Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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OX IsoRED Ci®, IsoRED Ci® XS, IsoRED Max®, IsoRED Max® WF, IsoRED Max® GF, IsoRED Max® LD, and IsoRED Max® HD Foam Plastic Insulating Sheathing

Trade Secret Report Holder:

Amrize Building Envelope, LLC

Phone: 269-435-2425 Website: www.oxengineeredproducts.com

CSI Designations:

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 20 00 - Thermal Protection

Section: 07 21 00 - Thermal Insulation

Section: 07 22 00 - Roof and Deck Insulation

Section: 07 25 00 - Water-Resistive Barriers/Weather Barriers

Section: 07 27 00 - Air Barriers

1 Innovative Products Evaluated[1]

1.1 IsoRED Polyiso Foam Insulated Sheathing Products:

1.1.1 IsoRED Ci Polyiso Foam Insulated Sheathing

1.1.2 IsoRED Ci XS Polyiso Foam Insulated Sheathing

1.1.3 IsoRED Max Polyiso Foam Insulated Sheathing

1.1.4 IsoRED Max WF Polyiso Foam Insulated Sheathing

1.1.5 IsoRED Max GF Polyiso Foam Insulated Sheathing

1.1.6 IsoRED Max LD Polyiso Foam Insulated Sheathing

1.1.7 IsoRED Max HD Polyiso Foam Insulated Sheathing

2 Product Description and Materials

2.1 *IsoRED Ci and IsoRED Ci XS*

2.1.1 IsoRED Ci and IsoRED Ci XS are Type I, Class 1, Dual Faced Rigid Cellular Polyisocyanurate Insulation Board products as defined in ASTM C1289.

2.1.2 IsoRED Ci and IsoRED Ci XS consist of a proprietary polyisocyanurate rigid board with facers on both sides. The facers are designed with a base foil layer, combined with layers of other material(s).

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2.2 *IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD*

2.2.1 These products are Type I, Class 2, Dual Faced Rigid Cellular Polyisocyanurate Insulation Board products as defined in ASTM C1289.

2.2.2 These products consist of a proprietary polyisocyanurate rigid board with facers on both sides. The facers are designed with a base foil layer. Facer material thicknesses vary by product.

2.3 Examples of logos of the innovative products evaluated in this report are shown in **Figure 1**, **Figure 2**, and **Figure 3**.



Figure 1. IsoRED Ci



Figure 2. IsoRED Ci XS

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Figure 3. IsoRED Max

2.4 *Material Availability*

2.4.1 *Thickness:*

2.4.1.1 *IsoRED Ci and IsoRED Ci XS:*

2.4.1.1.1 Range from 0.5" (12.7 mm) up to 2.0" (50.8 mm)

2.4.1.2 *IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD:*

2.4.1.2.1 Up to 4.0" (102 mm)

2.4.2 *Standard Product Width:*

2.4.2.1 48" (1,219 mm)

2.4.3 *Standard Product Length:*

2.4.3.1 96" (2,438 mm)

2.4.3.2 108" (2,743 mm)

2.4.3.3 120" (3,048 mm)

2.5 As needed, review material properties for design in **Section 6** and the regulatory evaluation in **Section 8**.

3 Definitions[2]

3.1 New Materials[3] are defined as building materials, equipment, appliances, systems, or methods of construction, not provided for by prescriptive and/or legislatively adopted regulations, known as alternative materials.[4] The design strength and permissible stresses shall be established by tests[5] and/or engineering analysis.[6]

3.2 Duly authenticated reports[7] and research reports[8] are test reports and related engineering evaluations that are written by an approved agency[9] and/or an approved source.[10]

3.2.1 This report utilizes intellectual property and/or trade secrets to create public domain material properties for commercial end-use.

3.2.1.1 This report protects confidential Intellectual Property and trade secrets under the regulation, 18.US.Code.90, also known as Defend Trade Secrets Act of 2016 (DTSA).[11]

3.3 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited. DrJ Engineering, LLC (DrJ) is accredited and listed in the ANAB directory.

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3.4 An approved source is *"approved"* when a professional engineer (i.e., Registered Design Professional, hereinafter RDP) is properly licensed to transact engineering commerce. The regulatory authority governing approved sources is the state legislature via its professional engineering regulations.[12]

3.5 Testing and/or inspections conducted for this duly authenticated report were performed by an ISO/IEC 17025 accredited testing laboratory, an ISO/IEC 17020 accredited inspection body, and/or a licensed RDP.

3.5.1 The Center for Building Innovation (CBI) is ANAB[13] ISO/IEC 17025 and ISO/IEC 17020 accredited.

3.6 The regulatory authority shall enforce[14] the specific provisions of each legislatively adopted regulation. If there is a non-conformance, the specific regulatory section and language of the non-conformance shall be provided in writing[15] stating the nonconformance and the path to its cure.

3.7 The regulatory authority shall accept duly authenticated reports from an approved agency and/or an approved source with respect to the quality and manner of use of new materials or assemblies as provided for in regulations regarding the use of alternative materials, designs, or methods of construction.[16]

3.8 ANAB is an International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA) signatory. Therefore, recognition of certificates and validation statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA with the appropriate scope shall be approved.[17] Thus, all ANAB ISO/IEC 17065 duly authenticated reports are approval equivalent,[18] and can be used in any country that is an MLA signatory found at this link: https://iaf.nu/en/recognised-abs/

3.9 Approval equity is a fundamental commercial and legal principle.[19]

4 Applicable Local, State, and Federal Approvals; Standards; Regulations[20]

4.1 *Local, State, and Federal*

4.1.1 Approved in all local jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured local jurisdictions: Austin, Baltimore, Broward County, Chicago, Clark County, Dade County, Dallas, Detroit, Denver, DuPage County, Fort Worth, Houston, Kansas City, King County, Knoxville, Las Vegas, Los Angeles City, Los Angeles County, Miami, Nashville, New York City, Omaha, Philadelphia, Phoenix, Portland, San Antonio, San Diego, San Jose, San Francisco, Seattle, Sioux Falls, South Holland, St. Louis County, Texas Department of Insurance, and Wichita.[21]

4.1.2 Approved in all state jurisdictions pursuant to ISO/IEC 17065 duly authenticated report use, which includes, but is not limited to, the following featured states: California, Florida, New Jersey, Oregon, New York, Texas, Washington, and Wisconsin.[22]

4.1.3 Approved by the Code of Federal Regulations Manufactured Home Construction: Pursuant to Title 24, Subtitle B, Chapter XX, Part 3282.14[23] and Part 3280[24] pursuant to the use of ISO/IEC 17065 duly authenticated reports.

4.1.4 Approved means complying with the requirements of local, state, or federal legislation.

4.2 *Regulations*

4.2.1 *IBC – 18, 21, 24: International Building Code®*

4.2.2 *IRC – 18, 21, 24: International Residential Code®*

4.2.3 *CBC – 19, 22: California Building Code (Title 24, Part 2)*

4.2.4 *FBC-B – 20, 23: Florida Building Code[25] – Building (FL 28290)*

4.2.5 *FBC-R – 20, 23: Florida Building Code[25] – Residential (FL 28290)*

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4.3 *Standards*

4.3.1 *ANSI/ABTG-FS 100: Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies*

4.3.2 *ASTM C203: Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation*

4.3.3 *ASTM C209: Standard Test Methods for Cellulosic Fiber Insulating Board*

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

4.3.5 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

4.3.6 *ASTM D2126: Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging*

4.3.7 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

4.3.8 *ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials*

4.3.9 *ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference*

4.3.10 *ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls*

4.3.11 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*

4.3.12 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*

4.3.13 *NFPA 259: Standard Test Method for Potential Heat of Building Materials*

4.3.14 *NFPA 285-12: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*

4.3.15 *NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*

5 Listed[26]

5.1 Equipment, materials, products, or services included in a List published by a nationally recognized testing laboratory (e.g., CBI), an approved agency (e.g., CBI and DrJ), and/or an approved source (e.g., DrJ), or other organization(s) concerned with product evaluation (e.g., DrJ), that maintains periodic inspection (e.g., CBI) of production of listed equipment or materials, and whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.

6 Tabulated Properties Generated from Nationally Recognized Standards

6.1 *General*

6.1.1 IsoRED Ci and IsoRED Ci XS are Foam Plastic Insulating Sheathing (FPIS) used as wall sheathing in accordance with IBC Section 2603 and IRC Section R303[27] for Type V construction.

6.1.2 IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD are FPIS used as wall sheathing in accordance with IBC Section 2603 for Types I, II, III, IV, and V construction.

6.1.3 Except as provided for in **Section 6.7**, IsoRED Ci and IsoRED Ci XS must be used with full protection from the interior of the building by an approved thermal barrier in accordance with IBC Section 2603.4 and IRC Section R303.4.[28]

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6.1.4 IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD are approved for use without the protection of a thermal barrier in accordance with IBC Section 2603.10 and IRC Section R303.6,[29] when applied to walls or ceilings.

6.1.5 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

6.2 *Transverse Loads*

6.2.1 IsoRED Ci and IsoRED Ci XS may be used to resist wind loads transverse to the face of the wall, as shown in **Table 1**.

6.2.2 The required component and cladding loads to be resisted are found in IBC Section 1609.1.1, IRC Table R301.2.1(1),[30] and IRC Table R301.2.1(2).[31]

6.2.3 As stated in **Section 8.1.4**, performance of IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD for wind pressure resistance is outside the scope of this report.

Table 1. Summary of Transverse Wind Load Resistance of IsoRED Ci and IsoRED Ci XS[7]

IsoRED Ci and IsoRED Ci XS Nominal Thickness (in)	Maximum Stud Spacing (in. o.c.)	Maximum Allowable Design Value[2,3,5,6] (psf)	Fastener Schedule[4]	Maximum Allowable Wind Speed[1] (mph)	
				Allowable Stress Design (ASD) Wind Speed, V_{asd}	Basic Design Wind Speed, V_{ult}
1/2	16	20.6	2" x 0.113" Galvanized Ring Shank Nail with 1" Plastic Cap Spaced 6" Along the Edges and 12" in the Field	90	120
1/2	24	30.3[7]	2" x 0.113" Galvanized Ring Shank Nail with 1" Plastic Cap Spaced 3" Along the Edges and 3" in the Field	110	145
1	16	33.5	1 3/4" x 0.106" Nail with 3/8" Head Spaced 12" Along the Edges and 12" in the Field	120	150
1	24	51.8	2 1/2" x 0.113" Galvanized Ring Shank Nail with 1" Plastic Cap Spaced 3" Along the Edges and 3" in the Field	150	190
1 1/2	16	65.3	2 3/8" x 0.113" Galvanized Smooth Shank, Full Head Nail 16" Along the Edges and 16" in the Field	155	200

SI: 1 in = 25.4 mm, 1-psf = 0.0479 kN/m^2, 1 mph = 1.61 km/h

1. Calculated in accordance with ASCE 7 Chapter 30 and the following assumptions:
2. A building height of 30-feet, GC_p= -1.4 for Zone 5 and an Effective Wind Area of 10ft^2, Topographic Factor: K_{zt}=1.0, Ground Elevation Factor: K_e=1.0, Internal Pressure Coefficient, GC_{pi}=+/-0.18 for an enclosed building, K_d = 0.85 for Component and Cladding, Exposure B
3. V_{ult} is limited to 200 mph.
4. ASD wind speed is determined in accordance with IBC Section 1609.3.1.
5. Any required adjustments to these loads for other site conditions shall be in accordance with the applicable building code.
6. Allowable design wind pressures are determined in accordance with ANSI/ABTG-FS100 with studs spaced a maximum distance as shown above.
7. Fastener schedule shows minimum size of fastener at maximum allowable spacing(s).
8. Tabulated values were determined in accordance with ANSI/ABTG FS 100 for a fully-blocked condition (i.e., all horizontal and vertical sheathing joints supported on blocking or framing members) using a Pressure Equalization Factor (PEF) of 0.9 where the allowable wind pressure is 30-psf or less.
9. Allowable wind pressures greater than 30-psf were determined using a PEF of 1.0.
10. Requires 1/2" gypsum conforming to ASTM C1396, to be installed on the interior side of the wall.

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6.3 *Drainage Efficiency*

6.3.1 IsoRED Polyiso Foam Insulated Sheathing Products were tested in accordance with ASTM E2925, Section 6.2, Annex A, and meet or exceed the > 90% drainage efficiency requirement of the IBC and IRC for Moist (A) and Marine (C) climate zones per IBC Section 2510.6.2, when installed in accordance with the manufacturer installation instructions and this report.

6.4 *Thermal Resistance (R-Value)*

6.4.1 IsoRED Polyiso Foam Insulated Sheathing Products meet the continuous insulating sheathing requirements complying with the provisions of IRC Section N1102, IECC Section R402, and IECC Section C402.

6.4.2 These products have the thermal resistance shown in **Table 2**.

Table 2. Thermal Resistances of IsoRED Polyiso Foam Insulated Sheathing Products[1,2]

Product	Nominal Thickness (in)	R-Value at 75° F Mean Temperature (ft^2•°F•hr/BTU)
IsoRED Ci and IsoRED Ci XS	2	13.0
	1 1/2	10.0
	1	6.5
	1/2	3.3
IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD	4	25.2
	3 1/2	22.1
	3	19.0
	2 1/2	16.0
	2	13.0
	1 1/2	10.0
	1	6.5
	3/4	5.0
	1/2	3.3

SI: 1 in = 25.4 mm, 1 [(ft^2•°F•hr/BTU] = 0.176 [(K•m^2)/W]

1. Thermal values are determined using the ASTM C518 test method at 75° F mean temperature on material conditioned according to ASTM C1289 Section 11.1.
2. IsoRED Polyiso Foam Insulated Sheathing Products maintain a 98% effective R-Value for 20° F mean temperature

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6.5 *Air Barrier*

6.5.1 Wall and ceiling assemblies constructed with IsoRED Polyiso Foam Insulated Sheathing Products are used to meet air barrier requirements in accordance with IRC Section N1102, IECC Section R402, and IECC Section C402.

6.5.2 All penetrations shall be flashed and sealed in accordance with the flashing manufacturer installation instructions. Self-adhered flashing tape shall meet AAMA 711 (FortiFlash® Butyl or equivalent).

6.5.3 IsoRED Polyiso Foam Insulated Sheathing Products are permitted for use as air barrier materials having an air permeance of less than 0.02 L/(s•m^2) at 75 Pa pressure difference when tested in accordance with ASTM E2178, in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.[32]

6.6 *Water-Resistive Barrier (WRB)*

6.6.1 IsoRED Polyiso Foam Insulated Sheathing Products are approved WRB in accordance with IBC Section 1403.2 and IRC Section R703.2, when installed with 2$^7/_8$" OX SeamTape®, $^7/_8$" IsoRED® WF Seam Tape, or 2$^7/_8$" IsoRED® GF Seam Tape. Flashing tape with release liner may be required for effective taping of inside and outside corners. See the manufacturer product information for further details.

6.6.2 IsoRED Ci and IsoRED Ci XS shall be installed with board joints placed directly over exterior framing spaced a maximum of 24" (610 mm) o.c. The fasteners used to attach the board shall be installed in accordance with **Section 9**.

6.6.3 A separate WRB may also be provided. If a separate WRB method is used, taping of the sheathing joints is not required.

6.6.4 Flashing of penetrations shall comply with the applicable code and must be installed at all sheathing penetrations. Use qualified flashing tape such as ArcticFLASH® Synthetic Flashing, HomeGuard Flexible Butyl Flashing, or HomeGuard RA-plus® Flashing. See **Figure 4**, **Figure 5**, and **Figure 6** for typical penetration flashing details.

6.6.5 *Flashing Details:*

6.6.5.1 Typical Flanged (**Figure 4**)

6.6.5.2 Unflanged (**Figure 5**)

6.6.5.3 Penetration and Flanged Window (**Figure 6**)

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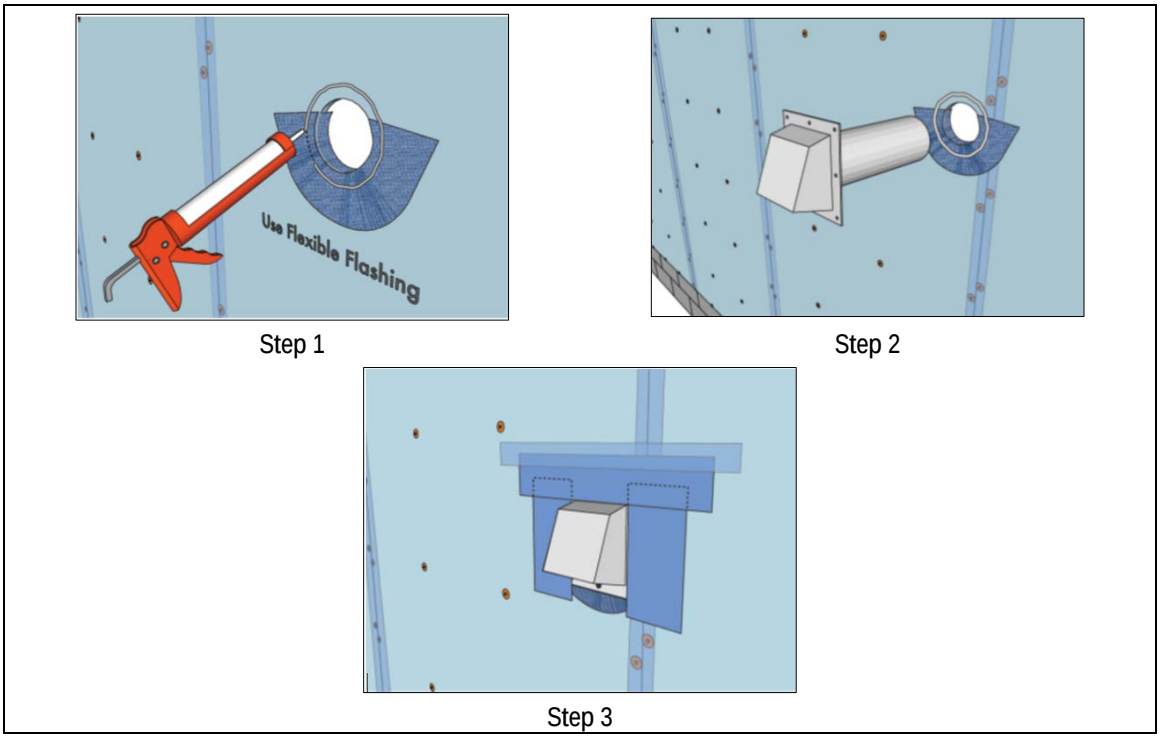


Figure 4. Typical Penetration Flashing Detail – Flanged

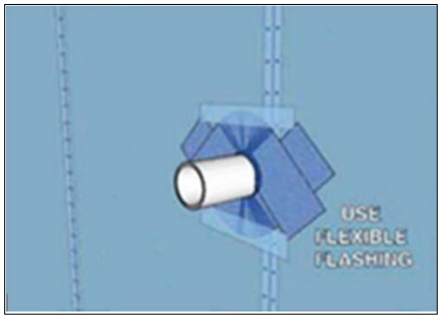


Figure 5. Typical Penetration Flashing Detail – Unflanged

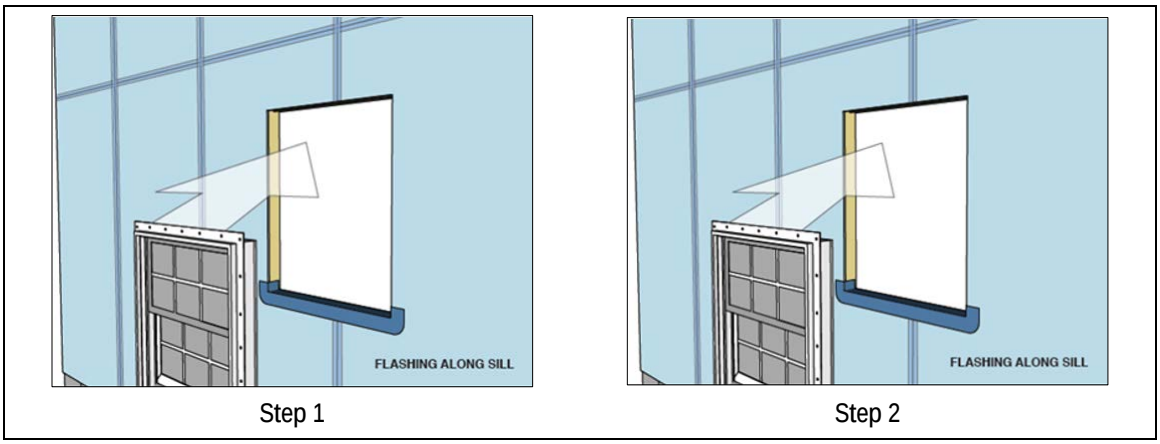


Figure 6. Typical Window Flashing Detail

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6.7 *Fire Safety Performance*

6.7.1 *Surface Burning Characteristics:*

6.7.1.1 IsoRED Polyiso Foam Insulated Sheathing Products have the flame spread and smoke developed ratings as shown in **Table 3** when tested in accordance with ASTM E84 per IBC Section 2603.3 and IRC Section R303.3.[33]

Table 3. Surface Burning Performance of IsoRED Polyiso Foam Insulated Sheathing Products

Product	Flame Spread	Smoke Developed	Classification
IsoRED Ci and IsoRED Ci XS[1]	< 75	< 450	Class B
IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD[2]	< 25	< 450	Class A

1. Tested in accordance with ASTM E84, with maximum foam thickness of 2".
2. Tested in accordance with ASTM E84, with maximum foam thickness of 4".

6.7.2 *Vertical and Lateral Fire Propagation:*

6.7.2.1 IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD were tested to assess performance with regard to vertical and lateral fire propagation in accordance with NFPA 285-12 and 2018 IBC Section 2603.5.5.

6.7.2.2 Engineering analysis has also been conducted to assess substitution of other products within the approved wall assemblies.

6.7.2.3 The wall assemblies listed in **Table 4** and **Table 5** are approved for use in buildings of Type I-IV construction.

Table 4. Approved NFPA 285 Wall Assemblies[1,2,3,4]

Wall Component	Materials
Base Wall System Use either 1, 2, 3, or 4 *Note:* May use 4 optionally when FRTW framing is allowed by code	1. Cast Concrete Wall 2. Concrete Masonry Wall 3. 20-gauge (minimum) 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 1 layer – 5/8" thick Type X gypsum wallboard on interior b. Lateral bracing every 4' 4. Where allowed in Types I-IV construction, FRTW (Fire Retardant Treated Wood) studs complying with 2018 IBC Section 2303.2, minimum nominal 2 x 4 spaced at a maximum 16" o.c. a. 5/8" (minimum) Type X gypsum wallboard interior b. Wall braced at mid-height and fire-stopped at top and bottom
Fire-Stopping in Stud Cavities at Floor Lines Use items 1 or 2 *Note:* As an option, use 2 with FRTW framing.	1. Any approved 4-pcf mineral fiber-based safing insulation in each stud cavity at floor line. Safing thickness must match stud cavity depth. 2. Solid FRTW fire blocking at floor line when Base Wall System, Item 4 is used.

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Table 4. Approved NFPA 285 Wall Assemblies[1,2,3,4]

Wall Component	Materials
Cavity Insulation Use any option 1 - 14	1. None 2. 1 1/2" (minimum) BASF WALLTITE® 2-pcf SPF (or equivalent) up to full cavity fill 3. 1 1/2" (minimum) Premium Spray Products Foamsulate 20 up to full cavity fill 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Batt or board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Icynene Classic, Classic Plus, Classic Ultra or Classic Ultra Select, MD-R-210, MD-C-200, or ProSeal™. Partial cavity filled with a maximum air space of 2" or full cavity fill not exceeding 7 5/8". Use with 1/2" exterior gypsum sheathing (minimum) 8. NCFI Polyurethanes, full cavity depth or less of InsulBloc®, InsulStar®, InsulStar® Plus, or ThermalStop™ closed cell (2.0 lb/ft³) spray polyurethane foam applied using sheathing as substrate and covering the width of the cavity. Use with 1/2" exterior gypsum sheathing (minimum) 9. SWD Urethane Quik-Shield 112 spray polyurethane foam applied using 5/8" Type X sheathing as substrate. Air gap must not exceed 2 1/2" 10. Demilec Sealection 500 or HeatLok Soy 200, up to full cavity fill. Use with 5/8" Type X exterior gypsum sheathing 11. Accella Polyurethane Bayseal® OC and OCX or Bayseal® CC, up to full cavity fill using minimum 1/2" exterior gypsum sheathing 12. Lapolla™ Foam-Lok™ FL 2000 with 5/8" Type X exterior sheathing in 3 5/8" studs (maximum) 13. Any cavity insulation which has been tested per ASTM E1354 (at a minimum of 20 kw/m² heat flux) and shown by analysis to be of equivalent or lesser flammability (based on T_{ign}, Pk. HRR) than the foam tested in Item 2 or 3 above. 14. Enverge EasySeal .5®, Enverge SucraSeal®, 3 5/8" (maximum); Use with 1/2" exterior sheathing
Exterior Sheathing Use 1, 2, or 3 (with limitations noted in Cavity Insulation Allowances *Note:* Exterior FRTW sheathing or gypsum wallboard is optional for Base Walls 1 and 2	1. None (only with Cavity Insulations 1, 2, 4, 5, or 6) 2. Minimum 1/2" exterior gypsum sheathing (unless 5/8" Type X exterior sheathing is otherwise specified with cavity insulations) 3. 1/2" (minimum) FRTW structural panels complying with 2018 IBC Section 2303.2 and installed in accordance with the code requirements for Types I-IV construction
Water-Resistive Barrier Over Base Wall Use 1, 2, or 3 *Note:* Item 3 applies when exterior gypsum sheathing is used.	1. None 2. WRB over Steel Framing: a. Kingspan GreenGuard® Max Building Wrap b. Dupont™ Tyvek® (Various per ESR-2375) c. Dupont™ Weathermate™ d. Dupont™ Weathermate™ Plus e. OX ThermoPLY® 3. WRB over Exterior Sheathing: a. Henry® Air Bloc® 32MR b. Henry® Foilskin® c. Henry® Metal Clad® d. CCW705 FR-A

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Table 4. Approved NFPA 285 Wall Assemblies[1,2,3,4]

Wall Component	Materials
Water-Resistive Barrier Over Base Wall Continued	e. Kingspan® GreenGuard® Max Building Wrap f. Dupont™ Tyvek® (various per ESR-2375) g. Dupont™ Weathermate™ h. Dupont™ Weathermate™ Plus i. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kw/m^2 heat flux) and shown by analysis to be of equivalent or lesser flammability (based on T_{ign}, Pk. HRR) than the exterior insulation foam core or baseline Item 3a above.
Exterior Insulation	1. Up to 4" thick OX IsoRED Max, consisting of a single panel or multiple thinner panels
WRB Over Exterior Insulation Use either 1 or 2	1. Aluminum construction tape as tested (or equivalent), maximum 6" wide over staggered insulation joints 2. For use with all Exterior Cladding options as written below: a. Henry® Foilskin® b. Henry® Metal Clad® c. CCW 705 FR-A d. Kingspan® GreenGuard® Max Building Wrap e. Dupont™ Tyvek® (various per ESR-2375) f. Dupont™ Weathermate™ g. Dupont™ Weathermate™ Plus h. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kw/m^2 heat flux) and shown by analysis to be of equivalent or lesser flammability (based on T_{ign}, Pk. HRR) than those listed above.
Exterior Cladding Use any of 1 through 6 *Note:* Masonry cladding items 2 – 6 do not employ an air gap or open joints.	1. Brick – Nominal 4" clay brick or veneer with maximum 2" air gap behind the brick; Brick ties/anchors 24" o.c. (maximum) 2. Stucco – Minimum $^3/_4$" thick exterior cement plaster and lath with approved WRB over insulation 3. Limestone – Minimum 2" thick, using any standard non-open joint installation technique such as shiplap 4. Natural Stone Veneer – Minimum 2" thick using any standard non-open joint installation technique 5. Terracotta Cladding – Minimum 1$^1/_4$" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap 6. Cast Artificial Stone – Minimum 1$^1/_2$" thick complying with ICC-ES AC51 installed using any standard non-joint installation technique such as shiplap

SI: 1 in = 25.4 mm, 1 BTU/(hr-ft^2) = 0.0032 kW/m^2

1. The assembly combinations created herein, and the various substitutions of products, are based on testing and professional thermal engineering analysis by Priest & Associates Consulting, LLC.
2. Acceptance criteria for ASTM E1354 testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis by Priest & Associates.
3. T_{ign} is the time to ignition from the start of the test until the sheathing ignites. Pk. HRR is the peak heat release rate during the test.
4. Compliant through the 2018 IBC.

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Table 5. Approved NFPA 285 Wall Assemblies[1,2,3,4]

Wall Component	Materials
Base Wall System Use 1, 2, 3, or 4 *Note:* May use 4 optionally when FRTW framing is allowed by code.	1. Cast Concrete Wall 2. Concrete Masonry Wall 3. 20-gauge (minimum) 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 1 layer – 5/8" thick Type X gypsum wallboard on interior b. Lateral bracing every 4' 4. Where allowed in Types I-IV construction, FRTW studs complying with 2018 IBC Section 2303.2, minimum nominal 2 x 4 spaced at a maximum 16" o.c. a. 5/8" (minimum) Type X gypsum wallboard interior b. Wall braced at mid-height and fire-stopped at top and bottom
Fire-Stopping in Stud Cavities at Floor Lines *Note:* Use 1 or 2. As an option, use 2 with FRTW framing	1. Any approved 4-pcf mineral fiber-based safing insulation in each stud cavity at floor line; Safing thickness must match stud cavity depth 2. Solid FRTW fire blocking at floor line when Base Wall System, Item 4 is used
Cavity Insulation Use any option 1 – 14	1. None 2. 1 1/2" (minimum) BASF WALLTITE® 2-pcf SPF (or equivalent) up to full cavity fill 3. 1 1/2" (minimum) Premium Spray Products Foamsulate 20 up to full cavity fill 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Batt or board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Icynene Classic, Classic Plus, Classic Ultra, or Classic Ultra Select, MD-R-210, MD-C-200, or ProSeal. Partial cavity fill with a maximum air space of 2" or full cavity fill not exceeding 7 5/8"; Use with 1/2" exterior gypsum sheathing (minimum) 8. NCFI Polyurethanes, full cavity depth or less of InsulBloc, InsulStar, InsulStar Plus, or ThermalStop™ closed cell (2.0 lb/ft^3) spray polyurethane foam applied using sheathing as substrate and covering the width of the cavity; Use with 5/8" Type X exterior gypsum sheathing (minimum) 9. SWD Urethane Quik-Shield 112 spray polyurethane foam applied using 5/8" Type X sheathing as substrate; Air gap must not exceed 2 1/2" 10. Demilec Sealection 500 or HeatLok Soy 200, up to full cavity fill. Use with 5/8" Type X exterior gypsum sheathing 11. Accella Polyurethane Bayseal® OC and OCX or Bayseal® CC, up to full cavity fill using minimum 1/2" exterior gypsum sheathing 12. Lapolla™ Foam-Lok™ FL 2000 with 5/8" Type X exterior sheathing in 3 5/8" studs (maximum) 13. Any cavity insulation which has been tested per ASTM E1354 (at a minimum of 20 kw/m^2 heat flux) and shown by analysis to be of equivalent or lesser flammability (based on T_{ign}, Pk. HRR) than the foam tested in Item 2 or 3 above 14. Enverge EasySeal .5®, Enverge SucraSeal, 3 5/8" (maximum); Use with 1/2" exterior sheathing

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Table 5. Approved NFPA 285 Wall Assemblies[1,2,3,4]

Wall Component	Materials
Exterior Sheathing Use 1 or 2 *Note:* Exterior FRTW sheathing or gypsum wallboard is optional for Base Walls 1 and 2	1. Minimum 1/2" exterior gypsum sheathing (unless 5/8" Type X exterior gypsum sheathing required when SPF in cavity) 2. 1/2" (minimum) FRTW structural panels complying with 2018 IBC Section 2303.2 and installed in accordance with the code requirements for Types I-IV construction
Water-Resistive Barrier Over Base Wall Use any item 1 - 8	1. None 2. Any WRB that has been tested per ASTM E1354 (at a minimum of 20 kw/m^2) and shown by analysis to be of equivalent or lesser flammability (based on T_{ign}, Pk. HRR) than the exterior insulation foam core or baseline Item 3 below 3. Henry Air Bloc 32MR 4. Kingspan GreenGuard® Max Building Wrap 5. Dupont™ Tyvek® (Various per ESR-2375) 6. Dupont™ Weathermate 7. Dupont™ Weathermate Plus 8. WRB over exterior sheathing: a. Henry® Foilskin® b. Henry® Metal Clad® c. CCW 705 FR-A d. Kingspan® GreenGuard® Max Building Wrap e. Dupont™ Tyvek® (various per ESR-2375) f. Dupont™ Weathermate™ g. Dupont™ Weathermate™ Plus
Exterior Insulation	1. Up to 4" thick OX IsoRED Max, consisting of a single panel or multiple thinner panels
WRB Over Exterior Insulation Use any item 1 - 5	1. None 2. Aluminum construction tape as tested (or equivalent), maximum 6" wide over staggered insulation joints 3. Henry® Foilskin® 4. Henry® Metal Clad® 5. CCW 705 FR-A
Exterior Cladding Use any item 1 - 11	1. Brick – Nominal 4" clay brick or veneer with maximum 2" air gap behind the brick; Brick ties/anchors 24" o.c. (maximum) 2. Stucco – Minimum 3/4" thick exterior cement plaster and lath with an optional secondary WRB between the exterior insulation and lath; the secondary barrier shall not be full coverage asphalt or self-adhered butyl membrane 3. Limestone – Minimum 2" thick, using any standard installation technique 4. Natural Stone Veneer – Minimum 2" thick using any standard installation technique 5. Cast Artificial Stone – Minimum 1 1/2" thick complying with ICC-ES AC51 installed using any standard installation technique 6. Terracotta Cladding – Minimum 1 1/4" thick, using any standard installation technique 7. Any MCM, ACM (aluminum, steel, copper, zinc) (with 1 1/2" ± 1/2" air gap) that has successfully passed NFPA 285 using any standard installation technique

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Table 5. Approved NFPA 285 Wall Assemblies[1,2,3,4]

Wall Component	Materials
Exterior Cladding Continued	8. Uninsulated sheet metal building panels including aluminum, steel, or copper using any standard installation technique 9. Uninsulated Fiber-cement siding using any standard installation technique 10. Stone/Aluminum honeycomb composite building panels that have passed NFPA 285 or equivalent (StoneLite Wall Panels by Stone Panels – ESR-1500) 11. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 using any standard installation technique

SI: 1 in = 25.4 mm, 1 BTU/(hr·ft²) = 0.0032 kW/m²

1. The assembly combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest & Associates Consulting, LLC.
2. Acceptance criteria for ASTM E1354 testing have not been well established in the referenced building codes and foam sheathing related sections. The criteria stated here for substitution of products is based on testing and professional thermal engineering analysis by Priest & Associates.
3. T_{ign} is the time to ignition from the start of the test until the sheathing ignites. Pk. HRR is the peak heat release rate during the test.
4. Compliant through the 2018 IBC.

6.7.3 *Thermal Barrier:*

6.7.3.1 IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD boards with a maximum thickness of 4" were tested in accordance with NFPA 286 and have met the acceptance criteria of IBC Section 803.1.1.1 and IRC Section R302.9.4 for use on walls or ceilings without a thermal barrier, in accordance with IBC Section 2603.9 and IRC Section R303.6,[34] per IBC Section 2603.4, IBC Section 2603.5.2, and IRC Section R303.5.[35]

6.7.3.2 IsoRED Ci and IsoRED Ci XS shall be fully protected from the interior of the building by an approved 15-minute thermal barrier or ignition barrier as required by IBC Section 2603.4 and IRC Section R303.4,[36] except as follows:

6.7.3.2.1 When installed in an attic, crawlspace or other uninhabitable space, IsoRED Ci and IsoRED Ci XS at a maximum thickness of 2", are approved for use without a thermal barrier or ignition barrier. This includes, but is not limited to, knee and gable end walls.

6.7.3.2.2 Use without an approved thermal barrier or ignition barrier is limited to areas where:

6.7.3.2.2.1 IsoRED Ci and IsoRED Ci XS are installed on the walls only.

6.7.3.2.2.2 Access to the space is required by IRC Section R807.1 or IRC Section R408.4.

6.7.3.2.2.3 Entry is made only for the purposes of repairs or maintenance.

6.8 Alternative techniques shall be permitted in accordance with accepted engineering practice and experience. These provisions for the use of alternative materials, designs, and methods of construction are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed herein. This includes, but is not limited to, the following areas of engineering: mechanics of materials, structures, building science, and fire science.

7 Certified Performance[37]

7.1 All construction methods shall conform to accepted engineering practices to ensure durable, livable, and safe construction and shall demonstrate acceptable workmanship reflecting journeyman quality of work of the various trades.[38]

7.2 The strength and rigidity of the component parts and/or the integrated structure shall be determined by engineering analysis or by suitable load tests to simulate actual loads and conditions of application that occur.[39]

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8 Regulatory Evaluation and Accepted Engineering Practice

8.1 IsoRED Polyiso Foam Insulated Sheathing Products comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 IsoRED Ci and IsoRED Ci XS have been evaluated to determine:

8.1.1.1 Wind pressure resistance performance for use as part of an exterior wall covering assembly in accordance with ANSI/FS100 as specified in IBC Section 2603.10 and IRC Section R303.8.[40]

8.1.1.2 Performance in accordance with the foam plastic requirements of IBC Section 2603 and IRC Section R303.[41]

8.1.1.3 Performance for use as continuous insulating sheathing in accordance with IRC Section N1102, IECC Section R402, and IECC Section C402.

8.1.1.4 Performance for use as a WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

8.1.1.5 Performance for use as a vapor retarder in accordance with IBC Section 202, IBC Section 1404.3, IRC Section R202, and IRC Section R702.7.

8.1.1.6 Performance for use as an air barrier in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.[42]

8.1.2 Performance of IsoRED Ci and IsoRED Ci XS for vertical and lateral fire propagation is outside the scope of this report.

8.1.3 IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD have been evaluated to determine:

8.1.3.1 Performance in accordance with the foam plastic requirements of IBC Section 2603 and IRC Section R303.[43]

8.1.3.2 Performance for use as continuous insulating sheathing in accordance with IRC Section N1102, IECC Section R402, and IECC Section C402.

8.1.3.3 Performance for use as a vapor retarder in accordance with IBC Section 202, IBC Section 1404.3, IRC Section R202, and IRC Section R702.7.

8.1.3.4 Performance for use as an air barrier in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.[44]

8.1.3.5 Performance for use without a thermal barrier in accordance with NFPA 286 per IBC Section 2603.9 and IRC Section R303.6,[45] and the acceptance criteria of IBC Section 803.1.1 and IRC Section R302.9.4.

8.1.3.6 Performance for vertical and lateral fire propagation in accordance with NFPA 285 and 2018 IBC Section 2603.5.5.

8.1.3.7 Performance for use as a WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

8.1.4 Performance of IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD for wind pressure resistance is outside the scope of this report.

8.2 When used as over-sheathing[46] on light-frame, masonry or concrete exterior walls, IsoRED Polyiso Foam Insulated Sheathing Products are not required to meet the wind pressure resistance requirements of this report.

8.3 This report does not address wind pressure resistance requirements for IsoRED Ci or IsoRED Ci XS used as part of an Exterior Insulation Finish System (EIFS). Refer to the EIFS manufacturer installation instructions for building code compliance.

8.4 IsoRED Polyiso Foam Insulated Sheathing Products shall comply with the standards in **Section 4** and shall be applied to exterior wall construction in accordance with the general requirements of **Section 6**. IsoRED Ci and IsoRED Ci XS shall also comply with the prescriptive wind pressure resistance requirements of **Section 6.2**.

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8.5 IsoRED Ci and IsoRED Ci XS used in accordance with this report, and that are required to resist wind pressure in exterior wall covering assemblies, shall also comply with the product marking requirements of **Section 13**, and the conditions of use listed in **Section 12**.

8.6 Any building code, regulation and/or accepted engineering evaluations (e.g., research reports, duly authenticated reports, etc.) that are conducted for this Listing were performed by DrJ, which is an ISO/IEC 17065 accredited certification body and a professional engineering company operated by RDP or approved sources. DrJ is qualified[47] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[48] respectively.

8.7 Engineering evaluations are conducted with DrJ's ANAB accredited ICS code scope of expertise, which is also its areas of professional engineering competence.

9 Installation

9.1 Installation shall comply with the approved construction documents, the manufacturer installation instructions, this report, and the applicable building code.

9.2 In the event of a conflict between the manufacturer installation instructions and this report, contact the manufacturer for counsel on the proper installation method.

9.2.1 See the Foam Sheathing Committee (FSC) Best Practices Guide for further details.

9.3 *Installation Procedure*

9.3.1 These products may be cut to size with a utility knife, handsaw, or power saw.

9.3.2 Attachment information is provided in **Table 6**.

Table 6. Attachment Information

Application	Stud Spacing[2]	Attachment Method	Fastener Spacing
Wood Framing	16" or 24"	Capped Nails, Capped Staples or Roofing Nails (~1" Framing Embedment)	12" Perimeter 12" Field
Metal Framing	16" or 24"	Corrosion-Resistant Self-Tapping Screws with 1" Diameter Cap or Washer (~1" Framing Embedment)	12" Perimeter 12" Field
Interior Masonry or Concrete	N/A	Suitable Construction Adhesive or Masonry Fastener with 1" Diameter Cap or Washer, or Combination of Adhesive and Mechanical Fasteners (~1" Embedment into Substrate)	Adhesive Beads Spaced 16" Horizontally and Full Perimeter Mechanical Fasteners 12" Perimeter and 12" Field Spaced 16" Horizontally
Exterior Masonry or Concrete Below Grade	N/A	Granular Water-Draining Fill	Only as Required to Ensure Intimate Contact to Masonry Surface or Water-Proofed Surface

SI: 1 in = 25.4 mm

1. Butt panels tightly and seal all joints where intrusion of bulk moisture or moisture vapor is undesirable with sealant and/or approved tape.
2. Panels used to resist transverse wind pressure or that are used as a WRB shall be installed on studs spaced a maximum of 16" o.c. and all panel edges shall be located on framing or blocking.
3. For required attachments in fire rated construction, consult the manufacturer-approved fire rated assembly details and refer to Table 4.

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9.3.3 Windows and doors shall be installed in accordance with the manufacturer installation instructions.

9.3.4 Windows, door openings, and other penetrations shall be flashed in accordance with IBC Section 1404.4 and IRC Section R703.4.

9.3.5 Follow the manufacturer instructions for installation of claddings and rain screens over these products.

10 Substantiating Data

10.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

10.1.1 Thermal properties testing in accordance with ASTM C518

10.1.2 Material properties testing in accordance with ASTM C1289

10.1.3 Surface burning characteristics testing in accordance with ASTM E84

10.1.4 Fire resistance testing in accordance with ASTM E119

10.1.5 Transverse wind pressure testing in accordance with ASTM E330

10.1.6 Water penetration testing in accordance with ASTM E331

10.1.7 Air permeance testing in accordance with ASTM E2178

10.1.8 Drainage testing in accordance with ASTM E2925

10.1.9 Use in attics and crawlspaces without thermal barrier or ignition barrier testing in accordance to NFPA 286

10.1.10 Vertical and lateral fire propagation properties testing in accordance with NFPA 285

10.2 IsoRED Ci and IsoRED Ci XS Quality Control Manuals in accordance with a third-party quality control program, with inspections that are conducted by an approved agency.

10.3 Engineering analysis on NFPA 285 testing performed by Priest & Associates Consulting, LLC.

10.4 Information contained herein may include the result of testing and/or data analysis by sources that are approved agencies, approved sources, and/or an RDP. Accuracy of external test data and resulting analysis is relied upon.

10.5 Where applicable, testing and/or engineering analysis are based upon provisions that have been codified into law through state or local adoption of regulations and standards. The developers of these regulations and standards are responsible for the reliability of published content. DrJ's engineering practice may use a regulation-adopted provision as the control. A regulation-endorsed control versus a simulation of the conditions of application to occur establishes a new material as being equivalent to the regulatory provision in terms of quality, strength, effectiveness, fire resistance, durability, and safety.

10.6 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, or duly authenticated reports from approved agencies and/or approved sources provided by the supplier. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this duly authenticated report, may be dependent upon published design properties by others.

10.7 *Testing and Engineering Analysis*

10.7.1 The strength, rigidity, and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.[49]

10.8 Where additional condition of use and/or regulatory compliance information is required, please search for IsoRED Polyiso Foam Insulated Sheathing Products on the DrJ Certification website.

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11 Findings

11.1 As outlined in **Section 6**, IsoRED Polyiso Foam Insulated Sheathing Products have performance characteristics that were tested and/or meet applicable regulations. In addition, they are suitable for use pursuant to its specified purpose.

11.2 When used and installed in accordance with this duly authenticated report and the manufacturer installation instructions, IsoRED Polyiso Foam Insulated Sheathing Products shall be approved for the following applications:

11.2.1 Wind pressure resistance performance for use as part of an exterior wall covering assembly in accordance with ANSI/FS100 as specified in IBC Section 2603.10 and IRC Section R303.8.[50]

11.2.2 Performance in accordance with the foam plastic requirements of IBC Section 2603 and IRC Section R303.[51]

11.2.3 Performance for use as continuous insulating sheathing in accordance with IRC Section N1102, IECC Section R402, and IECC Section C402.

11.2.4 Performance for use as a WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

11.2.5 Performance for use as a vapor retarder in accordance with IBC Section 202, IBC Section 1404.3, IRC Section R202, and IRC Section R702.7.

11.2.6 Performance for use as an air barrier in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.[52]

11.2.7 Performance for drainage efficiency in accordance with ASTM E2925 as an alternative to ASTM E2273 per IBC Section 1407.4.1.

11.3 When used and installed in accordance with this report and the manufacturer installation instructions, IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD products are approved for the following:

11.3.1 Performance in accordance with the foam plastic requirements of IBC Section 2603 and IRC Section R303.[53]

11.3.2 Performance for use as continuous insulating sheathing in accordance with IRC Section N1102, IECC Section R402, and IECC Section C402.

11.3.3 Performance for use as a vapor retarder in accordance with IBC Section 202, IBC Section 1404.3, IRC Section R202, and IRC Section R702.7.

11.3.4 Performance for use as an air barrier in accordance with IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.[54]

11.3.5 Performance for use without a thermal barrier in accordance with NFPA 286 per IBC Section 2603.9 and IRC Section R303.6,[55] and the acceptance criteria of IBC Section 803.1.1 and IRC Section R302.9.4.

11.3.6 Performance for vertical and lateral fire propagation in accordance with NFPA 285 and 2018 IBC Section 2603.5.5.

11.3.7 Performance for use as a WRB in accordance with IBC Section 1403.2 and IRC Section R703.2.

11.4 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Amrize Building Envelope, LLC.

11.5 IBC Section 104.2.3[56] (IRC Section R104.2.2[57] and IFC Section 104.2.3[58] are similar) in pertinent part state:

> 104.2.3 Alternative Materials, Design and Methods of Construction and Equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative is not specifically prohibited by this code and has been approved.

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11.6 **Approved:**[59] Building regulations require that the building official shall accept duly authenticated reports.[60]

11.6.1 An approved agency is *"approved"* when it is ANAB ISO/IEC 17065 accredited.

11.6.2 An approved source is *"approved"* when an RDP is properly licensed to transact engineering commerce.

11.6.3 Federal law, Title 18 US Code Section 242, requires that, where the alternative product, material, service, design, assembly, and/or method of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. Denial without written reason deprives a protected right to free and fair competition in the marketplace.

11.7 DrJ is a licensed engineering company, employs licensed RDPs and is an ANAB Accredited Product Certification Body – Accreditation #1131.

11.8 Through the IAF Multilateral Arrangement (MLA), this duly authenticated report can be used to obtain product approval in any jurisdiction or country because all ANAB ISO/IEC 17065 duly authenticated reports are equivalent.[61]

12 Conditions of Use

12.1 As defined in **Section 6**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

12.2 As listed herein, IsoRED Polyiso Foam Insulated Sheathing Products shall not be used:

12.2.1 As a structural nailing base for claddings, nor

12.2.2 To resist horizontal loads from concrete or masonry walls.

12.3 IsoRED Ci and IsoRED Ci XS shall be fully protected from the interior of the building by an approved 15-minute thermal barrier or ignition barrier where required by the applicable code, except when installed in attics and uninhabited spaces as described in **Section 6.7.3.2**. IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD are not required to be protected by a thermal barrier when installed in accordance with **Section 6.7.3**.

12.4 In areas where the probability of termite infestation is very heavy in accordance with IBC Section 2603.9 or IRC Figure R305.4,[62] IsoRED Polyiso Foam Insulated Sheathing Products shall not be installed on the exterior face of foundation walls, under interior or exterior foundation walls or under slab foundations located below grade. The clearance between the products installed above grade and exposed earth shall be at least 6".

12.4.1 *Exceptions:*

12.4.1.1 Buildings where the structural members of the walls, floors, ceilings, and roofs are entirely of noncombustible materials or are pressure preservative treated wood.

12.4.1.2 When, in addition to the requirements of IRC Section R305.1,[63] an approved method of protecting IsoRED Polyiso Foam Insulated Sheathing Products and the structure from subterranean termite damage is used.

12.5 When using IsoRED Polyiso Foam Insulated Sheathing Products, the stud walls shall be braced by other materials in accordance with the applicable code.

12.6 When required by adopted legislation and enforced by the building official, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:

12.6.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.6.2 This report and the installation instructions shall be submitted at the time of permit application.

12.6.3 At a minimum, these innovative products shall be installed per **Section 9**.

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12.6.4 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.6.5 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.6.6 The application of these innovative products in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

12.7 When required by adopted legislation and enforced by the building official, also known as the Authority Having Jurisdiction (AHJ) in which the project is to be constructed:

12.7.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice and, when prepared by an approved source, shall be approved when signed and sealed.

12.7.2 This report and the installation instructions shall be submitted at the time of permit application.

12.7.3 At a minimum, these innovative products shall be installed per **Section 9**.

12.7.4 The review of this report by the AHJ shall comply with IBC Section 104.2.3.2 and IBC Section 105.3.1.

12.7.5 These innovative products have an internal quality control program and a third party quality assurance program in accordance with IBC Section 104.7.2, IBC Section 110.4, IBC Section 1703, IRC Section R104.7.2, and IRC Section R109.2.

12.7.6 The application of these innovative products in the context of this report is dependent upon the accuracy of the construction documents, implementation of installation instructions, inspection as required by IBC Section 110.3, IRC Section R109.2, and any other regulatory requirements that may apply.

12.8 The approval of this report by the AHJ shall comply with IBC Section 1707.1, where legislation states in part, *"the building official shall make, or cause to be made, the necessary tests and investigations; or the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.2.3"*, all of IBC Section 104, and IBC Section 105.3.

12.9 Design loads shall be determined in accordance with the regulations adopted by the jurisdiction in which the project is to be constructed and/or by the building designer (i.e., owner or RDP).

12.10 The actual design, suitability, and use of this report for any particular building, is the responsibility of the owner or the authorized agent of the owner.

13 Identification

13.1 IsoRED Polyiso Foam Insulated Sheathing Products (IsoRED Ci, IsoRED Ci XS, IsoRED Max, IsoRED Max WF, IsoRED Max GF, IsoRED Max LD, and IsoRED Max HD Polyiso Foam Insulated Sheathings), as listed in **Section 1.1**, are identified by a label on the board or packaging material bearing the manufacturer name, product name, this report number, and other information to confirm code compliance.

13.2 Additional technical information can be found at www.oxengineeredproducts.com/product/polyiso-foam.

14 Review Schedule

14.1 This report is subject to periodic review and revision. For the latest version, visit www.drjcertification.org.

14.2 For information on the status of this report, please contact DrJ Certification.

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Issue Date: December 10, 2020
Supplement Revision Date: September 25, 2025
Subject to Renewal: October 1, 2027

FBC Supplement to Report Number 1306-02

REPORT HOLDER: Amrize Building Envelope, LLC

1 Evaluation Subject

1.1 IsoRED Polyiso Foam Insulated Sheathing Products:

1.1.1 IsoRED Ci Polyiso Foam Insulated Sheathing

1.1.2 IsoRED Ci XS Polyiso Foam Insulated Sheathing

1.1.3 IsoRED Max Polyiso Foam Insulated Sheathing

1.1.4 IsoRED Max WF Polyiso Foam Insulated Sheathing

1.1.5 IsoRED Max GF Polyiso Foam Insulated Sheathing

1.1.6 IsoRED Max LD Polyiso Foam Insulated Sheathing

1.1.7 IsoRED Max HD Polyiso Foam Insulated Sheathing

2 Purpose and Scope

2.1 Purpose

2.1.1 The purpose of this Report Supplement is to show IsoRED Polyiso Foam Insulated Sheathing Products, recognized in Report Number 1306-02, have also been evaluated for compliance with the codes listed below as adopted by the Florida Building Commission.

2.2 *Applicable Code Editions*

2.2.1 *FBC-B – 20, 23: Florida Building Code – Building (FL 28290)*

2.2.2 *FBC-R – 20, 23: Florida Building Code – Residential (FL 28290)*

3 Conclusions

3.1 IsoRED Polyiso Foam Insulated Sheathing Products, described in Report Number 1306-02, comply with the FBC-B and FBC-R and are subject to the conditions of use described in this supplement.

3.2 Where there are variations between the IBC and IRC and the FBC-B and FBC-R applicable to this report, they are listed here:

3.2.1 FBC-B Section 104 is reserved.

3.2.2 FBC-B Section 104.11 replaces IBC Section 104.2.3.2.

3.2.3 FBC-B Section 110.4 is reserved and replaces IBC Section 110.4.

3.2.4 FBC-B Section 104.6 is reserved and replaces IBC Section 104.4.

3.2.5 FBC-B Section 104.11 replaces IBC Section 104.2.3 and Section 104.2.3.2.

3.2.6 FBC-B Section 105.3 replaces IBC Section 105.3.

3.2.7 FBC-B Section 105.3.1 replaces IBC Section 105.3.1.

3.2.8 FBC-B Section 110.3 replaces IBC Section 110.3.

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3.2.9 FBC-B Section 202 replaces IBC Section 202.

3.2.10 FBC-B Section 803.1.1 replaces IBC Section 803.1.1.

3.2.11 FBC-B Section 803.1.2.1 replaces IBC Section 803.1.1.1.

3.2.12 FBC-B Section 1404.2 replaces IBC Section 1403.2.

3.2.13 FBC-B Section 1404.9 replaces IBC Section 1403.8.

3.2.14 FBC-B Section 1405.3 replaces IBC Section 1404.3.

3.2.15 FBC-B Section 1405.4 replaces IBC Section 1404.4.

3.2.16 FBC-B Section 1609.1.1 replaces IBC Section 1609.1.1.

3.2.17 FBC-B Section 1609.3.1 replaces IBC Section 1609.3.1.

3.2.18 FBC-B Section 1707.1 replaces IBC Section 1707.1.

3.2.19 FBC-B Section 2303.2 replaces IBC Section 2303.2.

3.2.20 FBC-B Section 2306.1 replaces IBC Section 2306.1.

3.2.21 FBC-B Section 2306.3 replaces IBC Section 2306.3.

3.2.22 FBC-B Section 2603 replaces IBC Section 2603.

3.2.23 FBC-B Section 2603.3 replaces IBC Section 2603.3.

3.2.24 FBC-B Section 2603.4 replaces IBC Section 2603.4.

3.2.25 FBC-B Section 2603.9 replaces IBC Section 2603.9.

3.2.26 FBC-R Section R104 and Section R109 are reserved.

3.2.27 FBC-R Section R202 replaces IRC Section R202.

3.2.28 FBC-R Section R316 replaces IRC Section R303.

3.2.29 FBC-R Section R316.3 replaces IRC Section R303.3.

3.2.30 FBC-R Section R316.4 replaces IRC Section R303.4.

3.2.31 FBC-R Section R316.5 replaces IRC Section R303.5.

3.2.32 FBC-R Section R316.6 replaces IRC Section R303.6.

3.2.33 FBC-R Section R318.1 replaces IRC Section R305.1.

3.2.34 FBC-R Section R408.4 replaces IRC Section R408.4.

3.2.35 FBC-R Section R702.7 replaces IRC Section R702.7.

3.2.36 FBC-R Section R703.2 replaces IRC Section R703.2.

3.2.37 FBC-R Section R703.3 replaces IRC Section R703.3.

3.2.38 FBC-R Section R703.4 replaces IRC Section R703.4.

3.2.39 FBC-R Section R807.1 replaces IRC Section R807.1.

3.2.40 FBC-R Section N1101.1 replaces IRC Section N1102 and IRC Section N1101.10.5.

4 Conditions of Use

4.1 IsoRED Polyiso Foam Insulated Sheathing Products, described in Report Number 1306-02, must comply with all of the following conditions:

4.1.1 All applicable sections in Report Number 1306-02.

4.1.2 The design, installation, and inspections are in accordance with additional requirements of FBC-B Chapter 16 and Chapter 17, as applicable.

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Notes

1 For more information, visit drjcertification.org or call us at 608-310-6748.

2 Capitalized terms and responsibilities are defined pursuant to the applicable building code, applicable reference standards, the latest edition of TPI 1, the NDS, AISI S202, US professional engineering law, Canadian building code, Canada professional engineering law, Qualtim External Appendix A: Definitions/Commentary, Qualtim External Appendix B: Project/Deliverables, Qualtim External Appendix C: Intellectual Property and Trade Secrets, definitions created within Design Drawings and/or definitions within Reference Sheets. Beyond this, terms not defined shall have ordinarily accepted meanings as the context implies. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

3 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1702

4 Alternative Materials, Design and Methods of Construction and Equipment: The provisions of any regulation code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by a regulation. Please review https://www.justice.gov/atr/mission and https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3

5 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.2:~:text=the%20design%20strengths%20and%20permissible%20stresses%20shall%20be%20established%20by%20tests

6 The design strengths and permissible stresses of any structural material shall conform to the specifications and methods of design of accepted engineering practice. https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1706.1:~:text=Conformance%20to%20Standards-,The%20design%20strengths%20and%20permissible%20stresses,-of%20any%20structural

7 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1:~:text=the%20building%20official%20shall%20make%2C%20or%20cause%20to%20be%20made%2C%20the%20necessary%20tests%20and%20investigations%3B%20or%20the%20building%20official%20shall%20accept%20duly%20authenticated%20reports%20from%20approved%20agencies%20in%20respect%20to%20the%20quality%20and%20manner%20of%20use%20of%20new%20materials%20or%20assemblies%20as%20provided%20for%20in%20Section%20104.2.3.

8 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4.2

9 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_agency

10 https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#approved_source

11 https://www.law.cornell.edu/uscode/text/18/1832 (b) Any organization that commits any offense described in subsection (a) shall be fined not more than the greater of $5,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. The federal government and each state have a public records act. To follow DTSA and comply state public records and trade secret legislation requires approval through ANAB ISO/IEC 17065 accredited certification bodies or approved sources. For more information, please review this website: Intellectual Property and Trade Secrets.

12 https://www.nspe.org/resources/issues-and-advocacy/professional-policies-and-position-statements/regulation-professional AND https://apassociation.org/list-of-engineering-boards-in-each-state-archive/

13 https://www.cbitest.com/accreditation/

14 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.1:~:text=directed%20to%20enforce%20the%20provisions%20of%20this%20code

15 https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#104.2.3 AND https://up.codes/viewer/mississippi/ibc-2024/chapter/1/scope-and-administration#105.3.1

16 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

17 https://iaf.nu/en/about-iaf-mla/#:~:text=Once%20an%20accreditation%20body%20is%20a%20signatory%20of%20the%20IAF%20MLA%2C%20it%20is%20required%20to%20recognise%20certificates%20and%20validation%20and%20verification%20statements%20issued%20by%20conformity%20assessment%20bodies%20accredited%20by%20all%20other%20signatories%20of%20the%20IAF%20MLA%2C%20with%20the%20appropriate%20scope

18 True for all ANAB accredited product evaluation agencies and all International Trade Agreements.

19 https://www.justice.gov/crt/deprivation-rights-under-color-law AND https://www.justice.gov/atr/mission

20 Unless otherwise noted, the links referenced herein use un-amended versions of the 2024 International Code Council (ICC) 2024 International Code Council (ICC) model codes as foundation references. Mississippi versions of the IBC 2024 and the IRC 2024 are un-amended. This material, product, design, service and/or method of construction also complies with the 2000-2012 versions of the referenced codes and the standards referenced therein. As pertinent to this technical and code compliance evaluation, CBI and/or DrJ staff have reviewed any state or local regulatory amendments to assure this report is in compliance.

21 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by the local jurisdiction. https://up.codes/codes/general

22 See Adoptions by Publisher for the latest adoption of a non-amended or amended model code by state. https://up.codes/codes/general

23 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3282/subpart-A/section-3282.14

24 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

25 All references to the FBC-B and FBC-R are the same as the 2024 IBC and 2024 IRC unless otherwise noted in the Florida Supplement at the end of this report.

26 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#p-3280.2(Listed%20or%20certified); https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#listed AND https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#labeled

27 2021 IRC Section R316 AND 2018 IRC Section R316

28 2021 IRC Section R316.4 AND 2018 IRC Section R316.4

29 2021 IRC Section R316.6 AND 2018 IRC Section R316.6

30 2018 IRC Table R301.2(2)

31 2018 IRC Table R301.2(3)

32 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

33 2021 IRC Section R316.3 AND 2018 IRC Section R316.3

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34 2021 IRC Section R316.6 AND 2018 IRC Section R316.6

35 2021 IRC Section R316.5 AND 2018 IRC Section R316.5

36 2021 IRC Section R316.4 AND 2018 IRC Section R316.4

37 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1703.4

38 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=All%20construction%20methods%20shall%20be%20in%20conformance%20with%20accepted%20engineering%20practices%20to%20insure%20durable%2C%20livable%2C%20and%20safe%20housing%20and%20shall%20demonstrate%20acceptable%20workmanship%20reflecting%20journeyman%20quality%20of%20work%20of%20the%20various%20trades

39 https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280#:~:text=The%20strength%20and%20rigidity%20of%20the%20component%20parts%20and/or%20the%20integrated%20structure%20shall%20be%20determined%20by%20engineering%20analysis%20or%20by%20suitable%20load%20tests%20to%20simulate%20the%20actual%20loads%20and%20conditions%20of%20application%20that%20occur

40 2021 IRC Section R316.8 AND 2018 IRC Section R316.8

41 2021 IRC Section R316 AND 2018 IRC Section R316

42 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

43 2021 IRC Section R316 AND 2018 IRC Section R316

44 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

45 2021 IRC Section R316.6 AND 2018 IRC Section R316.6

46 As used in this report, over-sheathing refers to the application of foam sheathing over and directly on the surface of wall sheathing material or solid wall construction, such as masonry or concrete, whereby the substrate is capable of resisting the full design transverse wind load required by the applicable building code or latest edition of the ASCE 7 standard. In addition, cladding is separately installed over foam sheathing in accordance with Section 5.1.5. An over-sheathing application of foam sheathing does not require that the foam sheathing resist wind pressure in accordance with this report.

47 Qualification is performed by a legislatively defined Accreditation Body. ANSI National Accreditation Board (ANAB) is the largest independent accreditation body in North America and provides services in more than 75 countries. DrJ is an ANAB accredited product certification body.

48 https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?prgID=1&orgID=2125&statusID=4#:~:text=Bill%20Payment%20Date-,Accredited%20Scopes,-13%20ENVIRONMENT.%20HEALTH

49 See Code of Federal Regulations (CFR) Title 24 Subtitle B Chapter XX Part 3280 for definition: https://www.ecfr.gov/current/title-24/subtitle-B/chapter-XX/part-3280

50 2021 IRC Section R316.8 AND 2018 IRC Section R316.8

51 2021 IRC Section R316 AND 2018 IRC Section R316

52 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

53 2021 IRC Section R316 AND 2018 IRC Section R316

54 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

55 2021 IRC Section R316.6 AND 2018 IRC Section R316.6

56 2021 IBC Section 104.11

57 2021 IRC Section R104.11

58 2018: https://up.codes/viewer/wyoming/ifc-2018/chapter/1/scope-and-administration#104.9 AND 2021: https://up.codes/viewer/wyoming/ibc-2021/chapter/1/scope-and-administration#104.11

59 Approved is an adjective that modifies the noun after it. For example, Approved Agency means that the Agency is accepted officially as being suitable in a particular situation. This example conforms to IBC/IRC/IFC Section 201.4 (https://up.codes/viewer/mississippi/ibc-2024/chapter/2/definitions#201.4) where the building code authorizes sentences to have an ordinarily accepted meaning such as the context implies.

60 https://up.codes/viewer/mississippi/ibc-2024/chapter/17/special-inspections-and-tests#1707.1

61 Multilateral approval is true for all ANAB accredited product evaluation agencies and all International Trade Agreements.

62 2021 IRC Figure R318.4 AND 2018 IRC Figure R301.2(7)

63 2021 IRC Section R318.1 AND 2018 IRC Section R318.1

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