

ICC-ES Evaluation Report

ESR-1962

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**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**
Section: 07 21 00—Thermal Insulation
Section: 07 22 00—Roof and Deck Insulation
**Section: 07 25 00—Water-Resistive Barriers /Weather
Barriers**
REPORT HOLDER:
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CORPORATION**

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EVALUATION SUBJECT:
**FALCON FOAM® , THERMALSTAR® AND ELEVATION™
EXPANDED POLYSTYRENE INSULATION BOARDS,
STACCATO™ T & G BOARD (T & G I, T & G II, T & G
IIR), X-GRADE® TALONGUARD EPS, STACCATO™
EIFS, THERMALSTAR D2D, AND THERMALSTAR
UNDERLAYMENT**
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)
- 2006 *International Energy Conservation Code*® (IECC)
- BOCA® *National Building Code*/1999 (BNBC)
- 1999 *Standard Building Code*® (SBC)
- 1997 *Uniform Building Code*™ (UBC)

Properties evaluated:

- Surface-burning characteristics
- Thermal resistance (*R*-values)
- Physical properties
- Attic and crawl space installation
- Fire resistance (ThermalStar D2D)
- Termite resistance (TalonGUARD EPS)
- Water-resistive barrier (ThermalStar Underlayment)

2.0 USES
**2.1 Falcon Foam, ThermalStar and Elevation
Expanded Polystyrene Insulation Boards:**

Falcon Foam, ThermalStar, and Elevation expanded polystyrene (EPS) insulation boards are used as

nonstructural thermal insulation in buildings of any construction type, and as components of Class A, B, and C roof covering systems installed on steel decks, when installed in accordance with this report. The insulation is for use in wall cavities, ceiling assemblies, and roof covering assemblies, or on the outside faces of exterior walls. The insulation may be used as roof insulation when recognized in a current ICC-ES evaluation report on the roof covering system, or when installed as described in Section 4.2. The insulation boards may also be directly exposed in attics and crawl spaces without a covering when installed as described in Section 4.2.2. The insulation may also be used as exterior perimeter insulation around concrete slab edges, on foundation walls, or under flat concrete slab on grade construction, except in areas where the probability of termite activity is “very heavy” as noted in Section 5.5.

When installed in accordance with Section 4.2.2 or 4.2.3 of this report, the insulation boards 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), or structures constructed in accordance with the IBC or IRC, with no thermal or ignition barriers applied to the foam plastic.

2.2 Staccato T & G Board (T & G I, T & G II, T & G IIR):

When installed in accordance with this report, Staccato T & G Boards are used as nonstructural thermal insulation in buildings of any construction type, as a component of a one-coat cementitious exterior wall coating system. The insulation is for use on the outside faces of exterior walls when an ASTM C 578 Type I or Type II EPS board is recognized in a current ICC-ES evaluation report for a one-coat cementitious exterior wall coating system, or when installed as described in Section 4.3. The insulation may also be directly exposed in attic and crawl spaces without a covering when installed as described in Section 4.2.2. Additionally, the insulation may be used as exterior perimeter insulation around concrete slab edges, on concrete or masonry foundation walls, or under flat concrete slab on grade construction, except in areas where the probability of termite activity is “very heavy” as noted in Section 5.5.

2.3 X-Grade® TalonGUARD Expanded Polystyrene:

X-Grade® TalonGUARD boards are recognized for the same uses as Falcon Foam, ThermalStar and Elevation EPS insulation boards and are recognized for use on the exterior face of foundation walls, under interior or exterior foundation walls or slab foundations below grade, or where located within 6 inches (152 mm) of exposed earth. When

installed in areas where the probability of termite infestations is very heavy as described in IBC Section 2603.8 or IRC Section R314.7, use is limited to areas exposed to the *Reticulitermes* species.

2.4 Staccato EIFS:

When installed in accordance with this report, Staccato EIFS is an EPS foam plastic insulation board used as nonstructural thermal insulation as a component in exterior insulation and finish systems (EIFS). The insulation may be used on the outside faces of exterior walls when an ASTM C 578 Type I EPS board is recognized in a current ICC-ES evaluation report for an EIFS.

2.5 ThermalStar D2D:

ThermalStar D2D insulation boards are EPS foam plastic insulation used as nonstructural thermal insulation as components of a Class A, B, or C roof covering system installed directly to steel decks when recognized in a current ICC-ES evaluation report, or when installed as described in Section 4.6 of this report.

2.6 ThermalStar Underlayment:

ThermalStar Underlayment insulation board is an EPS foam plastic insulation board used as nonstructural thermal insulation as components of a Class A, B, or C roof covering system, when recognized in a current ICC-ES evaluation report for the roof covering system, or when installed in accordance with Section 4.2.1 of this report. Also, the insulation is for use on the outside faces of exterior walls when an ASTM C 578 Type I or Type II EPS board is recognized in a current ICC-ES evaluation report for a one-coat cementitious exterior wall coating system, or when installed as described in Section 4.2.1 of this report.

The ThermalStar Underlayment boards may be used as an alternative to the water-resistive barriers specified in the codes when installed in accordance with Section 4.7.1.

3.0 DESCRIPTION

3.1 General:

The Atlas EPS insulation boards described in this report have a flame-spread index not exceeding 25 and a smoke-developed index not exceeding 450 when tested in accordance with ASTM E 84 (UBC Standard 8-1). Boards are alternately white or light orange color. See Table 1 for applicable use of the products.

3.2 Falcon Foam, ThermalStar and Elevation Expanded Polystyrene Insulation Boards:

Falcon Foam, ThermalStar, & Elevation Expanded Polystyrene (EPS) insulation boards comply with ASTM C 578 and are molded, closed-cell boards manufactured at minimum densities of 0.90, 1.15, 1.35 and 1.80 pcf (14.4, 18.4, 21.6 and 28.8 kg/m³). The designations for the four densities are Type I, Type VIII, Type II, and Type IX, respectively. For thermal resistance (*R*-values), see Table 2.

The EPS insulation boards are produced in various thicknesses up to 6 inches (152 mm), and in various sizes, with square, shiplap or tongue-and-groove edge profiles.

3.3 Staccato T & G Board (T & G I, T & G II, T & G IIR):

Staccato T & G Board insulation is molded, closed-cell, EPS foam plastic insulation board complying with the Type I and Type II requirements of ASTM C 578. The board insulation is molded at minimum densities of 0.90 pcf (14.4 kg/m³) for T & G I and 1.35 pcf (21.6 kg/m³) for T & G II and T & G IIR. For thermal resistance (*R*-values), see Table 2.

The Staccato T & G Board insulation consists of nominally 1-inch-thick (25 mm) boards produced in various sizes, with shiplap or tongue-and-groove edge profiles.

3.4 X-Grade® TalonGUARD Expanded Polystyrene Boards:

X-Grade® TalonGUARD boards are similar to EPS insulation boards described in Section 3.2 of this report, and comply with ASTM C 578. The insulation boards are used as described in Section 2.3 of this report when installed as described in Section 4.4.

3.5 Staccato EIFS:

Staccato EIFS is molded, closed-cell, EPS insulation board complying with the Type I requirements of ASTM C 578. The EPS insulation board is manufactured at a minimum density of 0.90 pcf (14.4 kg/m³). For thermal resistance (*R*-values), see Table 2.

The Staccato EIFS is produced in various thicknesses up to 6 inches (152 mm), and in various sizes, with square, shiplap or tongue-and-groove edge profiles.

3.6 ThermalStar D2D:

ThermalStar D2D insulation boards comply with ASTM C 578 and are molded, closed-cell, EPS boards manufactured at minimum densities of 0.90, 1.15, 1.35 and 1.80 pcf (14.4, 18.4, 21.6 and 28.8 kg/m³). The designations for the four densities are, respectively, ThermalStar D2D (Type I), ThermalStar D2D (Type VIII), ThermalStar D2D (Type II) and ThermalStar D2D (Type IX). For thermal resistance (*R*-values), see Table 2.

The ThermalStar D2D insulation boards are produced in flat or tapered boards, up to a thickness of 9 inches (229 mm) for ThermalStar D2D (Type I), 7.2 inches (183 mm) for ThermalStar D2D (Type VIII), 6.0 inches (152 mm) for ThermalStar D2D (Type II), and 4.5 inches (114 mm) for ThermalStar D2D (Type IX). The boards are produced in various sizes, with square, shiplap or tongue-and-groove edge profiles.

3.7 ThermalStar Underlayment:

ThermalStar Underlayment insulation boards are molded, closed-cell, EPS boards with polyethylene or polypropylene film facers adhered to both sides. The core material is a Type I EPS manufactured at a minimum density of 0.9 pcf (14.4 kg/m³). The facing is bonded to the EPS core with adhesive and is cured under factory-controlled conditions.

The ThermalStar Underlayment insulation boards are nominally 1 inch (25 mm) thick and are produced in various sizes, with square, shiplap or tongue-and-groove edge profiles. For thermal resistance (*R*-values), see Table 2. For minimum density, compressive strength and flexural strength see Table 3.

3.8 ThermalStar 007 Tape:

ThermalStar 007 tape must be used with ThermalStar Underlayment insulation boards when the board is used as an alternate to the water-resistive barrier as described in Section 4.7.1. The tape consists of a polyethylene backing with a rubber-based adhesive, and has a nominal thickness of 6 mils [0.006 inch (0.15 mm)] and a width of 2 inches (51 mm). The tape is supplied in rolls 36 yards (32.9 m) long.

3.9 Potential Heat:

See Table 4 for potential heat content of insulation boards when tested in accordance with NFPA 259.

4.0 INSTALLATION

4.1 General:

Installation of the foam plastic insulation must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at all times on the jobsite during installation. The EPS insulation boards must be attached to supports in a manner that will secure the insulation in place.

4.2 Falcon Foam, ThermalStar and Elevation EPS Insulation Boards:

4.2.1 General: The interior of the building must be separated from the insulation boards with a thermal barrier as required in IBC Section 2603.4, IRC Section R314.4, BNBC Section 2603.4, SBC Section 2603.5, or UBC Section 2602.4, as applicable, except as described in Section 4.2.2 or 4.2.3 of this report. A vapor retarder may be required by the code official in accordance with IECC Section 402.5 or 502.5 and IRC Section R318.1. A water-resistive barrier in compliance with IBC Section 1404.2, IRC Section R703.2, BNBC Section 1406.3.6, SBC Section 1403.1, and UBC Section 1402.1, is required and, when applied over wood-based sheathing, must comply with IBC Section 2510.6, IRC Section R703.6.3 or UBC Section 2506.4. The insulation board is permitted to be applied to exterior faces of walls, to a maximum thickness of 1½ inches (38 mm), except insulation board thicknesses greater than 1½ inches (38 mm) may be permitted if such installation is recognized in an ICC-ES evaluation report on wall coverings. The attachment of finish materials over the insulation board must provide a minimum 1-inch (25.4 mm) penetration of the fasteners into wood framing members. Wall covering over the insulation must be structurally adequate to resist the required horizontal forces perpendicular to the wall.

The insulation boards must not be used structurally to resist transverse, vertical or in-plane loads. The boards must not be used as exterior stud wall bracing. Wall bracing must be provided in accordance with the applicable code. All walls must be braced in accordance with IBC Sections 2308.9.3 and 2308.12.4, IRC Section R602.10.3, BNBC Sections 2305.7 and 2305.8, SBC Section 2308.2, and UBC Sections 2320.11.3 or 2320.11.4.

The insulation boards must not be used as a nailing base for exterior siding materials. All fastening must be made through the boards and either into the wall framing or into structural sheathing, as required by the siding manufacturer's published installation instructions, or in accordance with the applicable code.

4.2.2 Attics and Crawl Spaces: Staccato EIFS; Falcon Foam, ThermalStar, & Elevation Type I, II, VIII and IX EPS insulation boards; X-Grade TalonGUARD Type I, II, VIII and IX; Staccato T & G Boards (T & G I, T & G II, T & G IIR) and ThermalStar Underlayment insulation boards with a nominal thickness of 2 inches (50.8 mm) may be used on walls in attics and crawl spaces without a covering applied to the attic or crawl space side of the foam plastic, provided *all* of the following conditions are met:

- a. Entry to the attic or crawl space is only for servicing 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.
- b. Attic ventilation is provided when required by IBC Section 1203.2, IRC Section R806, BNBC Section

1210.1, SBC Section 2309.7, or UBC Section 1505.3, as applicable. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3, IRC Section R408.1, BNBC Section 1210.2, SBC Section 1804.6.3, or UBC Section 2306.7, as applicable.

- c. Combustion air is provided in accordance with Sections 701 and 703 of the 2006 *International Mechanical Code*[®], Sections 701 and 703.1 of the 1997 ICBO *Uniform Mechanical Code*, or Section M1703 of the IRC, as applicable.
- d. Boards have a maximum nominal density of 2.0 pcf (32 kg/m³) and a maximum thickness of 2 inches (51 mm).

4.2.3 Other Structures: Staccato EIFS; Falcon Foam, ThermalStar and Elevation Type I, II, VIII and IX EPS insulation boards; X-Grade TalonGUARD Type I, II, VIII and IX; Staccato T&G I, T&G II, T&G IIR; and ThermalStar Underlayment insulation boards with a maximum nominal thickness of 2 inches (50.8 mm), may be installed on any or all surfaces (wall, ceiling, floor) of a detached garage, pole barn, telecommunication shelter, concrete modular building, agricultural building, buildings under the IBC Utility and Miscellaneous Group U or other structures under the IBC or IRC, with no thermal or ignition barrier applied to the foam plastics, when all other requirements of the building code for that building are met.

4.2.4 Use on Exterior Walls in Type I, II, III and IV Construction: When used on exterior walls of Types I, II, III and IV construction, the assembly in which the ASTM C 578 Type I, II, VIII, IX Atlas EPS plastic insulation is used, must comply with IBC Section 2603.5. The potential heat of the foam plastic boards in any portion of the wall or panels must not exceed the potential heat, expressed in BTU/ft² (mJ/m²), of the foam plastic insulation contained in the wall assembly tested in accordance with NFPA 285. See Table 4 for the potential heat, per inch of thickness, for each C 578 type of foam plastic.

4.3 Staccato T & G Board (T & G I, T & G II, T & G IIR):

Staccato T & G Board must be installed in accordance with a current ICC-ES evaluation report on a one-coat cementitious exterior wall coating system. The insulation may also be installed in attic and crawl spaces without a covering as described in Section 4.2.2 of this report. The insulation boards may also be installed as exterior perimeter insulation around concrete slab edges, on concrete or masonry foundation walls, or under flat concrete slab on grade construction, except in areas where the probability of termite activity is "very heavy" as noted in Section 5.5.

4.4 X-Grade TalonGUARD Expanded Polystyrene:

X-Grade TalonGUARD insulation boards must be installed in the same manner as described for Falcon Foam, ThermalStar and Elevation EPS insulation boards in Section 4.2.

4.5 Staccato EIFS:

Staccato EIFS insulation must be installed as part of an EIFS system in accordance with the current ICC-ES evaluation report on the EIFS.

4.6 ThermalStar D2D:

4.6.1 Application Directly to Steel Roof Decks without a Thermal Barrier: ThermalStar D2D roof insulation boards may be used as a component of a Class A, B or C roof covering installed on steel decks without a thermal barrier, when installed in accordance with this section (Section 4.6) of this report.

4.6.2 Materials:

4.6.2.1 Steel Deck: Steel roof decking must be minimum No. 22 gage [0.030 inch (0.76 mm)], 1¹/₂-inch-deep (38 mm), unperforated, galvanized steel decking, with flutes spaced a maximum of 6 inches (152 mm) on center. The deck must be welded or mechanically fastened to structural supports in accordance with the applicable code.

4.6.2.2 Foam Plastic Insulation: The ThermalStar D2D insulation boards are recognized for use on steel decks without a thermal barrier. The ThermalStar D2D insulation boards are limited to have maximum thicknesses as follows: up to 9 inches (229 mm) for ThermalStar D2D (Type I), 7.2 inches (183 mm) for ThermalStar D2D (Type VIII), 6.0 inches (152 mm) for ThermalStar D2D (Type II), and 4.5 inches (114 mm) for ThermalStar D2D (Type IX).

4.6.2.3 Cover Board: When used, the cover board in the roof-covering system must be either 1/4-inch-thick (6.4 mm) Dens-Deck® Roof Board manufactured by Georgia-Pacific Corporation, or 1/2-inch-thick (12.7 mm) wood-fiber board.

4.6.2.4 Slip Sheet: The slip sheet must be one layer of FR10 or FR50 manufactured by Atlas Roofing Corporation, and may be used as an alternative to the cover board specified for the membrane roof systems noted in Section 4.6.2.5 of this report.

4.6.2.5 Roof Covering: The roof covering membrane must be either an EPDM or a thermoplastic membrane, recognized in a current ICC-ES evaluation report as part of a Class A, B or C roofing covering system. The membrane must be either mechanically attached, fully adhered, or ballasted. Thermoplastic membranes include polyvinyl chloride (PVC), modified PVC, chloro-sulphonated polyethylene (CSPE), and thermoplastic polyolefin (TPO). The membrane must be limited to a maximum nominal thickness of 0.045 inch (1.14 mm) for use under the IBC, BNBC, SBC and UBC. The evaluation report on the roof-covering system must specify one of the following systems as the only classified roof-covering system permitted under the conditions of this report:

- a. A generic EPS insulation board, having the same density and installed thickness as the ThermalStar D2D roof insulation boards recognized in Section 4.6.2.2 of this report; the cover board described in Section 4.6.2.3 or the slip sheet described in Section 4.6.2.4; and the mechanically attached roof-covering membrane described in this section, installed over a steel deck described in Section 4.6.2.1.
- b. A generic EPS insulation board, having the same density and installed thickness as the ThermalStar D2D roof insulation recognized in Section 4.6.2.2 of this report; the roof covering membrane described in this section; and stone ballast installed over a steel deck described in Section 4.6.2.1.

4.6.3 Installation: The ThermalStar D2D roof insulation boards must be loosely laid directly over the steel deck in single or multiple layers, to a maximum total thickness as described in Section 3.6. The top layer of insulation must be placed so that the wording required in item 1 of Section 7.0 is facing up. The optional cover board described in Section 4.6.2.3, or the slip sheet described in Section 4.6.2.4, must be laid over the insulation. The cover board is optional, depending on system requirements, when the method of attaching the roof membrane is either mechanical fastening or adhesion. A cover board is not permitted in the system when the roof membrane is ballasted.

The method of attaching the roof covering, cover board, slip sheet or ballast, and insulation boards to the steel roof deck must be in accordance with the ICC-ES evaluation report on the roof-covering membrane, and as described in Section 4.6.2.5.

4.6.4 Fire-extinguishing System: When installation is in jurisdictions enforcing the UBC, buildings or portions of buildings covered with the roof-covering assembly must be fully sprinklered with a wet-pipe automatic fire-extinguishing system complying with Chapter 9 of the UBC. The fire extinguishing system must be designed for the intended occupancy.

4.6.5 Reroofing: New roofing must not be applied over existing roof-covering systems described in this report, since the fire performance of the systems is directly affected by the materials covering the foam plastic insulation. The components of the existing roofing that are to remain on the roof deck must be inspected in accordance with IBC Section 1510, IRC Section R907, SBC Section 1510 or Section 1515 of UBC Appendix Chapter 15. The existing roof-covering membrane and, if necessary, the cover board must be removed before new roofing materials are installed; the new roofing materials must have characteristics specifically described in this report.

4.7 ThermalStar Underlayment:

ThermalStar Underlayment wall insulation boards must be installed as specified for Falcon Foam, ThermalStar, & Elevation EPS in Sections 4.2.1 or as described in Section 4.7.1 of this report.

4.7.1 Water-resistive Barrier:

4.7.1.1 General: When installed in accordance with this section, the ThermalStar Underlayment boards combined with ThermalStar 007 tape may be used as an alternative to the water-resistive barrier in IBC Section 1404.2, IRC Section R703.2, BNBC Section 1406.3.6, SBC Section 1403.1, and UBC Section 1402.1 when installed on exterior walls as described in this section.

The 2- or 4-foot-wide (610 or 1219 mm) ThermalStar Underlayment boards with tongue-and-groove joints on the long edges must be oriented horizontally, with tongues facing upward. The 2- or 4-foot-wide (610 or 1219 mm) boards with square edges may be oriented horizontally or vertically.

The ThermalStar Underlayment boards must be installed directly to framing spaced a maximum of 24 inches on center, except where further limited by the requirements for a wall covering. Fasteners used to attach the boards to framing must be corrosion-resistant roofing nails with a minimum 3/8-inch-diameter (9.5 mm) head; 6d ring-shank nails and 15/16-inch-diameter (24 mm) plastic washers; self-drilling screws with 3/4-inch-diameter (19 mm) cap washers; or 1-inch-wide-crown (25.4 mm), No. 16 gage staples. Fasteners must be spaced at a maximum of 24 inches (610 mm) apart, and be long enough to penetrate the framing members a minimum of 3/4 inch (19 mm). Joints between boards must be tightly butted together, and corners created with the boards, must be taped with ThermalStar 007 polyethylene tape centered over the joint. ThermalStar Underlayment boards must be installed with a weep screed, and require the use of self-adhering flashing complying with the ICC-ES Acceptance Criteria for Flashing Materials (AC148), around penetrations. The boards must be covered by an approved exterior wall cladding or cementitious wall coating recognized in a current ICC-ES evaluation report.

4.7.1.2 Installation Around Penetrations and Openings: The system is limited to use with flange-type windows. An AC148-compliant flashing material must be installed completely covering the framing sill and extending a minimum of 6 inches (152 mm) up the sides of the opening and approximately 1½ inches (38 mm) beyond the edge of the foam board at the front of the window opening. The sill flashing must be flush with the inside edge of the framing members on the inside of the wall. The flashing extending outside of the ThermalStar Underlayment board must be folded over the front face of the foam board. The flange-type window must then be installed in accordance with the window manufacturer's installation instructions. Jamb flashing must be installed prior to the installation of the head flashing. All jamb and head flashing must completely cover the window flanges.

Flashing of pipe penetrations must be accomplished by sealing around the pipe with flashing complying with AC148. Flashing of other penetrating items must be in accordance with the wall covering manufacturer's instructions.

5.0 CONDITIONS OF USE

The Falcon Foam, ThermalStar and Elevation EPS insulation boards described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The boards must be produced, identified and installed in accordance with this report and the manufacturer's published installation instructions. The installation instructions within this report must govern if there are any conflicts between the manufacturer's published installation instructions and this report.
- 5.2 The boards must be separated from the building interior with a thermal barrier complying with the applicable code, such as minimum ½-inch-thick (12.7 mm) gypsum wallboard installed in accordance with the applicable code, except as described in Sections 4.2.2, 4.2.3, 4.6.1 and 5.6 of this report.
- 5.3 Except for ThermalStar Underlayment boards installed in accordance with Section 4.7.1, when applied on exterior walls, the boards must be protected by a water-resistive barrier complying with IBC Section 1404.2, IRC Section R703.2, BNBC Section 1406.3.6, SBC Section 1403.1, and UBC Section 1402.1 and by wall coverings that provide the necessary structural resistance to wind and seismic forces in spanning between wall framing members. When used as a water-resistive barrier, all ThermalStar Underlayment joints must be backed with a stud or sheathing.
- 5.4 Walls must be braced in accordance with the applicable code.
- 5.5 In areas where the probability of termite infestation is defined as "very heavy," the foam plastic must be installed in accordance with IBC Section 2603.8, IRC Section 320.5 or SBC Section 2603.3, except as allowed for TalonGUARD EPS in Section 4.4 of this report.
- 5.6 ThermalStar D2D insulation boards are installed directly to a steel roof deck without a thermal barrier, the following conditions apply:
 - 5.6.1 The insulation boards must be part of a Class A, B or C roof covering system described in Section 4.6 of this report. The boards are permitted to be installed without the thermal

barrier addressed in IBC Section 2603.4.1, BNBC Section 2603.4.1, SBC Section 2603.5.1 and UBC Section 2602.5.3. The system is not permitted under the IRC.

- 5.6.2 In jurisdictions enforcing the UBC, a wet-pipe automatic fire-extinguishing system complying with Chapter 9 of the applicable code must be installed as described in Section 4.6.4 of this report.
- 5.6.3 Reroofing must be in accordance with Section 4.6.5.
- 5.6.4 In jurisdictions enforcing the UBC, permanent placards bearing the following words must be attached to roof hatches and wherever there is other roof access: "This roof covering includes foam plastic insulation applied directly to a steel deck. The existing roofing membrane and cover boards must be removed before reroofing. Limits also exist for cover boards and membranes. See ICC-ES evaluation report ESR-1962 before reroofing."
- 5.7 Boards are manufactured in Perryville, Missouri, and Byron Center, Michigan, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668); and in Tijuana, Baja California, Mexico, under a quality control program with inspections by RI Ogawa & Associates, Inc. (AA-705).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2009.
- 6.2 Data in accordance with UL1256 (IBC, BNBC, SBC), and in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation Applied Directly to Steel Decks (AC142), dated April 1999 (UBC).
- 6.3 Test reports of room corner fire tests in accordance with UBC Standard 26-3.
- 6.4 Test reports in accordance with ASTM E 84 (UBC Standard 8-1).
- 6.5 Test reports in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Sheathing Panels Used as Weather-resistive Barriers (AC71), dated February 2008.
- 6.6 Test reports in accordance with the ICC-ES Acceptance Criteria for Termite-resistant Foam Plastics (AC239), dated October 2008.
- 6.7 Test report in accordance with NFPA 286.
- 6.8 Test report in accordance with NFPA 259.

7.0 IDENTIFICATION

The Falcon Foam, ThermalStar and Elevation insulation boards must be packaged in bundles that are labeled with the manufacturer's name (Atlas EPS) and address; the date of manufacture; the product type (including TalonGUARD where applicable); the density; the flame-spread and smoke-developed indices; the thermal-resistance *R*-value (when applicable); the name of the inspection agency (Underwriters Laboratories Inc. or RI Ogawa & Associates, Inc.); and the evaluation report number (ESR-1962).

In addition to the labeling noted above, the following additional labeling is required:

- When ThermalStar D2D roof insulation boards are used in roof-covering assemblies attached directly to steel roof decks under Section 4.6 of this report, in addition to the labeling noted above, the boards must bear the designation “D2D” and the wording “When used in rebooting applications, limits exist for cover board and membrane. See ICC-ES evaluation report ESR-1962 before reroofing”; and the words “THIS SIDE UP” printed on, or included on a permanent label affixed to, one face of each insulation board.
- The Staccato T & G (T & G I, T & G II, T & G IIR) insulation boards are individually identified with the Atlas EPS name, the product type, the density, the evaluation report number (ESR-1962), and the name of the inspection agency (Underwriters Laboratories Inc. or RI Ogawa & Associates, Inc.).
- Staccato T & G (T & G I, T & G II, T & G IIR) and ThermalStar Underlayment insulation boards intended for use on walls required to be of noncombustible construction are also identified along one edge, and on the face of one board in each bundle, with the name of the exterior coating company and the company’s respective ICC-ES evaluation report number.
- Staccato EIFS insulation boards are individually identified by a label appearing on the edge of each insulation board, and on both faces of one board in each bundle, identifying the product type, the manufacturing plant designation, the ICC-ES evaluation report number (ESR-1962) and the name of the inspection agency (Underwriters Laboratories Inc. or RI Ogawa & Associates, Inc.).
- The ThermalStar 007 polyethylene tape is identified with the product name and the ICC-ES evaluation report number (ESR-1962).
- Insulation boards used for installations in attics and crawl spaces as described in Section 4.2.2 must be identified as being produced from BASF, Flint Hills Resources LP, Nova, or Styrochem beads.

TABLE 1—PRODUCT NAMES AND APPLICABLE USES

PRODUCT NAMES	SURFACE-BURNING CHARACTERISTICS	THERMAL PERFORMANCE (R-VALUE)	ROOFING APPLICATIONS WITHOUT A THERMAL BARRIER	TERMITE RESISTANCE	WATER RESISTIVE BARRIER
Staccato T & G, Staccato EIFS Board	✓	✓	—		—
Falcon Foam, ThermalStar and Elevation Expanded Polystyrene	✓	✓	—		—
ThermalStar D2D	✓	✓	✓		—
X-Grade TalonGUARD EPS	✓	✓	—	✓	—
ThermalStar Underlayment	✓	✓	—	—	✓

TABLE 2—R-VALUE (°F ft² h/Btu) AT 75°F MEAN TEMPERATURE

PROPERTY	TYPE I, T & G I, X-GRADE (TYPE I), STACCATO EIFS, D2D (TYPE I), THERMALSTAR UNDERLAYMENT	TYPE VIII, X-GRADE (TYPE VIII), D2D (TYPE VIII)	TYPE II, T & G II, T & G IIR, X-GRADE (TYPE II), D2D (TYPE II)	TYPE IX, X-GRADE (TYPE IX), D2D (TYPE IX)
Density, min., lb/ft ³ (kg/m ³)	0.90 (14.4)	1.15 (18.4)	1.35 (21.6)	1.80 (28.8)
Thermal resistance value, Per inch of thickness at 75°F. °F ft ² h/Btu (°K m ² /W)	3.60 (0.63)	3.80 (0.67)	4.00 (0.70)	4.20 (0.74)

For **SI**: 1 inch = 25.4 mm, 1 lb/ft³ = 16.02 kg/m³, 1°F·ft²·hr/Btu = 0.176 m²·K/W, 1°F = 1.8°C+32.

TABLE 3—PHYSICAL PROPERTIES OF THERMALSTAR UNDERLAYMENT EPS BOARDS

PROPERTY	THERMALSTAR UNDERLAYMENT
Minimum density, lb/ft ³ (kg/m ³)	0.9 (14.4)
Compressive strength @ 10% def., psi (kPa)	10 (69)
Flexural strength, psi (kPa)	38.9 (268)

For **SI**: 1 lb/ft³ = 16.02 kg/m³, 1°F·ft²·hr/Btu = 0.176 m²·K/W, 1 psi = 6.895 kPa.

TABLE 4—POTENTIAL HEAT OF INSULATION BOARD

C 578 TYPE ATLAS EPS	HEAT POTENTIAL (ENGLISH)	HEAT POTENTIAL (METRIC)
I	1500 Btu/ft ²	17.0 mJ/m ²
VIII	1875 Btu/ft ²	21.3 mJ/m ²
II	2250 Btu/ft ²	25.5 mJ/m ²
IX	3000 Btu/ft ²	34.0 mJ/m ²