



2015 Carolinas Mid-winter Roofing Expo
Charlotte, NC -- January 28, 2015

NRCA technical issue update

presented by

Mark S. Graham

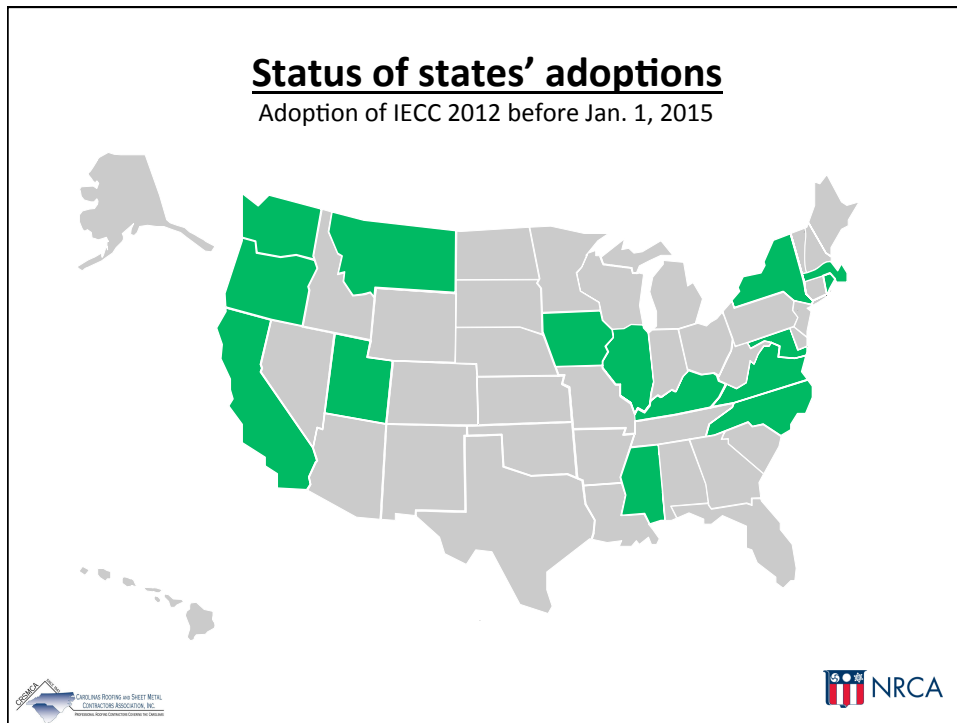
Associate Executive Director, Technical Services
National Roofing Contractors Association



Today's topics


- Energy code adoption status...payback
- Polyisocyanurate insulation update
- Asphalt update and developments
- Concerns with steel roof decks
- Water-based bonding adhesives
- Questions (other topics)






Is there payback...?

Carolin Roofing & Sheet Metal Contractors Association, Inc.
NATIONAL ROOFING CONTRACTORS ASSOCIATION OF AMERICA



NRCA “Industry Issue Update”

November 2014



Analyzing R-value Requirements

Cost paybacks to increases in R-values may not be practical

November 2014

Recent increases in the model energy code's building energy performance requirements have resulted in increased R-values being specified for many building's exterior envelopes, including roof systems.

Adoption of the International Energy Conservation Code (IECC) 2012 Edition (IECC 2012), which includes significant R-value increases for most roof systems, has been limited. The R-value increases were implemented into the code with minimal to no consideration of the added total construction cost and long-term payback to building owners.

Energy code requirements

The building envelope thermal (prescriptive) requirements contained in IECC 2012 include roof assembly minimum R-value requirements as shown in Figure 1. These R-values apply to all buildings, including roof system replacements, classified by the code as being for “unconditioned” buildings. IECC 2012 classifies all buildings as commercial except detached one- and two-family dwellings and multiple single-family dwellings (condominiums), as well as Group R-2, R-3 and R-4 buildings three stories or fewer in height above grade plane.

Compared to IECC 2009, minimum prescriptive R-values with those in the International Energy Conservation Code, 2009 Edition (IECC 2009) reveals minimum required R-values for roof assemblies have increased from R-5 to R-10 depending on specific climate zone and building (roof) assembly configurations.

In May 2012, the Department of Energy (DOE) issued a determination regarding IECC 2012 prescriptive energy efficiency in buildings that IECC 2009, ENR, indicated IECC 2012 makes substantial progress with achieving DOE's goal to provide a 30 percent overall improvement in building energy efficiency compared with the code's previous editions.

Code adoption

Also included in DOE's May 2012 determination is a requirement for individual states to review their current codes and certify by May 12, 2014, their residential energy efficiency requirements meet or exceed the levels established in IECC 2012. In the past, this type of certification was only required in individual states upgrading their building energy codes to the latest edition of the model code.

To determine the status of individual state energy code

adoptions, NRCA conducted a comprehensive survey of state adoption and plans for future code updates. From this survey, only seven states were discovered to have updated their energy code to IECC 2012 (led by NRCA's Major 17 Contractors Initiative—Illinois, Iowa, Maryland, Missouri, North Carolina, Rhode Island and Washington).

Four additional states—California, Florida, Massachusetts and New York—will upgrade to IECC 2012 by Jan. 1, 2015. The remaining states reported they have no immediate intention of upgrading their energy codes since none have no state-mandated energy code.

NRCA considers the findings of its energy code adoption survey to be significant. High R-value advocates, including some insulation manufacturers, trade associations and special interest groups, are leading designers and building owners to believe 2012 IECC R-values are required throughout the U.S. Other roof system manufacturers and some special interest group are going for as implying compliance with the International Energy Conservation Code, 2012 Edition doesn't require NRCA's energy results those high R-value claims are misleading in fact, most states do not yet require compliance with IECC 2012.

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Minimum prescriptive thermal insulation requirements for commercial buildings

Climate zone	Roof assembly configuration		
	Insulation entirely above roof	Roof buildings with 10 ft or thermal break	Attic and other
1	R-20	R-10 + R-11.5	R-10
2	R-20	R-10 + R-11.5	R-10
3	R-20	R-10 + R-11.5	R-10
4	R-20	R-10 + R-11.5	R-10
5	R-20	R-10 + R-11.5	R-10
6	R-20	R-10 + R-11.5	R-10
7	R-20	R-10 + R-11.5	R-10
8	R-20	R-10 + R-11.5	R-10

1 = Unconditioned buildings; 2 = Conditioned buildings; 3 = Conditioned buildings with 10 ft or thermal break; 4 = Conditioned buildings with 10 ft or thermal break and 10 ft or thermal break; 5 = Conditioned buildings with 10 ft or thermal break and 10 ft or thermal break; 6 = Conditioned buildings with 10 ft or thermal break and 10 ft or thermal break; 7 = Conditioned buildings with 10 ft or thermal break and 10 ft or thermal break; 8 = Conditioned buildings with 10 ft or thermal break and 10 ft or thermal break.



Figure 1. Minimum prescriptive thermal insulation requirements for commercial buildings.

Payback analysis:

- 100 sq. single story building
- Costs per R+5 increases
- Energy savings per R+5 increases
- Local energy costs
- Cost ÷ Savings = Payback
- 16 cities in 8 climate zones

Payback results:



- R-10 to R-15: 7 to 19 yrs.
- R-15 to R-20: 14 to 38 yrs.
- R-20 to R-25: 22 to 61 yrs.
- R-25 to R-30: 49 to 133 yrs.

Polyisocyanurate insulation

ASTM C1289:

- Type I (wall sheathing)
- Type II (faced roof insulation)
- Type III (perlite board laminate)
- Type IV (wood-fiber board laminate)
- Type V (OSB/plywood laminate)
- Type VII (glass mat-faced gypsum board laminate)

ASTM C1289, Type II:

- Class 1 (cellulose facers)
 - Grade 1: 16 psi compressive strength
 - Grade 2: 20 psi compressive strength
 - Grade 3: 25 psi compressive strength
- Class 2 (coated-glass facers)
- Class 3 (uncoated-glass facers)
- Class 4 (high-density product)
 - Grade 1: 80 psi compressive strength
 - Grade 2: 110 psi compressive strength
 - Grade 3: 140 psi compressive strength



When specifying/purchasing polyiso.

Use ASTM C1289 and the specific
Type, Class and Grade for the desired product



Polyisocyanurate insulation

- R-value versus LTTR:

	ASTM C518	ASTM C1303
1 inch	6.2	5.6 / inch
2 inch	12.3	5.7 / inch
3 inch	--	5.8 / inch
4 inch	--	5.9 / inch

- LTTR represents a 15-year time-weighted-average of R-value; corresponds to the estimated R-value after 5-years of aging.



Polyisocyanurate insulation

Tech Today

R-value concerns

R-values are found to be below LTTR
by Mark S. Graham

NRCA HAS CONDUCTED limited R-value testing of high R-value rigid board insulation. The test results show R-values lower than the product published long-term thermal resistance (LTTR) values. If you design roof systems using high R-value rigid board insulation, you should be aware of this data.

NRCA Testing
NRCA obtained 15 samples of one (one-inch-thick) 2-inch-thick, 6th-generation polyisocyanurate insulation from NRCA contractor members throughout the U.S.

The samples were provided as R-6 (9 Styrofoam, California, Texas, and Rhode Island) testing conditional according to ASTM C518, "Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat-Flow Meter Apparatus." The samples R-values were tested as received, meaning without any additional aging. The samples ranged in age from three to 13 months.

R-values were tested at a 75°F mean reference temperature, as well as at 25, 50, and 100°F. NRCA notes that additional test temperatures at being more representative of actual in-service conditions than the 75°F reference temperature typically used for product comparison and labeling. A graph of these tested R-values is provided in the figure.

Comparing R-values
LTTR is intended to represent the R-value of specimens tested after five years of aging when tested in a controlled laboratory environment. This five-year figure corresponds closely to a predicted 15-year, time-weighted average of R-values.

ASTM C518 - this test was method used to NRCA's testing - in the preferred test method for determining reference R-values in the LTTR methodology. However, in the LTTR methodology, the base material thickness is reduced (aged and tested) to another aging before testing (for additional information, see "Testing LTTR," January 2009 issue, page 30).

Review of NRCA's test results reveals tested R-values lower than the predicted five-year-old value in laboratory conditions (LTTR) - 6.0. Also, NRCA's tested values are somewhat lower than those of ASTM C1303, "Standard Specification for Rigid Cellular Polyisocyanurate Thermal Insulation Board," at 6.0.

What to do?
NRCA maintains its long-standing recommendation that designers determine polyisocyanurate board insulation's actual in-service thermal resistance on the basis of a R-value of 5.6 per inch.

However, based on NRCA's testing, it may be prudent for designers to use an even lower R-value when designing for cold conditions, such as in northern climates or cold storage applications.

Mark S. Graham is NRCA's executive director of technical services.

A comparison of tested R-values

NRCA tested data, LTTR and ASTM C1303 minimum required R-values

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May 2010 www.professionroofing.net

Professional Roofing, May 2010:

- Tested “aged” R-values are less than LTTR
- Polyiso’s LTTR and R-values are temperature sensitive
- NRCA’s recommendation:
 - $R_{Aged} = 5.0/\text{inch}$ (heating)
 - $R_{Aged} = 5.6/\text{inch}$ (cooling)



When specifying insulation...

...NRCA recommends insulation be specified by its thickness (and ASTM designation), not by its R-value or LTTR...



“Generic” polyiso

WHAT'S NEW

GENFLEX Roofing Systems

TECHNICAL BULLETIN | **MARKETING BULLETIN** | PRODUCT BULLETIN | PRICING BULLETIN | PRESS RELEASE

January 8, 2015

To: GenFlex Roofing Systems Distributors
Subject: Advisory on Generic Polyiso Commercial Roof Insulation

Recently, one of our competitors announced they are introducing a line of generic polyiso insulation that contains no markings on either the board product or the packaging in which it is bundled. According to this announcement, the product is not eligible for guarantees and **does not have any code approvals.**

GenFlex goes to great lengths to deliver superior products that you can count on. All of our polyiso commercial roof insulation passes applicable stringent ASTM standards, meets or exceeds FM approvals, are UL classified, and have achieved Miami-Dade County approval. Additionally, we participate in the QualityMark™ third-party product quality auditing program to ensure that the product you receive is always the highest quality we can produce.

The stated purpose for this product line introduction is to “increase in-stock positions at distributors as well as allow the ISO to be used under competitive membranes” and to “increase discretionary ISO sales.” It is for this reason that we feel that we must warn our customers to look out for this generic product and ensure that it is not used under GenFlex roofing membranes or in conjunction with its polyiso insulation.

Use of this insulation will void all GenFlex warranties or product guarantees when used as a part of the roof system.

Please direct any questions you may have to your Regional Business Manager.

Sincerely,
Tyler Cooper
Insulation Product Manager

200 West 90th Street, Indianapolis, IN 46201 | 1-800-442-4272 | www.GenFlex.com

MARKETING BULLETIN

Advisory on Generic Polyiso Announcement from Firestone Building Products - 1/8/15

ADVISORY ON GENERIC POLYISO COMMERCIAL ROOF INSULATION

Recently, one of our competitors announced they are introducing a line of generic polyiso insulation that contains no markings on either the board product or the packaging in which it is bundled. According to this announcement, the product is not eligible for guarantees and **does not have any code approvals.**

Firestone Building Products goes to great lengths to deliver on the promise made to you in our slogan **NOBODY COVERS YOU BETTER™**. All of our polyiso commercial roof insulation passes applicable, stringent ASTM standards, meets or exceeds FM approvals, are UL classified, and have achieved Miami-Dade County approval. Additionally, we participate in the QualityMark™ third-party product quality auditing program to ensure that the product you receive is always the highest quality we can produce.

The stated purpose for this product line introduction is to “increase in-stock positions at distributors as well as allow the ISO to be used under competitive membranes” and to “increase discretionary ISO sales.” It is for this reason that we feel that we must warn our customers to look out for this generic product and ensure that it is not used under Firestone Building Products roofing membranes or in conjunction with its polyiso insulation.

Use of this insulation will void all Firestone Red Shield™ Warranties or product guarantees when used as a part of the roof system.

Please direct any questions you may have to your Region Business Manager.

Sincerely,
Tyler Cooper
Insulation Product Manager

Asphalt update and developments

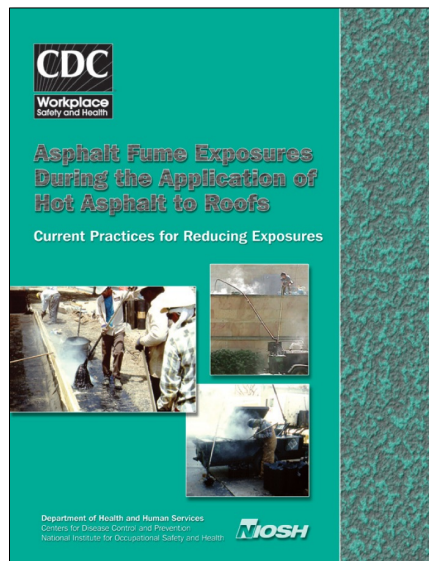


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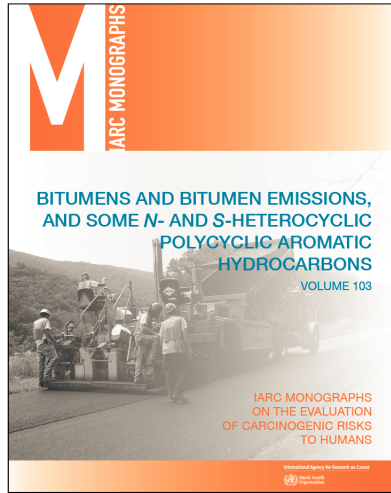
Asphalt

June 2003



Asphalt

May 2013



IARC Monograph – 103:

- Group 2A –Probably carcinogenic to humans
- Pgs. 160 – 165 specific to “Roofing workers exposed to bitumens”

No new regulation (yet)



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NRCA asphalt testing -- 1989

- 26 asphalt samples
- EVT:
 - Type III (125 cps) 400 – 430 F
 - Type III (75 cps) 420 – 470 F
 - Type IV (125 cps) 420 – 455 F
 - Type IV (75 cps) 445 – 485 F
- FPs:
 - Not reported



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NRCA asphalt testing -- 2000

- 19 asphalt lots sampled
- EVT's:
 - Type III (mop) 390 – 440 F
 - Type III (spreader) 415 – 475 F
- FP's: 585 – 640 F
- ASTM D312 compliance:
 - 10 of 19 did not comply



NRCA asphalt testing – 2014

- 14 asphalt lots (7 suppliers) sampled
- EVT's:
 - Type III (mop) 424 – 462 F
 - Type III (spreader) 452 – 486 F
 - Type IV (mop) 455 – 482 F
 - Type IV (spreader) 480 – 506 F
- FP's: 615 – 660 F
- 10 of 14 do not comply with ASTM D312's physical property requirements



Industry Issue Update, May 2014

INDUSTRY ISSUE UPDATE
NRCA Member Benefit

Asphalt Health and Safety Issues
Changing values and guidelines will affect applications

May 2014

Asphalt has been one of the fundamental products used in the manufacture and construction of roof systems in the U.S. From the development and maturation of single-ply membrane roof systems and other alternative products, asphalt use continues to be widespread in the U.S. Asphalt is used in the manufacture of asphalt shingles, polymer-modified bitumen sheet products and certain roof coating products. In field applications, hot-applied asphalt is used for adhering base shears, vapor retarders, insulation layers and polymer-modified bitumen shears, severely overlapping between ply sheets in built-up membrane construction; and as a membrane surfacing, commonly with aggregate.

Although asphalt has been used in the U.S. roofing industry for years, health and safety concerns when using hot asphalt and changes to asphalt's physical properties are issues of which users need to be aware.

HEALTH AND SAFETY
Roofing professionals have long recognized many of the health and safety concerns relating to using hot asphalt, and asphalt's odor when heated to elevated temperatures is objectionable to some people.

For more than 20 years, NRCA has worked closely with asphalt suppliers, product manufacturers, the United Union of Roofers, Waterproofers & Allied Workers, the Asphalt Roofing Manufacturers Association (ARMA) and the Asphalt Institute through an informal partnership to represent the roofing industry to government bodies studying health and safety aspects of the applied asphalt. This has included individual and joint research and outreach efforts.

An important combined effort includes development of the National Institute for Occupational Safety and Health's document "Asphalt Fume Exposures During the Application of Hot Asphalt to Roofs—Current Practices for Reducing Exposures" that provides industry guidelines for the safe use of hot asphalt. Its provisions have been incorporated into most asphalt supplier and product manufacturers' installation guidelines and their safety data sheets (SDS).

In October 2011, the World Health Organization's International Agency for Research on Cancer (IARC) issued a conclusion stating occupational exposures to oxidized bitumens and their

emissions during roofing applications probably are carcinogenic to humans (Group 2A). Oxidized bitumens include roofing asphalt used on roof systems.

In May 2013, IARC issued a report of its findings and conclusion. IARC Monograph Volume 103, "Bitumen and Bitumen Fractions, and Some N- and S-Heterocyclic Polycyclic Aromatic Hydrocarbons." Although the timing of this report was not surprising, NRCA believes IARC's research is not definitive.

With the IARC determination, in the coming years U.S. government and scientific groups such as the National Toxicology Program and the American Conference of Governmental Hygienists will make their own assessments.

ASPHALT TESTING
Originally published in 1920, the U.S. product standard for oxidized asphalt used in roofing is ASTM D312, "Standard Specification for Asphalt Used in Roofing." The current edition was published in 2000 and reapproved in 2006.

ASTM D312 provides for four types of asphalt—Types I, II, III and IV—based upon the asphalt's physical properties. An asphalt's tested softening point, hardness (penetration) and ductility properties dictate its type.

ASTM D312 also requires asphalt to have a minimum 500 F flash point (FP). The standard currently does not prescribe minimum or maximum values for an asphalt's exposure temperature (EVT) to simply require asphalt suppliers report the asphalt's EVT on the package labeling at full of labeling.

In 1989, NRCA conducted a temperature-viscosity data study of 26 asphalt samples procured from around the U.S. EVT data from the samples are provided in Figure 1. The 1989 study was limited to EVT testing and did not include FP testing or testing of other physical properties to determine compliance with ASTM D312.

In 2005, NRCA conducted a limited study of 19 lots of Type III asphalt procured from around the U.S. EVT and FP data for these samples are provided in Figure 2. Ten of the 19 samples analyzed did not meet the physical property requirements of ASTM D312, Type III.

This year, NRCA conducted limited testing of 14 lots of Types III and IV asphalt obtained in late 2013 from roofing contractors'

NRCA and ARMA have proposed a revision to ASTM D312



Revision to ASTM D312

Will be published as ASTM D312-15

- Maximum heating temp.: 550 F (575 F min. FP)
- Maximum EVTs:
 - Type III (mop) 430 F
 - Type III (spreader) 455 F
 - Type IV (mop) 470 F
 - Type IV (spreader) 485 F
- Lot-specific package labeling of EVT



NRCA's recommendations

Asphalt

- Seek out asphalt complying with ASTM D312-15
- Consider asking for certificates of compliance
- Do not overheat asphalt
 - 550 F maximum kettle/tanker temperature
- Apply at EVT (BUR application)
- Make field crews aware
- Contact NRCA with any questions or issues



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Issues with steel roof decks

- Probable under-design for wind uplift
- Deck overstress:
 - Seam-fastened mechanically-attached single-plies
- Possible structural overload:
 - Seam-fastened mechanically-attached single-plies



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Steel deck design

Prior to 2010:

- SDI's *Design Manual for Composite Decks, Form Decks and Roof Decks*
- ANSI/SDI RD1.0-2006, "Standard for Steel Roof Deck" (referenced in IBC 2009)

30-pound-per-square-foot (psf) uplift
and 45-psf uplift at roof overhangs



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Steel deck design

Since 2010:

- ANSI/SDI RD1.0-2010, "Standard for Steel Roof Deck" (referenced in IBC 2012 and IBC 2015)

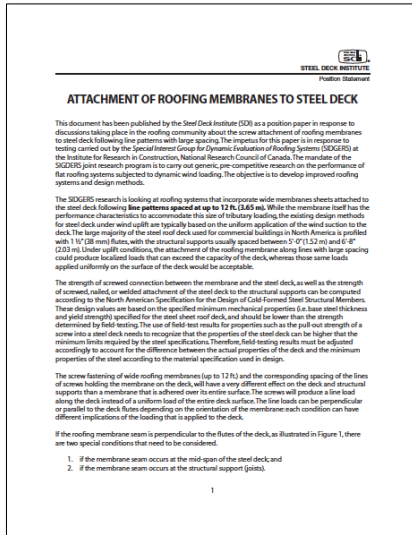
"... be anchored to resist the required net uplift forces, but not less than..."
30 psf and 45 psf for eave overhangs



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SDI bulletin



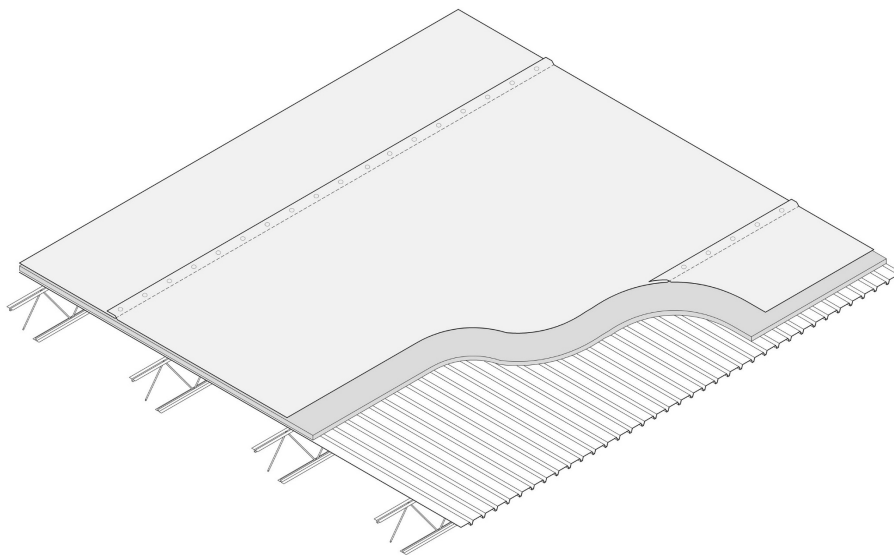
- Decks designed for joist spacing between 5' and 6' 8" o.c.
- Steel decks designed for uniform loading
- Seam-fastened single-ply membranes are a concern



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MEMBER NATIONAL CONTRACTORS ASSOCIATION OF AMERICA

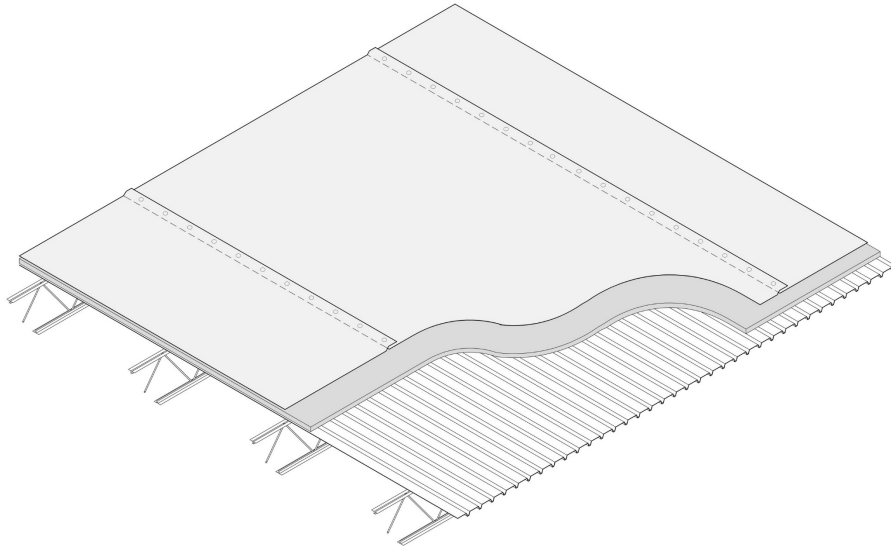


Membrane seams across deck flutes



SDI: 3.8 X moment (deck); 2 X load (joists)

Membrane seams in deck flute direction



SDI: 12 X bending moment and shear (deck)

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SDI bulletin -- Conclusion

“...SDI does not recommend the use of roofing membranes attached to the steel deck using line patterns with large spacing unless a structural engineer has reviewed the adequacy of the steel deck and the structural supports to resist to wind uplift loads transmitted along the lines of attachment. Those lines of attachment shall only be perpendicular to the flutes of the deck.”

NRCA's recommendations

- Beware of the situation
- Roof system designers should not rely on “excess capacity” in steel roof decks
- Be cautious of “accepting” responsibility for the roof deck; use NRLRC recommended proposal/contract language
- Better communication is needed between Roof system designers and roof deck designers



Professional Roofing “Tech today”

January 2015

TECH TODAY

Concerns with steel roof decks

Seam-fastened single-ply membrane systems may be problematic
by Mark S. Graham

Dialogue is necessary between steel roof deck designers and roof system designers

Steel roof decks are the most popular roof deck type used in the U.S. However, inconsistencies between design methods used for steel roof decks and roof systems are cause for concern.

SDI guidelines
Steel roof decks typically are designed using guidelines developed by the Steel Deck Institute (SDI).

Historically, SDI's design guidelines for steel roof decks have been published in various editions of SDI's *Design Manual for Composite Deck, Form Deck and Roof Deck*. SDI has revised and updated its manual a number of times during the year. For example, the 2010 edition is referred to as "Publication No. 31."

Beginning in 2006, SDI published its design specifications for steel roof decks as ANSISEN RD-1.2-2006, "Standard for Steel Roof Deck." The 2010 edition, ANSISEN RD-2010, is the current edition.

Before the 2010 edition of the International Building Code, SDI's design guidelines were not specifically referenced in model building codes. ANSISEN RD-1.2-2006 is referenced as a requirement in the International Building Code 2006 Edition (IBC 2006). ANSISEN RD-2010 is referenced in IBC 2012 and IBC 2015.

SDI's design manual and ANSISEN RD-1.2-2006 provide for roof decks to be designed for a 30-psf uniform load (uniformly applied) and 45-psf uplift at roof overhang. ANSISEN RD-1.2-2006 also allows

a roof deck's dead load to be deducted from the prescribed design uplift load.

ANSISEN RD-2010 stipulates roof decks must "... be anchored to meet the required net uplift forces, but not less than ... 30 psf and 45 psf for eave overhangs.

Also, in 2009, SDI issued a position statement, "Attachment of Roofing Membranes to Steel Deck." In this statement, SDI indicates its design methods are based on uniform loading of roof decks, such as that provided by adhered built-up, polymer-modified bitumen or single-ply membrane roof systems. SDI's statement further explains with design uplift loading conditions, attachment of seam-fastened mechanically attached single-ply membrane roof systems with wide seam spacing could result in localized loads that exceed roof deck capacity. These same loads applied uniformly on a deck's surface would be acceptable.

NRCA's analysis
When buildings are designed, the design team's structural engineer typically will be responsible for the design of the roof structure and roof deck. If SDI guidelines are used, steel roof decks most likely will be designed for a 30-psf uniform uplift capacity with little or no consideration of the roof system type being installed.

Roof system designers typically have relatively little knowledge of steel deck design. Many roof system designers rely on IBC Approval classifications for designing and specifying roof system uplift, which likely results in mutually different design expectations between roof systems and steel roof decks.

The example of a roof system with an FM 1-80 or Class 90 uplift classification is intended to resist a 45-psf uplift load in the roof

field and higher uplift loads in the roof ends perimeter and corners. If this roof system is designed to be installed on a steel roof deck using SDI's guidelines for a 30-psf uplift, the roof deck has a design uplift capacity of only about one-third (or less) that of the roof system. In this case, attachment of the roof deck to the roof structure is of specific concern.

Similarly, with seam-fastened mechanically attached membrane roof systems where the roof membrane's seam spacing exceeds the spacing of the roof deck's structural supports, the steel roof deck likely has a design uplift capacity (or possibly significantly less than the roof system). Roof deck buckling under uplift loading, attachment of the roof deck to the roof structure and, in some instances, localized excess uplift loading of the roof structure are of concern.

In many instances, steel roof decks are fabricated from steel deck with yield strengths in excess of those prescribed in ANSISEN RD-2010. This results in steel roof decks being somewhat stronger than what SDI's practices for uplift design purposes. However, roof system designers should not unknowingly rely on any capacity in excess of steel roof deck's design properties.

Clearly, dialogue is necessary between steel roof deck designers and roof system designers. Additional dialogue between the roofing and steel deck industries also is needed.

Additional information about steel roof decks is contained in the roof decks section of The NRCA Roofing Manual: Membrane Roof Systems, which is available by accessing www.nrca.org or calling (800) 433-NRCA (275-6722).

MARK S. GRAHAM is NRCA's associate executive director of technical services.

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www.professionroofing.com JANUARY 2015

Continuing concerns with water-based bonding adhesives



Professional Roofing, Aug. 2012

THE SAW BUT DIFFER

In markets subject to volatile organic compound (VOC) regulations, single-ply roof membrane manufacturers supply alternative materials for solvent-based adhesives and primers. Among the VOC-regulation-compliant materials that have emerged, low-VOC solvent-based and water-based adhesives are marketed as direct replacements for VOC-adhesive-based contact adhesives.

Although intended as direct replacements, these materials should be considered apart from traditional adhesive-based contact adhesives. For one thing, work and handling practices for low-VOC materials differ somewhat from those for traditional solvent-based materials. And water-based materials present some challenges that set them apart from both types of adhesive-based materials. Additionally, depending on specific products and manufacturers, different accommodations for handling and use may apply for products within the same general category.

Where are VOCs regulated?

The California Clean Air Act of 1988 established the framework for the state's air quality management plans, including requirements for controlling ground-level ozone. To meet the requirements, in 1989, the South Coast Air Quality Management District, which is the air pollution control agency for Orange County and urban portions of Los Angeles, Riverside and San Bernardino counties, adopted Rule 1108. Rule 1108 limits VOC content of adhesives and sealants, including single-ply roof membrane adhesives and sealants. The VOC content limits introduced in Rule 1108 later were included in similar regulations adopted by a number of other California air districts.

40 www.professionalroofing.com AUGUST 2012



Professional Roofing, "Tech today," Dec. 2013

TECH TODAY

Cold weather application

Installing roofing products and roof systems in fall and winter can prove challenging

by Mark S. Graham

Roofing in cold weather, such as during late fall and winter in northern climates, presents roofing contractors with challenges. In addition to having to manage relatively cold roofing temperatures and increased moisture concerns due to working with roofing products that are temperature- and moisture-sensitive. The new NRCA established a Cold Weather Application Task Force to review manufacturers' recommendations for roofing products and roof system applications during cold weather.

Certain roofing products and roof system types are temperature-sensitive

Temperature limitations
Roofing contractors have long recognized certain roofing products and roof system types are temperature-sensitive. For example, with low applied temperatures on less than 40 F, shortening the distance between breaching equipment and the point of application and using modified roofing becomes important and dispensing equipment is recommended by NRCA and most manufacturers to make sure moisture is at an equivalent temperature at the point of application.

For self-healing asphalt shingles, it is suggested shingle roofing strips may not immediately activate if installed in cold weather. However, some manufacturers provide asphalt shingles with rubber strips that will activate at lower temperatures. Also, in some cold-weather application situations, manufacturers suggest hand rubbing shingle tabs during installation to prevent shingle tabs from not fully activating.

The related water activation of water-based and low-VOC adhesive compounds is in recognition that roofing temperatures very much affect the rate and the side of performance. These points and ambient temperatures typically are lowest during early morning and midday. Also, the moisture is more common in northern climates during periods of cold temperatures.

For water-based and low-VOC adhesives, when the minimum recommended adhesive temperature or dew-point temperature cannot be met, adhesive application should be suspended.

Being aware
You need to be aware of the temperature- and moisture-related limitations of the products and systems you use and install. Product-specific limitations typically are provided in manufacturer printed installation instructions.

Building owners, designers, general contractors, construction managers and roofing contractors should also need to be aware of the limitations of roofing products and roof systems installed in colder temperatures. They also need to be aware of some weather conditions, roofing work will need to be suspended until more favorable conditions exist.

In situations where roofing work must take place during periods of unfavorable weather, such as when construction project sequencing requires roofing work be conducted in late fall and winter, building owners and designers should consider specifying roofing products and/or roof system types that are not sensitive. Roofing product manufacturers and roofing contractors should be consulted for specific recommendations. ■■■

MARK S. GRAHAM is NRCA's executive director of technical services.

12 www.professionalroofing.com DECEMBER 2013

Manufacturers:

- Store at 60F-90F
- Install at 40F and rising
- Longer green time

NRCA:

- Don't freeze
- Dew point differential of 5F or more



CAROLINA ROOFING & SHEET METAL CONTRACTORS ASSOCIATION, INC.
MEMBERSHIP SERVICE CENTER 1000 W. GREEN ST. SUITE 100
RICHMOND, VA 23220



MRCA/NRCA testing

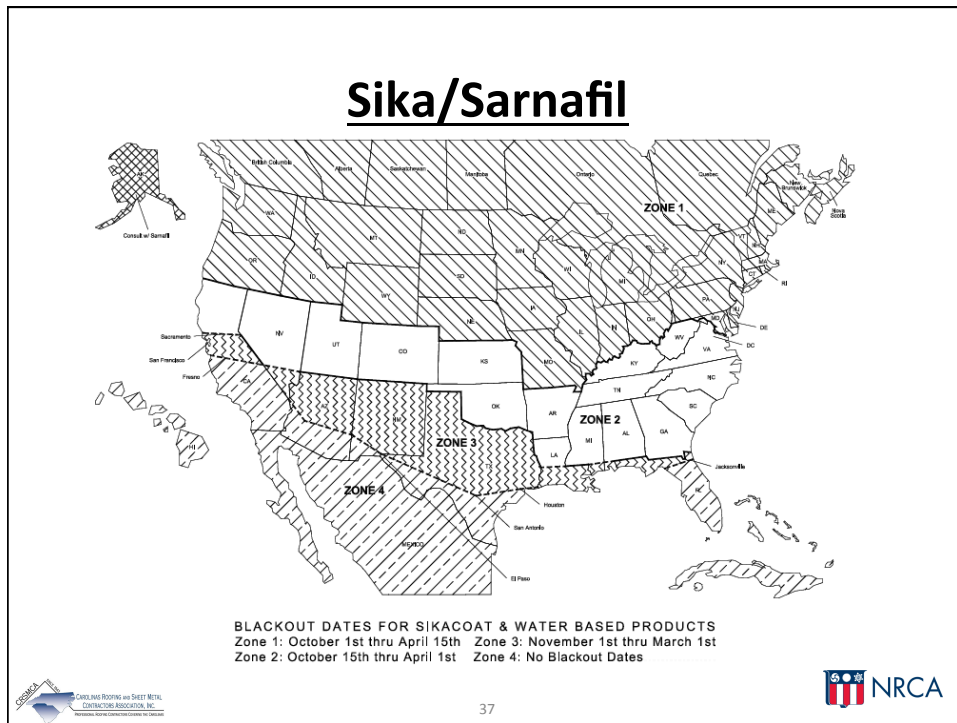
Water-based bonding adhesives

- Products vary
- Pails variability
- Long times to develop strengths
- Peel strengths are relatively low, particularly with paper-faced polyisocyanurate insulation



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JM technical bulletin

Water-Based Application for Single Ply Cold Weather Considerations

Background
As indicated in the JM single ply application instructions, product data sheets, industry bulletins published by the Single Ply Roofing Institute (SPRI) and JM published bulletins, the installation of single ply membranes (EPDM, PVC and TPO) at cooler temperatures (below 50°F, 10°C) requires additional care and consideration than what may otherwise be required in optimal weather conditions. This additional care includes allowing extra time for the membrane to visually 'heal' (i.e., lay flat) prior to installation and additional preparation of the water-based adhesives for their successful use and installation.

There are many variables to consider when using adhesives during cooler temperatures, and all water-based adhesives for roofing applications will take longer to dry in cool and high humidity conditions.

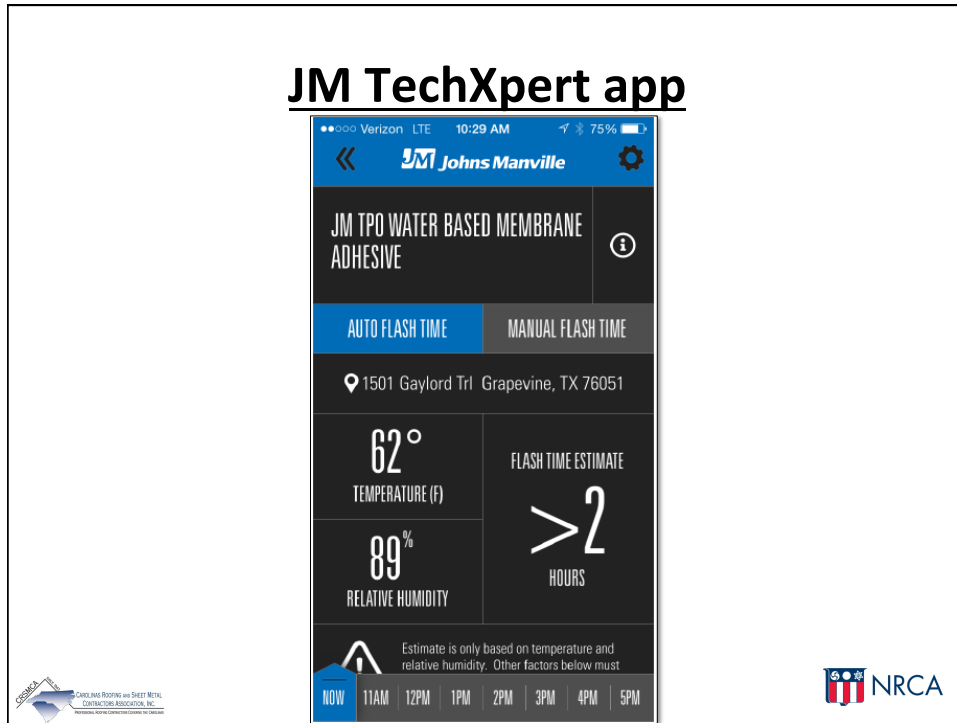
Installation Requirements
Water-based adhesives may not be used in situations when the ambient temperature is expected to fall below the dew point* at any point during application. Typically the situation when ambient temperature will fall below the dew point is in the cooler months of the year. As a result, Johns Marville will restrict any and all shipments of water-based single ply adhesives from October 1 through April 15 (see shipping restrictions map below.)

Shipping Restrictions Map:
 Zone 1: October 1 - April 15
 Zone 2: October 15 - April 1
 Zone 3: No Restrictions

- Shipment restrictions from 10/1 to 4/15
- Storage 60F – 80F
- Should not be applied:
 - Below 40F
 - RH 90%+
 - DP separation < 5F
 - Temp. = DP within 6 hrs.
 - Temp. < 32F within 48 hrs.

NRCA

JM TechXpert app



JM TechXpert app



NRCA's interim recommendations

- Manufacturers need to take a more active role
- Designers need to consider/offer alternatives
- Designers should specify Class 2 (coated glass) facers when using water-based adhesives
- Make field crews aware of limitations
- Consider alternative products/systems



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Questions



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