



BUILDING TRUST



SECTION 07 21 13 CONTINUOUS INSULATION

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Polyisocyanurate Foam Plastic Board Wall Insulation and Air Barrier System:
 - 1. Insulated air and water-resistive barrier system.
 - a. ECOMAXci Wall Solution, incorporating ECOMAXci FR Air Barrier.
- B. Aluminum Faced, Coated Glass Mat Faced and Polymeric Faced Insulation:
 - 1. Aluminum faced, polyisocyanurate foam insulating sheathing.
 - a. ECOMAXci FR.
 - b. Thermasheath.
 - 2. Aluminum faced, polyisocyanurate foam interior exposed insulation and insulating sheathing.
 - a. ECOMAXci FR.
 - b. TSX-8510.
 - 3. Polymer coated glass fiber mat faced, polyisocyanurate foam insulating sheathing.
 - a. Durasheath.
 - 4. Polymeric faced, below, grade polyisocyanurate foam insulation for foundation walls and slab-on-grade insulation.
 - a. Rmax Below Grade.
- C. Board Faced Insulation and SI Structural Insulation:
 - 1. Fire-retardant-treated nail base insulating sheathing.
 - a. ECOMAXci FR Ply.
 - b. ECOMAXci Ply.
 - 2. Nail base insulating sheathing.
 - a. ThermaBase-CI (TS).
 - b. ThermaBase-CI (DS).
 - 3. Aluminum faced, polyisocyanurate foam insulating structural sheathing.
 - a. Thermasheath-SI.
- D. Accessories:
 - 1. Insulation fastener components.
 - 2. Insulation joint and flashing components.
 - 3. Interior insulation attachment and joint closure system.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.

- B. Section 03 41 16 - Precast Concrete Slabs.
- C. Section 04 00 00 - Masonry
- D. Section 05 40 00 - Cold-Formed Metal Framing.
- E. Section 06 10 00 - Rough Carpentry.
- F. Section 07 10 00 - Dampproofing and Waterproofing
- G. Section 07 27 19 - Plastic Sheet Air Barriers .
- H. Section 07 27 00 - Air Barriers.
- I. Section 07 50 00 - Membrane Roofing.
- J. Section 09 22 16 - Non-Structural Metal Framing.
- K. Section 09 25 23 - Lime Based Plastering.

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 1. AAMA 711 - Voluntary Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Products.
 2. AAMA 714 - Voluntary Specification for Liquid Applied Flashing Used to Create a Water-Resistive Seal around Exterior Wall Openings in Buildings.
- B. American Association of Textile Chemists and Colorists (AATCC):
 1. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test.
- C. Air Barrier Association of America (ABAA).
- D. American National Standards Institute (ANSI):
 1. ANSI/SBCA FS 100-2012 - Standard Requirements for Wind Pressure Resistance of Foam Plastic Insulating Sheathing Used in Exterior Wall Covering Assemblies.
- E. ASTM International (ASTM):
 1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
 2. ASTM C272 - Standard Test Method for Water Absorption of Core Materials for Sandwich Construction.
 3. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 4. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
 5. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 6. ASTM C1763 - Standard Test Method for Water Absorption by Immersion of Thermal Insulation Materials.
 7. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 8. ASTM D7989 - Standard Practice for Demonstrating Equivalent In-Plane Lateral Seismic Performance to Wood-Frame Shear Walls Sheathed with Wood Structural Panels.
 9. ASTM E72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
 10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 11. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

12. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 13. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
 14. ASTM E564 - Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings.
 15. ASTM E2126 - Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings.
 16. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.
 17. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
- F. International Code Council (ICC):
1. ICC-ES AC71 - Acceptance Criteria for Foam Plastic Sheathing Panels Used as Weather-resistive Barriers.
- G. National Fire Protection Association (NFPA):
1. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.
 2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- H. Underwriters Laboratories (UL): USA.
1. UL 263 - Fire Tests of Building Construction and Materials.
 2. UL 723 - Standard for Test for surface Burning Characteristics of Building Materials.
 3. UL 1715 - Fire Test of Interior Finish Material.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- 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.
- C. Third-Party Documentation, including Technical Evaluation Reports and Engineering Judgements relative to NFPA Wall Assemblies, including, but not limited to, reference to various cladding types and wall construction.
- D. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 1. Accessories: Include details of all integral panel components and their interface with adjacent materials.
 2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Verification Samples: For each finish product specified, two samples, minimum size 4 x 6 inches (102 x 150 mm).
- F. Manufacturer Qualifications: All primary products specified in this section shall be supplied by a single manufacturer with a minimum ten years' experience.
- G. Installer Qualifications: All products listed in this section shall be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same

type and scope as specified.

- H. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Remodel mock-up area as required to produce acceptable work.
- I. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, foundation/structural system/substrate conditions, and insulation manufacturer's installation instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle products per manufacturer's instructions until ready for installation.

1.6 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.7 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 recommended limits.

1.8 WARRANTY

- A. Insulation Warranty: At project closeout, provide to Owner an executed copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
- B. Insulated Air Barrier System Warranty: At project closeout, provide to Owner an executed copy of the manufacturer's standard limited material warranty, addressing the primary component materials of the system, including insulation board, joint treatment, and flashing materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Rmax, A Business Unit of Sika Corporation, located at 2075 Midway Road, Lewisville, TX 75056; Tel: 800-527-0890; Email: rmax@rmax.com; Technical Support Tel: 972-850-3604; Technical Support Email: rmax.technical@us.sika.com; Web: www.rmax.com.
 - 1. Manufacturing plant locations in Dallas, TX, Greer, SC, and Fernley, NV, to serve multiple regions.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 POLYISOCYANURATE FOAM PLASTIC BOARD - INSULATED AIR AND WATER-RESISTIVE BARRIER SYSTEM

- A. Insulated Air and Water-Resistive Barrier System: Complete single-source continuous insulation system including tapes and flashings, and as required to provide an air and water-resistive barrier system. The system has been tested in accordance with ASTM E2357 and ICC-ES AC71 Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-Resistive Barriers and listed as an Air Barrier Association of America (ABAA) Evaluated Boardstock Air Barrier Assembly.
 - 1. The system incorporates polyisocyanurate foam insulation board, joint tapes, flashing tapes, liquid sealant, and flashing materials, by one manufacturer.

- B. Basis of Design: ECOMAXci Wall Solution System from Rmax, A Business Unit of Sika Corporation.
 - 1. System substitutions shall not be permitted, except when the system substitution includes all components and materials, which have been tested by the manufacturer as a total system. Submission of documentation substantiating testing and compliance shall be required.
 - 2. Exterior Usage in NFPA 285 Wall Assemblies:
 - a. System and all components to be installed within the system shall be acceptable for inclusion in NFPA 285 exterior wall assemblies, including those that do not include exterior gypsum sheathing.

- C. System Insulation Board Component: ECOMAXci FR Air Barrier from Rmax, A Business Unit of Sika Corporation.
 - 1. Aluminum Faced, Polyisocyanurate Foam Insulating Sheathing: ASTM C1289, Type I, Class 1 and Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to glass fiber reinforced aluminum facers on both sides. Heavy embossed 12 mil facer with aluminum reflective surface on exposed side.
 - 2. Flame Spread Index and Smoke Contribution Index (Class A) per ASTM E84:
 - a. Flame: 25 or less.
 - b. Smoke: 450 or less.
 - 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 - 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 - 5. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 - 6. Aged R-Value per ASTM C518: R-6.5 minimum at thickness of 1 inch (25 mm), R-10.0 minimum at thickness of 1.5 inch (38 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
 - 7. Required Insulation Thickness and R-Value: As indicated on the Drawings.

- D. System Fastening Components:
 - 1. General - Fasteners for Fastening Polyisocyanurate Wall Insulation to Wood Framing Components and Light Gauge Metal Wall Framing:
 - a. Steel drill screws, in type and length recommended by insulating sheathing manufacturer for thickness of insulating sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117. Fasteners in contact with fire-retardant-treated wood shall be of suitable material or provided with coating suitable for such use.
 - b. Provide washers or plates if recommended by insulating sheathing manufacturer. Washers shall be compatible with screw fasteners.
 - 2. Fasteners for Fastening Polyisocyanurate Wall Insulation to metal stud framed wall surfaces:
 - a. Self-drilling ceramic coated screw.
 - 1) Product: Grip-Deck screws as manufactured by TRUFAST Walls.

3. Fasteners for Fastening Polyisocyanurate Wall Insulation to Concrete or Masonry Wall Surfaces:
 - a. One-piece plastic washer and stem, installed by a power actuated pinner tool, into concrete or masonry surfaces without pre-drilling and 12 to 18 gauge steel studs.
 - 1) Product: Thermal-Grip Insulation Pin as manufactured by TRUFAST Walls. Washer head of 2.25 inch diameter, and anchor lengths of 1 inch to 6 inches.
 4. Washers: Self-sealing for use with Self-drilling screws:
 - a. Self-sealing 2 inches (51 mm) diameter polymer washer, UV stabilized, tested, and approved to provide air and water-resistive seal, in combination with compatible self-drilling screw.
 - 1) Product: Thermal-Grip ci prong washers as manufactured by TRUFAST Walls.
 5. Washers: Perforated Hurricane/High-Wind washers for use with self-drilling screws:
 - a. Perforated face washers 3.0 inch diameter polymer washer, with additives for extended UV exposure for use in combination with compatible self-drilling screw.
 - 1) Product: Grip-Lok hurricane washers as manufactured by TRUFAST Walls.
- E. System Joint Sealants, Joint Tapes, and Flashing Materials:
1. General - Joint Treatment and Flashing Components:
 - a. Material Standards:
 - 1) AAMA 711: For self-adhered flashing and joint materials.
 - 2) AAMA 714: For liquid applied flashing and joint materials.
 - b. Components for use at static joints, joining adjacent aluminum-faced insulation panels include liquid flashing, adhered joint tape, and adhered flashing and transition tape.
 - c. Components for use at static joints, joining aluminum-faced insulation and adjacent elements, including window and wall openings and items penetrating the insulation include liquid flashing and adhered flashing and transition tape.
 - d. Components for use at dynamic joints at aluminum faced insulation of up to 3/4 inch (19 mm) in width, shall be restricted to the use of flashing and transition tape, or materials and devices specifically designed to allow for dynamic movement.
 - e. Components for use at dynamic joints at aluminum faced insulation over 3/4 inch (19 mm) in width, shall be restricted to the use of materials and devices specifically designed for such joint widths.
 2. Liquid Flashing for Stationary Joint Treatment of Foil Faced Polyisocyanurate Insulation:
 - a. Product: R-SEAL 2000 LF sealant from Rmax, A Business Unit of Sika Corporation.
 - 1) One-component flexible flashing and water-resistive barrier sealant.
 - 2) ASTM C920, Type S, Grade NS, Class 12.5, use NT, G, A, O, M.
 - 3) Application Temperature Range: 40 to 104 degrees F (4 to 40 degrees C).
 - 4) Service Range: -40 to 170 degrees F (-40 to 77 degrees C).
 - 5) Curing Rate:
 - a) Skin Formation Time: 60 to 90 minutes.
 - b) Cure Depth: 0.16 inch (4 mm) in 24 hours.
 3. Joint Sealant Tape for Stationary Joint Treatment of Foil Faced Polyisocyanurate Insulation:
 - a. Product: R-SEAL 3000 tape from Rmax, A Business Unit of Sika Corporation.
 - 1) Dead soft aluminum foil coated with acrylic pressure-sensitive adhesive.
 - 2) Width: 4 inches (102 mm).

- 3) Width: 5 inches (127 mm) for use where coverage is necessary.
 - 4) Width: 5 inches (127 mm) for systems involving High-Velocity Hurricane Zones.
4. Flashing and Transition Tape for Joints Subject to Movement and Openings at Foil Faced Polyisocyanurate Insulation, and transition to other building materials.
- a. Product: R-SEAL 6000 tape from Rmax, A Business Unit of Sika Corporation.
 - 1) Polyethylene membrane with butyl rubber adhesive.
 - 2) Width 9 and 12 inches (229 and 305 mm).

2.3 ALUMINUM FACED, COATED GLASS MAT FACED AND POLYMERIC FACED INSULATION

- A. Aluminum Faced, Polyisocyanurate Foam Interior Exposed Insulation and Insulating Sheathing: ASTM C1289, Type I, Class 1 and Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to glass fiber reinforced aluminum facers on both sides. Heavy embossed 12 mil facer with aluminum reflective surface on exposed side.
1. Basis of Design: ECOMAXci FR from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index (Class A) per ASTM E84:
 - a. Flame: 25 or less.
 - b. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-10.0 minimum at thickness of 1.55 inches (39 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Insulation shall be suitable as continuous exterior wall insulation.
 10. Insulation shall be determined to be suitable for exposed interior use. Testing to be conducted in accordance with UL 1715 or NFPA 286, as addressed in IBC Section 2603.9 Special Approval; relative to the following:
 - a. Without need for an ignition barrier on walls and ceilings.
 - b. Without need for an ignition or thermal barrier on walls or ceilings within the same building space, conforming to the following:
 - 1) On walls only for insulation thickness of 4.5 inches (114 mm) maximum.
 - 2) On ceilings only for insulation thickness of 12 inches (305 mm) maximum.
 11. Exterior Usage in NFPA 285 Wall Assemblies:
 - a. Acceptable for inclusion in NFPA 285 exterior wall assemblies, including those that do not include exterior gypsum sheathing.
- B. Aluminum Faced, Polyisocyanurate Foam Interior Exposed Insulation and Insulating Sheathing: ASTM C1289, Type I, Class 1 and Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to glass fiber reinforced aluminum facers on both sides. The exposed side of the board has a white modified acrylic coating.
1. Basis of Design: TSX-8510 from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index (Class A) per ASTM E84:
 - a. Flame: 25 or less.
 - b. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-

- 10.0 minimum at thickness of 1.55 inches (39 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Insulation shall be determined to be suitable for exposed interior use. Testing to be conducted in accordance with UL 1715 or NFPA 286, as addressed in IBC Section 2603.9 Special Approval; relative to the following:
 - a. Without need for an ignition barrier on walls and ceilings.
 - b. Without need for an ignition or thermal barrier on walls or ceilings within the same building space, conforming to the following:
 - 1) On walls only for insulation thickness of 4.5 inches (114 mm) maximum.
 - 2) On ceilings only for insulation thickness of 12 inches (305 mm).
- C. Aluminum Faced, Polyisocyanurate Foam Insulating Sheathing: ASTM C1289, Type I, Class 1 and Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to reinforced aluminum facers on both sides.
1. Basis of Design: Thermasheath from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 75 or less.
 - b. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-10.0 minimum at thickness of 1.55 inches (39 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Exterior Usage in NFPA 285 Wall Assemblies:
 - a. Acceptable for inclusion in NFPA 285 exterior wall assemblies that include exterior gypsum sheathing.
- D. Polymer Coated Glass Fiber Mat Faced, Polyisocyanurate Foam Insulating Sheathing: ASTM C1289, Type II, Class 2, rigid, cellular, polyisocyanurate thermal insulation.
1. Basis of Design: Durasheath from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 25 or less at thickness of 1 inch (25 mm) or greater; and 75 or less at thickness of less than 1 inch (25 mm).
 - b. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 1.5 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-10.3 minimum at thickness of 1.70 inches (43 mm) and R-12.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Insulation shall be suitable as continuous exterior wall insulation.
 10. Exterior Usage in NFPA 285 Wall Assemblies:
 - a. Acceptable for inclusion in NFPA 285 exterior wall assemblies that include exterior gypsum sheathing.
- E. Below Grade Polyisocyanurate Foam Insulation: ASTM C1289, Type I, Class 1 and Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to reinforced polymeric facers on both sides.

1. Basis of Design: Rmax Below Grade from Rmax, A Business Unit of Sika Corporation.
2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 75 or less.
 - b. Smoke: 450 or less.
 - c. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
3. Water Absorption:
 - a. Per ASTM C272, 0.3 percent maximum.
4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
5. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
6. Aged R-Value per ASTM C518:
 - a. R-5.0 minimum at thickness of 0.75 inch (19 mm).
 - b. R-6.0 minimum at thickness of 1 inch (25 mm).
 - c. R-10.0 minimum at thickness of 1.5 inches (39 mm).
 - d. R-13.1 minimum at thickness of 2 inches (51 mm).
 - e. R-15.3 minimum at thickness of 2.3 inches (58 mm).
 - f. R-20.3 minimum at thickness of 3 inches (76 mm).
7. Required Insulation R-value and Thickness as indicated on the Drawings.

2.4 BOARD FACED INSULATION AND STRUCTURAL INSULATION

- A. Fire-Retardant-Treated Nail Base Insulating Sheathing, Consisting of Aluminum Faced, Polyisocyanurate Foam Insulating Sheathing bonded to Fire-Retardant-Treated Plywood: ASTM C1289, Type V with Type I, Class 1 and Class 2, rigid, cellular, polyisocyanurate thermal insulation.
 1. Basis of Design: ECOMAXci FR Ply from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index (Class A) per ASTM E84:
 - a. Flame: 25 or less.
 - b. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value of insulation component per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-10.0 at thickness of 1.55 inches (39 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Exterior Usage in NFPA 285 Wall Assemblies:
 - a. Acceptable for inclusion in NFPA 285 exterior wall assemblies, including those that do not include exterior gypsum sheathing.
 10. Fire-Retardant-Treated Plywood Thickness:
 - a. Fire-Retardant-Treated Plywood, Exposure 1: 5/8 inch (16 mm).
 - b. Fire-Retardant-Treated Plywood, Exposure 1: 3/4 inch (19 mm).
- B. Fire-Retardant-Treated Nail Base Insulating Sheathing, Consisting of Polymer Coated Glass Fiber Mat Faced, Polyisocyanurate Foam Insulating Sheathing bonded to Fire-Retardant-Treated Plywood: ASTM C1289, Type V with Type II, Class 2, rigid, cellular polyisocyanurate thermal insulation.
 1. Basis of Design: ECOMAXci Ply from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 25 or less for foam insulation component at thickness of 1 inch (25 mm) or greater, and 75 or less for foam insulation component at thickness of less than 1 inch (25 mm).
 - b. Flame: 25 or less for fire-retardant-treated plywood.
 - c. Smoke: 450 or less for foam insulation and fire-retardant-treated plywood.

3. Water Vapor Permeability per ASTM E96 desiccant method: 1.5 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value of insulation component per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), 10.3 minimum at thickness of 1.70 inches (43 mm) and R-12.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Exterior Usage in NFPA 285 Wall Assemblies:
 - a. Acceptable for inclusion in NFPA 285 exterior wall assemblies that include exterior gypsum sheathing.
 10. Fire-Retardant-Treated Plywood Thickness:
 - a. Fire-Retardant-Treated Plywood, Exposure 1: 5/8 inch (16 mm).
 - b. Fire-Retardant-Treated Plywood, Exposure 1: 3/4 inch (19 mm).
- C. Nail Base Insulating Sheathing, Consisting of Aluminum Faced, Polyisocyanurate Foam Insulating Sheathing bonded to OSB or Plywood: ASTM C1289, Type V with Type I, Class 1 or Class 2, rigid, cellular, polyisocyanurate thermal insulation.
1. Basis of Design: ThermaBase-CI (TS) from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 75 or less.
 - b. Flame: 75 or less for plywood or OSB component.
 - c. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-10 minimum at thickness of 1.55 inches (39 mm) and R-13.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Nailable Material and Thickness:
 - a. Oriented-Strand-Board Nominal Thickness: 7/16 inch (11 mm).
 - b. Oriented-Strand-Board Nominal Thickness: 1/2 inch (13 mm).
 - c. Oriented-Strand-Board Nominal Thickness: 5/8 inch (16 mm).
 - d. Oriented-Strand-Board Nominal Thickness: 3/4 inch (19 mm).
 - e. Plywood Nominal Thickness, Exposure 1: 1/2 inch (13 mm).
 - f. Plywood Nominal Thickness, Exposure 1: 5/8 inch (16 mm).
 - g. Plywood Nominal Thickness, Exposure 1: 3/4 inch (19 mm).
- D. Nail Base Insulating Sheathing, Consisting of Polymer Coated Glass Fiber Mat Faced, Polyisocyanurate Foam Insulation Bonded to OSB or Plywood: ASTM C1289, Type V with Type II, Class 2, rigid, cellular polyisocyanurate thermal insulation.
1. Basis of Design: ThermaBase-CI (DS) from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 25 or less for foam insulation component at thickness of 1 inch (25 mm) or greater; and 75 or less at thickness of less than 1 inch (25 mm).
 - b. Flame: 75 or less for plywood or OSB component.
 - c. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 1.5 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.

5. Compressive Strength per ASTM D1621: 20 psi (138 kPa).
 6. Compressive Strength per ASTM D1621: 25 psi (172 kPa).
 7. Aged R-Value per ASTM C518: R-6.0 minimum at thickness of 1 inch (25 mm), R-10.3 minimum at thickness of 1.70 inches (43 mm) and R-12.1 minimum at thickness of 2 inches (51 mm).
 8. Required Insulation Thickness and R-Value: As indicated on the Drawings.
 9. Nailable Material and Thickness:
 - a. Oriented-Strand-Board Nominal Thickness: 7/16 inch (11 mm).
 - b. Oriented-Strand-Board Nominal Thickness: 1/2 inch (13 mm).
 - c. Oriented-Strand-Board Nominal Thickness: 5/8 inch (16 mm).
 - d. Oriented-Strand-Board Nominal Thickness: 3/4 inch (19 mm).
 - e. Plywood Nominal Thickness, Exposure 1: 1/2 inch (12.7 mm).
 - f. Plywood Nominal Thickness, Exposure 1: 5/8 inch (15.9 mm).
 - g. Plywood Nominal Thickness, Exposure 1: 3/4 inch (19.1 mm).
- E. Aluminum Faced, Polyisocyanurate Foam Insulating Sheathing: ASTM C1289, Type I, Class 1 or Class 2, rigid, cellular, polyisocyanurate thermal insulation, bonded to reinforced aluminum facers on both sides and structural component bonded to one side.
1. Basis of Design: Thermasheath-SI from Rmax, A Business Unit of Sika Corporation.
 2. Flame Spread Index and Smoke Contribution Index per ASTM E84:
 - a. Flame: 75 or less.
 - b. Smoke: 450 or less.
 3. Water Vapor Permeability per ASTM E96 desiccant method: 0.1 perm or less.
 4. Air Permeability per ASTM E2178: 0.004 cfm per sq ft (1.2192 L per min per sq m) or less.
 5. Compressive Strength per ASTM D1621:
 - a. At Thickness of 1 inch (25 mm) or Greater: 20 psi (138 kPa).
 - b. At Thickness of Less Than 1 inch (25 mm): 16 psi (110 kPa).
 6. Aged R-Value per ASTM C518:
 - a. Insulation Thickness and R-Value: 1/2 inch (13 mm) at R-3.2.
 - b. Insulation Thickness and R-Value: 3/4 inch (19 mm) at R-5.0.
 - c. Insulation Thickness and R-Value: 1 inch (25 mm) at R-6.0.
 - d. Insulation Thickness and R-Value: 1-1/4 inch (32 mm) at R-7.8.
 7. Required Insulation Thickness and R-Value: As indicated on the Drawings.

2.5 ACCESSORIES

- A. Insulation Fastener Components:
1. General - Fasteners for Fastening Polyisocyanurate Wall Insulation to Wood Framing Components, Light Gauge Metal Wall Framing Components and Wood and Metal Roof Decks:
 - a. Steel drill screws, in type and length recommended by insulating sheathing manufacturer for thickness of insulating sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117. Fasteners in contact with fire-retardant-treated wood shall be of suitable material or provided with coating suitable for such use.
 - b. Provide washers or plates if recommended by insulating sheathing manufacturer. Washers shall be compatible with screw fasteners.
 2. Fasteners for Fastening Polyisocyanurate Wall Insulation to metal stud framed wall surfaces:
 - a. Self-drilling ceramic coated screw.
 - 1) Product: Grip-Deck screws or comparable products as manufactured by TRUFAST Walls or comparable product.
 3. Nail Board Fasteners: Engineered for attaching nail base wall and roof panels walls and wall framing and structural roof decks.

- a. Large-diameter, low profile 5/8 inch (16 mm) diameter head with No. 14 shaft diameter, epoxy e-coat to comply with governing standards for use with treated wood including fire-retardant-treated wood.
 - 1) Product: Nail Board Fasteners, as manufactured by TRUFAST Walls, or comparable product.
- b. Thread Style and Point:
 - 1) SIP TP Screws: Thread-point for attaching nail board panels to wood and timber substrates.
 - 2) SIP LD Screws: Light-duty drill point for attaching nail board panels to wood, masonry, concrete, light gauge metal framing of 16 to 20 gauge, and corrugated steel deck substrates.
 - 3) SIP HD Screws: Heavy-duty drill point for attaching nail board panels to 12 to 16 gauge steel substrates.
- 4. Fasteners for Fastening Polyisocyanurate Wall Insulation to Concrete or Masonry Wall Surfaces:
 - a. One-piece plastic washer and stem, installed by a power actuated pinner tool, into concrete or masonry surfaces without pre-drilling and 12 to 18 gauge steel studs.
 - 1) Product: Thermal-Grip Insulation Pin as manufactured by TRUFAST Walls. Washer head of 2.25 inch diameter, and anchor lengths of 1 inch to 6 inches.
- 5. Washers: Self-sealing for use with Self-drilling screws:
 - a. Self-sealing 2 inches (51 mm) diameter polymer washer, UV stabilized, tested, and approved to provide air and water-resistive seal, in combination with compatible self-drilling screw.
 - 1) Product: Thermal-Grip ci prong washers as manufactured by TRUFAST Walls or comparable product.
- 6. Washers: Perforated washers for use with self-drilling screws:
 - a. Perforated face washers 1.75-inch (44 mm) diameter polymer washer, with additives for extended UV exposure for use in combination with compatible self-drilling screw.
 - 1) Product: Plasti-Grip ci prong washers as manufactured by TRUFAST Walls or comparable product.
- 7. Washers: Perforated Hurricane/High-Wind washers for use with self-drilling screws:
 - a. Perforated face washers 3.0 inch diameter polymer washer, with additives for extended UV exposure for use in combination with compatible self-drilling ceramic coated screw.
 - 1) Product: Grip-Lok hurricane washers as manufactured by TRUFAST Walls or comparable product.
- B. Insulation Joint and Flashing Components:
 - 1. General - Joint Treatment and Flashing Components:
 - a. Material Standards:
 - 1) AAMA 711: For self-adhered flashing and joint materials.
 - 2) AAMA 714: For liquid applied flashing and joint materials.
 - b. Components for use at static joints, joining adjacent aluminum faced insulation panels include liquid flashing, adhered joint tape, and adhered flashing and transition tape.
 - c. Components for use at static joints, joining aluminum faced insulation and adjacent elements, including window and wall openings and items penetrating the insulation include liquid flashing and adhered flashing and transition tape.
 - d. Components for use at dynamic joints at aluminum faced insulation of up to 3/4 inch (19 mm) in width, shall be restricted to the use of flashing and transition tape, or materials and devices specifically designed to allow for dynamic movement.
 - e. Components for use at dynamic joints over 3/4 inch (19 mm) in width, shall be

- restricted to the use of materials and devices specifically designed for such joint widths.
2. Liquid Flashing for Stationary Joint Treatment of Foil Faced Polyisocyanurate Insulation:
 - a. Product: R-SEAL 2000 LF sealant from Rmax, A Business Unit of Sika Corporation or comparable product.
 - 1) One-component flexible flashing and water-resistive barrier sealant.
 - 2) ASTM C920, Type S, Grade NS, Class 12.5, use NT, G, A, O, M.
 - 3) Application Temperature Range: 40 to 104 degrees F (4 to 40 degrees C).
 - 4) Service Range: -40 to 170 degrees F (-40 to 77 degrees C).
 - 5) Curing Rate:
 - a) Skin Formation Time: 60 to 90 minutes.
 - b) Cure Depth: 0.16 inch (4 mm) in 24 hours.
 3. Joint Sealant Tape for Stationary Joint Treatment of Foil Faced Polyisocyanurate Insulation:
 - a. Product: R-SEAL 3000 tape from Rmax, A Business Unit of Sika Corporation or comparable product.
 - 1) Dead soft aluminum foil coated with acrylic pressure-sensitive adhesive.
 - 2) Width: 4 inches (102 mm).
 - 3) Width: 5 inches (127 mm) for use where coverage is necessary.
 - 4) Width: 5 inches (127 mm) for systems involving High-Velocity Hurricane Zones.
 4. Joint Sealant Tape for Stationary Joint Treatment of White Finished Foil Faced Polyisocyanurate Insulation:
 - a. Product: R-SEAL 3000W tape from Rmax, A Business Unit of Sika Corporation or comparable product.
 - 1) Dead soft white aluminum foil coated with acrylic pressure-sensitive adhesive.
 - 2) Width 3 inches (76 mm).
 5. Flashing and Transition Tape for Joints Subject to Movement and Openings at Foil Faced Polyisocyanurate Insulation, and transition to other building materials.
 - a. Product: R-SEAL 6000 tape from Rmax, A Business Unit of Sika Corporation or comparable product.
 - 1) Polyethylene membrane with butyl rubber adhesive.
 - 2) Width 9 and 12 inches (229 and 305 mm).
 6. Joint Sealant Tape for Stationary Joint Treatment of Foil Faced Polyisocyanurate Insulation, in Residential and Light Commercial Construction:
 - a. Product: R-SEAL Construction Tape from Rmax, A Business Unit of Sika Corporation or comparable product.
 - 1) White translucent OOP Film with acrylic pressure-sensitive adhesive.
 - 2) Width 3 inches (76 mm).
- C. Interior Insulation Attachment and Joint Closure System:
1. General - At Interior Installation of Foil Faced Polyisocyanurate Insulation over interior wall surfaces of buildings, provide in conformance with the following:
 - a. Components to be PVC extrusions, white in color, with flexible edge seal, and perforated fastening leg. Flame Spread Index of 0 and Smoke-Developed Index of 190, per UL 723.
 2. Two-Component System for Interior Installation of Foil Faced Polyisocyanurate Insulation; provide in conformance with the following:
 - a. Two-component system, consisting of male component for attachment to wall or framing surface, and T-shaped female component, to be installed over face of insulation panels, allowing for removal and replacement of insulation panels if necessary.
 - b. Product: Victory Bear; Flex-Tite Clip System or comparable product.

3. One Component System for Interior Installation of Foil Faced Polyisocyanurate Insulation; provide in conformance with the following:
 - a. One-component system, of size appropriate to the insulation thickness, with flanges for attachment to wall or framing surface; allowing for insulation panels to be installed progressively.
 - b. Product: Victory Bear; Quick Clip System or comparable product.
4. Perimeter Trim Component for Interior Installation of Foil Faced Polyisocyanurate Insulation; provide in conformance with the following:
 - a. J-Channel of size appropriate to the insulation thickness to be installed; intended to secure and conceal exposed edges of insulation panels.
 - b. Product: Victory Bear; Flex-Tite J-Channel or comparable product.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 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.

3.3 INSTALLATION, GENERAL

- A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION