



Valued Quality. Delivered.

DIVISION 07 00 00 – THERMAL AND MOISTURE PROTECTION

Section: 07 21 00 – Thermal Insulation

KINGSPAN INSULATION, LLC
2100 RIVEREDGE PARKWAY, SUITE 175
ATLANTA, GEORGIA 30328
(800) 241-4402
www.kingspaninsulation.us

REPORT SUBJECT:
GreenGuard® and GreenGuard® RCY Extruded Polystyrene Insulation Boards

1.0 SCOPE OF EVALUATION

This Research Report addresses compliance with the following Codes:

- 2015, 2012 and 2009 International Building Code® (IBC)
- 2015, 2012 and 2009 International Residential Code® (IRC)
- 2015, 2012 and 2009 *International Energy Conservation Code®* (IECC)
- 2014 Florida Building Codes (see Section 8.0)

The insulation boards described in this report have been evaluated for the following properties:

- Physical properties
- Surface-burning characteristics
- Thermal resistance (R-Value)
- Alternative to water-resistive barriers
- Air permeability

See Table 1 for applicable Code sections related to these properties.

2.0 USES

The GreenGuard® insulation board products described in this report are extruded polystyrene (XPS) foam plastic boards used as a non-structural thermal insulation in wall assemblies, ceiling/floor assemblies, door cavities, at the perimeter of foundations and basements, or in structures constructed in accordance with the IRC. The insulation boards may be used as an alternative to the water-resistive barrier required in IBC Section 1404.2 and IRC Section R703.2 when installed as described in Section 4.3.3.

The insulation boards may be used as air barrier materials when installed as described in Section 4.3.2.

3.0 DESCRIPTION

3.1 GreenGuard® and GreenGuard RCY:

The insulation boards comply with ASTM C578, Type IV (1.55 pcf minimum density) and Type VI (1.8 pcf minimum density), at 1 to 3 inch thicknesses.

3.2 Surface-Burning Characteristics:

The insulation boards have a flame-spread index of 25 or less and a smoke-developed index of 450 or less, when tested in accordance with ASTM E84 at a maximum thickness of 3 inches.

3.3 Thermal Resistance:

The insulation boards have a thermal resistance (R-Value) of 5.0 per inch of thickness.

3.4 Air Permeability:

The insulation boards, at a minimum thickness of 1 inch, are considered air-impermeable for installations in accordance with IBC Section 1203.3 (2015 only) and IRC Section R806.5 [2009 - R806.4], based on testing in accordance with ASTM E2178.

4.0 INSTALLATION

4.1 General:

The extruded polystyrene foam plastic insulation boards must be installed in accordance with the manufacturer's published installation instructions, the applicable Code, and this Research Report. The manufacturer's published installation instructions and this Research Report must be strictly adhered to, and a copy of the instructions must be available on the jobsite during installation.

4.2 Interior of Building Application:

The interior of the building must be separated from the insulation boards with a 15-minute thermal barrier as required by IBC Section 2603.4 and IRC Section R316.4 or as specifically permitted by R316.5.

4.3 Exterior of Building Application:

4.3.1 General: The insulation boards must not be used as a nailing base for exterior siding. Nailing of exterior siding must penetrate through the boards into the wall framing or structural sheathing. Fasteners for insulation boards that are thicker than 1-1/2 inches must be considered for lateral resistance to ensure support for the exterior wall covering. The insulation boards must not be used structurally to resist transverse, vertical or in-plane loads.

Wall bracing must be provided in accordance with the applicable Code.

The use of the insulation boards in areas of "very heavy" termite probability must comply with IBC Section 2603.8 [2012 - 2603.9] or IRC Section R318.4.

A water-resistive barrier must be provided in accordance with IBC Section 1404.2 or IRC Section R703.2 unless the insulation board is installed as described in Section 4.3.3.

4.3.2 Air Barrier: The insulation boards may be used as air barrier materials as defined in IRC Section N1101.6 and as permitted in IRC Table N1102.4.1.1, and in accordance with IECC Sections C402.5.1.2.1 [2012 - C402.4.1.2.1] and R402.4 (Table 402.4.1.1) [2009 - Table 402.4.2]. When used as an air barrier material, the insulation boards must be installed in accordance with the Kingspan Insulation, LLC installation instructions and this Research Report.

4.3.3 Alternative to Water-resistive Barrier: The GreenGuard® and GreenGuard® RCY Insulation Boards may be used as alternatives to the water-resistive barrier requirements of IBC Section 1404.2 and 2510.6, and IRC Section R703.2 when installed in accordance with Section 4.3.3.1.

4.3.3.1 Panels must be installed vertically. Vertical joints must occur over framing members or be backed. Gaps at penetrations must be sealed using a silicone sealant complying with ASTM C920, Type S, Grade NS, Class 25 or using an expanding spray foam sealant complying with AAMA 812. Horizontal and vertical insulation board joints must be sealed with GreenGuard® Seam Tape.

5.0 CONDITIONS OF USE

The GreenGuard® and GreenGuard® RCY insulation boards described in this Research Report comply with, or are suitable alternatives to, what is specified in those Codes listed in Section 1.0 and Table 1 of this report, subject to the following conditions:

5.1 Installation must comply with this Research Report, the manufacturer's published installation instructions and the applicable Code. In the event of a conflict between the manufacturer's instructions and this report, this report governs.

5.2 The insulation boards must be covered with an approved exterior wall covering in accordance with the applicable Code.

5.3 The insulation boards must be covered with an approved interior 15-minute thermal barrier in accordance with the applicable Code.

5.4 The insulation boards are produced in Winchester, VA under a quality control program with inspections by Intertek (AA-647).

6.0 SUPPORTING EVIDENCE

6.1 Reports of tests in accordance with ASTM C578, ASTM E2178, and ASTM E84.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015.

6.3 Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation Used as Water-resistive Barriers (AC71), dated February 2003 (editorially revised November 2013).

6.4 Intertek Listing Report ["Kingspan - GreenGuard Insulation Boards"](#).

7.0 IDENTIFICATION

The GreenGuard® and GreenGuard® RCY insulation boards described in this Research Report are identified by a marking on the product or packaging label bearing the report holder's name (Kingspan Insulation, LLC), the flame-spread and smoke-developed indices, the manufacturing location, the date of manufacture, the Intertek Mark, and the Code Compliance Research Report number (CCRR-1021).

8.0 FLORIDA BUILDING CODE

8.1 Scope of Evaluation:

The GreenGuard® and GreenGuard® RCY insulation boards were evaluated for compliance with the 2014 *Florida Building Code – Building*, *Florida Building Code – Residential* and *Florida Building Code – Energy Conservation*.

8.2 Conclusion:

The GreenGuard® and GreenGuard® RCY insulation boards, described in Sections 2.0 through 7.0 of this Research Report, comply with the 2014 *Florida Building Code – Building*, *Florida Building Code – Residential* and *Florida Building Code – Energy*, subject to the following conditions:

- Use of the insulation boards for compliance with the High-Velocity Hurricane Zone provisions of the 2014 *Florida Building Code – Building* and the *Florida Building Code – Residential* has not been evaluated, and is outside the scope of this Research Report.
- Use as air-impermeable insulation in unvented attic and unvented enclosed rafter assemblies is not permitted in the *Florida Building Code – Building* (reference IBC Section 1203.3).
- The foam plastic shall be installed in accordance with FBC – Building Section 2603.9 and FBC – Residential Section R318.5
- Intertek is a quality assurance entity approved by the Florida Building Commission.

9.0 CODE COMPLIANCE RESEARCH REPORT USE

9.1 Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

9.2 Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

9.3 Reference to the [Intertek website](#) is recommended to ascertain the current version and status of this report.

This Code Compliance Research Report ("Report") is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Report. Only the Client is authorized to permit copying or distribution of this Report and then only in its entirety, and the Client shall not use the Report in a misleading manner. Client further agrees and understands that reliance upon the Report is limited to the representations made therein. The Report is not an endorsement or recommendation for use of the subject and/or product described herein. This Report is not the Intertek Listing Report covering the subject product and utilized for Intertek Certification and this Report does not represent authorization for the use of any Intertek certification marks. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

TABLE 1A – PROPERTIES EVALUATED – 2015 I-Codes and 2014 Florida Building Code

PROPERTY	IBC	FBC – BUILDING	IRC	FBC – RESIDENTIAL	IECC	FBC - ENERGY
Physical properties	Not required	Not required	Not required	Not required	Not required	Not required
Surface-burning characteristics	2603.3	2603.3	R316.3	R316.3	Not applicable	Not applicable
Thermal resistance	1301	1301	N1101.10	See FBC - Energy	C303.1.1, C303.1.4, R303.1.1.1, R303.1.1.4	C303.1.1, C303.1.4, R303.1.1.1, R303.1.1.1.2
Water-resistive barrier	1404.2	1404.2	R703.2	R703.2	Not applicable	Not applicable
Air permeability	1203.3, 1301	1301	R806.5	R806.5	C402.4.1.2.1, R402.4 Table R 402.4.1.1	C402.4.1.2.1, R402.4 Table R402.4.1.1

TABLE 1B – PROPERTIES EVALUATED – 2012 and 2009 I-Codes

PROPERTY	IBC ¹	IRC ¹	IECC ¹
Physical properties	Not required	Not required	Not required
Surface-burning characteristics	2603.3	R316.3	Not applicable
Thermal resistance	1301	N1101.12 N1102 [N1101.1]	C303.1.1 C303.1.4 R303.1.1 R30301.4 [102.1.1 102.2.11]
Water-resistive barrier	1404.2	R703.2	Not applicable
Air permeability	1301	IRC: R806.5 [R806.4]	IECC: C402.4 and R402.4

¹Section numbers in parenthesis apply to the 2009 Codes, where different.