

ThermalStar[®]

Rigid Insulation

Substitution Request Packet

X-Grade[®]

for Below Grade Applications

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X-Grade®
Rigid Insulation

**When expectations exceed ordinary,
X-Grade® rigid insulation is the only choice.**

It's the proven XPS replacement for both commercial and residential projects including:

- Below grade insulation
- Perimeter foundation insulation
- Passivhaus footing isolation
- Radiant flooring insulation



**EPSX® TECHNOLOGY
ADVANTAGE**



**Termite
Resistant**



**Moisture
Resistant**



**Stable
R-value**



**Environmentally
Friendly**



**Limited Lifetime
Warranty**

Property & ASTM Test Method	Standard Product ID			
	X-Grade 15	X-Grade 25	X-Grade 40	X-Grade 60
Compressive Strength (minimum psi) at 10% Deformation¹ D1621	15	25	40	60
R-value per inch (minimum) at 75°F Mean Temperature C518	4.2	4.2	4.2	4.4
ASTM Classification C578	Type II	Type II	Type XIV	Type XV
R-value per inch (minimum) at 40°F Mean Temperature C518	4.6	4.7	4.7	4.7
R-value per inch (minimum) at 25°F Mean Temperature C518	4.8	4.9	5.0	5.0
Compressive Strength (minimum psi) at 1% Deformation¹ D1621	9	10	15	20
Flexural Strength (minimum psi) C203	42	50	75	95
Water Absorption Percent (%) by Volume, Maximum After 24 Hour Immersion C272	1.5	1.25	1.25	1.0
Water Vapor Permeance at 1" Thick (perms) - Typical E96, desiccant method	2.5	2.5	2.5	2.5
Surface Burning - Flame Spread and Smoked Developed E84	FS 20, SD 400 (meets code)			

Maximum Use Temperature

Short Term (10–15 minutes) 180°F, Long term 165°F

¹ ThermalStar X-Grade is elastic within 1–2% deformation. To prevent long term creep, 3:1 design safety factors for static loads of the 10% deformation values are recommended, or use the tested 1% deformation values for design, whichever is greater.



ThermalStar®
BY ATLAS EPS

Advantages of X-Grade:

STABLE R-VALUE

While XPS products degrade from initial R5 per inch as gases escape, X-Grade's thermal performance is stable over time, assuring R-value meets design requirements over the life of the structure.

LONG TERM MOISTURE ABSORPTION:

X-Grade has the ability to dry much faster than XPS, allowing it to remain drier during conditions of repeated exposure to moisture.*

INTEGRATED TERMITICIDE:

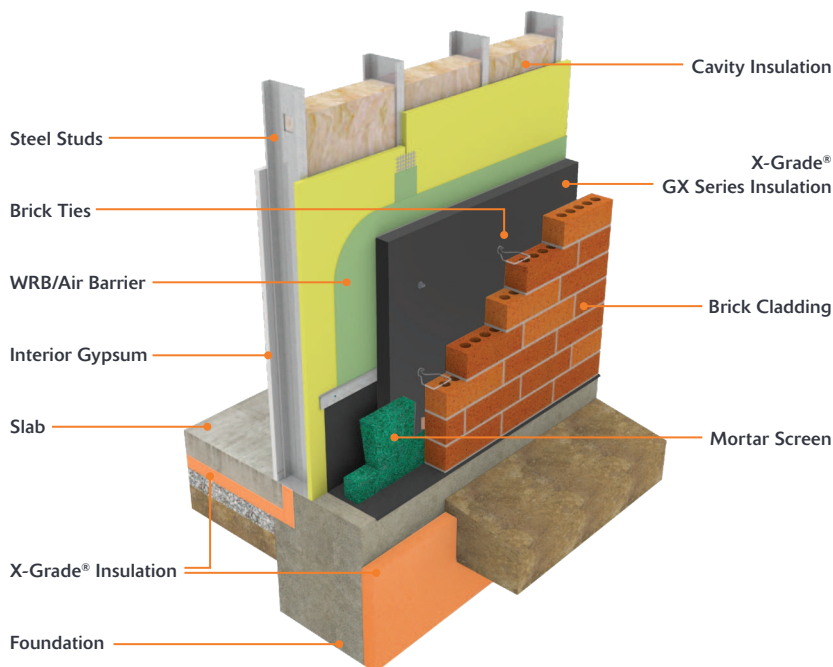
X-Grade has termiticide and a wax matrix that are integrated during the manufacturing process.

ENVIRONMENTALLY FRIENDLY:

XPS has HCFC gases in its insulating cells, and thus an extremely high global warming potential (GWP), whereas X-Grade cells simply contain air.**

RECYCLABLE:

X-Grade is readily accepted for recycle. Visit epspackaging.org to locate a drop-off location nearest you.



Specify ThermalStar X-Grade on Your Next Project!



*ORNL study of installed XPS below grade for 15 years resulted in accumulation of over 60% moisture by weight, and over 3 months to dry to initial conditions in the lab. "Measurement of Exterior Foundation Insulation to Assess Durability in Energy Saving Performance", April 2012, Oak Ridge National Laboratory.

**US EPA has mandated in July 2015 that XPS cease using high GWP gasses by December 2020.

INSTALLATION AND HANDLING

X-Grade can be handled much the same as any other foam or wood sheathing, using similar tools or a simple utility knife to customize panels to fit the application.

SAFETY

SDS for this product are available at atlaseps.com. Dust generated from sanding or cutting X-Grade should be avoided using a dust mask. X-Grade insulation is combustible and the product should be protected from ignition sources such as open flames or welder's torch. Applications not specifically listed in UL ER16529.1 require permanent separation of X-Grade insulation from the interior of the building by a thermal barrier such as drywall or concrete for fire safety.

WARRANTY

X-Grade Insulation is backed by a limited lifetime warranty for physical and thermal performance, and termite resistance.

CODE COMPLIANCE

ThermalStar X-Grade insulation complies with the model building codes when properly installed:

- Surface Burning – UL BRYX.R16529
- Physical Properties – UL QORW.R16529
- CAN/ULC S102.2, S701 – ULC BOZCC.R16529
- International Energy Conservation Code
- International Residential Code (IRC) – ICC-ES ESR-1962, ULEX R16529-01
- International Building Code (IBC) – ICC-ES ESR-1962, ULEX R16529-01
- ASTM C578 – (See product marking for type)

ThermalStar, the ThermalStar tag line, the color "Pale Creamy Orange," EPS[®], and X-Grade are registered trademarks of Atlas Roofing Corporation

Atlas EPS, a Division of Atlas Roofing Corporation
8240 Byron Center Ave SW, Byron Center, MI 49315
800.917.9138 | AtlasEPS.com

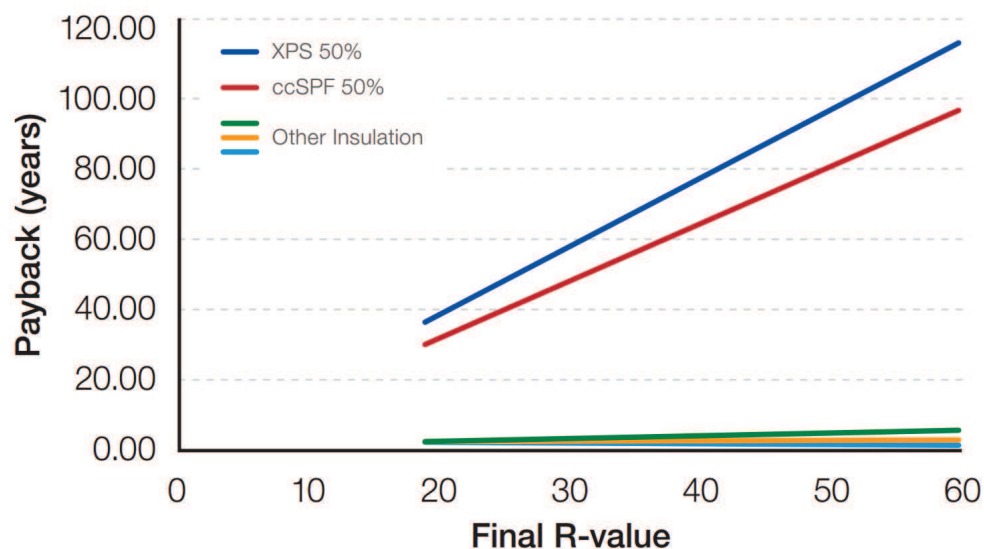
Global Warming Potential Comparison



ThermalStar® X-Grade® rigid insulation has been specifically designed as a low global warming potential (GWP) alternative to extruded polystyrene, which utilizes R134a gas in closed cells. GWP is an index of the overall climate impacts of a product. It relates to the impact of emissions of a gas to that of emission of equivalent mass of CO². For reference, CO² has GWP of 1. ThermalStar X-Grade utilizes air in closed insulating cells, thus providing zero ozone depletion and zero GWP. Extruded polystyrene utilizing R134a has a GWP exceeding 1400. Due to its high GWP, the EPA issued a final rule on July 20th, 2015, mandating end dates for R134a ranging from January 1st, 2017 for most products, to January 1st, 2021 for extruded polystyrene. Testimony by the extruded polystyrene industry at the EPA hearings revealed that it will take that industry 5 years to transition away from R134a.

Since ThermalStar X-Grade uses only air in closed cells, the aged R-value is the same from day one through the life of the building, which is backed by a limited lifetime warranty for thermal performance. X-Grade also includes a preservative to protect against termite attack. Finally, ThermalStar X-Grade does NOT contain the flame retardant HBCD.

The diagrams below from Building Science Corporation show the number of years of energy savings that will be required to neutralize the GWP of each insulation. Note that XPS will take a minimum of 30 years, while EPS will be covered after 3 years. If applied in large quantities, the greenhouse payback period for extruded polystyrene and standard closed cell spray polyurethane foam could exceed 100 years.



As the thickness of each insulation increases, the R-value also increases. Note that the payback period for EPS, shown in yellow, has a very minimal payback period, even at higher R-values.

VOC Emission Declaration

September 15, 2014

ThermalStar® X-Grade® rigid insulation is an expanded polystyrene (EPS) foam plastic enhanced with EPS[®] Technology for distinct orange color, moisture resistance and termite resistance. As the finished product relies on microcells filled with air to create insulating properties, it is not subject to thermal drift, nor out-gassing over time. VOC emissions would therefore be expected to be low.

To verify the actual emissions of the product, testing via CDPH Standard Method V1.1 “Standard Method for Testing and Evaluation of VOC Emissions” was conducted. The sample was selected from high density material with orange color and termiticide to present a worse case of all possible ingredients and mass which could contribute emissions. This is the testing conducted for “GreenGuard” certification, and was conducted by UL Environment for comparison against the criteria. The complete report from UL Environment is summarized in Table 1.

Table 1: Test Results and Modeling of ThermalStar® EPS

UL Environment Designation	Environment Modeled	Total VOC	Formaldehyde	Total Aldehydes	CREL/TLV Issues
GREENGUARD	Office	•	•	•	None
GREENGUARD	Office	•	•	•	None
GREENGUARD Gold	Classroom	•	•	•	None

- Predicted to meet criteria based on modeling

CDPH Standard Method V1.1 “Standard Method for Testing and Evaluation of VOC Emissions” chapter 8 titled “Guidelines for Use of Standard Method as Basis for a Building Product Claim” provides a path for self declaration of VOC emission performance. The following are requirements as met by Atlas EPS.

- Method used to test product declared - see CDPH method referenced
- 3rd party quality assurance and follow up audits - UL 3rd party listed and inspected
- Use accredited lab - UL Environment is ISO 17025 accredited for this test method
- Extension of tested products results to other models - high density EPS tested, highest VOC potential
- QC Manual for product - AC10 complaint QA Manual filed with UL
- Sample selection from typical production, “worse potential results” product - ThermalStar 25
- Grouping of product models based on similar formulation - all ThermalStar products are EPS
- Changes in formulation require retesting - EPS resin is controlled by 3rd party follow up, no changes

ThermalStar EPS easily meets the quality assurance requirements presented in the guidelines for manufacturer self declaration. This bulletin is current as of the date above. Please visit our website at www.AtlasEPS.com for the most recent technical information.

VOC = volatile organic compounds
CDPH = California Department of Public Health
UL = Underwriters Laboratories
CREL = chronic reference exposure level

TLV = threshold limit value
AC= Acceptance criterion
ISO = International Organization for Standardization
QC = quality control

Property & Test Method	Dow Styrofoam®	Owens Corning Foamular®	Atlas EPS X-Grade®
Compressive Strength, ASTM D1621 psi, min.	25 psi	25 psi	25 psi
Size	16 x 96	16 x 96	48 x 96 scored
Material	Polystyrene	Polystyrene	Polystyrene
Flexural Strength ASTM C203 psi, min. per ASTM C578	50	50	50
Water Absorption ASTM C272 % by volume, max.	0.3	0.1	1.25
Water Vapor Permeance, ASTM E96, at R10 thickness	0.7	0.5	1.5
Long-term Maximum Use Temp °F, max.	165°F	165°F	165°F
Water Affinity	Hydrophobic	Hydrophobic	Hydrophobic
Preserved Against Termite Degradation per Code Requirements in SC, GA, FL, AL, MS, LA, TX & CA***	Not Available	Not Available	Standard
Gas Inside Insulating Cells (per SDS)	Proprietary Blend (HFC 134a)	Proprietary Blend (HFC 134a)	Air
GreenGuard Schools & Children	No	Certified	Tested = 0
Global Warming Potential (GWP)	1430	1430	0
Burning Characteristics			
ASTM E84 Flame Spread and Smoke Developed	<25*, <450**	<25*, <450**	<25*, <450**
NFPA 285 Approval—Cementitious Claddings	Yes	Yes	Yes
Warranties			
Thermal Warranty	50 Years	Limited Lifetime	Limited Lifetime
Physical Warranty	50 Years	Limited Lifetime	Limited Lifetime
Termite Resistance Warranty	None	None	Limited Lifetime
ASTM C578 Type	IV	IV	II
Alternate 15 psi Compressive ASTM C578 TYPE	X	X	II

* Code requires flame spread rating of 75 maximum

** Code requires smoke development rating of 450 maximum

*** IBC 2603.8, IRC R318.4 requires foam plastic below grade or underslab be protected from termite attack in very heavy infestation areas

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ThermalStar® X-Grade® & X-Grade® GX Limited Lifetime Product Warranty

Atlas EPS, A DIVISION OF ATLAS ROOFING CORPORATION, ("Atlas EPS"), warrants ThermalStar® X-Grade® for the life of the home or building on which it originally installed the following:

- The representative thermal insulation value will not vary more than ten (10) percent from the published R-value
- The product will meet the physical performance requirements within ten (10) percent of the minimum requirements per published Type of ASTM C578-12
- The product will maintain a termite resistance of seven (7) or greater per AWPA E7.

If the product fails to perform as defined in these warranty limits as determined by the samples and testing set forth below, Atlas EPS will, subject to the terms and conditions below, refund to the owner of the building ("Owner") the original purchase price of the nonperforming product. The total expense for Atlas EPS for the duration of this Limited Lifetime Warranty shall be limited to the original purchase price of the product.

.....TERMS AND CONDITIONS

PROOF OF PURCHASE: As a condition precedent to recovery under this Limited Lifetime Warranty, Owner agrees to retain documentary proof of purchase(s)... (sales receipts, purchase orders, etc.) and to submit these documents to Atlas EPS in the event of a claim under this Limited Lifetime Warranty.

HANDLING AND INSTALLATIONS: Atlas EPS product(s) must be handled and installed according to the instruction outlined in its product literature. Atlas EPS will not be liable for any breach of this Limited Lifetime Warranty if the product is improperly installed or is abused, misused, or damaged due to the failure of any other building component. This Limited Lifetime Warranty is effective only if the product is used for the particular purposes recommended in the Atlas EPS product literature. This Limited Lifetime Warranty shall be void if in the judgment of Atlas EPS, the product's performance has been compromised by abuse, misuse, damage or by alteration without prior written consent by Atlas EPS.

SOLE WARRANTY: THIS LIMITED LIFETIME WARRANTY IS IN LIEU OF ALL OTHER GUARANTEES AND WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND SHALL NOT BE EXTENDED OR ALTERED EXCEPT BY WRITTEN INSTRUMENT SIGNED BY ATLAS EPS AND THE OWNER. THERE ARE NO WARRANTIES OR GUARANTEES WHICH EXTEND BEYOND THE DESCRIPTION SET FORTH IN THIS LIMITED LIFETIME WARRANTY. This Limited Lifetime Warranty contains all of the provisions of your remedies from Atlas EPS. Atlas EPS' liability is limited to the provisions of this Limited Lifetime Warranty, whether any claim against Atlas EPS is based upon strict liability, negligence, breach of warranty or any other theory or cause of action. No agent, salesperson, employee or representative of Atlas EPS is empowered to change, alter or amend this Limited Lifetime Warranty either orally or in writing.

LIMITATION OF ATLAS EPS LIABILITY: Obligations under this Limited Lifetime Warranty are applicable to product(s) manufactured by Atlas EPS after December 31st, 2013. This Limited Lifetime Warranty shall only apply if the product is installed in strict accordance with all Atlas EPS specifications, recommendations and guidelines which were in effect at the time of such installation. TOTAL ATLAS EPS EXPENSE FOR THE DURATION OF THIS LIMITED LIFETIME WARRANTY SHALL BE LIMITED TO THE ORIGINAL PURCHASE PRICE OF THE PRODUCT. IN NO INSTANCE SHALL ATLAS EPS BE RESPONSIBLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, AND IN NO EVENT SHALL ATLAS EPS BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES TO THE STRUCTURE OR BUILDING UPON WHICH THE ATLAS EPS PRODUCT IS APPLIED, ITS CONTENTS, OR OCCUPANTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THIS LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

INSULATION TESTING: If at any time within this Limited Lifetime Warranty period, the Owner detects a decline in the product's performance, (s)he shall notify Atlas EPS in writing within sixty (60) days. Owner agrees at Owner's expense to take samples of the insulation in accordance with Atlas EPS' sampling procedures and to test the product to determine the performance of interest for the product. Testing of the product samples shall be in accordance with the applicable ASTM or AWPA standard. All sampling related costs (including, but not limited to costs of product, its removal and repair costs) shall be at the Owner's expense. Procurement of samples must be witnessed by an Atlas EPS representative. All testing of the product samples will be conducted at a NVLAP certified independent testing laboratory, approved by Atlas EPS. Results of the testing will be final and binding on all parties concerned.

COMPLETE AGREEMENT: This Limited Lifetime Warranty includes the complete and exclusive agreement between the Buyer/Owner and Atlas EPS, and supersedes any and all prior, oral or written, agreements or representations, made by or between them.

SECTION 072100 BUILDING INSULATION



Rigid Cellular Plastic Insulation in Perimeter Foundation and Below-Slab Applications

*NOTE TO SPECIFIER: Bracket **BOLD []** 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

1.02 References

- A. Test and Materials Standards:
 - a. American Society for Testing and Materials (ASTM) C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
 - b. ASTM D1621 Test Method for Compressive Properties of Rigid Cellular Plastics
 - c. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - d. ASTM C1512 Test Method for Characterizing the Effect of Exposure to Environmental Cycling on Thermal Performance of Insulation Products
 - e. International Code Council (ICC) AC239 Acceptance Criteria for Termite Resistant Foam Plastics
- B. Building Codes
 - a. ICC International Building Code
 - b. ICC International Residential Code
 - c. CAN/ULC S701, CAN/ULC S102

1.03 Design Requirements

- A. Performance Requirements:
 - a. 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
 - b. Rigid foam insulation should have a water vapor permeance greater than 1.0 perm for the TOTAL thickness (not PER INCH value) where installed exterior to a heated building wall to provide drying potential of the exterior building envelope
 - c. EPS, XPS and polyisocyanurate foam plastics are water resistant and may be installed in direct contact with soil, assuming proper drainage features typical of current below grade construction are followed
 - d. Before pouring concrete slabs, a vapor retarder must be installed directly OVER any rigid foam insulation
 - e. 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, except as stated below
 - f. Foam plastic insulation passing criteria of ICC-ES Appendix B or NFPA286 at maximum thickness may be used on INTERIOR wall, ceiling and floor surface 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 over the foam plastic
- B. Compatibility Considerations:
 - a. Do not expose polystyrene insulation to temperatures exceeding 165°F
 - b. Heated asphalt or coal tar is not compatible with polystyrene insulation

- c. Waterproofing mastics or other materials should be tested for compatibility by installer prior to use. Non-compatible compounds include products that include ketones, gasoline or diesel solvents

1.04 Quality Assurance

- A. Installer Qualification: utilize an installer having demonstrated experience on projects of similar size and complexity.
- B. Regulatory Requirements and Approvals:
 - a. Rigid foam plastic insulation shall be classified for ASTM E84 / UL723 for Flame Spread <75, Smoke Developed < 450 by a recognized agency.
 - b. Rigid foam plastic insulation shall be classified for **[ASTM C578 or C1289] [CAN/ULC S701 or S704]** by a third party
 - c. Rigid foam plastic insulation shall demonstrate long term performance below grade via ASTM C1512
 - d. **[Provide Approval Report demonstrating compliance with [International Building Code (IBC)] [International Residential Code (IRC)] for permitted use in "very heavy termite infestation" areas]**
 - e. **[Provide Approval Report demonstrating 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]**

1.05 Warranty

- A. Manufacturer shall warrant rigid foam insulation for the life of the home or building on which it is originally installed for the following:
 - a. The representative thermal insulation value will not vary more than ten (10) percent from the published R-value
 - b. The product will meet the physical performance requirements within ten (10) percent of the minimum requirements per published Type of ASTM C578-14, C1289-14, CAN/ULC S701 or S704 as applicable
 - c. **[The product will retain a termite resistance of seven (7) or greater per AWPA E7]**

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
 - a. Avoid prolonged exposure to sunlight; cover with opaque tarp or in original packaging
- C. Handling: Rigid foam 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:
 - a. ICC-ES or UL report for building code compliance
 - b. Third party ASTM C578, C1289, CAN/ULC S701, or S704 listing
 - c. Recognized third party ASTM E84 / UL723 classification
 - d. Manufacturer test report for ASTM C1512
 - e. **[Copy of Approval Report for use in "very heavy termite infestation" areas]**

D. Warranties:

- a. Limited Lifetime Thermal Performance Warranty
- b. Limited Lifetime Physical Performance Warranty
- c. **[Limited Lifetime Termite Resistance Warranty]**

PART 2 — PRODUCTS

2.01 Manufacturers

- A. Expanded Polystyrene Insulation (EPS)
 - a. Atlas EPS, a Division of Atlas Roofing Corporation
 - b. Insulfoam LLC
 - c. Plastifab Corporation
- B. Extruded Polystyrene Insulation (XPS)
 - a. Diversifoam
 - b. The Dow Chemical Company
 - c. Owens Corning
- C. Polyisocyanurate Insulation (Polyiso)
 - a. Atlas Roofing Corporation
 - b. Johns Manville
 - c. RMAX

2.02 Materials

- A. Insulation Requirements — ALL TYPES
 - a. **[Published Thermal Resistance shall not decrease with mean wall or slab temperatures below 75°F]**
(Note to specifier: this typically removes polyiso as a material option in below grade conditions)
 - b. **[Global Warming Potential shall not exceed 10]**
(Note to specifier: this typically removes XPS as a material option)
 - c. **[Insulation must include gases other than air in foam cells]**
(Note to specifier: this removes EPS as a material option)
 - d. **[Insulation fire retardant shall not be HBCD, TCPP, TCEP or NPB]**
 - e. **[Project location requires the foam plastic insulation to meet requirements for “very heavy termite infestation”]**
 - f. Compressive resistance @ 10% deformation via ASTM D1621:
 - i. **[10 psi EPS]**
 - ii. **[12 psi EPS]**
 - iii. **[15 psi EPS] [15 psi XPS] [15 psi polyiso]**
 - iv. **[25 psi EPS] [25 psi XPS] [25 psi polyiso]**
 - v. **[40 psi EPS] [40 psi XPS]**
 - vi. **[60 psi EPS] [60 psi XPS]**
 - vii. **[100 psi XPS]**
 - g. Thermal Resistance per inch @ 75°F via ASTM C518 on conditioned product, minimum:
 - i. **[3.6 EPS]**
 - ii. **[3.8 EPS]**
 - iii. **[4.0 EPS]**
 - iv. **[4.2 EPS]**
 - v. **[4.4 EPS]**
 - vi. **[5.0 Graphite EPS] [5.0 XPS]**
 - vii. **[6.0 cgf faced polyiso]**
 - viii. **[6.5 foil faced polyiso]**
 - h. Insulation shall be **[]** inches wide x 96” x **[]** inches in thickness to achieve code required U-factor through the completed construction
 - i. Adhesive:
 - i. The adhesive shall be Liquid Nails Ultra Quik Grip, Loctite PL Premium, or other compatible foam board adhesive

2.03 Accessories

- A. Insulation Fasteners:
 - a. Mechanical fasteners shall be corrosion resistant with large heads or include washers
- B. Protective Finish:
 - a. 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:
 - a. Edge protection for exposed insulation shall be J-channel type

PART 3 – EXECUTION

3.01 Preparation

- A. Floor slab grade shall be 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.

3.02 Preparation

- A. General:
 - a. Install rigid foam insulation in a **[Single] [Double]** layer to achieve required R-value(s) as indicated in drawings. Cut and fit tightly around projections and penetrations.
 - b. Secure insulation to substrate with **[mechanical fasteners] [spot adhesive applied to back of board]** using quantity and pattern recommended by manufacturer
- B. Insulation Board Joints: Stagger insulation board joints in one direction for each course. Butt edges and ends tightly to adjacent boards
- C. Perimeter Foundation: Install insulation board on exterior surface or 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
- D. Slab-On-Grade: Install insulation board under slab-on-grade- and over properly prepared subgrade of drainage fill and under vapor retarder. Place insulation board with sides and ends butted

3.03 Cleaning

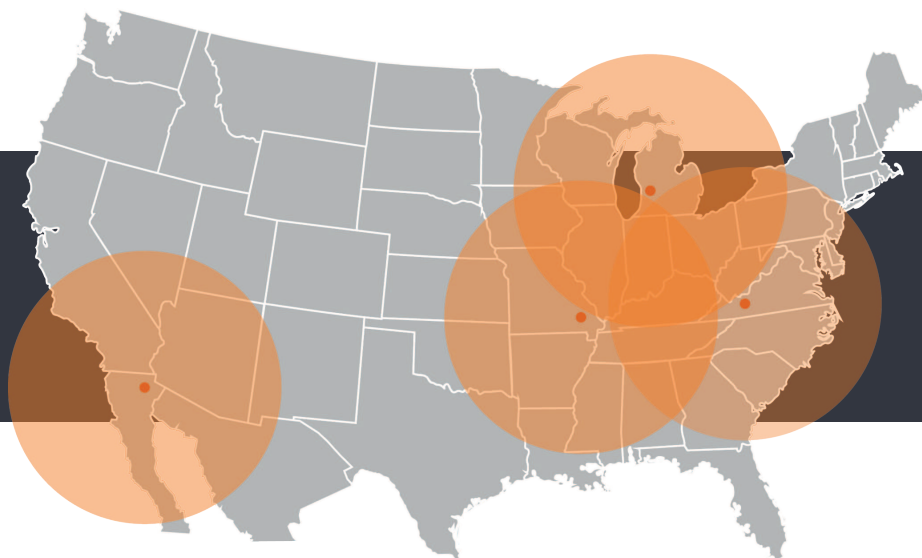
- A. General: Remove and legally dispose of waste material and other construction debris
- B. Clean EPS insulation may be recycled through a national program

LEED Information for ThermalStar X-Grade

Material Declarations		
Primary Composition	Polystyrene	98%
Flame Retardant	Polymeric FR (Emerald 3000)	<2%
Termiticide	Preventol	<0.05%
Does NOT contain HBCD	---	0%
Blowing Agent	Air	GWP = 0
Pre-Consumer Recycle Content	None	0%
Post-Consumer Recycle Content	None	0%
VOCs	None	0%

Manufacturing Location	Component	Source Location
8240 Byron Center Ave SW Byron Center, MI 49315	Steam expandable polystyrene resin polymerized with flame retardant	Peru, IL 61354
911 Industrial Drive Perryville, MO 63775	Steam expandable polystyrene resin polymerized with flame retardant	Peru, IL 61354
445 Industrial Park Drive Ridgeway, VA 24148	Steam expandable polystyrene resin polymerized with flame retardant	Monaca, PA 15061
Privada Misiones No. 1108 Tijuana, MX 22500	Steam expandable polystyrene resin polymerized with flame retardant	Altamira Tamaulipas, Mexico

*Oil is the raw material for polystyrene and is largely extracted in North America and Middle East.



Atlas EPS Plant Locations:

Byron Center, MI
Perryville, MO
Ridgeway, VA
Tijuana, MX

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