CODE EVALUATION REPORT

CERUS-1019

PUBLISHED: February 2025
REVISED: July 2025
EXPIRATION: June 2027

PRODUCT: **NEOPOR THERMAPLUS™**

REPORT HOLDER: BASF Corporation

CONTACT DETAILS:
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CSI DIVISION: 07 00 00 – Thermal and Moisture Protection

CSI SECTION:
07 21 00 – Thermal Insulation
07 25 00 – Weather Barriers
07 26 00 – Air Barriers

APPLICABLE CODES:
2021, 2018, 2015 International Building Code® (IBC)
2021, 2018, 2015 International Residential Code® (IRC)
2021, 2018, 2015 International Energy Conservation Code® (IECC).
2021, 2018 International Green Construction Code (IgCC).
2022, 2019 California Green Building Standards Code® (CALGreen), Title 24, Part 11
2020, 2015 ICC 700 *National Green Building Standard* ™ (ICC 700)

EVALUATED:
Foam Plastic, Surface Burning Characteristics
Thermal Insulation, Physical Performance
Direct to Framing Foam Sheathing
Water-Resistive Barrier
Air-Barrier
Combustible Components in Exterior Walls for Use in Types I-V Construction.

IAS ACCREDITED Product Certification Agency PCA-118

1.0 APPROVED FOR FOLLOWING:

APPROVED TYPES OF CONSTRUCTION:	Types I-V A/B
APPROVED USE:	Thermal insulation for use in walls, and foundations in Types I-V construction.
APPROVED INSTALLATIONS:	Bearing and non-load bearing exterior walls. Below-grade exterior walls.

2.0 DESCRIPTION:

2.1 General:

NEOPOR ThermaPlus™ products are rigid, cellular expanded polystyrene (EPS) foam plastic thermal insulation boards with a factory applied water-resistive barrier (WRB). NEOPOR ThermaPlus™ products are intended for use as nonstructural continuous insulation on exterior walls and foundation installations. Where used in exterior wall applications, NEOPOR ThermaPlus™ is evaluated for use over code complying sheathing or where used as exterior wall sheathing on framed wall assemblies based on compliance with ASTM C578 and ANSI/FS 100 in accordance with Section 2603.10 of the 2021 / 2018 / 2015 IBC. See Section 4.1 and Sections 8.2 and 8.3 of this report for additional details.

NEOPOR ThermaPlus™ assemblies comply for use as a water-resistive barrier when installed in accordance with Section 4.3.1.2 and Section 8.4 of this report complying with Section 1402.2 the 2021 / 2018 IBC, Section 1403.2 of the 2015 IBC, Section R703.1.1 of the 2021 / 2018 / 2015 IRC and Section 602.1.8 of the 2020 ICC 700.

NEOPOR ThermaPlus™ are classified as air-barrier assemblies when installed in accordance with Section 4.3.1.3 and Section 8.5 of this report, complying with Section 701.3.1.2 of the 2021 IgCC, Section 701.3.1.1 of the 2018 IgCC, and Section 5.407.1 of the 2022 CALGreen. After installation, NEOPOR ThermaPlus™ systems form part of the exterior thermal envelope continuous air barrier in accordance with the 2020 / 2015 ICC 700 Section 701.4.3.2.1 (2) and the 2021 IECC Section C402.5.1.4 with and air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s*m^2) determined in accordance with ASTM E2357.

NEOPOR ThermaPlus™ is evaluated for use as exterior below-grade insulation, complying with Section C401.2 of the 2021 / 2018 / 2015 IECC determined in accordance with ANSI/ASHRAE/IESNA 90.1.

NEOPOR ThermaPlus™ is approved for use in Types I-IV construction, where installed in accordance with Section 4.4 and Section 8.6 of this report.

NEOPOR ThermaPlus™ is available in the following production options and product accessories:

Table 1. NEOPOR ThermaPlus™ Product Configurations:

PRODUCT	EDGE OPTIONS	COMPRESSIVE STRENGTH psi (kPa)	THICKNESS inches (mm)	R-VALUE[1] @ 75°F (23°C) MEAN TEMPERATURE
SE 5X	Square	5	0.67 (17)	3.0
			7/8 (22)	4.0
			1-1/8 (29)	5.0
			1-5/8 (41)	7.5
			2-1/5 (56)	10.0
SE 10X	Square	10	1-1/16 (27)	5.0
			1-5/8 (41)	7.5
			2-1/8 (54)	10
			2-3/4 (70)	13
			3-1/5 (81)	15
			4-1/4 (108)	20
SE 15X	Square, Flap	15	1-1/16 (27)	5.0
			1-5/8 (41)	7.5
			2-1/8 (54)	10
			2-3/4 (70)	13
			3-1/5 (81)	15
			4-1/4 (108)	20
SE 20X	Square, Flap	20	1-1/16 (27)	5.0
			1-5/8 (41)	7.5
			2-1/8 (54)	10
			2-3/4 (70)	13
			3-1/5 (81)	15
			4-1/4 (108)	20
SE 25X	Square, Flap	25	1-1/16 (27)	5.0
			1-5/8 (41)	7.5
			2-1/8 (54)	10
			2-3/4 (70)	13
			3-1/5 (81)	15
			4-1/4 (108)	20
FastFOLD	Square, Fanfold	10, 15	2/5 (10)	1.9
			3/5 (15)	2.8
			4/5 (20)	3.8

Note 1: Additional product sizes are available on request subject to limitations based on use as outlined in this report.

2.2 PRODUCTS

2.2.1 NEOPOR® ThermaPlus™: is rigid cellular polystyrene thermal insulation with a factory laminated water-resistive barrier (WRB). NEOPOR ThermaPlus™ EPS complies with Types XI, I, VIII, II, and IX in accordance with ASTM C578. Thermal resistance values for NEOPOR ThermaPlus™ are outlined in Table 1 of this report.

NEOPOR ThermaPlus™ products have a flame spread index of 25 or less and smoke development index of 450 or less when evaluated to ASTM E84 and comply with the 2021 / 2018 / 2015 IBC Section 2603.3 and the 2021 / 2018 / 2015 IRC Section R316.3.

NEOPOR ThermaPlus™ products outlined in this report are listed by an *approved agency* and comply with labelling requirements of the 2021 / 2018 / 2015 IBC Section 2603.2 and 2021 / 2018 / 2015 IRC Section R316.2.

NEOPOR ThermaPlus™ of Types XI - IX are a Class III vapor retarder at minimum 1-inch (25 mm) thickness with a water vapor permeance of 1.0 perms – 10 perms determined in accordance with ASTM E96 Procedure A.

NEOPOR ThermaPlus™ of Types II - IX of minimum 1-1/16-inch (27 mm) thickness of fanfold, square edge (butt-joint) and flap installation options comply for use as water-resistive barriers evaluated in accordance with ASTM E331.

NEOPOR ThermaPlus™ of Types II – IX of square edge joint types are classified as an air-barrier material at a thickness of minimum ¼-inch thickness (6 mm) with air leakage of ≤ 0.02 L/s*m^2 determined in accordance with ASTM E2178 and ASTM E283.

2.2.2 Joint Treatment (Tapes & Sealant)

2.2.2.1 Typar® Construction Tape: Typar® Construction Tape is an ultraviolet resistant polypropylene coated pressure sensitive joint tape. When used with NEOPOR ThermaPlus™ SE type sheathing, Typar® Construction Tape is to be a minimum 3.6 mils (0.09 mm) thickness and nominal 2-inches (51 mm) width. Typar® Construction Tape is available in rolls up to 165 ft (50 m) length. Typar® Construction Tape is intended for application at minimum 14°F (-10°C) and maximum 170°F (82°C) temperatures. See manufacturer installation instructions for recommended application procedures.

2.2.2.2 3M 8087 and 8087CW: 3M 8087 and 3M 8087CW tapes are ultraviolet resistant polypropylene pressure sensitive joint tapes. Where used with NEOPOR ThermaPlus™ SE type sheathing, 3M 8087 and 3M 8087CW tapes are to be a minimum 3 mils thickness (0.08 mm) and nominal 4-inches (72 mm) width. 3M 8087 and 3M 8087CW tapes are available in rolls up to 165 ft (50 m) length. 3M 8087 tapes are intended for standard application temperatures. 3M 8087CW tapes are intended for low temperatures applications of minimum 14°F (-10°C) and maximum 185°F (85°C) temperatures. See manufacturer installation instructions for recommended application procedures.

2.2.2.3 Barricade® Seam Tape™: Barricade® Seam Tape™ is an ultraviolet resistant white polypropylene coated joint tape. Where used with NEOPOR ThermaPlus™ SE type sheathing, Barricade® Seam Tape™ is to be a minimum 3 mils (0.08 mm) thickness and nominal 3-inches (76 mm) width. Barricade® Seam Tape™ are available in rolls up to 165 ft (50 m) length. Barricade Seam Tape™ is intended for applications of minimum 14°F (-10°C) and maximum 122°F (50°C) temperatures. See manufacturer installation instructions for recommended application procedures.

2.2.2.4 BRINC Fluid FS: BRINC Fluid FS is an ultraviolent resistant blue silicon-based sealant for use with ThermaPlus™ Flap joint types. When used to seal horizontal or vertical joints under the ThermaPlus™ Flap joint, bead width is to be a minimum of 3/16 inch (4.8 mm) and no more than 1/4 inch (6.4 mm) in size, half inch (12.7 mm) away from the joint. BRINC Fluid FS is available in 20-ounce (567g) tubes and intended for application of minimum -60 °F (-51 °C) and maximum 300 °F (149 °C) temperatures. See manufacturer installation instructions for recommended application procedures.

3.0 DESIGN:

NEOPOR ThermaPlus™ products are non-structural elements of the exterior wall and foundation. Use of these products as exterior continuous thermal insulations, water-resistive barriers, air-barriers or below-grade exterior insulation is to be in accordance with the applicable code, the manufacturers installation instructions and this report.

NEOPOR ThermaPlus™ installed over code compliant sheathing, installation is to be in accordance with Section 4.3.1.1.1 of this report. NEOPOR ThermaPlus™ installed as exterior sheathing direct to framing is to be installed in accordance with Section 4.3.1.1.2 of this report. Where NEOPOR ThermaPlus™ is installed as exterior sheathing direct to framing, the resistance of the exterior wall assembly to in service loads including but not limited to seismic and wind loads are to be determined based on exterior cladding and wall construction without consideration of the NEOPOR ThermaPlus™ as a structural element. Wind pressure resistance values outlined in Section 8.2 of this report applies to NEOPOR ThermaPlus™ only.

NEOPOR ThermaPlus™ minimum Type II – IX products used in constructions governed by the 2021 / 2018 / 2015 IRC are to be installed based on the cladding manufacturer's approved installation instructions for application over foam sheathing or an *approved* design where the attachment exceeds the minimum fastening requirements outlined in Sections R703.15 or R703.16 as appropriate based on wall framing. NEOPOR ThermaPlus™ Types XI, I and VIII products installation for constructions under the 2021 / 2018 / 2015 IBC and 2021 / 2018 / 2015 IRC are to be in accordance with an *approved* design and the applicable code, with anchoring of the cladding into the underlying structure for transfer of pressure loads, without consideration of NEOPOR ThermaPlus™.

NEOPOR ThermaPlus™ used as exterior sheathing attached direct to framing requires the use of rigid cladding to resist negative wind load deformation of NEOPOR ThermaPlus™. NEOPOR ThermaPlus™ used in exterior sheathing applications are limited to use in areas of maximum wind speed and installations as outlined in Section 8.2 of this report. Use of NEOPOR ThermaPlus™ in wind speed areas outside those noted, are outside the scope of this report and are to be approved by the Authority Having Jurisdiction.

4.0 INSTALLATIONS:

4.1 General:

Installation of NEOPOR ThermaPlus™ must comply with the manufacturer's published installation instructions, this report and the applicable code(s). Where conflicts exist, this report and the applicable building code govern. For sites governed by the 2021 / 2018 / 2015 IRC, NEOPOR ThermaPlus™ of Types II to IX are approved to maximum thicknesses for installations as outlined in Tables R703.15.1 / R703.16.1(installation of cladding without furring) and R703.15.2 / R703.16.2 (installation of cladding with furring strips) of the IRC respectively, with other NEOPOR ThermaPlus™ Types and installations requiring support by Engineering Design.

NEOPOR ThermaPlus™ is intended for installation in exterior continuous insulation applications either installed over code complying sheathing or as exterior sheathing direct to framing. Use of NEOPOR ThermaPlus™ as a load resisting structural sheathing element is outside the scope of this report. Use of NEOPOR ThermaPlus™ as an anchoring medium is not permitted.

Installation of a code approved thermal barrier on the interior of the occupancy is required in accordance with the 2021 / 2018 / 2015 IBC Section 2603.4 and 2021 / 2018 / 2015 IRC Section R316.4.

4.1.1 Special Inspection: Use of NEOPOR ThermaPlus™ does not require special inspection unless required by other exterior wall components or site conditions per 2021 / 2018 / 2015 IBC Section 1705.

4.2 Interior:

NEOPOR ThermaPlus™ is not intended for interior applications.

4.3 Exterior:

4.3.1 Above Grade

4.3.1.1 Exterior Continuous Insulation:

4.3.1.1.1 Installation Over Sheathing: NEOPOR ThermaPlus™ is approved for installation over code compliant sheathing. Prior to installation, the sheathing should be inspected to ensure no abrasive, sharp or protruding items are present that may puncture the NEOPOR ThermaPlus™ during installation. NEOPOR ThermaPlus™ is to be attached to the underlying wall with nails, screws or staple type fasteners. Nails and screws are to include a minimum 2-inch (51 mm) diameter plastic cap. Fasteners anchoring NEOPOR ThermaPlus™ are to penetrate the underlying sheathing and studs, with minimum 3/4-inch (19 mm) penetration. Fasteners are to be spaced at 12-inches (405 mm) spacing around the perimeter, and at intermediate stud locations with studs spaced at maximum 24 inches (610 mm) on center spacing. Joints of adjacent NEOPOR ThermaPlus™ are to be tight after installation, without compressing the NEOPOR ThermaPlus™ products. An approved joint tape or seam treatment as outlined in Section 2.2.2 of this report is to be manually applied over joints and fastener locations along the perimeter by applying uniform firm pressure to ensure full contact and adhesion of the joint tape to the NEOPOR ThermaPlus™ SE boards. After joint tape installation, a visual inspection should be done to ensure no folds, wrinkles, gaps or through voids are present. Where deficiencies are observed, additional application of tape layers to ensure joint coverage should be applied.

Strapping is recommended of minimum ½-inch (13 mm) depth to create an air cavity capillary break. Fasteners for strapping attachment are to penetrate into the underlying framing of sufficient depth to resist service loads and are not to rely on NEOPOR ThermaPlus™ as an anchoring medium. Strapping installation shall be in accordance with the applicable code.

Exterior claddings where face fastened directly over NEOPOR ThermaPlus™ are to be anchored to the underlying elements in accordance with the applicable code and are not to rely on NEOPOR ThermaPlus™ as an anchoring medium.

See Section 8.3 of this report for installation over code complying sheathing details.

4.3.1.1.2 Installation as Exterior Sheathing Direct to Framing: NEOPOR ThermaPlus™ is approved for installation as exterior sheathing direct to framing without code complying sheathing. Prior to installation, the framing should be inspected to ensure no abrasive, sharp or protruding items are present that may puncture the NEOPOR ThermaPlus™ during installation. NEOPOR ThermaPlus™ installation for orientation to framing, maximum framing spacing, fastener details and blocking are to be in accordance with Section 8.2 of this report for maximum wind speeds noted. Joints of adjacent NEOPOR ThermaPlus™ are to be tight after installation, with vertical joints located over stud locations, without compressing the NEOPOR ThermaPlus™ products. An approved joint tape as outlined in Section 2.2.2 of this report is to be manually applied over joints and fastener locations by applying uniform firm pressure to ensure full contact and adhesion of the joint tape to the NEOPOR ThermaPlus™ boards. After joint tape installation, a visual inspection should be done to ensure no folds, wrinkles, gaps or through voids are present. Where deficiencies are observed, additional application of tape layers to ensure joint coverage should be applied.

Strapping is recommended of minimum ½-inch (13 mm) depth to create an air cavity capillary break. Fasteners for strapping attachment are to penetrate into the underlying framing of sufficient depth to resist service loads and are not to rely on NEOPOR ThermaPlus™ as an anchoring medium. Strapping installation shall be in accordance with the applicable code.

Exterior claddings where face fastened directly over NEOPOR ThermaPlus™ are to be anchored to the underlying elements in accordance with the applicable code.

Rigid claddings are required to resist negative pressure deformations of NEOPOR ThermaPlus™.

See Section 8.2 of this report for additional installation details for exterior sheathing direct to framing.

4.3.1.2 Water Resistive Barrier:

NEOPOR ThermaPlus™ products of minimum Type II are approved for use as water-resistive barriers when installed in accordance with Section 4.3.1.1.1 or 4.3.1.1.2 of this report at a minimum 1-1/16-inch (27 mm) thickness. After installation foam panel joints and fastener heads are required to be covered with an approved joint tape as outlined in Section 2.2.2 of this report with fastener heads covered with minimum 2-inch x 2-inch (51 mm x 51 mm) tape. When applied under flap joints, the approved flashing sealant outlined in Section 2.2.2 of this report should be used to treat these seams. After installation, a visual inspection should be done to ensure no folds, wrinkles, gaps or through voids are present. Where deficiencies are observed, additional application of tape layers to ensure joint coverage should be applied.

Penetrations require sealant and taping or liquid flashing to prevent water ingress in accordance with sealing good practices. Sealing of penetrations is outside the scope of this report.

See Section 8.4of this report for additional installation details for water-resistive barrier assemblies.

4.3.1.3 Continuous Air Barrier:

NEOPOR ThermaPlus™ products of minimum Type are approved for use as air-barrier and exterior thermal envelope continuous air barriers when installed in accordance with this report at a minimum 1-1/16 inch (27.0 mm) thickness, and where installation complies with Section 4.3.1.1.1 of this report with installation over a code compliant sheathing with fasteners spaced at 12-inches (305 mm) around the perimeter and along interior stud locations. After installation as outlined in Section 4.3.1.1.1 of this report, joints and fastener heads are to be finished with 3M Construction Seaming Tape 8087 as outlined in Section 2.2.2.2 of this report. After installation, a visual inspection should be done to ensure no folds, wrinkles, gaps or through voids are present. Where deficiencies are observed, additional application of tape layers to ensure joint coverage should be applied.

Penetrations require sealing, taping, liquid flashing or a combination thereof to prevent air leakage in accordance with the 2021 IECC Section C405.1.1 in accordance with good installation practices.

See Section 8.5of this report for additional installation details for use as continuous air-barrier assembly.

4.3.1.4 Vapor Retarders:

NEOPOR ThermaPlus™ of Types XI, I, VIII, II and IX are Class III vapor retarder at minimum 1-inch (25 mm) thickness or greater, so where a Class III vapor retarder is required, this can be omitted.

4.3.1.5 Termite Protection:

Where NEOPOR ThermaPlus™ are installed in areas defined as “very heavy” as indicated in Figure 2603.8 of the 2021 / 2018 / 2015 IBC and Figure R301.2(6) of the 2021 / 2018 / 2015 IRC, and where the EPS foam component is located within 6 in. (152 mm) above grade from exposed earth, construction is to follow Section 2603.8 of the 2021 / 2018 / 2015 IBC and R318.4 of the

2021 / 2018 / 2015 IRC. This construction requires all structural elements of walls, floors, ceilings, and roofs to be of noncombustible materials or preservative-treated wood, unless an approved method of protecting the foam plastic from subterranean termite damage is provided to the authority having jurisdiction.

4.3.2 BELOW GRADE:

NEOPOR ThermaPlus™ complies for use as exterior continuous insulation complying with Section 5.8.1.7.3 of ANSI/ASHRAE/IESNA 90.1 through testing to ASTM C272 with water absorption of less than 0.3%.

Damproofing or waterproofing as applicable is required applied to the foundation wall prior to installation of the NEOPOR ThermPlus™ exterior below-grade insulation.

4.3.2.1 Termite Protection:

Where NEOPOR ThermaPlus™ is used below grade in areas defined as “very heavy” termite infestation probability as indicated in Figure 2603.8 of the 2021 / 2018 / 2015 IBC and Figure R301.2(6) of the 2021 / 2018 / 2015 IRC, construction is to follow Section 2603.8 of the 2021 / 2018 / 2015 IBC and R318.4 of the 2021 / 2018 / 2015 IRC. All structural elements in walls, floors, ceilings, and roofs are required to be noncombustible materials or preservative-treated wood unless an approved method of protecting the foam plastic from subterranean termite damage is provided to the authority having jurisdiction.

4.4 Types I-IV (Non-combustible) Construction:

NEOPOR ThermaPlus™ is approved for use in exterior walls of Types I-IV construction. Installation is to be in accordance with Section 8.6 of this report.

5.0 LIMITATIONS

- Installation of NEOPOR ThermaPlus™ products are to comply with the applicable codes, this report and the manufacturer’s installation instructions.
- NEOPOR ThermaPlus™ products require separation from occupancy by a code compliant thermal barrier, or thermal barrier complying with NFPA 275 compatible for use over expanded polystyrene foam plastic insulation.
- NEOPOR ThermaPlus™ where installed as exterior sheathing direct to framing, installation is to comply with Section 4.3.1.1.2 and Section 8.2 of this report.
- NEOPOR ThermaPlus™ where used as exterior continuous insulation, installation is to comply with Section 4.3.1.1 and Section 8.3 of this report.
- NEOPOR ThermaPlus™ where used as a water-resistive barrier, installation is to be in accordance with Section 4.3.1.2 and Section 8.4 of this report.
- NEOPOR ThermaPlus™ where used as a continuous air-barrier is to be installed in accordance with Section 4.3.1.3 and Section 8.5 of this report.
- Rigid code complying exterior cladding is required installed over NEOPOR ThermaPlus™ for supporting negative load deflections, with the exterior cladding anchored to the underlying sheathing or structural elements to resist the anticipated service loads.
- Neopor ThermaPlus™ for use in IRC jurisdictions are to be Type II to Type IX of maximum thickness noted in Tables R703.15.1 and R703.15.2 for fasteners and cladding shown.
- NEOPOR ThermaPlus™ products used in Types I-IV Construction are to be installed in accordance with Section 4.4 and Section 8.6 of this report.
- NEOPOR ThermaPlus™ where installed at less than 6 inches (152 mm) from exposed earth or below grade in termite infestation areas defined as “very heavy” as indicated in Figure 2603.8 of the 2021 / 2018 / 2015 IBC and Figure R301.2(6) of the 2021 / 2018 / 2015 IRC are to follow Section 2603.8 of the

2021 / 2018 / 2015 IBC and R318.4 of the 2021 / 2018 / 2015 IRC as outlined in Sections 4.3.1.5 and 4.3.2.1.2 of this report.

- NEOPOR ThermaPlus™ products are manufactured at locations as outlined in Section 10.0 of this report with inspections by QAI Laboratories.

6.0 SUPPORTING INFORMATION:

The following data has been evaluated the NEOPOR ThermaPlus™ products:

- Data outlining compliance for surface burning characteristics evaluated to ASTM E84.
- Data outlining compliance of Type XI, I, VIII, II, II+ and IX thermal insulation per ASTM C578.
- Thermal resistance testing per ASTM C518.
- Data outlining compliance for use as a water-resistive barrier including testing to ASTM E331.
- Data outlining compliance for vertical and lateral flame propagation per NFPA 285.
- Data for potential heat of combustion per NFPA 259.
- Data for water vapor permeance determined in accordance with ASTM E96.
- Data outlining compliance as an air-barrier determined in accordance with ASTM E283.
- Data outlining compliance as an air-barrier determined in accordance with ASTM E2178.
- Data outlining compliance for use as a continuous air-barrier determined in accordance with ASTM E2357.
- Data for use as sheathing applied direct to framing in accordance with ANSI/ FS100.

7.0 MARKING:

NEOPOR ThermaPlus™ products complying with this report, include the following information:

- Manufacturer's Name
- Manufacturing Address
- Product Name
- Date of Manufacture
- QAI CER_{US}-1019
- ASTM E84 Flame Spread and Smoke Developed Ratings (FSI < 25 / SDI < 450)
- QAI Logo outlined below:

8.0 RESULTS / RATINGS:

8.1 NEOPOR THERMAPLUS™ THERMAL INSULATION TYPES AND THERMAL RESISTANCE

APPROVED TYPE PER ASTM C578	MINIMUM DENSITY lbs/ft^3 (kg/m^3)	R-VALUE/1-INCHES @ 75ºF (23ºC) MEAN TEMPERATURE[1]	R-VALUE/1.0625-INCHES @ 75ºF (23ºC) MEAN TEMPERATURE[1]
XI	0.7 (11.2)	4.6	N/A
I	0.9 (14.4)	4.7	5.0
VIII	1.15 (18.4)	4.7	5.0
II	1.35 (21.6)	4.7	5.0
II+[2]	1.45 (23.2)	4.7	5.0
IX	1.80 (28.8)	4.7	5.0

Note 1: R-value units of measure ºF*ft^2*hr/ Btu. R-value / 5.678 = RSI (metric).
Note 2: Type II+ is nominal 1.5 lbs/ft^3 density target. This type is not ASTM C578 defined.

8.2 NEOPOR THERMAPLUS™ MAXIMUM DESIGN WIND SPEEDS (MPH) FOR DIRECT TO FRAMING APPLICATIONS[1,2,3,4,5,6,7]

	TYPE	MINIMUM THICKNESS, inches (mm)	ORIENTATION TO FRAMING	FASTENER	FASTENER SPACING (inches)	FRAME SPACING, inches (mm)	EXPOSURE CATEGORY			ALLOWABLE DESIGN PRESSURE, psf (kPa)
							B	C	D	
1	II, IX	0.67 (17)	Parallel	Nails or Screws with 1-inch (25 mm) diameter washer	6-inches (152 mm) on center (OC) spacing around perimeter, 12-inches (305 mm) OC in the field at framing locations.	24 (610)	140	120	110	38 (1.8)
2	II, IX	1-1/16 (27)	Parallel	Nails or Screws with minimum 1-inch (25 mm) diameter washer	6-inches (152 mm) on center (OC) spacing around perimeter, 12-inches (305 mm) OC in the field at framing locations.	16 (406)	140	120	110	40 (1.9)
3	II, IX	1-1/16 (27)	Parallel	Nails or Screws with minimum 1-inch (25 mm) diameter washer	6-inches (152 mm) on center (OC) spacing around perimeter, 12-inches (305 mm) OC in the field at framing locations.	16 (406)	120	100	90	26 (1.2)

1. Design Wind Speed are per ANSI/SBCA FS100 – 2012 Table 1.
2. Wind speeds are based off a mean roof height of 30 ft (9.1 m) enclosed buildings, with an importance factor of 1.0 per ASCE 7-05.
3. Definitions of Category B, C and D per ASCE 7 where B = suburban wooded terrain, C = open flat terrain, D = ocean / lake exposure).
4. Structures where topographical effects are present, calculations are to be in accordance with ASCE 7 in accordance with Section 4.2 of ANSI/SBCA FS100.
5. Wind speeds are based off corner zones assuming a wind tributary area of 10 ft^2 (0.93 m^2).
6. Installation is for direct to framing, where NEOPOR ThermaPlus™ is exposed to positive pressure loading only, and negative load resistance is provided by rigid cladding.
7. Fastener installation is to follow Figure 2of this report.

8.3 NEOPOR THERMAPLUS™ CONTINUOUS INSULATION DETAILS:

TYPE	MIN. THICK. inches (mm)	ORIENT. TO FRAMING	APPROVED SEAM TAPE	JOINT TYPES	FASTENER	FASTENER DETAILS	SHEATHING[1]
XI, I, II, II Heavy, IX	See Table 1 of this report.	Parallel or Perpendicular	Typar Construction Tape, 3M 8087 and 8087CW, Barricade Seam Tape	Square Edge, Fanfold	Nails, screws or staples with minimum 1-inch (25 mm) diameter washer.	12-inches (305 mm) on center (OC) spacing around perimeter and in field at framing locations (maximum framing spacing 24-inches (610 mm). Fasteners are approved for installation on edge NEOPOR ThermaPlus™ joint edge, or with fastener installed in joint, with washer spanning joint edge as shown in Figure 1 and Figure 2 of this report. Optional: Fastener heads can be taped.	Optional: ½'' (13 mm) complying with the applicable code. Where installed direct to framing as sheathing, installation is to comply with Section 8.2.

Note 1: Where installed as exterior sheathing direct to framing, see Section 4.3.1.1.2 and 8.2 of this report.

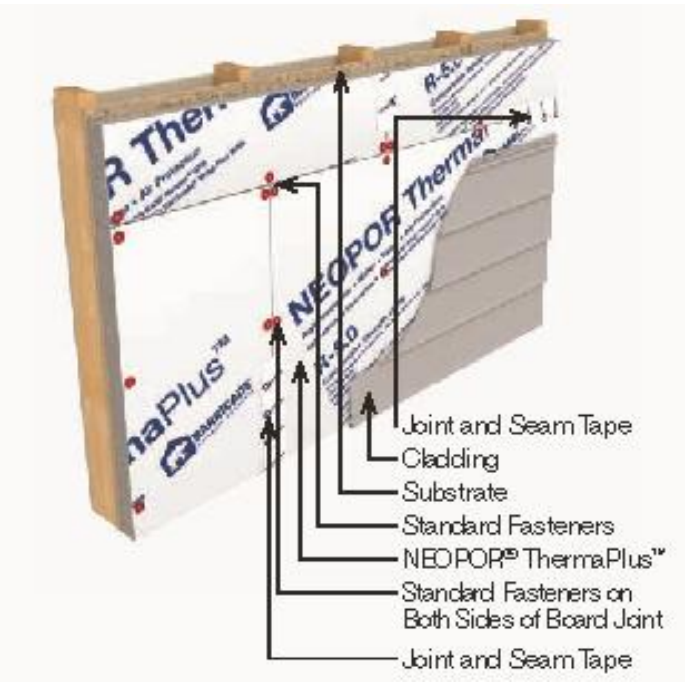

Figure 1. Standard NEOPOR ThermaPlus™ Installation With Fasteners on Each Joint Edge.

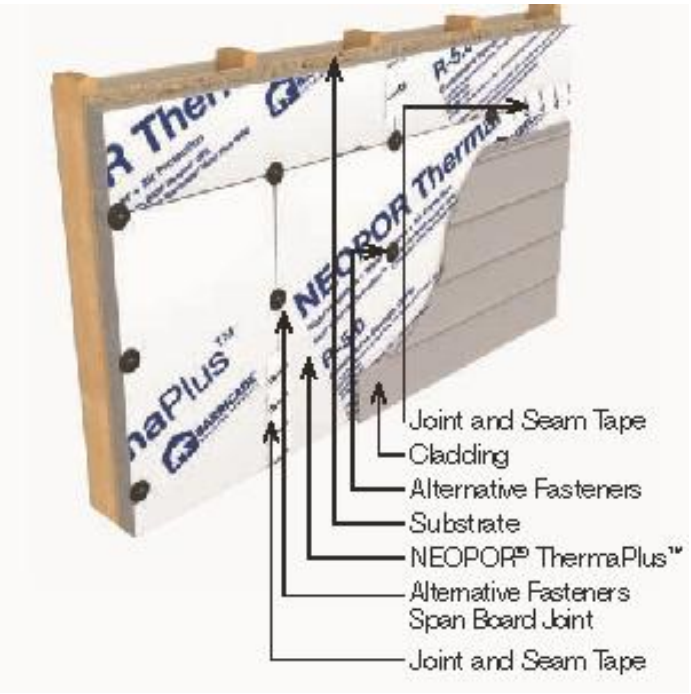

Figure 2. Alternate NEOPOR ThermaPlus™ Installation with Fastener Washer Spanning Joint.

8.4 NEOPOR THERMAPLUS™ WATER-RESISTIVE BARRIER DETAILS:

TYPE	MIN. THICK. inches (mm)	ORIENT. TO FRAMING	APPROVED SEAM TAPE	JOINT TYPES	FASTENERS	FASTENER DETAILS	SHEATHING[1]
II, IX	1-1/16 (27)	Parallel or Perpendicular	Typar Construction Tape, 3M 8087 and 8087CW, Barricade Seam Tape	Square Edge, Flap[2]	Nails, screws or staples with minimum 1-inch (25 mm) diameter washer.	12-inches (305 mm) on center (OC) spacing around perimeter and in field at framing locations (maximum framing spacing 24-inches (610 mm). Fasteners are approved for installation around perimeter and in the field of NEOPOR ThermaPlus™ as shown in Figure 3 of this report. Fastener heads require taping with minimum 2-inch x 2-inch (51 mm x 51 mm) size tape.	Optional: ½'' (13 mm) complying with the applicable code.

Note 1: Where installed as exterior sheathing direct to framing, see Section 4.3.1.1.2 and 8.2 of this report.
Note 2: All flaps at the seam are sealed in accordance with section 2.2.2.4 of this report.

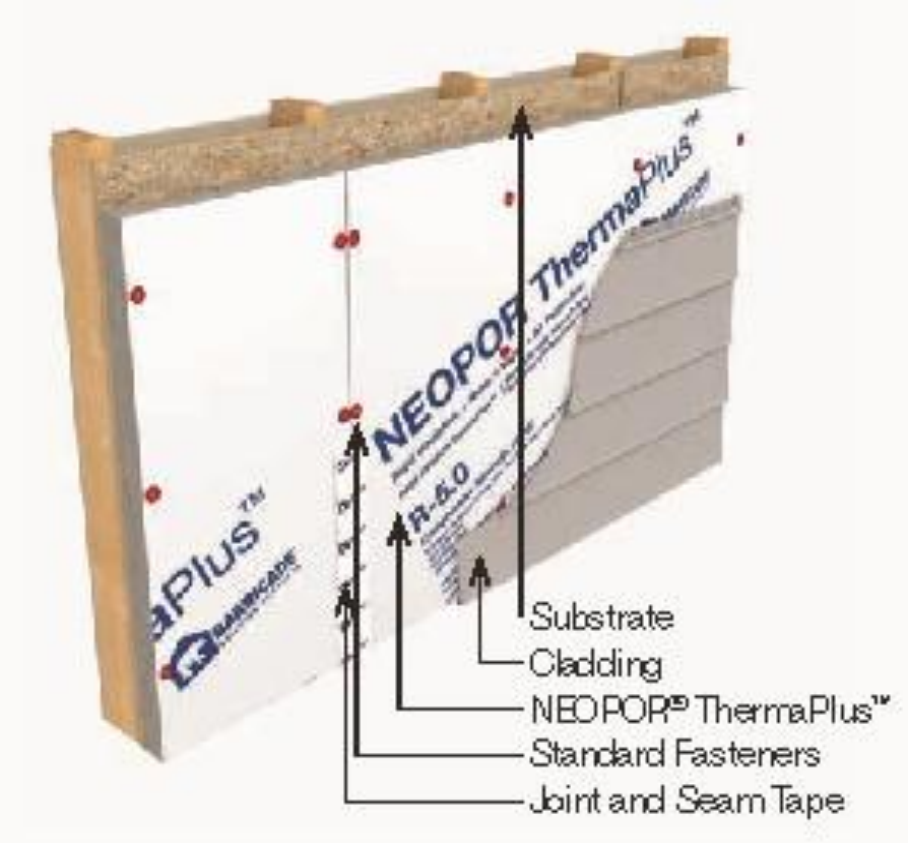

Figure 3. Standard NEOPOR ThermaPlus™ Water-Resistive Barrier Insulation[1,2,3]

1: Fastener heads require taping (not shown).
2: Sheathing shown is optional.
3: Furring strips installation not shown. Where furring strips are installed, furring strips are to be anchored into underlying studs without relying on NEOPOR ThermaPlus™ for support.

8.5 NEOPOR THERMAPLUS™ AIR-BARRIER ASSEMBLY DETAILS:

TYPE	MIN. THICK. inches (mm)	ORIENT. TO FRAMING	APPROVED SEAM TAPE	JOINT TYPES	FASTENER	FASTENER DETAILS	SHEATHING	PENETRATION TREATMENT[1]
II, IX	1-1/16 (27)	Parallel or Perpendicular	4-inch (102 mm) width 3M 8087[2] seam tape.	Square Edge	3-inch (76 mm) length TruFast THERMAL-GRIP with 2-inch (51 mm) plastic diameter washers.	12-inches (305 mm) on center (OC) spacing around perimeter and in field at framing locations. Fasteners are approved for installation around perimeter and in the field of NEOPOR ThermaPlus™ as shown in Figure 4 of this report. Optional: Fastener heads can be taped.	Minimum ½-inch (13 mm) exterior gypsum complying with ASTM C1177 or equivalent.	Brick Ties, Electrical Boxes: Tremco Spectrem 2. ≤ 4-inch (102 mm) Ducts and Piping: Barricade Ulti™ Flashing Tape. Window Openings: 6-inch width (152 mm) Barricade Conform Flashing Tape. Wall to Foundation: Henry Blueskin SA LowTemp applied with primer, overlapped 4.5-inches (114 mm)

Note 1: Penetrations are to be flashed following general approved construction methodology.
Note 2: See Section 2.2.2.2 of this report for product details.

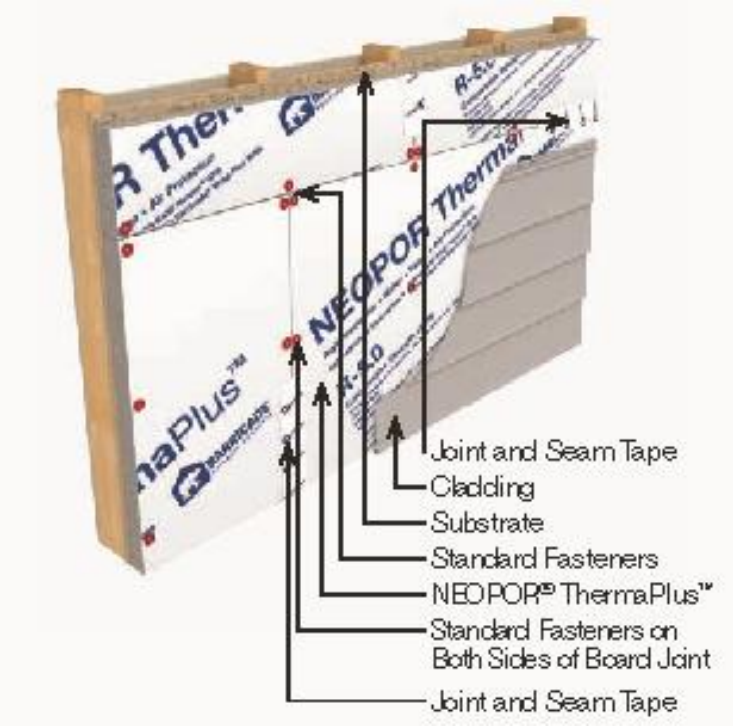

Figure 4. Standard NEOPOR ThermaPlus™ Installation With Fasteners on Each Joint Edge.

8.6 NEOPOR ThermaPlus™ Type I-IV Construction Wall Assembly[1]

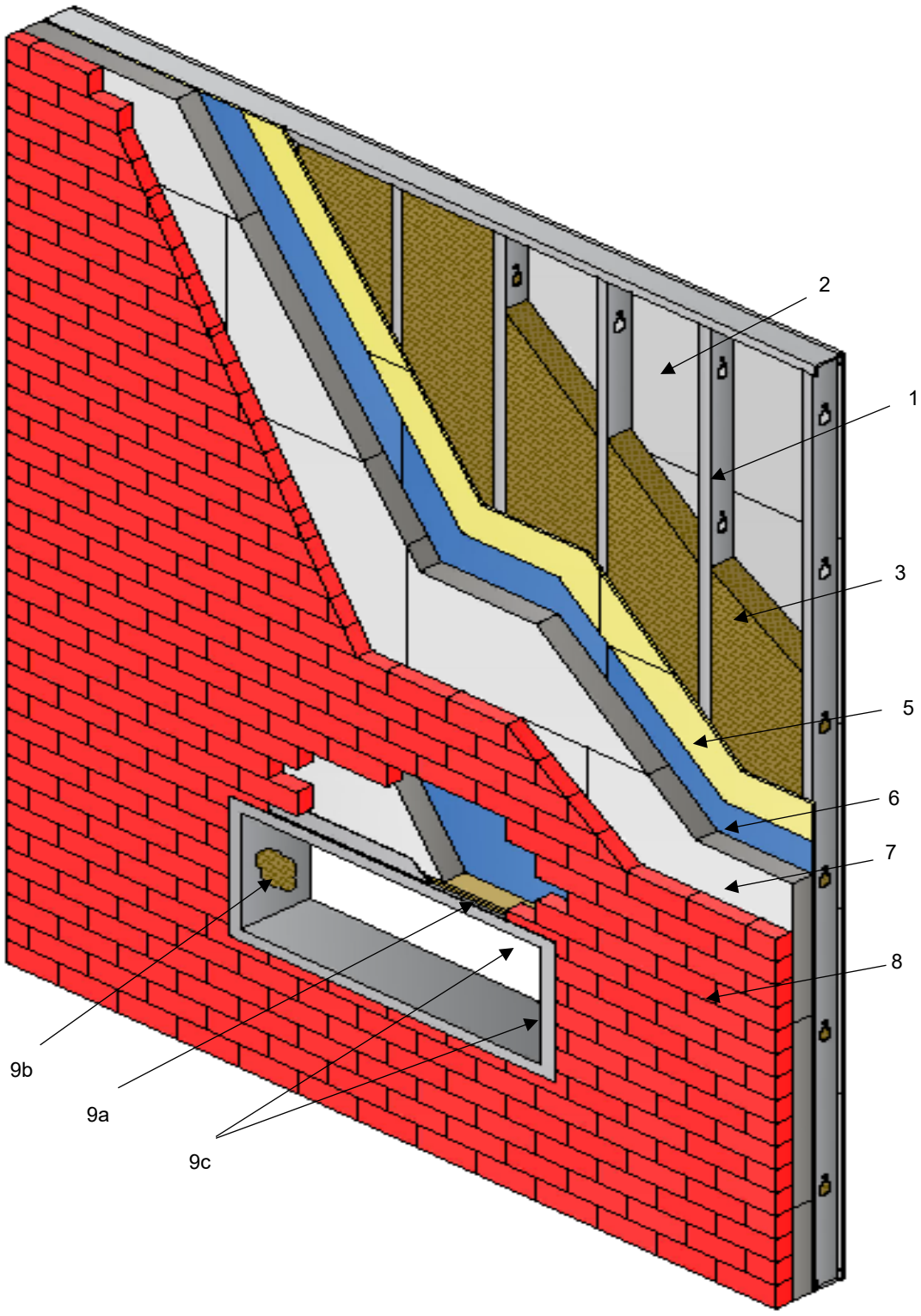

Figure 5. NEOPOR ThermaPlus™ Types I-IV Construction (NFPA 285) Approved Assemblies

ITEM	WALL COMPONENT	APPROVED TYPE
1	Base Wall	1. Concrete. 2. Masonry. 3. Steel Studs at maximum 24 inches (410 mm) spacing, minimum 20-gauge of 3-5/8-inches depth.
2	Interior Finish (Base Wall 3 Requirement)	1. 5/8-inch (16 mm) Type X gypsum board, listed and labeled compliant to ASTM C1396 by an independent third-party accredited to ISO 17065, finished in accordance with the applicable code. Joints and fastener locations to have a minimum Level 2 finish per ASTM C840.
3	Stud Cavity Insulation (Optional) (Base Wall 3 Requirement)	1. None. 2. Faced fiberglass or mineral wool batt compliant with ASTM C665 (any thickness). 3. Unfaced fiberglass or mineral wool batt classified noncombustible (must fill cavity where no exterior sheathing board is used). 4. BASF Waltite® HP+, Walltite® US, Walltite® US-N or Spraytite® 81206 for entire cavity depth to maximum 1-inch (25 mm) airgap. 5. BASF Spraytite® 178 for entire cavity depth (no airgap permitted).
4	Fire Blocking (not shown)	1. Minimum 4-inch (102 mm) thickness mineral wool or mineral fiber insulation at minimum 4.0 lbs/ft^3 (64 kg/m^3) density, friction fit or with Z-clips or equivalent methods at the floor line in each stud cavity to securely attach fire blocking.
5	Exterior Sheathing (Base Wall 3 Requirement)	1. None (for use with stud cavity insulation item 2 only). 2. Minimum ½-inch (13 mm) Type X complying with ASTM C1177, listed and labeled by an independent third-party accredited to ISO 17065. 3. Minimum 5/8-inch (16 mm) Type X gypsum board listed and labeled compliant to ASTM C1396 or ASTM C1177, by an independent third-party accredited to ISO 17065.
6	Water-Resistive Barrier (Where NEOPOR ThermaPlus™ is used as Item 7, Use Option 1 Where NEOPOR ThermaPlus™ is used as exterior continuous insulation, use Options 2 or 3)	1. None. 2. 1 layer Barricade Building Products Barricade Plus Protective House Wrap. 3. Any of the following, applied per individual manufacturer instruction: a) Tremco EXOAir 130 or EXOAir 230 b) Grace Perm-A-Barrier VPS, AWM, VPL, NPS, NPL, NPL 10, VPL LT c) CCW Barritech NP, VP, VP LT, FireResist 705VP or FireResist 705FR-A Prosoco R-Guard Car-5, R-Guard VB, R-Guard MVP (NLA), R-Guard Spray Wrap (NLA), R-Guard Spraywrap MVP Note: NLA = No Longer Available, but may be used if needed. d) STO Emerald Coat. e) Dow Corning DefendAir 200 Low Temp (now known only as DefendAir 200 f) Hohmann & Barnard Enviro-Barrier VP or Enviro-Barrier. g) Air Bloc 31 MR2-Henry Co. h) AIR-SHIELD™ LMP2 (black only) - W.R. Meadows. i) Backstop® NT2 – Dryvit. j) Barritech™ VP2, Fire-Resist Barritech™ NP2 – Carlisle. k) CCW-705FR with CCW-702WB Primer NP2 – Carlisle. l) Green Guard® Max Building Wrap – Pactiv. m) Perm-A-Barrier'8 Aluminum Wall Membrane with WB Primer2 - Grace Construction Products. n) Perm-A-Barrier® VPS2 - Grace Construction Products. o) Tyvek* Fluid Applied WB+™, DuPont (L) Wall Guardian™ FW/100A2- STS Inc. [Note: All barriers to be installed at recommended application rates per manufacturer's installation instructions.
7	Exterior Insulation With Water-Resistive Barrier[2] & Air-Barrier[3] over Sheathing Use 1 and choose one Type up to maximum thickness.	NEOPOR ThermaPlus™ laminated with Barricade Plus, Protective House Wrap of the following types: 1. Type XI of density 0.75 lbs/ft^3 (12.0 kg/m^3) at up to 11.5 inches (292 mm). max R- 54 & 5 PSI Compressive[4].Type I of density 1.0 lbs/ft^3 (16.0 kg/m^3) at up to 9 inches (229 mm). max R-42 & 10 PSI Compressive[4]. 2. Type VIII of density 1.25 lbs/ft^3 (20.0 kg/m^3) at up to 8 inches (203 mm). max R-38 &15 PSI Compressive[4]. 3. Type II of density 1.5 lbs/ft^3 (24.0 kg/m^3) at up to 7 inches (178 mm). max R-33 & 20 PSI Compressive. 4. Type IX of density 2.0 lbs/ft^3 (32 kg/m^3) at up to 4.5 inches (114 mm). max R-21 & 25 PSI Compressive. NEOPOR ThermaPlus™ EPS insulation component has a potential heat of combustion of 16,551 Btu/lbs.

8	Approved Exterior Claddings[5]	1. Brick Veneer – Minimum 3-5/8-inch (92 mm) thickness, installed with 1-inch to maximum 2-inch (25-51 mm)) air space. 2. Concrete – Minimum 2-inch (51 mm) thickness with maximum 2-inch (51 mm) air gap. 3. Concrete Masonry - Minimum 2-inch (51 mm) thickness with maximum 2-inch (51 mm) air gap. 4. Precast Stone Veneer – Minimum 1-1/2-inch (38 mm) thickness. 5. Natural Stone - Minimum 2-inch (51 mm) thickness of types: marble, granite, limestone, or sandstone with closed joint installation. 6. Terra Cotta - Minimum 1-1/2-inch (38 mm) thickness, of solid type only (hollow type not permitted).
9	Window Opening	a) Header 2 layers of ¾-inch (19 mm) plywood mechanically attached to steel header with minimum #6 self-tapping screws spaced at 6-inches (152 mm) on center spacing, two rows with a row at each steel header edge. b) Noncombustible Insulation Protection: Minimum 1-inch (25 mm) thickness mineral fiber or alternate noncombustible insulation installed extending from the exterior gypsum sheathing surface to the interior surface of exterior cladding at jambs. Noncombustible insulation may be used to replace ¾-inch (19 mm) plywood layers, where installed at 1-inch thickness as installed at jambs. c) Window Flashing: Minimum 25-gauge flashing anchored to underlying jambs, header and sill in accordance with the applicable code.

Note 1: Exterior wall assemblies described above evaluated to NFPA 285, are eligible for use in load-bearing applications.
Note 2: Installation where NEOPOR ThermaPlus™ is the Water-Resistive Barrier is to comply with Section 8.4 of this report.
Note 3: Installation where NEOPOR ThermaPlus™ is the air-barrier, installation is to comply with Section 8.5 of this report.
Note 4: Installation of noted Type XI, I, and VIII are for use as exterior insulation only, and require a code complying Water-Resistive Barrier outlined in Item 6.
Note 5: Connection of the exterior cladding is to penetrate the underlying structural elements, and not rely on the exterior NEOPOR ThermaPlus™ for anchorage. Spacing and fastener type are to match the Engineering Design for resisting intended service loads. Design and connection of exterior cladding is outside the scope of this report.

8.7 NEOPOR THERMAPLUS™ THERMAL INSULATION TYPES AND HEAT POTENTIAL CAPACITY

APPROVED TYPE PER ASTM C578	MINIMUM DENSITY lbs/ft^3 (kg/m^3)	MEAN POTENTIAL HEAT OF COMBUSTION Btu/lb (KJ/kg)	MEAN POTENTIAL HEAT OF COMBUSTION PER UNIT AREA[1] Btu/ft^2 (mJ/m^2)
XI	0.7 (11.2)	17 067 (39 698)	996 (11.31)
I	0.9 (14.4)	16 883 (39 269)	1407 (15.98)
II+[1]	1.45 (23.2)	17 188 (39 979)	2149 (24.40)
IX	1.80 (28.8)	16 809 (39 097)	2802 (31.82)

Note 1: Type II+ is nominal 1.5 lbs/ft^3 density target. This type is not ASTM C578 defined.

10.0 MULTIPLE LISTEES

1. IntegraTherm, LLC
   New Bethlehem, PA
   USA

11.0 ELIGIBILITY OF REPORT

QAI's Code Evaluation Report complies with the 2021 / 2018 / 2015 IBC Section 104.11 *Alternative materials, design and methods of construction and equipment* subsection 104.11.1 *Research Reports*. Supporting data has been evaluated by QAI for compliance of the noted materials and assemblies to the applicable code by QAI, and *approved* source as detailed below.

The attached report has been reviewed by a QAI Registered Professional Engineer approved by the specific state Board of Professional Engineers noted on the specific P.E. seal(s).

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1 on Independence, Section 1703.1.2 on Equipment and Section 1703.1 on Personnel.

This Evaluation report has been designed to meet the performance requirements of IBC Section 1703.4 and contains the required information to show the product, material or assembly meets the applicable code requirements.

The product is labeled per section IBC 1703 and subject to follow-up inspection per IBC 1703.6 using QAI IAS accredited ISO/IEC 17020 inspection program (see IAS AA-723).

For more information regarding QAI Laboratories, please visit www.qai.org.

The above is an example of the QAI registered Listing mark. The Listing mark may only be used by the Report Holder per the QAI service agreement on products defined in this report. The 'us' indicator in the 4 o'clock position indicates the product complies with the properties evaluated with limitations outlined in this report for use in the US market. A 'c' indicator in the 8 o'clock position indicates the product has been evaluated for use in the Canadian market.

11.0 REFERENCED STANDARDS

ANSI/FS 100 *Standard Requirements for Wind Pressure Resistance for Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies*.
ASTM E2357 *Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies*.
ASTM E84 *Standard Test Method for Surface Burning Characteristics of Building Materials.*
ASTM C578 *Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*.
ASTM E2178 *Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials*.
ASTM E331 *Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference*.
ASTM E283 *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.*
ASTM E96 *Standard Test Methods for Water Vapor Transmission of Materials*.
NFPA 285 *Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Non- load-bearing Wall Assemblies Containing Combustible Compartments*.
NFPA 259 *Standard Test Method for Potential Heat of Building Materials*.