMA 202® Certified Fiber Glass Metal Building Insulation minimizes heat loss or heat gain, controls condensation, and provides acoustical integrity in metal buildings.

6.2 Surface Burning Characteristics – The surface burning characteristics shall be determined in accordance with ASTM E84, or UL723, or CAN/ULC S102.

This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment, which takes into account all of the factors that are pertinent to an assessment of the fire hazard of a particular end use.

6.2.1 The classification shall be no greater than:

FLAME SPREAD INDEX: 25
SMOKE DEVELOPED INDEX: 50

Values are for unfaced insulation. To ensure compliance with the building code, the insulation must be tested with the appropriate facing and adhesive.

6.3 Water Vapor Sorption – The water vapor sorption shall not be greater than 0.2% by volume when determined in accordance with the procedure set forth in ASTM C991.

6.4.1 Corrosiveness – When tested in accordance with the procedure in ASTM C665, using steel test plates, the insulation shall show no greater corrosion than the washed and dried sterile cotton control.

6.4.2 Corrosion Alternative Test (for steel only) - When tested in accordance with the procedure in Practice ASTM C1617, the mass loss corrosion rate of the unfaced insulation extract shall not exceed that of the 5 ppm chloride solution.

6.5 Fungi Resistance – When tested in accordance with the procedure in ASTM C1338, the insulation shall have no growth greater than that observed on the comparative control item.

6.6 Odor Emission – When tested in accordance with the procedure in ASTM C1304, the insulation shall not emit an objectionable odor as determined by three or more of the five panel members.

6.7 Dimensional Tolerances – The average measured length and width shall not differ from the manufacturer's standard dimensions, when determined in accordance with paragraph 9.1, by more than the following:

LENGTH	- 0 inches	(0 mm)
WIDTH	± 1/4 inch	(6 mm)

7.0 | Workmanship

7.1 The material shall indicate good workmanship and shall not have visible defects which adversely affect its serviceability.

8.0 | Sampling and Inspection

8.1 Unless otherwise agreed, the manufacturer's normal sampling and inspection procedures shall be acceptable, or as outlined in Section No. 4 of ASTM C390.

9.0 | Test Methods – Dimensional Properties

9.1 Roll Weight

9.1.1 Test Procedure – Using a scale, weigh the blanket insulation as received in packaged roll form. Remove and weigh the roll packaging materials.

9.1.2 Calculation and Report – Calculate and record insulation roll net weight by subtracting packaging material weight from packaged roll weight.

9.2 Length and Width

9.2.1 Test Procedure – Unroll the weighed roll of insulation from paragraph 9.1 on a flat, smooth, hard surface. Using a steel measuring tape, measure the entire insulation blanket length and width in several locations. An alternate method may be used where the flat surface has been previously ruled out to facilitate ease of measurement.

9.2.2 Calculation and Report – Calculate the average insulation blanket length and width dimensions and record the values.

9.3 Thickness

9.3.1 Test Procedure – Use at least 35 feet (10.7 m) in length of the unrolled and measured roll of insulation from paragraph 9.2. When roll lengths are in excess of 70 feet (21.3 m), it is permissible to cut the roll into two equal lengths for ease of handling. The test roll is then flipped over for its entire length. Finally, after grasping one end, the material is pulled back over itself until the original surface is again facing up. Ten thickness

NAIMA 202® Certified Fiber Glass Metal Building Insulation is produced in a special manufacturing process to give it the structural integrity it needs to recover thickness after lamination, shipping, and installation.

measurements are then taken, using a pin and disc gauge per ASTM C167 on each end of the roll starting 10 feet (3 m) in from the roll ends. The ten thickness checks should be spaced uniformly over the next 15 feet (4.5 m), sampling the full width but not closer than 1/10 of the width from edges.

9.3.2 Calculation and Report – Calculate and record the average of the twenty thickness recovery checks. The lesser of either the average thickness recovery value or the pre-laminated (unfaced) label thickness shall be used to calculate the thermal resistance in 6.1 providing the thermal conductivity of the material is known or has been provided by the manufacturer.

9.4 Density

9.4.1 Test Procedure – Obtain the roll length and width from paragraph 9.2, the thickness as determined in paragraph 9.3, and the net roll weight from paragraph 9.1.

9.4.2 Calculation and Report – Calculate and record the density from the following equation:

$$\text{Density (lb/ft}^3\text{)} = \frac{\text{Roll Weight (lb.)} \times 144}{\text{Length (ft.)} \times \text{Width (in.)} \times \text{Thickness (in.)}}$$

$$\text{Density (kg/m}^3\text{)} = \frac{\text{Roll Weight (kg)} \times 10^6}{\text{Length (m)} \times \text{Width (mm)} \times \text{Thickness (mm)}}$$

10.0 | Inspection

10.1 Inspection of the material shall be agreed upon by the purchaser and the supplier as part of the purchase contract.

11.0 | Rejection

11.1 If inspection of the sample shows failure to conform to the thermal and dimensional property requirements of this Standard, a second sample from the same lot shall be tested and the results of this retest averaged with the results of the original test.

11.2 Upon retest as described in 11.1, failure to conform to this Standard shall constitute grounds for rejection.

11.3 In case of rejection, the manufacturer or seller shall have the right to inspect the rejected shipment or resubmit the lot after removal of that portion of the shipment not conforming to the specified requirements.

12.0 | Product Thermal Certification

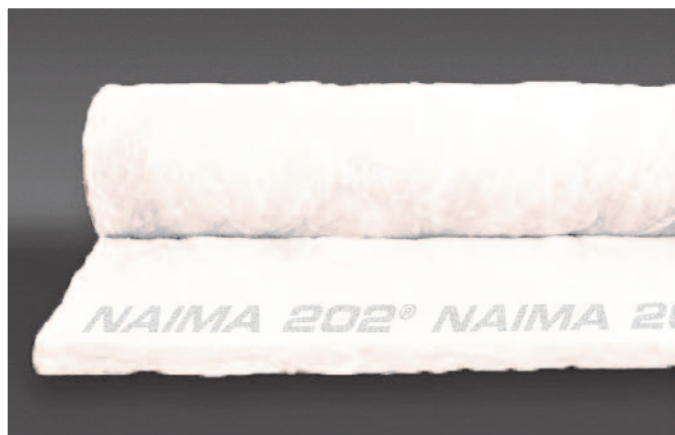
12.1 Samples of this product shall be tested quarterly by a nationally recognized independent laboratory and determined to meet the stated requirements of the NAIMA 202® Standard. Manufacturer represents that their product has been produced to the same standard as samples tested.

13.0 | Marking

13.1 Standard sizes of fiber glass insulations are listed by their thermal resistance (R-value) as shown in paragraph 6.1 with the following permanent marking identified on the insulation in a repetitive or continuous manner:

Manufacturer and/or Product Name
NAIMA 202®
Symbol “R” for registered (®)
The appropriate R-value

The use of “NAIMA 202®” is restricted to NAIMA Metal Building Committee members.



NAIMA 202® Certified Fiber Glass Metal Building Insulation is clearly identified with the manufacturer's name, NAIMA 202® and the R-value printed on the insulation.



NAIMA 202® Certified Fiber Glass Metal Building Insulation is distributed nationwide by qualified independent laminators who are experienced in providing NAIMA 202® Certified Insulation with attractive, light reflective vapor retarder facings in widths and lengths that fit most any metal building.

14.0 | Packaging

14.1 Unless otherwise specified, the package shall be marked with the seller's name and designation, length, width, nominal thickness, R-value, total number of square feet, manufacturing date code, and surface burning characteristics.

14.2 Unless otherwise agreed or specified between the purchaser and the manufacturer or seller, the insulation shall be packed in the manufacturer's standard commercial container.

15.0 | Storage

15.1 The material shall be stored in such a manner as to protect the package from direct sunlight, weather, and temperature extremes.

15.2 Shelf life shall be agreed upon between the seller and the purchaser.

Appendix

Recommended Lamination Practices

X1.0 Lamination and Thickness Recovery*

X1.1 Control adhesive application rates to minimize the accumulation of excess moisture within the insulation.

X1.2 Minimize nip roller pressure to reduce compression of the insulation during lamination.

X1.3 Control compression of the insulation during windup after lamination. Excessive compression in the package will have a detrimental effect on thickness recovery. The compression ratio should be less than 5.5:1. For optimal thickness recovery, use compression ratios of 5.0:1 or less.

X1.3.1 Compression ratio is calculated by:

$$\text{Compression Ratio} = \frac{\text{Pre-laminated Thickness (in.)}^{**} \times \text{Roll Length (ft.)} \times 150.8}{\text{circumference (in.)} \times \text{circumference (in.)}}$$

$$\text{Compression Ratio} = \frac{\text{Pre-laminated Thickness (mm)}^{**} \times \text{Roll Length (m)} \times 12566}{\text{circumference (mm)} \times \text{circumference (mm)}}$$

X1.4 Package ends should be pierced, about one square inch (650 mm²) per end, to provide a ventilation path to allow the moisture in the package to escape as the adhesive cures.

X1.5 Packages of faced insulation should be stacked on their sides to allow cross ventilation and the removal of water through evaporation.

X1.6 Minimize storage time in the package after lamination. Excessive storage time will adversely affect the thickness recovery. A maximum of seven days storage is recommended. The stack height of stored material should not be so high that the rolls on bottom layers are crushed by the weight of the product above them.

* See NAIMA's *Insulation Facts #28, Facts About Lamination Process Control And Thickness Recovery After Lamination* (Pub. No. MB308) for more information on the lamination process.

** Thickness refers to the prelamination thickness printed on the bag label.

About NAIMA

NAIMA is the association for North American manufacturers of fiber glass, rock wool, and slag wool insulation products. Its role is to promote energy efficiency and environmental preservation through the use of fiber glass, rock wool, and slag wool insulation, and to encourage the safe production and use of these materials. NAIMA, continuing its members' commitment to safety has established a renewed Product Stewardship Program, which embodies the components of the earlier OSHA-NAIMA Health and Safety Partnership Program (HSPP). The HSPP was a comprehensive eight-year partnership with OSHA, which NAIMA completed in May 2007, and now NAIMA incorporates these safe work practices into NAIMA's Product Stewardship Program.

For additional information on fibrous glass duct systems, contact one of the manufacturers listed below:

CertainTeed

www.certainteed.com • 800-233-8990

Johns Manville

www.jm.com • 800-654-3103

Knauf Insulation

www.knaufnorthamerica.com • 800-825-4434

Owens Corning

www.owenscorning.com • 800-GET-PINK

For more information, contact:



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