

Metal flashing thicknesses

Inconsistencies in building codes can lead to confusion

by Mark S. Graham

Roofing professionals know metal flashings can play important roles in properly terminating at roof perimeters and providing weathertightness for penetrations. However, there is little agreement regarding the thicknesses of metals to be used for specific metal flashing conditions. The following offers some guidance.

Code requirements

Building codes generally provide for minimum metal thicknesses used in roof systems. For example, the *International Building Code,® 2015 Edition* (IBC 2015), Section 1503.2-Flashings indicates: "... Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.483 mm) (No. 26 galvanized steel)."

An identical statement is made in the *International Residential Code,® 2015 Edition* (IRC 2015), Section R903.2-Flashing.

One specific problem with this code requirement is the indication of "(No. 26 galvanized steel)." If using the U.S. Standard Gauge to determine metal gauge from metal thicknesses, 0.019 inch correlates to a 26-gauge metal thickness. However, if using B & S (Brown and Sharpe) gauge conversions, 26 gauge only is 0.0159 of an inch thick.



In standards and codes, the first numerical value provided generally is considered to be the requirement and any parenthetical values generally are interpreted as informational or advisory only. On this basis, 0.019 can be interpreted as the minimum code-required thickness for metal flashings.

IBC 2015's Table 1506.2.9.2 provides minimum metal thicknesses for open valleys lined with metal for asphalt shingle roof systems. This table requires thicker metal than the Section 1503 requirement when using aluminum (0.024 inch), cold-rolled copper (0.0216 inch), lead-coated copper (0.0216 inch) or zinc (0.027 inch). Interestingly, the table indicates metal valley liners thinner than the Section 1503.2 requirement are permitted when using galvanized steel (0.0179 inch), high-yield copper (0.0162 inch) or lead-coated high-yield copper (0.0162 inch). This appears to be an unintended conflict in IBC 2015. IRC 2015's Table R905.2.8.2 is similar.

IBC 2015 Section 1507.5.7 addressing flashings for metal shingle roof systems indicates metal valley flashings shall be the same minimum thickness as required for the metal shingles as described in Table 1507.4.3(1). The table requires minimum metal thicknesses of 0.024 of an inch for aluminum, 12 ounces (0.0162 of an inch) for copper and 0.027 of an inch for zinc. The 12-ounce copper requirement also appears to be an unintended conflict with IBC 2015's Section 1503.2 requirement.

IBC 2015's Section 1504.5-Edge Securement for Low-slope Roofs indirectly provides minimum thicknesses for edge metal flashings (except gutters) for built-up, polymer-modified bitumen and single-ply membrane roof systems. This section requires edge metal be tested according to ANSI/SPRI ES-1 (2011 edition). Within this standard, Table 3 provides minimum recommended metal thicknesses for flatness based on specific ranges of face dimensions.

> "There is little agreement regarding the thicknesses of metals to be used for specific metal flashing conditions"

For example, for exposed face dimensions ranging from 4 inches to 8 inches, using a minimum 24-gauge galvanized or stainless steel, 0.040-inch aluminum or 16-ounce copper is recommended. Thicker metal may be required based on the specific edge metal flashing configuration tested.

NRCA recommendations

In The NRCA Roofing Manual, NRCA provides minimum metal thickness recommendations for specific metal flashing configurations based on roof system type.

For example, in the Architectural Metal Flashing section of The NRCA Roofing Manual, Figure 2-16 provides NRCA's minimum thickness guidelines for weatherability for counterflashings used in low-slope roof systems. NRCA recommends metal counterflashings be a minimum 26-gauge galvanized, prefinished galvanized or stainless steel; 26-gauge Galvalume®; 0.032-inch aluminum or prefinished aluminum; or 16-ounce copper or lead-coated copper. The use of thicker metal for counterflashings may be necessary based on the specific metal counterflashing configuration.

Similarly, the manual's Figure 3-12 provides NRCA's minimum weatherability thickness guidelines for valley metal used in various steep-slope roof systems. For asphalt shingle roof systems, NRCA recommends valley metal be a minimum of 26 gauge for galvanized, prefinished galvanized, Galvalume or stainless steel; 0.016 of an inch for copper-coated stainless steel; 0.032 of an inch for aluminum or prefinished aluminum; or 16 ounces for copper or lead-coated copper.

For slate roof systems, NRCA recommends valley metal be 26-gauge stainless steel; 0.0216-inch copper-coated stainless steel; or 20-ounce copper or lead-coated copper.

Fewer metal types are recommended for slate roof systems because of material compatibility. Thicker metals are recommended for slate roof systems because of their expected longer service lives.

Additional information about metal flashings is provided in the Architectural Metal Flashing section of The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing.

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NIST director joins ASTM International board of directors


Chin

Joannie Chin, deputy director of the Engineering Laboratory at the National Institute of Standards and Technology (NIST), has joined ASTM International's board of directors. Chin assumed the position following the departure of Laurie Locascio, who resigned after taking a new professional position.

ASTM International's board of directors is composed of 25 leaders from a variety of companies, associations and government bodies worldwide. NIST is a federal agency within the U.S. Department of Commerce that advances measurement science, standards and technology.

Chin has served NIST in her current role since 2013 and previously served as a materials research engineer, supervisory materials research engineer and program analyst. She has a background in research at Gould Inc., Eastlake, Ohio; Virginia Polytechnic Institute and State University, Blacksburg; and NIST's Materials and Structural Systems Division. She has worked on fiber-reinforced polymeric composites used in infrastructure and on polymeric material service-life prediction and durability. Chin also is a member of the American Chemical Society and previously has served on the Structural Composites Committee of the Transportation Research Board.

NRCA update

In September, NRCA Technical Services staff attended the Solar Power International trade show at the Mandalay Bay Convention Center in Las Vegas. During the event, visitors saw the latest rooftop photovoltaic offerings from national and international manufacturers. NRCA staff participated in several educational opportunities, including the Solar Energy Industries Association Solar Codes & Standards Annual Workshop Sept. 13. The 2018 Solar Power International trade show will be held Sept. 24-27 in Anaheim, Calif.

New roofing industry association focuses on underlayment

NRCA member Carlisle Construction Materials LLC, Carlisle, Pa.; Gardner-Gibson Inc., Chicago; Maryland Paper Co., Williamsport, Md.; and NRCA member Mid-States Asphalt, Tuscaloosa, Ala., have formed the Asphalt Underlayment Council (AUC) to cultivate the long-term success of underlayment products for building envelope applications for residential and commercial structures. An AUC Interim Executive Council will help support the standardization of underlayment product quality, performance and integrity.

Current AUC members include NRCA member GAF, Parsippany, N.J.; NRCA member GAP Roofing, Pryor, Okla.; GMC Roofing & Building Paper Products Inc., Shafter, Calif.; NRCA member Mule-Hide Manufacturing, Cornell, Wis.; NRCA member Owens Corning, Toledo, Ohio; NRCA member Polyglass USA, Deerfield Beach, Fla.; and Warrior Roofing Manufacturing Co. Inc., Tuscaloosa.

"With the introduction of new types of roofing underlayment products, it was felt that an industry group was needed to monitor, administer and contribute to product standards," says AUC Executive Director Michelle Miller.

Standards and requirements for roof system repair, reroofing, roof recovering and replacement often lack clarification within the definition of underlayment. AUC's inaugural technical committee will focus on code classifications and industry regulations.

"The pathways to code compliance vary depending on the product type," says John Woestman, AUC's technical director. "The continuous influx of newly designed products and ever-evolving regulations requires a strong knowledge base with deep understanding of the codes prevalent in this industry."

AUC will actively help develop building codes to ensure the high performance of roof systems, as well as raise awareness of regulatory issues through educational initiatives and industry outreach.

"We will work directly with installers and contractors who may not be aware of the various product categories that are occurring in the underlayment industry," says Robert Almon, AUC Interim Executive Council member. "Understanding the nuances of underlayment, as well as discerning codes and comprehending code compliance are vital. With our combined historical experience, AUC is in a prime position to ensure all the issues surrounding underlayment are addressed through a range of resources from an engaged council, committees and membership to a vibrant website that will be launched soon, growing media outreach, literature development and ongoing educational opportunities."

AUC invites roof underlayment firms to join the association to help make its important initiatives viable and sustainable. To learn more about AUC, visit www.aucunderlaymentcouncil.org, email info@aucunderlayment council.org or call (847) 686-2243.