NRLRC
National Roofing Legal Resource Center

Roofing Issues: Decks to Dockets
September 18-21, 2018 – New York, NY

Emerging Technical Issues Posing Liability Risks to Roofing Contractors

presented by

Mark S. Graham
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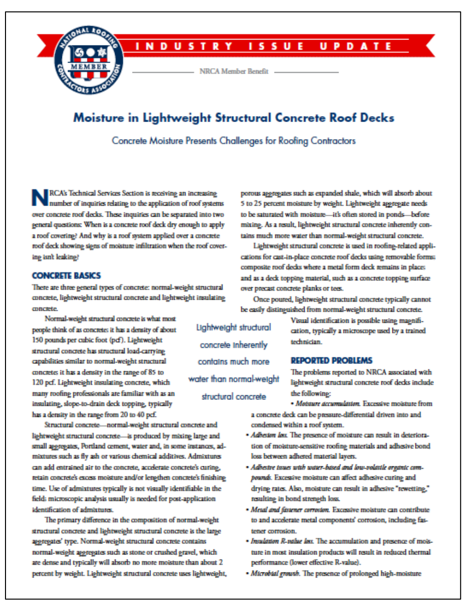
National Roofing Contractors Association (NRCA)

<u>Topics</u>

- Moisture in concrete roof decks (an update)
- Field uplift testing
- Polyiso. use
- Coverboard use
- Questions…. and additional topics

Moisture in concrete roof decks

NRCA Industry Issue Update, August 2013



INDUSTRY ISSUE UPDATE

NRCA Member Benefit

Moisture in Lightweight Structural Concrete Roof Decks

Concrete Moisture Presents Challenges for Roofing Contractors

NRCA's Technical Services Section is receiving an increasing number of inquiries relating to the application of roof systems over concrete roof decks. These inquiries can be separated into two general questions: When is a concrete roof deck dry enough to apply a roof covering? And why is a roof system applied over a concrete roof deck showing signs of moisture infiltration when the roof covering isn't leaking?

CONCRETE BASICS

There are three general types of concrete: normal-weight structural concrete, lightweight structural concrete and lightweight insulating concrete.

Normal-weight structural concrete is what most people think of as concrete; it has a density of about 150 pounds per cubic foot (pcf). Lightweight structural concrete has structural load-carrying capabilities similar to normal-weight structural concretes; it has a density in the range of 85 to 120 pcf. Lightweight insulating concrete, which many roofing professionals are familiar with as an insulating, slope-to-drain deck topping, typically has a density in the range from 20 to 40 pcf.

Structural concrete—normal-weight structural concrete and lightweight structural concrete—is produced by mixing large and small aggregates, Portland cement, water and, in some instances, admixtures such as fly ash or various chemical additives. Admixtures can add entrained air to the concrete, accelerate concrete's curing, retain concrete's excess moisture and/or lengthen concrete's finishing time. Use of admixtures typically is not visually identifiable in the field; microscopic analysis usually is needed for post-application identification of admixtures.

The primary difference in the composition of normal-weight structural concrete and lightweight structural concrete is the large aggregates' type. Normal-weight structural concrete contains normal-weight aggregates such as stone or crushed gravel, which are dense and typically will absorb no more moisture than about 2 percent by weight. Lightweight structural concrete uses lightweight, porous aggregates such as expanded shale, which will absorb about 5 to 25 percent moisture by weight. Lightweight aggregate needs to be saturated with moisture—it's often stored in ponds—before mixing. As a result, lightweight structural concrete inherently contains much more water than normal-weight structural concrete.

Lightweight structural concrete is used in roofing-related applications for cast-in-place concrete roof decks using removable forms; composite roof decks where a metal form deck remains in place; and as a deck topping material, such as a concrete topping surface over precast concrete planks or tees.

Once poured, lightweight structural concrete typically cannot be easily distinguished from normal-weight structural concrete. Visual identification is possible using magnification, typically a microscope used by a trained technician.

Lightweight structural concrete inherently contains much more water than normal-weight structural concrete

REPORTED PROBLEMS

The problems reported to NRCA associated with lightweight structural concrete roof decks include the following:

- *Moisture accumulation.* Excessive moisture from a concrete deck can be pressure-differential driven into and condensed within a roof system.
- *Adhesion loss.* The presence of moisture can result in deterioration of moisture-sensitive roofing materials and adhesive bond loss between adhered material layers.
- *Adhesive issues with water-based and low-volatile organic compounds.* Excessive moisture can affect adhesive curing and drying rates. Also, moisture can result in adhesive "rewetting," resulting in bond strength loss.
- *Metal and fastener corrosion.* Excessive moisture can contribute to and accelerate metal components' corrosion, including fastener corrosion.
- *Insulation R-value loss.* The accumulation and presence of moisture in most insulation products will result in reduced thermal performance (lower effective R-value).
- *Microbial growth.* The presence of prolonged high-moisture

[Link]

Concrete moisture-related issues

- Moisture accumulation
- Adhesion loss
- Water-based and LVOC adhesives issues
- Material degradation
- Metal and fastener corrosion
- Insulation R-value loss
- Microbial growth

PORTLAND CEMENT ASSOCIATION
RESEARCH AND DEVELOPMENT LABORATORIES
Development Department • Bulletin D89

Table 1 Drying time in days at 73 F and 50% relative Humidity for a 4-inch-thick specimen to reach 3 lbs/1,000 sq. ft./24 hrs.

Water-Cement Ratio	Bottom Sealed	Bottom Exposed to Water Vapor	Bottom in Contact with Water
0.4	46	52	54
0.5	85	144	199
0.6	117	365	>>365
0.7	130	>>365	>>365
0.8	148	>>365	>>365
0.9	166	>>365	>>365
1.0	190	>>365	>>365

***Concrete Floors and Moisture* (2008)**
Howard Kanare

A concrete slab will reach a 75% RH
- Normal weight structural concrete
  - Less than 90 days
- Lightweight structural concrete
  - Almost 6 months

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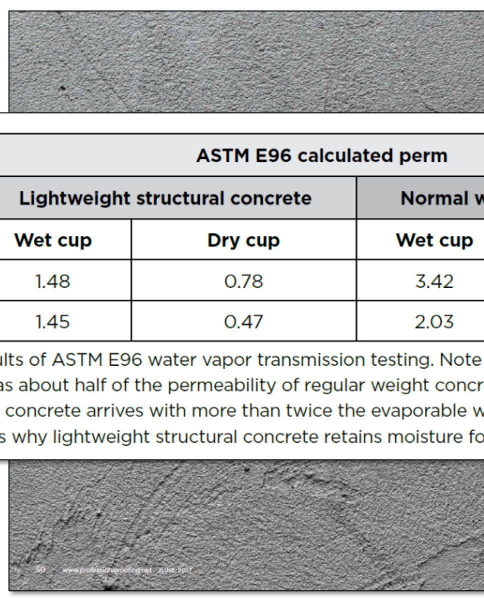
June 2017



	ASTM E96 calculated perm			
	Lightweight structural concrete		Normal weight concrete	
Age	**Wet cup**	**Dry cup**	**Wet cup**	**Dry cup**
28 days	1.48	0.78	3.42	1.05
60 days	1.45	0.47	2.03	1.13

The figure shows results of ASTM E96 water vapor transmission testing. Note the lightweight structural concrete has about half of the permeability of regular weight concrete. Considering lightweight structural concrete arrives with more than twice the evaporable water of regular weight concrete, this explains why lightweight structural concrete retains moisture for so long.

Re-think our concept of concrete roof decks

A concrete deck is not a non-breathable, non-absorptive solid

Re-think our concept of concrete roof decks

RESEARCH + TECH

Are admixtures the answer?

Moisture in concrete roof decks continues to be problematic

by Mark S. Graham

NRCA's Technical Services Section has been receiving inquiries regarding the use and effectiveness of specific concrete mix additives and topical surface treatments to address moisture release-related concerns with concrete roof decks. Such admixtures broadly are referred to as moisture vapor reduction admixtures (MVRAs) or porosity-inhibiting admixtures. NRCA provides recommendations regarding their use.

MVRAs

Concrete admixtures intended as MVRAs are specific chemicals added during concrete's batching and mixing to provide an additional chemical reaction during the concrete's hydration and curing process. MVRAs use the concrete mix's excess water and chlorides to create a calcium silicate hydrate gel within the concrete. The gel is said to fill the small pores and capillary openings in curing concrete, minimizing the concrete's ability to pass and release moisture vapor. The gel is intended to be permanent and integral throughout the concrete's entire thickness.

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Link

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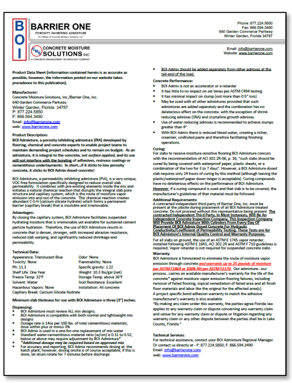
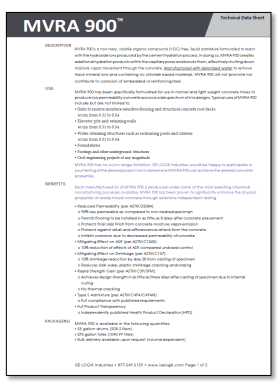
<u>Moisture vapor reduction admixtures (MVRAs)</u>





NRCA still has not seen an MVRA perform successfully in concrete <u>roof deck</u> applications

ASTM E96 testing of MVRA vs Non-MVRA concrete decks

Figure 1 – Roofing concrete cores without MVRA, samples 6-1 and 6-2

Figure 2 – Roofing concrete cores with MVRA, samples A-1 and A-2.

Figure 3 – Roofing concrete cores with MVRA, samples B-1 and B-2.

Without an MVRA

With an MVRA

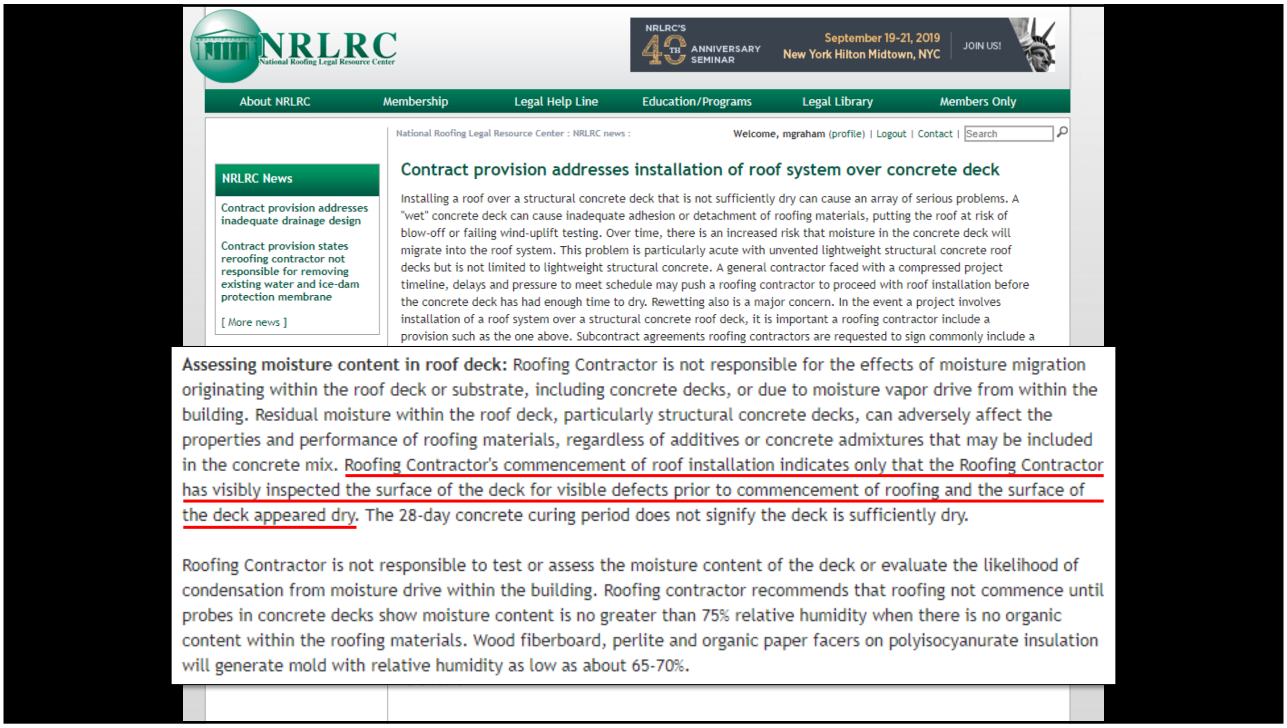
TABLE 2.1 SUMMARY OF AVERAGE WATER VAPOR TRANSMISSION PROPERTIES						
	SAMPLES 6-1 AND 6-2		SAMPLES A-1 AND A-2		SAMPLES B-1 AND B-2	
SAMPLE ID	6-1	6-2	A-1	A-2	B-1	B-2
Perm-in	1.9	1.8	3.7	3.4	3.7	3.8
Permeance for 25.4 mm (ng/Pa*s*m2)	108	101	214	195	210	215
Permeability (ng/Pa*s*m)	2.8	2.6	5.4	4.9	5.3	5.5

The specimens containing an MVRA have tested WVT values about two times (i.e., more “vapor open”) more than the specimens without the MVRA

Deck acceptance

Whose moisture is it in the concrete?

Why should we take responsibility (or incur liability) for someone else’s moisture?



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NRLRC News

Contract provision addresses inadequate drainage design

Contract provision states reroofing contractor not responsible for removing existing water and ice-dam protection membrane

[More news]

Contract provision addresses installation of roof system over concrete deck

Installing a roof over a structural concrete deck that is not sufficiently dry can cause an array of serious problems. A "wet" concrete deck can cause inadequate adhesion or detachment of roofing materials, putting the roof at risk of blow-off or failing wind-uplift testing. Over time, there is an increased risk that moisture in the concrete deck will migrate into the roof system. This problem is particularly acute with unvented lightweight structural concrete roof decks but is not limited to lightweight structural concrete. A general contractor faced with a compressed project timeline, delays and pressure to meet schedule may push a roofing contractor to proceed with roof installation before the concrete deck has had enough time to dry. Rewetting also is a major concern. In the event a project involves installation of a roof system over a structural concrete roof deck, it is important a roofing contractor include a provision such as the one above. Subcontract agreements roofing contractors are requested to sign commonly include a

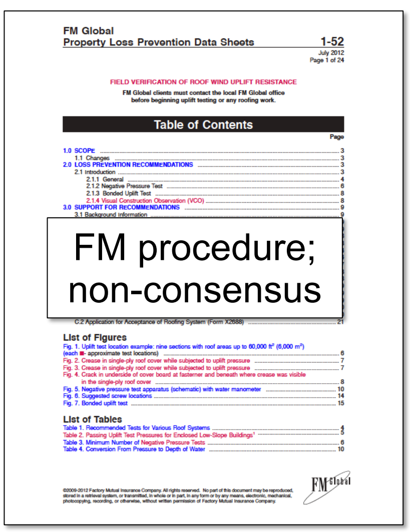
Assessing moisture content in roof deck: Roofing Contractor is not responsible for the effects of moisture migration originating within the roof deck or substrate, including concrete decks, or due to moisture vapor drive from within the building. Residual moisture within the roof deck, particularly structural concrete decks, can adversely affect the properties and performance of roofing materials, regardless of additives or concrete admixtures that may be included in the concrete mix. Roofing Contractor's commencement of roof installation indicates only that the Roofing Contractor has visibly inspected the surface of the deck for visible defects prior to commencement of roofing and the surface of the deck appeared dry. The 28-day concrete curing period does not signify the deck is sufficiently dry.

Roofing Contractor is not responsible to test or assess the moisture content of the deck or evaluate the likelihood of condensation from moisture drive within the building. Roofing contractor recommends that roofing not commence until probes in concrete decks show moisture content is no greater than 75% relative humidity when there is no organic content within the roofing materials. Wood fiberboard, perlite and organic paper facers on polyisocyanurate insulation will generate mold with relative humidity as low as about 65-70%.

Field uplift testing

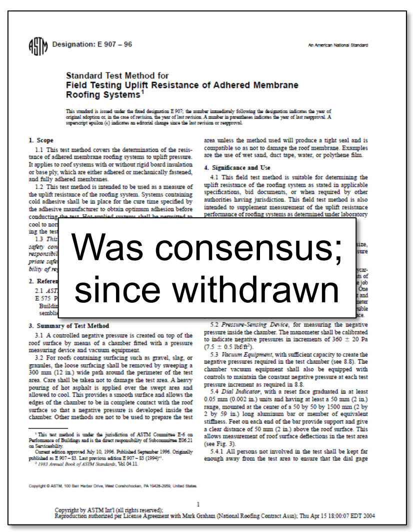
Link

Methods



FM procedure; non-consensus

FM 1-52



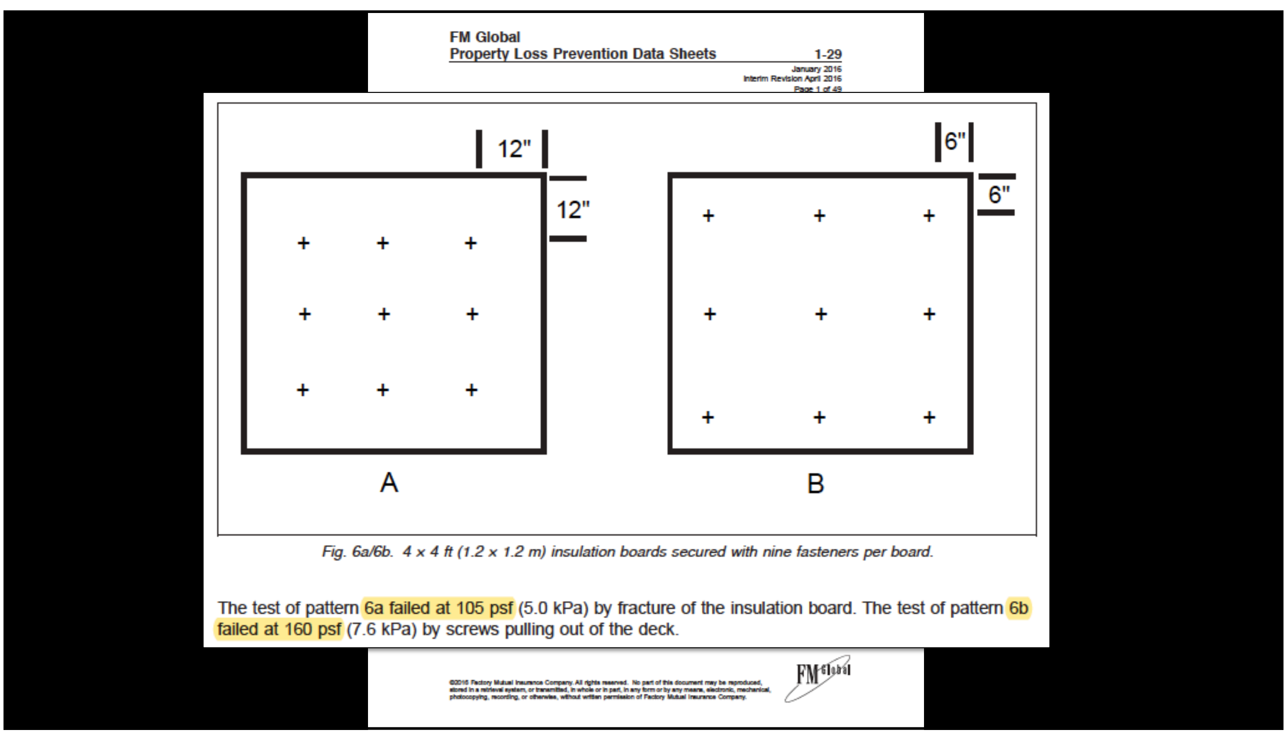
Was consensus; since withdrawn

ASTM E907

ASTM E907 is being re-drafted

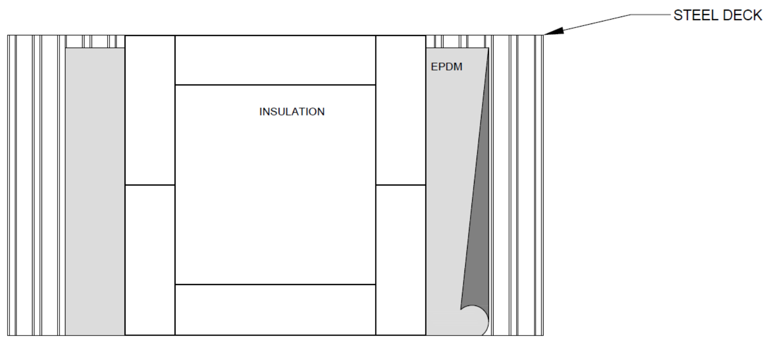
From the ASTM committee process…

- FM has acknowledged there is no correlation between their lab. testing and the 5’ x 5’ field test
- Allowable deflection limits will not be prescribed; will likely be as agreed upon by the “interested parties”
- ASTM test methods require a precision and bias statement; currently no data available



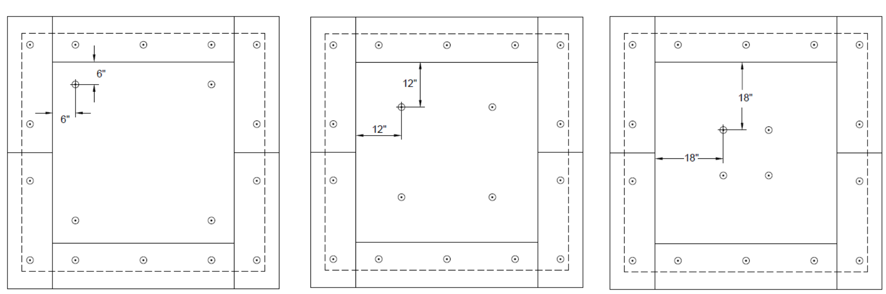
NRCA's laboratory testing

Controlled laboratory conditions



NRCA's laboratory testing

Controlled laboratory conditions

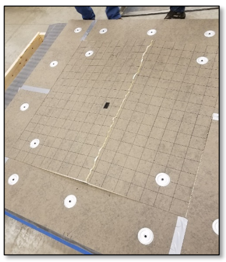


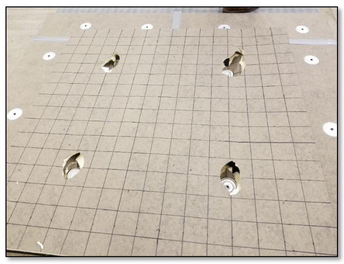
6" from edge **12" from edge** **18" from edge**

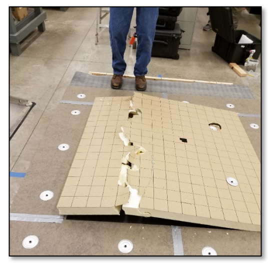
NRCA's laboratory testing -- Results

Controlled laboratory conditions

Condition	Fastener placement		
	6" from edge	12" from edge	18" from edge
Load a test failure	52.5 to 55 psf	60 to 75 psf	45 to 50 psf
Deflection at test failure	3¼" to 4"	2" to 5"	½" to 1"







NRCA's laboratory testing

Controlled laboratory conditions

Interim findings:

- Results are variable/not repeatable
- Differences in failure loads between 6" and 12" fastener offsets are not as large as is indicated in FM 1-29
- FM 1-52's ¼" to 1"/ASTM E907's 1"maximum allowable deflections appear arbitrary/very conservative

Recommendations

Field uplift testing

- Be knowledgeable and cautious….
- Consider contract provision language
  - See Industry Issue Update or NRLRC Contract Provisions
- In hurricane-prone regions consider alternative systems
  - Field uplift testing does not apply to mechanically-attached membrane systems
- Witness any testing and ask for/only act on written test reports
- Contact NRCA Technical Services

Polyiso. usage

TECH TODAY

Polyiso recommendations

The NRCA Roofing Manual provides guidance for polyisocyanurate insulation

by Mark S. Graham

In the U.S., various types, classes and grades of rigid board, faced, polyisocyanurate insulation are used as components of low-slope roof systems. *The NRCA Roofing Manual: Membrane Roof Systems—2015* provides NRCA's best practice guidelines for using specific polyisocyanurate insulation products in membrane roof systems. Following is an overview of some of these guidelines.

NRCA recommends designers specify a suitable cover board

ASTM C1289

The U.S. product standard for rigid board, faced, polyisocyanurate insulation is ASTM C1289-16a, "Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board." ASTM C1289 addresses 18 products. Within ASTM C1289, types, classes and grades differentiate various products.

NRCA recommends roof system designers use the complete ASTM C1289 designation (including type, class and grade) to clearly delineate the specific product intended.

R-value

ASTM C1289 requires polyisocyanurate insulation be tested and found to have the minimum thermal resistances (R-values) provided in ASTM C1289's Table 2—Thermal Resistance Properties. Also, product (board) or package marking must bear the product's tested R-value.

Instead of using R-value, U.S. polyisocyanurate insulation manufacturers are going to market using the long-term thermal resistance (LTTR) method for identifying polyisocyanurate insulation thermal resistance properties.

NRCA recommends designers specifying polyisocyanurate insulation determine roof system thermal resistance using an in-service R-value of 5.0 per inch. In NRCA's opinion, this design in-service R-value more closely represents conditions in the built environment than LTTR or tested R-value.

In addition to design in-service R-value, NRCA recommends designers specify polyisocyanurate insulation by its desired thickness and not LTTR or R-value to avoid possible confusion.

Application-specific guidance

Polyisocyanurate insulation is available in 4- by 4- and 4- by 8-foot board sizes. NRCA recommends roof system designers specify a maximum 4- by 4-foot board size for polyisocyanurate adhered to a substrate. The 4- by 8-foot size is appropriate for loosely laid and mechanically attached applications.

Available thicknesses range from 1 to 4 inches thick. When using flatstock polyisocyanurate insulation, NRCA recommends designers specify polyisocyanurate insulation be installed in multiple layers with a 1½-inch minimum and 2½-inch maximum thickness per layer.

Furthermore, NRCA recommends designers specify polyisocyanurate insulation be manufactured to have a minimum 20-psi compressive strength (Grades 2 or 3) and have facers that are compatible with the assembly method and other roof assembly components.

ASTM C1289, Type I (foil facers) products generally are used in wall sheathing applications and, because of their facers and compressive strengths, they are not considered to be appropriate for roofing applications.

ASTM C1289, Type II generally designates products appropriate for roofing applications. Type II, Class 1 (reinforced cellulosic mat facer) products may be suitable with all roof system types. NRCA recommends Type II, Class 2 (coated glass facer) products be used with single-ply membrane roof systems using water-based bonding adhesives. Type II, Class 3 (uncoated glass facer) products may be suitable with hot-applied built-up and polymer-modified bitumen roof systems. Type II also has a Class 4 that designates high-density polyisocyanurate panels intended for use as roof insulation cover boards at a maximum thickness of ½ of an inch.

ASTM C1289 also includes four additional product types (Type III, Type IV, Type V and Type VII) to address polyisocyanurate insulation-based composite board products.

NRCA recommends designers specify the use of a suitable cover board layer over polyisocyanurate insulation before roof membrane installation.

Additional information regarding using polyisocyanurate insulation in membrane roof systems is provided in *The NRCA Roofing Manual: Membrane Roof Systems—2015*'s Chapter 4—Rigid Board Insulation, Section 4.9—Polyisocyanurate.

ON the WEB

Descriptions of ASTM C1289's type, class and grade designations and links to additional information regarding polyisocyanurate insulation are accessible at www.professionalroofing.net.

MARK S. GRAHAM is NRCA's vice president of technical services.

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Link

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ASTM C1289's Types, Classes and Grades

TABLE 1 Physical Properties[A]

Product Type	Type I Class 1	Type I Class 2	Type II Class 1	Type II Class 2	Type II Class 3	Type II Class 4[B]	Type III	Type IV	Type V	Type VII
Facer covering one surface	See 4.1.1	See 4.1.1	See 4.1.2.1	See 4.1.2.2	See 4.1.2.3	See 4.1.2.4	Perlite insulation board	Cellulosic fiber insulating board	OSB or plywood	Glass mat faced gypsum board
Facer covering opposite surface	See 4.1.1	See 4.1.1	See 4.1.2.1	See 4.1.2.2	See 4.1.2.3	See 4.1.2.4	See 4.1.3	See 4.1.4	See 4.1.5	See 4.1.6
Physical Property										
Compressive Strength, psi (kPa), min										
	16 (110)	16 (110)	Grade 1 16 (110) Grade 2 20 (138) Grade 3 25 (172)	Grade 1 16 (110) Grade 2 20 (138) Grade 3 25 (172)	Grade 1 16 (110) Grade 2 20 (138) Grade 3 25 (172)	Grade 1 80 (551) Grade 2 110 (758) Grade 3 140 (965)	16 (110)	16 (110)	16 (110)	16 (110)
Dimensional Stability, Percent Linear Change, Thickness, max										
−40°F (−40°C)/ amb, RH	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
158°F (70°C)/ 97 % RH	4.0	4.0	4.0	4.0	4.0	4.5	4.0	4.0	4.0	4.0
200°F (93°C)/ amb RH	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Dimensional Stability, Percent Linear Change, length and width, max										
−40°F (−40°C) / amb RH	2.0	1.5	2.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0
158°F (70°C)/ 97 % RH	2.0	1.5	2.0	2.0	2.0	1.0	2.0	4.0	4.0	4.0
200°F (93°C)/ amb, RH	4.0	1.5	2.0	2.0	2.0	1.0	2.0	4.0	4.0	4.0
Flexural Strength (modulus of rupture)										
psi (kPa), min	40 (275)	40 (275)	40 (275)	40 (275)	40 (275)	400 (2750)	40 (275)	40 (275)	40 (275)	40 (275)
(Break load) lbf (N), min	8 (35)	8 (35)	17 (75)	17 (75)	17 (75)	20 (89)	17 (75)	17 (75)	17 (75)	17 (75)
Tensile strength, psf (kPa), min Perpendicular to board surface										
	500 (24)	500 (24)	500 (24)	500 (24)	500 (24)	2000 (95)	500 (24)	500 (24)	500 (24)	500 (24)
Water absorption 2h percent by volume, max										
	1.0	1.0	1.5	1.5	2.0	4.0	2.0	2.0	1.0	1.0
Water vapor permeance, perm (ng/Pa·s·m²), max										
	0.3 (17.2)	0.3 (17.2)	1.5 (85.8)	4.0 (228.8)	8.0 (457.6)	1.5 (85.5)	8.0 (457.6)	[C]	[C]	[C]

[A]Core foam thickness and facer type, thickness, and permeance can all influence the magnitude of values measured for the above physical properties. A product with a nominal 1 in. foam core (except for Type II, Class 4) with the facers on has been described for referee purposes. Consult manufacturers regarding specific foam-facer composite products (Types III, IV, V, and VII) and other product thicknesses. When appropriate, physical property values as agreed between buyer and seller shall replace those listed in Table 1 as qualification requirements described in 10.3.

[B]Products made at a maximum thickness of 0.5 in. (12.7 mm).

[C] Not applicable.

Polyiso. facer usage recommendations

The NRCA Roofing Manual: Membrane Roof Systems-2019

- Foil facers (Type I):
  - Wall assemblies
- Reinforced cellulosic facers (Type II, Class 1):
  - Most common facer
  - Hot-applied systems
  - Not recommended for water-based or LVOC adhesives

ASTM C1289, Type II, Class 1 facer

Raw material

Finished product

Polyiso. facer usage recommendations

The NRCA Roofing Manual: Membrane Roof Systems-2019

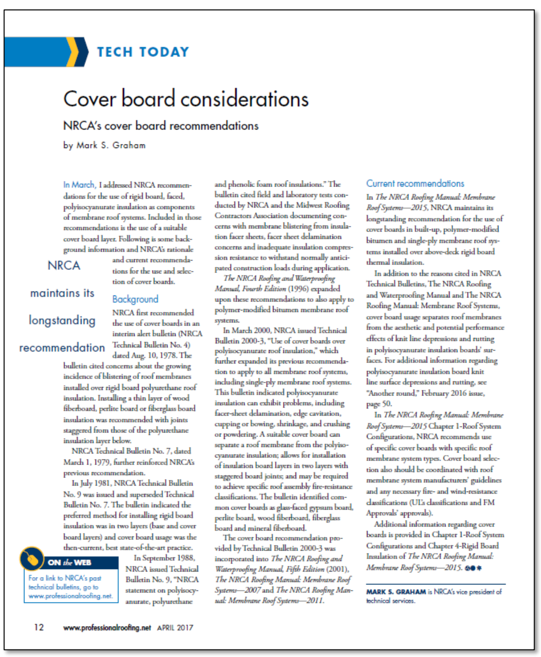
- Foil facers (Type I):
  - Wall assemblies
- Reinforced cellulosic facers (Type II, Class 1):
  - Most common facer
  - Hot-applied systems
  - Not recommended for water-based or LVOC adhesives
- Coated glass facers (Type II, Class 2):
  - Generally the same facer used on HD polyiso. (Type II, Class 4)
  - Adhesive-applied systems
- Uncoated glass facers (Type II, Class 3):
  - Hot-applied systems

Polyiso. usage

NRCA recommends the use of a suitable coverboard over polyiso. insulation

--The NRCA Roofing Manual-Membrane Roof Systems-2019

Coverboard usage



TECH TODAY

Cover board considerations

NRCA's cover board recommendations

by Mark S. Graham

In March, I addressed NRCA recommendations for the use of rigid board, faced, polyisocyanurate insulation as components of membrane roof systems. Included in those recommendations is the use of a suitable cover board layer. Following is some background information and NRCA's rationale and current recommendations for the use and selection of cover boards.

NRCA maintains its longstanding recommendation

Background

NRCA first recommended the use of cover boards in an interim alert bulletin (NRCA Technical Bulletin No. 4) dated Aug. 10, 1978. The bulletin cited concerns about the growing incidence of blistering of roof membranes installed over rigid board polyurethane roof insulation. Installing a thin layer of wood fiberboard, perlite board or fiberglass board insulation was recommended with joints staggered from those of the polyurethane insulation layer below.

NRCA Technical Bulletin No. 7, dated March 1, 1979, further reinforced NRCA's previous recommendation.

In July 1981, NRCA Technical Bulletin No. 9 was issued and superseded Technical Bulletin No. 7. The bulletin indicated the preferred method for installing rigid board insulation was in two layers (base and cover board layers) and cover board usage was the then-current, best state-of-the-art practice.

In September 1988, NRCA issued Technical Bulletin No. 9, "NRCA statement on polyisocyanurate, polyurethane and phenolic foam roof insulations." The bulletin cited field and laboratory tests conducted by NRCA and the Midwest Roofing Contractors Association documenting concerns with membrane blistering from insulation facer sheets, facer sheet delamination concerns and inadequate insulation compression resistance to withstand normally anticipated construction loads during application.

The NRCA Roofing and Waterproofing Manual, Fourth Edition (1996) expanded upon these recommendations to also apply to polymer-modified bitumen membrane roof systems.

In March 2000, NRCA issued Technical Bulletin 2000-3, "Use of cover boards over polyisocyanurate roof insulation," which further expanded its previous recommendation to apply to all membrane roof systems, including single-ply membrane roof systems. This bulletin indicated polyisocyanurate insulation can exhibit problems, including facer-sheet delamination, edge cavitation, cupping or bowing, shrinkage, and crushing or powdering. A suitable cover board can separate a roof membrane from the polyisocyanurate insulation; allows for installation of insulation board layers in two layers with staggered board joints; and may be required to achieve specific roof assembly fire-resistance classifications. The bulletin identified common cover boards as glass-faced gypsum board, perlite board, wood fiberboard, fiberglass board and mineral fiberboard.

The cover board recommendation provided by Technical Bulletin 2000-3 was incorporated into *The NRCA Roofing and Waterproofing Manual, Fifth Edition* (2001), *The NRCA Roofing Manual: Membrane Roof Systems—2007* and *The NRCA Roofing Manual: Membrane Roof Systems—2011.*

Current recommendations

In *The NRCA Roofing Manual: Membrane Roof Systems—2015*, NRCA maintains its longstanding recommendation for the use of cover boards in built-up, polymer-modified bitumen and single-ply membrane roof systems installed over above-deck rigid board thermal insulation.

In addition to the reasons cited in NRCA Technical Bulletins, The NRCA Roofing and Waterproofing Manual and The NRCA Roofing Manual: Membrane Roof Systems, cover board usage separates roof membranes from the aesthetic and potential performance effects of knit line depressions and rutting in polyisocyanurate insulation boards' surfaces. For additional information regarding polyisocyanurate insulation board knit line surface depressions and rutting, see "Another round," February 2016 issue, page 50.

In *The NRCA Roofing Manual: Membrane Roof Systems—2015* Chapter 1-Roof System Configurations, NRCA recommends use of specific cover boards with specific roof membrane system types. Cover board selection also should be coordinated with roof membrane system manufacturers' guidelines and any necessary fire- and wind-resistance classifications (UL's classifications and FM Approvals' approvals).

Additional information regarding cover boards is provided in Chapter 1-Roof System Configurations and Chapter 4-Rigid Board Insulation of *The NRCA Roofing Manual: Membrane Roof Systems—2015.*

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Coverboard usage

- Cement board (ASTM C1325):
  - Compressive strength and rigidity
- Glass-faced gypsum board (ASTM C1177):
  - Compressive strength and rigidity
- High-density polyiso. (ASTM C1289, Type II, Class 4):
  - Compressive strength and adhesive compatibility
- Perlite board (ASTM C728):
  - Hot asphalt and torch application compatible
- Wood Fiberboard (ASTM C209):
  - Hot asphalt and asphalt adhesive compatible

Coverboard usage

Purchasing coverboards on a private-label basis from the warrantying roof membrane manufacturer is recommended.

Questions and other topics…

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