

September | October 2015

Vol. 6 | Issue 5

Roofing

THE INDUSTRY'S VOICE

A+ Educational Projects

→ HUTCHINSON FILES

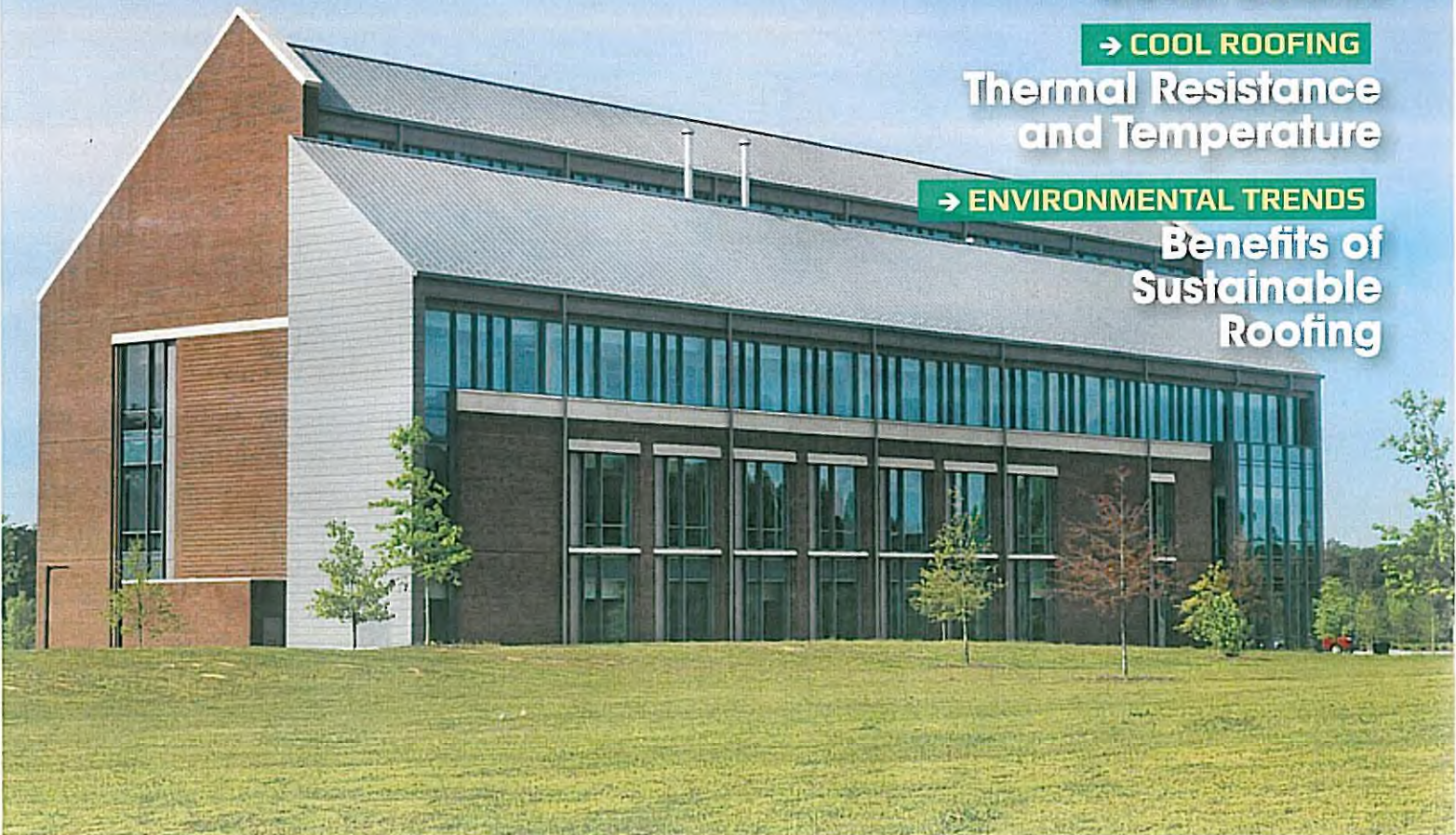
All About
Cover Boards

→ COOL ROOFING

Thermal Resistance
and Temperature

→ ENVIRONMENTAL TRENDS

Benefits of
Sustainable
Roofing



RAISE THE ROOF

WRITTEN BY CHRISTINA KOCH

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Learning and Trying New Things

The start of a new school year is always an exciting time. As I see my friends post photos on Facebook of their kids' first days of school, I am reminded of the excitement I felt way back when. I loved wearing a new outfit, seeing friends I hadn't seen in awhile and anticipating all the fun—and learning—in the year ahead. In a way, I get to recreate those feelings each time I put together a new issue of *Roofing*. I'm continually learning about the industry and this issue is no different.

For example, in "From the Hutchinson Files," Thomas W. Hutchinson, AIA, FRCI, RRC, CSI, RRP, principal of Hutchinson Design Group, Barrington, Ill., and a *Roofing* editorial advisor, explains the virtues of cover boards. As he points out in his article, the use of cover boards can now be considered a good roofing practice. See why on page 60.

Meanwhile, Jared O. Blum, president of the Polyisocyanurate Insulation Manufacturers Association, Bethesda, Md., explains a new white paper about polyisocyanurate insulation R-values in "Cool Roofing". He states the R-value of polyiso roof insulation is reduced at some point at lower temperatures, but within any reasonable temperature range associated with typical building operating conditions in almost any climate in North America the difference appears to be very small. Learn more on page 52.

In addition, we here at *Roofing* like to learn and try new things. As a result, this issue is interactive! Please download the free Layar Augmented Reality app, which was designed to bring print to life. Then hover

over page 45 with your smartphone or tablet to view a video about Virginia Polytechnic Institute and State University's Indoor Practice Facility in Blacksburg, Va., which features almost 1,000 squares of 238-foot-long, curved, standing-seam metal panels. We're really excited about this new capability and would love to know what you think. [R](#)

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If you enjoyed reading this issue, please consider submitting something for the next one. Let's talk about ideas! Call me at (630) 308-4602; email me at christina@roofingmagazine.com; post a comment on our website; and/or Facebook and tweet us. This magazine—and your peers—are counting on you!

Roofing

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Roofing welcomes letters to the editor. Letters must be signed and include a return address/email and telephone number. *Roofing* reserves the right to edit letters for clarity and length. Send letters to Christina@RoofingMagazine.com.

MAGAZINE STAFF

PUBLISHER **BARRETT HAHN**
Barrett@RoofingMagazine.com

EDITOR IN CHIEF **CHRISTINA KOCH**
Christina@RoofingMagazine.com

EDITORIAL ASSISTANT **ELIZABETH BROOKS**

VP OF BUSINESS DEVELOPMENT **JOHN RIESTER**
John@RoofingMagazine.com

MEDIA SALES **DAN BURKE**
Dan@BurkeMediaGroup.com

ADVISORY BOARD

ANDY BAKER
Baker Roofing Co.

CHUCK HOWARD, P.E.
Metal Roof Consultants

THOMAS W. HUTCHINSON, AIA, FRCI, RRC, CSI, RRP
Hutchinson Design Group Ltd.

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FROM THE HUTCHINSON FILES

WRITTEN BY THOMAS W. HUTCHINSON, AIA, FRCI, RRC, CSI, RRP

COVER BOARDS

The Membrane and Insulation Protector



High-density polyisocyanurate is gaining fans with its light weight and ease of handling. In this photo, it is being mechanically fastened in a RhinoBond application.

Continuing on our roof system component analysis—after discussion of the roof deck, substrate board, vapor retarders and insulation—we now have worked our way up to the cover board. For the purpose of this discussion, the cover board is defined as the board placed upon the insulation as the final substrate to which the roof cover will be placed.

The purpose of the cover board is multifaceted; it can include:

- **Insulation Protection:** Placed to protect the thermal layer from the often deleterious effects of repeated foot

traffic, which can result in insulation crushing, loss of roof-cover adhesive, inability to resist wind uplift and mechanical-fastener puncture through the membrane.

- **Enhanced Roof-cover Adhesion:** Cover boards can enhance the bond between the roof cover to the substrate.
- **Enhanced Resistance to Wind Uplift:** Cover boards and their ability to enhance the bond of the roof cover to the underlying substrate can result in an increased wind-uplift rating above and beyond that which can be provided with organic-faced insulations.

PHOTO: CLARK ROOFING

continues on page 62



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They reduce the possible effects of facer-sheet delamination.

- ◆ **Enhanced Fire Resistance:** Many cover boards will enhance the fire resistance of the assembly.
- ◆ **Hail Protection:** Numerous studies show the value of cover boards in enhancing a roof cover's ability to resist damage by hail.

MORE FROM HUTCH

"Roofs Are Systems", January/February 2014, page 52, or bit.ly/1hBr2db

"Roof Decks", March/April 2014, page 54, or bit.ly/1kEsPxm

"Substrate Boards", July/August 2014, page 52, or RoofingMagazine.com/substrate-boards

"Vapor Retarders", September/October 2014, page 52, or RoofingMagazine.com/vapor-retarders

"Insulation", November/December 2014, page 50, or RoofingMagazine.com/insulation

"Wind-damaged Roof Systems", January/February 2015, page 60, or RoofingMagazine.com/wind-damaged-roof-systems

◆ **Provides Separation:** A cover board provides separation between a roof cover and insulation that may not be compatible or the attachment adhesive of the roof membrane is not compatible with the insulation.

◆ **Reduces Thermal Shorts (Energy Loss):** Thermal insulation is often attached to the roof deck with mechanical fasteners, which results in conductive heat loss, up to 7 percent according to the Rosemont, Ill.-based National Roofing Contractors Association. This is a large value when some roof covers, which utilize mechanical attachment, purport to provide energy savings. Furthermore, when only one layer of insulation is used (a cardinal sin in my opinion) an additional 7 to 8 percent energy loss can occur. Placing a cover board above mechanically attached insulation and/or a single layer of insulation will enhance the energy performance of the roof system.

◆ **Enhance Roof-system Performance:** I firmly believe the use of a roof cover board in a roof system improves the overall performance of the roof system and increases the probability of the roof attaining a long-term service

continues on page 64



Asphaltic core boards are very flexible and will conform to irregular surfaces and offsets without fracture. Here crews work to install the cover board in bead-foam adhesive in preparation for the three-ply modified bitumen roof cover.

life, which is the essence of sustainability. NRCA agrees; the organization recommends the use of cover boards in all low-slope assemblies.

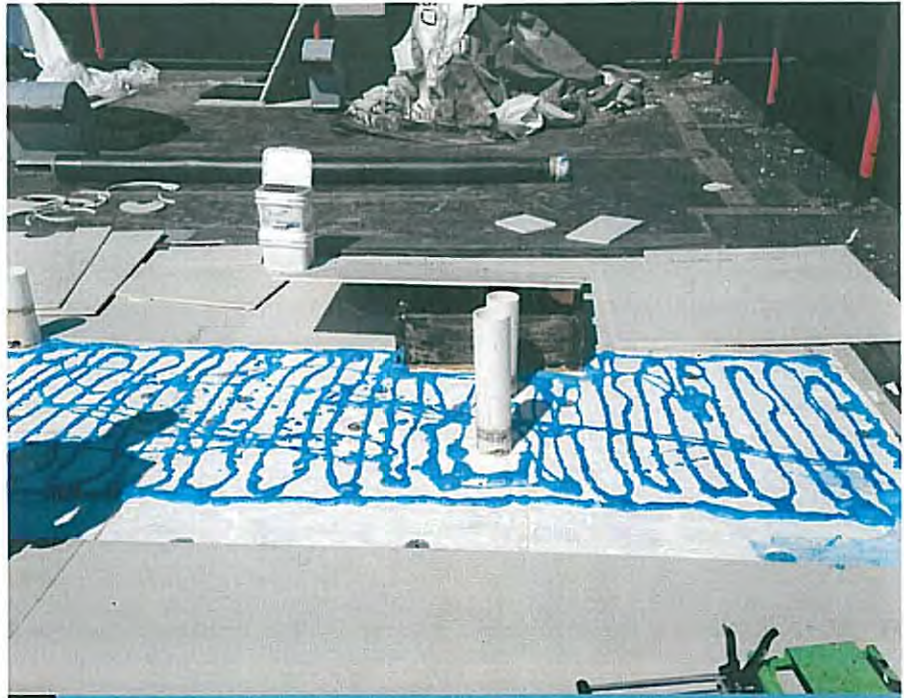
COVER-BOARD SELECTION

The first requirement of a cover board is that it be compatible with the roof-cover material, installation method and approved by the membrane manufacturer as an appropriate substrate. Additionally, it must be compatible with the adhesive and attachment method. The project conditions, building type, use, time of year for installation and weather conditions also need to be considered. My firm predominately specifies the cover board be provided by the membrane manufacturer to ensure compatibility and a clear line of liability if concerns should arise.

TYPES

There are numerous cover boards from which to choose. For decades, the industry

continues on page 66



High-density polyisocyanurate can also be set in polyurethane foam adhesive.

PHOTO: HUTCHINSON DESIGN GROUP LTD.

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cover-board workhorses were perlite and high-density fiberboard that worked well with bituminous products and hot-asphalt attachment. As the single-ply market matured, the need for a less fibrous cover board rose. In response, modified gypsum cover boards were developed.

Following are the most common cover boards in use today:

Glass-mat-faced and Fiber-reinforced Gypsum: Gypsum boards had been used in the roofing industry as a substrate and cover board but lacked resistance to moisture and the paper facer often proved problematic. Atlanta-based Georgia-Pacific and Chicago-based USG Corp. developed modified gypsum boards that have integral moisture resistance and no paper facer. They are produced in various thicknesses:

1/4, 3/8, 1/2 and 5/8 inch. The integral nature of the board makes it an excellent substrate to which a single-ply membrane can be adhered. They are produced in 4- by 4-foot and 4- by 8-foot sizes. The packaging of these boards can become quite heavy. I suggest the pallets be split prior to placement on the roof and then spread out on the roof to avoid overloading.

High-density Wood Fiber: Composed of compressed wood fiber, these boards are hydroscopic and need close attention in the field and during installation to prevent moisture absorption. Typical thicknesses are 1/2 inch and sizes are 4 by 4 foot and 4 by 8 foot.

High-density Polyisocyanurate Insulation: Through technology, and with

consideration for worker ergonomics, polyiso manufacturers developed thin polyisocyanurate boards of high density, approaching 100 psi. The boards are light and easy to install. The facer on these boards is a double-coated fiberglass, which is resistant to mold and provides a good surface to which to bond.

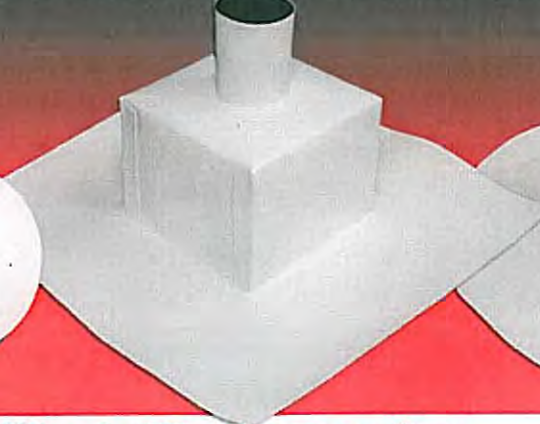
Perlite: Perlite is one of the oldest cover boards. Manufactured of expanded perlite, the board is inert and is a good fit in asphalt attachment. The board's small size of 2 by 4 feet makes installation easy.

Plywood/OSB Board: While not often used, plywood and oriented strand board are used when a high degree of wind-uplift resistance and/or roof-cover support is required.

Cement Board: This is a newer cover-board product. It is non-combustible and moisture resistive and tends to be designed for conditions of periodic wetting potential.

Like insulation, the attachment of the cover board is critical to the system's success.

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Placing a cover board above mechanically attached insulation and/or a single layer of insulation will enhance the energy performance of the roof system.

Asphaltic Core Board: These boards are thin (1/8 and 1/4 inch) and are semi-rigid. They actually are quite flexible, which allows for conformance over irregular surfaces without fracturing. They are utilized in bituminous applications (see photo, page 62).


ATTACHMENT METHODS

Cover boards, like all components of a roof system, need to be compatible with

the insulation, roof membrane and attachment methods. Attachment methods include hot asphalt, cold adhesive, bead polyurethane foam and spray polyurethane foam, as well as mechanical attachment.

The method of attachment selected should be based on the roof-deck type, roof-system components, design requirements and the roof-cover type. Like insulation, the attachment of the cover board is critical to the system's success. As with insulation, when cover boards are placed in an adhesive, they must be fully embedded in the adhesive and not just "stepped in" place. Instead, they must be weighted in until the adhesive is set. I specify 35-pound weight (the weight of a full 5-gallon adhesive can) at each board corner and in the center. Cover boards can cup and, if only stepped in place, will often cup upward out of the adhesive, resulting in a cover board and, ultimately, a roof cover that is not adhered and, therefore, susceptible to wind uplift.

GOOD PRACTICE

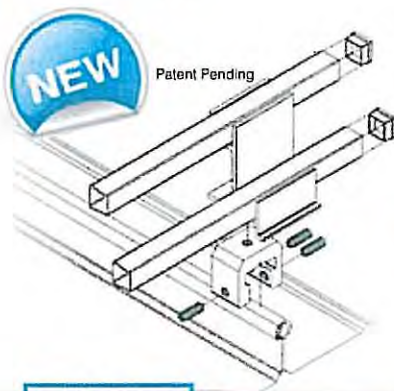
Cover boards are an important and integral part of the roof system and when properly specified and installed will enhance the roof system's ability to achieve a greater service life and reach sustainability. Cover boards' use can now be considered good roofing practice. 

→ LEARN MORE

Additional Information can be found in the *NRCA Waterproofing Manual*, NRCA.net/store/detail/the-nrca-waterproofing-manual/353. Read articles by Dr. James Hoff, "The Sustainable Roof Cover Board", *Roofing Contractor*, April 2015, and Jason Wilen, "Covering Your Options", *Professional Roofing*, May 2014. Also, view various cover-board manufacturers' product data sheets.



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