



## **NRCA update on roofing industry technical issues**

Education Seminar – August 12, 2022



**Mark S. Graham**  
Vice President, Technical Services  
National Roofing Contractors Association  
Rosemont, Illinois

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### **Topics**

- Supply chain issues
- Market conditions
- NRCA ProCertification
- Code issues
- Technical issues
- Advocacy and liaisons

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# Supply chain issues

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**ASPHALT ROOFING MANUFACTURERS ASSOCIATION**  
 Asphalt, The Roofing Solution™  
 Guide for Professionals | Guide for Homeowners | Excellence in Asphalt Roofing | Resources | About ARMA | Publications

**ARMA Releases Fourth Quarter 2021 Report on Asphalt Roofing Product Shipments**

**Media Contact**  
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**Forest Hill, MD** (January 20, 2022) – The Asphalt Roofing Manufacturers Association (ARMA) has released its Quarterly Product Shipment Report for the fourth quarter of 2021. The report covers asphalt roofing product shipments in the United States and Canada in the final quarter, as well as year-to-date shipment information and a comparison with the prior year's data.

*"The shipment report provides valuable insight into the asphalt roofing industry to trade professionals and interested parties," said ARMA's*


Shipments (squares)	Q4 2021	Q4 2020	% Change	YTD 2021	YTD 2020	% Change
Shingles – U.S. (including individual shingles)	37,014,634	41,209,313	-10.2%	169,188,143	161,416,435	4.8%
BUR base, ply, and mineral cap sheets – U.S. (not including saturated felts)	1,344,956	1,597,293	-15.8%	6,587,255	7,078,723	-6.9%
Modified Bitumen – U.S.	8,652,926	8,955,985	-3.4%	38,693,700	34,545,343	12.0%
Shingles – Canada (including Individual shingles)	2,917,763	2,450,144	19.1%	14,215,825	12,910,687	10.1%

**2020: 161,416,435**  
**2019: 146,605,438**  
**2018: 143,453,436**  
**2017: 151,098,256**  
**+18%**

**About ARMA:**  
 The Asphalt Roofing Manufacturers Association (ARMA) is a trade association representing North America's asphalt roofing manufacturing companies and their raw material suppliers. The association includes the majority of North American manufacturers of asphalt shingles and asphalt low slope roof membrane systems. Information that ARMA gathers on modern asphalt roofing materials and practices is provided to building and code officials, as well as to regulatory agencies and allied trade groups. Committed to advances in the asphalt roofing industry, ARMA is proud of the role it plays in promoting asphalt roofing to those in the building industry and to the public.

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**INDUSTRY ISSUE UPDATE**

NRCA Member Benefit

**Roofing material shortages and price volatility**

September 2021

The U.S. roofing industry is experiencing unprecedented shortages of roofing materials and products and significant price volatility. NRCA is providing this Industry Issue Update to help its members with building owners, facility managers, general contractors and construction managers involved in roof purchasing decisions.

Although this information is intended to apply specifically to the U.S. roofing market, based on NRCA's communications with its affiliate partners in Canada, Mexico and elsewhere worldwide, shortages of roofing materials and products and price volatility appear to be global issues.

**BACKGROUND**

Compared with other industries, the U.S. roofing industry is domestic in nature. With few exceptions, a vast majority of roofing products and materials used are manufactured in the U.S. from U.S.-sourced raw materials, delivered by U.S. suppliers and distributors, and installed by U.S. roofing contractor companies. Although the global economy has some effect on many purchasing decisions, the U.S. roofing industry is largely driven by the U.S. economy, interest rates and consumer sentiment.

During the past decade, the U.S. roofing industry has experienced a period of consistent, moderate growth. The roofing materials and products supply chain has expanded in capacity and roofing contractors have added field personnel and capability to fill this growing need. In many regions of the U.S., additional roofing industry growth has been limited by a lack of adequately trained field personnel.

At the same time, energy code requirements and sustainability incentive programs have resulted in a demand for more energy-efficient roof systems. For example, when reroofing a building, it is not unusual to replace an existing, aged roof system having an R-10 insulation value with a new roof system with an energy code mandated minimum R-20, R-25, R-30 or R-35 insulation value. Such increases in insulation value necessitate using greater amounts of and thicker insulation, usually in multiple layers, longer fasteners, more layers of insulation adhesives, and additional material handling and installation labor.

**THE CURRENT SITUATION**

The U.S. roofing industry responded and adapted to the onset of the COVID-19 pandemic remarkably well. The U.S. roofing industry quickly was considered "essential," and at the start of the pandemic, the roofing materials and products supply chain functioned with only minimal interruptions. Roofing contractors adapted to additional risk-mitigation practices necessary to perform work on occupied buildings during the pandemic.

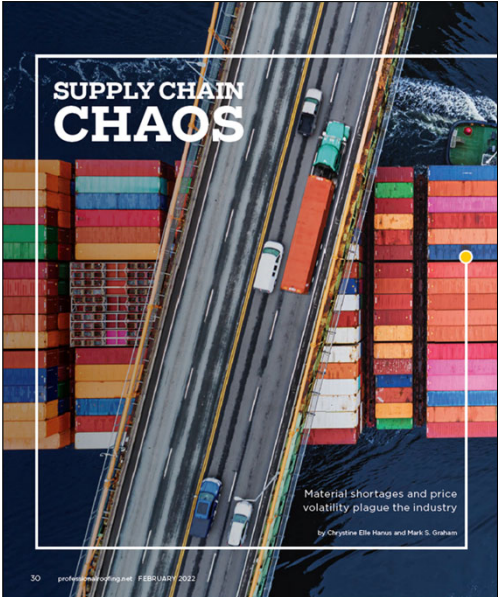
By many measures, 2020 was a productive year for the U.S. roofing industry. For example, 2020 was a near historic record level year for asphalt shingle installation. Homeowners invested in reroofing and maintaining their homes during the pandemic, spurred in part by low interest rates and the availability of stimulus funding, and the roofing industry responded to several weather events involving high winds and hail. The institutional and industrial segments of the U.S. roofing industry also experienced similar levels of activity.

However, one noticeable change in the level of roofing material and product inventory shrank considerably. Roofing material suppliers and distributors reduced their material and product inventories. Since the start of the pandemic, far more roofing materials and products are being shipped on a job-specific basis. This especially is the case with reroofing and roof covering projects and certain specialty products, such as fasteners and adhesives. A few years ago, many roofing jobs often could be carried out with roofing materials and products held in inventory, but manufacturers now are shipping roofing materials and products on a job-specific basis with fewer roofing materials and products being stocked in inventory.

## NRCA Industry Issue Update: Roofing Material Shortages and Price Volatility

[Link](#)

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**SUPPLY CHAIN CHAOS**

Material shortages and price volatility plague the industry

by Christine Elin Hanus and Mark S. Graham

30 professional roofing Feb. FEBRUARY 2022

## Professional Roofing

### February 2022

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# Supply Chain Shortage Information



Construction material prices are 20.1% higher than a year ago

Construction material prices rose 1.9% in June and are up 20.1% on a year-over-year basis; nonresidential construction material

prices are 20.3% higher than a



Construction material prices are 21.4% higher than a year ago

Construction material prices rose 2.3% in May and are up 21.4% on a year-over-year basis.



Construction material prices are 23.7% higher than a year ago

Construction material prices rose 0.8% in April and are up 23.7% on a year-over-year basis; nonresidential construction material prices are 24% higher than a year ago.

Calendar

NRCA Education

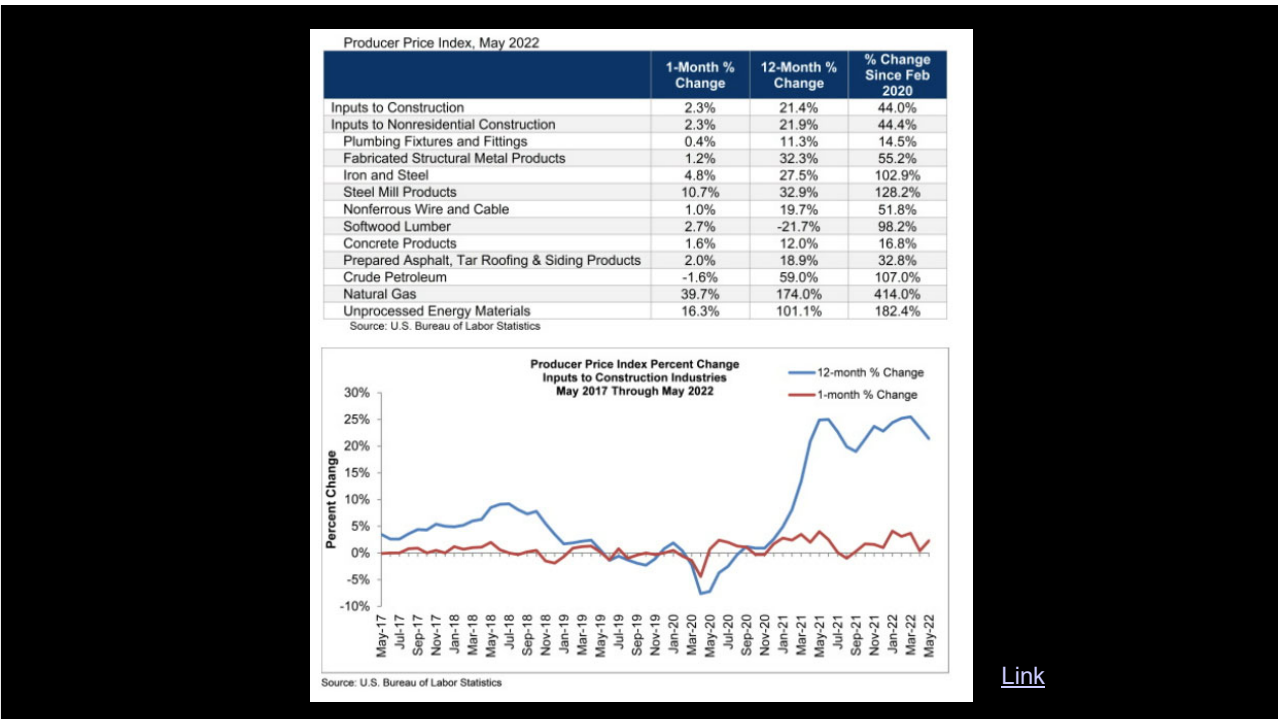
Industry

- Oct. 27-29 Decks to Dockets Austin, Texas
- March 7-9, 2023 NRCA's 136th Annual Convention and International Roofing Expo 2023 Dallas, Texas
- April 18-19, 2023 Roofing Day in DC 2023 Washington, D.C.
- July 11-15, 2023 NRCA's Midyear Meetings Chicago

[+Full List of Events](#)

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### **Supply chain issues**

- This is a long-term situation
- Raw material challenges/high demand
- Material/product pricing is significantly impacted
- Pricing established at the time of delivery
- Trucking is an additional challenge
- Labor shortage is still a continuing issue

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### **Recommendations**

Supply chain issues

- Establish expectations early
- Pricing:
  - Avoid fixed-price contracts
  - Include price escalation provisions
- Actively manage projects:
  - Documentation is more important than ever

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# Market conditions

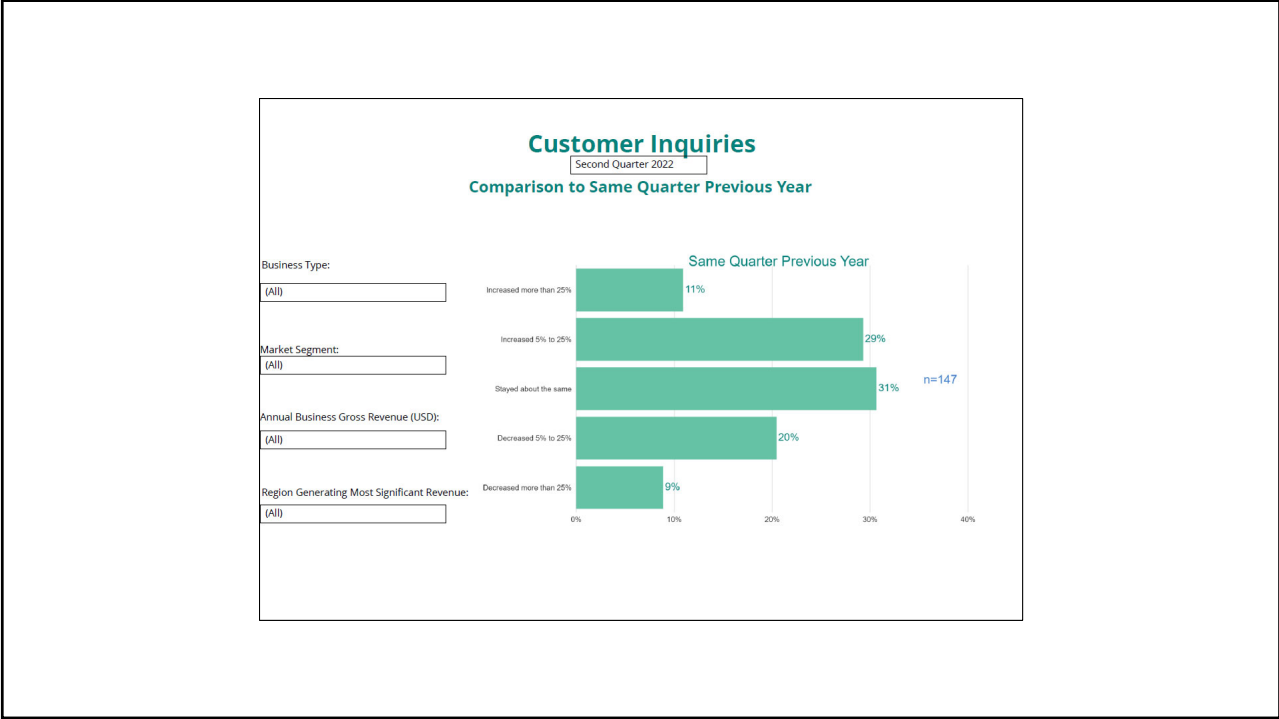
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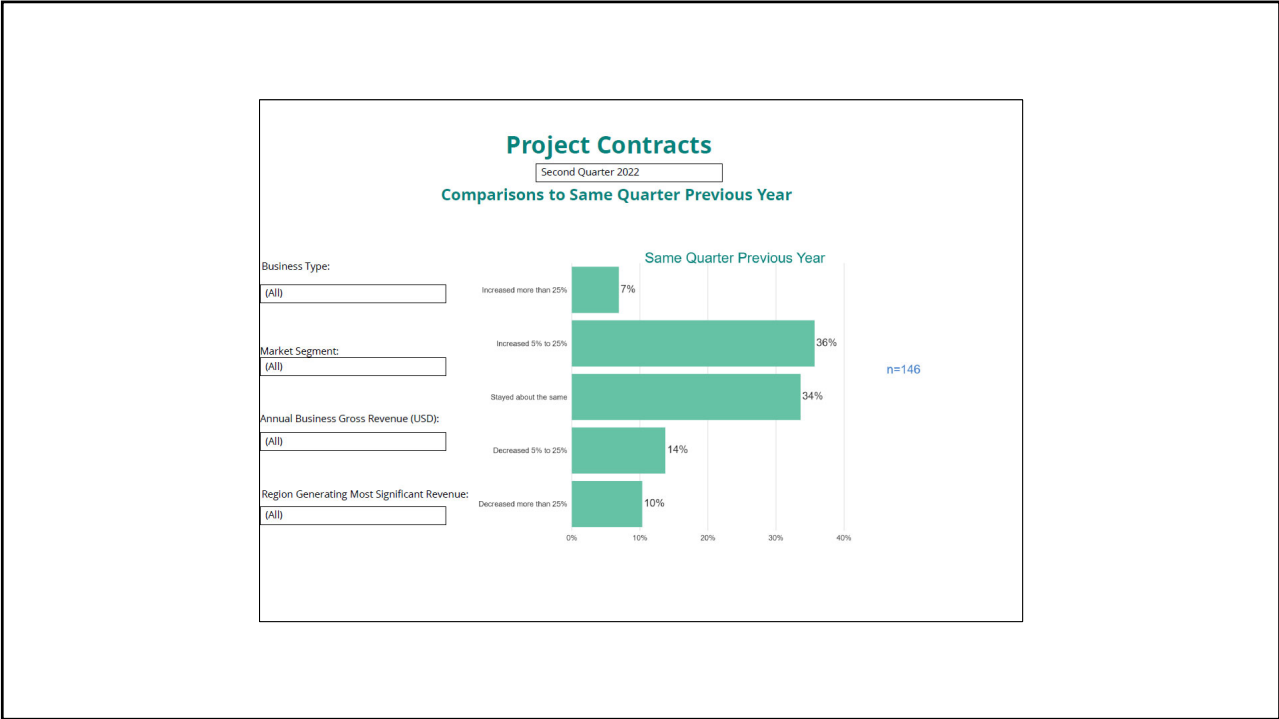
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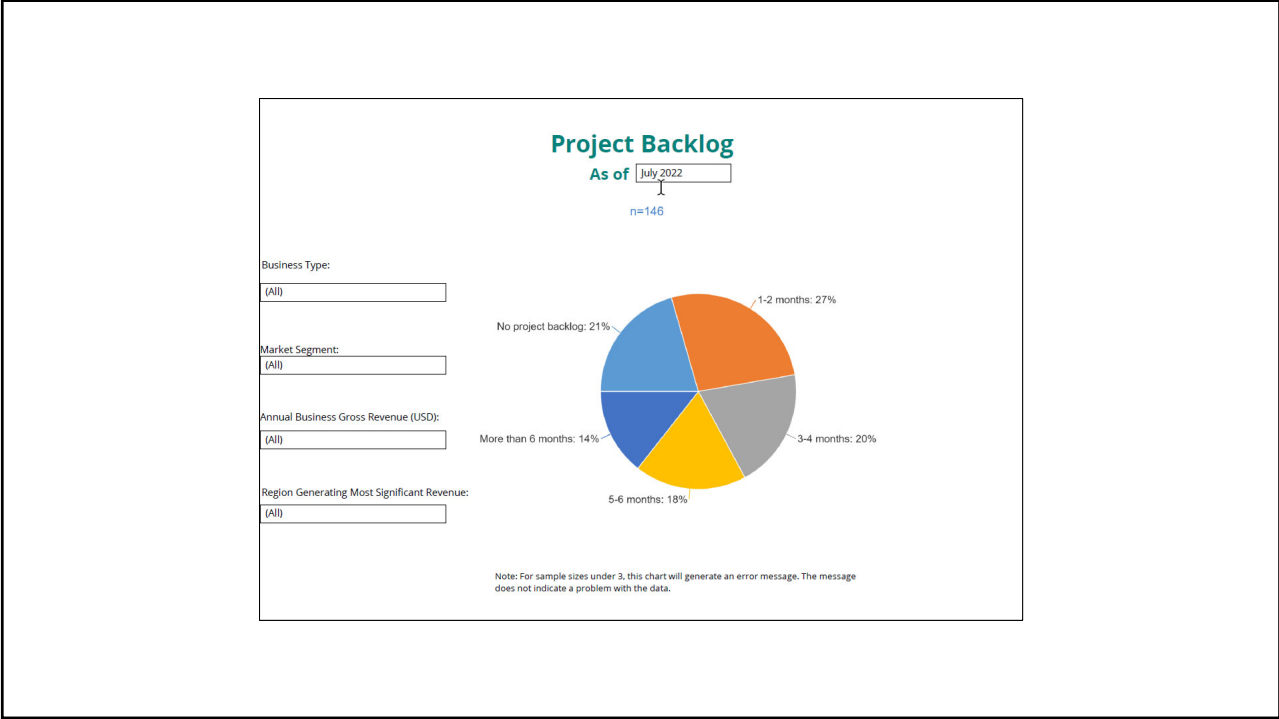
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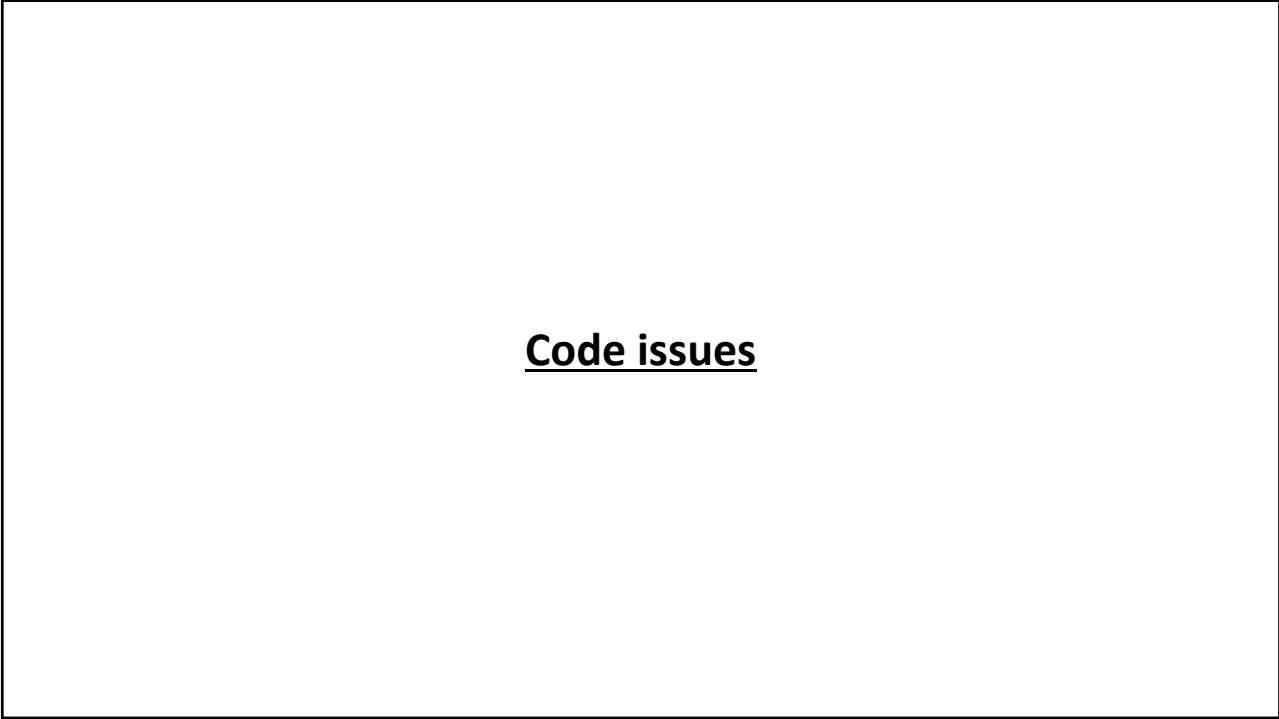


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- Qualified assessor
- Foreman
- Architectural metal flashings and accessory installer
- Asphalt shingle system installer
- Clay and concrete tile installer
- EPDM system installer
- Metal panel system installer
- Thermoplastic system installer

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Georgia Department of Community Affairs *Helping to build strong, vibrant communities.*

Select Language

**Current Mandatory Codes as Adopted by DCA:**

- International Building Code, 2018 Edition, with Georgia Amendments ([2020](#)), ([2022](#))
- International Residential Code, 2018 Edition, with Georgia Amendments ([2020](#))
- International Fire Code, 2018 Edition (Contact State Fire Marshal Below)
- International Plumbing Code, 2018 Edition, with Georgia Amendments ([2020](#)), ([2022](#))
- International Mechanical Code, 2018 Edition, with Georgia Amendments ([2020](#))
- International Fuel Gas Code, 2018 Edition, with Georgia Amendments ([2020](#)), ([2022](#))
- National Electrical Code, 2020 Edition, with Georgia Amendments ([2021](#))
- International Energy Conservation Code, 2015 Edition, with Georgia Supplements and Amendments ([2020](#)), ([2022](#))
- International Swimming Pool and Spa Code, 2018 Edition, with Georgia Amendments ([2020](#))

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## **Development of the 2024 I-codes is underway**

- 2021 Group A is complete
- 2022 Group B is underway
  - March 27-April 6, Rochester, NY
  - September 14-21, Louisville, KY
- IECC 2024 development
  - ICC’s standards development process

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# ICC codes accessible online

[codes.iccsafe.org](http://codes.iccsafe.org)



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# www.iccsafe.org

[shop.iccsafe.org](http://shop.iccsafe.org)

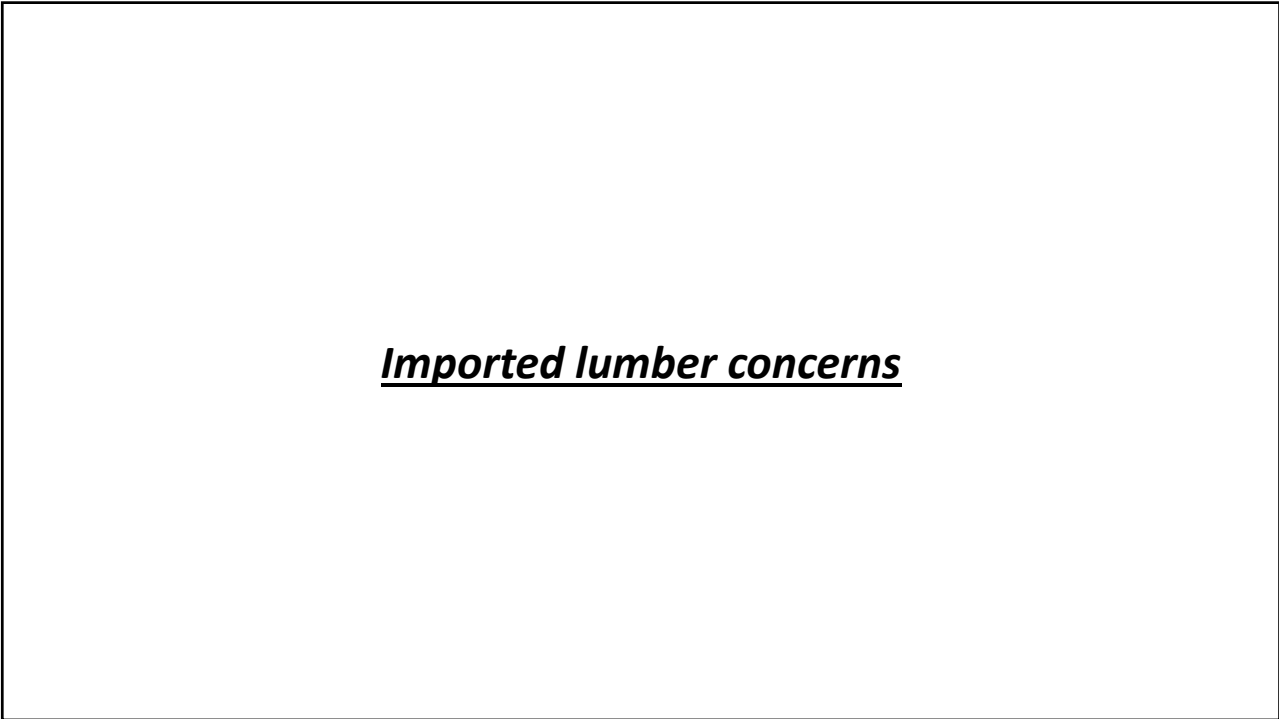


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**Technical issues**

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**Imported lumber concerns**

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**N.C. Building Code Council warns of the use of European lumber in North Carolina**

RALEIGH  
Jun 15, 2021

North Carolina Insurance Commissioner Mike Causey today has issued an alert about the use of European lumber in the construction of homes and buildings throughout the state. The N.C. Department of Insurance regulates the state's building codes and oversees the N.C. Building Code Council.

The council has determined European lumber, which is being imported to help with the nation's lumber shortage, does not meet N.C. building code requirements and, in some cases, could cause catastrophic failures in wall, floor and roof framing.

A primary concern is the specific gravity or wood density that affects the performance of fastening devices, such as nails, screws or gusset plates. A lower specific gravity may result in a decreased resistance capacity of a shear wall, designed to withstand wind and seismic loads, lower gripping strength of a truss metal plate, or lower bending strength that could affect wall height.

There are also concerns with the differences between U.S. and imported lumber milling processes.

The American Lumber Standard Committee (ALSC) requires the lumber species to be identified in the grade stamp on each piece of lumber. The structural properties widely vary by species and the origin where the wood was grown and harvested.

"Contractors should be aware that, despite a piece of lumber bearing a 'No. 2' stamp, there can be significant differences in the wood's engineering properties depending on where it came from," said Commissioner Causey. "I urge builders to know the difference between imported and domestic 'No. 2' stamped lumber so they don't mistakenly use the wood in an unsafe manner that does not meet code."

As a result of these significant issues, the N.C. Building Code Council has issued an advisory that European lumber can only be used as an alternate material that must be reviewed by the code enforcement official before it is used. This does not mean European wood products are prohibited, it simply requires additional supporting documentation to assure the wood characteristics are properly reflected in the overall project design.

Code enforcement officials must ensure the documentation includes the testing or evaluation performed on the lumber to support compliance with the building code requirements. Without the documentation, the use of European lumber products will require an engineering analysis and subsequent seal to verify code compliance.

Contact Information  
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msirk@spr.ncdoi.gov

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**AWC Response to NCDOT Press Release**

Jun 18, 2021

LEESBURG, VA. – On June 11, the North Carolina Department of Insurance (NCDOT) issued a news release warning of the use of European lumber in North Carolina. The news release identified several potential use issues given the building community's lack of familiarity with European lumber and served to alert suppliers, designers, builders, and regulators that lumber should be used in accordance with applicable codes and standards; however, there were several statements that need to be clarified or corrected. The Pacific Lumber Inspection Bureau has

**AWC In the News**

- [New Report Aids in Compliance With Sound Transmission Code Provisions](#)  
Feb 19, 2019 | Construction Executive

Prescriptive provisions in the building codes that cover wood-frame construction are primarily based on the four major commercial species combinations: Douglas Fir-Larch, Hem-Fir, Southern pine, and Spruce-Pine-Fir (SPF) from Canada. These prescriptive provisions provide species- and grade-specific span tables for common loading conditions for the four major species combinations or the requirements are based on the minimum properties for certain grades of the four major species combinations. However, the building code allows the use AWC's [Span Tables for Joists and Rafters \(STJR\)](#) for other grades and species of lumber and for other loading conditions. The span tables in STJR are species independent and only require the user to know the adjusted design values for the grade and species of lumber. Where European lumber has the same or higher design values than North American lumber, the material can be directly substituted.

Due to the rapid increase in use of and lack of familiarity with lumber species other than the four major species, prescriptive design provisions for these other species are lagging, but are being developed. The Pacific Lumber Inspection Bureau is working to develop species-specific span tables for use with the prescriptive provisions in the building codes based on the NDS and has already developed exterior wall stud tables in accordance with provisions of the WFCM for use in high wind areas and can be located at the following link: [TR-5-Max-Stud-Length-Tables-for-European-Species-1.pdf \(plib.org\)](#).

[Link](#)

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NC Department of Insurance  
 Office of the State Fire Marshal - Engineering Division  
 1202 Mail Service Center, Raleigh, NC 27699-1202  
 919-647-0000

The Use of Lumber Species not Recognized by the Residential Code

Code: 2018 NC Residential Building Code      Date: June 28, 2021  
 Section: R502.1.1, R502.3, R502.5, R602.2, R802.4, R802.5      Rev. Date: August 9, 2021

Note: This interpretation is currently final until more complete information is available.

Question #1:  
 Can lumber of wood species that are not recognized by the code be used?

SPECIES	GRADE STAMP NOMENCLATURE	Specific Gravity
ALASKA SPRUCE	AK SPR	0.41
ASPEN	ASPEN	0.39
COTTONWOOD	COT	0.41
EASTERN HEMLOCK-BALSAM FIR	E HEM B FIR	0.36
EASTERN HEMLOCK-TAMARACK	E HEM-TAM	0.41
EASTERN SOFTWOODS	EASTERN SOFTWOODS	0.36
EASTERN WHITE PINE	EW PINE (N)	0.36
NORTHERN SPECIES	N. SPECIES	0.35
NORTHERN WHITE CEDAR	NW CEDAR	0.31
NORWAY SPRUCE ROMANIA & UKRAINE	N SPR (I) ROM UKR	0.38
NORWAY SPRUCE (NORTH)	N SPR	0.4
REDWOOD	REDWOOD	0.37
SPRUCE-PINE-FIR (SOUTH)	SPF(S)	0.36
WESTERN CEDAR	WC	0.36
WESTERN WOODS	WW	0.36

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**Element of a Grade Stamp**

**Photo #2 Lumber Grade Stamp**

NORWAY SPRUCE ROMANIA & UKRAINE      N SPR (I) ROM; UKR      0.38

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**Example:**

**NO.2**  
**TP<sup>®</sup> AT00** **KDHT**  
**AS-SCP(I)AUS**

What is the code allowable span for this European 2x10 floor joist spaced 16 inches on center?  
 Design Criteria:  
 10 psf Dead Load  
 40 psf Live Load (Table R301.5)  
 Live Load Deflection limit = L/360 (Table R301.7)

From PLIB Simplified Span Tables for Light Frame Construction Imported Species:

Species and Grade	Imperial Units - joist spacing 16 in. (406 mm)								
	2x10				2x12				
	16 in. (406 mm)	18 in. (457 mm)	20 in. (508 mm)	24 in. (609 mm)	16 in. (406 mm)	18 in. (457 mm)	20 in. (508 mm)	24 in. (609 mm)	
European Larch Kieferleite Kieferleite	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Spruce Tanne Tanne	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Fir Douglas Fir Douglas Fir	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Pine Kieferleite Kieferleite	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Oak Eiche Eiche	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Beech Buche Buche	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Ash Esche Esche	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Elm Eiche Eiche	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
European Walnut Walnuss Walnuss	100	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	120	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8
	140	11.4	12.8	14.3	15.8	17.3	18.8	20.3	21.8

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## Recommendations

Imported lumber

- Beware of imported lumber and its possibly lower properties
- You should not make representations of roof deck's or wood blocking's strengths

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**RESEARCH+TECH**



**Considering substitutions**  
Be aware of potential consequences with product substitution  
by Mark S. Graham

**W**ith ongoing shortages of building materials and products, substitutions have become more commonplace – but they can have unintended consequences. One issue that has arisen involves substituting European timber for North American lumber, a decision that could result in unintended consequences.

*The situation*

At the start of the COVID-19 pandemic, wood product producers were operating under the same uncertainty as the rest of the world. Many mills curtailed production in anticipation of worker shortages and reduced demand. At the same time, many wholesale and retail lumber customers significantly reduced inventory levels. Also, because of the Great Recession, several mills had closed permanently. The American Wood Council reports between 2007 and 2017, mill closures in the South resulted in lumber capacity loss between 1.7 to 2.6 billion board feet. Mill closures in the Pacific Northwest represented 10% of the work mills.

Although the demand for wood products had dipped, it quickly rebounded during the pandemic because of increased remodeling projects and new housing starts approved, in part, by low interest

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September 2021

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**Plywood and OBS roof deck concerns**

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## **Standards for wood structural panels**

*International Residential Code, 2018 Edition*

### **Plywood:**

- U.S. Department of Commerce PS-1, “Structural Plywood”
- CSA Group O325, “Construction Sheathing”

### **Oriented-strand board (OSB):**

- U.S. Department of Commerce PS-2, “Performance Standard for Wood-based Structural-use Panels”
- CSA Group O437, “Standards for OSB and Waferboard”

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## **Common, but not referenced in the Code**

### **Plywood and OSB:**

- APA-The Engineered Wood Association Standard PRP-108, “Performance Standards and Policies for Structural-Use Panels”

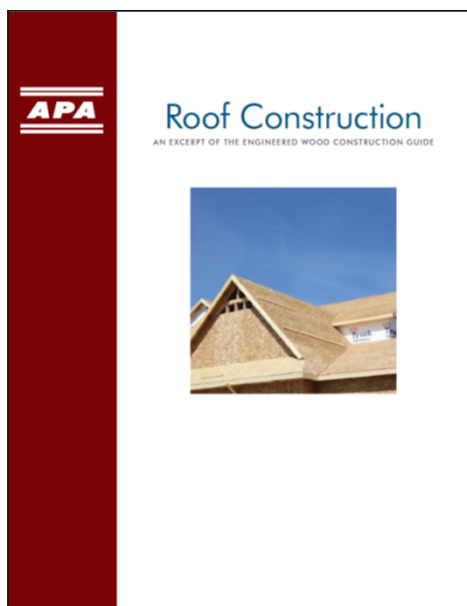
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## Roof sheathing attachment

### IRC 2018 Table 602.3(1), Rows 30-32 (minimum attachment):

- Panel edges:
  - 2½-inch-long 8d common nails at 6 inches o.c. at supported panel edges
- Intermediate supports:
  - 2½-inch-long 8d common nails at 12 inches o.c. at intermediate supports

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### APA Form E30, "Roof Construction"

--Roofing-specific excerpts from  
*APA's Engineered Wood Construction  
Guide* (102 pages)

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## Recommendations

Roof sheathing attachment

- **New construction:**
  - Be careful with deck “acceptance”.
  - Deck acceptance should be limited to the visual surface and no visual presence of moisture on the surface
  
- **Reroofing:**
  - Since deck condition and attachment typically cannot be determined until roof covering tear-off, consider unit price or T & M pricing for deck replacement and/or deck re-fastening
  - Prepare building owners for the need for deck replacement and/or deck reattachment

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**RESEARCH+TECH**



**Know your steep-slope roof decks**

Following plywood and OSB installation guidelines can help ensure a successful roof system performance  
by Mark S. Graham

**P**lywood or oriented strand board structural panel sheathing are integral components of many steep-slope roof assemblies, and proper use of these products can help ensure successfully performing assemblies. If you use or encounter plywood and/or OSB structural panel sheathing roof decks, it is important to be knowledgeable of the applicable code requirements and APA, The Engineered Wood Association and NRCA guidelines applicable to them.

**IBC 2018**  
The International Residential Code® provides specific requirements applicable to plywood and OSB structural panel sheathing used as roof decks for one- and two-family dwellings. In IBC's distribution, specific requirements are provided in Section 0505 Roof Sheathing.

**IBC 2018** requires wood structural panels conform to the Department of Commerce's PS1, "Structural Plywood," or PS2, "Performance Standard for Wood-based Structural Use Panels," or CSA Group's O225, "Construction Sheathing," or O247, "Standards on OSB and Weatherboard." PS1 and O225 generally are recognized to apply to plywood, and PS2 and O247 apply to OSB.

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December/January 2020-21

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## Concerns with Brazilian plywood

NRCA
DECKS & DOCKETS OCT. 27-29  
AMSTERDAM, TEXAS  
LEGAL CONFERENCE

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### Lawsuit highlights inferior Brazilian plywood and false certification

A recent lawsuit has shined a light on the use of inferior Brazilian plywood and its false certification by long-time certifier PFS-TECO, according to NRCA General Counsel Trent Cotney.

**What the lawsuit claimed**

The suit was filed by U.S. Structural Plywood Integrity Coalition, which includes nine family-owned plywood manufacturers. The group alleged that PFS-TECO designated PS 1 certification for the plywood despite failing to meet U.S. standards. The lawsuit claimed negligence, false advertising and loss of revenue.

PS 1 certification indicates structural integrity for plywood panels used in floors, roofs and walls of commercial and residential buildings. After its production, PFS-TECO inspected the plywood and stamped it PS 1 before it was made available in the U.S.; however, the plywood had substantial failure rates during American Plywood Association testing and evaluation from other laboratories. Unfortunately, the plywood in question has been used throughout the U.S. for new construction projects, as well as for reconstruction in Florida, Puerto Rico and other areas affected by hurricanes.

The suit alleges that dating to Jan. 1, 2016, the inspection services "made false statements of fact through certifications that authorized 35 Brazilian plywood producers to export plywood into Florida" they either knew or

JUL/AUG 2022  
VOL. 52 ISSUE 6

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PFS Corporation d/b/a PFS-TECO  
An Employee-Owned Company

### NEWS RELEASE

**For Immediate Release**  
For more information, contact:  
Scott Drake  
Office: (808) 839-1013  
scott.drake@pfs-teco.com

#### Court-Issued Permanent Injunction related to Brazilian Plywood

**Cottage Grove, WI (May 31, 2022)** — In September 2019, a group of US plywood manufacturers filed a complaint in the Southern District of Florida concerning PFS-TECO's work as an accredited third-party agency in Southern Brazil. The complaint alleged that the PFS-TECO certification mark should be considered false advertising because their group believes it is not possible for plywood made from pine grown in Southern Brazil to meet the requirements of US DOC Product Standard 1 (PS 1).

PFS-TECO has tested and certified plywood in Brazil for over 20 years. PFS-TECO has been accredited and recognized by International Accreditation Services, Inc. as an inspection and testing agency and Standards Council of Canada as a certification agency. The third-party certification system for building products involves the manufacturer taking responsibility for their product while the third-party agency's role is to be the impartial link between the manufacturer and the local building official's review of the application of the product. The certification mark is intended to inform the building official that the manufacturer has demonstrated they have the capability to comply with the product standard and they had third-party oversight at the time the product was manufactured. The referenced product type and grade in the mark are then used during the building official's inspection.

On May 23, 2022, PFS-TECO and the U.S. Structural Plywood Integrity Coalition agreed on the terms of a permanent injunction to settle the ongoing dispute between them. On the following day, according to the terms agreed by the parties, the judge issued a permanent injunction under which PFS-TECO exits the certification market for PS 1 rated plywood in Southern Brazil. The case was settled before the jury trial took place and/or the Court has made any determination on the case's merits. Therefore, the federal district court has not made any determination concerning the accuracy of the plaintiff's allegations concerning the "strength" of the Brazilian plywood bearing the PFS-TECO stamps or what "wholesalers and retailers" must or should do regarding existing stocks of the labeled product.

Indeed, the injunction does not prohibit, limit, or restrain the sale and/or use of the products labeled with PFS-TECO mark on or before May 31, 2022. The injunction entered by the Court addresses only the future actions of PFS-TECO. The injunction was made without any findings of fact about the products that have been labeled. The injunction specifically does not order the removal or obliteration of any label applied to the product on or before May 31, 2022. The relevant injunction language states:

"IT IS ORDERED AND ADJUDGED that, within seven (7) days of the entry of this Judgment, PFS-TECO is ordered to revoke all of the PS 1 certificates and grade stamps that PFS-TECO has issued to plywood mills located in southern Brazil by emailing a notice of PS 1 certificate revocation to each Brazilian licensee and to remove all revoked PS 1 certificates from the PFS-TECO website."

608.839.1013 1507 Marl Pkwy Cottage Grove, WI 53022  
WWW.PFS-TECO.COM

## PFS-TECO New Release

### May 31, 2022


[Link](#)

44



**Synthetic underlayment**

45



**Understanding underlayments**

Some roofing underlayment products may not be code-compliant

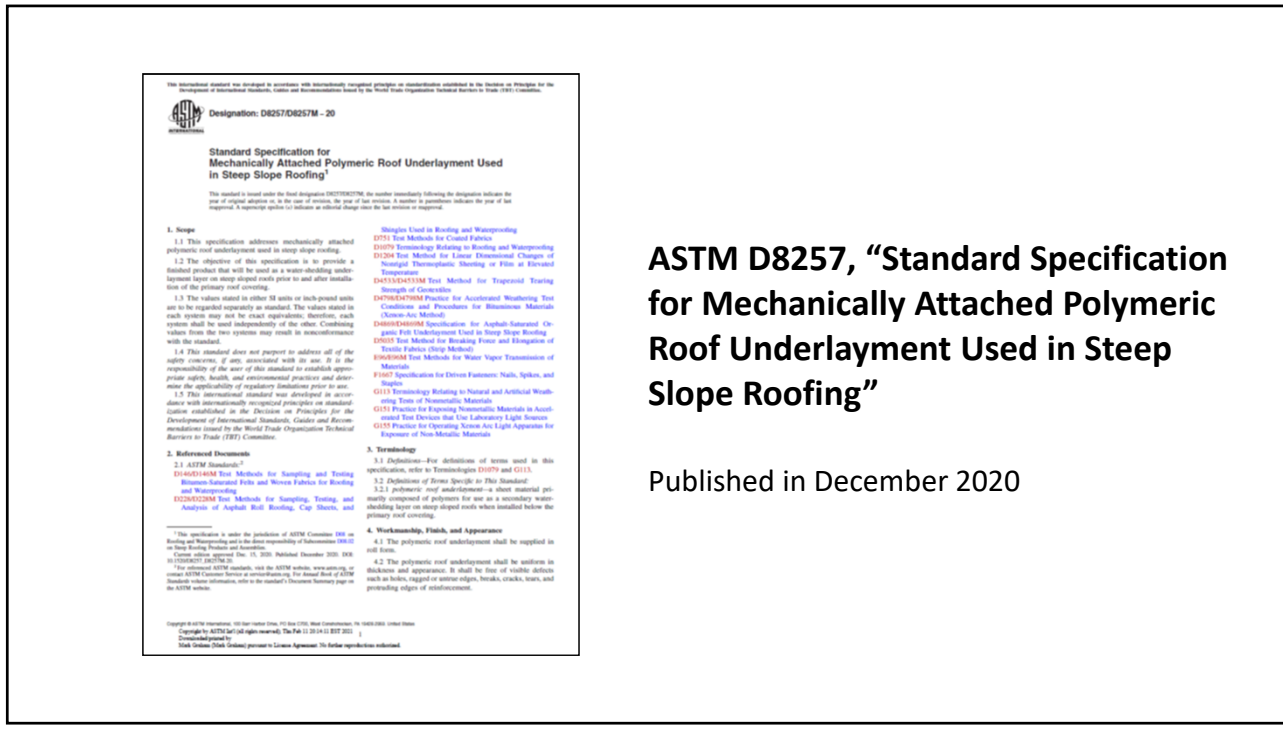
If use of a nonasphaltic or synthetic underlayment product is being considered for a specific project, code acceptance can be sought by making a specific request to the authority having jurisdiction (AHJ). AHJs typically will request an evaluation report, such as those provided by ICC Evaluation Service or Underwriters Laboratories Inc. AHJs may grant code acceptance for alternative underlayment products on a project-by-project basis and typically not a blanket acceptance applying to all future projects in a specific jurisdiction.

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December 2016

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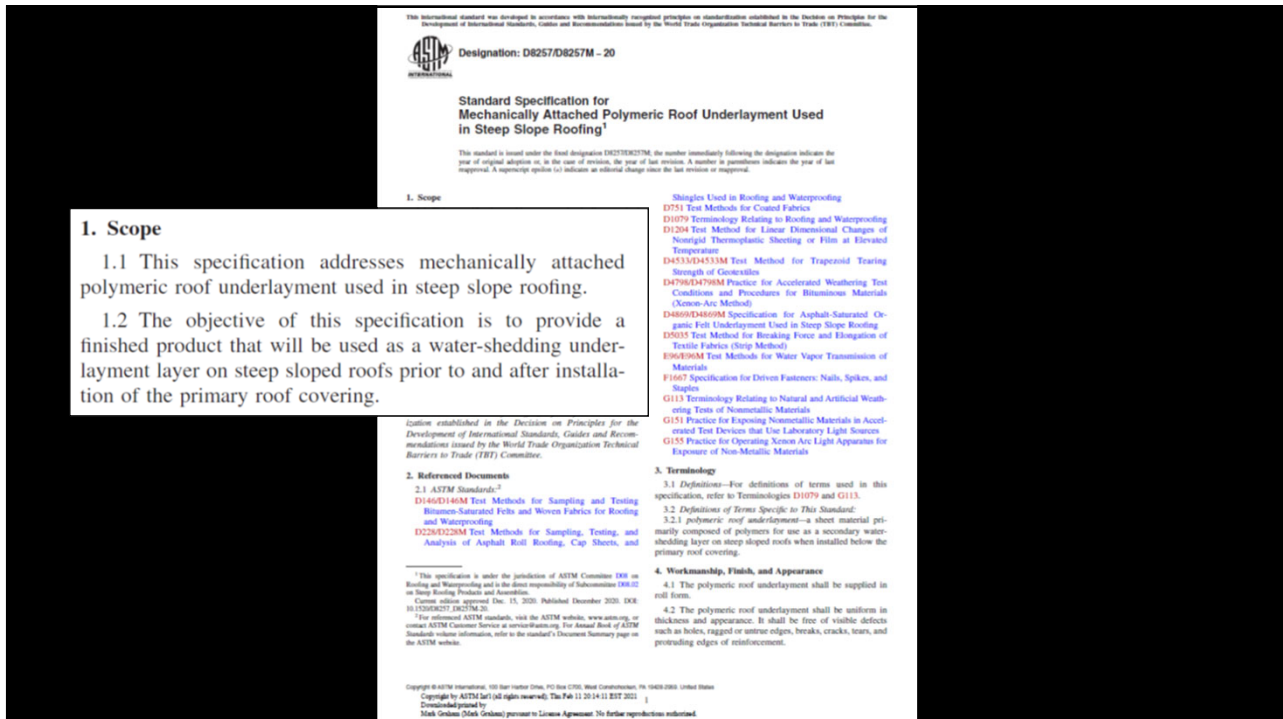
46



# ASTM D8257, “Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep Slope Roofing”

Published in December 2020

47



**1. Scope**

1.1 This specification addresses mechanically attached polymeric roof underlayment used in steep slope roofing.

1.2 The objective of this specification is to provide a finished product that will be used as a water-shedding underlayment layer on steep sloped roofs prior to and after installation of the primary roof covering.

48



**D8257/D8257M - 20**

4.3 The surface of the underlayment sheet shall be designed to provide traction and slip resistance to the applicator. **7. Test Methods**  
7.1 Conditioning—Unless otherwise stated, all specimens to be tested shall be conditioned for a minimum period of 24 h at

**TABLE 1 Requirements for Polymeric Roof Underlayments**

Test Requirement	Specimen Type	Test Method	Conditions of Acceptance
Unrolling	As received	7.2	No visible cracking, tearing, or delamination of underlayment
Pliability	As received	7.3	No visible cracking or delamination of underlayment
Water Vapor Transmission	As received	7.4	Results shall be reported in Perms
Liquid Water Transmission	As received	7.5	Shall meet the "PASS" requirements of ASTM D4869/D4869M
Linear Dimensional Change	As received	7.6	Max. linear change of -2.5 to +1 %
Tensile Strength (machine and cross-machine direction)	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.7 7.7 and 7.11 7.7 and 7.12	Min. 3.5 kN/m [20 lbf/in.]
Tearing Strength (machine and cross-machine direction)	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.8 7.8 and 7.11 7.8 and 7.12	Min. 67 N [15 lbf]
Fastener Pull-Through Resistance	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.9 7.9 and 7.11 7.9 and 7.12	Min. 111 N [25 lbf]
Hydrostatic Resistance	As received After Thermal Cycling After Laboratory Accelerated Weathering	7.10 7.10 and 7.11 7.10 and 7.12	No water shall pass through any specimen
Thermal Cycling	As received	7.11	No visible damage such as peeling, chipping, crazing, splitting, cracking, flaking, or pitting
Laboratory Accelerated Weathering <sup>A</sup>	As received	7.12	No visible damage such as peeling, chipping, crazing, splitting, cracking, flaking, or pitting

<sup>A</sup> The effect of laboratory accelerated weathering on the tensile strength, tearing strength, fastener pull-through resistance, and hydrostatic resistance of the roof underlayment is for the purpose of simulating the effect of solar radiation, heat, and moisture on the roof underlayment during the period in which it is exposed to the environment before the roof covering is installed.

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**D8257/D8257M - 20**

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*Some synthetic underlayments are vapor retarders, while others are vapor "open"*

50

*Where would a “breathable” underlayment be preferred over an “non-breathable” underlayment?*

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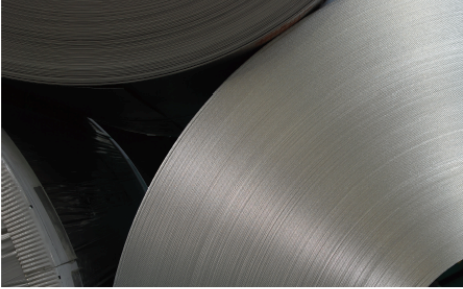
## **Conclusions and recommendations**

Synthetic underlayments

- Specify, select and purchase synthetic underlayments based upon ASTM D8257
- Beware of specific products’ vapor retarder or vapor “open” characteristics
- ASTM D8257 will first be introduced into IBC 2024 and IRC 2024
  - Until then, code official “acceptance” is still needed

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**RESEARCH+TECH**



**A new standard**  
Guidelines for synthetic underlayments  
by Mark S. Graham

**A**fter more than eight years in development, in December 2020 ASTM International published the first U.S. product standard applicable to synthetic, steep-slope underlayment products. If you are involved with the design or installation of steep-slope roof systems, I encourage you to become familiar with this standard and begin to use it when specifying and procuring steep-slope underlayment products.

**ASTM D8257**  
ASTM D8257, "Standard Specification for Mechanically Attached Polymeric Roof Underlayment Used in Steep-Slope Roofing," addresses mechanically attached synthetic underlayment used in steep-slope roof systems.  
The standard defines polymeric underlayment as a sheet material primarily composed of polymers for use as a secondary water-shedding layer on steep-slope roofs when installed below a primary roof covering. The standard's objective is to provide a finished product that will be used as a water-shedding underlayment layer before and after the installation of a primary steep-slope roof covering.

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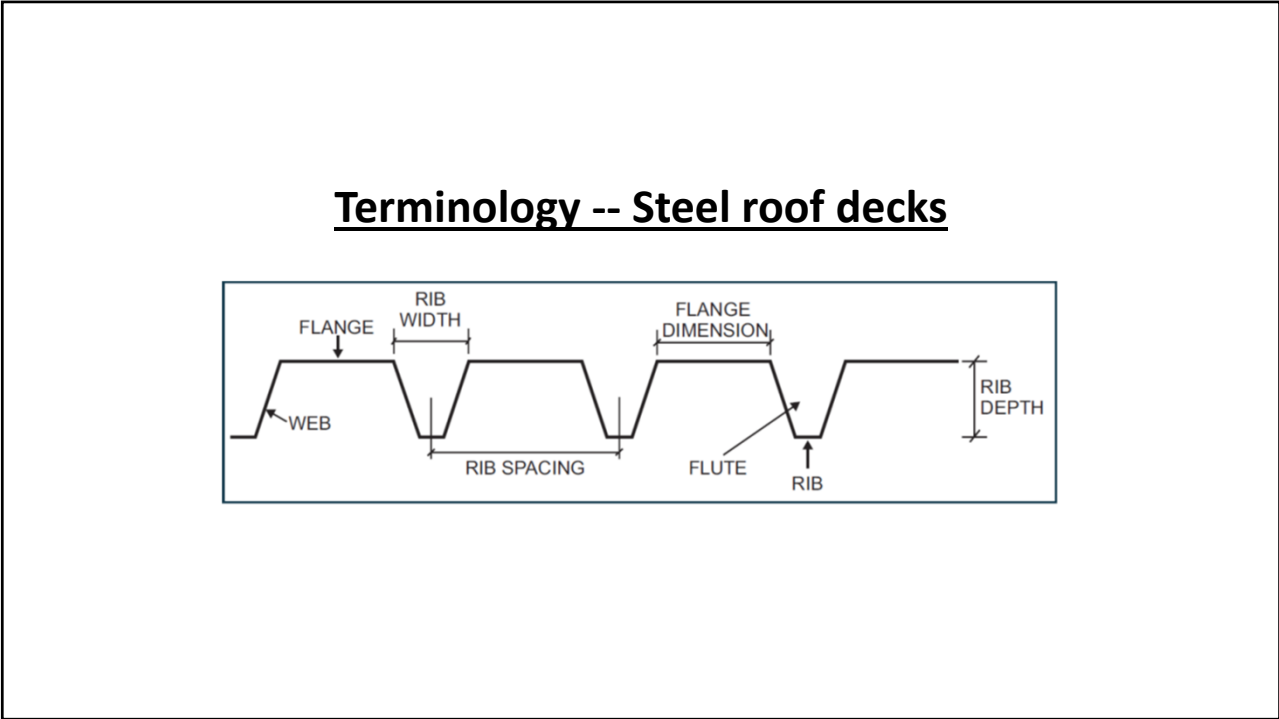
July/August 2021

[Link](#)

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## Steel roof decks

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**RESEARCH+TECH**

**Consider the deck**  
SDI provides additional guidance for steel roof deck designers  
by Mark S. Graham

In November 2019, the Steel Deck Institute issued new guidance for steel roof decks that feature seam-fastened, mechanically attached, single-ply membranes. Although this guidance is directed toward roof deck designers, single-ply membrane manufacturers and suppliers, roof system designers and roofing contractors also should be aware of SDI's latest guidelines.

**Previous guidance**  
In May 2009, SDI issued a position statement, "Attachment of Roofing Membranes to Steel Deck," indicating seam-fastened, mechanically attached, single-ply membrane roof systems apply wind-uplift loads to roof decks differently than adhered membrane roof systems. Although adhered membrane roof systems apply uplift loads uniformly across a roof deck, seam-fastened membrane systems result in concentrated line loads along the deck. Such line loads can result in excess bending moment and shear applied to the deck or a doubling of uplift loads on specific structural supports (purlins) depending on the orientation of the membrane sheets relative to the deck flutes and joints.

SDI's document goes on to recommend structural engineers should review the adequacy of steel roof decks and their underlying

20 www.professionalroofing.net JANUARY 2020

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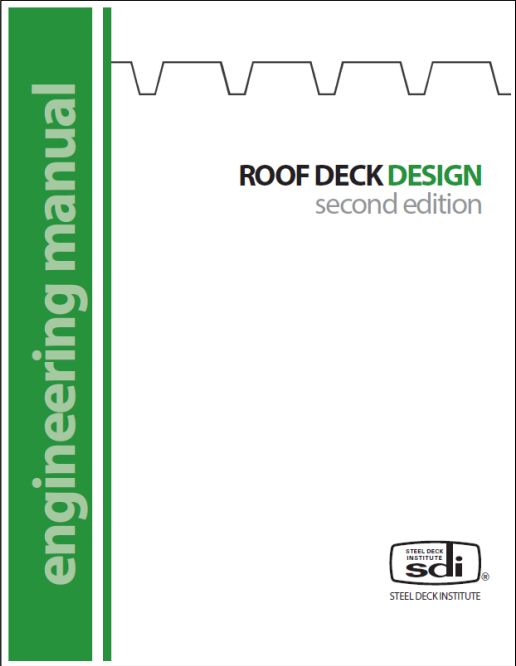


The image shows the cover of a technical note. At the top left is the SDI logo with the text 'STEEL DECK INSTITUTE'. Below it, the title 'Technical Note - No. 7' is displayed in a bold, sans-serif font. Underneath the title is the subtitle 'MECHANICAL ATTACHMENT OF SINGLE-PLY ROOFING MEMBRANES TO STEEL ROOF DECK: IMPLICATIONS FOR STEEL DECK DESIGN' in a smaller, all-caps font. The background features a large, faint 'sdi' watermark. At the bottom right of the cover, there is a small copyright notice: 'copyright 2019 steel deck institute'. To the right of the cover image is a blue 'Link' text.

**SDI Technical Note-No. 7** (Nov. 2019)  
 Mechanical attachment of single-ply roofing membranes to steel roof deck: Implications for steel deck design

[Link](#)

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The image shows the cover of an engineering manual. On the left side, there is a vertical green bar with the text 'engineering manual' written vertically in white. To the right of this bar is a white background with a black line drawing of a corrugated steel roof deck profile. Below the drawing, the title 'ROOF DECK DESIGN' is written in a bold, sans-serif font, with 'DESIGN' in green. Underneath the title is the subtitle 'second edition' in a smaller, lowercase font. At the bottom right of the cover is the SDI logo with the text 'STEEL DECK INSTITUTE'. To the right of the cover image is a blue 'Link' text.

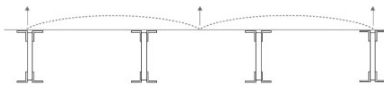
**SDI's Roof Deck Design Manual, Second Edition**  
 --June 2020

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**Section 2.14 Mechanically Attached Single-Ply Roof Membranes**

For both new construction and reroofing or recovering of existing roofs, mechanically attached single-ply roofing membranes are often used. As opposed to adhered membranes which are continuously adhered to the insulation board, and uniformly load the deck when loaded by wind uplift, mechanically attached membranes are attached using lines of mechanical fasteners at the membrane seams. These seams can be spaced from 4 foot to over 20 foot on center in some applications. Then loaded by wind uplift, these membranes load the steel deck with line loads that can increase the bending moment by several hundred percent over a uniformly applied uplift.



**Figure 2.4 – Membrane Loading Deck**

Some key points that the Designer should keep in mind.

1. The lines of fasteners must not be permitted to be placed parallel to the roof deck ribs. In this case, the deck resistance is reduced to that of a single rib, and failure of the steel deck is inevitable.
2. The Designer must consider the effect of the line loads on the steel roof deck and underlying framing, and design the deck and framing accordingly.
3. When reroofing or recovering an existing roof, strict attention must be given to the capacity of an existing steel deck that was originally designed for a uniform uplift load. A mechanically attached membrane may not be feasible.

SDI Technical Note 7, "Mechanical Attachment of Single-ply Roofing Membranes to Steel Roof Deck: Implications for Steel Deck Design" should be referred to for additional information.

STEEL DECK INSTITUTE

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**ANSI/SDI SD-2022, "Standard for Steel Deck"**

[Link](#)

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## Recommendations

Steel roof decks

- Be particularly careful with “acceptance” of steel roof decks
- Do not make representations (either express or implied) of the structural capacity, wind uplift resistance, corrosion resistance or suitability for use of steel roof decks
- Limit your “acceptance” to:
  - The deck surface
  - Relatively clean (“broom clean”)
  - Free of visible moisture

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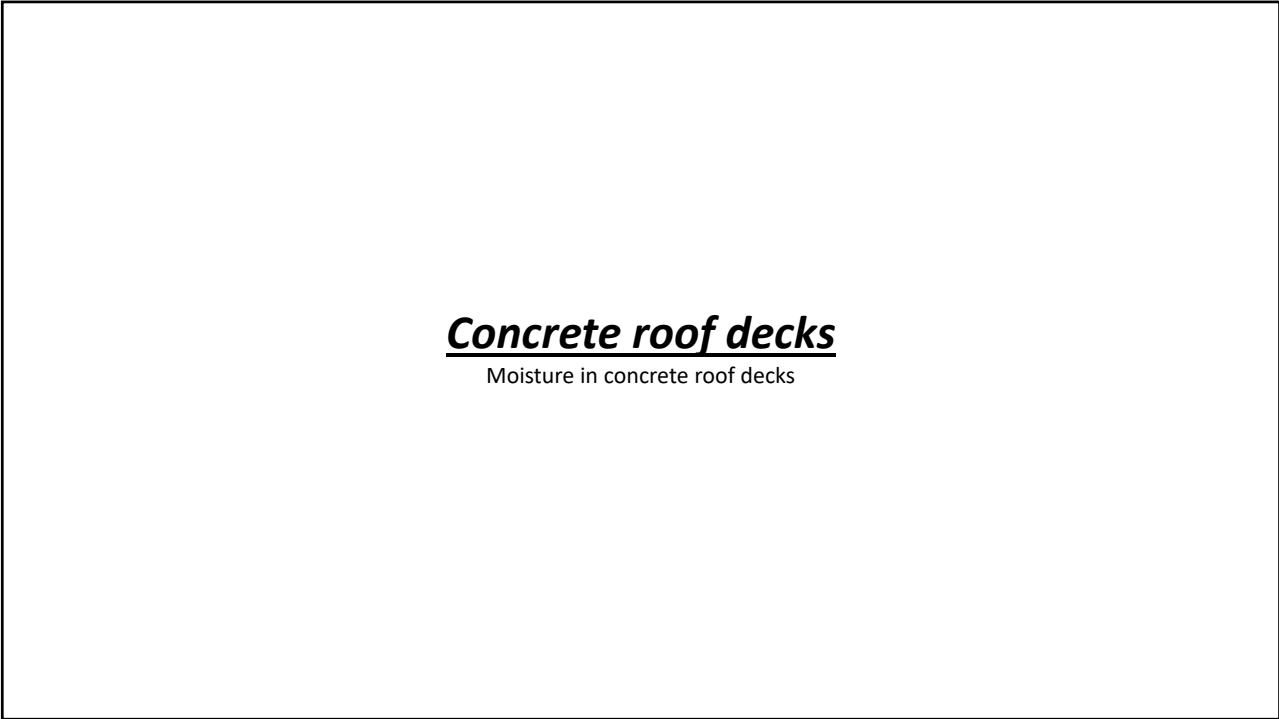
### 15. Roof deck conditions

In the event that roofing is to be installed over a concrete or other wet deck or substrate, the determination as to when the concrete or wet substrate is sufficiently cured and dried so that roofing materials can be installed without potential future adverse effect shall be made by the General Contractor in consultation with the concrete subcontractor, concrete manufacturer and design professional. Roofing Contractor is not responsible to evaluate the concrete mix, drying characteristics or effect of the substrate on the roofing, and for water intrusion while the deck is drying. Roofing contractor will commence installation of roofing materials when directed by the General Contractor or design professional.

Explanation: *Roof deck conditions*

*Roofing Contractor's commencement of the roof installation indicates only that Roofing Contractor has visually inspected the surface of the roof deck for visible defects and has accepted the surface of the roof deck. Roofing Contractor is not responsible for the construction, structural sufficiency, undulations, durability, fastening, moisture content, suitability, or physical properties of the roof deck or other trades' work or design. Roofing Contractor is not responsible to test or assess moisture content of the deck or substrate.*

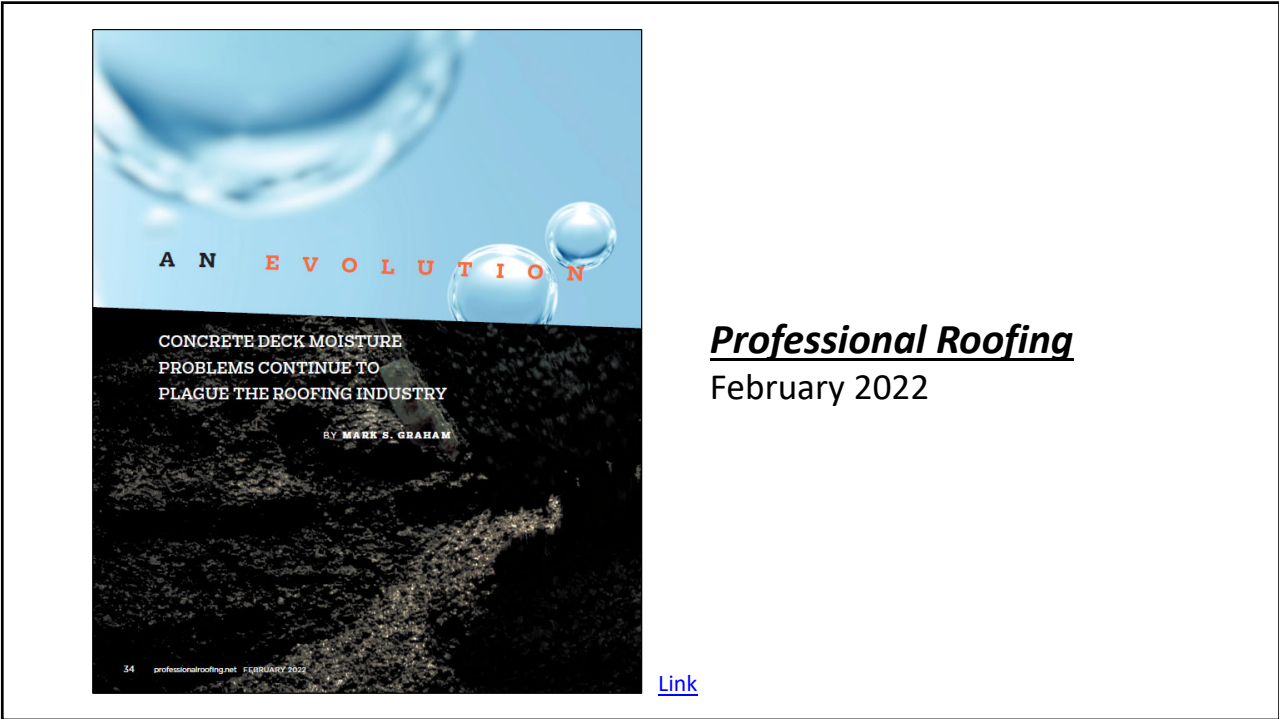
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**Concrete roof decks**

Moisture in concrete roof decks

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February 2022

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**What we now know... what we have learned**  
 Moisture in concrete roof decks

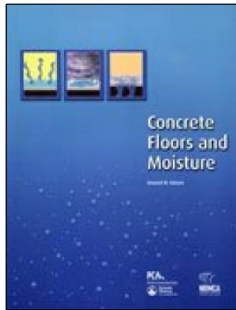
65

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

66



### ***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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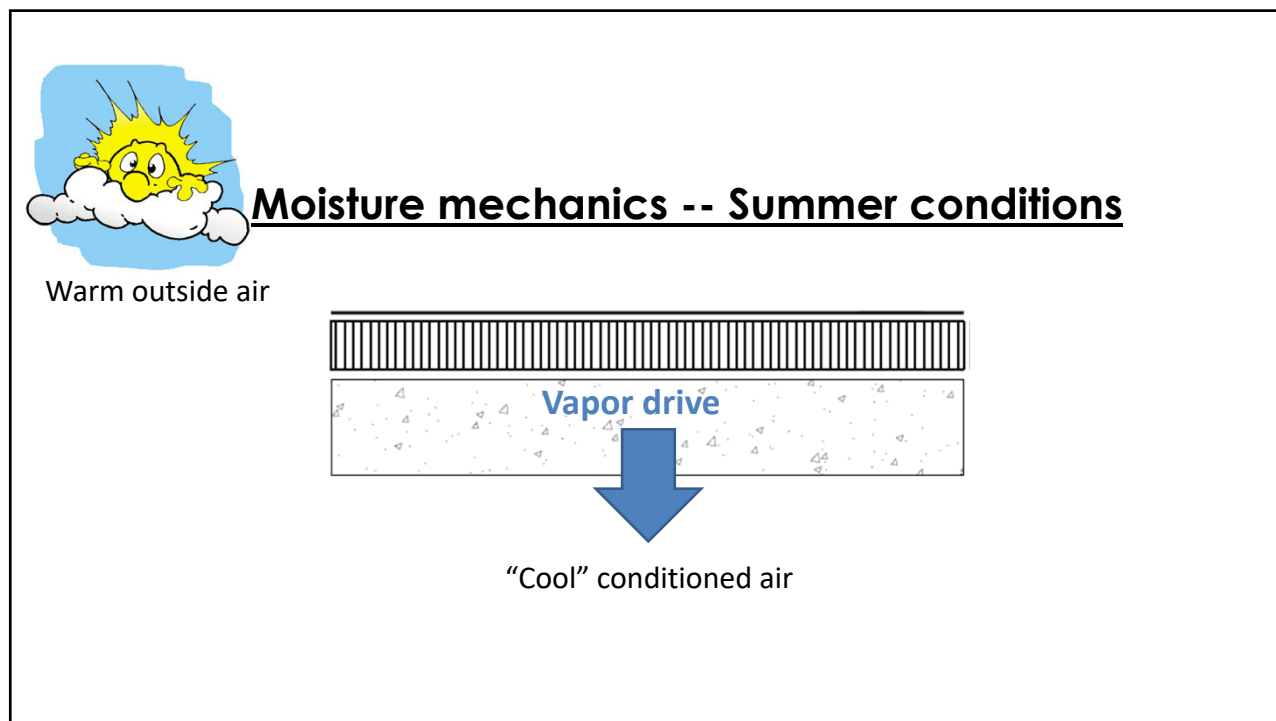
### **Some other things we have learned...**

- Concrete requires a water-to-cement ration of about 0.24 for proper hydration; additional water is added to facilitate handling and placement
- Actual field measured water-to-cement ratios of 0.5 up to 0.75 are not unusual
- Concrete will continue to cure when it's RH is about 80% or higher and its temperature is about 40 F or higher

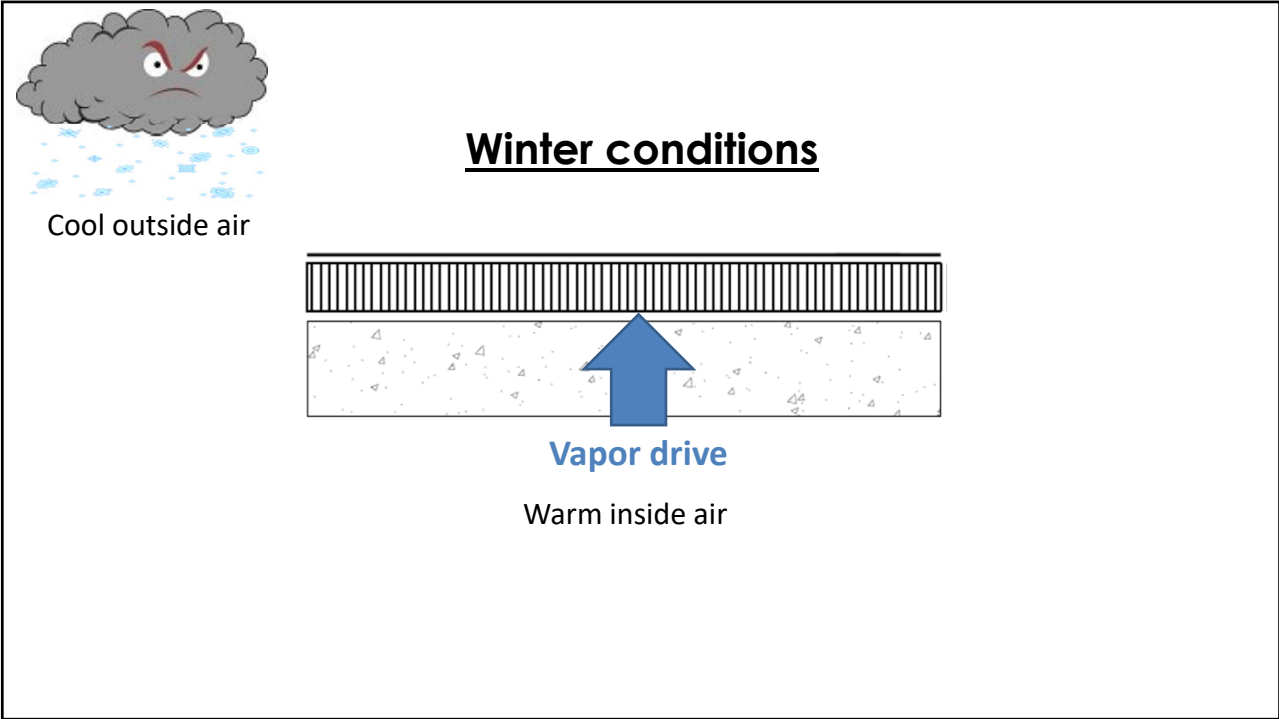
68

- Concrete's porosity is at its highest shortly after placement and its porosity gradually decreases over time (curing)
- Fly ash (a concrete additive) typically reduces concrete's porosity
- Concrete finishing techniques can impact concrete's porosity
- Many concrete admixtures will retard concrete drying
- Power finishing air-entrained concrete mixes can result in surface dusting, crazing and spalling.
- Concrete is a highly variable construction material

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RESEARCH+TECH



**Are admixtures the answer?**  
Moisture in concrete roof decks continues to be problematic  
by Mark S. Graham

**N**NRCA's Technical Service Section has been receiving negative feedback regarding the use and effectiveness of specific concrete mix additives and liquid surface treatments to address moisture-related concerns with concrete roof decks. Such admixtures broadly are referred to as moisture vapor reduction admixtures (MVRAs) or gravity resisting admixtures. NRCA provides recommendations regarding their use.

Concrete admixtures intended as MVRAs are specific chemicals added during concrete's heating and curing to provide an additional chemical reaction during the concrete's hydration and curing process. MVRAs use the concrete mix's excess water and chloride to create a calcium silicate hydrate gel within the concrete. The gel is used 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 permeable and transport throughout the concrete's entire thickness.

24    www.professionalroofing.net    DECEMBER 2018

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December 2018

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## From the Roofing Industry Research, Phase 1

Age	ASTM E96 calculated perm			
	Lightweight structural concrete		Normal weight concrete	
	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.

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Without an MVRA

With an MVRA

SAMPLE ID	SAMPLES 6-1 AND 6-2		SAMPLES A-1 AND A-2		SAMPLES B-1 AND B-2	
	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*m <sup>2</sup> )	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*

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## Conclusions...

- It's not the roofing industry's water
- We shouldn't take responsibility (or be held responsible) for concrete deck moisture
- Roofing contractors typically do not have the expertise or project-specific knowledge to make "dryness" or "when to roof" decisions on concrete roof decks
- Use proper deck "acceptance" language

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### Contract provision addresses installation of roof system over concrete deck

December 27, 2019

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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 provision stating the subcontractor's commencement of its work constitutes the subcontractor's acceptance of adjacent surfaces. This is why it is particularly important you have a provision that states commencement of the roofing contractor's work only indicates acceptance of the surface of the deck, as included in the provision above.

**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%.

Tags: [Legal Contract Provisions](#)

[Calendar](#)

NRCA	Education	Industry
March 10, 2022	LEGAL CON	Rosemont, IL
April 5-6, 2022	Roofing Day in D.C. 2022	Washington, D.C.
April 21-23, 2022	Roofing Alliance Member Meeting	Sarasota, Fla.
July 12-16, 2022	NRCA Midyear Meetings	Chicago

[Link](#)

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## **Recommendations**

Concrete roof deck moisture

- When deck dryness cannot be assured:
  - Use a well-adhered, low-perm-rate vapor retarder
  - Do not penetrate the vapor retarder (e.g., excludes mechanically-attached roof systems):
    - Adhered roof system
    - Loosely-laid, ballasted roof system
  - Minimize the use of roofing materials with organic content (e.g., excludes cellulose-mat-faced polyisocyanurate insulation, perlite board and wood fiberboard)

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## **Recommendations -- continued**


Concrete roof deck moisture

- Roof replacement:
  - Where there is evidence of concrete deck-related moisture problems, use roof system designs similar to those for newly placed concrete roof decks

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# Construction-generated moisture

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**RESEARCH+TECH**  
**Construction-generated moisture**  
 Unintended moisture accumulation can affect roof system performances  
 by Mark S. Graham

The process of constructing buildings and certain building systems and finishes can result in the generation and release of relatively large amounts of moisture. Left unaccounted for and allowed to become entrapped within a building, this moisture can result in premature deterioration of some building systems and materials, including roof systems. Following is a brief discussion of some construction-generated moisture sources and examples of how their effects can be mitigated.

**Moisture sources**  
 During construction, large amounts of water are used in the manufacture and installation of certain building materials. For example, a normal-weight structural concrete mix with a water-to-cement ratio of 0.45 contains about 30 gallons of water per cubic yard of concrete. In some instances, additional water is added to ease the transport and placement of concrete. About half of this water will be consumed during the concrete's hydration and curing process. The remaining water is left to dissipate by evaporation and moisture vapor transport over time. Similarly, many building construction finish materials contain large amounts of water. Plaster, drywall, drywall compounds, some adhesive

24 professionalroofing.net DECEMBER/JANUARY 2021-22

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### **Some things we know...**

Construction-generated moisture

- Cooler temperatures are more challenging than warmer temperatures
  - Cool air holds less moisture
- Some “modern” materials are less moisture tolerant
- Water-based products release moisture; more than solvent-based materials
- Concrete is placed using much more water than is necessary for proper hydration
- Concrete admixtures typically slow moisture release

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### **Some things we know (cont.)...**

Construction-generated moisture

- Temporary enclosures can trap moisture/prevent moisture release
- Temporary heating can be problematic
  - Propane heaters release large amounts of moisture vapor
- Bringing warm, stored materials out into a cold environment can result in surface condensation

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## **Recommendations**

Construction-generated moisture

- Realize practical (and physical) limitations
- Consider appropriate contract provision language so you don't take on additional liability
- When construction-generated moisture cannot be controlled, use a vapor retarder at the deck level

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## **Questions (and other topics)**

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**Mark S. Graham**  
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