Roofing coatings and code compliance

The latest International Building Code® provides clearer guidance

by Mark S. Graham

Until the publication and adoption of the *International Building Code,® 2021 Edition,* building code requirements for roof coating products and applications were somewhat vague and sometimes led to inconsistent interpretations. Beginning with IBC 2021, the code's requirements for roof coatings became clearer and more streamlined, which means interpretations should now be more consistent and what is required of roof coating manufacturers and roofing contractors involved in roof coating applications should be better defined.

Previous editions

In IBC's previous editions, code requirements for roof coatings are addressed in the sections addressing built-up membrane roof systems, spray polyurethane foam roof systems and liquid-applied membrane roof systems. As a result, it has sometimes been unclear which of these sections' requirements apply to new applications of membrane and SPF roof systems and which apply to roof coating applications.

Beginning with IBC 2018 and the *International Residential Code,® 2018 Edition,* a clarifying statement was added indicating the

addition of a new protective roof coating to an existing roof system need not be considered an additional roofing layer when determining the maximum two-roof layer requirement before complete roof system removal and replacement would be required by the code. However, the codes did not specify which of the products in the liquid-applied membrane roof system section were considered protective roof coatings to take advantage of the clarifying statement.

IBC 2021

In IBC 2021, Chapter 2-Definitions, the term roof coating is defined as "a fluid-applied, adhered coating used for roof maintenance or *roof repair*, or as a component of a *roof covering* or *roof assembly*." The italicized words denote specific terms also defined in Chapter 2.

In IBC 2021's Chapter 15-Roof Assemblies and Rooftop Structures, a new section, Section 1509-Roof Coatings, was added to specifically address roof coatings.

Section 1509.1-General indicates the application of a roof coating on a roof covering is required by the code to comply with other requirements in the section and the code's requirements in Section 1505-Fire Classification.

Section 1505 requires roof assemblies to be classified for their external fire resistances. The code requires fire classification to be determined and listed using ASTM E108, "Standard Test Methods for Fire Tests of Roof Coverings," or UL 790, "Standard Test Methods for Fire Tests of Roof Coverings." These are the test methods from which Class A, B and C fire classifications are determined.

Section 1509.2-Material Standards indicates roof coating materials are required to comply with one of the product standards listed in Table 1509.2-Roof Coating Material Standards. This table lists the following coating products:

- Acrylic roof coatings complying with ASTM D6083, "Standard Specification for Liquid Applied Acrylic Coating Used in Roofing"
- Asphalt emulsion coatings complying with ASTM D1227, "Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing"
- Asphalt coatings complying with ASTM D2823, "Standard Specification for Asphalt Roof Coatings, Asbestos Containing"
- Asphalt roof coatings complying with ASTM D4479, "Standard Specification For Asphalt Roof Coatings—Asbestos-Free"
- Aluminum-pigmented asphalt coatings complying with ASTM D2824, "Standard Specification for Aluminum-Pigmented Asphalt Roof Coatings, Nonfibered, and Fibered without Asbestos"
- Silicone coatings complying with ASTM D6694, "Standard Specification for Liquid-Applied Silicone Coating Used in Spray Polyurethane Foam Roofing Systems"
- Moisture-cured polyurethane coatings complying with ASTM D6947, "Standard Specification for Liquid Applied Moisture Cured Polyurethane Coating Used in Spray Polyurethane Foam Roofing System"

These product standards generally require roof coating product packaging to include markings indicating compliance with the applicable standard. Also, code-approved testing agencies providing fire classifications generally require listed products to bear the agency's label (UL mark, FM Approvals' diamond) on product packaging.

In Section 1512-Reroofing, Item 4 under Section 1512.2.1-Roof Recover indicates a new roof coating being applied over an existing roof covering or roof coating is permitted by the code without tearing off existing roof coverings.

NRCA was the proponent of the code change that added IBC 2021's Section 1509. This effectively separates the code's requirements for roof coatings from the code's other requirements for membrane and SPF roof systems.

NRCA has submitted a similar code change proposal in the International Code Council®'s current code development cycle for inclusion into IRC 2024.

NRCA's recommendations

NRCA encourages roof coating manufacturers to make proof of compliance with the applicable ASTM International product standards and code-required fire classifications more readily accessible. Also, manufacturers need to provide the necessary product markings to facilitate code compliance.

To read more about code requirements for protective roof coatings, see "Coating concerns," March 2019 issue.

NRCA also encourages roof system designers and contractors to seek out and use products that comply with the applicable ASTM International product standards and bear an agency label.

Additional information about specifying and using roof coatings is provided in *NRCA Guidelines for the Application of Roof Coatings* and Chapter 7-Surfacings of The NRCA Roofing Manual: Membrane Roof Systems. NRCA members can access electronic versions of both documents for free, and nonmembers can purchase hard copies from shop.nrca.net.

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New standard will address design of barriers in building construction

A new ASTM International standard will describe in detail the design and specification process for water vapor transmission properties of water-resistive barriers and air barriers in building construction. ASTM International's Committee E06 on Performance of Buildings developed the new standard, which will soon be published as E3127.

ASTM International member Danko Davidovic says the new standard will explain how water-resistive barrier and air barrier systems perform in different wall and roof assemblies in various climates when the moisture migration by water vapor diffusion is taken into consideration. The standard reflects the current best building science practices with regards to how water vapor transmission properties of water-resistive barriers and air barriers impact moisture transport and moisture management in wall and roof assemblies. It also acknowledges the dynamic behavior of water-resistive barriers and air barriers and describes the benefits of expanding testing requirements to several temperature and relative humidity levels to better describe behaviors of water-resistive barriers and air barriers in service.

"The new standard is focused on the most relevant factors affecting performance of water-resistive barriers and air barriers, best practices to test, report and specify water vapor transmission characteristics without going into in-depth analysis and not using overwhelming technical language," Davidovic says.

Davidovic envisions several ways the new standard will be used:

- Manufacturers can use the standard as a resource to educate themselves about the actual performance of water-resistive barrier and air barrier products and use it as a guide to improve product characteristics and make the barriers more suitable for certain climates and building envelope types;
- Regulatory agencies can use the guide to improve requirements for water-resistive barrier and air barrier materials and systems in current building codes;
- Architects, designers and engineers will use the standard to better calibrate requirements and specify water vapor transmission properties in design documents; and
- The new standard could be a supplemental educational tool in engineering curriculums pertinent to building envelopes in colleges, as well as in industry trade training programs.

"Recommendations and guidelines provided in the new standard should establish a solid framework for design of more durable wall and roof assemblies that will provide healthier indoor environments for humans and reduce potential risk for moisture-related damage in building envelopes," Davidovic says. "This could lead to longer lifespan of buildings and reduction in construction waste, which also may result in more sustainable and resilient buildings, advocating construction practices that will support such intent."

Drones can assist with job-site safety

Construction contractors use drones for site surveys, stockpile profiling, material measurement and more, allowing them to quickly gather real-time data about job-site progress, according to forconstructionpros.com. Information gathered by drones can be used to get high-quality work done faster and at a lower cost.

Jason Hurdis, global market professional for Caterpillar, Irving, Texas, says drones also can offer the following safety benefits:

- **Removing people from potentially unsafe situations**. Drones can handle jobs risky for humans, such as climbing a pile to measure stockpile inventory or climbing a ladder to access a roof.
- **Getting a bird's-eye view of a job site.** Seeing where people are in relation to machines and other hazards can make it easier to identify blind spots and potential risks before accidents happen.
- **Responding to near misses.** Drones can capture footage of particular tasks or locations, enabling employers to analyze footage and make changes.
- **Reacting to site changes.** What might be a safe situation on day one may not be safe during a project's later stages. A drone can take snapshots of progress over time and help employers incorporate necessary changes into safety plans.

To listen to a podcast discussing drone use in the construction industry, go to professionalroofing.net.

RT3 seeks submissions for Innovator of the Year award

Roofing Technology Think Tank, a group of roofing professionals focused on technology solutions for the industry, is accepting nominations for the 2022 Innovator of the Year award.

The award was created to nationally recognize a roofing contractor who has contributed to the advancement of the roofing industry through technical innovation and/or product development in one of the following areas: production/technology efficiency; safety innovation; client service/quality of delivery; employee recruitment/training/retention; or environmental impact.

Judging criteria will be based on innovation, results, design and strategy. The recipient will be announced at the Best of Success conference in Scottsdale, Ariz., Dec. 4-6.

To be eligible, a roofing contractor must be licensed and bonded for a minimum of five years and have a minimum $2 million in annual revenue. He or she also must be a member of a professional industry association and be able to cite community enrichment ties through support of nonprofits or company culture programs.

The deadline for submissions is Sept. 15. For more information or to submit an award application, visit rt3thinktank.com/award. There is a $50 nomination fee to cover processing and award costs.

Ken Kelly (third from left), president of Kelly Roofing, Bonita Springs, Fla., was the 2021 recipient of RT3's Innovator of the Year award.