

SECTION 07240

EXTERIOR INSULATION AND FINISH SYSTEM – CLASS PB WITH ROLL ON MEMBRANE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Exterior Insulation and Finish System. One hundred percent (100%) acrylic polymer based exterior wall finish system with insulation board applied to an approved substrate.

1.02 RELATED SECTIONS

- A. Section 03300 – Cast - in - Place Concrete
- B. Section 03400 – Precast Concrete
- C. Section 04200 – Unit Masonry
- D. Section 05400 – Cold Formed Metal framing
- E. Section 06100 – Rough Carpentry
- F. Section 07900 – Joint Sealers
- G. Section 09250 – Gypsum Board

1.02 REFERENCES

- A. ANSI/EIMA 99-A-2001 – American National Standard for Exterior Insulation and Finish Systems, (EIFS).
- B. ASTM C150-00 – Standard Specification for Portland Cement.
- C. ASTM C1397-98 – Standard Practice for Application of Class PB Exterior Insulation and Finish Systems.
- D. ASTM C578-00 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- E. ASTM E2098-00 – Standard Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to a Sodium Hydroxide Solution.
- F. ASTM B117-97 – Standard Practice for Operating Salt Spray (Fog) Apparatus

- G. ASTM C79/C79M-00 – Standard Specification for Treated Core and Nontreated Core Gypsum Sheathing Board
- H. ASTM D968 (Federal Test Standard 141A Method 6191) Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive.
- I. ASTM D2247 (Federal Test Standard 141A Method 6191) Practice for Testing Water Resistance of Coatings.
- J. ASTM E84 Test Method for Surface Burning Characteristics of Building Materials.
- K. ASTM E96 Test Methods for Water Vapor Transmission of Materials.
- L. ASTM E108 (Modified) Method for Fire Tests of Roof Coverings.
- M. ASTM E119 Method for Fire Tests of Building Construction and Materials.
- N. ASTM E330 Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- O. ASTM E331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- P. ASTM G23 (Federal Test Standard 141A Method 6151) Recommended Practice for Operating-Exposure Apparatus (Carbon-Arc Type) with and without water. For Exposure of Nonmetallic Materials. (Replaced by ASTM G153/G152).
- Q. ASTM G152a - Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials.
- R. ASTM G153-00a Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials.
- S. ASTM G53 Practice for Operating Light – and Water – Exposure Apparatus (Fluorescent UV- Condensation Type) for Exposure of Nonmetallic Materials. (Replaced by ASTM G154-00a).
- T. ASTM G154-00A – Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials. (Replaced ASTM G53).
- U. EIMA Std. 101.86 Standard Test Method for Resistance of Exterior Insulation Finish Systems (EIFS), Class PB to the Effects of Rapid Deformation (Impact).
- V. Federal Specification C-578-85 – Foam Insulation (Superceding HH-1-524C)
- W. Mil Std. 810C Environmental Test Methods.
- X. UBC Std. 26-4 (Formally UBC 17-6) Multi-Story Fire Evaluation of Exterior Non Load-bearing Foam Plastic Insulated Wall systems.

Y. ULC S101 Standard Methods of Fire Endurance Tests of Building Construction Materials.

1.03 SYSTEM DESCRIPTION

- A. A field applied or panelized Exterior Insulation and Finish System, Class PB, consisting of an adhesively attached insulation board, fiberglass mesh, reinforced base coat, with integrally colored, textured finish and applicable accessories.

1.04 SUBMITTALS

- A. Provide submittals in accordance with section 01340.
- B. Submit product data including manufacturer's comprehensive product description marked to suit project requirements; include manufacturer's specification and installation recommendations
- C. Submit for Architect approval a 24 inch by 24 inch sample panel constructed using proposed materials, color(s) and texture(s).
- D. Test Reports – When requested, the Contractor shall submit to the owner/architect copies of selected test reports verifying the performance of the Exterior Insulation and Finish System.

1.05 QUALITY ASSURANCE

- A. Applicator: Shall be knowledgeable in the proper installation of the Energex Therm PB System and shall be experienced and competent in the installation of Exterior Insulation and Finish Systems.
- B. Manufacturer: Shall have manufactured Exterior Insulation and Finish System products in the United States for not less than twenty (20) years.
- C. Approvals: System shall be recognized for its intended use by the applicable building code(s).
- D. Field Samples: Samples constructed on jobsite by the actual applicator and approved by Architect shall be considered basis of quality for finished work.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to job site in manufacturer's original containers, clearly labeled with product identification, batch number and color.
- B. Upon arrival, materials shall be inspected for physical damage, freezing, or overheating. Questionable materials shall not be used.
- C. Store fiberglass mesh, cementitious materials and moisture sensitive materials in a dry, clean, weather protected area.

- D. Store insulation materials flat, away from heavy traffic areas, off the ground and under well ventilated cover.
- E. Store adhesive, base coat and finish in tightly sealed containers out of direct sunlight, protected from temperatures below 40° ° Fahrenheit.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Application of system shall not take place during inclement weather unless appropriate protection is employed.
- B. Maintain ambient temperature of 40° ° Fahrenheit or higher for 24 hours after installation.

1.08 WARRANTY

- A. Submit warranty in accordance with section 01740.
- B. Submit Manufacturer's standard, limited five (5) year warranty covering replacement of defective materials.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Energex PB System with roll on membrane as manufactured by Energex.

2.02 MATERIALS

- A. Weather Barrier
 - 1. Enerseal: 100% acrylic polymer based dispersion with a quartz or silica aggregate. Product is used as a weather barrier for the Energex EIFS with drainage.
- B. Adhesive
 - 1. Energex Enermix Adhesive/Basecoat: 100% acrylic polymer dispersion with a quartz or silica aggregate that is field blended with type I or type II Portland Cement 1:1 by weight. Product is used as both an adhesive and a basecoat for the Energex EIF Systems.
 - 2. Energex Enermix Dry Adhesive/Basecoat: 100% acrylic polymer based dry bagged Adhesive/Basecoat with Type I or Type II Portland Cement and a quartz or silica aggregate that is field blended with 1 ½ to 2 gallons of potable water. Product is used as both an adhesive and basecoat for the Energex EIF System.

C. Portland Cement: Type I or II, Complying with ASTM C 150

D. Insulation Board

1. Expanded Polystyrene (EPS) Board: Molded, aged, complying with ASTM C 578 and Federal Specification C-578-85, 3/4 inch to 4 inch thickness with an average density of 1.0 pounds per cubic foot, flame spread rating of less than 25, smoke developed rating of less than 450, K = 0.23 at 40° ° Fahrenheit, K = 0.26 at 75° Fahrenheit, edges square within 1/32 inch per foot, thickness tolerance plus or minus 1/16 inch; manufacturer approved by Energex, meets EIMA Guideline Specifications and is accepted with an established third party inspection program approved by the applicable code bodies.

E. Reinforcing Fabric: Balanced, open weave, glass fiber fabric made from twisted, multi -end strands treated for compatibility with synthetic coating and adhesives. Manufacturer approved by Energex.

1. Standard Mesh: 4.5-ounce mesh +/- 10% per square yard weight mesh used to reinforce wall areas, architectural foam shapes, aesthetic grooves and termination/penetration edges of the wall. Standard mesh provides a system that meets 50-89 force inch pound impact resistance ranges when tested in accordance with EIMA Test Method and Standard 101.86. This system will achieve the EIMA Standard Impact Classification.
2. Enermite 6 Mesh: Optional, 6 ounce +/- 10% per square yard weight mesh used when specified to reinforce wall areas. Enermite 6 mesh provides a system that meets the 50-89-force inch pound impact resistance range when tested in accordance with EIMA Test Method and Standard 101.86.
3. Enermite 10 Mesh: Optional, 10 ounce +/- 10% per square yard weight mesh used when specified to reinforce wall areas. Enermite 10 mesh provides a system that meets the 90-150-force inch pound impact resistance range when tested in accordance with EIMA Test Method and Standard 101.86. This system will achieve the EIMA Medium Impact Classification.
4. Enermite 15 Mesh: Optional, 15 ounce +/- 10% per square yard weight mesh used when specified with Standard Mesh applied over it in a second layer to provide additional impact resistance to ground floor applications, abnormal stress areas or areas exposed to deliberate impacts. Enermite 15 Mesh with Standard Mesh applied over it in a second layer provides a system that meets the over 150 -force inch pound impact resistance range when tested in accordance with EIMA Test Method and Standard 101.86. This system will achieve the EIMA Ultra High Impact Classification.

5. Enermite 20 Mesh: Optional, 20.0 ounce +/- 10% per square yard weight mesh used when specified with Standard Mesh applied over it in a second layer to provide additional impact resistance to ground floor applications, abnormal stress areas or areas exposed to deliberate impacts. Enermite 20 Mesh with Standard Mesh applied over it in a second layer provides a system that meets the over 300-force inch pound impact resistance range when tested in accordance with EIMA Test Method and Standard 101.86. This system will exceed the EIMA Ultra High Impact Classification.

6. Corner Mesh: Optional, Used when specified to provide additional impact resistance on corners.

EIMA Mesh Impact Classification

EIMA CLASIFICATION	IMPACT RANGE J (in-lbs.)	ENERGEX REINFORCING MESH(ES)
Standard	3-6 (50-89)	Enermite 4.5 Mesh
Medium	10-17 (90-150)	Enermite 10 Mesh
Ultra High	>17 (>150)	Enermite 15 Mesh
Ultra High	>17 (>150)	Enermite 20 Mesh

F. Base Coat (Choose one)

1. Energex Enermix Adhesive/Basecoat: 100% acrylic polymer dispersion with a quartz or silica aggregate that is field blended with type I or type II Portland cement 1:1 by weight.

2. Energex Enermix Dry Adhesive/Basecoat: 100% acrylic polymer based dry bagged Adhesive/Basecoat with Type I or Type II Portland cement and a quartz or silica aggregate that is field blended with 1 ½ to 2 gallons of potable water.

3. Energex Non Cem Basecoat: Ready mixed 100% Acrylic polymer dispersion of hardening air-cured materials with a quartz or silica aggregate.

4. Enertite Adhesive/Basecoat: 100% acrylic polymer based, fiber reinforced dispersion that is field blended with Type I or Type II Portland cement 1:1 by weight. enertite Adhesive/Basecoat is specially formulated for its waterproof properties and is recommended wherever water exposure is high as in below grade applications, splash areas, parapets and windowsills. A 1/8" thickness of enertite Adhesive/Base Coat has been shown by testing to withstand up to an 8-foot head of water.

5. Energex Enermix Plus Base/Leveler: 100% acrylic polymer based, fiber reinforced dispersion that is field blended with Type I or Type II Portland cement 1:1 by weight. Enermix Plus Base/Leveler is specially formulated for less shrinkage when drying and can be applied up to ½" thick in one coat.
- G. Finish: Energex Finishes are factory mixed, water based, UV, weather resistant, integrally colored, textured, 100% Acrylic polymer finishes with time tested resistance to weather and accumulation of dirt.
 1. Energex Standard Finish: 100% acrylic polymer dispersion of hardening air -cured materials with a quartz and/or marble aggregate. Finishes available are; Sand (fine, medium, course), Worm/Riled (fine, medium, course), and Sprayplaster (fine, medium, course). Color as selected from manufacturer's standard range or other color as selected.

3.01 MIXES

- A. Energex Enermix Adhesive/Basecoat: Combine fresh Portland cement with Adhesive/Basecoat in a ratio of 1:1 by weight. Mix in a clean container free of foreign matter. Properly dispose of hardened or partially hardened material.
- B. Energex Enermix Plus Base/Leveler: Combine fresh Portland cement with Energex Enermix Plus Base/Leveler in a ratio of 1:1 by weight. Mix in a clean container free of foreign matter. Properly dispose of hardened or partially hardened material.
- C. Energex Enermix Dry Adhesive/Basecoat: Combine 1 to 2 gallons of potable water with each 50-pound bag of Energex Enermix Dry Adhesive/Basecoat. Mix in a clean container free of foreign matter. Properly dispose of hardened or partially hardened material.
- D. Enertite Adhesive/Basecoat: Combine fresh Portland cement with Enertite Adhesive/Basecoat in a ratio of 1:1 by weight. Mix in a clean container free of foreign matter. Properly dispose of hardened or partially hardened material.
- E. Energex Non Cem Adhesive/Basecoat: Factory blend finish material is ready to use direct from the container after stirring. Small quantities, maximum 8 ounces per pail, of potable water may be added to adjust workability.
- F. Enerseal Adhesive: Factory blend material is ready to use direct from the container after stirring.

- G. Energex Acrylic Finish Coat: Open finish container and mix with a rust free high speed mixer taking care to avoid excessive up and down motion with blade. To much vertical motion will introduce air into the finish and may inhibit proper curing. A maximum of 6 ounces of clean potable water may be added to improve workability.

3.02 SOURCE QUALITY CONTROL

- A. The system shall meet or exceed the following performance standards when tested by methods shown.

DURABILITY

TEST	METHOD	CRITERIA	RESULTS
Accelerated Weathering	ASTM G-23 replaced by ASTM G153/G152	No Deleterious effects at 2000 hours when viewed under 5x magnification.	No change after 2000 hours exposure.

Accessory Performance—Starter Track

TEST	METHOD	CRITERIA	RESULTS
Specification for Rigid PVC	ASTM D-1784	Meets cell classification 13244C	Pass

PART 3 EXECUTION

3.01 EXAMINATION

- A. Substrate
 1. Inspect surfaces to receive Exterior Insulation and Finish system for planar irregularities in excess of 1/4" in four feet in any direction, areas that are unsupported, areas of high alkalinity, and areas with releasing agents and other residue. Notify Architect if these or other detrimental conditions exist prior to starting work.
 2. Wall sheathings must be securely fastened per applicable building code requirements.

B. Flashings

1. Head, jambs and sills of all openings must be flashed with a minimum 230 mm (9") strip of Secondary Moisture Barrier prior to window/door, HVAC, etc. installation.
2. Windows and openings shall be flashed according to design and Building Code Requirements.
3. Individual windows that are ganged to make multiple units require continuous head flashing and/or the joints between the units must be fully sealed.

C. Utilities

1. The system must be properly terminated (back -wrapped, sealed, flashed) at all lighting fixtures, electrical outlets, hose bibs, dryer vents, etc.

D. Air/ Weather Barrier

1. Verify that the Energex Seal with 4" Reinforcing Mesh is installed on every sheathing joint and Energex seal is applied to the entire substrate.
2. Verify that the Tyvek Flex Wrap is installed around all opening, according to Tyvek Specifications.

E. Roof

1. Verify that all roof flashings have been installed in accordance with the guidelines set by the Asphalt Roofing Manufacturers Association (ARMA).
2. Kick-out flashing must be leak proof and angled (min 100o) to allow for proper drainage and water diversion.

F. Air Seals

1. Install between the primary air/weather barrier and other wall components (penetrations, etc.) in order to maintain continuity of the air barrier system

G. Unsatisfactory conditions shall be reported to the General Contractor and/or Builder and /or Architect and/or Owner. Do not proceed until all unsatisfactory conditions have been corrected

3.02 PREPARATION

A. Prepare surfaces in accordance with manufacturer's instructions.

3.03 INSTALLATION – Must be installed in accordance to Energex installation instructions and complies with ASTM C 1397

A. Accessories

1. Attach Starter Track level and per manufacturer's instructions.
2. Air/Weather Barrier
 - a. All sheathing joints and windows/openings must be protected and the Air/ Weather Barrier applied according to Energex Installation guidelines.
 - b. Substrate shall be of a type approved by Energex.
 - c. Substrate shall be dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 6.4 mm in 3 m (1/4" in 4').
 - d. Unsatisfactory conditions shall be reported to the General Contractor and corrected before application of the Energex PB System With Trowel on membrane is started.
 - e. Installed materials should be checked before final system application.
 - f. Ensure [4" Reinforcing Mesh] [EnerSeal] overlaps the top flange of the drainage track.

B. Insulation Board – Method of attachment shall be in accordance with applicable building codes.

1. Use a ½" x ½" x 2" notched trowel to apply adhesive vertically over entire back surface of insulation boards.
2. Apply insulation board horizontally, beginning at the base from a firm, permanent or temporary support. Stagger all vertical joints and interlock corners. Insulation board joints shall be offset from substrate joints. Cut insulation board as required to fit openings, projections and corners.
3. Press boards to substrate and apply equal pressure over entire surface to ensure proper bonding. If insulation boards do not abut tightly and there is a gap in the joint, the joint shall be filled with a piece of insulation board.
4. Allow a minimum of 12 hours adhesive cure before proceeding.
5. EPS board shall be rasped or sanded smooth. Use a 4-foot straight edge to check wall uniformity and smoothness. The entire wall area must be sanded/rasped.
6. Cut all aesthetic grooves (reveals) in EPS board as detailed on drawings, using appropriate router and bit or special EPS cutting grooving equipment. EPS boards may be pre grooved at the factory, if grooved to ensure other foam board installation requirements are met.

7. Foam shaped (pop outs), as detailed on the drawings, shall be adhered directly to the face of the installed insulation board by applying applicable Energex adhesives to the back of the foam shape and pressing it firmly into position.
- C. Edge, Termination and Penetration Details: Apply basecoat material to system edges or terminations and penetrations. Embed Energex Standard Mesh onto this basecoat over edge and onto insulation board face. Installer shall ensure that water cannot penetrate behind insulation boards at edges and shall ensure that edge -reinforcing mesh is adhered tightly to insulation board edges and wraps not less than 3" onto the insulation board face.
- D. Expansion Joints: Joints between different substrates and areas of the substrate where structural movement has been concentrated by separating the substrate into independent units shall have a separation continued through the Energex PB System. Both sides of this separation shall have the Energex PB System installed as described for Edges in Section 3.03C of this specification. The gap remaining at this location shall be bridged by installation of backer rod and joint sealer. Installation of backer rod and joint sealer shall be the responsibility of the joint sealer applicator and done in accordance with Section 07900.
- E. Reinforced Base Coat:
1. Apply base coat material to the entire outer surface of insulation boards to a uniform thickness or approximately 1/16 inch.
 2. Immediately place reinforcing mesh against the wet basecoat material and trowel from center to edge to fully embed mesh into basecoat. Apply mesh continuous at all surface corners or use optional Energex Corner Mesh. Avoid wrinkles while embedding mesh. Mesh pieces shall overlap at least 3" minimum with adjoining pieces. Mesh pieces adjoining edge reinforcing mesh shall overlap edge reinforcing mesh 3" minimum.
 3. All installed reinforcing mesh shall be completely covered with base coat material. If necessary apply a second coat of basecoat to achieve complete embedding of mesh.
 4. Allow sufficient time for drying to a hard surface before applying finish, but not less than 12 hours.
- F. Enermite Mesh or High Impact Enermite Mesh System
1. Install optional Enermite Mesh where detailed and/or specified. Energex Enermite Mesh's are installed by embedding them into basecoat material as described for Standard Mesh in section 3.03E, of this specification EXCEPT that Energex Enermite Mesh pieces butt together and shall not overlap.
 2. Base Coat material must be allowed sufficient time to dry to a hard surface before proceeding with Standard Mesh installation, but not less than 12 hours drying time.

3. Energex Standard Mesh embedded in a second coat of base coat material shall be installed over all areas where Energex Enermite Mesh has been installed. Install this Standard Mesh layer as described in Section 3.03E

G. Finish

1. Inspect reinforced base coat layer to ensure that it is dry and hard before proceeding with finish application. Remove irregularities by sanding.
2. Apply specified Energex Finish directly over reinforced base coat to the thickness of the largest aggregate or approximately 1/16" with a clean steel trowel. Some Energex Finishes may also be applied by use of spray equipment.
3. Maintain wall surface in a wet state and finish from corner to corner to joint to avoid cold joints or staging marks.
4. Finish shall be applied in accordance with Architects approved sample(s).

3.04 CLEANING

- A. Remove all residue and excess items resulting from the work.

END OF SECTION