

ICC-ES Evaluation Report

ESR-2043

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This report is subject to re-examination in two years.

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 22 00—Roof and Deck Insulation

REPORT HOLDER:

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EVALUATION SUBJECT:

ACH ROOF INSULATION FOR USE IN ROOFING SYSTEMS DIRECTLY APPLIED TO STEEL ROOF DECKS

1.0 EVALUATION SCOPE
Compliance with the following code:

 2006 *International Building Code*® (IBC)

Property evaluated:

Elimination of the thermal barrier when application is directly to steel roof decks.

2.0 USES

ACH Foam Technologies roof insulation is used as part of a roof covering system applied directly over steel roof decks.

3.0 DESCRIPTION
3.1 General:

ACH Foam Technologies roof insulation is an expanded polystyrene (EPS) insulation board that is used as a component of a Class A, B, or C roof covering installed on steel decks without a thermal barrier in accordance with IBC Section 2603.4.1.5, when installation is in accordance with Section 4.0 of this report.

3.2 Materials:

3.2.1 Steel Deck: Steel roof decking must be minimum No. 22 gage [0.030 inch (0.76 mm) base-metal thickness], 1½-inch-deep (38 mm), unperforated, painted or 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.

3.2.2 Foam Plastic Insulation: The roof insulation is recognized in [ESR-1006](#) and has nominal densities of 1.0, 1.25, 1.50 or 2.0 pcf (16, 20, 24 and 32 kg/m³). The insulation boards are 4 feet (1219 mm) wide and 4 or 8

feet (1219 or 2438 mm) long, and are available in thicknesses with 1/8-inch (3.2 mm) increments. Maximum thickness is as noted in Table 1.

3.2.3 Cover Board: When used, the cover board in the roof covering assembly is 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 complying with ASTM C 208.

3.2.4 Roof Covering: The roof covering membrane must be a mechanically attached, fully adhered or ballasted EPDM or thermoplastic membrane listed in a current ICC-ES evaluation report as part of a Class A, B, or C roof covering assembly. Thermoplastic membranes include polyvinyl chloride (PVC), modified PVC, chlorosulphonated polyethylene (CSPE), and thermoplastic polyolefin (TPO). The membrane is limited to a maximum nominal thickness of 0.045 inch (1.1 mm). The evaluation report on the roof covering assembly must specify one of the following assemblies as the only components of the classified roof covering assembly permitted under the conditions of this report:

- A generic EPS insulation board having the same density and installed thickness as the ACH Foam Technologies roof insulation listed in Table 1 of this report, the cover board described in Section 3.2.3, and the roof covering membrane described in this section (Section 3.2.4), installed over a steel deck as described in Section 3.2.1.
- A generic EPS insulation board having the same density and installed thickness as the roof insulation listed in this report, the roof covering membrane described in this section (Section 3.2.4), and stone ballast, installed over a steel deck as described in Section 3.2.1.

4.0 INSTALLATION
4.1 General:

The ACH Foam Technologies roof insulation boards are loosely laid directly over the steel deck in single or multiple layers, up to the maximum total thickness based on classification and density as noted in Table 1. The top layer of insulation must be placed so that the labeling required in Section 7.0 is facing up. Tapered roof insulation boards may be installed, provided the maximum allowable thickness is not exceeded. The cover board described in Section 3.2.3, when required, is laid over the insulation. The method of attaching the roof covering, cover boards, 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 3.2.4 of this report.

4.2 Reroofing:

When applying new roofing over existing roof covering assemblies, the components of the existing roofing that are to remain on the roof deck must be inspected in accordance with IBC Section 1510. Additional roof insulation may be added over existing roof insulation, provided inspection indicates the existing EPS is sound material, the density of the EPS being added is equal to the density of the existing EPS, the existing EPS meets the requirements of this report, and the total thickness of the existing EPS plus the new EPS being added conforms to Table 1. The existing roof covering and, if necessary, the cover board must be removed before new roofing materials, having characteristics specifically described in this report, can be installed.

5.0 CONDITIONS OF USE

The ACH Foam Technologies roof insulation described in this report complies with, or is a suitable alternative to what is specified in, the code indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1 The manufacturer’s published installation instructions and this report must be strictly adhered to, and a copy of the instructions must be available on the jobsite at all times during installation. If there is a conflict between the manufacturer’s instructions and this report, the most restrictive governs.
- 5.2 Evaluation of the roof covering system for Class A, B, or C classification in accordance with ASTM E 108 or UL 790 is outside the scope of this report. The roof covering must be recognized in a current ICC-ES evaluation report as noted in Section 3.2.4 of this report.

5.3 Reroofing must be applied as described in Section 4.2 of this report.

5.4 Permanent placards bearing the following words must be attached to roof hatches and where other roof access is located: “This roof covering includes foam plastic insulation applied directly to a steel deck. The existing roofing membrane, slip sheets, and cover boards must be removed before reroofing. Limits also exist for cover boards and membranes. See ICC-ES evaluation report ESR-2043 before reroofing.”

6.0 EVIDENCE SUBMITTED

- 6.1 Test reports in accordance with UL 1256.
- 6.2 A quality control manual.

7.0 IDENTIFICATION

The edge of each EPS insulation board is marked with the ACH Foam Technologies name, the plant identification number, the name of the inspection agency (Underwriters Laboratories Inc.), the words Flint Hills Resources “NOVA” or “BASF,” the number of this evaluation report (ESR-2043), and [“ESR-1006.”](#)

Additionally, one face of each insulation board has printed on it, or on a permanent label affixed to it, the wording “When used in reroofing application, limits exist for cover board and membrane. See ICC-ES evaluation report ESR-2043 before reroofing” and the words “THIS SIDE UP.”

TABLE 1—MAXIMUM DENSITY AND THICKNESS

MAXIMUM DENSITY (pcf)	MAXIMUM THICKNESS (inches)
1.00	9.0
1.25	7.2
1.50	6.0
2.00	4.5

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³.