

UL Evaluation Report

UL ER11812-04

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UL Category Code: ULEX

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DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

Sub-level 2: 07 20 00 - Thermal Protection

Sub-level 3: 07 21 00 - Thermal Insulation

Sub-level 4: 07 21 13 - Board Insulation

Sub-level 3: 07 22 00 - Roof and Deck Insulation

Sub-level 4: 07 22 16 - Roof Board Insulation

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1. SUBJECT:

FOAM-CONTROL® PLUS+® INSULATION BOARDS

FOAM-CONTROL® PLUS+® WITH PERFORM GUARD INSULATION BOARDS

FOAM-CONTROL® PLUS+® WITH PERFORM GUARD2 INSULATION BOARDS

Throughout this report, unless specifically indicated otherwise:

- The reference to Foam-Control PLUS+ Insulation Boards will also apply to Foam-Control PLUS+ Insulation Boards with Perform Guard and Perform Guard2.

2. SCOPE OF EVALUATION:

- 2015 *International Building Code*® (IBC)
- 2015 *International Residential Code*® (IRC)
- 2015 *International Energy Code*® (IECC)
- ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised May 2016)
- ICC-ES Acceptance Criteria for Termite Resistant Foam Plastic (AC239), dated October 2008 (editorially revised February 2014)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014

The products were evaluated for the following properties

Foam-Control PLUS+ Insulation Boards:

- Surface Burning Characteristics (ANSI/UL723, ASTM E84)
- Physical Properties (ASTM C578)
- Roof Deck Construction Material With Resistance to Internal Fire Exposure (ANSI/UL1256)
- Roofing Systems for Exterior Fire Exposure (ANSI/UL790, ASTM E108)
- Uplift Tests For Roof Covering Systems, (ANSI/UL1897)
- Flammability Testing for Use in Attics and Crawl Spaces (AC12, App. A and B)
- Termite Resistance –Foam-Control PLUS+ with Perform Guard Insulation Boards and Foam-Control PLUS+ with Perform Guard2 Insulation Boards, only, (ICC-ES AC239)
- For Use on Exterior Commercial Walls (NFPA 285)

3. REFERENCED DOCUMENTS

■ ICC-ES:

- ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised May 2016)
- ICC-ES Acceptance Criteria for Quality Documentation (AC10), dated June 2014
- ICC-ES Acceptance Criteria for Termite Resistant Foam Plastic (AC239), dated October 2008 (editorially revised February 2014)

■ ANSI/UL:

- ANSI/UL723 (ASTM E84), 10th Edition, Test for Surface Burning Characteristics of Building Materials
- ANSI/UL790 (ASTM E108), 7th Edition, Standard Test Methods for Fire Tests of Roof Coverings
- ANSI/UL1256, 4th Edition, Standard for Fire Test of Roof Deck Constructions
- ANSI/UL 1897, 7th Edition, Uplift Tests for Roof Covering Systems

■ ASTM:

- ASTM C578-12, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

■ NFPA:

- NFPA 285, 2012 Edition, Standard Fire Test for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Assemblies Containing Combustible Components

4. USES

4.1 Foam-Control PLUS+ Insulation Boards:

Foam-Control PLUS+ Insulation Boards are used as nonstructural insulation on the interior or exterior of above grade walls, on the interior or exterior of below grade walls, below concrete slabs, around concrete slab edges, or as roof insulation. Installation shall be in accordance with Section 6.2 of this report.

The insulation boards may be used on walls in attics and crawl spaces when installation is in accordance with Section 6.2.2.

5. PRODUCT DESCRIPTION

5.1 General:

Foam-Control PLUS+ Insulation Boards described in 5.2 are molded, closed-cell expanded polystyrene having a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 for thicknesses up to 5 inches when tested in accordance with UL723 (ASTM E84) as required by Section [2603.3](#) of the IBC or Section [R316.3](#) of the IRC, as applicable.

The following products are treated for termite resistance in accordance with Section [2603.9](#), exception 2 of the IBC or Section [R318.4](#), exception 2 of the IRC, as applicable:

- Foam-Control PLUS+ with Perform Guard Insulation Boards
- Foam-Control PLUS+ with Perform Guard2 Insulation Boards

5.2 Foam-Control PLUS+ Insulation Boards:

Foam-Control PLUS+ 150, 250, 400, and 600 Insulation Boards are manufactured at minimum densities of 1.35, 1.80, 2.40, and 3.00 lbs/ft³ and comply with ASTM C578 designations of Type II, Type IX, Type XIV, and Type XV respectively. See Table 1.

Table 1 – Thermal Resistance of Foam-Control PLUS+ Insulation Boards

PRODUCT	ASTM C578 Type	DENSITY ₃ , min., lb/ft ³	THERMAL RESISTANCE ¹ , min., °F-ft ² -h/Btu
Foam-Control PLUS+150	II	1.35	4.0
Foam-Control PLUS+ 250	IX	1.80	4.2
Foam-Control PLUS+ 400	XIV	2.40	4.2
Foam-Control PLUS+ 600	XV	3.00	4.3

¹Thermal resistance (R) values are based on tested values at 1 inch thickness and 75F mean temperature and must be multiplied by the installed thickness for thicknesses greater than 1 inch.

Table 2 – Potential Heat of Foam-Control PLUS+ Insulation Boards

PRODUCT	ASTM C578 TYPE	HEAT POTENTIAL ¹ , Btu/ft ²	HEAT POTENTIAL ¹ , mJ/m ²
Foam-Control PLUS+150	II	2250	25.5
Foam-Control PLUS+ 250	IX	3000	34.0
Foam-Control PLUS+ 400	XIV	4000	45.4
Foam-Control PLUS+ 600	XV	5000	56.8

¹Based on 1 in. thickness

6. INSTALLATION

6.1 General:

Foam-Control PLUS+ Insulation Boards are installed in accordance with the manufacturer’s published installation instructions and this evaluation report. The manufacturer’s published installation instructions and this report must be strictly adhered to, and a copy of the instructions shall be available on the jobsite during installation.

6.2 Foam-Control PLUS+ Insulation Boards:

Foam-Control PLUS+ Insulation Boards must be attached to the structure in a manner that will hold the insulation securely in place. The insulation boards must not be used structurally to resist transverse, axial or shear loads.

The interior of the building must be separated from the Foam-Control PLUS+ Insulation Boards with a thermal barrier as required by Section [2603.4](#) of the IBC or Section [R316.4](#) of the IRC, as applicable.

Foam-Control PLUS+ Insulation Boards may be used as vapor retarders based on perm values described in Table 2, when required in accordance with the applicable sections of the IBC, IRC and IECC. Vapor retarders are classified as follows:

Class I: 0.1 perm or less

Class II: $0.1 < \text{perm} \leq 1.0$

Class III: $1.0 < \text{perm} \leq 10$ perm

Table 3 – Water Vapor Permeance of Foam-Control PLUS+ Insulation Board

PRODUCT	ASTM C578 Type	DENSITY, min., lb/ft ³	PERMEANCE ¹ , max., perms
Foam-Control PLUS+150	II	1.35	3.5
Foam-Control PLUS+ 250	IX	1.80	2.5
Foam-Control PLUS+ 400	XIV	2.40	2.5
Foam-Control PLUS+ 600	XV	3.00	2.5

¹ Water vapor permeance values are based on 1 inch thickness when tested in accordance with ASTM C578 and ASTM E96. Actual water vapor permeance values may be calculated based on insulation thickness, by dividing the perm value shown by the installed thickness in inches.

6.2.1 Foam-Control PLUS+ Insulation Boards Used in Roofing:

Foam-Control PLUS+ Insulation Boards are used as a roofing insulation as follows:

- As part of a UL Classified Class A, B or C roof-covering assembly in accordance with UL 790,
- As part of a UL Classified Roof Deck Construction in accordance with UL 1256, or
- As part of a UL Classified Roofing System, Uplift Resistance, in accordance with UL 1897.

6.2.2 Foam-Control PLUS+ Insulation Boards Used in Attics and Crawl Spaces:

Foam-Control PLUS+ Insulation Boards may be used on walls of attics and crawl spaces, without the coverings listed in Section [2603.4.1.6](#) of the IBC or Sections [R316.5.3](#) and [R316.5.4](#) of the IRC, as follows:

1. Entry to the attic or crawl space is limited to service of utilities, and no storage is permitted. Utilities include, but are not limited to, mechanical equipment, electrical wiring, fans, plumbing, gas or electric hot water heaters, and gas or electric furnaces.
2. There are no interconnected crawl space areas
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Under-floor (crawl space) ventilation is provided when required by Section [1203.3](#) of the IBC or Section [R408.1](#) IRC, as applicable.
5. Combustion air is provided in accordance with IMC Section [701](#) (2015 IMC).

6. Foam-Control PLUS+ Insulation boards are limited to a maximum thickness of 2-2/3 inches (67.8 mm) for Foam-Control PLUS+ 150, or a maximum thickness of 2 inches (51 mm) for Foam-Control PLUS+ 250.

6.2.4 Foam-Control PLUS+ Insulation Boards used on the exterior of above grade walls:

Foam-Control PLUS+ Insulation Boards are used on the exterior of above grade walls as follows:

- Exterior Walls of One- and Two-Family Dwellings in accordance with the 2015 IRC,
- Exterior walls of one story buildings of Types I, II, III, or IV construction in accordance with Section [2603.4.1.4](#) of the IBC,
- Exterior walls of Type V construction in accordance with Section [2603.2](#), [2603.3](#), and [2603.4](#) of the IBC, or
- Exterior walls of buildings more than one story of Types I, II, III, or IV construction in accordance with Section [2603.5](#) of the IBC, when part of
 - a UL Classified Exterior Wall System in accordance with NFPA 285. See Section 7.2.
 - an Exterior Wall System in accordance with NFPA 285. See Table 3.

Table 4 – NFPA 285 Compliant Assembly Options – See Figure 1

Base Wall Options
<ol style="list-style-type: none"> 1) Cast Concrete Walls 2) CMU Cast Concrete Walls 3) Steel Stud Framed Wall <ol style="list-style-type: none"> a. 25 GA. (min.) 3 5/8" (min.) steel studs spaced 24" o.c. (max.) b. Lateral Bracing Every 4 ft. vertically c. 5/8" Type X Gypsum Wallboard Interior d. Cavity Insulation <ol style="list-style-type: none"> i. None ii. Any Class A, B, or C Fiberglass batt insulation (faced or unfaced) iii. Any noncombustible insulation e. Any 1/2" (min.) Exterior Gypsum Sheathing
Water Resistive Barrier / Air Barrier Options Over Base Wall
<ol style="list-style-type: none"> 1) None 2) BASF Enershield HP 3) BASF Enershield I 4) Carlisle Barritech NP 5) Carlisle Barritech VP 6) Dupont Fluid Applied WB 7) Dupont Tyvek Commercialwrap (1 or 2 layers) 8) Grace Perm-A-Barrier VPS 9) Tremco EXOAir 230
Foam-Control EPS Exterior Insulation Options
<ol style="list-style-type: none"> 1) 7" (max.) Foam-Control PLUS+ 150 2) 5 1/4" (max.) Foam-Control PLUS+ 250 3) 4" (max.) Foam-Control PLUS+ 400 4) 3 1/4" (max.) Foam-Control PLUS+ 600
Exterior Cladding Options
<ol style="list-style-type: none"> 1) Brick - Nominal 4" clay brick or veneer with 2" (max.) air gap behind the cladding. Brick with ties/anchors 24" o.c. (max.) 2) Concrete - 2" (min.) with 2" (max.) air gap behind the cladding 3) Concrete Masonry Units - 4" (min.) with 2" (max.) air gap behind the cladding 4) Limestone - 2" (min.) with non-open joints installation technique such as shiplap 5) Natural Stone Veneer - 2" (min.) with non-open joints installation technique such as shiplap 6) Precast Artificial Stone - 1-1/2" (min.) complying with ICC-ES, AC 51 with non-open joint installation technique 7) Terra Cotta Cladding - 1-1/4" (min.) solid with non-open joint installation technique such as shiplap 8) Stucco - 3/4" (min.) exterior cement plaster and lath
Fire Stopping at Floor Line Options
<ol style="list-style-type: none"> 1) Mineral wool fiber fire stop in each stud cavity at floor line. Thickness equal to stud cavity depth. Follow manufacturer instruction for installation.
Window Header Detail
<ol style="list-style-type: none"> 1) 25 GA. (min.) sheet metal (steel) flashing with 1" thick, 4 pcf mineral wool over interior of sheet steel 2) Header design equal or better than item 1

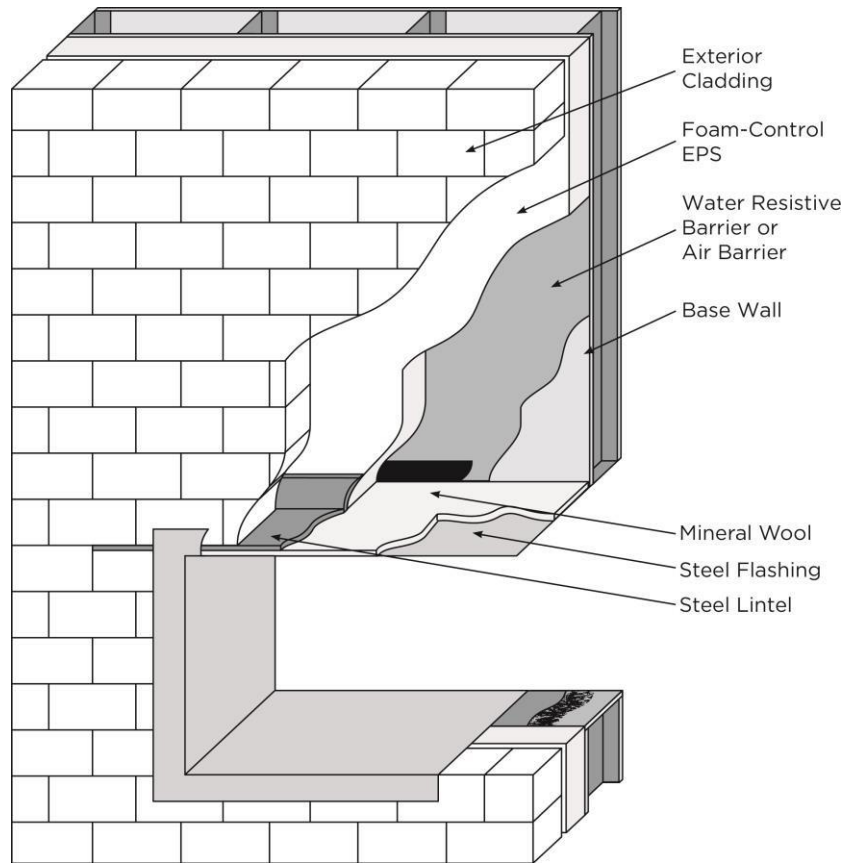


Figure 1 – NFPA 285 Wall Assembly

7. CONDITIONS OF USE

7.1 General:

The Foam-Control PLUS+ Insulation Boards described in this report comply with, or are suitable alternatives to what is specified in those codes listed in Section 2 of this report, subject to the following conditions. The Foam-Control PLUS+ Insulation Boards must be produced, identified, and installed in accordance with the manufacturer’s published installation instructions. If there is a conflict between this report and the manufacturer’s instructions this report governs.

In areas where the probability of termite infestation is defined as “very heavy”, Foam-Control PLUS+ Insulation Boards without the Perform Guard or Perform Guard2 treatment must be installed in accordance with IBC Section [2603.9](#) of the IBC or Section [R318.4](#) of the IRC, as applicable.

The use of Foam-Control PLUS+ Insulation Boards with the Perform Guard or Perform Guard2 treatment are not restricted in areas where the probability of termite infestation is defined as “very heavy” in accordance with Section [2603.9](#) of the IBC or Section [R318.4](#) of the IRC, as applicable.

7.2 Foam-Control PLUS+ Insulation Boards:

The Foam-Control PLUS+ Insulation Boards must be separated from the building interior with a thermal barrier, such as ½ in. gypsum board, as required by Section [2603.4](#) of the IBC or Section [R316.4](#) of the IRC, as applicable.

For a listing of applicable UL Certifications for Foam-Control PLUS+ Insulation Boards, see the Online Certifications Directory for the following categories.

- See UL Online Certifications Directory for Foamed Plastic, UL Classified for Surface Burning Characteristics in accordance with UL723 ([BRYX](#)).
- See UL Online Certifications Directory for Polystyrene Thermal Insulation, Rigid Cellular, UL Classified in accordance with ASTM C578 ([QORW](#)).
- See UL Online Certifications Directory for Class A, B or C roof-covering assemblies UL Classified in accordance with UL 790 ([TGFU](#)).
- See UL Online Certifications Directory for Roof Deck Constructions for assemblies UL Classified in accordance with UL 1256 ([TJBX](#)):
- See UL Online Certifications Directory for Roof Deck Constructions for assemblies UL Classified in accordance with UL 1897 ([TGIK](#)):
- See UL Online Certifications Directory for Exterior Walls for assemblies UL Classified in accordance with NFPA 285 (FWFO):
 - Exterior Wall System [EWS0001](#) ○
 - Exterior Wall System [EWS0002](#) ○
 - Exterior Wall System [EWS0003](#)

7.4 Manufacturing Locations:

The products are manufactured at the following locations described in Table 4 under the UL LLC Listing or Classification and Follow-Up Service Program, which includes audits in accordance with ICC-ES Acceptance Criteria for Quality Documentation, AC 10.

Table 5 – Manufacturing Locations

LISTEE	LOCATION	PLANT ID NO.
ACH Foam Technologies, Inc.	5250 North Sherman Street Denver, Colorado 80216	U-1
ACH Foam Technologies, Inc.	111 West Fireclay Avenue Murray, Utah 84107	U-2
ACH Foam Technologies, Inc.	2731 White Sulfur Road Gainesville, Georgia 30503	U-4
ACH Foam Technologies, Inc.	13695 Mt. Anderson Street Reno, NV 89506	U-53
ACH Foam Technologies, Inc.	1400 North 3rd St. Kansas City, Kansas 66101	U-8
ACH Foam Technologies, Inc.	90 Trowbridge Drive Fond Du Lac, Wisconsin 54936-0669	U-37
ACH Foam Technologies, Inc.	809 East 15th Street Washington, Iowa 52353	U-55
Big Sky Insulations, Inc.	15 Arden Drive Belgrade, Montana 59714	U-30
Thermal Foams, Inc.	2101 Kenmore Ave Buffalo, NY 14207	U-26

8. SUPPORTING EVIDENCE

8.1 Foam-Control PLUS+ Insulation Boards:

8.1.1 Data in accordance with ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2012 (editorially revised August 2013).

8.1.2 Data in accordance with ICC-ES Acceptance Criteria for Termite Resistant Foam Plastics (AC239), dated October 2008 (editorially revised February 2014).

8.1.3 UL Classification reports in accordance with UL 723, ASTM C578, UL 790, UL 1256, 1897 and NFPA 285. See UL Product Certification Categories (BRYX), (QORW), (TGFU), (TJBX), (TGIK) and (FWFO) respectively.

See links to UL's On-Line Certification Directory in Section 7.2.

8.1.4 Reports and analysis of wall fire tests in accordance with NFPA 285.

8.1.5 Documentation of quality system elements described in AC10.

9. IDENTIFICATION

The Foam-Control PLUS+ Insulation Boards described in this evaluation report are identified by a marking bearing the report holder's name (AFM), the plant identification, the product name, the UL Classification Mark, and the evaluation report number UL ER11812-04. The validity of the evaluation report is contingent upon this identification appearing on the product or UL Classification Mark certificate.

10. USE OF UL EVALUATION REPORT

10.1 The approval of building products, materials or systems is under the responsibility of the applicable authorities having jurisdiction.

10.2 UL Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL.

10.3 The current status of this report, as well as a complete directory of UL Evaluation Reports may be found at UL.com via our On-Line Certifications Directory:

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