



GreenGuard® XPS Insulation Board

GUIDE SPECIFICATION

Part 1 - General

1.1 Introduction

This Section specifies extruded polystyrene insulation board (XPS) for use as thermal insulation in commercial applications.

Specifier Note: Coordinate related work requirements with contents of referenced specification sections.

Related Work in Other Sections

1. Section 014000 — Quality Requirements; coordination with Owner's independent testing and inspection agency.
2. Section 014339 — Mock-ups; exterior wall mock-ups.
3. Section 015000 — Temporary Facilities and Controls; requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.
4. Section 033000 — Cast-In-Place Concrete; requirement that backup concrete be free of fins, protrusions and large holes.
5. Section 042000 — Masonry Units; requirement that backup masonry joints are flush and completely filled with mortar, and that excess mortar on brick ties will be removed; requirement for gap at deflection joints and fillers; coordination with sequencing of through-wall flashing.
6. Section 0422190 — Insulated Concrete Unit Masonry; for insulation installed in cavity walls and on the interior of concrete block and monolithic walls.
7. Section 0616130 — Insulating Sheathing; for insulation board installed over Steel or Wood framing members.
8. Section 071000 — Damproofing and Waterproofing; for insulation installed over waterproofing membrane materials, such as Self-Adhering Sheet Waterproofing, Elastomeric Sheet Waterproofing, Thermoplastic Sheet Waterproofing, Hot Fluid-Applied Rubberized Asphalt Waterproofing, Cold Fluid-Applied Waterproofing.
9. Section 072600 — Vapor Retarder; requirement that vapor retarder materials are installed in accordance with industry standards.
10. Section 072113.13 — Board Insulation, Below Grade; for insulation below-grade on perimeter foundation walls and frost-protected shallow foundation walls.
11. Section 0722160 — Roof Board Insulation, Protected Roof Membrane Assemblies; for insulation installed over the roof membrane.
12. Section 072400 — Exterior Insulation Finish Systems (EIFS); for insulation installed in conjunction with EIFS, such as polymer-based EIFS and water-drainage EIFS.
13. Section 072670 — Mechanically-fastened, Membrane Air Barriers; requirement that membrane air barriers are installed in accordance with industry standards.
14. Section 072723 — Board Product Air Barriers; for insulation installed as the primary air barrier in an exterior wall assembly.
15. Section 072800 — Water-resistive Barriers; requirement that water-resistive barrier materials are installed in accordance with industry standards.
16. Section 074200 — Wall Panels; for insulation installed behind various types of exterior wall panels, such as metal, wood, plastic, composite wall panels and fabricated wall panels.
17. Section 074600 — Siding; for insulation installed behind various types of siding materials, such as cement-fiber, vinyl and wood.
18. Section 075000 — Membrane Roofing; requirement for coordination with sequencing of membrane roofing; requirement to seal roof membrane to wall air barrier.
19. Section 076000 — Flashing and Sheet Metal; requirement that sheet metal flashings are installed in accordance with industry standards.
20. Section 077600 — Roof Pavers; for insulation installed under pavers, such as concrete and stone.
21. Section 078400 — Firestopping; for proper firestopping details to be used in conjunction with foam plastic insulation board.

- 22. Section 084400 — Curtain Wall and Glazed Assemblies; for insulation installed in wall assemblies with glazed aluminum curtain walls, glazed bronze curtain walls and glazed stainless steel curtains walls.
- 23. Section 092000 — Plaster and Gypsum Board; for insulation installed in conjunction with cementitious Exterior Coverings (Stucco).
- 24. Section 092530 — Sheathing; requirement that backup gypsum sheathing has been installed with damaged corners repaired, joints filled and surface flush with compatible material as acceptable to the insulation manufacturer; requirement for gap at deflection joints and fillers.

1.2 Performance Requirements

- A. Material Performance, Thermal Insulation: Provide extruded polystyrene insulation board (XPS) that meets the requirements of ICC-ES AC12, "Acceptance Criteria for Foam Plastic Insulation", ASTM C 578, Type IV and Type VI and CAN/ULC-S701, Type 4.
- B. Mechanically-fastened, Air Barrier Material: Provide extruded polystyrene insulation board (XPS) with an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 0.3 in. water (1.57 psf) (0.02 L/sm @ 75 Pa.) when tested in accordance with ASTM E 2178 and shall meet the requirements of CCMC Technical Guide 07273, "Air Barrier Materials" and test reports from accredited testing laboratories shall be made available upon request.
- C. Material Performance, Alternate Water-resistive Barrier: Provide extruded polystyrene insulation board (XPS) that meets the requirements of ICC-ES AC71, "Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-resistive Barriers " and test reports from accredited testing laboratories shall be made available upon request.
- D. Connections to Adjacent Materials: Provide connections to prevent air leakage at the following locations:
 - 1. walls, including penetrations, ties and anchors;
 - 2. walls, windows, curtain walls or doors;
 - 3. different wall assemblies, and fixed openings within those assemblies;
 - 4. wall and roof connections;
 - 5. wall control and expansion joints;
 - 6. wall pipe and duct penetrations; and
 - 7. wall seismic and expansion joints.

1.3 Submittals

- A. Submittals: submit in accordance with Division 1 requirements.
- B. Quality Assurance – Installer qualifications:
 - 1. installer shall have experience with installation of water-resistive barriers, air barrier materials and insulation board; and
 - 2. installation shall be in accordance with insulation manufacturer's installation guidelines.
- C. Product Data: Submit insulation manufacturer's product data, building code compliance reports or test reports and the insulation manufacturer's printed installation guidelines.
 - 1. Submit product literature or a letter from the insulation manufacturer indicating approval of products not manufactured by the specified insulation manufacturer.
 - 2. If a letter is submitted, it must include a statement that materials are compatible with adjacent materials proposed for use.
- D. Samples: Submit clearly labeled samples, 3 by 4 in. minimum size of each material specified.
- E. Shop Drawings of Wall Assembly Mock-Up: Submit shop drawings of proposed wall assembly mock-ups showing the location of the insulation board in the wall assembly and location of all wall window and door openings, penetrations and terminations involving structures attached to the exterior wall, i.e., decks, shelf angles, roof-wall intersections, etc.

1.4 Quality Assurance - XPS Insulation Board

- A. Insulation Manufacturer: Obtain insulation board from a single manufacturer regularly engaged in manufacturing the extruded polystyrene insulation board (XPS) referenced in Section 1.2. Obtain secondary materials from a source acceptable to the primary insulation manufacturer.
- B. Accredited Laboratory Testing for XPS insulation board: Laboratory accredited by International Accreditation Service Inc. (IAS), American Association for Laboratory Accreditation (A2LA), or the Standards Council of Canada (SCC).
- C. Preconstruction Meeting: Convene a minimum of two weeks prior to commencing work of this Section. Agenda shall include, at a minimum, review of wall assembly mock-up drawings, sequence of construction, coordination with substrate preparation, materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.
- D. Wall Assembly Mock-Up: Build a mock-up representative of primary exterior wall assemblies using all specified insulation and other related auxiliary materials following the insulation manufacturer's installation guidelines. Mock-up shall be approximately 8 feet long by 8 feet high and include all components in the exterior wall assembly.

1.5 Delivery, Storage and Handling

- A. Deliver insulation board to the project site in original packaging, labeled with manufacturer's information, product name, date of manufacture, and directions for storage.
- B. Store insulation board in its original undamaged packaging or in a clean, dry, protected location and within temperature range required by insulation manufacturer. Protect stored materials from direct sunlight.

1.6 Project Conditions

- A. Temperature: Install insulation board within range of ambient and substrate temperatures recommended by the insulation manufacturer. Do not apply insulation board to a damp or wet substrate.
- B. Field Conditions: Do not install insulation board in snow, rain, fog, or mist. Do not install insulation board or auxiliary materials when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the insulation and auxiliary material manufacturers.

1.7 Scheduling

- A. Review requirements for sequencing of installation of the air barrier building wrap with installation of windows, doors, louvers and flashing materials to ensure a weather-tight air barrier assembly.
- B. Schedule installation of exterior cladding within one month of the air barrier building wrap installation.

1.8 Warranty

Specifier note: verify warranty length with self-adhering butyl flashing manufacturer.

Material Warranty: Provide manufacturer's warranty.

Part 2 - Products

2.1 Extruded Polystyrene Insulation Board (XPS) Material Manufacturer

Kingspan Insulation LLC; 2100 RiverEdge Parkway, Suite 175, Atlanta, GA 30328, 1-800-241-4402,
Further information can be found at: www.kingspaninsulation.us

2.2 Extruded Polystyrene Insulation Board (XPS)

Self-adhering Butyl Flashing Membrane: Subject to requirements described in Section 1.2, provide one of the following:

1. *Kingspan GreenGuard*® XPS Insulation Board CM (square edges 1/2 - 3 in., Type IV and 2-3 in., Type VI);
2. *Kingspan GreenGuard*® XPS Insulation Board SB (scored board: 1-2 in., Type IV);
3. *Kingspan GreenGuard*® XPS Insulation Board DC (drainage channels, 2 in., Type VI);
4. *Kingspan GreenGuard*® XPS Insulation Board SL (shiplap edges 1/2 - 2 in., Type IV); and
5. *Kingspan GreenGuard*® SLX Sheathing (film-faced, shiplap edges, 1/2 - 1 in., Type IV);

2.3 Auxiliary Material

Specify auxiliary materials as shown below or other alternative materials approved by the self-adhering flashing membrane manufacturer.

1. *Kingspan GreenGuard*® Standard Seam Tape and / or Custom Seam Tape
2. *Kingspan GreenGuard*® Butyl Flashing and / or *Kingspan GreenGuard*® SuperStretch™ Butyl Flashing
3. Adhesives, Sealants and Primers: Specify adhesives, sealants and primers that are compatible with the insulation board. Specify adhesives, sealants and primers that are referenced in the Kingspan Insulation LLC Application Guide AG-002 or other products approved by the insulation manufacturer.

Part 3 - Execution

3.1 Examination

- A. Examine substrates, areas and conditions under which self-adhering butyl flashing membrane will be applied, with installer present, for compliance with requirements. Verify that surfaces and conditions are suitable prior to commencing work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Review requirements for sequencing of installation of self-adhering butyl flashing as demonstrated in the mock-up wall assembly described in Section 1.4, D.

3.2 Installation

Specifier Note: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

1. Place a 6-mil polyethylene vapor retarder sheet over graded, smooth dry, well tamped fill. Lap sheet a minimum of 2 in. and extend vertically up the perimeter foundation wall a minimum of 2 in.
2. Lay insulation boards over the vapor retarder sheet, cutting to size as necessary. Adjacent insulation boards shall be installed with joints staggered. Subsequent layers of insulation board shall be installed over the lower layer with board joints staggered.
3. Use sealant to seal gaps between the insulation board and the perimeter foundation wall. Apply sealant as recommended by the sealant manufacturer. Many common sealants are compatible with *Kingspan GreenGuard® XPS Insulation Board*. For more information regarding sealants go to www.kingspaninsulation.us and refer to Application Guide AG-002.
4. Pour concrete over the insulation board and allow to cure sufficiently before applying loads.

3.3 Installation - Below-Grade, Perimeter Foundation Insulation

Specifier Note: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

1. Install insulation board to the exterior side of masonry walls after the waterproofing membrane has cured according to the manufacturer's installation instructions. If the surface of the cured waterproofing membrane is not tacky enough to hold the insulation board in place until backfilling takes place, then an adhesive can be used to secure the insulation board to the wall. Apply adhesive to the insulation board as recommended by the adhesive manufacturer using the amount and pattern required for the application. Many common adhesives are compatible with *Kingspan GreenGuard® XPS Insulation Board*. For more information regarding adhesives go to www.kingspaninsulation.us and refer to Application Guide AG-002.
2. Place backfill directly in contact with the insulation board. Remove all large rocks and other debris that may damage insulation board during backfilling.
3. Do not leave insulation boards exposed above grade. If insulation board is exposed above the grade line, then it must be covered with an exterior cladding material or foundation covering.

3.4 Installation - Cavity Wall Insulation

Specifier Note: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

1. Install insulation board against the masonry wall using an adhesive or by friction fitting boards between masonry wall ties. If an adhesive is used, then apply the adhesive using the amount and pattern recommended by the adhesive manufacturer. Many common adhesives are compatible with *Kingspan GreenGuard® XPS Insulation Board*. For more information regarding adhesives go to www.kingspaninsulation.us and refer to Application Guide AG-002.
2. Adjacent insulation board seams must be staggered and all board edges must be firmly butted together.
3. Install the exterior veneer in accordance with the manufacturer's installation instructions.

3.5 Installation - Framed Walls - Exterior Insulating Sheathing and Alternate WRB/Air Barrier

Specifier Note 1: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

Specifier Note 2: If the insulation board is intended to perform as an alternate WRB in lieu of building wrap, then additional steps must be followed to seal all penetrations, tape board seams and to seal around window and door openings using self-adhering flashing. If a building wrap is used as the WRB, then it may be installed either before or after the insulation board is installed. Follow the WRB manufacturer's installation instructions.

1. Begin by aligning the first board at a corner of the structure making sure that the bottom of the board overlaps the sill plate. If installing the insulation board as a WRB or air barrier, run a bead of sealant along the face of the sill plate and press the insulation board into the sealant bead to form a seal.
2. Insulation boards must be installed with the board length in the vertical direction on the wall. Vertical joints must be located over framing members or be backed
3. Attach the insulation board using fasteners that are appropriate for the framing type. Refer to the Kingspan Insulation LLC Application Guide AG-001 for selection of the applicable fastener type and spacing requirements.
4. Seal all gaps, penetrations and repair damaged areas using a silicone sealant complying with ASTM C 920, Type S, Grade NS, Class 25, use expanding spray foam complying with AAMA 812, or use either *Kingspan GreenGuard® Seam Tape* or *Kingspan GreenGuard® Butyl Flashing*. If the insulation board is intended to be used as an alternate WRB or air barrier, then tape all seams using *Kingspan GreenGuard® Seam Tape* and use *Kingspan GreenGuard® Butyl Flashing* to seal around doors, windows and other wall penetrations. Use of other seam tape and self-adhering flashings must be approved by Kingspan Insulation LLC prior to installation
6. Install the exterior siding or cladding in accordance with the manufacturer's installation instructions. Refer to Table R703.4 of the International Residential Code (IRC) for attachment requirements for siding materials.

3.6 Installation - Exterior Insulation Finish Systems (EIFS)

Specifier Note: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

1. Before proceeding with installation, contact the EIFS manufacturer to confirm that the insulation board is recognized for use with the specified EIFS.
2. Install the insulation board as described in Section 3.5.
3. Install the EIFS in accordance with the manufacturer's installation guidelines.

3.7 Installation - Curtain Wall Insulation

Specifier Note: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

1. Install insulation board in curtain wall assemblies in accordance with the wall panel manufacturer's installation guidelines.
2. Hold insulation boards in place by securing metal clips and straps or integral pockets within frames as indicated in the wall panel specifications.
3. Install the curtain wall panels in accordance with the manufacturer's installation instructions.

3.8 Installation - Roof System Insulation

Specifier Note 1: The installation information provided in this Section describes some common applications and represents current industry practice. This information is intended to be used as a Guide. For information regarding other applications and more detailed installation information go to www.kingspaninsulation.us. Alternate installation details may be used if approved in writing by Kingspan Insulation LLC prior to installation.

Specifier Note 2: Refer to the UL LLC (UL) Roofing Materials Guide and the FM Approvals "RoofNav" for approved roof assemblies that incorporate extruded polystyrene insulation board (XPS).

1. Examine the roof deck for suitability to receive insulation board. Verify that the substrate is dry, clean and free of foreign materials that may damage insulation or impede installation.
2. Verify that roof drains, scuppers, roof curbs, nailers, equipment supports, vents and other roof accessories are secured properly and installed in conformance with the Contract Drawings and submittals.
3. Start of installation indicates that the installer accepts the conditions of the roof deck surfaces.
4. Do not proceed with work during inclement weather or install insulation board over wet surfaces.
5. Install only as much insulation board as can be covered by the roofing materials in the same day.
6. Install the insulation board in accordance with the manufacturer's installation guidelines for attachment, using the applicable fasteners and spacing.
7. Install the roof covering materials in accordance with the manufacturer's installation guidelines and the applicable UL LLC or FM Approvals roof system listings.

3.9 Field Quality Control

Owner's Inspection and Testing: Cooperate with owner's testing agency. Allow access to work areas and staging. Notify owner's testing agency in writing of schedule for work of this Section to allow sufficient time for testing and inspection. Daily inspection and testing may be required. Do not cover work of this Section until testing and inspection is accepted.

3.10 Protecting and Cleaning

Protect insulation board from damage during installation and remainder of construction period, according to manufacturer's written instructions.

1. Coordinate with installation of insulation board to ensure exposure periods do not exceed the manufacturer's recommendations.



Kingspan Insulation LLC

2100 RiverEdge Parkway, Suite 175, Atlanta, Georgia 30328
info@kingspaninsulation.us

1-800-241-4402

www.kingspaninsulation.us

www.kingspaninsulation.ca