DREXEL DEFEND-R

SECTION 07 21 13

POLYISOCYANURATE ROOF INSULATION

AUGUST 2024

*** NOTE TO SPECIFIER ***

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This section is based on the products of Drexel Metals, which is located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance flat insulation panels for flat roofing applications and is viable in green and sustainable building designs. This specification is for flat and tapered Drexel Defend-R a rigid roof insulation panel composed of a closed cell polyisocyanurate foam core bonded on each side to fiber reinforced facers.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flat Polyisocyanurate Roof Insulation.

1.02 RELATED SECTIONS

*** NOTE TO SPECIFIER ** Delete any sections below not relevant to this project; add others as required.*

A. Section 07200 - Building Insulation.

B. Section 05300 - Steel Deck.

C. Section 06114 - Wood Blocking.

D. Section 06150 - Wood Decking.

E. Section 07223 – Low Slope Cover Board.

F. Section 07260 - Vapor Retarders.

G. Section 07510 - Built-Up Roofing.

H. Section 07520 – Cold Applied Bituminous Roofing.

I. Section 07530 - Electrometric Membrane Roofing.

J. Section 07540 - Thermoplastic Membrane Roofing.

1.03 REFERENCES

*** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section.*

A. ASTM C 209 - Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

C. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Thermal Insulation Board.

D. ASTM D 312 - Standard Specification for Asphalt Used in Roofing.

E. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

F. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

G. ASTM E 84 - Surface Burning Characteristics of Building Materials.

H. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

I. ASTM E 108 - Standard Tests Method for Fire Tests of Roof Coverings.

J. ASTM E 119 - Standard Test Methods For Fire Tests Of Building Construction and Materials.

K. ICC – ESR-5453

L. FM Approval Guide - FM 4450 Approval Standard - Class I Insulated Steel Roof Decks.

M. FM Approval Guide - FM 4470 Approval Standard - Class I Roof Covering.

N. UL 263 - Fire Tests of Building Construction and Materials.

O. UL 790 - Tests for Fire Resistance of Roof Covering Materials.

P. UL 1256 - Fire Test of Roof Deck Constructions.

1.04 SYSTEM DESCRIPTION

*** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required for the project.*

A. Performance Requirements:
   1. UL Assemblies:
      a. Component of Class A Roof System – UL 790.
      b. Hourly Rated P series roof assemblies (UL 263 foam core only) P 225, 230, 232, 259, 508, 510, 514, 519, 701, 713, 717, 718, 719, 720, 722, 723, 724, 727, 728, 729, 730, 732, 734, 735, 739, 801, 814, 815, 818, 819, 823, 824, 826, 827, 828, 832.
      c. Insulated metal deck assemblies - UL 1256 (nos. 120, 123).
   2. Factory Mutual:
      a. FM 4450 Class I Insulated Steel Roof Decks (Foam Core Only).
      b. FM 4470 Approval Standard - Class I Roof Covering (Foam Core Only).
      c. FM Class 1 approval for steel roof deck constructions, Class 1 Fire and 1-60 and 1-90 windstorm classification (FM 4450).

B. Physical properties (Foam Core Only):
   1. Compressive Strength: ASTM D 1621 and ASTM C 1289, Type II, 20 psi (138 kPa) minimum for Grade 2 and 25 psi (172 kPa) for Grade 3.
   2. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
   3. Moisture Vapor Transmission: ASTM E 96, < 1 perm ((57.5ng/(Pa•s•m2)).
   4. Water Absorption: ASTM C 209, < 1 percent by volume.
   5. Service Temperature: Minus 100 degrees to 250 degrees F (Minus 73 degrees C to 122 degrees C).
   6. Foam Core R Values: Based on LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289.
   7. Foam core flame spread index of 75 or less and smoke developed of 450 or less when tested in accordance with ASTM E 84.

1.05 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Roof plan showing slopes, layout of boards and fastening patterns.

*** NOTE TO SPECIFIER ** Delete the following paragraphs if LEED is not applicable.*

D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
   1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
   2. Manufacturer-Specific Environmental Product Declaration which conforms to ISO 14025

E. Verification Samples: For each finish product specified, two samples, representing actual product.
   1. Submit 6 by 6 inch (152 mm by 152 mm) samples of each board type required.
   2. Submit samples of each fastener type required.

F. Manufacturer's Certificates: Manufacturer's certification that materials meet or exceed specification requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures polyisocyanurate and fully assembled nailbase insulation panels in-house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Metals polyiso products are protected by a 2-step packaging process using shrink wrap and a UV resistant polyethylene bag. This moisture resistant package is designed for protection from the elements during flatbed shipment from our facilities to the job-site.

B. Store products in accordance with the manufacturer recommendations.

C. Store product on a solid flat foundation and elevate a minimum of 2 inches above the finished surface.

D. Slit the bundle packaging vertically down the center of the two sides and cover with a waterproof tarpaulin

E. Protect insulation from open flame and keep dry at all times.

1.08 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not install insulation on roof deck when water of any type is present. Do not install insulation or roofing materials when substrate is damp or wet or when proper adhesive temperature cannot be maintained.

1.09 COORDINATION

A. Coordinate work with installation of roof covering and associated roof penetrations and counterflashings installed by other sections as work of this section proceeds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

*** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.*

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 MATERIALS

A. Roof Board Insulation: Provide products that comply with the following:

*** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.*

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. Florida Building Code Approval FL# 46439.
5. Miami Dade County, Florida Product Control No. 23-1208.12.

*** NOTE TO SPECIFIER ** Select one or more of the insulation types as required for the project from the following paragraphs. Delete the paragraphs that are not required.*

B. Flat Foam Roof Insulation with Fiber-Reinforced Facers: Drexel Defend-R; closed-cell polyisocyanurate foam core bonded to fiber-reinforced facers on both sides; conforming to ASTM C 1289, Type II, Class 1 with square edges.
   1. Manufactured using 3rd Generation Zero ODP, EPA Compliant Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually no Global Warming Potential (GWP)
   2. Fire Ratings:
      a. UL 1256, No. 120 and 123.
      b. UL 790 (ASTM E 108), Class A.
      c. UL 263 (ASTM E 119).
      d. FM 4450/4470, Class 1. Fire Rating.

*** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.*

   3. FM Approval, Wind Uplift Classification: 1-60.
   4. FM Approval, Wind Uplift Classification: 1-90.

*** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.*

   5. Compressive Strength: 20 pounds per square inch (138 kPa) Grade 2.
   6. Compressive Strength: 25 pounds per square inch (172 kPa) Grade 3.

*** NOTE TO SPECIFIER ** Select the required panel thickness paragraph from the following list. Delete the paragraphs not required. When a foam thickness of 3.5 inch or greater is required, a two layer system with staggered joints is recommended. Also, If more than one thickness is required identify the location of the materials required on the Drawings.*

   7. R Value: Provide Insulation with LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289. Minimum thickness of panels shall be as follows:
      a. Thickness 1.00 inch (25 mm), R Value 5.7, flute spanability 2 5/8 inches (67 mm).
      b. Thickness 1.50 inch (38 mm), R Value 8.6, flute spanability 4-3/8 inches (111.13 mm).
      c. Thickness 1.60 inch (41 mm), R Value 9.1, flute spanability 4-3/8 inches (111.13 mm).
      d. Thickness 1.70 inch (43 mm), R Value 9.7, flute spanability 4-3/8 inches (111.13 mm).
      e. Thickness 1.80 inch (46 mm), R Value 10.3, flute spanability 4-3/8 inches (111.13 mm).

f. Thickness 2.00 inch (51 mm), R Value 11.4, flute spanability 4-3/8 inches (111.13 mm).
g. Thickness 2.50 inch (64 mm), R Value 14.4, flute spanability 4-3/8 inches (111.13 mm).
h. Thickness 2.70 inch (69 mm), R Value 15.6, flute spanability 4-3/8 inches (111.13 mm).
i. Thickness 3.00 inch (76 mm), R Value 17.4, flute spanability 4-3/8 inches (111.13 mm).
j. Thickness 3.10 inch (79 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
k. Thickness 3.30 inch (84 mm), R Value 19.2, flute spanability 4-3/8 inches (111.13 mm).
l. Thickness 3.50 inch (89 mm), R Value 20.5, flute spanability 4-3/8 inches (111.13 mm).
m. Thickness 3.60 inch (91 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).
n. Thickness 3.70 inch (94 mm), R Value 21.7, flute spanability 4-3/8 inches (111.13 mm).
o. Thickness 4.00 inch (102 mm), R Value 23.6, flute spanability 4-3/8 inches (111.13 mm).
p. Thickness 4.50 inch (113 mm), R Value 26.8, flute spanability 4-3/8 inches (111.13 mm).

C. Flat Foam Roof Insulation with Coated Glass Facer: Drexel Defend-R Coated Glass; closed-cell polyisocyanurate foam core bonded to high performance coated glass fiber facers on both sides; conforming to ASTM C 1289, Type II, Class 2 with square edges.
1. Manufactured using 3rd Generation Zero ODP, EPA Compliant Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually no Global Warming Potential (GWP)
2. Fire Ratings:
a. UL 1256, No. 120 and 123.

*** NOTE TO SPECIFIER ** Select one of the following three paragraphs and delete the ones not required.*
Class A - Drexel Defend-R Coated Glass at a thickness of 3 inches or greater in either a single layer or in a combination of multiple layers (two-layers @ 1.5 inches) is approved for a Class A Assembly without the use of a fire rated slip sheet or gypsum cover board. (contact Drexel Metals for a list of which multiple layers are approved).
Class B - Drexel Defend-R Coated Glass at a thickness of 1.9 inch or greater is a single layer is approved for a Class B assembly without the use of a fire rated slip sheet or gypsum cover board.
FM Class 1 – Approved for Class1 insulated steel, concrete, and gypsum roof deck constructions for 1-60 to 1-270. Refer to FM Approval's RoofNav for details on specific system.

b. UL 790 (ASTM E 108), Class A.
c. UL 790 (ASTM E 108), Class B.
d. UL 263 (ASTM E 119).
e. FM 4450/4470, Class 1. Fire Rating.

*** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.*

3. Compressive Strength: 20 pounds per square inch (138 kPa) Grade 2.
4. Compressive Strength: 25 pounds per square inch (172 kPa) Grade 3.

*** NOTE TO SPECIFIER ** Select the required paragraphs from the following list. Delete the paragraphs not required. Indicate required insulating value on the Drawings.*

5. R Value: Provide Insulation with LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289. Minimum thickness of panels shall be as follows:
a. Thickness 1.00 inch (25 mm), R Value 5.7, flute spanability 2 5/8 inches (67 mm).

b. Thickness 1.50 inch (38 mm), R Value 8.6, flute spanability 4-3/8 inches (111.13 mm).
c. Thickness 1.60 inch (41 mm), R Value 9.1, flute spanability 4-3/8 inches (111.13 mm).
d. Thickness 1.70 inch (43 mm), R Value 9.7, flute spanability 4-3/8 inches (111.13 mm).
e. Thickness 1.90 inch (48 mm), R Value 10.8, flute spanability 4-3/8 inches (111.13 mm).
f. Thickness 2.00 inch (51 mm), R Value 11.4, flute spanability 4-3/8 inches (111.13 mm).
g. Thickness 2.50 inch (64 mm), R Value 14.4, flute spanability 4-3/8 inches (111.13 mm).
h. Thickness 2.70 inch (69 mm), R Value 15.6, flute spanability 4-3/8 inches (111.13 mm).
i. Thickness 3.00 inch (76 mm), R Value 17.4, flute spanability 4-3/8 inches (111.13 mm).
j. Thickness 3.10 inch (79 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
k. Thickness 3.30 inch (84 mm), R Value 19.2, flute spanability 4-3/8 inches (111.13 mm).
l. Thickness 3.50 inch (89 mm), R Value 20.5, flute spanability 4-3/8 inches (111.13 mm).
m. Thickness 3.60 inch (91 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).
n. Thickness 4.00 inch (102 mm), R Value 23.6, flute spanability 4-3/8 inches (111.13 mm).
o. Thickness 4.50 inch (113 mm), R Value 26.8, flute spanability 4-3/8 inches (111.13 mm).

D. Target Sumps
1. Hinged Target Sump 8’x8’
a. ASTM Type II, Class 1 or 2, Grade 3 (172 kPa)
b. 8’x8’ pre-assembled drain sump
c. Perimeter Edge Thicknesses 1.5”, 2.0” 2.5” and 3.0”
d. Slope of Hinged Target Sump board shall be:
1) 1/4 inch (6 mm) per foot.
2) 1/2 inch (13 mm) per foot.
3) 3/8 inch (10 mm) per foot
2. Target Sump 4’x4’
a. ASTM Type II, Class 2, Grade 3 (172 kPa)
b. 4’x4’ pre-assembled drain sump
c. Perimeter Edge Thicknesses 1.5”, 2.0” 2.5” and 3.0”
d. Slope of Target Sump board shall be:
1) 1/2 inch (13 mm) per foot.

2.03 ACCESSORIES

A. Approved Fasteners: Appropriate for purpose intended and approved by FM Approvals and system manufacturer; length required for thickness of insulation material and penetration of deck substrate, with distribution plates if required.

B. Base Ply: As recommended by membrane manufacturer.

C. Asphalt Bitumen: ASTM D 312, Type III, or Type IV.

1. Use only on approved board insulation types.
2. Provide with labels indicating flash point, softening point, finished blowing temperature and equiviscous temperature.

D. Cant Strip and Tapered Edge Strip: Standard machine cut perlite or wood fiberboard strips in sizes indicated or required.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Examine roof deck for suitability to receive insulation. Verify that substrate is dry, clean, and free of foreign material that will damage insulation installation.

C. Verify that roof drains, scuppers, roof curbs, nailers, equipment supports, vents, and other roof accessories are secured properly and installed in conformance with drawings and submittals.

D. Verify that deck is structurally sound to support installers, materials, and equipment without damaging or deforming work.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

*** NOTE TO SPECIFIER ** The incorporation of a vapor barrier or retarder within the roofing assembly is highly recommended when the project is located in Zones 1, 2 or 3 of the United States. Drexel Defend-R is not intended to substitute for a vapor barrier. Vapor barrier or retarder when used shall have a perm rating of 0.5 or less as determined by ASTM E-96.*

C. Apply vapor barrier and or retarder, as specified by the Architect or required by the local building code, to decking prior to installation of insulation.

3.03 INSTALLATION

A. Install specified insulation in accordance with manufacturer's latest printed instructions and as required by governing codes and Owner's insurance carrier.

B. Do not leave installed insulation exposed to weather. Cover and waterproof immediately after installation.

C. Seal exposed insulation joints at the end of each day. Remove seal when work resumes.

D. Remove installed insulation that has become wet or damaged and replace with new solid and dry insulation material.

*** NOTE TO SPECIFIER *** Select one of the following three installation system paragraphs for the roof system required and delete the ones not required. Edit each system as required by the governing codes and Owners insurance requirements. Coordinate with the requirements of the roof system manufacturer.*

E. Built-Up, Coal Tar and Modified Bitumen Systems:

*** NOTE TO SPECIFIER *** Select the installation method or combination of methods required from the following three paragraphs and delete those not required. Coordinate with the requirements of the roof system manufacturer and edit as required.*

1. Secure each Drexel Defend-R panel to the roof deck with Factory Mutual approved fasteners and plates (appropriate to the deck type).
2. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with a full mopping of hot steep asphalt.
3. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with FM approved cold adhesive.
4. Butt edges and stagger joints of adjacent panels.

*** NOTE TO SPECIFIER *** The following three paragraphs apply to multi-layer systems only select the method required and delete those not required. Delete if not required.*

5. Multi-layer systems: Adhere subsequent layers with a full mopping of hot steep asphalt.
6. Multi-layer systems: Adhere subsequent layers with FM approved cold adhesive.
7. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
8. Install the roof covering according to the roof manufacturer's specifications.

F. Single-Ply Systems Ballasted Single-Ply Systems:

1. Each Drexel Defend-R panel is loosely laid on the roof deck.
2. Butt edges and stagger joints of adjacent panels.
3. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
4. Install the roof covering according to the roof manufacturer's specifications.

G. Mechanically Attached Single-Ply Systems:

1. Each Drexel Defend-R panel must be secured to the roof deck with Factory Mutual approved fasteners and plates (appropriate to the deck type).
2. Butt edges and stagger joints of adjacent panels.
3. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
4. Install the roof covering according to the roof manufacturer's specifications.

H. Fully Adhered Single-Ply Systems:

*** NOTE TO SPECIFIER *** Select the installation method or combination of methods required from the following three paragraphs and delete those not required. Coordinate with the requirements of the roof system manufacturer and edit as required.*

1. Secure each Drexel Defend-R panel to the roof deck with Factory Mutual approved fasteners and plates (appropriate to the deck type).
2. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with a full mopping of hot steep asphalt.
3. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with cold adhesive.
4. Butt edges and stagger joints of adjacent panels.

*** NOTE TO SPECIFIER *** The following three paragraphs apply to multi-layer systems only select the method required and delete those not required. Delete if not required.*

5. Multi-layer systems: Adhere subsequent layers with a full mopping of hot steep asphalt.

6. Multi-layer systems: Adhere subsequent layers with FM approved cold adhesive.
7. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
8. Install the roof covering according to the roof manufacturer's specifications.

*** NOTE TO SPECIFIER ** Note the following paragraph can apply to Drexel Defend-R Coated Glass. Drexel Defend-R Coated Glass provides a sustainable solution in retrofit applications when existing insulation is left in place. To facilitate compliance with ASHRAE 90.1 Standards for energy efficiency, Drexel Defend-R Coated Glass can be installed in a single layer on top of intact and dry insulation after the Single-Ply membrane is removed. The new Single-Ply membrane can then be installed over an insulation assembly that complies with the latest energy code requirements.*

I. Re-roofing Single-Ply systems:
   1. Remove existing single ply membrane and clean surface of debris or irregularities.
   2. Verify that the existing insulation is dry and sound.
   3. Install insulation panels in a single layer on top of intact and dry insulation.
   4. Butt edges and stagger the joints in accordance with good roofing practice and fasten as per manufacturer’s specifications.
   5. Install the new Single-Ply membrane according to the roof manufacturer's specifications.

3.04 CLEANING

A. Remove trash and construction debris from insulation before application of roofing membrane.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Protect installed insulation traffic by use of protective covering materials during and after installation.

C. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels. Only apply enough insulation per day that can be covered by the finished roofing system.

D. Do not leave panels exposed to moisture. Wet panels shall be removed or allowed to completely dry prior to application of vapor barrier and/or roof covering.

E. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R COATED GLASS

SECTION 07 21 13

POLYISOCYANURATE ROOF INSULATION

AUGUST 2024

*** NOTE TO SPECIFIER ****

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This section is based on the products of Drexel Metals, which is located at:

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Drexel Metals is the developer and producer of high performance flat and sloped polyisocyanurate insulation panels for flat roofing applications and is viable in green and sustainable building designs. This specification is for flat Drexel Defend-R Coated Glass a rigid roof insulation panel composed of a closed cell polyisocyanurate foam core bonded on each side to glass fiber reinforced facers.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flat Polyisocyanurate Roof Insulation.

1.02 RELATED SECTIONS

** NOTE TO SPECIFIER ** Delete any sections below not relevant to this project; add others as required.

A. Section 07200 - Building Insulation.

B. Section 05300 - Steel Deck.

C. Section 06114 - Wood Blocking.

D. Section 06150 - Wood Decking.

E. Section 07223 – Low Slope Cover Board.

F. Section 07260 - Vapor Retarders.

G. Section 07510 - Built-Up Roofing.

H. Section 07520 – Cold Applied Bituminous Roofing.

I. Section 07530 - Electrometric Membrane Roofing.

J. Section 07540 - Thermoplastic Membrane Roofing.

1.03 REFERENCES

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section.

A. ASTM C 209 - Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

C. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Thermal Insulation Board.

D. ASTM D 312 - Standard Specification for Asphalt Used in Roofing.

E. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

F. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

G. ASTM E 84 - Surface Burning Characteristics of Building Materials.

H. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

I. ASTM E 108 - Standard Tests Method for Fire Tests of Roof Coverings.

J. ASTM E 119 - Standard Test Methods For Fire Tests Of Building Construction and Materials.

K. FM Approval Guide - FM 4450 Approval Standard - Class I Insulated Steel Roof Decks.

L. FM Approval Guide - FM 4470 Approval Standard - Class I Roof Covering.

M. ICC – ESR-1208.12

N. UL 263 - Fire Tests of Building Construction and Materials.

O. UL 790 - Tests for Fire Resistance of Roof Covering Materials.

P. UL 1256 - Fire Test of Roof Deck Constructions.

1.04 SYSTEM DESCRIPTION

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required for the project.

A. Performance Requirements:
   1. UL Assemblies:
      a. Component of Class A Roof System – UL 790.
      b. Hourly Rated P series roof assemblies (UL 263 foam core only) P 225, 230, 232, 259, 508, 510, 514, 519, 701, 713, 717, 718, 719, 720, 722, 723, 724, 727, 728, 729, 730, 732, 734, 735, 739, 801, 814, 815, 818, 819, 823, 824, 826, 827, 828, 832.
      c. Insulated metal deck assemblies - UL 1256 (nos. 120, 123).
   2. Factory Mutual:
      a. FM 4450 Class I Insulated Steel Roof Decks (Foam Core Only).
      b. FM 4470 Approval Standard - Class I Roof Covering (Foam Core Only).
      c. FM Class 1 approval for steel roof deck constructions, Class 1 Fire and 1-60 and 1-90 windstorm classification (FM 4450).

B. Physical properties (Foam Core Only):
   1. Compressive Strength: ASTM D 1621 and ASTM C 1289, Type II, 20 psi (138 kPa) minimum for Grade 2 and 25 psi (172 kPa) for Grade 3.
   2. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
   3. Moisture Vapor Transmission: ASTM E 96, < 1 perm ((57.5ng/(Pa•s•m2)).
   4. Water Absorption: ASTM C 209, < 1 percent by volume.
   5. Service Temperature: Minus 100 degrees to 250 degrees F (Minus 73 degrees C to 122 degrees C).
   6. Foam Core R Values: Based on LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289.
   7. Foam core flame spread index of 75 or less and smoke developed of 450 or less when tested in accordance with ASTM E 84.

1.05 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Roof plan showing slopes, layout of boards and fastening patterns.

** NOTE TO SPECIFIER ** Delete the following paragraphs if LEED is not applicable.

D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
   1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
   2. Manufacturer-Specific Environmental Product Declaration which conforms to ISO 14025

E. Verification Samples: For each finish product specified, two samples, representing actual product.
   1. Submit 6 by 6 inch (152 mm by 152 mm) samples of each board type required.
   2. Submit samples of each fastener type required.

F. Manufacturer's Certificates: Manufacturer's certification that materials meet or exceed specification requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures polyisocyanurate and fully assembled nailbase insulation panels in-house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Metals polyiso products are protected by a 2-step packaging process using shrink wrap and a UV resistant polyethylene bag. This moisture resistant package is designed for protection from the elements during flatbed shipment from our facilities to the job-site.

B. Store products in accordance with the manufacturer recommendations.

C. Store product on a solid flat foundation and elevate a minimum of 2 inches above the finished surface.

D. Slit the bundle packaging vertically down the center of the two sides and cover with a waterproof tarpaulin

E. Protect insulation from open flame and keep dry at all times.

1.08 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not install insulation on roof deck when water of any type is present. Do not install insulation or roofing materials when substrate is damp or wet or when proper adhesive temperature cannot be maintained.

1.09 COORDINATION

A. Coordinate work with installation of roof covering and associated roof penetrations and counterflashings installed by other sections as work of this section proceeds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 MATERIALS

A. Roof Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. Florida Building Code Approval FL# 46439.
5. Miami Dade County, Florida Product Control No. 23-1208.12.
6. ICC – ESR-1208.12

** NOTE TO SPECIFIER ** Select one or more of the insulation types as required for the project from the following paragraphs. Delete the paragraphs that are not required.

B. Flat Foam Roof Insulation with Fiber-Reinforced Facers: Drexel Defend-R; closed-cell polyisocyanurate foam core bonded to fiber-reinforced facers on both sides; conforming to ASTM C 1289, Type II, Class 1 with square edges.
   1. Manufactured using 3rd Generation Zero ODP, EPA Compliant Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually no Global Warming Potential (GWP)
   2. Fire Ratings:
      a. UL 1256, No. 120 and 123.
      b. UL 790 (ASTM E 108), Class A.
      c. UL 263 (ASTM E 119).
      d. FM 4450/4470, Class 1. Fire Rating.

** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.

   3. FM Approval, Wind Uplift Classification: 1-60.
   4. FM Approval, Wind Uplift Classification: 1-90.

** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.

   5. Compressive Strength: 20 pounds per square inch (138 kPa) Grade 2.
   6. Compressive Strength: 25 pounds per square inch (172 kPa) Grade 3.

** NOTE TO SPECIFIER ** Select the required panel thickness paragraph from the following list. Delete the paragraphs not required. When a foam thickness of 3.5 inch or greater is required, a two layer system with staggered joints is recommended. Also, If more than one thickness is required identify the location of the materials required on the Drawings.

   7. R Value: Provide Insulation with LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289. Minimum thickness of panels shall be as follows:
      a. Thickness 1.00 inch (25 mm), R Value 5.7, flute spanability 2 5/8 inches (67 mm).
      b. Thickness 1.50 inch (38 mm), R Value 8.6, flute spanability 4-3/8 inches (111.13 mm).
      c. Thickness 1.60 inch (41 mm), R Value 9.1, flute spanability 4-3/8 inches (111.13 mm).
      d. Thickness 1.70 inch (43 mm), R Value 9.7, flute spanability 4-3/8 inches (111.13 mm).
      e. Thickness 1.80 inch (46 mm), R Value 10.3, flute spanability 4-3/8 inches (111.13 mm).

f. Thickness 2.00 inch (51 mm), R Value 11.4, flute spanability 4-3/8 inches (111.13 mm).
g. Thickness 2.50 inch (64 mm), R Value 14.4, flute spanability 4-3/8 inches (111.13 mm).
h. Thickness 2.70 inch (69 mm), R Value 15.6, flute spanability 4-3/8 inches (111.13 mm).
i. Thickness 3.00 inch (76 mm), R Value 17.4, flute spanability 4-3/8 inches (111.13 mm).
j. Thickness 3.10 inch (79 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
k. Thickness 3.30 inch (84 mm), R Value 19.2, flute spanability 4-3/8 inches (111.13 mm).
l. Thickness 3.50 inch (89 mm), R Value 20.5, flute spanability 4-3/8 inches (111.13 mm).
m. Thickness 3.60 inch (91 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).
n. Thickness 3.70 inch (94 mm), R Value 21.7, flute spanability 4-3/8 inches (111.13 mm).
o. Thickness 4.00 inch (102 mm), R Value 23.6, flute spanability 4-3/8 inches (111.13 mm).
p. Thickness 4.50 inch (113 mm), R Value 26.8, flute spanability 4-3/8 inches (111.13 mm).

C. Flat Foam Roof Insulation with Coated Glass Facer: Drexel Defend-R Coated Glass; closed-cell polyisocyanurate foam core bonded to high performance coated glass fiber facers on both sides; conforming to ASTM C 1289, Type II, Class 2 with square edges.
1. Manufactured using 3rd Generation Zero ODP, EPA Compliant Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually no Global Warming Potential (GWP)
2. Fire Ratings:
a. UL 1256, No. 120 and 123.

** NOTE TO SPECIFIER ** Select one of the following three paragraphs and delete the ones not required.

Class A – Drexel Defend-R Coated Glass at a thickness of 3 inches or greater in either a single layer or in a combination of multiple layers (two-layers @ 1.5 inches) is approved for a Class A Assembly without the use of a fire rated slip sheet or gypsum cover board. (contact Drexel Metals for a list of which multiple layers are approved).

Class B – Drexel Defend-R Coated Glass at a thickness of 1.9 inch or greater is a single layer is approved for a Class B assembly without the use of a fire rated slip sheet or gypsum cover board.

FM Class 1 – Approved for Class1 insulated steel, concrete, and gypsum roof deck constructions for 1-60 to 1-270. Refer to FM Approval's RoofNav for details on specific system.

b. UL 790 (ASTM E 108), Class A.
c. UL 790 (ASTM E 108), Class B.
d. UL 263 (ASTM E 119).
e. FM 4450/4470, Class 1. Fire Rating.

** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.

3. Compressive Strength: 20 pounds per square inch (138 kPa) Grade 2.
4. Compressive Strength: 25 pounds per square inch (172 kPa) Grade 3.

** NOTE TO SPECIFIER ** Select the required paragraphs from the following list. Delete the paragraphs not required. Indicate required insulating value on the Drawings.

5. R Value: Provide Insulation with LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289. Minimum thickness of panels shall be as follows:
a. Thickness 1.00 inch (25 mm), R Value 5.7, flute spanability 2 5/8 inches (67 mm).

b. Thickness 1.50 inch (38 mm), R Value 8.6, flute spanability 4-3/8 inches (111.13 mm).
c. Thickness 1.60 inch (41 mm), R Value 9.1, flute spanability 4-3/8 inches (111.13 mm).
d. Thickness 1.70 inch (43 mm), R Value 9.7, flute spanability 4-3/8 inches (111.13 mm).
e. Thickness 1.90 inch (48 mm), R Value 10.8, flute spanability 4-3/8 inches (111.13 mm).
f. Thickness 2.00 inch (51 mm), R Value 11.4, flute spanability 4-3/8 inches (111.13 mm).
g. Thickness 2.50 inch (64 mm), R Value 14.4, flute spanability 4-3/8 inches (111.13 mm).
h. Thickness 2.70 inch (69 mm), R Value 15.6, flute spanability 4-3/8 inches (111.13 mm).
i. Thickness 3.00 inch (76 mm), R Value 17.4, flute spanability 4-3/8 inches (111.13 mm).
j. Thickness 3.10 inch (79 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
k. Thickness 3.30 inch (84 mm), R Value 19.2, flute spanability 4-3/8 inches (111.13 mm).
l. Thickness 3.50 inch (89 mm), R Value 20.5, flute spanability 4-3/8 inches (111.13 mm).
m. Thickness 3.60 inch (91 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).
n. Thickness 4.00 inch (102 mm), R Value 23.6, flute spanability 4-3/8 inches (111.13 mm).
o. Thickness 4.50 inch (113 mm), R Value 26.8, flute spanability 4-3/8 inches (111.13 mm).

D. Target Sumps
1. Hinged Target Sump 8’x8’
a. ASTM Type II, Class 1 or 2, Grade 3 (172 kPa)
b. 8’x8’ pre-assembled drain sump
c. Perimeter Edge Thicknesses 1.5”, 2.0” 2.5” and 3.0”
d. Slope of Hinged Target Sump board shall be:
1) 1/4 inch (6 mm) per foot.
2) 1/2 inch (13 mm) per foot.
3) 3/8 inch (10 mm) per foot
2. Target Sump 4’x4’
a. ASTM Type II, Class 2, Grade 3 (172 kPa)
b. 4’x4’ pre-assembled drain sump
c. Perimeter Edge Thicknesses 1.5”, 2.0” 2.5” and 3.0”
d. Slope of Target Sump board shall be:
1) 1/2 inch (13 mm) per foot.

2.03 ACCESSORIES

A. Approved Fasteners: Appropriate for purpose intended and approved by FM Approvals and system manufacturer; length required for thickness of insulation material and penetration of deck substrate, with distribution plates if required.

B. Base Ply: As recommended by membrane manufacturer.

C. Asphalt Bitumen: ASTM D 312, Type III, or Type IV.
   1. Use only on approved board insulation types.
   2. Provide with labels indicating flash point, softening point, finished blowing temperature and equiviscous temperature.

D. Cant Strip and Tapered Edge Strip: Standard machine cut perlite or wood fiberboard strips in sizes indicated or required.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Examine roof deck for suitability to receive insulation. Verify that substrate is dry, clean, and free of foreign material that will damage insulation installation.

C. Verify that roof drains, scuppers, roof curbs, nailers, equipment supports, vents, and other roof accessories are secured properly and installed in conformance with drawings and submittals.

D. Verify that deck is structurally sound to support installers, materials, and equipment without damaging or deforming work.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

** NOTE TO SPECIFIER ** The incorporation of a vapor barrier or retarder within the roofing assembly is highly recommended when the project is located in Zones 1, 2 or 3 of the United States. Drexel Defend-R Coated Glass is not intended to substitute for a vapor barrier. Vapor barrier or retarder when used shall have a perm rating of 0.5 or less as determined by ASTM E-96.

C. Apply vapor barrier and or retarder, as specified by the Architect or required by the local building code, to decking prior to installation of insulation.

3.03 INSTALLATION

A. Install specified insulation in accordance with manufacturer's latest printed instructions and as required by governing codes and Owner's insurance carrier.

B. Do not leave installed insulation exposed to weather. Cover and waterproof immediately after installation.

C. Seal exposed insulation joints at the end of each day. Remove seal when work resumes.

D. Remove installed insulation that has become wet or damaged and replace with new solid and dry insulation material.

** NOTE TO SPECIFIER ** Select one of the following three installation system paragraphs for the roof system required and delete the ones not required. Edit each system as required by the governing codes and Owners insurance requirements. Coordinate with the requirements of the roof system manufacturer.

E. Built-Up, Coal Tar and Modified Bitumen Systems:

** NOTE TO SPECIFIER ** Select the installation method or combination of methods required from the following three paragraphs and delete those not required. Coordinate with the requirements of the roof system manufacturer and edit as required.

1. Secure each Drexel Defend-R panel to the roof deck with Factory Mutual approved fasteners and plates (appropriate to the deck type).
2. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with a full mopping of hot steep asphalt.
3. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with FM approved cold adhesive.
4. Butt edges and stagger joints of adjacent panels.

** NOTE TO SPECIFIER ** The following three paragraphs apply to multi-layer systems only select the method required and delete those not required. Delete if not required.

5. Multi-layer systems: Adhere subsequent layers with a full mopping of hot steep asphalt.
6. Multi-layer systems: Adhere subsequent layers with FM approved cold adhesive.
7. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
8. Install the roof covering according to the roof manufacturer's specifications.

F. Single-Ply Systems Ballasted Single-Ply Systems:

1. Each Drexel Defend-R panel is loosely laid on the roof deck.
2. Butt edges and stagger joints of adjacent panels.
3. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
4. Install the roof covering according to the roof manufacturer's specifications.

G. Mechanically Attached Single-Ply Systems:

1. Each Drexel Defend-R panel must be secured to the roof deck with Factory Mutual approved fasteners and plates (appropriate to the deck type).
2. Butt edges and stagger joints of adjacent panels.
3. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
4. Install the roof covering according to the roof manufacturer's specifications.

H. Fully Adhered Single-Ply Systems:

** NOTE TO SPECIFIER ** Select the installation method or combination of methods required from the following three paragraphs and delete those not required. Coordinate with the requirements of the roof system manufacturer and edit as required.

1. Secure each Drexel Defend-R panel to the roof deck with Factory Mutual approved fasteners and plates (appropriate to the deck type).
2. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with a full mopping of hot steep asphalt.
3. Adhere maximum 4 foot by 4 foot (1220 mm by 1220 mm) panels of Drexel Defend-R to a prepared concrete deck with cold adhesive.
4. Butt edges and stagger joints of adjacent panels.

** NOTE TO SPECIFIER ** The following three paragraphs apply to multi-layer systems only select the method required and delete those not required. Delete if not required.

5. Multi-layer systems: Adhere subsequent layers with a full mopping of hot steep asphalt.

6. Multi-layer systems: Adhere subsequent layers with FM approved cold adhesive.
7. In multi-layer installations, stagger joints in top and bottom layers. Do not align joints in insulation.
8. Install the roof covering according to the roof manufacturer's specifications.

** NOTE TO SPECIFIER ** Note the following paragraph can apply to Drexel Defend-R Coated Glass. Drexel Defend-R Coated Glass provides a sustainable solution in retrofit applications when existing insulation is left in place. To facilitate compliance with ASHRAE 90.1 Standards for energy efficiency, Drexel Defend-R Coated Glass can be installed in a single layer on top of intact and dry insulation after the Single-Ply membrane is removed. The new Single-Ply membrane can then be installed over an insulation assembly that complies with the latest energy code requirements.

I. Re-roofing Single-Ply systems:
   1. Remove existing single ply membrane and clean surface of debris or irregularities.
   2. Verify that the existing insulation is dry and sound.
   3. Install insulation panels in a single layer on top of intact and dry insulation.
   4. Butt edges and stagger the joints in accordance with good roofing practice and fasten as per manufacturer’s specifications.
   5. Install the new Single-Ply membrane according to the roof manufacturer's specifications.

3.04 CLEANING

A. Remove trash and construction debris from insulation before application of roofing membrane.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Protect installed insulation traffic by use of protective covering materials during and after installation.

C. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels. Only apply enough insulation per day that can be covered by the finished roofing system.

D. Do not leave panels exposed to moisture. Wet panels shall be removed or allowed to completely dry prior to application of vapor barrier and/or roof covering.

E. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R NAIL BASE

SECTION 07 21 13

NAILBASE INSULATION PANELS

AUGUST 2024

*** NOTE TO SPECIFIER ****

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This section is based on the products of Drexel Metals, which is located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance ventilated nailbase insulation panels for steep slope roofing applications greater than 3 inches in 12 inches. A universally accepted substrate for all major types of roof coverings, Drexel Metals offers superior compressive strength, competitive pricing and the highest R-value per inch of any insulating material on the planet.

Our products complement the development of sustainable design practices and fundamentally enhance the building's effectiveness in the environment by reducing energy consumption. Our products components include OSB and plywood that are USGBC certified and our insulating foam contains a recycled content to promote sustainable design practices and significantly reduce energy consumption. It's our way of helping keep the world green.

PART 1 GENERAL

1.01 SECTION INCLUDES

** NOTE TO SPECIFIER ** Delete any paragraphs below not applicable to project.

A. Section includes nailbase insulation panel system.

1.02 RELATED SECTIONS

** NOTE TO SPECIFIER ** Delete sections below not relevant to this project; add others as required.

A. Section 05300 – Steel Deck.

B. Section 06110 - Wood Framing: Structural deck sheathing.

C. Section 06114 - Wood Blocking.

D. Section 06150 - Plywood Decking.

E. Section 07260 - Vapor Retarders.

F. Section 07310 - Roof Shingles.

G. Section 07320 - Roof Tiles.

1.03 REFERENCES

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section.

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

C. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

D. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

E. ASTM E 84 – Surface Burning Characteristics of Building Materials.

F. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

G. CAN/ULC S770 - Standard Test Method for Determination of Long Term Thermal Resistance of Closed Cell Plastic Thermal Insulating.

H. ICC – ESR - 5453

I. UL 1256 - Fire Test of Roof Deck Constructions.

J. PS2-92 - Performance Standard for Wood-based Structural-use Panels.

K. FM 4450 - Class I Insulated Steel Deck Roofs.

L. FM 4470 - Class I Roof Covers (Foam Core Only).

M. FM Class 1 approval for steel roof deck constructions, Class 1 Fire and I-60 and I-90 wind storm classifications

N. Florida Building Code Approval FL# 46439

O. Miami Dade Product Control – Notice of Acceptance NOA No. 23-1208.12.

1.04 SYSTEM DESCRIPTION

A. Physical properties (Foam Core):

1. Manufactured using 3rd Generation Zero ODP, EPA Compliant Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually no Global Warming Potential (GWP)
2. Compressive Strength: ASTM D 1621 and ASTM C 1289, Type V, Class 1, 20 psi (138 kPa) minimum for Grade 2
3. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
4. Moisture Vapor Transmission: ASTM E 96, < 1 perm ((57.5ng/(Pasm2)).
5. Water Absorption: ASTM C 209, < 1 percent by volume.
6. Service Temperature: Minus 100 degrees to 250 degrees F (Minus 73 degrees C to 122 degrees C).
7. Foam core flame spread index of 75 or less and smoke developed of 450 or less when tested in accordance with ASTM E 84.

B. Foam Core R Values: Based on LTTR (Long Term Thermal Resistance) in accordance with ASTM C 1289.

C. UL Assemblies: Insulated steel deck assemblies - UL 1256 (nos. 120, 123).

D. UL Assemblies: Insulated steel deck assemblies - UL 1256 (nos. 120, 123) TGDY. R20624 Shingle Deck Accessory; Drexel Defend-R Nail Base roof insulation is classified for use with any Class A, B, or C asphalt glass mat or asphalt organic shingles, standing seam metal or tile roof coverings.

** NOTE TO SPECIFIER ** Use the following three paragraphs to identify system performance requirements or functional criteria. Delete references that are not actually required.

E. FM Class 1 (Low Slope) approval for steel roof deck constructions, Class 1 Fire and I-60 and I-90 wind storm classifications.

F. Hail Rating: SH-1 and VSH

1.05 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on nailbase insulation panels and fasteners to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

** NOTE TO SPECIFIER ** Delete the following paragraphs if LEED is not applicable.

C. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Manufacturer-Specific Environmental Product Declaration which conforms to ISO 14025

D. Verification Samples: For each finish product specified, two samples, representing actual product.
1. Submit 6 by 6 inch (152 mm by 152 mm) samples of each board type required.
2. Submit samples of each fastener type required.

E. Manufacturer's Certificate: Certify nailbase insulation panels will conform to specified performance requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures polyisocyanurate and fully assembles nailbase insulation panels in-house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Metals Drexel Defend-R Nail Base are protected by a 2-step packaging process using **shrink wrap and a UV resistant polyethylene bag**. This moisture resistant package is designed for protection from the elements during flatbed shipment from our facilities to the job-site.

B. Store products in accordance with the manufacturer recommendations.

C. Store product on a solid flat foundation and elevate a minimum of 2 inches above the finished surface.

D. Slit the bundle packaging vertically down the center of the two short sides and cover with a waterproof tarpaulin

E. Protect insulation from open flame and keep dry at all times.

1.08 PROJECT CONDITIONS

A. Install only as much insulation as can be covered the same day by a completed roof covering material.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Drexel Defend-R Nail Base produced by Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com. Web: www.drexelmetals.com.

** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

** NOTE TO SPECIFIER ** Select the required panel paragraphs from the following list. Delete the paragraphs not required. If more than one product is required identify the location of the materials required on the Drawings. For slate and tile roofs, Drexel Defend-R Nail Base with plywood is recommended. Drexel Defend-R Nail Base may be used on non-mechanically

attached low slope assemblies but must be manufactured online without the use of glue and have an OSB top layer.

2.02 PANEL CONSTRUCTION

A. Roof Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. Florida Building Code Approval FL# 46439.
5. Miami Dade County, Florida Product Control No. 23-1208.12.
6. ICC – ESR-5453

B. Panels shall consist of a top layer of APA/TECO rated Oriented Strand Board (OSB) core that is laminated, on-line, to a bottom layer of fiber-reinforced facers (GRF) polyisocyanurate foam insulation.

1. Polyisocyanurate foam insulation shall conform to ASTM C 1289, Type V.

** NOTE TO SPECIFIER ** Select one of the following two paragraphs and delete the one not required.

2. Compressive Strength: 20 pounds per square inch (138 kPa) Grade 2.
3. OSB Top layer substrate shall conform to PS2 and shall be as follows:
   a. OSB:

** NOTE TO SPECIFIER ** Select one of the two following OSB types and delete the paragraph that is not required. Include FSC type if LEED certification is required.

      1) Type:
         (a) Standard sheathing grade.

** NOTE TO SPECIFIER ** Select one of the following OSB thicknesses and delete the paragraphs that are not required.

      2) Thickness:
         (a) 7/16 inch (11.1 mm).
         (b) 5/8 inch (15.9 mm).

** NOTE TO SPECIFIER ** Select one of the following edge detail paragraphs and delete the one not required.

   b. Edge detail:
      1) Rabbeted.
      2) Non-rabbeted.

C. Panels shall consist of a top layer of APA exterior grade 5-ply CDX plywood laminated off-line to fiber-reinforced facers (GRF) polyisocyanurate foam insulation.

1. Polyisocyanurate foam insulation shall conform to ASTM C 1289, Type V with a compressive strength of:
   a. Grade 2: 20 psi (138 kPa) minimum).
2. 5-ply CDX Plywood Top layer substrate shall conform to PS2 and shall be as follows:

** NOTE TO SPECIFIER ** Select one of the two following plywood types and delete the paragraph that is not required. Include the third paragraph FSD LEED certification if required.

   a. Type:
      1) Standard sheathing grade.
      2) 5-ply Fire-treated sheathing grade.

** NOTE TO SPECIFIER ** Select one of the following plywood thicknesses and delete the paragraphs that are not required.

   b. Thickness:
      1) 5/8 inch (15.9 mm).
      2) 3/4 inch (19.0 mm).

** NOTE TO SPECIFIER ** Select one of the following edge detail paragraphs and delete the one not required.

c. Edge detail:
   1) Rabbeted.
   2) Non-rabbeted.

** NOTE TO SPECIFIER ** Select one of the following panel types and delete the paragraphs that are not required. The first paragraph refers to panels with a top layer substrate thickness of 7/16 inch (11.1 mm) or /8 inch (15.9 mm). The second paragraph refers to panels with a top layer thickness of 3/4 inch (19 mm).

2.03 PANEL TYPES

A. Drexel Defend-R-Nail Base panels 7/16 inch (11 mm) OSB shall be 47-1/2 inches by 95-1/2 inches (1207 mm by 2426 mm) with an overall thickness, R-value, and flute spanability as follows:

** NOTE TO SPECIFIER ** Select the required panel thickness paragraph from the following list. Delete the paragraphs not required. When a foam thickness of 3.5 inch or greater is required, a two layer system with staggered joints is recommended. Also, If more than one thickness is required identify the location of the materials required on the Drawings.

1. Thickness 1.5 inches (38 mm), R Value 6.3, flute spanability 4-3/8 inches (111.13 mm).
2. Thickness 2.0 inches (51 mm), R Value 9.2, flute spanability 4-3/8 inches (111.13 mm).
3. Thickness 2.5 inches (64 mm), R Value 12. 0, flute spanability 4-3/8 inches (111.13 mm).
4. Thickness 3.0 inches (76 mm), R Value 15. 0, flute spanability 4-3/8 inches (111.13 mm).
5. Thickness 3.5 inches (89 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
6. Thickness 4.0 inches (102 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).

B. Drexel Defend-R-Nail Base panels 5/8 inch (16 mm) OSB foam size shall be 47-1/2 inches by 95-1/2 inches (1207 mm by 2426 mm) with an overall thickness, R-value, and flute spanability as follows:

** NOTE TO SPECIFIER ** Select the required panel thickness paragraph from the following list. Delete the paragraphs not required. When a foam thickness of 3.5 inch or greater is required, a two layer system with staggered joints is recommended. Also, If more than one thickness is required identify the location of the materials required on the Drawings.

1. Thickness 1.6 inches (41 mm), R Value 6.3, flute spanability 4-3/8 inches (111.13 mm).
2. Thickness 2.1 inches (53 mm), R Value 9.2, flute spanability 4-3/8 inches (111.13 mm).
3. Thickness 2.6 inches (66 mm), R Value 12.0, flute spanability 4-3/8 inches (111.13 mm).
4. Thickness 3.1 inches (79 mm), R Value 15.0, flute spanability 4-3/8 inches (111.13 mm).
5. Thickness 3.6 inches (91 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
6. Thickness 4.1 inches (104 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).

C. Drexel Defend-R-Nail Base panels 5/8 inch (16 mm) 5-ply CDX plywood foam size shall be 48 inches by 96 inches (1220 mm by 2438 mm) with an overall thickness, R-value, and flute spanability as follows:

** NOTE TO SPECIFIER ** Select the required panel thickness paragraph from the following list. Delete the paragraphs not required. When a foam thickness of 3.5 inch or greater is required, a two layer system with staggered joints is recommended. Also, If more than one thickness is required identify the location of the materials required on the Drawings.

1. Thickness 1.6 inches (41 mm), R Value 6.3, flute spanability 4-3/8 inches (111.13 mm).
2. Thickness 2.1 inches (53 mm), R Value 9.2, flute spanability 4-3/8 inches (111.13 mm).
3. Thickness 2.6 inches (66 mm), R Value 12.0, flute spanability 4-3/8 inches (111.13 mm).
4. Thickness 3.1 inches (79 mm), R Value 15.0, flute spanability 4-3/8 inches (111.13 mm).
5. Thickness 3.6 inches (91 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
6. Thickness 4.1 inches (104 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).

D. Drexel Defend-R-Nail Base panels 3/4 inch (19 mm) 5-ply CDX plywood foam size shall be 48 inches by 96 inches (1220 mm by 2438 mm) with an overall thickness, R-value, and flute spanability as follows:

** NOTE TO SPECIFIER ** Select the required panel thickness paragraph from the following list. Delete the paragraphs not required. When a foam thickness of 3.5 inch or greater is required, a two layer system with staggered joints is recommended. Also, If more than one thickness is required identify the location of the materials required on the Drawings.

1. Thickness 1.7 inches (43 mm), R Value 6.3, flute spanability 4-3/8 inches (111.13 mm).
2. Thickness 2.2 inches (56 mm), R Value 9.2, flute spanability 4-3/8 inches (111.13 mm).
3. Thickness 2.7 inches (69 mm), R Value 12.0, flute spanability 4-3/8 inches (111.13 mm).
4. Thickness 3.2 inches (81 mm), R Value 15.0, flute spanability 4-3/8 inches (111.13 mm).
5. Thickness 3.7 inches (94 mm), R Value 18.0, flute spanability 4-3/8 inches (111.13 mm).
6. Thickness 4.2 inches (107 mm), R Value 21.1, flute spanability 4-3/8 inches (111.13 mm).

2.04 PANEL FASTENERS

** NOTE TO SPECIFIER ** Select one of the two following fastener substrate paragraphs and delete the paragraph that is not required. Include both if more than one substrate is required.

A. Fasteners shall be FM Approved Drexel Metals SIP/SD Panel Fasteners for steel deck application. Fasteners have a 3/16 inch (5 mm) shank, and are corrosion resistant with oversized heads. Length of fasteners shall be as recommended by Drexel Metals. Use of 2 inch (51 mm) round plates are not required. See the Drexel Metals application guide for instructions.
   1. Penetration of fastener into bottom flute is not acceptable.

B. Fasteners shall be FM Approved Drexel Metals SIP/WD Panel fasteners for wood deck application. Fasteners have a 3/16 inch (5 mm) shank, and are corrosion resistant with oversized heads. Length of fasteners shall be as recommended by Drexel Metals. Use of 2 inch (51 mm) round plates are not required. See the Drexel Metals application guide for instructions.

PART 3 EXECUTION

** NOTE TO SPECIFIER ** See Drexel Metals Installation Guide for recommended fastening patterns and installation methods. Coordinate roof covering installation requirements with roof covering manufacturer.

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify deck, adjacent materials, and structural backing is dry and ready to receive insulation.

C. Verify deck surface is flat, free of fins, protrusions and irregularities.

D. If deck preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

** NOTE TO SPECIFIER ** The incorporation of a vapor barrier or retarder within the roofing assembly is highly recommended when the project is located in Zones 1, 2 or 3 of the United States. Drexel Defend-R is not intended to substitute for a vapor barrier. Vapor barrier or retarder when used shall have a perm rating of 0.5 or less as determined by ASTM E-96.

B. Apply vapor barrier and or retarder, as specified by the Architect or required by the local building code, to decking prior to the installation.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. For multiple layered installations, install the base layer of panels loose-laid, and stagger the joints of subsequent layers in accordance with good roofing practice. Fasten panels through the top nailable surface and also through the wood block panel spacers using Drexel Metals approved threaded fasteners.

C. For adhered low slope installations, apply panels in hot asphalt or cold adhesive using only Drexel Defend-R Nail Base with OSB. Contact finished roof manufacturer for details.

D. Only install enough Drexel Defend-R-Nail Base per day that can be covered the same day by a completed roof covering material.

E. Use only UL or FM approved synthetic underlayment over nailbase insulation panels. The use of 15 or 30 pound roofing felt is not recommended.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

C. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

END OF SECTION

DREXEL DEFEND-R CI FOIL WALL PANELS

SECTION 07 21 13

CONTINUOUS INSULATION – WALL PANELS

AUGUST 2024

*** NOTE TO SPECIFIER ****

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the exterior continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Metals Defend-R CI products are designed for use in commercial wall applications to provide continuous insulation and weather-resistive barrier performance within the building envelope.

This specification includes Drexel Defend-R CI Foil, an energy efficient rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded online during a restrained-rise manufacturing process to trilaminate foil facers on both sides. Drexel Defend-R CI Foil can be applied to the interior or exterior of structural exterior walls of residential and commercial buildings and can be used in wall assemblies meeting the acceptance criteria of NPFA 285. For a complete list of NFPA 285 compliant assembly options please call our technical team at (888) 321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, ***www.drexelmetals.com.*** *The impermeable foil facer resists air and water intrusion.*

PART 1 GENERAL

1.01 SECTION INCLUDES

Drexel Defend-R CI Foil Continuous Insulation for Exterior Walls

1.02 RELATED SECTIONS

** NOTE TO SPECIFIER ** Delete sections below not relevant to this project; add others as required.

A. Section 03300 - Cast In Place Concrete: Concrete base wall.

Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.

Section 04210 - Clay Masonry: Brick facing.

Section 04800 - Masonry Assemblies: Masonry base wall.

Section 04850 - Stone Facing.

Section 05400 - Cold Formed Metal Framing.

Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

Section 09110 - Non-Structural Metal Framing.

Section 09200 - Plaster and Gypsum Board.

Section 09220 - Stucco.

1.03 REFERENCES

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section; add others as required.

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

ASTM C 518 – Steady State Thermal Transmission by Means of the Heat Flow Meter Apparatus (R Value)

ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

ASTM E 84 (UL 723) - Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

ASHRAE 90.1-2010 - Energy Standard for Buildings Except Low-Rise Residential Buildings.

IBC Chapter 26 – Foam Plastic Insulation.

Miami-Dade County FL NOA No: 22-1208.11.

CCMC 13460-L; Type 2, Class 1

CAN/ULC S-704 Type 1, Class 1

DrJ Engineering TER 2403-03; 2404-03.

Priest and Associates Engineering Extensions Based on NFPA 285 Tests

NFPA 285 - Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

UL 263- Standard for Fire Tests of Building Construction and Materials

NOTE TO SPECIFIER System Description section is for Drexel Defend-R CI Foil wall assemblies that must comply with NPFA 285. This section lists components that may be part of an NFPA 285 compliant assembly. Drexel Metals has an Engineering Extension Report from Priest and Associates that outlines all compliant wall assembly options for Types I, II, III, and IV buildings that can be achieved using Drexel Defend-R CI Foil. For a complete list of NFPA 285 compliant assembly options please contact our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com. If the assembly does not need to comply with NFPA 285, delete this section.
SPECIFIER INSTRUCTIONS - Continuous insulation wall panels are intended to be used continuous over framing members and to be relatively free of significant thermal bridging. Coordinate with other trades to minimize the penetration of thermal conductors through the wall system. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is a critical element of a continuous insulation wall assembly. It is strongly recommended that the Architect perform a hygrothermal analysis of the assembly at the location of each project using local code requirements and ASHRAE Standards. The calculations should be used to verify the performance of the assembly and to determine the locations of the weather resistant barrier(s) as required.

1.04 SYSTEM DESCRIPTION

A. Exterior Wall Assembly; Exterior Insulation (Table 3 of Engineering Extension Report)
   1. Base Wall
   2. Fire-stopping at floor lines
   3. Cavity Insulation (optional)
   4. Exterior Sheathing or Sheathing/WRB combined product (optional)
   5. WRB on base wall (optional)
   6. Exterior Insulation
   7. WRB on Insulation (optional)
   8. Exterior Cladding System

B. Exterior Wall Assembly; Interior Insulation (Table 6 of Engineering Extension Report)
   1. Base Wall
   2. Exterior Coating (optional)
   3. WRB over Base Wall Interior (optional)
   4. Continuous Insulation
   5. WRB over Continuous Insulation (optional)
   6. Interior Cladding

** NOTE TO SPECIFIER **- Delete sections below not relevant to this project; add others as required.

1.05 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

Physical properties (Foam Core):
Water Absorption: ASTM C 209, less than 0.05 percent by volume.
Compressive Strength: ASTM D 1621; Type I; Grade 2 (20 psi/138 kPa) and Grade 3 (25 psi /172 kPa).
Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
Moisture Vapor Permeance: ASTM E 96, less than 0.05 perm (2.875ng/(Pa•s•m2)).
Flame Spread Index: ASTM E 84, less than 75
Smoke Developed: ASTM E 84, less than 450
Resistance to Mold: ASTM D3272 Passed (10)
Service Temperature: Minus 100 degrees F to 250 degrees F (Minus 73 degrees C to 122 degrees C).
3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFC; Virtually zero Global Warming Potential (GWP)

Drexel Defend-R CI Foil has passed the following:
Meets the current continuous insulation standards of ASHRAE 90.1, IECC and IBC Chapter 26.
NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-746-1114 or reference the report titled Engineering Extensions Based On NFPA 285 Test on our website, www.drexelmetals.com.
UL 263 Time-Rated Assemblies

Drexel Defend-R CI Foil is evaluated and listed under DrJ TER 2403.03; 2404-03. Tests include:
Flame spread index of <75 and smoke developed index of <450 when tested in accordance with ASTM E 84.
Classified as Type I in accordance with ASTM C 1289.

1.06 SUBMITTALS

A. Submit under provisions of Section 01300.

Product Data: Manufacturer's data sheets and installation guides on wall panels and fasteners to be used, including:
Preparation instructions and recommendations.
Storage and handling requirements and recommendations.
Installation methods and accessories.

SPECIFIER INSTRUCTIONS - Delete the following paragraphs if LEED is not applicable.
LEED Submittals: Provide documentation of how the requirements of Credit will be met:
List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
Manufacturer-Specific Environmental Product Declaration (EPD) which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD

D. DrJ Engineering 2403.03; 2404-03. (state-specific stamped reports available)

E. Priest and Associates Engineering Extensions Based on NFPA 285 Tests.

F. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer's installation guidelines.
Review firestopping requirements and weather resistive membrane requirements and placement locations.
Review field quality control procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Defend-R CI Foil are protected by a 2-step packaging process using **shrink wrap and a UV resistant polyethylene bag**. This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the job-site. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2". Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

1.09 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Roof Board Insulation: Provide products that comply with the following:
** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

ASTM standards specified.
Factory Mutual (FM) approvals specified.
Underwriters Laboratories Inc. (UL) classifications specified.
Miami Dade County, Florida Product Control No. 23-1208.11.
DrJ Engineering TER 2403-03; 2404-03.

Basis of Design: Drexel Defend-R CI Foil produced by Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** - Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

Substitutions: Not permitted.

Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Drexel Defend-R CI Foil complies with ASTM C1289 Type I and ASTM E85 Class B. Boards are energy efficient rigid insulation panels composed of a closed cell polyisocyanurate foam core bonded on-line during a restrained-rise manufacturing process to trilaminate foil facers on both sides.

Foam Core
Grade 2 (20 psi).
Grade 3 (25 psi).

Panel Size:

** NOTE TO SPECIFIER ** Other sizes are available upon special request (for example: 12 inch, 16 inch, or 24 inch widths by 96 inch length). Note that custom size orders are available. Contact the manufacturer for additional information.

4 feet by 8 feet (1220 mm by 2440 mm).
Additional lengths/width available upon request.

Thickness / R Value: ASTM C 518 at 75 degrees F (23.9 degrees C).

** NOTE TO SPECIFIER ** Select one of the following Grade paragraphs and delete those not required.

1.0 inches (25 mm) / R Value 6.5
1.5 inches (38 mm) / R Value 10.0
2.0 inches (51 mm) / R Value 13.3
2.5 inches (64 mm) / R Value 17.0
3.0 inches (76 mm) / R Value 20.3
3.5 inches (89 mm) / R Value 24.0
4.0 inches (100 mm) / R Value 27.0
Provide to the thickness indicated on the Drawings.

2.03 JOINT SEALANT, PANEL FASTENERS, AND ADHESIVES

A. Liquid Joint Sealants:
BarriBond XL
BarriBond
DynaTrol I-XL Hybrid

B. Foil Grip 1402 Tape: Foil-faced butyl flashing tape
Backing: 2 mils aluminum foil

Width: 2 to 6 inches
Thickness: 17 mils

C. AlumaGrip 701 Tape: Foil-faced butyl flashing tape
Backing: 2 mils aluminum foil
Width: 2 to 6 inches
Thickness: 30 mils

D. ECHOtape MT-A7757: Foil-faced acrylic flashing tape.
Width: Nominal 2.0”, 3.0”, and 4.0”
Thickness: 3.35 mils

E. Construction Grade Adhesives including: Loctite, Chemlink, DAP, BASF

F. Insulation Adhesive: CAV-GRIP

G. Approved Fastening Methods:
Screw type with washers (TRUFAST Walls)
Powder or gas-actuated fasteners with washers
Impalement type (stick pins)
Adhesive: any general construction grade adhesive (not recommended for ceiling applications)

PART 3 EXECUTION

** NOTE TO SPECIFIER **** **NOTE TO SPECIFIER** ** - See Drexel Metals Panel Installation Guide for recommended fastening and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

3.01 EXAMINATION

Do not begin installation until exterior walls have been properly prepared.

Verify that all wall assembly construction has been completed to the point where the insulation may correctly be installed.

Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

Install without gaps or voids. Do not compress insulation.

Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

Fasten or adhere insulation as recommended by the manufacturer's Installation Guide.

Insulation must be protected from open flame and stored in accordance with the manufacturer's instructions.

SPECIFIER INSTRUCTIONS - During the time between installation of continuous wall insulation panels and the application of the finished exterior cladding, it is recommended that a building wrap be applied over the wall insulation. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is also a critical element of the wall assembly. It is recommended that a hygrothermal analysis of the proposed assembly be conducted to determine the type and locations of a proposed Weather Resistant Barriers. Select one of the following three paragraphs and delete those not required.

Install vapor retarders over insulation panels as specified in Section 07260.

Install air barriers over insulation panels as specified in Section 07270.

Drexel Defend-R wall insulation is not intended to be left exposed for extended periods of time without adequate protection. If extended exposure is anticipated all exposed foam surfaces exposed to daylight should be taped with a compatible waterproof tape.

Install exterior cladding as recommended by the cladding manufacturer and as specified in other sections of this specification.

3.04 PROTECTION

A. Protect installed products until completion of project.

Cover the top and edges of unfinished wall panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

Wet panels shall be allowed to completely dry prior to application of vapor barrier and/or cladding.

Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R FOIL CLASS A

SECTION 07 21 13

CONTINUOUS INSULATION DREXEL DEFEND-R CI FOIL CLASS A WALL PANELS

AUGUST 2024

** NOTE TO SPECIFIER **

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Defend-R CI products are designed for use in commercial and residential wall applications to provide "ci" continuous insulation and weather resistive barrier performance within the building envelope.

This specification includes Drexel Defend-R CI Foil Class A, an energy efficient rigid insulation panel composed of a closed cell Class A polyisocyanurate foam core bonded on-line during a restrained-rise manufacturing process to 15-mil thick glass fiber-reinforced foil facers on both sides. With proper seam treatment, Drexel Defend-R CI Foil Class A can be used as a complete weather barrier. Drexel Defend-R CI Foil Class A is designed for use as exterior or interior continuous insulation in wall assemblies capable of meeting NFPA 285. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888 321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com. Additionally, Drexel Defend-R CI Foil Class A is approved for interior exposed applications on walls or ceilings.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drexel Defend-R CI Foil Class A Continuous Insulation for Exterior Walls

1.02 RELATED SECTIONS

SPECIFIER INSTRUCTIONS - Delete sections below not relevant to this project; add others as required.

A. Section 03300 - Cast In Place Concrete: Concrete base wall.

B. Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.

C. Section 04210 - Clay Masonry: Brick facing.

D. Section 04800 - Masonry Assemblies: Masonry base wall.

E. Section 04850 - Stone Facing.

F. Section 05400 - Cold Formed Metal Framing.

G. Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

H. Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

I. Section 09110 - Non-Structural Metal Framing.

J. Section 09200 - Plaster and Gypsum Board.

K. Section 09220 - Stucco.

1.03 REFERENCES

SPECIFIER INSTRUCTIONS - Delete references from the list below that are not actually required by the text of the edited section; add others as required.

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 – Steady State Thermal Transmission by Means of the Heat Flow Meter Apparatus (R-value)

C. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

D. ASTM D 1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

E. ASTM D 1621 - Test Methods for Compressive Properties of Rigid Cellular Plastics.

F. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

G. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

H. ASTM E 84 (UL 723) - Standard Test Method for Surface Burning Characteristics of Building Materials

I. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

J. ASTM E 283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Window, Curtain Walls and Doors Under Specific Pressure Differences Across the Specimen

K. ASTM E 330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

L. ASTM E 331 – Standard Test Method for Water Penetration of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

M. ASTM E 2178 – Standard Test Method for Air Permeance of Building Materials

N. ASTM E 2357 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

O. ASHRAE 90.1-2010 - Energy Standard for Buildings Except Low-Rise Residential Buildings.

P. IBC Chapter 26 – Foam Plastic Insulation.

Q. ICC – ESL-1607

R. NFPA 285 - Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

S. NFPA 286 - Standard Methods Of Fire Tests For Evaluating Contribution Of Wall And Ceiling Interior Finish To Room Fire Growth

T. UL 1715 - Standard for Fire Test of Interior Finish Material.

U. UL 263 – Standard for Fire Tests of Building Construction and Materials

V. CCMC 13460-L

W. CAN/ULC S-704 Type 1, Class 1

X. DrJ Engineering TER 2404-03; 2403.06: Fire Performance; Air and Water-Resistive Barrier Performance

Y. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

*** NOTE TO SPECIFIER ** System Description contains components which must be part of an NFPA 285 compliant assembly. Drexel Metals has an Engineering Extension Report from Priest & Associates that outlines all compliant wall assembly options for Types I, II, III and IV buildings that can be achieved using Drexel Defend-R CI Foil Class A. For a complete list of NFPA 285 compliant assembly options please contact our technical team at 888 321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com.*

1.04 SYSTEM DESCRIPTION:

A. Exterior Wall Assembly; Exterior Insulation (Table 1 of Engineering Extension Report)
   1. Base Wall
   2. Fire-stopping at floor lines
   3. Cavity Insulation (optional)

4. Exterior Sheathing, Sheathing/WRB combined product (optional)
5. WRB on base wall (optional)
6. Exterior Insulation
7. WRB on Exterior Insulation
8. Exterior Cladding

B. Exterior Wall Assembly; Interior Insulation (Table 6 of Engineering Extension Report)
1. Base Wall
2. Exterior Coating (optional)
3. WRB over Base Wall Interior (optional)
4. Continuous Insulation
5. WRB over Continuous Insulation (optional)
6. Interior Cladding

***NOTE TO SPECIFIER** - Delete sections below not relevant to this project; add others as required.*

1.05 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Physical properties of Drexel Defend-R CI Foil Class A:
Flame Spread Index: ASTM E 84, less than 25.
Smoke Developed: ASTM E 84, less than 250.
Compressive Strength: ASTM D 1621; Grade 2 (20 psi / 138 kPa) or Grade 3 (25psi / 172 kPa).
Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
Moisture Vapor Permeance: ASTM E 96, less than 0.04 perm (2.875ng/(Pa•s•m2)).
Water Absorption: ASTM C 209, less than 0.05 percent by volume.
Air Permeance of Building Material: ASTM E 2178, less than 0.001 L(s.m2) at 75 Pa
Air Leakage of Air Barrier Assemblies: ASTM E 2357, no leakage
Rate of Air Leakage: ASTM E 283, less than 0.04 cfm/ft2
Structural Performance by Uniform Static Air Pressure Difference: ASTM E 330, less than 0.04 cfm/ft2
Water Penetration by Static Air Pressure Difference: ASTM E 331, pass, no leakage
Resistance to Mold: ASTM D 3273 Passed (10).
Impact Resistance: ASTM D 1037 (Janka Ball Test): 40
Pressure washable 15 mil reinforced foil facer
3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFC; Virtually no Global Warming Potential (GWP)
Service Temperature: Minus 100 degrees to 250 degrees F (minus 73 degrees C to 122 degrees C)

C. Drexel Defend-R CI Foil Class A has passed the following:
1. Meets the current continuous insulation standards of ASHRAE 90.1, IECC and IBC Chapter 26.
2. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888 321-9630 or reference the report titled Engineering Extensions Based On NFPA 285 Test on our website, www.drexelmetals.com.
3. NFPA 286 Corner Burn Test for walls or ceilings only, with or without joint treatment, allowing product to be left exposed on interior application without a thermal barrier up to 3.5 inches thick.

4. UL 1715 with up to 8 inches for exposed applications on ceilings only.
5. UL 263 Time-Rated Assemblies

D. Drexel Defend-R CI Foil Class A is evaluated and listed under DrJ TER 2404-03; 2403-06. Tests include:
1. Flame spread index of <25 and smoke developed index of <250 when tested in accordance with ASTM E 84.
2. Classified as Type I in accordance with ASTM C 1289.
3. Weather Resistive Barrier Performance

*** NOTE TO SPECIFIER ** - Delete sections below that are not applicable.*

1.06 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets and installation guides on wall panels and fasteners to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods and accessories.

SPECIFIER INSTRUCTIONS - Delete the following paragraphs if LEED is not applicable.

C. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Manufacturer-Specific Environmental Product Declaration (EPD) which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD.

D. DrJ Engineering TER 2404-03; 2403-06 (state-specific stamped reports available)

E. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

F. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

C. Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
1. Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
2. Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
3. Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer’s installation guidelines.
4. Review firestopping requirements and weather resistive membrane requirements and placement locations.

5. Review field quality control procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Defend-R CI Foil Class A are protected by a 2-step packaging process using shrink wrap and a UV resistant polyethylene bag. This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the jobsite. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2". Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

B. Protect insulation from open flame.

1.09 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. ICC - ESL-1607
5. DrJ Engineering TER 2404-03; 2403.06

B. Basis of Design: Drexel Defend-R CI Foil Class A produced by Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630 or (502) 690-6174. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** - Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

C. Substitutions: Not permitted.

D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Drexel Defend-R CI Foil Class A complies with ASTM C 1289 Type I and ASTM E 84 Class A. Boards are energy efficient rigid insulation panels composed of a closed cell Class A polyisocyanurate foam core bonded during a restrained-rise manufacturing process to 15-mil thick reinforced foil facers on both sides.

B. 1. Foam Core
   a. Grade 2 (20 psi)
   b. Grade 3 (25 psi)
   c. Panel Size:
   d. 4 feet by 8 feet (1220 mm by 2440 mm).
   e. Additional lengths/widths available upon request

2. Thickness / R-value: ASTM C 518 at 75 degrees F (23.9 degrees C).

SPECIFIER INSTRUCTIONS - Select one of the following Grade paragraphs and delete those not required.

   a. 1.0 inches (25 mm) / R-value 6.3
   b. 1.5 inches (38 mm) / R-value 9.5
   c. 1.6 inches (40 mm) / R-value 10.1
   d. 2.0 inches (51 mm) / R-value 13.0
   e. 2.5 inches (64 mm) / R-value 16.0
   f. 3.0 inches (76 mm) / R-value 19
   g. 3.5 inches (89 mm) / R-value 22
   h. 4.0 inches (100 mm) / R-value 25.2
   i. Provide to thickness indicated on the Drawings.

2.03 JOINT SEALANT, PANEL FASTENERS, AND ADHESIVES

1. Liquid Joint Sealants:
   a. Xci BarriBond XL
   b. Xci BarriBond
   c. Xci DynaTrol I-XL Hybrid

2. Foil Grip 1402 Tape: Foil-faced butyl flashing tape
   a. Backing: 2 mils aluminum foil
   b. Width: 2 to 6 inches
   c. Thickness: 17 mils

3. AlumaGrip 701 Tape: Foil-faced butyl flashing tape
   a. Backing: 2 mils aluminum foil
   b. Width: 2 to 6 inches
   c. Thickness: 30 mils

4. ECHOtape MT-A7757: Foil-faced acrylic flashing tape.
   a. Width: Nominal 2.0”, 3.0”, and 4.0”
   b. Thickness: 3.35 mils

5. Construction Grade Adhesives including: Loctite, Chemlink, DAP, BASF

6. Insulation Adhesive: CAV-GRIP

7. Approved Fastening Methods:
    a. Screw type with washers (TRUFAST Walls)
    b. Powder or gas-actuated fasteners with washers
    c. Impalement type (stick pins)
    d. Adhesive: any general construction grade adhesive (not recommended for ceiling applications)
    e. Insulation retainment systems for exposed applications: Victory Bear or Nudo Products

PART 3 EXECUTION

NOTE TO SPECIFIER** **NOTE TO SPECIFIER** ** -** See Drexel Metals Installation Guide for recommended fastening and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

SPECIFIER INSTRUCTIONS - See Drexel Metals Installation Guide for recommended fastening patterns and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

3.01 EXAMINATION

A. Do not begin installation until exterior walls have been properly prepared.

B. Verify that all wall assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

D. If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Fasten or adhere insulation as recommended by the manufacturer’s Installation Guide.

F. Insulation must be protected from open flame and stored in accordance with the manufacturer’s instructions.

SPECIFIER INSTRUCTIONS - During the time between installation of continuous wall insulation panels and the application of the finished exterior cladding, it is recommended that a building wrap be applied over the wall insulation. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is also

a critical element of the wall assembly. It is recommended that a hygrothermal analysis of the proposed assembly be conducted to determine the type and locations of a proposed Weather Resistant Barriers. Select one of the following three paragraphs and delete those not required.

G. Install vapor retarders over insulation panels as specified in Section 07260.

H. Install air barriers over insulation panels as specified in Section 07270.

I. Drexel Defend-R wall insulation is not intended to be left exposed for extended periods of time without adequate protection. If extended exposure is anticipated all exposed foam surfaces exposed to daylight should be taped with a compatible waterproof tape. When properly installed, Drexel Defend-R CI Foil Class A can remain uncovered up to 180 days.

J. Install exterior cladding as recommended by the cladding manufacturer and as specified in other sections of this specification.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished wall panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Wet panels shall be allowed to completely dry prior to application of weather barrier and/or cladding.

D. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R CI COATED GLASS

SECTION 07 21 13

CONTINUOUS INSULATION DREXEL DEFEND-R CI COATED GLASS WALL PANELS

AUGUST 2024

** NOTE TO SPECIFIER **

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the exterior continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Metals Drexel Defend-R CI products are designed for use in commercial and residential wall applications to provide "ci" continuous insulation and air barrier performance within the building envelope.

This specification includes Drexel Defend-R CI Coated Glass, an energy efficient rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded online during a restrained-rise manufacturing process to premium performance polymer bonded glass mat facers on both sides. Drexel Defend-R CI Coated Glass can be applied to the interior or exterior of structural exterior walls and can be used in wall assemblies meeting the acceptance criteria of NPFA 285. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com. With proper seam treatment, Drexel Defend-R CI Coated Glass can be used as an air barrier in the wall assembly.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drexel Defend-R CI Coated Glass Continuous Insulation for Exterior Walls

** NOTE TO SPECIFIER ** - Delete any paragraphs below not applicable to project.

1.02 RELATED SECTIONS

A. Section 03300 - Cast In Place Concrete: Concrete base wall.

B. Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.

C. Section 04210 - Clay Masonry: Brick facing.

D. Section 04800 - Masonry Assemblies: Masonry base wall.

E. Section 04850 - Stone Facing.

F. Section 05400 - Cold Formed Metal Framing.

G. Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

H. Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

I. Section 09110 - Non-Structural Metal Framing.

J. Section 09200 - Plaster and Gypsum Board.

K. Section 09220 - Stucco.

1.03 REFERENCES

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section; add others as required.

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 – Steady State Thermal Transmission By Means of the Heat Flow Meter Apparatus (R Value).

C. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

D. ASTM D 1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.

E. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

F. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

G. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

H. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials

I. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

J. ASTM E 2178 – Standard Method for Air Permeance of Building Materials.

K. NFPA 285 - Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

L. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

M. DrJ Engineering TER 2404-03; 2403-03.

N. ASHRAE 90.1- Energy Standard for Buildings Except Low-Rise Residential Buildings

O. IBC Chapter 26- Foam Plastic

P. UL 263- Standard for Fire Tests of Building Construction and Materials

Q. Miami Dade Product Control – Notice of Acceptance NOA No. 23-1208.11

S. CAN/ULC S-704 Type 2, Class 2

T. CCMC 13460-L

** NOTE TO SPECIFIER ** System Description contains components which must be part of an NFPA 285 compliant assembly. Drexel Metals has an Engineering Extension Report from Priest & Associates that outlines all compliant wall assembly options for Types I, II, III and IV buildings that can be achieved using Drexel Defend-R CI Coated Glass. For a complete list of NFPA 285 compliant assembly options please contact our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com.

** NOTE TO SPECIFIER ** Continuous insulation wall panels are intended to be used continuous over framing members and to be relatively free of significant thermal bridging. Coordinate with other trades to minimize the penetration of thermal conductors through the wall system. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is a critical element of a continuous insulation wall assembly. It is strongly recommended that the Architect perform hygrothermal analysis of the assembly at the location of each project using local code requirements and ASHRAE Standards. The calculations should be used to verify the performance of the assembly and to determine the locations of the weather resistant barrier(s) as required.

1.04 SYSTEM DESCRIPTION

A. Exterior Wall Assembly; Exterior Insulation (Table 1 of Engineering Extension Report)
1. Base Wall
2. Fire-stopping at floor lines
3. Cavity Insulation (optional)
4. Exterior Sheathing, Sheathing/WRB combined product (optional)
5. WRB on base wall (optional)
6. Exterior Insulation
7. WRB on Exterior Insulation (optional)
8. Exterior Cladding

B. Exterior Wall Assembly; Interior Insulation (Table 6 of Engineering Extension Report)
1. Base Wall
2. Exterior Coating (optional)
3. WRB over Base Wall Interior (optional)
4. Continuous Insulation
5. WRB over Continuous Insulation (optional)
6. Interior Cladding

** NOTE TO SPECIFIER ** - Delete sections below not relevant to this project; add others as required.

** NOTE TO SPECIFIER ** The following four paragraphs contain various IBC non-combustible wall types for Types I, II, III and IV Construction with minimum requirements to meet NFPA 285 requirements. NFPA test results are not available in the UL directory. They are only available after passing large scale tests in accordance with NFPA 285. Select the approved assemblies meeting NFPA 285 for Base Wall Systems of Concrete Masonry, Concrete, Steel Studs and Fire Treated Wood Studs together with approved exterior assemblies for each as required from the following paragraphs and delete those not required. Coordinate the Drawings with the following applications paragraphs. Contact Drexel Metals for additional information on approved assemblies.

1.05 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Physical properties (Foam Core):
1. Water Absorption: ASTM C 209, less than 0.1 percent by volume
2. Impact Resistance: ASTM D 1037 (Janka Ball Test): 15
3. Compressive Strength: ASTM D 1621; Type II, Grade 2 (20 psi/138 kPa) and Grade 3 (25 psi/172 kPa)
4. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days)
5. Moisture Vapor Permeance: ASTM E 96, less than 1 perm (57.5ng/(Pa*s*m2)
6. Air Permeance of Building Material: ASTM E 2178, less than 0.001 L(s*m2) at 75 Pa
7. Resistance to Mold: ASTM D 3273 Passed (10)
8. Service Temperature: Minus 100 degrees F to 250 degrees F (Minus 73 degrees C to 122 degrees C)
9. 3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually zero Global Warming Potential (GWP)

C. Drexel Defend-R CI Coated Glass has passed the following:
1. Meets the current continuous insulation standards of ASHRAE 90.1, IECC and IBC Chapter 26.
2. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based On NFPA 285 Test on our website, www.drexelmetals.com.
3. UL 263 Time-Rated Assemblies

D. Drexel Metals Drexel Defend-R CI Coated Glass is evaluated and listed under DrJ TER 2404.03; 2403-03. Tests include:
1. Flame spread index of <75 and smoke developed index of <450 when tested in accordance with ASTM E 84.
2. Classified as Type II, Class 2 in accordance with ASTM C 1289.
3. Air Barrier Performance per ASTM E 2178

1.06 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets and installation guides on wall panels including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods and accessories.

** NOTE TO SPECIFIER ** - Delete the following paragraphs if LEED is not applicable.

C. LEED Submittals: Provide documentation of how the requirements of Credit will be met:

1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Manufacturer-Specific Environmental Product Declaration (EPD) which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD.

D. DrJ Engineering TER 2404-03; 2403-03 (state-specific stamped reports available)

E. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

F. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

** NOTE TO SPECIFIER ** Delete the following paragraphs if LEED is not applicable.

1.07 QUALITY ASSURANCE

A. Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

C. Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
1. Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
2. Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
3. Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer’s installation guidelines.
4. Review firestopping requirements and weather resistive membrane requirements and placement locations.
5. Review field quality control procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Metals Drexel Defend-R CI Coated Glass are protected by a 2-step packaging process using **shrink wrap and a UV resistant polyethylene bag**. This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the job-site. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2”. Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

1.09 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. Miami Dade County, Florida Product Control No. 23-1208.11.
5. DrJ Engineering TER 2404-03; 2403-03.

B. Basis of Design: Drexel Defend-R CI Coated Glass produced by Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174 E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** - Delete one of the following two paragraphs; coordinate with the requirements of Division 1 section on product options and substitutions.

C. Substitutions: Not permitted.

D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Drexel Metals Drexel Defend-R CI Coated Glass complies with ASTM C1289 Type II, Class 2 and ASTM E84 Class B. Boards are energy efficient rigid insulation panels composed of a closed cell polyisocyanurate foam core bonded online during a restrained-rise manufacturing process to premium performance polymer bonded glass mat facers on both sides.

1. Foam Core
   a. Grade 2 (20psi)
   b. Grade 3 (25psi)

2. Panel Size:
   a. 4 feet by 8 feet (1220 mm by 2440 mm)
   b. Additional lengths/widths available upon request

3. Thickness / R Value: ASTM C 518 at 75 degrees F (23.9 degrees C).

** NOTE TO SPECIFIER ** Select one of the following Grade paragraphs and delete those not required. Values calculated based on 5/8 inch plywood facing.

   a. 1.0 inches (25 mm) / R Value 6.0
   b. 1.5 inches (38 mm) / R Value 9.0
   c. 2.0 inches (51 mm) / R Value 12.1
   d. 2.5 inches (64 mm) / R Value 15.3
   e. 3.0 inches (76 mm) / R Value 18.5
   f. 3.3 inches (84 mm) / R Value 20.4
   g. 3.5 inches (89 mm) / R Value 21.7
   h. 4.0 inches (102 mm) / R Value 25.0
   i. Provide to the thickness indicated on the Drawings.

** NOTE TO SPECIFIER ** Several factors are involved in the proper fastening of insulation panels. These include overall thickness of the panel, the weight of the specified cladding and the type of support provided at the base of the wall assembly. Please contact Drexel Metals for assistance with fastening rate and fastener type.

2.03 JOINT SEALANT, PANEL FASTENERS, AND ADHESIVES

1. Liquid Joint Sealants:
   a. BarriBond XL
   b. BarriBond
   c. DynaTrol I-XL Hybrid

2. Foil Grip 1402 Tape: Foil-faced butyl flashing tape
   a. Backing: 2 mils aluminum foil
   b. Width: 2 to 6 inches
   c. Thickness: 17 mils

3. AlumaGrip 701 Tape: Foil-faced butyl flashing tape
   a. Backing: 2 mils aluminum foil
   b. Width: 2 to 6 inches
   c. Thickness: 30 mils

4. ECHOtape MT-A7757: Foil-faced acrylic flashing tape.
   a. Width: Nominal 2.0”, 3.0”, and 4.0”
   b. Thickness: 3.35 mils

5. Construction Grade Adhesives including: Loctite, Chemlink, DAP, BASF

6. Insulation Adhesive: CAV-GRIP

7. Approved Fastening Methods:
   a. Screw type with washers (TRUFAST Walls)
   b. Powder or gas-actuated fasteners with washers
   c. Impalement type (stick pins)
   d. Adhesive: any general construction grade adhesive (not recommended for ceiling applications)

PART 3 EXECUTION

** NOTE TO SPECIFIER** - See Drexel Metals Installation Guide for recommended fastening and installation methods. Coordinate panel installation requirements with wall covering manufacturer

3.01 EXAMINATION

A. Do not begin installation until exterior walls have been properly prepared.

B. Verify that all exterior wall assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

D. If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in exterior spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Fasten insulation as recommended by the Drexel Metals Installation Guide. Provide base support for the insulation panels as required for the exterior cladding to be installed over the panels.

F. Insulation must be protected from open flame and stored in accordance with the manufacturer’s instructions.

** NOTE TO SPECIFIER ** During the time between installation of continuous wall insulation panels and the application of the finished exterior cladding, it is recommended that a building wrap be applied over the wall insulation. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is also a critical element of the wall assembly. It is recommended that a hygothermal analysis of the proposed assembly be conducted to determine the type and locations of a proposed Weather Resistant Barriers. Select one of the following three paragraphs and delete those not required.

G. Install vapor retarders over insulation panels as specified in Section 07260.

H. Install air barriers over insulation panels as specified in Section 07270.

I. Drexel Defend-R wall insulation is not intended to be left exposed for extended periods of time without adequate protection. If extended exposure is anticipated all exposed foam surfaces exposed to daylight should be taped with a compatible waterproof tape.

J. Install exterior cladding as recommended by the cladding manufacturer and as specified in other sections of this specification.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Do not leave panels exposed to moisture. Wet panels shall be removed or allowed to completely dry prior to application of vapor barrier and/or roof covering.

D. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R CI COATED GLASS CLASS A

SECTION 07 21 13

CONTINUOUS INSULATION DREXEL DEFEND-R CI COATED GLASS CLASS A WALL PANELS

AUGUST 2024

** NOTE TO SPECIFIER **

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the exterior continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Metals' Drexel Defend-R CI products are designed for use in commercial and residential wall applications to provide "ci" continuous insulation and air barrier performance within the building envelope.

This specification includes Drexel Defend-R CI Coated Glass Class A, an energy efficient rigid insulation panel composed of a closed cell Class A polyisocyanurate foam core bonded on-line during a restrained-rise manufacturing process to premium performance polymer bonded glass mat facers on both sides. Drexel Defend-R CI Coated Glass Class A can be applied to the interior or exterior of structural exterior walls and can be used in wall assemblies meeting the acceptance criteria of NPFA 285. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com. With proper seam treatment, Drexel Defend-R CI Coated Glass Class A can be used as an air barrier in the wall assembly.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drexel Defend-R CI Coated Glass Class A Continuous Insulation for Exterior Walls

** NOTE TO SPECIFIER ** - Delete any paragraphs below not applicable to project.

1.02 RELATED SECTIONS

** NOTE TO SPECIFIER ** Delete sections below not relevant to this project; add others as required.

A. Section 03300 - Cast In Place Concrete: Concrete base wall.

B. Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.

C. Section 04210 - Clay Masonry: Brick facing.

D. Section 04800 - Masonry Assemblies: Masonry base wall.

E. Section 04850 - Stone Facing.

F. Section 05400 - Cold Formed Metal Framing.

G. Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

H. Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

I. Section 09110 - Non-Structural Metal Framing.

J. Section 09200 - Plaster and Gypsum Board.

K. Section 09220 - Stucco.

1.03 REFERENCES

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section; add others as required.

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 – Steady State Thermal Transmission By Means of the Heat Flow Meter Apparatus (R Value).

C. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

D. ASTM D 1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.

E. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

F. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

G. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

H. ASTM E 84 (UL 723) – Standard Test Method for Surface Burning Characteristics of Building Materials

I. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

J. ASTM E 2178 – Standard Method for Air Permeance of Building Materials.

K. NFPA 285 - Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

L. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

M. DRJ Engineering TER 2404-03; 2403-06

N. ASHRAE 90.1- Energy Standard for Buildings Except Low-Rise Residential Buildings

O. IBC Chapter 26- Foam Plastic

P. UL 263- Standard for Fire Tests of Building Construction and Materials.

S. CAN/ULC S-704 Type 2, Class 2

T. CCMC 13460-L

** NOTE TO SPECIFIER ** System Description contains components which must be part of an NFPA 285 compliant assembly. Drexel Metals has an Engineering Extension Report from Priest & Associates that outlines all compliant wall assembly options for Types I, II, III and IV buildings that can be achieved using Drexel Defend-R CI Coated Glass Class A. For a complete list of NFPA 285 compliant assembly options please contact our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com.

1.04 SYSTEM DESCRIPTION:

A. Exterior Wall Assembly; Exterior Insulation (Table 1 of Engineering Extension Report)
1. Base Wall
2. Fire-stopping at floor lines
3. Cavity Insulation (optional)
4. Exterior Sheathing, Sheathing/WRB combined product (optional)
5. WRB on base wall (optional)
6. Exterior Insulation
7. WRB on Exterior Insulation (optional)
8. Exterior Cladding

B. Exterior Wall Assembly; Interior Insulation (Table 6 of Engineering Extension Report)
1. Base Wall
2. Exterior Coating (optional)
3. WRB over Base Wall Interior (optional)
4. Continuous Insulation
5. WRB over Continuous Insulation (optional)
6. Interior Cladding

** NOTE TO SPECIFIER ** - Delete sections below not relevant to this project; add others as required.

1.05 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Physical properties (Foam Core):
1. Flame Spread Index: ASTM E 84, less than 25
2. Smoke Developed: ASTM E 84, less than 250.
3. Water Absorption: ASTM C 209, less than 0.1 percent by volume
4. Impact Resistance: ASTM D1037 (Janka Ball Test): 15
5. Compressive Strength: ASTM D 1621; Type II, Grade 3 (25psi/172 kPa)
6. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days)
7. Moisture Vapor Permeance: ASTM E 96, 1.1 perm (57.5ng/(Pa*s*m2)

8. Air Permeance of Building Material: ASTM E 2178, less than 0.001 L(s*m2) at 75 Pa
9. Resistance to Mold: ASTM D 3273 Passed (10)
10. Service Temperature: Minus 100 degrees F to 250 degrees F (minus 73 degrees C to 122 degrees C)
11. 3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFCs; Virtually zero Global Warming Potential (GWP).

C. Drexel Defend-R CI Coated Glass Class A has passed the following:
1. Meets the current continuous insulation standards of ASHRAE 90.1, IECC and IBC Chapter 26.
2. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based On NFPA 285 Test on our website, www.drexelmetals.com.
3. UL 263 Time-Rated Assemblies

D. Drexel Defend-R CI Coated Glass Class A is evaluated and listed under DrJ TER 2404-03; 2403-06. Tests include:
1. Flame spread index of <25 and smoke developed index of <250 when tested in accordance with ASTM E 84.
2. Classified as Type II, Class 2 in accordance with ASTM C 1289.
3. Air Barrier Performance per ASTM E 2178

1.06 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets and installation guides on wall panels, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods and accessories.

** NOTE TO SPECIFIER ** - Delete the following paragraphs if LEED is not applicable.

C. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Manufacturer-Specific Environmental Product Declaration (EPD) which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD

D. DrJ Engineering TER 2404-03; 2403-06 (state-specific stamped reports available)

E. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

F. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

C. Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
   1. Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
   2. Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
   3. Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer's installation guidelines.
   4. Review firestopping requirements and weather resistive membrane requirements and placement locations.
   5. Review field quality control procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Defend-R CI Coated Glass Class A are protected by a two-step packaging process using shrink wrap and a UV resistant polyethylene bag. This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the job-site. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2". Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

B. Protect insulation from open flame.

1.09 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Roof Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

   1. ASTM standards specified.
   2. Factory Mutual (FM) approvals specified.
   3. Underwriters Laboratories Inc. (UL) classifications specified.
   4. DrJ Engineering TER 2404-03; 2403-06

B. Basis of Design: Drexel Defend-R CI Coated Glass Class A produced by Drexel Metals, 1234 Gardiner Lane, Louisville, Ky 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** - Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions

C. Substitutions: Not permitted.

D. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Drexel Defend-R CI Coated Glass Class A complies with ASTM C1289 Type II, Class 2 and ASTM E84 Class A. Boards are energy efficient rigid insulation panels composed of a closed cell Class A polyisocyanurate foam core bonded online during a restrained-rise manufacturing process to premium performance polymer bonded glass mat facers on both sides.

1. Foam Core
   a. Grade 3 (25psi)

2. Panel Size:
   a. 4 feet by 8 feet (1220 mm by 2440 mm)
   b. Additional lengths/widths available upon request
   3. Thickness / R-value: ASTM C 518 at 75 degrees F (23.9 degrees C).

** NOTE TO SPECIFIER ** Select one of the following Grade paragraphs and delete those not required. Values calculated based on 5/8 inch plywood facing.

   a. 1.0 inches (25 mm) / R-value 6.0
   b. 1.5 inches (38 mm) / R-value 9.0
   c. 2.0 inches (51 mm) / R-value 12.1
   d. 2.5 inches (64 mm) / R-value 15.3
   e. 3.0 inches (76 mm) / R-value 18.5
   f. 3.3 inches (84 mm) / R-value 20.4
   g. 3.5 inches (89 mm) / R-value 21.7
   h. 4.0 inches (102 mm) / R-value 25.0
   i. Provide to the thickness indicated on the Drawings.

** NOTE TO SPECIFIER ** Several factors are involved in the proper fastening of insulation panels. These include overall thickness of the panel, the weight of the specified cladding and the type of support provided at the base of the wall assembly. Please contact Drexel Metals for assistance with fastening rate and fastener type.

2.03 JOINT SEALANT, PANEL FASTENERS, AND ADHESIVES

1. Liquid Joint Sealants:
   a. BarriBond XL
   b. BarriBond
   c. DynaTrol I-XL Hybrid

2. Foil Grip 1402 Tape: Foil-faced butyl flashing tape
   a. Backing: 2 mils aluminum foil
   b. Width: 2 to 6 inches
   c. Thickness: 17 mils

3. AlumaGrip 701 Tape: Foil-faced butyl flashing tape
   a. Backing: 2 mils aluminum foil

b. Width: 2 to 6 inches
c. Thickness: 30 mils

4. ECHOtape MT-A7757: Foil-faced acrylic flashing tape.
   a. Width: Nominal 2.0”, 3.0”, and 4.0”
   b. Thickness: 3.35 mils

5. Construction Grade Adhesives including: Loctite, Chemlink, DAP, BASF

6. Insulation Adhesive: CAV-GRIP

7. Approved Fastening Methods:
   a. Screw type with washers (TRUFAST Walls)
   b. Powder or gas-actuated fasteners with washers
   c. Impalement type (stick pins)
   d. Adhesive: any general construction grade adhesive (not recommended for ceiling applications)

PART 3 EXECUTION

** NOTE TO SPECIFIER ** - See Drexel Metals Installation Guide for recommended fastening and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

3.01 EXAMINATION

A. Do not begin installation until exterior walls have been properly prepared.

B. Verify that all exterior wall assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

D. If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in exterior spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Fasten insulation as recommended by the Drexel Metals Installation Guide. Provide base support for the insulation panels as required for the exterior cladding to be installed over the panels.

F. Insulation must be protected from open flame and stored in accordance with the manufacturer's instructions.

** NOTE TO SPECIFIER ** During the time between installation of continuous wall insulation panels and the application of the finished exterior cladding, it is recommended that a building wrap be applied over the wall insulation. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is also a critical element of the wall assembly. It is recommended that a hygothermal analysis of the proposed assembly be conducted to determine the type and locations of a proposed Weather Resistant Barriers. Select one of the following three paragraphs and delete those not required.

G. Install vapor retarders over insulation panels as specified in Section 07260.

H. Install air barriers over insulation panels as specified in Section 07270.

I. Drexel Defend-R wall insulation is not intended to be left exposed for extended periods of time without adequate protection. If extended exposure is anticipated all exposed foam surfaces exposed to daylight should be taped with a compatible waterproof tape.

J. Install exterior cladding as recommended by the cladding manufacturer and as specified in other sections of this specification.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Wet panels shall be allowed to completely dry prior to application of weather barrier and/or cladding.

D. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R CI PLY

SECTION 07 21 13

CONTINUOUS INSULATION DREXEL DEFEND-R CI PLY WALL PANELS

AUGUST 2024

** NOTE TO SPECIFIER **

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 609-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Defend-R CI products are designed for use in commercial and residential wall applications to provide "ci" continuous insulation within the building envelope.

This specification includes Drexel Defend-R CI Ply, an energy efficient rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and 5/8 inch or 3/4 inch 5-ply fire treated (FT) plywood on the other. It is designed to provide both continuous insulation and a cladding attachment substrate in commercial wall assemblies meeting the acceptance criteria of NFPA 285 for building Types I-IV. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com. In specific wood stud applications this panel can be used as structural sheathing.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drexel Defend-R CI Ply Continuous Insulation Composite Panels for Exterior Walls

** NOTE TO SPECIFIER ** Delete any paragraphs below not applicable to project

1.02 RELATED SECTIONS

A. Section 03300 - Cast In Place Concrete: Concrete base wall.

B. Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.

C. Section 04210 - Clay Masonry: Brick facing.

D. Section 04800 - Masonry Assemblies: Masonry base wall.

E. Section 04850 - Stone Facing.

F. Section 05400 - Cold Formed Metal Framing.

G. Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

H. Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

I. Section 09110 - Non-Structural Metal Framing.

J. Section 09200 - Plaster and Gypsum Board.

K. Section 09220 - Stucco.

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section; add others as required.

1.03 REFERENCES

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 - Steady State Thermal Transmission By Means Of The Heat Flow Meter Apparatus (R Value)

C. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

D. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

E. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

F. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

G. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

H. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

I. NFPA 285 - Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

J. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

K. DrJ TER 2404-03; 2403-03.

N. ASHRAE 901—Energy Standard for Buildings Except Low-Rise Residential Buildings

O. IBC Chapter 26- Foam Plastic

P. UL 263- Standard for Fire Tests of Building Construction and Materials

** NOTE TO SPECIFIER ** Continuous insulation wall panels are intended to be used continuous over framing members and to be relatively free of significant thermal bridging. Coordinate with other trades to minimize the penetration of thermal conductors through the wall system. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is a critical element of a continuous insulation wall assembly. It is strongly recommended that the Architect perform hygrothermal analysis of the assembly at the location of each project using local code requirements and ASHRAE Standards. The calculations should be used to verify the performance of the assembly and to determine the locations of the weather resistant barrier(s) as required.
** NOTE TO SPECIFIER ** System Description contains components which must be part of an NFPA 285 compliant assembly. Drexel Metals has an Engineering Extension Report from Priest & Associates that outlines all compliant wall assembly options for Types I, II, III and IV buildings that can be achieved using Drexel Defend-R CI Ply. For a complete list of NFPA 285 compliant assembly options please contact our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com.

1.04 SYSTEM DESCRIPTION (Table 4 of Engineering Extension Report)

A. Base Wall
B. Fire-stopping at floor lines
C. Cavity Insulation (optional)
D. Exterior Sheathing, Sheathing/WRB combined product (optional)
E. WRB on base wall (optional)
F. Exterior Insulation
G. WRB on Exterior Insulation (required)
H. Exterior Cladding

** NOTE TO SPECIFIER ** - Delete sections below not relevant to this project; add others as required.

1.05 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Physical properties (Foam Core):
1. Flame Spread Index: ASTM E 84; less than 75
2. Smoke Developed: ASTM E 84; less than 450.
3. Compressive Strength: ASTM D 1621; Grade 2 (20psi / 138 kPa) or Grade 3 (25psi / 172 kPa).
4. Dimensional Stability: ASTM D 2126; 2 percent linear change (7 days).
5. Moisture Vapor Permeance: ASTM E 96; less than 1 perm (57.5ng/(Pa•s•m2)).
6. Water Absorption: ASTM C 209; less than 0.1 percent by volume.
7. Service Temperature: Minus 100 degrees to 250 degrees F (Minus 73 degrees C to 122 degrees C).
8. Resistance to Mold: ASTM D 3273; Passed (10).
9. 3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFC; Virtually no Global Warming Potential (GWP)

C. Fire Treated Plywood:
1. Flame Spread Index: ASTM E 84; less than 25
2. Smoke Developed: ASTM E 84; less than 250
3. 5-Ply CDX

D. Drexel Defend-R CI Ply is evaluated and listed under DrJ TER 2404-03; 2403-03 (state-specific stamped reports available). Tests include:
   1. Flame spread index of <75 and smoke developed index of <450 when tested in accordance with ASTM E 84.
   2. Classified as Type V in accordance with ASTM C 1289

F. Drexel Defend-R CI Ply has passed the following:
   1. Meets the current continuous insulation standards of ASHRAE 90.1, IECC, and IBC Chapter 26.
   2. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-746-1114 or reference the report titled Engineering Extensions Based On NFPA 285 Test on our website, www.drexelmetals.com
   3. UL 263 Time-Rated Assemblies

** NOTE TO SPECIFIER ** - Delete sections below that are not applicable.

1.06 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets and installation guides on wall panels and fasteners, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Fastening Guidelines: Manufacturer's 3rd party engineering evaluations for attachment of Drexel Defend-R CI Ply, including:

** NOTE TO SPECIFIER ** - Choose one of the following two options depending on the application.
   1. Shear Wall Performance of Drexel Defend-R CI Ply: for wood stud applications only with maximum foam thickness of 2.0". (state-specific stamped reports available)
   2. For all non-structural applications of Drexel Defend-R CI Ply to wood and steel studs, concrete, and CMU.

** NOTE TO SPECIFIER ** - Delete the following paragraphs if LEED is not applicable.

D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
   1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
   2. Manufacturer Specific Environmental Product Declaration which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD

E. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

C. Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
   1. Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
   2. Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
   3. Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer's installation guidelines.
   4. Review firestopping requirements and weather resistive membrane requirements and placement locations.
   5. Review field quality control procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Defend-R CI Ply are protected with a two-step packaging process using **shrink wrap and a UV resistant polyethylene bag.** This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the job-site. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2". Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

1.09 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Drexel Defend-R CI Ply produced by Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Board Insulation Bonded to Plywood: Drexel Defend-R CI Ply is an energy efficient rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and 5/8" or ¾" fire treated plywood on the other.
   1. Foam core:
      a. Grade 2 (20 psi)
   2. Fire Treated Plywood Thickness:
      a. 5/8 inch.
      b. 3/4 inch.
   3. Panel Size:
      a. 4 feet by 8 feet (1220 mm by 2440 mm).
   4. Thickness / R Value: based on ASTM C 518 at 75 degrees F (23.9 degrees C)
      a. 1.6 inches (41 mm) / R Value 6.8 with 5/8 inch plywood facing
      b. 2.1 inches (53 mm) / R Value 9.8 with 5/8 inch plywood facing
      c. 2.6 inches (66 mm) / R Value 12.9 with 5/8 inch plywood facing
      d. 3.1 inches (79 mm) / R Value 16.1 with 5/8 inch plywood facing
      e. 3.6 inches (94 mm) / R Value 19.3 with 5/8 inch plywood facing
      f. 4.1 inches (104 mm) / R Value 22.5 with 5/8 inch plywood facing
      g. 4.6 inches (117 mm) / R Value 25.8 with 5/8 inch plywood facing
      h. 1.7 inches (43 mm) / R Value 7.0 with 3/4 inch plywood facing
      i. 2.2 inches (56 mm) / R Value 10.0 with 3/4 inch plywood facing
      j. 2.7 inches (69 mm) / R Value 13.1 with 3/4 inch plywood facing
      k. 3.2 inches (81mm) / R Value 16.3 with 3/4 inch plywood facing
      l. 3.7 inches (97 mm) / R Value 19.5 with 3/4 inch plywood facing
      m. 4.2 inches (104 mm) / R Value 22.7 with 3/4 inch plywood facing
      n. 4.7 inches (119 mm) / R Value 26.0 with 3/4 inch plywood facing
   5. Provide to the thickness indicated on the Drawings.

** NOTE TO SPECIFIER ** Several factors are involved in the proper fastening of insulation panels. These include overall thickness of the panel, the weight of the specified cladding and the type of support provided at the base of the wall assembly. Please contact Drexel Metals for assistance with fastening rate and fastener type.

2.03 PANEL FASTENERS

A. Fasteners shall be approved Drexel Metals fasteners. Fasteners are a corrosion resistant type with oversized heads. Length of fasteners shall be as recommended by the panel manufacturer.
   1. SIP/HD and SIP/HD-PT (Partial Thread): 12-16 gauge steel studs
   2. SIP/SD and SIP/SD-PT (Partial Thread): 18-22 gauge steel studs
   3. SIP/SD: Concrete and CMU (pre-drilling required)
   4. SIP/WD: Wood studs
   5. SIP/WD: Concrete and CMU (pre-drilling required)
   6. Engineering Evaluations for fastening patterns

2.04 WRB

A. Vapor permeable barrier recommended for exterior of Drexel Defend-R CI Ply panels (10-60 perms)
B. For NFPA 285 compliance, barrier must be chosen from approved options listed in our Engineering Evaluation Report from Priest and Associates

** NOTE TO SPECIFIER ** -Choose option C if single-source insulation/WRB system is desired

2.05 LIQUID JOINT SEALANT

A. BarriBond XL
B. BarriBond
C. Dyna-Trol I-XL Hybrid

PART 3 EXECUTION

** NOTE TO SPECIFIER ** ** **NOTE TO SPECIFIER ** -** See Drexel Metals Installation Guide for recommended fastening patterns and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

3.01 EXAMINATION

A. Do not begin installation until exterior walls have been properly prepared.

B. Verify that all exterior wall assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

D. If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in exterior spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Insulation must be protected from open flame and stored in accordance with the manufacturer’s instructions.

F. Fasten composite insulation to the structural base wall. Coordinate with the cladding or wall finish manufacturer for the attachment requirements over insulation panels. Contact Drexel Metals for guidance when determining fastening pattern.

G. Install vapor retarders over insulation panels as specified in Section 07260.

H. Install air barriers over insulation panels as specified in Section 07270.

I. Drexel Defend-R CI Ply is not intended to be left exposed for extended periods of time. During the time between the installation of the Drexel Defend-R CI Ply and the application of the exterior cladding it is recommended that the WRB be installed as soon as possible. If the WRB is not being installed right away it is recommended that the Drexel Defend-R CI Ply be protected from excess moisture and UV. All unfaced foam exposed directly to daylight can be taped with a compatible waterproof tape and the edges of the boards can be buttered with a compatible sealant.

J. Install exterior cladding as recommended by the cladding manufacturer and as specified in other sections of this specification. Note: the cladding manufacturer may require you to fasten the exterior cladding through the composite insulation to the structural wall.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished wall panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Wet panels shall be allowed to completely dry prior to application of vapor barrier and/or cladding.

D. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R CI PLY CLASS A

SECTION 07 21 13

CONTINUOUS INSULATION DREXEL DEFEND-R CI PLY CLASS A WALL PANELS

AUGUST 2024

** NOTE TO SPECIFIER **

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40213
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Defend-R CI products are designed for use in commercial and residential wall applications to provide "ci" continuous insulation within the building envelope.

This specification includes Drexel Defend-R CI Ply Class A, an energy efficient rigid insulation panel composed of a closed cell class A polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and 5/8 inch or ¾ inch 5-ply fire treated (FT) plywood on the other. It is designed to provide both continuous insulation and a cladding attachment substrate in commercial wall assemblies meeting the acceptance criteria of NFPA 285 for building Types I-IV. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com. In specific wood stud applications this panel can be used as structural sheathing.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drexel Defend-R CI Ply Class A Continuous Insulation Composite Panels for Exterior Walls

** NOTE TO SPECIFIER ** - Delete any paragraphs below not applicable to project

1.02 RELATED SECTIONS

A. Section 03300 - Cast In Place Concrete: Concrete base wall.

B. Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.

C. Section 04210 - Clay Masonry: Brick facing.

D. Section 04800 - Masonry Assemblies: Masonry base wall.

E. Section 04850 - Stone Facing.

F. Section 05400 - Cold Formed Metal Framing.

G. Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

H. Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

I. Section 09110 - Non-Structural Metal Framing.

J. Section 09200 - Plaster and Gypsum Board.

K. Section 09220 - Stucco.

** NOTE TO SPECIFIER ** Delete references from the list below that are not required by the text of the edited section; add others as required.

1.03 REFERENCES

A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 - Steady State Thermal Transmission by Means of The Heat Flow Meter Apparatus (R-Value)

C. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

D. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

E. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

F. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

G. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

H. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

I. NFPA 285 - Standard Fire Test Method for Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

J. Priest and Associates Engineering Extensions Based on NFPA 285 Tests

K. DrJ TER 2404-03; 2403-06.

** NOTE TO SPECIFIER ** Continuous insulation wall panels are intended to be used continuous over framing members and to be relatively free of significant thermal bridging. Coordinate with other trades to minimize the penetration of thermal conductors through the wall system. The incorporation of Weather Resistant Barriers (air, vapor and moisture) is a critical element of a continuous insulation wall assembly. It is strongly recommended that the Architect perform hygrothermal analysis of the assembly at the location of each project using local code requirements and ASHRAE Standards. The calculations should be used to verify the performance of the assembly and to determine the locations of the weather resistant barrier(s) as required.

N. ASHRAE 90.1- Energy Standard for Buildings Except Low-Rise Residential Buildings

O. IBC Chapter 26- Foam Plastic

** NOTE TO SPECIFIER ** System Description contains components which must be part of an NFPA 285 compliant assembly. Drexel Metals has an Engineering Extension Report from Priest & Associates that outlines all compliant wall assembly options for Types I, II, III and IV buildings that can be achieved using Drexel Defend-R CI Ply Class A. For a complete list of NFPA 285 compliant assembly options please contact our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based on NFPA 285 Tests on our website, www.drexelmetals.com

1.04 SYSTEM DESCRIPTION (Table 4 of Engineering Extension Report)

A. Base Wall
B. Fire-stopping at floor lines
C. Cavity Insulation (optional)
D. Exterior Sheathing, Sheathing/WRB combined product (optional)
E. WRB on base wall (optional)
F. Exterior Insulation
G. WRB on Exterior Insulation (vapor permeable barrier required)
H. Exterior Cladding

** NOTE TO SPECIFIER ** - Delete sections below not relevant to this project; add others as required.

1.05 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Physical properties (Foam Core):
1. Flame Spread Index: ASTM E 84; less than 25
2. Smoke Developed: ASTM E 84; less than 250.
3. Compressive Strength: ASTM D 1621; Grade 3 (25 psi / 172 kPa).
4. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
5. Moisture Vapor Permeance: ASTM E 96, 1.1 perm (57.5ng/(Pa•s•m2)).
6. Water Absorption: ASTM C 209, less than 0.1 percent by volume.
7. Service Temperature: Minus 100 degrees F to 250 degrees F (Minus 73 degrees C to 122 degrees C).
8. Resistance to Mold: ASTM D 3273 Passed (10).
9. 3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFC; Virtually no Global Warming Potential (GWP)

C. Fire Treated Plywood:
1. Flame Spread Index: ASTM E 84; less than 25
2. Smoke Developed: ASTM E 84; less than 250.
3. 5-Ply CDX

D. Drexel Defend-R CI Ply Class A is evaluated and listed under DrJ TER 2404-03; 2403-06. Tests include:

1. Flame spread index of <25 and smoke developed index of <450 when tested in accordance with ASTM E 84.
2. Classified as Type V in accordance with ASTM C 1289

E. Drexel Defend-R CI Ply Class A Tests include:
1. Structural shearwall attachment of Drexel Defend-R CI Ply Class A to wood studs. Limited panel thicknesses for this application.

F. Drexel Defend-R CI Ply Class A has passed the following:
1. Meets the current continuous insulation standards of ASHRAE 90.1, IECC, and IBC Chapter 26.
2. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components. For a complete list of NFPA 285 compliant assembly options please call our technical team at 888-321-9630 or reference the report titled Engineering Extensions Based On NFPA 285 Test on our website, www.drexelmetals.com

** NOTE TO SPECIFIER ** - Delete sections below that are not applicable.

1.06 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets and installation guides on wall panels and fasteners, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

** NOTE TO SPECIFIER ** - Delete the following paragraphs if LEED is not applicable.

C. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Manufacturer Specific Environmental Product Declaration which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD.

D. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

B. Manufacturer shall have multiple manufacturing facilities to ensure consistency of product supply.

C. Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
1. Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
2. Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
3. Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer’s installation guidelines.

4. Review firestopping requirements and weather resistive membrane requirements and placement locations.
5. Review field quality control procedures.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Defend-R CI Ply Class A are protected with a two-step packaging process using **shrink wrap and a UV resistant polyethylene bag**. This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the job-site. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2". Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

1.09 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Drexel Defend-R CI Ply Class A produced by Drexel Metal, 1234 Gardiner Lane, Louisville, KY 40213. Phone: (888) 321-9630. Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** - Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. DrJ TER 2404-03; 2403-06.

B. Board Insulation Bonded to Plywood: Drexel Defend-R CI Ply Class A is an energy efficient rigid insulation panel composed of a closed cell Class A polyisocyanurate foam core bonded

to a premium performance coated glass facer on one side and 5/8" or ¾" fire treated plywood on the other.

1. Foam core:
   a. Grade 3 (25 psi)
2. Fire Treated Plywood Thickness:
   a. 5/8 inch.
   b. 3/4 inch.
3. Panel Size:
   a. 4 feet by 8 feet (1220 mm by 2440 mm).
4. Thickness / R Value: based on ASTM C 518 at 75 degrees F (23.9 degrees C)
   a. 1.6 inches (41 mm) / R-value 6.8 with 5/8 inch plywood facing
   b. 2.1 inches (53 mm) / R-value 9.8 with 5/8 inch plywood facing
   c. 2.6 inches (66 mm) / R-value 12.9 with 5/8 inch plywood facing
   d. 3.1 inches (79 mm) / R-value 16.1 with 5/8 inch plywood facing
   e. 3.6 inches (94 mm) / R-value 19.3 with 5/8 inch plywood facing
   f. 4.1 inches (104 mm) / R-value 22.5 with 5/8 inch plywood facing
   g. 4.6 inches (117 mm) / R-value 25.8 with 5/8 inch plywood facing
   h. 1.7 inches (43 mm) / R-value 7.0 with 3/4 inch plywood facing
   i. 2.2 inches (56 mm) / R-value 10.0 with 3/4 inch plywood facing
   j. 2.7 inches (69 mm) / R-value 13.1 with 3/4 inch plywood facing
   k. 3.2 inches (81mm) / R-value 16.3 with 3/4 inch plywood facing
   l. 3.7 inches (97 mm) / R-value 19.5 with 3/4 inch plywood facing
   m. 4.2 inches (104 mm) / R-value 22.7 with 3/4 inch plywood facing
   n. 4.7 inches (119 mm) / R-value 26.0 with 3/4 inch plywood facing
5. Provide to the thickness indicated on the Drawings.

** NOTE TO SPECIFIER ** Several factors are involved in the proper fastening of insulation panels. These include overall thickness of the panel, the weight of the specified cladding and the type of support provided at the base of the wall assembly. Please contact Drexel Metals for assistance with fastening rate and fastener type.

2.03 PANEL FASTENERS

A. Fasteners shall be approved Drexel Metals fasteners. Fasteners are a corrosion resistant type with oversized heads. Length of fasteners shall be as recommended by the panel manufacturer.
   1. SIP/HD and SIP/HD-PT (Partial Thread): 12-16 gauge steel studs
   2. SIP/SD and SIP/SD-PT (Partial Thread): 18-22 gauge steel studs
   3. SIP/SD: Concrete and CMU (pre-drilling required)
   4. SIP/WD: Wood studs
   5. SIP/WD: Concrete and CMU (pre-drilling required)
   6. Engineering Evaluations for fastening patterns

2.04 WRB

A. Vapor permeable barrier recommended for exterior of Drexel Defend-R CI Ply Class A panels (10-60 perms)

B. For NFPA 285 compliance, barrier must be chosen from approved options listed in our Engineering Evaluation Report from Priest and Associates

2.05 LIQUID JOINT SEALANT

A. BarriBond XL
B. BarriBond
C. Dyna-Trol I-XL Hybrid

PART 3 EXECUTION

** NOTE TO SPECIFIER ** ** NOTE TO SPECIFIER ** - See Drexel Metals Installation Guide for recommended fastening patterns and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

3.01 EXAMINATION

A. Do not begin installation until exterior walls have been properly prepared.

B. Verify that all exterior wall assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

D. If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in exterior spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Insulation must be protected from open flame and stored in accordance with the manufacturer’s instructions.

F. Fasten composite insulation to the structural base wall. Coordinate with the cladding or wall finish manufacturer for the attachment requirements over insulation panels. Contact Drexel Metals for guidance when determining fastening pattern.

G. Install vapor retarders over insulation panels as specified in Section 07260.

H. Install air barriers over insulation panels as specified in Section 07270.

I. Drexel Defend-R CI Ply Class A is not intended to be left exposed for extended periods of time. During the time between the installation of the Drexel Defend-R CI Ply Class A and the application of the exterior cladding it is recommended that the WRB be installed as soon as possible. If the WRB is not being installed right away it is recommended that the Drexel Defend-R CI Ply Class A be protected from excess moisture and UV. All unfaced foam exposed directly to daylight can be taped with a compatible waterproof tape and the edges of the boards can be buttered with a compatible sealant.

J. Install exterior cladding as recommended by the cladding manufacturer and as specified in other sections of this specification. Note: the cladding manufacturer may require you to fasten the exterior cladding through the composite insulation to the structural wall.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished wall panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Wet panels shall be allowed to completely dry prior to application of vapor barrier and/or cladding.

D. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DREXEL DEFEND-R CI NAIL BASE

SECTION 07 21 13

CONTINUOUS INSULATION DREXEL-DEFEND-R CI NAIL BASE WALL PANELS

AUGUST 2024

** NOTE TO SPECIFIER **

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

*Follow the instructions listed in the ** NOTE TO SPECIFIER ** sections included throughout the specification. Edit carefully to suit project requirements. Modify as necessary and delete paragraphs that are not applicable.*

This specification is based on the continuous insulation products of Drexel Metals, located at:

1234 Gardiner Lane
Louisville, KY 40230
Phone: (888) 321-9630
Fax: (502) 690-6174
E-mail: info@drexelmetals.com
Internet: www.drexelmetals.com

Drexel Metals is the developer and producer of high performance polyisocyanurate insulation panels for the interior or exterior of structural exterior walls of residential and commercial buildings. Drexel Defend-R products are designed for use in commercial and residential wall applications to provide "ci" continuous insulation within the building envelope.

This specification includes Drexel Defend-R CI Nail Base, an energy efficient rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and OSB (7/16" or 5/8") or 5-ply plywood (5/8" or ¾") on the other. It is designed for use in exterior wall assemblies of Type V buildings to provide both continuous insulation and a cladding attachment substrate. In specific wood stud applications this panel can be used as structural sheathing.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drexel Defend-R CI Nail Base Continuous Insulation Composite Panels for Exterior Walls.

** NOTE TO SPECIFIER ** - Delete any paragraphs below not applicable to project

1.02 RELATED SECTIONS

A. Section 03300 - Cast in Place Concrete: Concrete base wall.

B. Section 03400 - Pre-Cast Concrete: Pre-cast concrete base wall.
C. Section 04210 - Clay Masonry: Brick facing.

D. Section 04800 - Masonry Assemblies: Masonry base wall.

E. Section 04850 - Stone Facing.

F. Section 05400 - Cold Formed Metal Framing.

G. Section 07260 - Vapor Retarders: Vapor retarder materials over insulation to adjacent insulation.

H. Section 07270 - Air Barriers: Air seal materials over insulation to adjacent insulation.

I. Section 09110 - Non-Structural Metal Framing.

J. Section 09200 - Plaster and Gypsum Board.

K. Section 09220 - Stucco.

** NOTE TO SPECIFIER ** Delete references from the list below that are not actually required by the text of the edited section; add others as required.

1.03 REFERENCES

A. ASTM C 209 - Methods of Testing Insulating Board, Structural and Decorative.

B. ASTM C 518 - Steady State Thermal Transmission By Means Of The Heat Flow Meter Apparatus (R Value)

C. ASTM C 1289 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.

D. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.

E. ASTM D 2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

F. ASTM D 3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

G. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

H. ASTM E 96 - Test Method for Water Vapor Transmission of Materials.

I. California Code of Regulations, Title 24, Insulation Quality Standard License #TI-1420

J. DrJ TER 2404-03.

L. ASHRAE 90.1- Energy Standard for Buildings Except Low-Rise Residential Buidlings

M. IBC Chapter 26- Foam Plastic
N. UL 263- Standard for Fire Tests of Building Construction and Materials

** NOTE TO SPECIFIER ** - Delete sections below not relevant to this project; add others as required.

1.04 DESIGN REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Physical properties (Foam Core):
1. Flame Spread Index: ASTM E 84; less than 75
2. Smoke Developed: ASTM E 84; less than 450.
3. Compressive Strength: ASTM D 1621; Grade 2 (20psi / 138 kPa) or Grade 3 (25psi / 172 kPa).
4. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
5. Moisture Vapor Permeance: ASTM E 96, less than 1 perm (57.5ng/(Pa•s•m2)).
6. Water Absorption: ASTM C 209, less than 0.1 percent by volume.
7. Service Temperature: Minus 100 degrees to 250 degrees F (Minus 73 degrees C to 122 degrees C).
8. Resistance to Mold: ASTM D 3273 Passed (10).
9. 3rd Generation Zero ODP Blowing Agent; Contains zero CFCs, HCFCs, or HFC; Virtually no Global Warming Potential (GWP)

C. OSB or Plywood substrate:
1. Flame Spread Index: ASTM E84; less than 75
2. Smoke Developed: ASTM E84; less than 450
3. Plywood is 5-ply CDX

D. ASTM C1289 Type V panel (foam core is Type 2, Class 2)

E. Drexel Defend-R CI Nail Base is evaluated and listed under DrJ TER 2404-03. Test include:
1. Structural shearwall attachment of Drexel Defend-R CI Nail Base to wood studs.
2. Limited panel thicknesses for this application.

F. Drexel Defend-R CI Nail Base has passed the following:
1. Meets the current continuous insulation standards of ASHRAE 90.1, IECC, and IBC Chapter 26.
2. UL 263 Time-Rated Assemblies

1.05 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets and installation guides on wall panels and fasteners, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Fastening Guidelines: Manufacturer's 3rd party engineering evaluations for attachment of Drexel Defend-R CI Ply, including:

** NOTE TO SPECIFIER ** - Choose one of the following two options depending on the application.

1. DrJ TER 2404-03.

** NOTE TO SPECIFIER ** - Delete the following paragraphs if LEED is not applicable.

D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:

1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Manufacturer Specific Environmental Product Declaration which conforms to ISO 14025 and Polyisocyanurate Insulation Manufacturers Association EPD

E. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall be a company that regularly manufactures and assembles specified insulation in house with no outside fabrication operations.

B. Pre-Installation Meeting: Convene minimum one week prior to commencing Work of this section. Review installation procedures and coordination required with Related Work and include the following:
1. Participants: Authorized representatives of the Contractor, Architect, Installer, and Manufacturer.
2. Review wall assemblies for potential interference and conflicts and coordinate layout and support provisions for interfacing work.
3. Review continuous insulation wall panels installation methods and procedures related to application, including manufacturer’s installation guidelines.
4. Review firestopping requirements and weather resistive membrane requirements and placement locations.
5. Review field quality control procedures.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Drexel Defend-R CI Nail Base are protected with a two-step packaging process using **stretch wrap and a UV resistant polyethylene bag**. This moisture resistant package is designed for protection from the elements during flatbed shipment from our factories to the job-site. Outdoor storage for extended periods of time requires waterproof tarpaulins and elevated storage above ground level a minimum of 2”. Additionally, we recommend slitting the bundle packaging vertically down the center of the two short sides to prevent moisture accumulation within the package.

1.08 SEQUENCING

A. Coordinate with the installation of vapor retarders and air seal materials specified in Section 07260 and Section 07270.

B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.09 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Drexel Defend-R CI Nail Base produced by Drexel Metals, 1234 Gardiner Lane, Louisville, KY 40230. Phone: (888) 321-9630 Fax: (502) 690-6174. E-mail: info@drexelmetals.com.

** NOTE TO SPECIFIER ** - Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 BOARD INSULATION

A. Board Insulation: Provide products that comply with the following:

** NOTE TO SPECIFIER ** Delete all of the following standards that are not required; coordinate with product specifications.

1. ASTM standards specified.
2. Factory Mutual (FM) approvals specified.
3. Underwriters Laboratories Inc. (UL) classifications specified.
4. DrJ TER 2404-03.

B. Board Insulation Bonded to OSB or Plywood: Drexel Defend-R CI Nail Base is an energy efficient rigid insulation panel composed of a closed cell polyisocyanurate foam core bonded to a premium performance coated glass facer on one side and OSB or plywood on the other.

1. Foam core:
   a. Grade 2 (20 psi).
   b. Grade 3 (25 psi).

2. Wood Panel Thickness:
   a. 7/16 inch Oriented Strand Board (OSB).
   b. 5/8 inch Oriented Strand Board (OSB).
   c. 5/8 inch Plywood.
   d. 3/4 inch Plywood

3. Panel Size:
   a. 4 feet by 8 feet (1220 mm by 2440 mm).

4. Thickness / R Value: based on ASTM C 518 at 75 degrees F (23.9 degrees C)
   a. 1.5 inches (41 mm) / R Value 6.6 with 7/16 inch OSB facing
   b. 1.6 inches (42 mm) / R Value 6.6 with 5/8 inch OSB facing
   c. 1.6 inches (42 mm) / R Value 6.8 with 5/8 inch plywood facing
   d. 1.7 inches (43 mm) / R Value 7.0 with 3/4 inch plywood facing
   e. 2.0 inches (53 mm) / R Value 9.6 with 7/16 inch OSB facing
   f. 2.1 inches (54 mm) / R Value 9.6 with 5/8 inch OSB facing
   g. 2.1 inches (54 mm) / R Value 9.8 with 5/8 inch plywood facing
   h. 2.2 inches (56 mm) / R Value 10.0 with 3/4 inch plywood facing
   i. 2.5 inches (65 mm) / R Value 12.7 with 7/16 inch OSB facing
   j. 2.6 inches (66 mm) / R Value 12.7 with 5/8 inch OSB facing
   k. 2.6 inches (66 mm) / R Value 12.9 with 5/8 inch plywood facing
   l. 2.7 inches (69 mm) / R Value 13.1 with 3/4 inch plywood facing
   m. 3.0 inches (76 mm) / R Value 15.9 with 7/16 inch OSB facing
   n. 3.1 inches (79 mm) / R Value 15.9 with 5/8 inch OSB facing
   o. 3.1 inches (79 mm) / R Value 16.1 with 5/8 inch plywood facing
   p. 3.2 inches (81mm) / R Value 16.3 with 3/4 inch plywood facing
   q. 3.5 inches (89 mm) / R Value 19.1 with 7/16 inch OSB facing

r. 3.6 inches (91 mm) / R Value 19.1 with 5/8 inch OSB facing
s. 3.6 inches (91 mm) / R Value 19.3 with 5/8 inch plywood facing
t. 3.7 inches (94 mm) / R Value 19.5 with 3/4 inch plywood facing
u. 4.0 inches (102 mm) / R Value 21.7 with 7/16 inch OSB facing
v. 4.1 inches (104 mm) / R Value 21.7 with 5/8 inch OSB facing
w. 4.1 inches (104 mm) / R Value 22.5 with 5/8 inch plywood facing
x. 4.2 inches (107 mm) / R Value 22.7 with 3/4 inch plywood facing

5. Provide to the thickness indicated on the Drawings.

2.03 PANEL FASTENERS

A. Fasteners shall be approved Drexel Metals fasteners. Fasteners are a corrosion resistant type with oversized heads. Length of fasteners shall be as recommended by the panel manufacturer.
1. SIP/HD and SIP/HD-PT (Partial Thread): 12-16 gauge steel studs
2. SIP/SD and SIP/SD-PT (Partial Thread): 18-22 gauge steel studs
3. SIP/SD: Concrete and CMU (pre-drilling required)
4. SIP/WD: Wood studs
5. SIP/WD: Concrete and CMU (pre-drilling required)
6. Engineering Evaluations for fastening patterns.

2.04 WRB

A. Vapor permeable barrier recommended for exterior of Drexel Defend-R CI Nail Base panels (10-60 perms).

PART 3 EXECUTION

** NOTE TO SPECIFIER ** - See Drexel Metals Installation Guide for recommended fastening patterns and installation methods. Coordinate panel installation requirements with wall covering manufacturer.

3.01 EXAMINATION

A. Do not begin installation until exterior walls have been properly prepared.

B. Verify that all exterior wall assembly construction has been completed to the point where the insulation may correctly be installed.

C. Verify that mechanical and electrical services in walls have been installed and tested and, if appropriate, verify that adjacent materials and finishes are dry and ready to receive insulation.

D. If wall assembly preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in exterior spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

E. Insulation must be protected from open flame and stored in accordance with the manufacturer's instructions.

F. Fasten composite insulation to the structural base wall. Coordinate with the cladding or wall finish manufacturer for the attachment requirements over insulation panels. Contact Drexel Metals for guidance when determining fastening pattern.

G. Install vapor retarders over insulation panels as specified in Section 07260.

H. Install air barriers over insulation panels as specified in Section 07270.

I. Drexel Defend-R CI Nail Base is not intended to be left exposed for extended periods of time. During the time between the installation of the Drexel Defend-R CI Nail Base and the application of the exterior cladding it is recommended that the WRB be installed as soon as possible. If the WRB is not being installed right away it is recommended that the Drexel Defend-R CI Nail Base be protected from excess moisture and UV. All unfaced foam exposed directly to daylight can be taped with a compatible waterproof tape and the edges of the boards can be buttered with a compatible sealant.

3.04 PROTECTION

A. Protect installed products until completion of project.

B. Cover the top and edges of unfinished wall panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels.

C. Wet panels shall be allowed to completely dry prior to application of vapor barrier and/or cladding.

D. Repair or replace damaged products before Substantial Completion.

END OF SECTION