

SECTION 07210 BUILDING INSULATION

ThermalStar®
X-Grade Insulation

ThermalStar® X-Grade Insulation in Perimeter Foundation and Below-Slab Applications

NOTE TO SPECIFIER: Bracket [] denotes either (1) a choice between bracketed alternatives or (2) a choice to either include or omit the single bracketed language.

PART 1 – GENERAL

1.01 Scope

- A. Use of rigid cellular insulation in perimeter foundation, below-grade and below-slab applications.
- B. Installation instructions and illustrations are included at the end of this document.

1.02 References

- A. American Society for Testing and Materials (ASTM):
 1. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
 2. ASTM D1621 Test Method for Compressive Properties of Rigid Cellular Plastics
 3. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 4. ASTM C1512 Test Method for Characterizing the Effect of Exposure to Environmental Cycling on Thermal Performance of Insulation Products
- B. Building Codes:
 1. ICC International Building Code
 2. ICC International Residential Code
 3. CAN/ULC S701, CAN/ULC S102

1.03 Design Requirements

- A. Performance Requirements:
 1. In "very heavy termite infestation" areas, as identified in termite probability maps of the IBC or IRC, rigid foam insulation is not permitted within 6" of grade unless treated with an approved preservative. ThermalStar® X-Grade Insulation is preserved and approved for use in these areas; see ICC-ES ESR-1962.

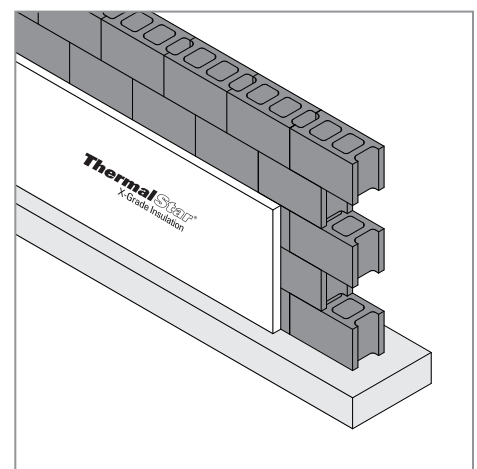
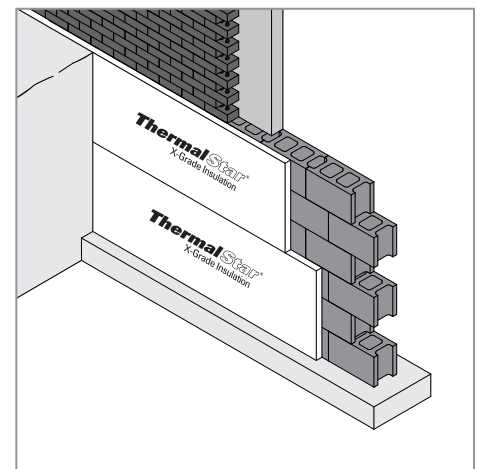
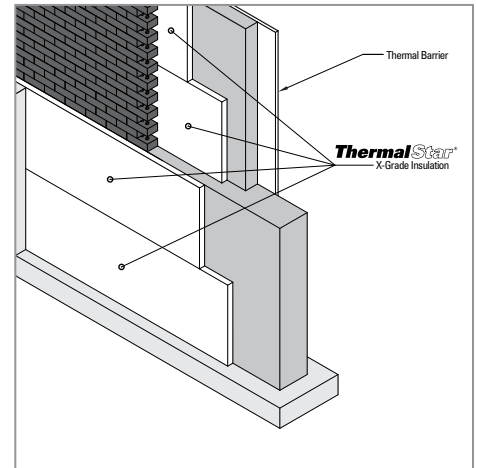
2. Rigid foam insulation should have a water vapor permeance greater than 1.5 perm where installed exterior to a heated building to avoid condensation within the insulation envelope. ThermalStar® X-Grade Insulation has a water vapor permeance of 2.0 perm/inch minimum.
3. Adequate thermal barrier, including 1/2" gypsum, 1" masonry or concrete, or other approved thermal barrier, must be provided between rigid foam insulation and interior of the building.
4. In certain structures and limited access areas, ThermalStar® X-Grade Insulation may be used on wall, ceiling and floor surfaces of attics, crawl spaces, detached garages, pole barns, telecommunication shelters, concrete modular buildings, agricultural buildings, buildings regulated under IBC Section 312 (Utility and Miscellaneous, Group U), with NO thermal or ignition barriers applied to the foam plastic; see ICC-ES ESR-1962.

B. Compatibility Considerations:

1. Do not expose ThermalStar® X-Grade Insulation to temperatures exceeding 165F.
2. Heated asphalt or coal tar is not compatible with ThermalStar® X-Grade Insulation.
3. Waterproofing mastics or other materials should be tested for compatibility by installer prior to use. Non-compatible compounds include ketones, gasoline or diesel solvents.

1.04 Quality Assurance

- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.



- B. Regulatory Requirements and Approvals:
1. Provide review of compliance with International Building Code (IBC), International Residential Code (IRC) for permitted use in "very heavy termite infestation" areas.
 - a) ICC-ES ESR-1962
 2. Provide review of compliance with International Building Code (IBC), International Residential Code (IRC) for permitted use without thermal or ignition barrier in limited access areas of buildings and Group U buildings of the IBC.
 - a) ICC-ES ESR-1962
- C. Certifications:
1. Provide third party certification for testing, inspection and review of product production practices for compliance with ASTM C578 and ASTM E84.
 - a) Underwriters Laboratories QORW.R16529 physical properties
 - b) Underwriters Laboratories BRYX.R16529 surface burning characteristics
 2. Provide third party certification for testing, inspection and review of product production practices for compliance with CAN/ULC S701, S102.
 - a) Underwriters Laboratories Canada BOZCC.R16529
 3. Provide manufacturer test reports verifying thermal performance after environmental exposure cycling.
 - a) Atlas EPS Report ASTM C1512 Environmental Cycling

1.05 Warranty

- A. Termite Preservative Warranty: Performance against termite infestation of foam insulation resulting in degradation.
1. Warranty Period: 20 years beginning with date of substantial project completion.
- B. Thermal Performance Warranty: Insulation R-value when tested according to ASTM C578.
1. Warranty Period: 20 years beginning with date of substantial project completion.

1.06 Delivery, Storage & Handling

- A. Delivery: Materials shall be delivered in original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature conditions recommended by the manufacturer.
1. Avoid prolonged exposure to sunlight; cover with opaque tarp or in original packaging.
 2. Color indicator in ThermalStar® X-Grade Insulation will fade to white to indicate over-exposure to sunlight.
- C. Handling: ThermalStar® X-Grade Insulation may be cut, drilled, sawn, sanded, rasped or otherwise handled similar to other construction materials, such as wood.

1.07 Submittals

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Shop Drawings: Provide drawings indicating typical installation.
- C. Quality Assurance/Control Submittals. Submit the following:
1. Copy of ICC-ES report for building code compliance: ESR-1962
 2. Copy of material compliance for use in "very heavy termite infestation" areas: ESR-1962
 3. Copy of third party ASTM C578 compliance: UL QORW.R16529
 4. Copy of third party ASTM E84 characterization: UL BRYX.R16529
 5. Copy of third party compliance to CAN/ULC S701, S102: UL BOZCC.R16529
 6. Copy of manufacturer's test report for ASTM C1512: Atlas EPS ASTM C1512 Environmental Cycling Report
- D. Warranties:
1. Copy of Thermal Performance Warranty: Atlas EPS 20-Year Thermal Performance Warranty
 2. Copy of Termite Resistance Warranty: Atlas EPS 20-Year Termite Resistance Warranty

PART 2 – PRODUCTS

2.01 Manufacturer

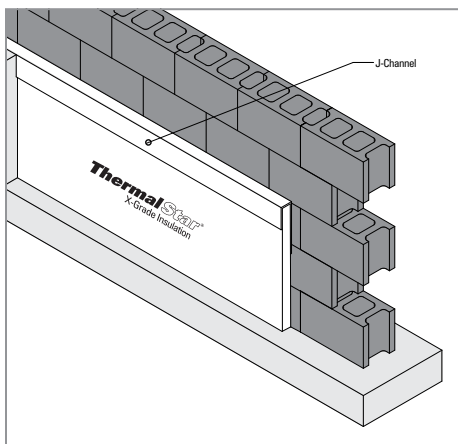
- A. Insulation: Atlas EPS, a Division of Atlas Roofing Corporation – ThermalStar® X-Grade Insulation.
1. Contact: 8240 Byron Center SW, Byron Center, MI 49315; Telephone: (800) 917-9138; Fax: (616) 878-9942; website www.atlaseps.com.
- B. Adhesive: Contech PL300 or other compatible polystyrene foam board adhesive.

2.02 Materials

- A. Insulation:
1. Insulation shall be Atlas EPS ThermalStar® X-Grade Insulation.
 2. ASTM C578 Type shall be:
 - a) Type VIII for 13 psi compressive resistance (X-Grade 13)
 - b) Type II for 15 psi compressive resistance (X-Grade 15)
 - c) Type IX for 25 psi compressive resistance (X-Grade 25)
 - d) Type XIV for 40 psi compressive resistance (X-Grade 40)
 - e) Type XV for 60 psi compressive resistance
 3. Insulation shall be [] inches wide x 96" x [] inches in thickness to achieve code required U-factor through the completed construction.
 4. ASTM E84 Flame Spread shall be less than 75 and Smoke Developed less than 450.
 5. ThermalStar® X-Grade Insulation has a stable R-value of 4.2 ft² h F/BTU per inch when tested at 75F mean temperature in accordance with ASTM C518.
 6. Insulation shall not have a facer or polymer skin adhered to surface.
 7. Insulation shall not contain Formaldehyde, CFCs, HCFCs, or other volatile components.
 8. Insulation shall include a preservative against termite damage.
 9. Insulation shall have a vapor permeance greater than 1.5 perm per inch.
- B. Adhesive:
1. The adhesive shall be Contech PL300 or other compatible polystyrene foam board adhesive.

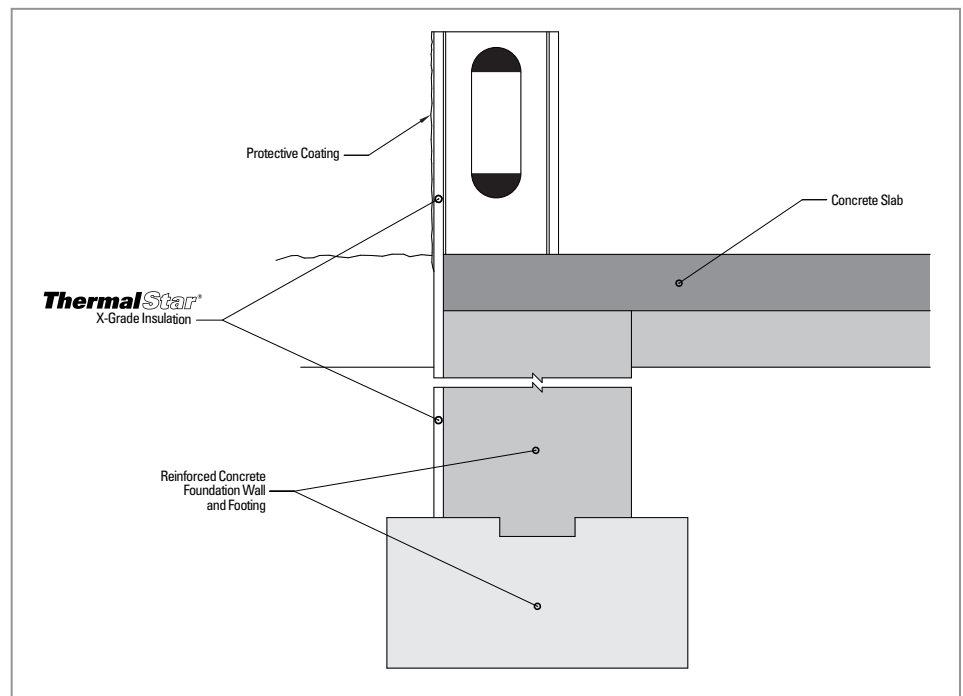
2.03 Accessories

- A. Insulation Fasteners:
- Mechanical fasteners shall be corrosion-resistant with large heads or include washers.
- B. Protective Finish:
- Exposed insulation above grade shall be covered with wall cladding or a coating system, such as stucco or EIFS specifically manufactured for use on rigid foam insulation.
- C. Edge Covering:
- Edge protection for exposed insulation shall be J-channel type.



3.02 Preparation

- A. General:
- Install ThermalStar® X-Grade Insulation in a [Single] [Double] layer to achieve required R-value(s) as indicated in drawings. Cut and fit tightly around projections and penetrations.
- D. Cavity Walls: Install ThermalStar® X-Grade insulation board on exterior surface of interior width of cavity wall, fitting board between wall ties and other projections and penetrations. On interior side of wall, install minimum 1/2" (12.7 mm) thick gypsum wallboard over insulation board, except where not required per ICC-ES ESR-1962.



PART 3 – EXECUTION

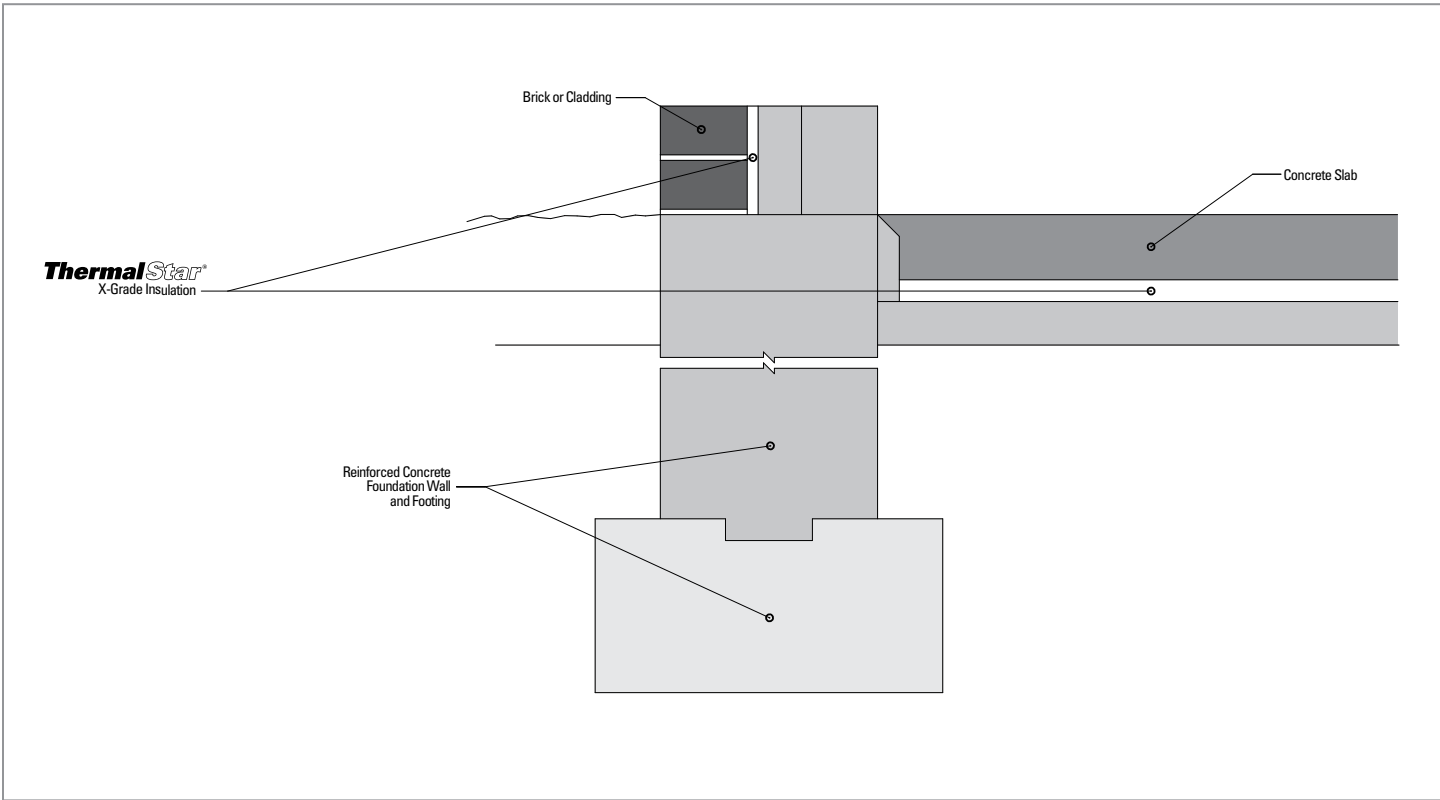
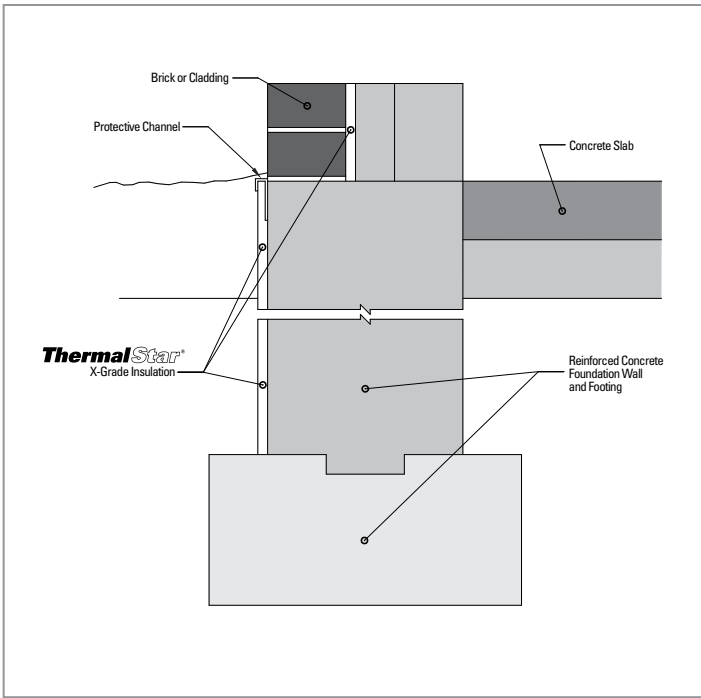
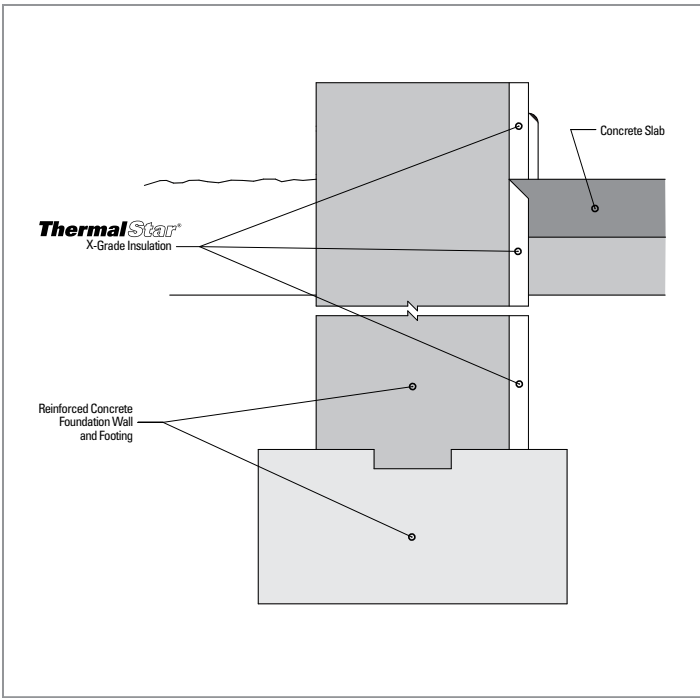
3.01 Preparation

- A. Floor slab grade shall be covered with a suitable vapor barrier, well-drained and tamped.
- B. Foundation walls shall be dry and relatively clean to allow use of adhesive.
- C. Foundation walls shall be flat and free of protrusions that may impede adhesive or mechanical bond.
- D. Backfill and surrounding grade shall be free of wood construction waste or other non-preserved wood that would serve as nest sites in "very heavy termite infestation" areas.
- E. Preservative in ThermalStar® X-Grade Insulation is EPA-registered for use as a wood and construction plastics preservative and is approved for use exposed on foundation walls or below-slab.

- Secure insulation to substrate with [mechanical fasteners] [Or] [spot adhesive applied to back of board] using quantity and pattern recommended by manufacturer.
- B. Insulation Board Joints: Stagger ThermalStar® X-Grade insulation board joints in one direction for each course. Butt edges and ends tightly to adjacent boards.
- C. Sheathing and Underlayment Installation: On exterior side of stud framing, install ThermalStar® X-Grade insulation board [Vertically] [Horizontally]. Fasten vertically 12" (300 mm) maximum on centers using fasteners recommended by manufacturer. On interior side of stud framing, install minimum 1/2" (12.7 mm) thick gypsum wallboard over insulation board, except where not required per ICC-ES ESR-1962.
- E. Perimeter Foundation: Install ThermalStar® X-Grade insulation board on exterior surface of perimeter foundation walls. Secure board with spot adhesive applied to back of board, or with mechanical fasteners, using quantity and pattern recommended by manufacturer. Alternately, the insulation may be held in place against the foundation wall using backfill soil.
- F. Slab-On-Grade: Install ThermalStar® X-Grade insulation board under slab-on-grade and over properly prepared subgrade of compacted fill and vapor retarder. Place insulation board with sides and ends butted.

3.03 Cleaning

- A. General: Remove and legally dispose of waste material and other construction debris.
- B. Clean ThermalStar® X-Grade Insulation may be recycled; see recycle drop-off centers at www.epspackaging.org.



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