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Hello!

Professional Roofing launches a new look

by Ambika Puniani Reid

elcome to our new design! The *Professional Roofing* team has spent the past 18 months re-envisioning NRCA's publication while continuing to provide you with important, useful information in an easy-to-navigate format.

We began the process with a comprehensive reader survey asking what readers like and don't like about the magazine. The good news is, by and large, you all like what we do and how we do it. So we focused on a few content tweaks and a visual refresh.

The new things you may notice: We discontinued our #Hashtag section; refreshed our logo; and changed how the table of contents, Details and Marketplace are presented. We also revised our headers, page numbers and paper stock (yes, it is now matte and not glossy).

You also will notice changes in certain design elements throughout the publication.

During the past two years, we added two designers and an editorial assistant to our team, and it was wonderful to have new ideas and excitement injected into the process.

It had been several years since our previous redesign, and our hope is this new one will serve you well for many more. As always, please reach out with feedback and send us your story ideas. We want to continue our job of producing the most respected and well-read publication in the roofing industry.

Next up: redesign of the magazine's website,

professionalroofing.net. We have contracted with a website design firm to help us with that process, and we expect to launch this fall.

mbika

AMBIKA PUNIANI REID is editor of *Professional Roofing* and NRCA's vice president of communications.







CLOSE-UP

killsUSA® held its second annual commercial roofing competition during the week of June 24 at its National Leadership & Skills Conference in Atlanta.

During the competition, winners from state contests competed to install TPO membrane roof systems on mockups. Each student worked with a coach to install a roof system per NRCA PROCertification[®] standards.

To read about this year's winners, see "Students receive awards for SkillsUSA national roofing competition," page 16.

To submit a photo to Close-up, email professionalroofing@professionalroofing .net. Submittals should include a photo and a description of the photo. **S•***

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Mission: Professional Roofing provides cutting-edge content, valuable insight and innovative ideas to help roofing professionals succeed.

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NEW IDEAS

Nailers increase sub-flush

DEWALT[®] has launched its 20V MAX XR[®] Brushless Cordless 21-degree Plastic Collated Framing Nailer and 30-degree Paper Collated Framing Nailer. The nailers feature a flywheel that allows the tool to stay active after the trigger is released to minimize downtime between shots. They also are said to drive nails up to 72% more sub-flush than previous nailer models.

DEWALT also has announced its XR POWERPACK[™] 8 Ah battery, a 20V MAX tabless cell battery. With a greater surface area, the battery reportedly conducts more energy to provide users with increased power outputs.

Additionally, the battery features impact and weather resistance, as well as an LED indicator for its charge level.

dewalt.com

Color finishes are durable

Fabral Metal Wall and Roof Systems has

introduced its Sherwin-Williams[®] WeatherXL[™] color lineup, which offers a robust finish in 21 colors for wall and roof panels.

With a two-coat, silicone-modified polyester coating, Sherwin-Williams WeatherXL

is durable and can endure extreme conditions; resists chalking, fading and scratching; and retains color and gloss retention.

Sherwin-Williams WeatherXL is available for a range of Fabral's residential and agricultural metal panels, including the Grandrib series, the Horizon series, and trim and soffit panels.

fabral.com



Gloves provide dexterity

Brass Knuckle® has made available its Smart-Flex[™] 400 Series



gloves. Designed with a lightweight, 13-gauge nylon shell and a polyurethane coating for grip and dexterity, the gloves also are abrasionresistant. They are available in three colors: black nylon with gray coating, white nylon with white coating and black nylon with black coating.

brassknuckleprotection.com



Vent stack extension has compatibility

Tubos Inc. has introduced its 5-inch diameter vent stack extension for commercial roofing applications.

Tubos pipe extensions also are available in 2-, 3- and 4-inch diameters and are compatible with cast iron and PVC vent stacks. Additionally, the extension features a 6-inch internal splice sleeve to prevent water and moisture from leaking into a roof assembly. **tubos.biz**





Another type of cancer

The industry needs to do more to address mental health struggles

by McKay Daniels

hen my wife and I returned to Washington, D.C., for my third tour of duty as a congressional staffer, the house we purchased had a lot of "deferred maintenance." We got to work rehabbing the interior and exterior, and the contractor leading the work basically became part of our family because we were living in the house during the months-long rehab.

So it was heartbreaking to receive an email from his son saying our friend had terminal cancer. He had previously beaten two former bouts of different cancers, but this one was untreatable.

With the other diagnoses, he was able to ring the bell, a celebratory moment for cancer patients who complete their treatment.

There would be no bell ringing this time.

Coincidentally, ringing a bell came up in a conversation that had nothing to do with cancer; a roofing contractor and I were

discussing mental health, drug and alcohol addiction, and suicide in the roofing industry. The contractor pointed out there are celebrations and bell ringing for beating cancer but there is no such public celebration or excitement to acknowledge tackling or overcoming addiction or mental health struggles. These milestones are either private or shared with a small group of trusted friends and family. We've all likely seen social media posts for someone's cancer being in remission or eliminated. When was the last time you saw a post about someone saying they no longer contemplated suicide?

In another conversation about mental health with a different roofing contractor, he, too, made the comparison to cancer and cancer treatment. The contractor pointed out if one of his family members had cancer, he would go to the ends of the Earth for the best treatment possible. But the public response is different with mental health.

Culturally, we often tell struggling people to "suck it up" or "deal with it" or avoid talking about mental health issues outright. Even in a welcoming environment, this attitude can make the person who is struggling feel as though there is no one to talk to because of fear of a negative response. As a result, far too often, we're not even aware a person is struggling at all.

But there's a cancer permeating through society. It doesn't show up on a CAT scan or X-ray. It's not as easily diagnosed or as straightforwardly treated with cycles of chemo and radiation, but it's there and it's pervasive. Deaths by suicide hit an all-time high in 2022, the most recent year of data, with more than 50,000 lives lost. And indications are the number continues to rise. Sadly, data shows roofing and construction workers are more susceptible to suicide than the general population. Construction has the second-highest suicide rate of all industries; death by suicide happens within construction at twice the rate of the male population at large. (Men are 3¹/₂ times more likely to die by suicide than females. Roofing is a male-centric industry, so it makes sense to exclude females from the comparison.)

But mental health struggles can manifest in ways other than suicide. Construction workers also have substance use disorders occurring at twice the rate of the general population and are seven times more likely to die of an overdose than workers in any other occupation.

In fact, 12% of construction workers have an alcohol use disorder versus 7.5% nationally.

It doesn't help that human attachment and interaction are in decline and loneliness is on the rise. Gallup reports 20% of respondents to a recent survey said they felt lonely for "a lot of the day yesterday." This is distressing.

One in five people! Look around your office, and you hit that number pretty quickly.

"A lot of the day!" Not for a moment or in passing but a meaningful portion of an entire day.

Yesterday! Not in the past month or recently but *yesterday*.

The numbers are even higher for those younger than 35 years old: 22% of individuals under 35 years old report being lonely.

Gallup states: "The risk of mortality among people who lacked community and social ties was two times greater than that of people who had many

DID YOU KNOW?

September is Suicide Prevention Month, and Sept. 9-13 is Construction Suicide Prevention Week (NRCA is a sponsor). To participate in the week and raise awareness among your team, go to constructionsuicideprevention.com.

NRCA contractor members will be receiving mental health awareness kits this month, and NRCA offers several webinars addressing the topic, which can be accessed at nrca.net/education/ webinar-recordings.

social contacts. These differences were independent of physical health, socioeconomic status and health practices. Other studies have found similar relationships between strong social connections and longevity."

During the past two NRCA board of directors meetings, members participated in substantive, compelling presentations about the mental health issues facing our industry and how those issues manifest themselves whether by alcoholism, absenteeism, drug abuse, suicide or other ways.

NRCA's Health and Safety Committee officially added mental health to its areas of focus and deemed it an issue NRCA should focus on with the same intensity as more commonly discussed health and safety issues such as falls, soft-tissue injuries, auto accidents, torch safety and others.

This month is suicide awareness month. All NRCA contractor members will be receiving a kit with some baseline information and resources for their teams. Please consider ways to begin incorporating this topic into your training and conversations.



This is not going to be quick, easy or a straight line to success, and there are many aspects out of our control. But we owe it to our teams and ourselves to, at a minimum, engage, be informed, take steps to destigmatize this issue and be upfront about it. It is killing our friends and colleagues, and we owe them the opportunity to be able to ring a bell in their own ways as we work together to get them the care and help they need.

MCKAY DANIELS is NRCA's CEO. MDANIELS@NRCA.NET

Roofing Corp of America partners with Crowther Roofing & Cooling

Roofing Corp of America has announced it has added NRCA member Crowther Roofing & Cooling, Fort Myers, Fla., to its portfolio.

Crowther Roofing & Cooling will operate as a standalone entity within Roofing Corp of America and will continue to be led by CEO Lee S. Crowther, President Kevin Callans and Chief Financial Officer Dan Mazon.

"We chose Roofing Corp of America because we



shared its vision for growth and expansion and the central role our people play in that," Crowther says. "We could not be more excited

about our future in partnership with this impressive group of leading contractors."

"I have long admired Crowther Roofing & Cooling," adds Randy Korach, CEO of Roofing Corp of America. "It is an iconic business and brand in our industry with top-notch leadership. Through this partnership, we meaningfully expand our presence in Florida, one of the nation's largest roofing markets, and we gain competence with new service offerings that we will look to scale across our broader geographic footprint."

NRCA launches Spanish membership site

NRCA has announced the launch of its new membership category available exclusively in Spanish. This initiative marks a milestone in NRCA's ongoing efforts to better serve the Spanishspeaking roofing community.



The new membership site is designed to provide essential business knowledge and a wide range of benefits tailored to the unique needs of Spanish-speaking business owners and workers. The content includes educational resources, videos and products in categories such as finance, legal business, operations and planning, professional certifications, safety and training.

Current NRCA members can access Spanish-only content for free by logging into their NRCA accounts. For more information, go to spanish .nrca.net or contact membership@nrca.net.



AEA Investors acquires Nations Roof

The Middle Market Private Equity team for AEA Investors, New York, has announced its fund has closed the acquisition of NRCA member Nations Roof, Mobile, Ala.

Nations Roof is a commercial roofing contractor that offers reroofing, new roof system installation, and maintenance and repair services. The company serves a diverse array of segments, including national retailers, property managers, and commercial and industrial customers, as well as a broad base of local customers across the roofing value chain. Nations Roof focuses on national account customers and employs the industry's largest dedicated national account sales team. The company has completed projects in all 50 states through its 22 business units and nine service center locations.

Nations Roof is the 10th building products platform investment AEA Investors has made during the past two decades.

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NEWS + VIEWS



Students receive awards for SkillsUSA national roofing competition

SkillsUSA, an organization that aims to prepare and empower students for careers in the trades, held its second annual commercial roofing competition during the week of June 24 at its National Leadership & Skills Conference in Atlanta.

Students from throughout the U.S. competed in state competitions to earn the right to compete for the national title. There were 11 competitors total in this year's competition.

On June 28, Brandon Lopez of South Carolina received first place in the High School category. Noemi Marinez of Florida received second place and Matthew Rodriguez of Arizona received third place.

Tyler Hutcheson of New York received first place in the College category. Matthew Addington of Florida received second place and Hunter Hamilton of Tennessee received third place.

First-place winners received \$1,200 and a champions belt; second-place winners received \$1,000; and third-place winners received \$800.



NRCA, contractors, trade schools and industry partners are working together to get roofing training and exposure to more young people. You can play a vital part in recruiting hardworking, skilled young workers to your company by partnering with a trade school in your area. To learn more, contact NRCA Director of Workforce Development John Esbenshade at (800) 323-9545, ext. 7524, or jesbenshade@nrca.net.

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RESEARCH + TECH



Know the options

Proper specification is essential for nailbase insulation

by Mark S. Graham

n roof assembly configurations with nailable roof coverings, such as asphalt shingles and metal panels, factoryfabricated, nail-base insulation is becoming more common as a component of insulation entirely above the roof deck. Because nail-base insulation serves multiple functions, including being a roof covering substrate and thermal insulation layer, proper design and specification are essential for roof assembly performance.

The basics

Nail-base insulation is composed of a layer of rigid board insulation factory-adhered or laminated to a layer of structural wood panel sheathing, such as plywood or oriented strand board.

The U.S. product standard for nail-base insulation is ASTM C1289, "Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board," Type V. It provides requirements for a polyisocyanurate insulation foam core faced with plywood or OSB on one major surface and an aluminum foil facer, fiberglass-reinforced cellulose facer or coated glass facer on the other major surface. Plywood is required to comply with one of the following:

- The Department of Commerce's Voluntary Product Standard PS
 1, "Structural Plywood," or PS 2, "Performance Standard for Wood Based Structural Use Panels"
- Canadian Standard CSA 0121, "Douglas Fir Plywood," or CSA 0151, "Canadian Softwood Plywood"

OSB is required to comply with PS 2 or Canadian Standard O325, "Construction Sheathing."

ASTM C1289, Type V does not indicate specific plywood or OSB thickness, span rating or bond classification.

Nail-base insulation with a polystyrene foam core also is available; however, there is not a specific U.S. product standard applicable to it.

When nail-base insulation is installed, the rigid board insulation adhered directly to the structural wood panel sheathing prevents ventilation from occurring between the insulation layer and roof covering. This is referred to as a compact roof assembly. This lack of ventilation coupled with insulation's thermal resistance properties can result in increased roof covering temperatures during high-ambient temperatures, which can adversely affect a roof covering's service life.

To address this issue, manufacturers offer nail-base insulation with spacers added between the rigid board insulation core and the plywood or OSB, creating air space that can provide ventilation.

Vented nail-base products fall outside of ASTM C1289, Type V.

Product literature

Manufacturers' product literature shows nail-base insulation board sizes typically are 4 by 8 feet long and range in thickness from $1\frac{1}{2}$ to $4\frac{1}{2}$ inches in $\frac{1}{2}$ -inch increments. One manufacturer indicates it has a product with a foam core size of $47\frac{1}{2}$ inches by $95\frac{1}{2}$ inches when manufactured on-line and 48 inches by 96 inches when manufactured off-line.

Vented nail-base insulation typically is available in nominal 4- by 8-foot-wide sheets with thicknesses ranging from $2^{1}/_{2}$ to $6^{1}/_{2}$ inches in $\frac{1}{_{2}}$ -inch increments. Vent spaces typically are 1, $1^{1}/_{2}$ or 2 inches thick.

Spacers, spacer configuration and spacer layout vary among manufacturers.

The net free ventilating areas of vented nail-base products also vary. This appears attributable to manufacturers using different spacer materials, configurations and layouts in their vented nail-base products.

Nail-base and vented nail-base insulation generally are recommended to be installed with ½-inch-wide gaps, similar to what is recommended for

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Because nail-base insulation serves multiple functions, proper design and specification are essential for roof assembly performance conventional structural wood panel sheathing. One manufacturer's product literature shows edges of structural wood panel sheathing can be factoryrabbeted so the edges of the foam core can be tightly butted while the wood panel edges are slightly gapped.

Nail-base and vented nail-base insulation are available with several structural wood panel sheathing options, including ¹⁵/₃₂-, ¹⁹/₃₂- and ³/₄-inch-thick plywood and 7/₁₆- and ⁵/₈-inch thick OSB. One manufacturer's technical bulletin indicates ¹⁵/₃₂-inchthick plywood should be avoided, citing dimensional stability concerns.

Additional considerations

When specifying nail-base and vented nail-base insulation, designers should realize there are multiple product options and design intents need to be clearly communicated. In addition to overall board thickness, the core insulation type and its compressive strength; the type, thickness, grade and edge treatment of the structural wood panel sheathing; and type of number of fasteners used to attach the product to the substrate should be clearly indicated.

Also, for vented nail-base insulation, the product's vent space thickness and net free ventilating area should be specified.

Designers also should consider a two-layer application when using nailbase or vented nail-base insulation. For example, when using nail-base insulation with a polyisocyanurate insulation core, a layer of conventional polyisocyanurate insulation can be applied over the deck followed with the nail-base insulation being installed with staggered and offset board joints. This configuration will minimize thermal shorts and moisture vapor transfer through board joints.

In addition, when using vented nail-base, designers should consider specifying the use of self-adhering flashing tape at all board joints to limit air and vapor leakage from the vent space through the board joints.

More information and considerations for the use of nailbase and vented nail-base insulation is provided in the roof deck section of *The NRCA Roofing Manual: Steep-slope Roof Systems* available at shop.nrca.net.

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

ASHRAE installs 2024-25 leadership

ASHRAE

ASHRAE has installed its 2024-25 leadership, including its president, executive committee officers and directors.

M. Dennis Knight will serve as the organization's 2024-25 president. During his inaugural presidential address, Knight introduced the theme for his term: "Empowering Our Workforce: Building a Sustainable Future." The theme highlights the impact the industry is making to address climate change, sustainable development, indoor air quality and new technologies.

The full list of officers and directors is available at ashrae .org.



CDC partners with NOAA to offer heat resources

The Centers for Disease Control and Prevention recently launched a Heat and Health Initiative to help protect workers from dangerous conditions, according to *Safety+Health* magazine.

The initiative includes three resources: the HeatRisk Forecast Tool, HeatRisk Dashboard and newly developed clinical guidance.

The HeatRisk Forecast Tool was developed in partnership

with the National Oceanic and Atmospheric Administration and features a seven-day national heat forecast to alert workers to potentially harmful conditions.

The HeatRisk Dashboard integrates the forecast tool with other data, including local air quality, to inform workers regarding how best to protect themselves when outdoor temperatures are high and could affect their health. The clinical guidance is designed to give medical professionals insights that can help keep at-risk individuals safe when heat and air quality reach dangerous levels.

The resources aim to provide information to help people protect themselves in the heat and can be accessed at cdc.gov.

NRCA's heat safety resources also are available at nrca.net/ safety/heat-illness-prevention.



How technology can help improve construction safety

Safety is crucial in the construction industry, and implementing technology and innovation can help reduce risk.

Construction Dive shares the following examples of technologies that can contribute to safety in the construction industry.

- **Wearables.** Smart helmets, vests and wristbands have sensors that can monitor vital signs; detect hazardous substances; provide real-time alerts in case of accidents; and track workers' movements to prevent collisions.
- Virtual reality/augmented reality. VR and AR platforms can be used for immersive safety training simulations, allowing workers to practice handling hazardous situations in a controlled environment.
- **Drones.** Unmanned aerial vehicles with cameras and sensors can conduct surveys of job sites to identify potential hazards, monitor progress and inspect hard-to-reach areas without risking worker safety.
- Artificial intelligence. AI-powered algorithms can use data from sensors, cameras and other sources to predict safety incidents before they occur; schedule maintenance tasks; and automate safety inspections.
- **Building information modeling.** This software allows architects, engineers and construction teams to create digital models of buildings and infrastructure

projects that can simulate construction processes, identify safety hazards and plan logistics more efficiently.

- **Robotics.** Robotic systems can perform repetitive or dangerous tasks such as heavy lifting and demolition with precision and consistency in hazardous environments.
- **3D** printing/additive manufacturing. 3D printing can be used to create custom safety equipment, tools and building materials tailored to specific project requirements.
- **Predictive analytics.** Applying predictive analytics to historical safety data can identify trends and risk factors associated with workplace accidents; the information can be used to prevent future incidents.
- **Remote monitoring and telepresence.** These allow supervisors to oversee construction activities and provide real-time guidance to workers from a centralized location.
- **Exoskeletons.** Wearable robotic devices can help reduce the risk of musculoskeletal injuries by providing support and assistance to workers when performing physically demanding tasks.



Beneficial ownership information reporting

Understanding the Corporate Transparency Act

by Deborah Mazol

n 2021, the Corporate Transparency Act passed as part of the annual National Defense Authorization Act. This provision was added to the final legislation, one of the few remaining bills Congress views as a "must-pass" each year. Proponents of the Corporate Transparency Act aim to combat illicit activities including tax fraud, money laundering and financing for terrorism by obtaining more ownership information for U.S. businesses.

Corporate Transparency Act requirements took effect Jan. 1. This means most entities incorporated or registered to do business in the U.S. must disclose information about their owners, officers and other key stakeholders. This information must be provided to the Financial Crimes Enforcement Network, which is part of the Department of Treasury.

Which entities must report?

The Corporate Transparency Act primarily will affect an estimated 32 million small businesses. Reporting companies

required to comply must file initial reports by the following deadlines:

- Existing companies: Reporting companies created or registered to do business in the U.S. before Jan. 1, 2024, must file by Jan. 1, 2025.
- Newly created or registered companies: Reporting companies created or registered to do business in the U.S. during 2024 have 90 calendar days to file after receiving actual or public notice the company's creation or registration is effective.

What information must be filed?

A reporting company's beneficial owner is defined as an individual with substantial control over a given company or an individual who owns (or controls) at least 25% interest in the company. However, depending on a company's structure, a business owner may have 1,000 employees and still be required to report under this law.

Generally, reporting companies must provide four pieces of information about each beneficial owner: name, date of birth, address and an identifying number. This number and issuer must be from either a nonexpired U.S. driver's license, a nonexpired U.S. passport or a nonexpired identification document issued by a state, local government or Indian Tribe. A nonexpired foreign passport also is acceptable. All document types require an image to be provided.

Which companies are exempt?

Many larger companies are not required to comply with the Corporate Transparency Act or may be subject to other requirements. Large companies are exempt from the Corporate If you believe your company falls into the category of those required to report, you should begin determining your obligations as soon as possible

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Transparency Act if they meet all the following criteria:

- Employ more than 20 full-time workers in the U.S.
- Operate physical offices in the U.S.
- Report more than \$5 million in gross sales or receipts as evidenced by the previous year's tax return

Status of judicial challenges

There have been numerous legal challenges regarding the Corporate Transparency Act. Earlier this year, a federal district court in Alabama held the Corporate Transparency Act is unconstitutional.

The opinion states "while the legislation may have sensible and praiseworthy ends," the government's arguments that Congress has "the power to regulate millions of entities and their stakeholders the moment they obtain a formal corporate status" from a state "are not supported by precedent." The act "exceeds the Constitution's limits on the legislative branch and lacks a sufficient nexus to any numerated power to be a necessary or proper means of achieving Congress' policy goals," the opinion notes. Unfortunately, relief was only provided to the plaintiffs in this case. The number of active challenges include:

- Alabama (appealed): NSBA et al v. Yellen (Nov. 15, 2022)
- Maine: William Boyle v. Yellen (March 15, 2024)
- Massachusetts: BECMA et al v. Yellen (May 29, 2024)
- Michigan: Small Business Association of Michigan et al v. Yellen (March 1, 2024)
- Ohio: Robert J. Gargasz Co. L.P.A. et al v. Yellen (Dec. 29, 2023)
- Texas: NFIB et al v. Yellen (May 28, 2024)

NSBA et al v. Yellen is due to be heard before the 11th Circuit this month, putting a ruling by that court possibly before the end of 2024.

Legislation in Congress

In December 2023, the House of Representatives passed bipartisan legislation (H.R. 5119) to extend Corporate Transparency Act deadlines by a vote of 420-1. Also, more than 80 senators and representatives sent a letter to the Financial Crimes Enforcement Network calling for a one-year delay of Corporate Transparency Act reporting requirements. However, the Senate has yet to take up this legislation. NRCA sent a letter with coalition partners to encourage Congress to delay these actions for one year at a minimum and sent another letter to support legislation to fully repeal the Act, introduced by Sen. Tommy Tuberville (R-Ala.) and Rep. Warren Davidson (R-Ohio).

In June, the House Financial Services Appropriations subcommittee released its funding bill for fiscal year 2025. This legislation includes a provision that prohibits funds from being used for the Financial Crimes Enforcement Network to promulgate the beneficial ownership reporting rules that have been found unconstitutional or do not reflect Congressional intent. It is unclear whether the Senate will agree to this provision as a part of the larger bill and whether the provision is enforceable given it was the statue and not the rules that were found to be unconstitutional.

Additionally, lawmakers are considering reintroduction of the ENABLERS Act, which expands the Corporate Transparency Act's reporting requirements by subjecting business owners, senior officers, lawyers, accountants and others to additional oversight under the Bank Secrecy Act.

Where do we go from here?

If you believe your company falls into the category of those required to report, you should begin determining your obligations as soon as possible. The Corporate Transparency Act has rules about how to count employees, consider office space and total profits across affiliates, so make sure you understand those guidelines.

NRCA continues to work diligently with Congress and the Department of Treasury to gain greater clarification regarding this law and either repeal or delay its implementation.

Editor's note: The information contained in this article is for general educational information only. It does not constitute legal advice nor should it be relied upon as legal advice.

DEBORAH MAZOL is NRCA's director of federal affairs in Washington, D.C.

DOL announces final rule updating Hazard Communication Standard

In May, the Department of Labor announced a final rule from its Occupational Safety and Health Administration that will update the current Hazard Communication Standard to better protect workers by improving the amount and quality of information on labels and safety data sheets,



which allows workers and first responders to react more quickly during an emergency, according to OSHA. The update took effect in July.

Aligned primarily with the seventh revision of the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals, the updated standard requires labels on small packaging to be more comprehensive and readable and makes changes to help ensure trade secrets no longer prevent workers and first responders from receiving critical hazard information on safety data sheets; updated physical hazard classes to better inform users regarding safe handling of explosives, aerosols and chemicals under pressure; and updated precautionary statements about how to safely handle, store and dispose of hazardous chemicals.

OSHA's previous Hazard Communication Standard update, published in 2012, was the first to align with GHS. That final rule incorporated the third revision to provide a common and coherent approach to classifying chemicals and communicating hazard information.

Safety+Health magazine reports employers using products covered under the standard must update their hazard communication programs, labeling and employee training by July 26, 2026, or Jan. 19, 2028, depending on substances or mixtures. Until those dates, employers can comply with the old or new standard, or both.

The Hazard Communication Standard provides a standardized approach to workplace hazard communications associated with exposure to hazardous chemicals. All employers with hazardous chemicals in

To learn more about the seventh revised edition of GHS, go to professional roofing.net.

their workplaces must have labels and safety data sheets for their exposed workers and train them to handle the chemicals safely.

OSHA finds contractor did not provide safeguards to prevent employee fatality

The Occupational Safety and Health Administration has determined roofing contractor OJR Construction Inc., Watertown, Mass., again violated federal regulations for fall protections following a workplace safety investigation into how an employee suffered fatal injuries after falling about 27 feet when trying to carry materials and climb a ladder jack scaffold at a job site in September 2023, according to OSHA. The company is not an NRCA member.

OSHA cited OJR Construction in March 2017 and September 2019 for failing to protect employees from fall hazards by complying with required safety standards.

OSHA inspectors found the company willfully exposed employees to fall hazards by not providing a safety net or personal fall-arrest or guardrail systems and by failing to have a program to train employees to recognize and address fall hazards.



The investigation also determined OJR Construction exposed workers to falls and other hazards by not complying with OSHA regulations that required:

- Installing guardrails on scaffolds or determining the tipping weight of scaffold planks that extended more than 18 inches over a supporting surface, exposing employees to falls over 15 feet
- Guaranteeing ladder side rails extended at least 3 feet above the upper landing surface being accessed

- Ensuring the area below the scaffold and ladders within the pathway of vehicular traffic were barricaded to prevent fall and struck-by hazards
- Having a competent person on the job site to ensure the use of fall protection
- Preventing debris from accumulating at the bottom of ladders to provide safe access to the job site
- Providing and ensuring eye protection for employees using nail guns

Following its investigation, OSHA cited OJR Construction for one willful violation and 10 serious violations and assessed \$88,721 in proposed penalties.

OJR Construction has chosen to contest OSHA's citations before the independent Occupational Safety and Health Review Commission.

> NRCA's classes, webinars and products offer information to ensure you properly train your employees and can keep them safe. Visit shop.nrca.net for more information.

Contractor cited for exposing workers to fall hazards

Inspectors with the Department of Labor's Occupational Safety and Health Administration observed employees of Elmer Miller, operating as Miller Building Systems LLC, Arcola, Ill., standing, climbing and walking on trusses and top plates of residential homes at heights greater than 18 feet above ground level without proper fall protection at four worksites. Inspectors allege when workers did wear fall protection, they were not directed to properly tie-off or secure the body harness, rendering the equipment ineffective. The company is not an NRCA member.

Since 2019, OSHA has cited the company 17 times for fall-related violations, including seven times in 2023. Miller exercised his right to contest the 2023 citations and awaits a hearing before an administrative law judge with the Occupational Safety and Health Review Commission to challenge the violations.





HAPPY Honeowners

the world of home improvement and construction, the relationship between contractors and homeowners is built on trust. Homeowners depend on contractors not just for technical expertise but also for guidance when making decisions that align closely with their personal priorities, such as the integrity of their homes, cost-efficiency and, increasingly, environmental impact. This relationship requires contractors to consider a holistic approach and keep immediate and long-term implications of home improvement projects in mind.

Offering environmentally friendly options for customers

by Jay Saldana, P.E.

Recent trends indicate a shift in homeowner preferences, particularly among millennials, who tend to favor sustainable, energy-efficient solutions even if those come with added costs.

According to a survey conducted by Midea, a heat-pump HVAC manufacturer based in Louisville, Ky., 76% of millennial homeowners are actively seeking environmentally responsible options for their homes. Furthermore, an overwhelming 85% of millennial homeowners report a heightened focus on energy efficiency compared with five years ago, and 83% would be interested in discussing energy-efficient technological upgrades with contractors. This data underscores the growing environmental consciousness among younger homeowners and highlights their reliance on contractors to provide sustainable options that align with their goals.

Millennials now comprise a higher percentage of homeowners, and the market continues to tilt toward sustainability, so it is vital contractors stay informed and responsive to evolving homeowner preferences.

Contractors must bolster their service offerings to include the latest eco-friendly technologies and practices, ensuring they can effectively advise and implement solutions that meet the dual demands of efficiency and environmental stewardship. By doing so, contractors will cater to the current needs of homeowners and position themselves as forward-thinking leaders in the construction and renovation industries. Taking a proactive approach to adapting to what clients prefer will help earn trust, ensure lasting relationships and attract new business.

Air quality and shingles

To address these evolving environmental priorities, the construction industry, including residential roofing, has seen a shift toward integrating sustainable materials and methods into building projects. It is up to contractors to educate homeowners about the latest sustainable technologies available on the market.

There are eco-friendly roofing enhancements for shingles, and a new smog-reducing shingle just entered the market. The shingles integrate 3M[™] Smog-Reducing Granules that actively contribute to air quality improvement. This not only helps to purify the air around the home, but it also contributes to wider community health benefits by reducing the level of atmospheric pollutants.

Other significant enhancements in shingle technology also deserve mention. For instance, reflective shingles are designed to deflect sunlight and heat away from buildings, helping to lower cooling costs and reduce the urban heat island effect. Additionally, shingles made from recycled materials are becoming more popular, offering a sustainable option that helps reduce landfill waste.



For contractors, recommending the latest shingle technologies to homeowners addresses the growing demand for sustainable building materials and provides a tangible solution to rising air quality concerns. By educating clients about the benefits of sustainable shingles, contractors can play a pivotal role in promoting environmentally friendly living practices while delivering innovative products that enhance both the value and environmental footprint of homes.



Repair versus replace

For homes with low-slope roof systems, the traditional approach of a full tear-off and replacement often can be substituted with more sustainable, cost-effective methods. When appropriate, contractors can guide homeowners toward more sustainable practices by emphasizing the benefits of patching and repair work in place of complete roof system replacements.

According to International Code Council[®] regulations, roof system replacement typically requires the removal of all existing layers of roof coverings down to the roof deck. Although the regulation is intended to ensure new roof system installations have a solid foundation, many of these layers, especially in low-slope roof systems, may be in good condition and not necessarily need replacement. In such cases, opting for patch and repair work instead of a full tear-off is a more sustainable, cost-effective choice, conserving materials that would otherwise contribute to landfill waste. Furthermore, applying specialized coatings can enhance roof system functionality and longevity of the roof. There are flashing-grade silicone roof sealants that can provide excellent adhesion, flexibility and durability, particularly in climates with significant precipitation. The application of sealants is less resource-intensive than a full roof system replacement and contributes to the sustainability of the building by enhancing energy efficiency and reducing waste.

By educating homeowners about alternatives to full roof system replacement, contractors can help homeowners make informed decisions that balance cost, performance and environmental impact.

Comfort and efficiency

When it comes to home insulation, spray polyurethane foam has emerged as the solution for achieving high-performance, energy-efficient homes. SPF insulation provides an energy-efficient solution that can reduce monthly heating and cooling costs, as well as improve indoor air quality and comfort by sealing off cracks to prevent outdoor pollutants and maintaining stable indoor temperatures to reduce unnecessary energy expenditure. Contractors recommending this advanced insulation technology are equipping homes with a modern approach that can substantially transform living spaces.

SPF insulation, true to its name, is applied by spraying a thin layer onto surfaces such as wall cavities, roof decks and floor joists where insulation is desired. The layer expands, adhering to the applied surface while filling cracks and voids. Traditional home insulation such as fiberglass, mineral wool batts or blown-in cellulose can sag or slump over time, reducing their energy efficiency, but SPF remains firmly in place, providing better long-term thermal performance. Moreover, it acts as an air barrier, effectively sealing cracks and gaps and preventing unintended air entry or escape through the exterior building envelope.

This assembly helps maintain consistent indoor temperatures year-round, reducing the need for

constant heating or cooling, and improves indoor air quality by preventing outdoor pollutants and allergens from entering the home. The efficiency gained decreases the burden on the HVAC system, potentially allowing for the use of a smaller, more energy-efficient system, further lowering monthly energy costs and reducing future HVAC replacement costs.

With homebuilding regulations increasingly focusing on energy efficiency and long-term performance, SPF is a viable insulation choice for new construction and retrofitting projects. Its compliance with rigorous energy standards makes it a compelling choice for contractors and homeowners aiming to enhance the sustainability and future readiness of their properties.

Rainwater collection

Another effective strategy contractors can recommend to homeowners is the installation of rainwater collection systems. These systems are designed to capture rainwater from roofs, which can then be repurposed for watering gardens, landscaping or other outdoor uses. By implementing such collection systems, homeowners can reduce their reliance on municipal water supplies, which not only lowers utility bills but also conserves an everyday resource.

Rainwater collection systems are important in managing stormwater runoff—a growing concern in many urban areas. Capturing rainwater before it can run off into streets and storm drains can help mitigate the risk of flooding and prevent the overloading of sewer systems during heavy rains. Additionally, rainwater collection systems reduce the amount of pollutants carried into local waterways, contributing to healthier aquatic ecosystems. This simple yet effective method contributes positively to the environment while providing practical benefits for homeowners.

Maintenance

When it comes to sustainable home improvement, the role of contractors extends beyond installation and repair. A critical component of their service involves regular roof system inspections and preventive maintenance, not only for the longevity of the roof but also for the overall health and efficiency of the home. Contractors should emphasize to homeowners the value of conducting regular inspections so contractors can spot potential issues early on, such as missing or damaged shingles and blocked drainage systems, and address them before they escalate into more severe and costly problems.

The benefits of proactive roof system maintenance are significant. Routine checks and minor repairs can extend the life of a roof, avoiding the need for premature replacements. Wellmaintained roof systems contribute to the overall structural integrity of the house and offer better protection against environmental elements, which can lead to substantial savings on potential water damage repairs and energy costs. This will not only help homes remain safe and secure but also will reduce waste and the need for new materials.

Contractors should work closely with homeowners to establish a customized inspection schedule that considers the specific needs of each roof based on factors like age, material and typical climate or regional conditions. A location in coastal regions or the risk factor of severe hail, for example, are conditions that require extra maintenance and more regular inspections.

A strong relationship

The emphasis on regular maintenance and personalized care plans by contractors ensures the durability and functionality of homes and promotes a broader commitment to sustainability. Through diligent inspections and maintenance, contractors help homeowners make informed, cost-effective and environmentally conscious decisions, reinforcing the trust and reliability that are the foundation of the homeowner-contractor relationship.

JAY SALDANA, P.E., is principal building scientist for Holcim Building Envelope, Nashville, Tenn.

ZOOK FOOFING

Huber & Associates installs an unusual roof on an Ohio residence

by Chrystine Elle Hanus

Uilt in 1929 when European architecture was prominent, a private residence in Silver Lake, Ohio, was constructed with a uniquely designed thatch-style roof. This distinguished feature required materials and skilled labor not readily available in the U.S. at the time.

A stained-shingle company, Creo-Dipt, devised a way to mimic thatch roofs using a system of framing that incorporated rolled edges and steam-bent shingles. Eaves, gables, valleys and hips were "softened" like a thatch roof, according to architectural details discovered from that time.

During 2021, Huber & Associates, Lake City, Fla., was tasked with replacing the Silver Lake roof system, matching its original style and design.

The Zook look

The Silver Lake home features a Zook-style roof. The design calls for cedar shingles installed on the front in a "drunken-weave pattern," a variation in which shorter, stacked shingles (rather than full-length, steam-bent shingles) are used along the gables and eaves to create a thatch effect.



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Below: Zook roofs were popular during the 1920s and feature short, stacked shingles along the gables and eaves to mimic a thatch effect.



Left and below: The Silver Lake, Ohio, Zook roof before renovations.

Construction details of a thatched gable roof

Project name: Zook roof system replacement Project location: Silver Lake, Ohio Project duration: June 15-July 9, 2021 Roofing contractor: Huber & Associates, Lake City, Fla. Roof system type: Cedar shingles Roofing manufacturer: ABC Supply Co. Inc., Beloit, Wis.

workers took pictures of each roof plane to reference during installation.

This variation was developed by Chicago architect R. Harold Zook, known for his work in suburban Chicago during the 1920s. Zook designed many thatch roofs in Chicagoland that employed the short shingles from the same time period.

The Silver Lake house's original architect, Roy Firestone, used the Zook short-shingle concept with the thatch wave coursing. The front of the home features prominent short shingles while the sides and back have full-length, steam-bent shingles.

"This is an extremely rare feature to have both styles of faux roofing combined," says Jamin Huber, vice president of Huber & Associates. "Not only did the roof have the short, stacked shingles along the eaves and gables, the back of the house features steam-bent shingles along the eaves. The roof we tore off is thought to have been previously replaced after a 1947 fire in the home, but the design is the original from when it was first built."

Before the Huber & Associates team began the tear-off process on the 4,500-square-foot roof, "With a historical home like this, attention to detail is key when attempting to match the original roof," Huber says. "We studied pictures of the original roof and took several pictures of the 1947 reroof to ensure we recreated the same look and appearance."

Wearing harnesses and using ropes and tie-off points for safety, a team of four crew members removed all materials down to the tongue-and-groove wood plank deck. Then, team members fastened ABC[®] PRO GUARD 20 synthetic underlayment to the roof deck followed by No. 1 grade Western Red Cedar Perfection Architectural Shingles custom fabricated and CCA-treated (wood preservative pesticide) by Huber & Associates craftsmen.

"All the specially cut shingles were fabricated in our off-site shop along with steam-bent, full-length 18-inch shingles for the back of the house," Huber says. "Following the details, we tapered the short shingles from full butt thickness to 1/8 of an inch over their 4-inch lengths with as many as 20 courses per

Below: The Zook roof system replacement project in progess



Above and right: Aerial view o the newly completed Zook roof system Ron Policy (middle), current homeowne of the Silver Lake residence with the Huber & Associates roofing team



One-of-a-kind

The Huber & Associates team completed the Silver Lake roofing project in about one month, on time and without incident.

"The end result and seeing such a happy homeowner was by far the most rewarding part of this roof system install," Huber says. "We strive to perfect every roof we install, but of course having an owner ecstatic and the roof looking that beautiful, we can't help but feel proud!"

For its work on the Silver Lake residence, Huber & Associates received a 2024 NRCA Gold Circle Award in the Outstanding Workmanship: Steep-slope category.

"Huber & Associates worked with me to replace the roof and match the design to the original, creating a unique and historically accurate roof," Ron Policy, the current Silver Lake homeowner, wrote in a letter nominating the project for the award. "Because of the complicated nature of my roof, I believe Huber & Associates is deserving of the honorable award."

CHRYSTINE ELLE HANUS is *Professional Roofing's* associate editor and an NRCA director of communications.

foot, each shingle layer glued before fastening with stainless-steel fasteners."

About 44 squares of additional shingles were required to create the numerous Zook-style layers, and more than 10,000 short shingles were used on the front of the house to accommodate the shingles' small exposure.

"Having invented and patented our own steambending equipment in 1982, we install many of these types of roofs, giving us greater ability to match the old roof designs," Huber explains. "As with all older and historical homes, we took careful steps to maintain the look of the original roof while still finding ways for improvement to ensure roof longevity."

Flashings also were custom-fabricated by Huber & Associates craftsmen using 16-ounce copper provided by ABC Supply Co. Inc., Beloit, Wis.

"We are so proud to have completed this roof system replacement project and hope to help keep the legacy of faux thatch roofing alive," Huber says. "Each roof has unique beauty, and we hope to continue this style of roofing for many years to come."

What's to come?

Manufacturers share how they see the future of the roofing industry

by Avery Timmons

he roofing industry is in a state of constant flux. In between developing a knowledgeable workforce, managing finances during an unpredictable economy and navigating constant supply chain woes, roofing professionals always must watch and prepare for ever-changing challenges and trends.

This month, *Professional Roofing* surveyed roofing professionals from the manufacturing community and asked them how they view the roofing industry in the near future.

Challenges

As with any industry, some challenges are unexpected and others are persistent. When asked what challenges they see the industry facing in the next one to three years, respondents shared similar responses. Greg Hudson, director of commercial Dens[®] sales for Georgia-Pacific Gypsum LLC, Atlanta, says he sees upcoming challenges being the same as current industry challenges: workforce development and regulation.

"Training is in place and accessible from multiple outlets," Hudson says. "The challenge is attracting the right talent to the industry and ensuring they are trained properly. [Another challenge is] understanding regulation, standards and sustainability initiatives that effect how we select and install products for roof systems and handle waste."

According to David Sanders, sales director for Beacon Building Products, Herndon, Va., as new workers come into the industry, the challenge is making sure their technical and interpersonal skill development is balanced and blended.

Frank Palmer, senior vice president of sales for Elevate Commercial Roofing Systems, Nashville, Tenn., agrees the labor shortage will continue to be a persistent challenge and notes economic challenges, as well.

"The construction industry doesn't have a strong pipeline of new entrants, which affects all the trades, not just roofing," Palmer explains. "Additional challenges the roofing industry faces in the near future will be driven by economic factors such as high interest rates, which could dampen new construction."

Supply chain issues

Supplying materials for construction projects continues to be a persistent issue for some manufacturers, particularly with lingering effects from the COVID-19 pandemic.

"Issues such as delays in material supplies, plus global logistics and geopolitical challenges, led to increased ordering throughout the industry," Palmer says. "My sense is there still is lingering inventory sitting in warehouses as a result of overpurchasing during the supply chain crunch."

Jason Stanley, CEO of IB Roof Systems, Grapevine, Texas, agrees excess inventory is an issue. He also notes the bullwhip effect.

"Initially, a shortage of supplies caused contractors to order more than needed, leading to excess inventory and a false sense of high demand," Stanley says. "In response, manufacturers and distributors increased production and invested in new equipment, resulting in surplus stock, layoffs and discounts. To address these challenges, a comprehensive approach is needed to minimize disruptions."

However, some manufacturers report no supply chain issues.

"Demand has been strong," Hudson says. "Our supply chain is keeping up."

Trends

Keeping up with technology and trends is essential for manufacturers. Some are seeing an increased demand for stronger roofing products.

"I have seen an increased awareness and demand for resiliency in roof systems," Hudson says. "The impacts of weather and natural disasters, combined with costs and insurance availability, have heightened the need for resiliency."

Stanley notes the size of products seems to be changing, following the idea that "bigger is better," which, he says, may not necessarily be true.

"Thermoplastic roll sizes for low-slope roofing have grown from 6 feet to 10, 12 and even 16 feet," Stanley says. "This increase in size has led to more production by some manufacturers—often without considering the practical effects on workers and how the product is used."

Other manufacturers have spotted trends in the way roofing companies are doing business. Sanders says he has seen more owners selling their businesses to private equity firms.

Others, like Josh Kelly, senior vice president of business development for OMG Inc., Agawam, Mass., note the use of subcontractors seems to be increasing, which may affect other areas of the roof system installation process.

"Introducing new technology is becoming more difficult because products are purchased by one entity and installed by other parties paid only to provide labor at a fixed cost," Kelly says. "This process reduces opportunities for installers to try something new."

Growth and contractions

Despite a qualified labor shortage and supply chain issues, the roofing industry continues to thrive. Stanley notes the industry currently is enjoying a boom in the education and training arena. "The integration of structured certifications and educational programs is gaining momentum," Stanley says. "These initiatives are expected to enhance and standardize the dissemination of knowledge within the industry, ensuring a more unified approach toward professional development and industry practices."

In addition to professional development, Sanders says he has seen growth in the formation of roofing companies. In the past, work was spread across few companies, but now, according to Sanders, the work has evened out across more companies.

Hudson also says he has seen certain aspects of the industry return to "pre-pandemic norms," including overall demand as well as reroofing and new construction projects.

"This [return] shows demand is growing steadily across the U.S.," Hudson explains. "Contractors report backlogs of three to six months, which is more in line with historical averages."

Both Palmer and Kelly expect to see an increase in reroofing demand. Kelly also predicts roofs that had been repaired during the supply chain crisis likely will not last because contractors were forced to use only materials available to them at the time.

"Also, the roofs installed on new construction [projects] during the boom 20 years ago are reaching the end of their service lives and will require replacement," Kelly adds. "Longer-term trends will be driven by system enhancements that address severe weather or new methods of construction that extend the usable life of a roof or improve sustainability in other ways."

Surprises

No matter the predictions made, some aspects of the industry still can surprise experienced roofing professionals.

"It is impressive how the industry bounced back from a tumultuous supply chain environment," Palmer says. "We all learned a great deal about how to manage our businesses with a fixed or reduced amount of supply." Similarly, Hudson noted he was surprised by the amount of stored material.

"Not knowing how long supply chain issues would last, a vast majority of contractors I have spoken with purchased and stored roofing materials during 2021-22 to ensure they could complete jobs on the books and any others that may come," Hudson says. "2023 saw a correction in actual demand while distribution and contractors worked through existing stock."

Kelly also was surprised by the amount of excess material the market brought into stock during 2022.

"It will be interesting to see how this trend affects distribution channels as we go forward," Kelly says.

According to Stanley, he is surprised and concerned by profit margins in the industry, such as the disparity between margin dollars and margin percentages.

"Moving forward, there is a critical need for contractors to refine their estimating processes, ensuring transparency and accuracy that neither overinflates nor undercuts material expenses," Stanley says. "This will safeguard against unwarranted fluctuations in profits."

What's next?

With unprecedented events often taking place, there is no way to know precisely what's to come for the roofing industry. However, manufacturers continue to learn from experience to provide contractors and the community with materials required to complete successful roofing projects.

"In light of the industry's vulnerability to unpredictable forces such as disease, severe weather and shifting policies, manufacturers have taken steps to mitigate risks," Kelly says. "Some of these initiatives include investing in high-speed production equipment to replenish inventory and react quickly to changes in demand and qualifying redundant sources for raw materials to reinforce supply chains and restore confidence."

AVERY TIMMONS is *Professional Roofing's* editorial assistant.

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Roof blisters have a long history in the roofing industry

by Matt Dupuis, Ph.D., P.E.

here are new people entering the roofing industry, which is good and necessary as our industry continues to grow and replenish those retiring from the ranks of the old guard. But there seems to be a problem conveying some lessons learned and information gathered among roofing contractors, consultants and manufacturers alike.

Many new to the industry may not have wielded a mop loaded with hot bitumen, know the unmistakable smell of a hot kettle, or heard the snap and crackle of hot asphalt being mopped on a substrate during a cool morning. This is a result, in no small part, of the shift at the turn of the century from asphalt to single-ply membranes and low-rise foam adhesives.

But for those who still work with hot asphalt, one risk is always present: blisters. Roofing workers used to know how to spot a blister, repair a blister and how to avoid making them. But even that knowledge is fading. And because blisters are not unique to asphalt-based roof systems, I would like to review blister research, types of blisters, what causes them and how to avoid them.

Research

Blisters have been a topic in roofing research for almost 100 years. The first publication I know of that addressed blisters was published just after World War II. Professor Clarence Lund (the same C.E. Lund whose research helped establish the 1:300 ventilation ratio for steep-slope roofing) at the University of Minnesota, Minneapolis, published Principles Affecting Insulated Built-Up *Roofs* in 1952. In 1959, James McCawley's book Roofing discussed blisters in more common terms and expanded on the topic. However, McCawley heavily referenced Lund's work. Interestingly, they both identified how water vapor exacerbates blister growth and formation.

In 1960, the National Research Council published *A Study to Improve Built-Up Roofs* in which the paper "A Theory of the Mechanism of Blistering" by Warren Warden was included. Warden goes into great detail and effort to establish the cause and behavior of blisters.



Plate, or pancake, blisters are the size of a dinner plate and one continuous air space. They can grow to be large in size.



Linear blisters can range from several feet in length to 20 or 30 feet long. They are commonly found at the side laps of sheet membranes.



This close-up view shows a rash blister on detailing tape for an EPDM roof system. These blisters typically are tightly clustered and most common on tapes, laps and liquid coatings and/or membranes but also can occur on asphalt shingles.

Several interesting conclusions came from this work. The first was confirmation that roof blisters are composed almost exclusively of air and water vapor; no hydrocarbons or volatile gases were typically present. Second, Warden identified the gauge pressure inside blisters could be positive and negative compared with the surrounding atmosphere. Blisters under the effect of nighttime radiative cooling of roof membranes generally will cause a negative gauge pressure and deflate. Conversely, heat generated by solar loading and warmer daytime temperatures will cause positive gauge pressure, and a blister will inflate. Finally, Warden opined blisters had fissures that allowed them to exchange a small amount of gases as these pressures changed.

Several decades later, in 1987, Walt Rossiter, a technical researcher, and others examined the gases found in blisters on built-up roof systems installed above polyurethane foam boards. (Polyurethane foam boards were the forerunner to modern polyisocyanurate foam boards.) The change from polyurethane to polyisocyanurate was necessitated by the need for more fire resistance provided by polyisocyanurate. In his

research, Rossiter found a small amount of chlorofluorocarbons in the blisters. These CFC gases were the blowing agents present in the polyurethane. However, a majority of the gas found inside the studied blisters were still atmospheric gases and water vapor.

Research on blistering seemed to be quiet until the early 1990s when blistering in polymermodified bitumen sheets became a pressing technical issue. In 1998, NRCA and National Research Council Canada published "Investigating the cause of blistering in SBS polymer-modified bitumen roofing membranes." This research confirmed the findings of earlier works and explored new variables. The research led NRCA to issue the following recommendations in an interim report: "Consider repairing blisters that occur in high traffic areas. Repair should also be considered if a blister has pulled apart a seam by about one-third or more of the seam width." This effectively set guidance for when to leave blisters alone and when to repair them.

The NRCA Repair Manual for Low-slope Roof Systems, 2nd Edition provides additional guidance regarding blister assessment and repair. The manual recommends repairing blisters if they are open, have excessive loss of surfacing, have exposed reinforcement or have fatigue cracking around them.

In the 1990s, other researchers made important contributions on adhesion tests for polymer coatings and described the mechanics of the blister testing in closed-form equations for the "interfacial fracture energy." This allowed blisters to be explained mathematically.

Blister types

There are three types of blisters, and they are not mutually exclusive. You potentially could observe more than one type in the same roof area. The first type is the plate, or pancake, blister. This classic blister shape typically is the size of a dinner plate or larger. A plate blister is one continuous air pocket. Some plate blisters can be so highly pressurized they can withstand a person standing on them like an air mattress. Photo 1 shows a plate blister in the field.

The next type of blister is the linear blister, which commonly is found where rolled membranes or felts are layered and or installed with staggered laps. The assembly and stagger can lead to a systemic issue where a blister forms along the lap of two layers of felt or polymer-modified bitumen cap sheet, base sheet or vapor retarders. Linear blistering was the primary concern in NRCA's 1990s work. Photo 2 shows a linear blister along a lap.

The third blister is small but prevalent: the rash

blister. Rash blisters are small, typically 1/4 to 1/2 of an inch in size. They are tightly packed together in an area and can be found on most types of roofs. Most commonly they are seen at seam tapes, detailing tapes or liquid coatings/membranes. These can even occur on asphalt shingles, particularly when an asphalt appliqué is used during the manufacturing process. Photo 3 shows a rash blister.

What causes them?

In the simplest terms, a blister is a confined air pocket within the layers of a roof system. For example, blisters can occur between the base sheet and cap sheet of a polymer-modified bitumen roof system (see Photo 4). They also can occur between a vapor retarder and concrete deck and have been observed with single-ply membranes adhered directly to lightweight insulating concrete. Blisters even can occur between an uncured adhesive and single-ply membrane (see Photo 5).

The physics of what occurs inside a blister is generally related to the Ideal Gas Law. If you took high school chemistry, you may remember the relationship between pressure, volume and temperature for a given amount of a gas. (To view the equations I discuss, see "The equations," page 42.)

The Ideal Gas Law is a cornerstone of our physical world. For our purposes, we can assume if volume doesn't change and the amount of gas in the blister is the same, we are left with pressure equals temperature. This goes back to Warden's early work. If temperature goes up, pressure must go up. When the temperature goes down, pressure must go down. This is the most basic description of a blister. If we add volume, as pressure goes up and down, the volume of the blister will grow and shrink accordingly with membrane's elasticity.

If the pressure inside a blister grows and places sufficient stress on its perimeter, there will be an adhesion failure at the perimeter of the confined space and the blister will grow.

Think of this like a ratcheting effect. As the daily heating cycle is applied, pressure can expand a blister to equilibrium to balance the pressure exerted inside the blister and the confining forces of the membrane and its adhesion to the substrate. The blister will continue this cycle of growth, drawing in more air and water vapor nightly, as available, until an equilibrium has been achieved.

Although the Ideal Gas Law dictates the inner workings of a blister, those of us who have been around for a while know wet substrates and water make blisters worse. The pressure of several gases, such as nitrogen, oxygen, water vapor and benzene (benzene is used as a solvent in roofing adhesives and cleaners) can be strongly affected by temperature. But water vapor is by far the most influential.

One way to understand the significance of water vapor is to consider a unit mass, such as a kilogram of each gas. Water vapor is twice as potent in a blister as air (nitrogen and oxygen) and four times more potent than benzene. This is one major reason why water in a roof system makes blisters worse. Water vapor has a pronounced effect because a rise in temperature makes water-laden air twice as pressurized as dry air. Kilo per kilo (or pound for pound), water is twice as bad for pressurizing blisters.

There is another major reason water can lead to blisters, which has to deal with the creation of a void in a roof system. Remember, there needs to be a confined volume of gas to create a blister. Water can create this void when a worker applies hot bitumen over a substrate with elevated water content. Water will rapidly vaporize with heat, create voids and prevent the typical bonding process, leaving an area of unbonded bitumen that can become pressurized as moisture migrates.

This reaction is similar to what is occurring in Photo 5. A void should and typically does collapse, and a



This plate blister was cut in a crosssection as part of a forensic investigation. Note the sealed air space created between the plies of this hot-mopped polymer-modified bitumen roof system. Plate and linear blisters were prevalent throughout this system and were traced to cold mopping temperatures.



This series of blisters occurred on a newly installed black EPDM roof membrane between a water-based adhesive and the membrane. The membrane surface temperature was in excess of 140 F and created plate blisters because the wet lay of the membrane and a water-based adhesive. The blisters will subside once the vapor is out of the system by solar heating.

THE EQUATIONS

THE IDEAL GAS LAW **PV = nRT** P = Pressure $\left(\frac{\text{kg}}{\text{m}\cdot\text{s}^2}\right)$ V = Volume (m³) n = Amount of matter (moles) R = Universal gas constant $\left(\frac{\text{kg}\cdot\text{m}^2}{\text{s}^2\cdot\text{K}\cdot\text{mol}}\right)$ T = Temperature (K)

THE IDEAL GAS LAW WITH SPECIFIC GAS CONTENT

 $PV = mR_{Specific}T$ $P = Pressure\left(\frac{kg}{m \cdot s^{2}}\right)$ $V = Volume (m^{3})$ m = Mass (kg) $R_{specific} = Specific gas constant$ T = Temperature (K)

SPECIFIC GAS CONSTANTS Nitrogen = 296.80 Oxygen = 259.84 Water = 461.52 Benzene = 106.45 bond is made as the excess moisture moves out and the water-based adhesive cures (dries) over the top of a gypsum cover board. But in other roof system types, a void could be present as a result of various issues, including a wet substrate, and moisture will migrate in as the blister grows to equilibrium.

Another major point to consider in blister formation and growth is temperature. Numerous voids are created when a sheet, such as a self-adhering vapor retarder, is applied to a concrete roof deck. It doesn't help that many vapor retarders have poor solar reflectivity and when exposed to sun they dramatically rise in temperature. As discussed, if temperature increases, pressure and volume need to rise to balance the equation.

The solution for a blistered vapor retarder is to place insulation over it. The insulation will regulate the temperature of the vapor retarder; the blisters should collapse as the temperature component is removed and the vapor flow can return to the interior of the building to be handled by the HVAC system. This phenomenon has been observed in the field.

Avoiding blisters

Early research focused on uniform hot bitumen application to avoid creating voids. This still is the case. Mopping asphalts are not what they used to be, so this now may be more difficult. But the point is still valid. Applying bitumen safely at or preferably above its equiviscous temperature with uniform coverage will lessen the chances of a void. You also can avoid blisters by not installing roofing materials over wet substrates. This can be difficult because some cover board and insulation materials can arrive at job sites with elevated moisture contents. This means a field crew needs to be vigilant and inspect products as they arrive for excess moisture and protect stored materials. When in doubt, ask the manufacturer what the materials' moisture content should be and how to test it; preferably, get this information in writing.

As discussed, some blisters are relatively temporary in nature. Remove temperature changes, and blisters should collapse and eliminate themselves. Additionally, some manufacturers can suggest products and application techniques to avoid this altogether or lower the chance of it occurring.

Main points

Blisters on roofs can appear for any number of reasons, but it will help to remember these tips:

- A blister needs a void to begin or, at a minimum, a disbonded area.
- Substrate moisture can create voids or the disbondment necessary for blister formation.
- Blisters need a temperature change to create the pressures needed to grow.
- Water vapor makes pressure changes higher in a blister.
- If the blister is closed, consider leaving it alone.
- If a blister is in a high-traffic area, it may be prudent to repair it even if still closed.
- If a blister has ruptured (opened), has exposed the membrane reinforcement or has fatigue cracks forming around it, cut it out and repair the membrane per manufacturer's guidance and/or NRCA's Repair Manual for Low-slope Membrane Roof Systems, 2nd Edition.

I have forensically sampled blister gases in the field as to find causation and to see whether cold adhesives were the culprit. But when blister gas was subjected to Fourier Transform Infrared Spectroscopy, it consistently returned results of nitrogen, oxygen and water vapor. Therefore, research and field experience have routinely shown blisters only contain atmospheric gas and water. Stay safe out on the roof.

MATT DUPUIS, PH.D., P.E., is president of SRI Consultants, Waunakee, Wis.



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BRIEFINGS

MANUFACTURER NEWS



GAF begins production at new facility

GAF, Parsippany, N.J., has begun production in a new polyisocyanurate insulation manufacturing plant in Peru, Ill.

The 450,000-square-foot plant

added 70 manufacturing and engineering jobs to the community. The facility produces GAF's EnergyGuard[™] line of polyisocyanurate insulation products, including EnergyGuard Non-Halogenated boards made with nonhalogenated flame retardants, custom and tapered design boards, and composite board offerings.

In addition, the team at GAF's new manufacturing plant has donated to four local community organizations: Habitat for Humanity of LaSalle, Bureau and Putnam Counties; Illinois Valley United Way; IV PADS Shelter; and Second Story Teen Center of Princeton, Ill.

"GAF is dedicated to becoming a proud member of the Peru community," says Gary Ashley, plant manager for GAF's Peru facility. "We're proud to support these amazing organizations that are already doing great work in Peru. We look forward to working together to further uplift its residents."

Tremco CPG celebrates graduates

Tremco Construction Products Group, Beachwood, Ohio, has announced the graduation of its first cohort of students from Achieve Green, a Rising Stars program that provides opportunities



for young people to gain the skills and perspectives needed to pursue careers within various green construction fields.

The cohort students followed the International Union of Painters and Allied Trades Apprenticeship Pathway. They are now eligible to complete the final steps to become apprentice glaziers.

"There is a critical need across the nation for skilled workers in the construction industry," says David Hutchinson, Tremco CPG's Rising Stars program director. "Tremco CPG's Rising Stars Program was developed in response to this issue and is proud to work with affiliate programs, including Achieve Green, to provide a pathway for young adults interested in learning a skilled trade."



Cy Jolliffe receives the Garland scholarship.

Garland awards scholarship

The Garland Co. Inc., Cleveland, has awarded an academic scholarship to Cy Jolliffe of Independence, Ohio. The scholarship will help defray expenses related to Jolliffe's pursuit of a degree in construction management at the University of Akron, Akron, Ohio.

The Garland scholarship was created in 2020 to honor the company's 125th anniversary. Each year's award amount coincides with the number of years the company has been in business; this year's scholarship amount was \$12,900.

"We are particularly pleased to give this year's award to a young man aspiring to join our industry and make a positive difference in his community," says David Sokol, president and CEO of Garland Industries Inc.

IKO constructs new facility

IKO, Wilmington, Del., has announced construction of a new asphalt shingle manufacturing facility in Jacksonville, Fla. Dana B. Kenyon Co., Jacksonville, Fla., is the general contracting firm for the project.

The site covers more than 75 acres and is IKO's first shingle production facility in Florida. When completed, the facility will be about 700,000 square feet.



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DISTRIBUTOR NEWS

Beacon honors female roofing professional

Beacon, Herndon, Va., has announced Brooke Laizure, owner of Whirlwind Roofing & Construction, Bixby, Okla., is the winner of the 2024 North American Female Roofing Professional of the Year campaign, which highlights women in the roofing industry throughout the U.S. and Canada.

Laizure is a founding member of National Women in Roofing and chairs the NWiR Oklahoma Council, which she cofounded in 2019. Through NWiR, she is involved in Build My Future, a construction career day for high school students in Tulsa, Okla., and Oklahoma City. She also supports Women Accessing Non-Traditional Trades; is a member of the American Indian Chamber of Commerce; and has served as an Oklahoma Roofing Contractors Association board member. "Being named the North American Female Roofing Professional of the Year goes beyond personal accomplishment; it's a celebration of



Brooke Laizure was named the 2024 North American Female Roofing Professional of the Year.

empowerment in an industry where women continue to break barriers and redefine what it means to be a professional roofing contractor," Laizure says. "I hope my story inspires other women to pursue their passions and make a difference in the industry."

More information about Beacon's annual North American Female Roofing Professional of the Year program is available at go.becn.com/femaleroofpro.

CONTRACTORS

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CONTRACTOR NEWS

Hero Roofing partners with Omnia Exterior Solutions™

Hero Roofing, Newnan, Ga., has partnered with Omnia Exterior Solutions, a portfolio company of CCMP Growth Advisors. "We're not simply selling roof systems and accessories," says Nick Branon, CEO of Hero Roofing. "We have a process in place that is as much about enhanced customer service as it is about technical installations. With that mindset, choosing to partner with Omnia Exterior Solutions makes excellent business sense."

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NRCA NEWS

NRCA releases new podcast episode

NRCA has released a new episode of its podcast series, "Growing America's Roofing Workforce."

Two finalists from the Skills-USA® commercial roofing competition, Noemi Marinez of Florida and Tyler Hutcheson of New York, share how they prepared for the competition.

"Live from SkillsUSA's Awards Ceremony" is available at nrca .net/news-events/podcast; roofing workforce.podbean.com; or wherever you get your podcasts.

OTHER NEWS

Roofing Alliance welcomes new member

The **Roofing Alliance** has announced Frost Roofing Inc., Wapakoneta, Ohio, has joined at the Governor level and is the foundation's 200th member.

Frost Roofing has been a leader in the commercial and industrial roofing industry in northwest Ohio since 1928.



Support mental health in the roofing industry

The construction industry has the second-highest suicide rate of all major industries in the U.S. To support your mental health awareness efforts, NRCA offers several resources:

- Access to Perspectives, an employee assistance program that provides counseling and resources for life issues
- Hard hat stickers that provide a visual reminder for your crews
- A mental health awareness webinar Sept. 17

By working together, we can build a healthier roofing community.

Learn more about NRCA's resources and join the movement for better mental health.

nrca.net/mentalhealth









RT3 opens award nominations

Roofing Technology Think Tank has opened nominations for its 2024 Innovator the Year Award. The award was created to recognize a roofing contractor that has contributed to the advancement of the roofing industry through technical innovation and/or product development in one of the following areas: client service/quality of delivery, employee recruitment/training/retention, environmental impact,

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Nominations are reviewed blindly by a team of RT3 members and past award recipients. The 2024 recipient will be announced at the Best of Success Conference Dec. 4-6 in Bonita Springs, Fla.

The nomination period closes Sept. 30. For more information and to submit an award application, go to rt3thinktank.com/2024award.

Additionally, RT3 has made Richard Carroll, founder of Carroll Consulting Group, Minneapolis, its newest board member.

"We are looking forward to Carroll joining the board," says Karen Edwards, RT3's director. "He has been an active member of RT3 and brings a strong background in the roofing industry that will help us continue to advance the adoption of technology."

UP THE LADDER

ABC Supply Co. Inc. has promoted 51 branch managers to managing partners. The full list of managing partners is available at abcsupply .com/news-events.

Holcim Building Envelope has named **Jason Loftus** vice president of commercial for adhesives, coatings and sealants, and spray foam, and has promoted **Lauren Pagano** to president of adhesives, coatings and sealants, and spray foam.

Mule-Hide Products Co. has promoted **David Phillip** to technical services manager.

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NOVEMBER

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12-15

NRCA's Fall Committee Meetings and Roofing Alliance Member Meetings NRCA Austin, Texas Contact: NRCA's Customer Service Department (866) ASK-NRCA (275-6722) or info@nrca.net nrca.net

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- C Six Architecture, Spring, Texas
- Duffy Engineering, Arlington, Mass. JNS Architecture & Interior Design, Denver

KBA Architects, New Britain, Conn. Matthew Hill, PE, Roanoke, Texas

Open Source Engineering LLC, Falls Church, Va.

Q2Bx LLC, Tryo, Mich.

RH Building Consultants LLC, Hillsboro, Ore.

Tamara Cicchetti Charter, Las Vegas Wallace & Todd PLLC, Lexington, Ky.

CONTRACTORS

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- All American Restoration LLC, Rogers, Minn.
- AMC Construction and Remodeling LLC, Houston, Pa.
- American Restoration Group Inc., Schaumburg, Ill.
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- Ballman Roofing & Coating LLC, Kasota, Minn.
- BluDog Roofing LLC, Wilmington, Del.
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BRIEFINGS

continued from page 54

NRCA NEW MEMBERS

Hernandez Roofing LLC, New Berlin, Wis.
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Intercontinental Build LLC, Washington, D.C.
K Construction LLC, Cornelius, N.C.
Laing Roofing, Kelowna, British Columbia, Canada
M&M Prime Roofing Inc., Hillsboro, Ore.
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Ramp Construction Co. Inc., Eighty Four, Pa.

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Restco Roofing Inc., Mission Viejo, Calif.

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UNDERSTANDING

YOUR EXIT OPTIONS

What business advice are you most thankful for?



"You can't manage what you don't measure."

Nick Sabino, Deer Park Roofing Cincinnati

"Richard Branson, founder of the Virgin Group, believes taking care of employees is crucial for business success. I also like how Jeff Bezos, founder of Amazon, stated customer satisfaction is key to success. When you combine these two, it reminds me of something Pete Korellis, former CEO of Korellis, used to say all the time: 'Korellis is a family business that takes care of its employees. If you take care of them, they'll take great care of your customers.'"

Joel Barnes, Korellis Hammond, Ind.

A Dad Joke

Number of states that held SkillsUSA student roofing contests



#NationalTradesmenDay

On the third Friday in September, National Tradesmen Day honors the men and women whose skills and hard work build the U.S. and keep it running strong. The day recognizes the professionals who maintain the complex infrastructure of our roads, cities, water systems and power grids.

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Scope of works: Slate Re-Roof, Standing Seam Copper Roof, and Gutters Replacement

Contractor: A.W. Farrell & Son, Inc. Erie, Pennsylvania

Copper Roof and Gutters: Armor Fab, LLC, Erie, Pennsylvania. 30-SQ of Copper Roofing. 750' feet of gutter

Project Manager: Randy Pace

Assistant Project Manager: Tony Lazarony

Slate Foremen: Sean Irwin and Gary Fish, and Journeyman Paul Gibbs from Roofer's Local 210. 230-SQ of Slate

Copper Work Foremen: Kody Pace and Chris Hogue from Sheetmetal Local 12

In 1873 ground was broken to begin the building of the St. Peters Cathedral in Erie, Pennsylvania. A slate roof was installed on the steep pitches, along with a standing seam copper roof at lower pitches, and copper gutters set-into the stone perimeter of the roof.

Prior to the re-roof \$2 million in "gold leaf" was applied to the walls and ceilings inside the church. This meant the winter prior to the new roof installation the existing roof had to be protected. The re-roof began in the Spring of 2023, with the 150-year-old slate being removed first, as Sharkskin Ultra SA[®] was installed to protect the Cathedral.

Sharkskin Ultra SA[®] was chosen for the re-roof of the St. Peters Cathedral, in Erie, Pennsylvania, for its long term 50-year warranty and High-Temp rating under the new Greenstone Slate roof and Standing Seam Copper Roof. In addition, the Cathedral is approximately a little more than a mile from Lake Erie. Lake Erie is known for its strong "lake breeze" winds. The men from A.W. Farrell & Son, Inc., have experience with Sharkskin Ultra SA[®] and know once installed properly, it's not going to blow off.

In addition, the walking surface of the





Sharkskin Ultra SA[®] provided the men setting the roof scaffolding, and roof jacks with a safe walking surface. The scaffolding set directly on top of the Sharkskin Ultra SA[®] was leak-free during the roof installation. Sharkskin Ultra SA provided leak-free protection on the entire project from start to finish, as well as providing 12-Month UV Protection.

With the top of the Cathedral steeple at 300' and the distance to the top of the gutters at 80'-100', it was important that the project ran smoothly. Every pallet of slate had to be "ring tested," which means a hammer is used to test the slate, to make sure there are no cracks. The slate will ping in just the right way to confirm, soundness. In addition, slate was pulled from three separate pallets onto one, to maintain even color dispersion across the roof





plane, to eliminate blotches of lighter and darker slates.

The standing seam copper roof panels and copper gutters were fabricated locally by Armor Fab, LLC, owned by Robert Pace. The copper gutters were made in 20' lengths and craned up to the roof. The onsite crane was invaluable for the installation of both the Copper Sheetmetal work and slate roof installation.

Another beautiful roof installation from the men at A.W. Farrell & Son, Inc.





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