Listing and Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

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R2+® SILVER, R2+® MATTE, and R2+® BASE Fire Performance in Exterior Walls of Building of Type I-IV Construction

Trade Secret Report Holder:

Henry®, A Carlisle Company

Phone: 800-486-1278 Website: www.henry.com Email: jodi.thomas@henry.com

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 10 00 - Rough Carpentry

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 - Thermal Insulation

Section: 07 48 00 - Exterior Wall Assemblies

1 Innovative Products Evaluated[1]

1.1 R2+ SILVER, R2+ MATTE, and R2+ BASE

2 Product Description and Materials

2.1 R2+ SILVER is comprised of a closed-cell polyisocyanurate (polyiso) insulation board adhered to *"tri-laminate"* foil facers and is compliant with ASTM C1289 Type I, Class 1, Grade 2 and Grade 3.

2.1.1 Layers of the facer material are as follows:

2.1.1.1 Aluminum foil, kraft paper, aluminum foil

2.2 R2+ MATTE is comprised of a closed-cell polyiso insulation board adhered to coated glass facers and is compliant with ASTM C1289 Type II, Class 2, Grade 2 and Grade 3.

2.3 R2+ BASE is comprised of a closed-cell polyiso insulation board with coated glass facers laminated to APA TECO rated exposure fire treated plywood and is compliant with ASTM C1289 Type V.

2.4 The innovative products evaluated in this report are shown in **Figure 1**.

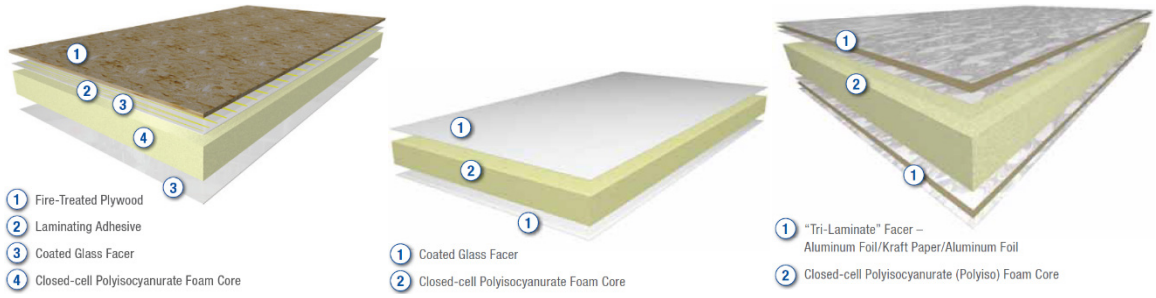

Figure 1. R2+ Products: R2+ SILVER, R2+ MATTE, and R2+ BASE

2.5 The foam core of R2+ SILVER, R2+ MATTE, and R2+ BASE is manufactured in accordance with ASTM C1289.

2.6 *Material Availability*

2.6.1 *Thickness:*

2.6.1.1 *R2+ SILVER and R2+ MATTE:*

2.6.1.1.1 1" (25 mm) through $3^{1}/_{2}$" (89 mm)

2.6.1.2 *R2+ BASE:*

2.6.1.2.1 Available with either a $^{5}/_{8}$" or $^{3}/_{4}$" fire treated plywood and 1" through 4" coated glass polyiso

2.6.1.2.1.1 *Total Thickness with $^{5}/_{8}$" Substrate:*

2.6.1.2.1.1.1 $1^{5}/_{8}$" through $4^{5}/_{8}$"

2.6.1.2.1.2 *Total Thickness with $^{3}/_{4}$" Substrate:*

2.6.1.2.1.2.1 $1^{3}/_{4}$" through $4^{3}/_{4}$"

2.6.2 *Standard Product Width:*

2.6.2.1 48" (1,219 mm)

2.6.3 *Standard Product Length:*

2.6.3.1 *R2+ SILVER and R2+ MATTE:*

2.6.3.1.1 96" (2,438 mm)

2.6.3.1.2 120" (3,048 mm)

2.6.3.1.3 144" (3,657 mm)

2.6.3.2 *R2+ BASE:*

2.6.3.2.1 96" (2,438 mm)

2.6.4 Custom widths, lengths, and thicknesses for R2+ SILVER and R2+ MATTE are available upon request.

2.7 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.

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 *IECC – 18, 21, 24: International Energy Conservation Code®*

4.3 *Standards*

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

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

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

4.3.4 *ASTM E136: Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750° C*

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

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

4.3.7 *FM 4880: Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials*

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

4.3.9 *NFPA 268: Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source*

4.3.10 *NFPA 285-19 & 23: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*

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

4.3.12 *UL 723: Test for Surface Burning Characteristics of Building Materials*

4.3.13 *UL 1040: Fire Test of Insulated Wall Construction*

4.3.14 *UL 1715: Fire Test of Interior Finish Material*

5 Listed[25]

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 and 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 R2+ SILVER, R2+ MATTE, and R2+ BASE are Foam Plastic Insulating Sheathing (FPIS) complying with IBC Section 2603 and IRC Section R303.[26]

6.1.2 R2+ SILVER, R2+ MATTE, and R2+ BASE are used in exterior walls of buildings of any height and of Type I-IV construction, in accordance with IBC Section 2603.5.

6.1.3 Environmental Product Declarations (EPD) for R2+ SILVER, R2+ MATTE, and R2+ BASE are available at www.polyiso.org/page/EPDs.

6.2 *Fire Safety Performance*

6.2.1 *Surface Burning Characteristics:*

6.2.1.1 R2+ SILVER, R2+ MATTE, and R2+ BASE were evaluated to assess performance regarding flame spread and smoke developed indexes in accordance with ASTM E84 as specified in IBC Section 2603.3 and IBC Section 2603.5.

6.2.1.2 Flame spread and smoke developed indices are provided in **Table 1**.

Table 1. Surface Burning Characteristics of R2+ SILVER, R2+ MATTE, and R2+ BASE[1]

Product Name	Flame Spread Index	Smoke-Developed Index	Classification
R2+ SILVER	≤ 75	≤ 450	Class B
R2+ MATTE			
R2+ BASE			

1. The polyiso foam core was tested in accordance with ASTM E84 at a maximum thickness of 4½". Flame spread and smoke-developed indexes are shown for comparison purposes only and are not intended to represent the performance under actual fire conditions.

6.2.2 *Ignition:*

6.2.2.1 R2+ SILVER, R2+ MATTE, and R2+ BASE were evaluated to assess performance with regard to ignition (NFPA 268) in accordance with IBC Section 2603.5.7. R2+ SILVER, R2+ MATTE, and R2+ BASE comply with this section when the exterior side of the sheathing is protected with one of the following materials:

6.2.2.1.1 A thermal barrier complying with IBC Section 2603.4

6.2.2.1.2 A minimum 1" (25 mm) thickness of concrete or masonry

6.2.2.1.3 Glass-fiber reinforced concrete panels of a minimum thickness of ⅜" (9.5 mm)

6.2.2.1.4 Metal-faced panels having minimum 0.019" thick (0.48 mm) aluminum or 0.016" thick (0.41 mm) corrosion-resistant steel outer facings

6.2.2.1.5 A minimum ⅞" (22.2 mm) thickness of stucco complying with IBC Section 2510

6.2.2.1.6 A minimum ¼" (6.35 mm) thickness of fiber cement siding complying with IBC Section 1404.17,[27] and IBC Section 1404.17.1[28] or IBC Section 1404.17.2.[29]

6.2.3 *Potential Heat:*

6.2.3.1 R2+ SILVER, R2+ MATTE, and R2+ BASE were tested in accordance with NFPA 259 to assess the potential heat generated by the FPIS in accordance with IBC Section 2603.5.3, as shown in **Table 2**.

Table 2. Potential Heat of R2+ SILVER, R2+ MATTE, and R2+ BASE

Product	Potential Heat[1] (BTU/lb)
R2+ SILVER	11,503
R2+ MATTE	11,503
R2+ BASE	11,503

SI: 1 BTU/lb = 0.0025 MJ/kg

1. Tested in accordance with NFPA 259.

6.2.4 *Vertical and Lateral Fire Propagation:*

6.2.4.1 R2+ SILVER, R2+ MATTE, and R2+ BASE were tested to assess their performance with regard to vertical and lateral fire propagation in accordance with NFPA 285-21 and IBC Section 2603.5.5.

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

6.2.4.3 The wall assemblies listed in **Table 3**, **Table 4**, **Table 5**, and **Table 6** are approved for use in buildings of Type I-IV construction by demonstrating equivalency to similar assemblies tested in accordance with NFPA 285 and meeting the prescriptive requirement for < 25 Flame Spread Index (FSI) material as required in IBC Section 2603.5.4.

Table 3. Approved NFPA 285 Wall Assemblies Using R2+ MATTE as Exterior Insulation[1,2,3]

Wall Component	Materials
Base Wall System Use Option 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (Fire-Retardant-Treated Wood) studs: minimum nominal 2 x 4 dimension, spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by building code
Fire-Stopping at Floor Lines	1. Any approved 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 in accordance with building code requirements for Type III construction
Cavity Insulation Use any Option 1 – 15 Items 8, 9, 10, and 11 may only be used with exterior sheathing[2]	1. None 2. 1 1/2" minimum Covestro EcoBay CC SPF (up to full cavity thickness) 3. 1 1/2" minimum BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [minimum] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2" 11. 1 1/2" (minimum) ThermoSeal 2000 (up to full cavity thickness) 12. Carlisle® SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21 or SealTite PRO OCX – up to full cavity thickness with 1/2" (minimum) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3 1/2" (maximum) for use with 5/8" Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8" maximum thickness with no air gap, 6" maximum thickness with air gap) for use with 1/2" or thicker exterior gypsum sheathing
Exterior Sheathing Use Option 1, 2, or 3	1. None (only with claddings 1 - 6 and cavity insulation 1, 2, 4, 5, or 6) 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction
Water Resistive Barrier (WRB) Over Base Wall Surface	1. See **Table 6**

Table 3. Approved NFPA 285 Wall Assemblies Using R2+ MATTE as Exterior Insulation[1,2,3]

Wall Component	Materials
Exterior Insulation Use Option 1	1. 3 1/2" (maximum) R2+ MATTE
WRB Over Exterior Insulation	1. See **Table 6** ***Note:*** The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used it may only be used with cladding 1, 2, 3, 4, 5, or 6, or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4" minimum
Exterior Cladding Use any Option 1 – 17 Item 7 may use any tested/approved installation technique Items 8, 9, or 12 may use any standard installation technique	1. Brick – Nominal 4" thick, clay or concrete 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. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (**Table 6**) can be used as a slip sheet between the WRB/exterior insulation and the lath 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 such as grouted/mortared stone 5. Cast artificial stone – Minimum 1 1/2" thick complying with ICC-ES AC 51 using any standard non open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap 7. Any MCM that has successfully passed NFPA 285 8. Uninsulated sheet metal building panels including steel, copper, aluminum 9. Uninsulated fiber-cement siding 10. Stone/Aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria 11. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 criteria 12. Terra Cotta Cladding – Any rain-screen Terra Cotta (minimum 1/2" thick) with ventilated shiplap 13. 1/2" stucco – Any one coat stucco (1/2" minimum) which meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes 14. Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to ASTM E119 (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test. Minimum 3/4". For these systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (**Table 6**) can be used as a slip sheet between the WRB/AVP and the lath 15. Glen Gery Thin Tech Elite Series Masonry Veneer or TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive 16. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique 17. Fundermax m.look Grey Core – minimum 1/4" thick using any standard installation technique

Table 3. Approved NFPA 285 Wall Assemblies Using R2+ MATTE as Exterior Insulation[1,2,3]

Wall Component	Materials
SI: 1 in = 25.4 mm 1. The assembly combinations created herein, and the various substitutions of products, are based on testing and professional thermal engineering analysis by Priest and Associates. 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 and 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.	

Table 4. Approved NFPA 285 Wall Assemblies with R2+ SILVER as Exterior Insulation[1,2,3]

Wall Component	Materials
Base Wall System Use Option 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW (Fire-Retardant-Treated Wood) studs: minimum nominal 2 x 4 dimension, spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	1. Any approved 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 in accordance with building code requirements for Type III construction
Cavity Insulation Use any Option 1 – 15 Items 8, 9, 10, and 11 may only be used with exterior sheathing[2]	1. None 2. 1 1/2" minimum Covestro EcoBay CC SPF (up to full cavity thickness) 3. 1 1/2" minimum BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [minimum] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" (maximum) stud cavities with an air gap not exceeding 2 1/2" 11. 1 1/2" (minimum) ThermoSeal 2000 (up to full cavity thickness) 12. Carlisle® SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21 or SealTite PRO OCX – up to full cavity thickness with 1/2" (minimum) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, or F1880 – 3 1/2" (maximum) for use with 5/8" exterior gypsum sheathing

Table 4. Approved NFPA 285 Wall Assemblies with R2+ SILVER as Exterior Insulation[1,2,3]

Wall Component	Materials
Cavity Insulation Continued	14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8" maximum thickness with no air gap, 6" maximum thickness with air gap) for use with 1/2" or thicker exterior gypsum sheathing
Exterior Sheathing Use Option 1, 2, or 3	1. None (only with cavity insulation 1, 4, 5, or 6) 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction allowed in place of gypsum sheathing when combustible cavity insulation is not used
WRB Over Base Wall Surface	1. See **Table 6**
Exterior Insulation Use Option 1	1. 3 1/2" (maximum) R2+ SILVER
WRB Over Exterior Insulation	1. See **Table 6** ***Note:*** The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4" minimum
Exterior Cladding Use any Option 1 - 6	1. Brick – Nominal 4" thick, clay or concrete 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. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (**Table 6**) can be used as a slip sheet between the WRB/exterior insulation and the lath 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 such as grouted/mortared stone 5. Cast Artificial Stone – Minimum 1 1/2" thick using any standard non-open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap

SI: 1 in = 25.4 mm

1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest and Associates.
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 and 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.

Table 5. Approved NFPA 285 Wall Assemblies with R2+ BASE as Exterior Insulation[1,2,3]

Wall Component	Materials
Base Wall System Use Option 1, 2, 3, or 4	1. Cast concrete walls 2. CMU concrete walls 3. 25-gauge minimum 3 5/8" (minimum) steel studs spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Lateral bracing every 4' 4. FRTW studs: minimum nominal 2 x 4 dimension, spaced 24" o.c. (maximum) a. 5/8" Type X gypsum wallboard interior b. Bracing as required by code
Fire-Stopping at Floor Lines	1. Any approved 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 in accordance with building code requirements for Type III construction
Cavity Insulation Use any Option 1 – 15 Items 3, 8, 9, 10, and 11 may only be used with exterior sheathing[2]	1. None 2. 1 1/2" minimum Covestro EcoBay CC SPF (up to full cavity thickness) 3. 1 1/2" minimum BASF Walltite SPF (up to full cavity thickness) 4. Any noncombustible insulation per ASTM E136 5. Any mineral fiber (Board type Class A ASTM E84 faced or unfaced) 6. Any fiberglass (Batt type Class A ASTM E84 faced or unfaced) 7. Any foam plastic insulation (SPF or board type) that has been tested per ASTM E1354 (at a minimum of 20 kW/m^2 heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than Covestro EcoBay CC or BASF Walltite 8. NCFI InsulBloc SPF (up to full cavity thickness) 9. Icynene MD-C-200v3 (Proseal) up to 5 1/2" (only with 1/2" [minimum] exterior gypsum sheathing) 10. SWD Urethane Quik-Shield 112 up to 6" in 6" (maximum) stud cavities with an air gap not exceeding 2 1/2" 11. 1 1/2" (minimum) ThermoSeal 2000 (up to full cavity thickness) 12. Carlisle® SealTite PRO High Yield, SealTite PRO Open Cell, SealTite PRO No Mix, SealTite PRO No Trim 21, or SealTite PRO OCX – up to full cavity thickness with 1/2" (minimum) exterior gypsum sheathing 13. Gaco (Firestone) F6500R, 052N, F4500, 183M, F1850, F1880 – 3 1/2" (maximum) for use with 5/8" Exterior Gypsum Sheathing 14. JM Corbond III or Corbond IV – Full stud cavity depth or less for use with 5/8" exterior gypsum sheathing 15. Huntsman ProSeal HFO (8" maximum thickness with no air gap, 6" maximum thickness with air gap) for use with 1/2" or thicker exterior gypsum sheathing
Exterior Sheathing Use Option 1, 2, or 3	1. None (only with cavity insulation 1, 2, 4, 5, or 6) 2. 1/2" or thicker exterior gypsum sheathing 3. 1/2" (minimum) FRTW structural panels in Type III construction
WRB Over Base Wall Surface	1. See **Table 6**

Table 5. Approved NFPA 285 Wall Assemblies with R2+ BASE as Exterior Insulation[1,2,3]

Wall Component	Materials
Exterior Insulation Use Option 1	1. 4 1/4" (maximum) R2+ BASE (3 1/2" foam maximum, 3/4" FR Plywood maximum)
WRB Over Exterior Insulation	1. See **Table 6** ***Note:*** The exterior insulation may be used with or without CavClear® Masonry Mat over the insulation with a maximum 1" air gap between the CavClear® and the cladding. When CavClear® is used, this may only be used with cladding 1, 2, 3, 4, 5, or 6 or with thin brick/thin stone adhered to stucco as long as the total thickness is 3/4" minimum
Exterior Cladding Use any Option 1 – 17 Item 9 may use any tested/approved installation technique Items 10, 11, or 14 may use any standard installation technique	1. Brick – Nominal 4" thick, clay or concrete 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. For systems that require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (**Table 6**) can be used as a slip sheet between the WRB/exterior insulation and the lath 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 such as grouted/mortared stone 5. Cast Artificial Stone – Minimum 1 1/2" thick using any standard non-open joint installation technique such as shiplap 6. Terra Cotta Cladding – Minimum 1 1/4" thick (solid or equivalent by weight) using any standard non-open joint installation technique such as shiplap 7. Thin brick/cultured stone set in thin set adhesive and metal lath that has been tested to ASTM E119 (brick exposed to furnace) and remains in place for a minimum of 30 minutes, or has passed an NFPA 285 test. Minimum 3/4". For these systems, which require a more durable WRB system, any building wrap or 15# felt that meets requirement #11 in WRB Over Exterior Insulation (**Table 6**) can be used as a slip sheet between the WRB/AVP and the lath 8. TABS II Panel System with 1/2" thick bricks using TABS Wall Adhesive 9. Any MCM that has successfully passed NFPA 285 10. Uninsulated sheet metal building panels including steel, copper, aluminum 11. Uninsulated fiber-cement siding 12. Stone/Aluminum honeycomb composite building panels that have successfully passed NFPA 285 criteria 13. Autoclaved-Aerated-Concrete (AAC) panels that have successfully passed NFPA 285 criteria 14. Terra Cotta Cladding – Any rain-screen Terra Cotta (minimum 1/2" thick) with ventilated shiplap 15. 1/2" Stucco – any one coat stucco (1/2" minimum) which meets AC11 acceptance criteria or is approved for use in Type I-IV construction or has been tested per NFPA 285 or stays in place when tested per ASTM E119 (stucco exposed to fire) for at least 30 minutes 16. Natural Stone Veneer – minimum 1 1/4" thick using any standard installation technique 17. Fundermax m.look Grey Core – minimum 1/4" thick using any standard installation technique

Table 5. Approved NFPA 285 Wall Assemblies with R2+ BASE as Exterior Insulation[1,2,3]

Wall Component	Materials
SI: 1 in = 25.4 mm 1. The assemblies' combinations created herein and the various substitutions of products are based on testing and professional thermal engineering analysis by Priest and Associates. 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 and 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.	

Table 6. Allowable NFPA 285 WRB Materials with R2+ SILVER, R2+ MATTE, and R2+ BASE[1,2,3,4]

Wall Component	Materials
WRB Over Base Wall Surface Use any Option 1 – 32, or None ***Note:*** Some WRB are only allowed with specific systems Item 23 (Securock® Exoair® 430) or 24 (DensElement w/ FastFlash) replaces the exterior sheathings in **Table 3** through **Table 5**. When either of these items are used, do not use exterior sheathings listed in **Table 3** through **Table 5**, or WRB on base wall surface in this table	1. Hunter Xci VP-SA WRB 2. Carlisle® Fire Resist 705 VP, Fire Resist 705 FR-A, Fire Resist Barritech NP, Fire Resist Barritech VP (or VP LT). Fire Resist 705 VP may be used with 702 WB, Cav-Grip, or Low VOC Travel-Tack adhesives. Fire Resist FR-A may be used with CCW 702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel-Tack adhesives 3. GE Momentive SEC 2500 SilShield 4. Vaproshield Wrapshield SA, RevealShield SA 5. WR Grace Perm-A-Barrier® VPS, Perm-A-Barrier® NPL (aka PAB NP20), Perm-A-Barrier® VPL, Perm-A-Barrier® Aluminum Wall Membrane 6. StoGuard® VaporSeal® 7. 3M 3015 (with Hold Fast 70 adhesive at 6 mils) 8. Henry Air-Bloc 21S, AB 33, AB 31, or AB 17. AB 32MR may be used only with R2+ SILVER, R2+ MATTE, or R2+ BASE 9. Tyvek CommercialWrap or CommercialWrap D. Fluid Applied WB may be used with R2+ SILVER, R2+ MATTE, and R2+ BASE 10. PolyGuard Air Lok Flex VP or FlexGuard. Air Lok Flex can be implemented only with claddings 1 - 6 11. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB, or R-Guard Spray Wrap MVP 12. Dryvit Backstop NT 13. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR 14. Cosella-Dörken Products, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx 15. 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 less flammable (improved T_{ign}, Pk. HRR) than those listed above 16. BASF Enershield HP or Enershield I 17. Soprema Sopraseal Stick VP, Soprasolin HD, Stick 1100T with Elastacool 600c Primer (for use with R2+ SILVER, R2+ MATTE, and R2+ BASE) 18. Pecora XL Perm Ultra VP 19. Siga Majvest or Majvest 500 SA 20. Sto Gold Coat or Emerald Coat 21. Tremco ExoAir 230 and ExoAir 130 22. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable, WeatherSmart Commercial, or Super Jumbo Tex 60 23. USG Securock® Exoair® 430 System – see note on left

Table 6. Allowable NFPA 285 WRB Materials with R2+ SILVER, R2+ MATTE, and R2+ BASE[1,2,3,4]

Wall Component	Materials
WRB Over Base Wall Surface Continued	24. 5/8" Georgia Pacific DensElement, flashed with Prosoco R-Guard FastFlash on sheathing joints 25. Dow Corning Dowsil DefendAir200 26. Hohmann & Barnard Enviro Barrier and Enviro Barrier VP 27. STS FW100 or FW100A 28. Karnak 321 K-NRG 29. NaturaSeal AirSeal NS-A-250LP, AirSeal NS-A-250HP 30. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A 31. Master Wall Rollershield 32. Parex WeatherSeal Spray & Roll-On
WRB Over Exterior Insulation Use any Option 1 – 26, or None ***Note:*** Some WRB are only allowed with specific systems Insulation Joints may be taped with Foil-Grip 1402, 4" width (maximum)	1. Hunter Xci VP-SA WRB 2. Carlisle® Fire Resist 705 VP (with 702 WB, Cav-Grip, or Low VOC Travel-Tack adhesives), Fire Resist 705 FR-A (with CCW 702, 702LV, 702 WB, CAV-Grip, and Low VOC Travel Adhesives), Fire Resist Barritech VP (or VP LT), Fire Resist Barritech NP 3. GE Momentive SEC 2500 SilShield 4. Vaproshield Wrapshield SA, RevealShield SA 5. WR Grace Perm-A-Barrier® NPL (aka PAB NP20), Perm-A-Barrier® VPL, Perm-A-Barrier® Aluminum Wall Membrane 6. Henry Air-Bloc 21S, AB 33, AB 31, or AB 17 7. Tyvek CommercialWrap 8. PolyGuard Air Lok Flex VP, FlexGuard, Air Lok Flex (only with claddings 1 - 6) (**Table 4**) 9. Prosoco R-Guard Cat 5, R-Guard Cat 5 Rainscreen, R-Guard VB or R-Guard Spray Wrap MVP 10. Sto Gold coat 11. Dryvit Backstop NT 12. 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 less flammable (improved T_{ign}, Pk. HRR) than those listed above 13. 3" Aluma-GRIP 701 or 4" FG-1402 joint tape may be interchanged. (Hardcast AFT is a rebrand of Aluma-GRIP 701) 14. WR Meadows Air Shield LMP (Gray), Air Shield LMP (Black), Air Shield TMP, Air Shield LSR 15. Cosella-Dörken Products, Inc., Delta-Vent SA, Delta-Vent S, Delta-Fassade S, Delta Maxx 16. Soprema Sopraseal Stick VP, Soprasolin HD 17. Pecora XL Perm Ultra VP 18. Siga Majvest (for all claddings) or Majvest 500 SA (only with claddings 1 - 6) 19. Fortifiber Building Systems Group WeatherSmart Housewrap, WeatherSmart Drainable or WeatherSmart Commercial 20. Dow Corning Dowsil DefendAir 200 21. Hohmann & Barnard Enviro Barrier VP 22. STS FW100A 23. Karnak 321 K-NRG

Table 6. Allowable NFPA 285 WRB Materials with R2+ SILVER, R2+ MATTE, and R2+ BASE[1,2,3,4]

Wall Component	Materials
WRB Over Exterior Insulation Continued	24. Jumpstart HWW-65A, HWW-65B, HWHP-80A, HWMP-90A, HWD2-72A, HWHPT-92A, HWMPC-105A 25. Master Wall Rollershield 26. Parex WeatherSeal Spray & Roll-On

SI: 1 in = 25.4 mm

1. The following adhesives may be used for attachment of the polyisocyanurate (polyiso) insulation:
   a. Adhesive applied discontinuously at a rate of 3/8" x 3" dabs, 16" o.c.: LM 800 XL, or BarriBond or BarriBond XL
   b. Aerosol adhesive at the application rate as per mfg. instructions: CAV-Grip™ or Low VOC Travel-Tack
2. The following may be used as gap filler between insulation panels: FOMO HandiFoam FireBlock and TVM FireBlock.
3. These manufacturer detailing materials may be used over the base wall assembly. The detailing materials can be used alone or with any approved WRB for the construction.
   a. Board Joint Treatments:
      i. 2" x 40 mil ribbon of BarriBond or BarriBond XL
      ii. 4" DCH Reinforcing Fabric embedded in Fire-Resist Barritech VP/NP/NP LT or embedded in Fire Resist Barrithane VP
      iii. 4" Foil-GRIP 1402 (with surface preparation as recommended by Henry, A Carlisle Company using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer, or Low VOC EPDM Primer per instructions on Product Data Sheet)
      iv. 4" AlumaGRIP 701 (with surface preparation as recommended by Henry, A Carlisle Company using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer, or Low VOC EPDM Primer per instructions on Product Data Sheet)
   b. Termination Mastic for Flashing/Membrane: 1" x 40 mil ribbon or tooled 3/8" bead of SURE-SEAL Lap Sealant, CCW-704, LM 800 XL, BarriBond, or BarriBond XL.
   c. Detail Flashing, 3" on each side, at Openings, Terminations, Penetrations, Transitions and Angle Changes.
      i. CCW-705/XLT, CCW-705 TWF/XLT, or Fire Resist 705 FR-A/XLT (all with surface preparation as recommended by Henry, A Carlisle Company using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer, or Low VOC EPDM Primer per instructions on Product Data Sheet)
      ii. SURE-SEAL P/S Elastoform or SURE-SEAL P/S Cover Strip (both with surface preparation as recommended by CCW using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer or Low VOC EPDM Primer per instructions on Product Data Sheet)
      iii. LiquiFiber or DCH Reinforcing Fabric embedded in Barritech VP/NP/NP LT
      iv. 40 mil application of BarriBond, BarriBond XL, or Barrithane VP
4. These manufacturer detailing materials may be used over the polyiso insulation and can be used alone or with any approved WRB for the assembly.
   a. Board Joint Treatments:
      i. 2" x 40 mil ribbon of BarriBond or BarriBond XL
      ii. 4" DCH Reinforcing Rabric embedded in Fire-Resist Barritech VP/NP/NP LT or embedded in Fire Resist Barrithane VP
      iii. 4" Foil-GRIP 1402 (with surface preparation as recommended by Henry, A Carlisle Company using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer, or Low VOC EPDM Primer per instructions on Product Data Sheet)
      iv. 4" AlumaGRIP 701 (with surface preparation as recommended by Henry, A Carlisle Company using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer, or Low VOC EPDM Primer per instructions on Product Data Sheet)
   b. Termination Mastic for Flashing/Membrane: 1" x 40 mil ribbon or tooled 3/8" bead of SURE-SEAL Lap Sealant, LM 800 XL, BarriBond, or BarriBond XL.
   c. Detail Flashing, 3" on each side, at Openings, Terminations, Penetrations, Transitions and Angle Changes.
   d. Fire Resist 705 FR-A/XLT (with surface preparation as recommended by Henry, A Carlisle Company using CCW-702, CCW-702 LV, CCW-702 WB, CCW-715, Low VOC Travel-Tack, CAV-Grip, HP 250 Primer, or Low VOC EPDM Primer per instructions on Product Data Sheet).

6.2.5 *Special Approval – 2018 IBC:*

6.2.5.1 R2+ SILVER, R2+ MATTE, and R2+ BASE have been tested in accordance with NFPA 285, which is a full-scale fire test that evaluates the use of foam plastics in exterior wall assemblies using actual end use configurations. See **Section 6.2.4** for the wall assemblies and the evaluations listed in **Section 10**.

6.2.5.2 Special approval by large-scale testing is allowed by 2018 IBC Section 2603.9, which states:

> **2603.9 Special approval**. Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.1.1.1), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall conform to the flame spread and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

6.2.5.2.1 The testing listed in this section (NFPA 286, FM 4880, UL 1040, or UL 1715) are all tests that evaluate the potential for fire growth of combustible interior finishes.

6.2.5.2.2 Since R2+ SILVER, R2+ MATTE, and R2+ BASE are not intended for use as interior finishes, these are not the appropriate end-use tests for these applications.

6.2.5.2.3 This section allows the use of other larger-scale tests. NFPA 285 is a large-scale test that evaluates the wall assembly in fire conditions after flashover occurs, and it is indicative of the end use conditions.

6.2.5.2.4 This special approval exempts a product from the need to comply with 2018 IBC Section 2603.4 and 2018 IBC Section 2603.6. This change in the code language from the 2012 version does not include the exemption from 2018 IBC Section 2603.5.4, which requires a flame spread rating of 25 or less.

6.2.5.2.5 R2+ SILVER, R2+ MATTE, and R2+ BASE are not interior finish materials and shall be covered with a minimum $^1/_2$" gypsum wallboard, which meets the requirements of 2018 IBC Section 2603.5.2 for thermal barriers.

6.2.5.2.6 There is no flame spread requirement in 2018 IBC Chapter 8 that applies to foam plastics used as insulation inside exterior non-load bearing wall assemblies in which foam is covered by a thermal barrier.

6.2.5.2.7 The foam plastic materials in R2+ SILVER, R2+ MATTE, and R2+ BASE do not have a flame spread index of 25 or less as required by 2018 IBC Section 2603.5.4. However, they have met the intent of the code by showing that in their end use configuration, they meet the requirements of the NFPA 285 assembly test and are for the assemblies defined herein, equivalent to assemblies containing foam plastics with a flame spread of 25 or less.

6.2.5.2.8 Based upon the above analysis and interpretation, R2+ SILVER, R2+ MATTE, and R2+ BASE meet the requirements of 2018 IBC Section 2603.9 when installed in accordance with the provisions of this report.

6.2.6 *Special Approval – 2021 IBC:*

6.2.6.1 R2+ SILVER, R2+ MATTE, and R2+ BASE have been tested in accordance with NFPA 285, which is a full-scale fire test that evaluates the use of foam plastics in exterior wall assemblies using actual end use configurations. See **Section 6.2.4** for the wall assemblies and the evaluations listed in **Section 10**.

6.2.6.2 Special approval by large-scale testing is allowed by 2021 IBC Section 2603.9, which states:

> Foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.1.1.1), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall conform to the flame spread and smoke-developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

6.2.6.2.1 The testing listed in this section (NFPA 286, FM 4880, UL 1040, or UL 1715) are all tests that evaluate the potential for fire growth of combustible interior finishes.

6.2.6.2.2 Since R2+ SILVER, R2+ MATTE, and R2+ BASE are not intended for use as interior finishes, these are not the appropriate end-use tests for these applications.

6.2.6.2.3 This section allows the use of other larger-scale tests. NFPA 285 is a large-scale test that evaluates the wall assembly in fire conditions after flashover occurs, and it is indicative of the end use conditions.

6.2.6.2.4 This special approval exempts a product from the need to comply with 2021 IBC Section 2603.4 and 2021 IBC Section 2603.6. This change in the code language from the 2012 version does not include the exemption from 2021 IBC Section 2603.5.4, which requires a flame spread rating of 25 or less.

6.2.6.2.5 R2+ SILVER, R2+ MATTE, and R2+ BASE are not interior finish materials and shall be covered with a minimum $^1/_2$" gypsum wallboard, which meets the requirements of 2021 IBC Section 2603.5.2 for thermal barriers.

6.2.6.2.6 There is no flame spread requirement in 2021 IBC Chapter 8 that applies to foam plastics used as insulation inside exterior non-load bearing wall assemblies in which foam is covered by a thermal barrier.

6.2.6.2.7 The foam plastic materials in R2+ SILVER, R2+ MATTE, and R2+ BASE do not have a flame spread index of 25 or less as required by 2021 IBC Section 2603.5.4. However, they have met the intent of the code by showing that in their end use configuration, they meet the requirements of the NFPA 285 assembly test and are for the assemblies defined herein, equivalent to assemblies containing foam plastics with a flame spread of 25 or less.

6.2.6.2.8 Based upon the above analysis and interpretation, R2+ SILVER, R2+ MATTE, and R2+ BASE meet the requirements of 2021 IBC Section 2603.9 when installed in accordance with the provisions of this report.

6.3 *Air Barrier*

6.3.1 R2+ MATTE meets the requirements of IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1,[30] for use as a component of the air barrier, when installed in accordance with the manufacturer installation instructions and this report.

6.3.1.1 The air permeance of an air barrier material is defined by the IECC and the Air Barrier Association of America (ABAA) as being no greater than 0.02 L/(s•m^2) at 75 Pa pressure difference when tested in accordance with ASTM E2178.

6.3.2 The air barrier properties of R2+ MATTE are shown in **Table 7**.

Table 7. Air Permeability[1]

Product Name	Air Pressure	Air Permeability
R2+ MATTE	75 Pa	< 0.02 L/(s•m^2)

Imperial Units: 1 Pa = 0.021-psf, 1 L/(s·m^2) = 0.2 cfm/ft^2

1. Foam core tested in accordance with ASTM E2178. Air pressure and permeability numbers shown represent R2+ MATTE compliance and are not intended to represent the performance under actual conditions.

6.4 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[31]

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.[32]

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 the actual loads and conditions of application that occur.[33]

8 Regulatory Evaluation and Accepted Engineering Practice

8.1 R2+ SILVER, R2+ MATTE, and R2+ BASE comply with the following legislatively adopted regulations and/or accepted engineering practice for the following reasons:

8.1.1 Performance for use in exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5.

8.1.2 Performance in accordance with ASTM E84 for flame spread and smoke-developed index ratings in accordance with IBC Section 2603.3.

8.1.3 Performance for use in exterior walls of buildings of Type I–IV construction is based on special approval in accordance with IBC Section 2603.9 in place of IBC Section 2603.5.4.

8.1.4 Performance for use without a thermal barrier in accordance with the provisions in IBC Section 2603.9, as specified in IBC Section 2603.5.2.

8.1.5 Performance regarding the potential heat generated by the FPIS in accordance with IBC Section 2603.5.3.

8.1.6 Performance with regard to vertical and lateral fire propagation in accordance with IBC Section 2603.5.5.

8.1.7 Performance related to ignition in accordance with IBC Section 2603.5.7.

8.2 R2+ MATTE was evaluated for use as an air impermeable insulation (air barrier material) as provided IRC Section N1101.10.5, IECC Section R303.1.5, and IECC Section C402.6.2.3.1.[34]

8.3 Wind pressure resistance in accordance with IBC Section 2603.10 and IRC Section R303.8[35] is outside the scope of this evaluation.

8.4 Fire-resistance rated wall assemblies in accordance with IBC Section 2603.5.1 are outside the scope of this evaluation.

8.5 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[36] to practice product and regulatory compliance services within its scope of accreditation and engineering expertise,[37] respectively.

8.6 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.

9.3 *Installation Procedure*

9.3.1 This section provides general guidelines for the installation of R2+ SILVER, R2+ MATTE, and R2+ BASE. Refer to the manufacturer installation instructions, in addition to this report, for complete details and requirements.

9.3.1.1 Protect surrounding areas and surfaces from damage.

9.3.1.2 If wall assembly design calls for WRB installed over the base wall, ensure that the WRB is one of those identified in **Table 6**, and the WRB is installed correctly and in good condition before covering with FPIS.

9.3.1.3 FPIS shall not be applied over walls while they are vulnerable to water intrusion from above or behind.

9.3.1.4 Do not block flashing, weeps, or other drainage paths with FPIS.

9.3.1.5 Do not span expansion joints with FPIS.

9.3.1.6 During installation, take precautions to minimize moisture intrusion behind insulation.

9.3.1.7 Beginning at the base of the wall, apply FPIS horizontally or vertically using maximum board lengths to minimize number of joints.

9.3.1.8 Pre-cut FPIS to fit openings and penetrations.

9.3.1.9 Offset FPIS board joints a minimum of 6". Do not form 4-corner intersections.

9.3.1.10 Form a *"corner lock"* pattern by staggering vertical joints at inside and outside corners.

9.3.1.11 Fill gaps greater than $^1/_8$" between FPIS boards with expanding spray foam or butter edge of board with approved sealant, and strike flush. Expanding spray foam may also be applied onto the FPIS board edges during installation.

9.3.1.12 Verify all materials are installed in accordance with current Henry published literature and local code requirements.

9.3.1.13 Additional information on the installation and detailing of R2+ SILVER, R2+ MATTE, and R2+ BASE can be found at www.henry.com/products.

9.3.2 This section provides additional general guidelines for the installation of ***R2+ SILVER and R2+ MATTE only***. In addition to this report, refer to the manufacturer installation instructions for complete details and requirements.

9.3.2.1 Cut with a knife using a square to guide the cut, or use a table saw.

9.3.2.2 Abut all joints tightly and ensure an overall flush, level surface.

9.3.2.3 Mechanically fasten using the fastening pattern as indicated.

9.3.2.4 Space fasteners 12" o.c. at the perimeter and 16" o.c. in the field.

9.3.2.5 Set back perimeter fasteners $^{3}/_{8}$" from board edges.

9.3.2.5.1 ***Note:*** Where R2+ SILVER or R2+ MATTE are installed by the same trade as the cladding, or in close cooperation with that trade, cladding attachment hardware can supplement or replace the insulation fasteners and insulation adhesive. Cladding fasteners fulfilling the R2+ SILVER or R2+ MATTE attachment function shall be designed for this function. If the cladding attachment is 16" o.c. or closer, and it tightly secures the insulation, no additional fastening or adhesive is required.

9.3.2.6 When adhesive is used, periodically verify adhesion. Properly installed adhesively applied R2+ SILVER or R2+ MATTE will cohesively break the adhesive while still wet and destroy the substrate when dry.

9.3.2.7 Consult the detailed manufacturer installation instructions for the proper adhesive pattern to maintain the drainage plane.

9.3.3 This section provides additional general guidelines for the installation of ***R2+ BASE only***. Refer to the manufacturer installation instructions and this report, for complete details and requirements.

9.3.3.1 Provide separation of the edge of R2+ BASE from concrete at grade with pressure-treated lumber sill plate, sill gasket, or non-permeable flashing material.

9.3.3.2 Begin at base of wall from a firm, permanent support.

9.3.3.3 Fasten R2+ BASE with proper fasteners and spacing to accommodate design. Fasten R2+ BASE to the structure using SIP fasteners or similar hardware driven into steel studs, wood studs, concrete, or CMU substrate. Fastening shall be approved by a structural engineer, as the fastening must be sufficient to support both the weight of the R2+ BASE and the weight of the cladding for the project conditions.

9.3.3.4 Allow a minimum $^{1}/_{8}$" and a maximum $^{1}/_{4}$" gap between R2+ BASE boards to accommodate hygroscopic movement of wood. Fasten boards tightly to provide a flush, level surface.

9.3.3.5 Apply WRB from the approved list in **Table 6**, over plywood side of R2+ BASE according to WRB manufacturer instructions.

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 Flame spread and smoke developed index testing in accordance with ASTM E84

10.1.2 Fire performance criteria testing in accordance with NFPA 285

10.1.3 Potential heat testing in accordance with NFPA 259

10.1.4 Air permeance testing in accordance with ASTM E2178

10.2 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.

10.3 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.

10.4 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.

10.5 *Testing and Engineering Analysis*

10.5.1 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.[38]

10.6 Where additional condition of use and/or regulatory compliance information is required, please search for R2+ SILVER, R2+ MATTE, and R2+ BASE on the DrJ Certification website.

11 Findings

11.1 As outlined in **Section 6**, R2+ SILVER, R2+ MATTE, and R2+ BASE 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, R2+ SILVER, R2+ MATTE, and R2+ BASE shall be approved for the following applications:

11.2.1 R2+ SILVER, R2+ MATTE, and R2+ BASE are approved for use in exterior walls of buildings of Type I-IV construction in accordance with IBC Section 2603.5, based on special approval per IBC Section 2603.9.

11.2.2 R2+ SILVER, R2+ MATTE, and R2+ BASE are approved for use in wall assemblies meeting the requirements of NFPA 285 testing when constructed in accordance with **Table 3**, **Table 4**, **Table 5**, and **Table 6**.

11.2.3 R2+ SILVER, R2+ MATTE, and R2+ BASE comply with, or are a suitable alternative to, the applicable sections of the codes listed in **Section 4**.

11.2.4 R2+ MATTE may be used as an air barrier material in exterior wall assemblies as denoted in **Section 6.3**.

11.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Henry, A Carlisle Company.

11.4 IBC Section 104.2.3[39] (IRC Section R104.2.2[40] and IFC Section 104.2.3[41] 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.

11.5 **Approved:**[42] Building regulations require that the building official shall accept duly authenticated reports.[43]

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

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

11.5.3 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.

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

11.7 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.[44]

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 This report and the installation instructions, when required by a code official, shall be submitted at the time of permit application.

12.3 R2+ SILVER, R2+ MATTE, and R2+ BASE are approved for use in exterior walls of buildings of any height and of Type I, II, III, or IV construction, as described in **Table 3**, **Table 4**, **Table 5**, and **Table 6**.

12.4 R2+ BASE may be used as a structural nailing base for claddings.

12.5 When installed in areas where the probability of termite infestation is designated as *"very heavy"*, installation shall meet the requirements of IBC Section 2603.8.

12.6 R2+ SILVER, R2+ MATTE, and R2+ BASE are manufactured in Montgomery, New York; Tooele, Utah; Terrell, Texas; Smithfield, Pennsylvania; Franklin Park, Illinois; Puyallup, Washington; and Lake City, Florida under a quality control program with quality control inspections in accordance with IBC Section 110.3.10[45] and IBC Section 110.3.11.[46]

12.7 The wall assemblies listed in **Table 3**, **Table 4**, **Table 5**, and **Table 6** are based on compliance to the fire provisions of the codes listed in **Section 4**. Consideration of wall assembly performance with regard to other attributes, such as water vapor control, condensation, energy code requirements, etc. are outside the scope of this report.

12.8 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:

12.8.1 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.

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

12.8.3 These innovative products have an internal quality control program and a third-party quality assurance program.

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

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

12.8.6 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.

12.8.7 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.

12.9 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.

12.10 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).

12.11 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 R2+ SILVER, R2+ MATTE, and R2+ BASE, 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.henry.com/products.

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.

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 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

26 2021 IRC Section R316

27 2021 IBC Section 1404.16

28 2021 IBC Section 1404.16.1

29 2021 IBC Section 1404.16.2

30 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

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

[32] 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

[33] 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

[34] 2021 IECC Section C402.5.1.3 AND 2018 IECC Section C402.5.1.2.1

[35] 2021 IRC Section R316.8

[36] 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.

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

[38] 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

[39] 2021 IBC Section 104.11

[40] 2021 IRC Section R104.11

[41] 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

[42] 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.

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

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

[45] 2018 IBC Section 110.3.9

[46] 2018 IBC Section 110.3.10